

VIVEKANANDHA

COLLEGE OF ENGINEERING FOR WOMEN

(An Autonomous Institution Affiliated to Anna University-Chennai Approved by AICTE – Accredited by NAAC and ISO 9001:2008 Certified) Elayampalayam , Tiruchengode – 637 205, Namakkal District, Tamilnadu.



CURRICULUM & SYLLABI – 2019

FOR

UNDER GRADUATE(UG)

B.TECH. – INFORMATION TECHNOLOGY

REGULATION 2019

CHOICE BASED CREDIT SYSTEM

After 16th Board of Studies

(Applicable to the students admitted from the academic year 2021-2022 onwards)





B.TECH. INFORMATION TECHNOLOGY

Regulations - 2019

CHOICE BASED CREDIT SYSTEM

COLLEGE VISION

To impart value based education in Engineering and Technology to empower young women to meet the societal exigency with a global outlook

COLLEGE MISSION

- To provide holistic education through innovative teaching-learning practices
- To instill self confidence among rural students by supplementing with cocurricular and extra-curricular activities
- To inculcate the spirit of innovation through training, research and development
- To provide industrial exposure to meet the global challenges
- To create an environment for continual progress through lifelong learning

DEPARTMENT VISION

Providing quality education to transform students into technically competent skilled women to excel in IT profession, innovation and entrepreneurship

DEPARTMENT MISSION

- To empower knowledge on cutting-edge technologies in the field of Information Technology to develop innovative solutions for real-world problems
- To create a platform for innovation, research and new technology development

• To inculcate ethical practices, life-long learning and sense of societal responsibilities to support the career and personal development of the learner

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO 1: Graduates will have knowledge in various programming languages and continuous up-gradation in emerging IT technologies.

PEO 2: Graduates will be able to analyze and find solutions for current industrial needs.

PEO 3: Graduates will contribute to the society by their ethical behavior and effective teamwork

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1	Optimal Solution : Graduates will be able to develop computer applications for the real life problem using suitable programming platform
PSO2	Successful Career : Graduates will be able to think innovatively and work on multi-disciplinary areas

PROGRAMME OUTCOMES (POs):

Undergraduate engineering programmes are designed to prepare graduates to attain thefollowing program outcomes:

- 1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineeringproblems.
- 2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public

health and safety, and the cultural, societal, and environmental considerations

- 4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- 11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

Mapping of Program Educational Objectives with Program Outcomes

A broad relation between the program objective and the outcomes is given in the following table

Programme Educational Objectives		Programme Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
I					\checkmark				\checkmark					
II				\checkmark					\checkmark	\checkmark				
III			\checkmark		\checkmark				\checkmark	\checkmark	\checkmark			

			PROGRAM OUTCOME(POs)									PSOs				
SEM	COURSE CODE	COURSE NAME	P 0 1	P 0 2	P 0 3	P 0 4	Р О 5	P 0 6	P 0 7	P 0 8	P 0 9	PO 10	P 0 11	P 0 12	PSO 1	PSO2
	U19MA101	Calculus	3	3	3	3									2	1
	U19EN101	English For Communication- I						2			3	3		3		2
	U19PH105	Engineering Physics	3	2	1	2	1	2							1	2
Т	U19CS101	Programming for Problem Solving	3	3	3	2	2							2	3	2
1	U19GE101	Engineering Graphics	3	3	2	3	3								2	2
	U19PH106	Physics Laboratory	3	3	1	2	2	1	1					1	1	2
	U19CS102	Computer Practices Laboratory	3	3	3	1	3			2	2	3		2	3	2
	U19MA202	Linear Algebra and Ordinary Differential Equations	3	3	3	2	1								2	1
Π	U19EN202	English For Communication- II						2			3	3		3	2	2
	U19CH207	Engineering Chemistry	3	3	2	2	1	2	2				1	2	2	1
	U19EE201	Basic Electrical and Electronics	3	2		2								3	3	2

Mapping of Courses with Program Outcomes

Basic Civil and U19GE202 Basic Civil and Mechanical Engineering 3 3 2 1 2	
U19GE202 Mechanical 3 3 2 1 2 Engineering	<u> </u>
019GE202 Mechanical 3 3 2 1 2 Engineering Image: State S	0 1
Engineering	2 1
Object oriented	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	3
U19TA201 500190 0000	
U19CH208Chemistry Laboratory3312211	1 2
Engineering	
U19GE203 Practices 3 2 3 3 2 1 2	2 1
Laboratory	2 1
U19MA304 Discrete 3 3 2 2 2 2	2 2
Mathematics	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	2 1
and Circuits	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	2 1
Communications	
U19IT303 Data Structures	0 0
	2 3
Computer	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	3 2
Architecture	
III Professional	
U19IT305 Ethics and Human $\begin{vmatrix} 2 \\ 1 \end{vmatrix} \begin{vmatrix} 2 \\ 1 \end{vmatrix} \begin{vmatrix} 2 \\ 2 \end{vmatrix} \begin{vmatrix} 1 \\ 3 \end{vmatrix}$	1 2
Values	
U19TA302 தொழில்நடப்மும்/	
Technology	
Circuits and	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	3 2
Laboratory	5 2
U19IT306 Data Structures	2 2
Laboratory 3 3 3 2 2 2 2 2	3 3
Statistics and	
U19MA405 Numerical 3 3	2
Methods	
LI19IT407 Linear Integrated 3 2 1 1	3 2
Circuits 5 2 1 1	5 2
U19IT408 Operating Systems 3 3 2 2 2	2 2
Design and	
	2 2
U19IT409 Analysis 2 3 2 3	
IV U19IT409 Analysis 2 3 2 3 of Algorithms	
IV U19IT409 Analysis of Algorithms 2 3 2 3 Database Image: Constraint of the second	
IV U19IT409 Analysis of Algorithms 2 3 2 3 U19IT410 Database Jatabase Jatabase Jatabase Jatabase U19IT410 Management 3 3 3 2 2 1 1 1	2 2
IVU19IT409Analysis of Algorithms2323U19IT410Database Management Systems33322	2 2
IV U19IT409 Analysis of Algorithms 2 3 2 3 U19IT409 Analysis of Algorithms 2 3 2 3 U19IT410 Database Management Systems 3 3 3 2 2 U19IT410 Management Systems 3 3 3 2 2	2 2
IVU19IT409Analysis of Algorithms232323U19IT410Database Management Systems33322111U19IT411Operating Systems Laboratory333221111	2 2 3 2
IVU19IT409Analysis of Algorithms232323U19IT410Database Management Systems33322111U19IT411Operating Systems Laboratory333221111Database U19IT411Operating Systems Laboratory333221111	2 2 3 2

		Systems Laboratory														
	U19IT513	Data Warehousing and Data Mining	2	2	1	2	2							3	3	2
	U19IT514	Microprocessor and Microcontroller	2	2	1		1	1			1	1			2	2
	U19IT515	Web Technology	3	1	3	1	3							2	2	3
V	U19IT516	Python Programming	3	3	1	1	2							2	3	2
	U19IT517	Web Technology Laboratory	3	3	3	2	1				2			2	3	2
	U19IT518	Python Programming Laboratory	3	3	1	1	2							2	3	2
	U19CS626	Compiler Design	3	3	3	2	2		1		2	1		2	3	3
	U19IT619	Introduction to Machine Learning	3	2	2	2	2						2	2	2	2
	U19IT620	Software Engineering	3	2	1	1									3	3
VI	U19IT621	Computer Communication Networks	3	3	3	2	1					2		2	2	2
	U19IT622	Machine Learning Laboratory	3	2	2	2	2						2	2	2	2
	U19IT623	Case Tools Laboratory	3	2	1	1									3	3
	U19EN603	Communication Skills Laboratory							2			3	3		3	
	U19IT724	Big Data Analytics	3	3	3	2	1							2	3	2
	U19IT725	Building of Internet of Things	3	2	3	1	1				1	1		2	3	3
VII	U19IT726	IoT and Data Analytics Laboratory	3	3	3		2							2	2	2
	U19IT727	Internship Training andSummer Project	2	2	3	3	3			2	2	3	3	2	3	3
VIII	U19IT828	Project Work	2	2	3	3	3			2	2	3	3	2	3	3



VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205



LIST OF HS,BS, ES COURSES

	Course	Category	Perio	ods / W	eek	Credit	Max	imum	Marks
Course Code	Name	Gutegory	L	Т	Р	С	CA	ESE	Total
U19EN101	English For Communication- I *	HSC	3	0	0	3	40	60	100
U19EN202	English For Communication- II *	HSC	3	0	0	3	40	60	100
U19TA201	தமிழர் மரபு / Heritage of Tamils	HSC	2	0	0	1	40	60	100
U19TA302	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	HSC	2	0	0	1	40	60	100
U19MA101	Calculus*	BSC	3	1	0	4	40	60	100
U19PH105	Engineering Physics ^{\$}	BSC	3	0	0	3	40	60	100
U19PH106	Physics Laboratory ^{\$}	BSC	0	0	4	2	60	40	100
U19MA202	Linear Algebra and Ordinary Differential Equations*	BSC	3	1	0	4	40	60	100
U19CH207	Engineering Chemistry@	BSC	3	0	0	3	40	60	100
U19CH208	Chemistry Laboratory @	BSC	0	0	4	2	60	40	100
U19CS101	Programming for Problem Solving*	ESC	3	0	0	3	40	60	100
U19GE101	Engineering Graphics*	ESC	2	0	3	3	40	60	100
U19CS102	Computer Practices Laboratory*	ESC	0	0	4	2	60	40	100
U19EE201	Basic Electrical and Electronics Engineering	ESC	3	0	0	3	40	60	100
U19GE202	Basic Civil and Mechanical Engineering*	ESC	3	0	0	3	40	60	100
U19IT201	Object oriented Programming	ESC	2	0	2	3	40	60	100
U19GE203	Engineering Practices Laboratory*	ESC	0	0	4	2	60	40	100

MANDATORY COURSES

Course Code	Course Name	Perio	ods / `	Week	Credit	Maximum Marks		
		L	Т	Р	С	CA	ESE	Total
U19MCFY1	Environmental Science and Engineering	3	0	0	0	100		100
U19MCFY2	Indian Constitution and Universal Human values	3	0	0	0	100		100
U19MCSY3	Numerical Ability	3	0	0	0	100		100
U19MCSY4	Verbal Ability	3	0	0	0	100		100
U19MCTY5	Logical Reasoning	3	0	0	0	100		100
U19MCTY6	Personality Development	3	0	0	0	100		100



(Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205



CURRICULUM BREAKDOWN STRUCTURE(Applicable to the Students admitted in the Academic Year 2022 -23)

Summary of Credit Distribution

				Ser	nester				Tatal	Curriculum Content
Category	SEM 1	SEM 2	SEM 3	SEM 4	SEM 5	SEM 6	SEM 7	SEM 8	No.of Credits	(% of total number of credits of the program)
HS	3	4	1						8	4.84
BS	9	9	4	4					26	15.57
ES	8	11	5	3					27	16.16
РС			14	14	16	15	7		66	39.5
PE					3	3	6	6	18	10.77
OE					3	3	3		9	5.38
EC						1	4	8	13	7.78
Semester wise total	20	24	24	21	22	22	20	14	167	100.00

CURRICUL	CURRICULUM BREAKDOWN STRUCTURE (Applicable to the Students admitted in the Academic year 2021 - 2022)												
	Summary of Credit Distribution												
				Ser	nester					Curriculum Content			
Category	SEM 1	SEM 2	SEM 3	SEM 4	SEM 5	SEM 6	SEM 7	SEM 8	Total No.of Credits	(% of total number of credits of the program)			
HS	3	3							6	3.64			
BS	9	9	4	4					26	15.76			
ES	8	11	5	3					27	16.36			
РС			14	14	16	15	7		66	40.00			
PE					3	3	6	6	18	10.91			
OE					3	3	3		9	5.45			
EC						1	4	8	13	7.88			
Semester wise total	20	23	23	21	22	22	20	14	165	100.00			

HS-HUMANITIES AND SOCIAL SCIENCE, **BS**-BASIC SCIENCES, **ES**- ENGINEERING SCIENCES, **PC**- PROFESSIONAL CORE, **PE**-PROFESSIONAL ELECTIVES, **OE**-OPEN ELECTIVES, **EEC**- EMPLOYABILITY ENHANCEMENT COURSES

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Programme	B.TECH	P	rogramme C	ode	104		Regulation	on	201	9	
Department	INFORMATION	TECHNOLOGY			<u> </u>		Semest	ter	I		
(4	Applicable to the	CU students admitted	J RRICULU d from the a	J M cade	mic ye	ear 2021	- 2022 c	onward	ls)		
Course	Course	e Name	Category	Per	riods /	Week	Credit	Max	imum	Marks	
Code			Category	L	Т	Р	С	CA	ESE	Total	
			THEORY	1	-	1				1	
U19MA101	Calculus*		BSC	3	1	0	4	40	60	100	
U19EN101	English For Co	mmunication- I*	HSC	3	0	0	3	40	60	100	
U19PH105	Engineering Ph	iysics ^{\$}	BSC	3	0	0	3	40	60	100	
U19CS101	Programming f Problem Solvir	or ng*	ESC	3	0	0	3	40	60	100	
U19GE101	Engineering G	raphics*	ESC	2	0	3	3	40	60	100	
		Р	RACTICA	L	•						
U19PH106	Physics Labora	atory ^{\$}	BSC	0	0	4	2	60	40	100	
U19CS102	Computer Prac Laboratory*	tices	ESC	0	0	4	2	60	40	100	
	MANDATORY COURSES										
	Mandatory cou	rse - I	МС	3	0	0	0	100	-	100	
						Total	20	420	380	800	

BSC - Basic Science Courses, ESC- Engineering Science Courses, PCC- Professional core courses, PEC- Professional Elective courses, OEC- Open Elective courses, MC-Mandatory courses, HS-Humanities and Social Sciences, EEC- Employability Enhancement Courses, SI- Summer Industry Internship, PROJ-IT-Project, CA-Continuous Assessment, ESE - End Semester Examination

* Common for all branches

\$ Common for CSE, CST, IT, BT

	VIVEKANANDH (Autonomous Insti Elayamp	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University) Elayampalayam, Tiruchengode – 637 205											
Programme	в.тесн	Programme Code	104	ł	Regu	lation		201	9				
Department	INFORMATION TE	CHNOLOGY	Ser	neste	er			II					
(Applica	able to the students adr	CURRICU nitted from the	LUN e aca	/I Idem	ic year	2021 - 2	2022 o	nward	s)				
Course Code	Course Name	Category	Per We	riods eek	/	Credit	Max	imum I	Marks				
			L	Т	Р	C	CA	ESE	Total				
	ו••••	THEOR	RY	r –		[1						
U19MA202	Cinear Algebra and Ordinary Differential Equations*	BSC	3	1	0	4	40	60	100				
U19EN202	English For Communication- II *	HSC	3	0	0	3	40	60	100				
U19CH207	Engineering Chemisrty [@]	BSC	3	0	0	3	40	60	100				
U19EE201	Basic Electrical and Electronics Engineering	ESC	3	0	0	3	40	60	100				
U19GE202	Basic Civil and Mechanical Engineering*	ESC	3	0	0	3	40	60	100				
U19IT201	Object oriented Programming	ESC	2	0	2	3	40	60	100				
U19TA201	தமிழர் மரபு / Heritage of Tamils [%]	HSC	2	0	0	1	40	60	100				
		PRACTIO	CAL										
U19CH208	Chemistry Laboratory [@]	BSC	0	0	4	2	60	40	100				
U19GE203	Engineering Practices Laboratory*	ESC	0	0	4	2	60	40	100				
MANDATO	RY COURSES												
	Mandatory course - II	МС	3	0	0	0	100	-	100				
					Total	24	500	500	1000				

BSC - Basic Science Courses, ESC- Engineering Science Courses, PCC- Professional core courses, PEC- Professional Elective courses, OEC- Open Elective courses, MC-Mandatory courses, HS-Humanities and Social Sciences, EEC- Employability Enhancement Courses, SI- Summer Industry Internship, PROJ-IT-Project, CA-Continuous Assessment, ESE - End Semester Examination

* Common for all branches

@ Common for CSE, CST, IT, BT

% Courses offered for the students who admitted from 2022 - 23 Academic Year

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Programme	З.ТЕСН		Prog	gramme Co	ode	104	Regulation	on	2019
Department I	NFORMATION TECHN	OLOGY					Semest	er	III
	(Applicable to the stud	C lents admitte	URRI d from	CULUM	mic year	2021 - 2	2022 onw	ards)	
Course Code	Course Norme	Catagory		Periods /	Week	Credit	Max	imum	Marks
Course Code	Course Name	Category	L	Т	Р	С	CA	ESE	Total
		ТН	EOR	Y	L	L			L
U19MA304	Discrete Mathematics *	BSC	3	1	0	4	40	60	100
U19EC308	Electronic Devices and Circuits	ESC	3	0	0	3	40	60	100
U19IT302	Data Communications	PCC	3	0	0	3	40	60	100
U19IT303	Data Structures	PCC	3	0	0	3	40	60	100
U19IT304	Computer Organization & Architecture	PCC	3	0	0	3	40	60	100
U19IT305	Professional Ethics and Human Values	PCC	3	0	0	3	40	60	100
U19TA302	தமிழரும் தொழில்நட்பமும் / Tamils and Technology [%]	HSC	2	0	0	1	40	60	100
	1	PRA	CTIC	CAL	1	•			r
U19EC309	Circuits and Devices Laboratory	ESC	0	0	4	2	60	40	100
U19IT306	Data Structures Laboratory	PCC	0	0	4	2	60	40	100
	Ν	ANDATC)RY (COURSE	S				
	Mandatory Course - III	MC	3	0	0	0	100	-	100
		· ·		Tota	l Credit	24	500	500	1000

BSC - Basic Science Courses, ESC- Engineering Science Courses, PCC- Professional core courses, PEC- Professional Elective courses, OEC- Open Elective courses, MC-Mandatory courses, HS-Humanities and Social Sciences, EEC- Employability Enhancement Courses, SI- Summer Industry Internship, PROJ-IT-Project, CA-Continuous Assessment, ESE - End Semester Examination

*Common to CSE & IT

% Courses offered for the students who admitted from the Academic Year 2022 - 23.

	VIVEKAN (Autonomous Elay	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205									
Programme	В.ТЕСН			Pro	gramme C	ode	104	Regulation	on	2019	
Department	INFORMATION	TECHN	OLOGY					Semest	er	IV	
	CURRICULUM (Applicable to the students admitted from the academic year 2021 - 2022 onwards)										
					Periods	/ Week	Crea	lit Max	kimum	Marks	
Course Code	e Course	Name	Category	L	Т	Р	C	CA	ESE	Total	
THEORY											
U19MA405	Statistics and Numerical Methods*		BSC	3	1	0	4	40	60	100	
U19IT407	Linear Integrat Circuits	Linear Integrated Circuits		3	0	0	3	40	60	100	
U19IT408	Operating Syst	ems	PCC	3	0	0	3	40	60	100	
U19IT409	Design and An of Algorithms	alysis	PCC	3	1	0	4	40	60	100	
U19IT410	Database Management S	ystem	PCC	3	0	0	3	40	60	100	
			PRA	CTIC	CAL						
U19IT411	Operating Syst Laboratory	ems	PCC	0	0	4	2	60	40	100	
U19IT412	Database Management Systems LaboratoryPCC00					4	2	60	40	100	
MANDATORY COURSES											
	Mandatory Cou	rse - IV	MC	3	0	0	0	100	-	100	
					Tota	l Credit	21	420	380	800	

CA - Continuous Assessment, ESE - End Semester Examination, BSC - Basic Science Courses, ESC - Engineering Science Courses, PCC – Professional Core Courses, HSC - Humanities and Social Science Courses, MC- Mandatory courses

*Common to CSE & IT

	VIVEKA (Autonomo	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205										
Programme	В.ТЕСН		1 9 /	F	Programme	Code	104	Regulati	on	2019		
Department	INFORMATION	N TECHN	NOLOGY					Semest	er	V		
	CURRICULUM (Applicable to the students admitted from the academic year 2021 - 2022 onwards)											
Course Co. 1	G	NT	Catal		Periods	/ Week	Crea	lit Max	kimum	Marks		
Course Cod	Course Name		Category	L	Т	Р	C	CA	ESE	Total		
THEORY												
U19IT513	Data Warehous and Data Minin	sing ng	PCC	3	0	0	3	40	60	100		
U19IT514	Microprocessor Microcontrolle	r and r	PCC	3	0	0	3	40	60	100		
U19IT515	Web Technology		PCC	3	0	0	3	40	60	100		
U19IT516	Python Program	nming	PCC	3	0	0	3	40	60	100		
	Professional Elective -I		PEC	3	0	0	3	40	60	100		
	Open Elective-	Ι	OEC	3	0	0	3	40	60	100		
	-		PRA	CTIC	AL		•					
U19IT517	Web Technolo Laboratory	gy	PCC	0	0	4	2	60	40	100		
U19IT518	Python Program Laboratory	ython Programming Aboratory PCC 0 0 4 2 60 40 1										
MANDATORY COURSES												
	Mandatory Cou	rse - V	МС	3	0	0	0	100	-	100		
	Total Credit 22 460 440 900											

CA - Continuous Assessment, ESE - End Semester Examination, BSC - Basic Science Courses, ESC - Engineering Science Courses, PCC – Professional Core Courses, HSC - Humanities and Social Science Courses, MC- Mandatory courses

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Programme	В.ТЕСН			Pro	gramme C	ode	104]	Regulatio	on	2019
Department	INFORMATION	TECHN	OLOGY						Semest	er	VI
	(Applicabl	e to the s	CURR tudents admi	ICUI tted fr	LUM from the act	ademic	year 20	021 -	- 2022 ог	nwards)
					Periods	/ Wee	k C	redit	Max	imum	Marks
Course Code	Course Na	me	Category	L	Т	Р		С	CA	ESE	Total
			TH	EOR	Y						
U19CS626	Compiler Design	n *	PCC	3	0	0		3	40	60	100
U19IT619	Introduction to N Learning	ntroduction to Machine earning		3	0	0		3	40	60	100
U19IT620	Software Engineering		PCC	3	0	0	0 3		40	60	100
U19IT621	Computer Communication Networks		PCC	3	0	0		3	40	60	100
	Professional El II	ective-	PEC	3	0	0		3	40	60	100
	Open Elective-	II	OEC	3	0	0		3	40	60	100
			PRA	CTIC	AL						
U19IT622	Machine Learnin Laboratory	ng	PCC	0	0	2		1	60	40	100
U19IT623	Case Tools Labo	oratory	PCC	0	0	4		2	60	40	100
U19EN603	Communication Skills Laboratory		EEC	0	0	3		1	100	-	100
		N	IANDATO	RY (COURSE	S			_		
	Mandatory Cour	se - VI	MC	3	0	0		0	100	-	100
					Tota	l Cred	lit 2	22	560	440	1000

*Common syllabus for CSE & IT

CA - Continuous Assessment, ESE - End Semester Examination, BSC - Basic Science Courses, ESC - Engineering Science Courses, PCC – Professional Core Courses, HSC - Humanities and Social Science Courses, MC- Mandatory courses

	VIVEKANANDH (Autonomous Institu Elayamp	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205									
Programme	В.ТЕСН		Prog	gramme C	ode	104	Regulati	on	2019		
Department	INFORMATION TECHN	NOLOGY					Semes	ter	VII		
	CURRICULUM (Applicable to the students admitted from the academic year 2021 - 2022 onwards)										
Course	Course Norres	Catagory		Periods	/ Week	Cree	dit Max	ximum	Marks		
Code	Course Name	Category	L	Т	Р	C	CA	ESE	Total		
	THEORY										
U19IT724	Big Data Analytics	PCC	3	0	0	3	40	60	100		
U19IT725	Building of Internet of Things	PCC	3	0	0	3	40	60	100		
	Professional Elective- III	PEC	3	0	0	3	40	60	100		
	Professional Elective- IV	PEC	3	0	0	3	40	60	100		
	Open Elective-III	OEC	3	0	0	3	40	60	100		
	PRACTICAL	· · ·					•				
U19IT726	IoT and Data Analytics Laboratory	PCC	0	0	2	1	60	40	100		
U19IT727	Internship Training and Summer Project	EEC	0	0	8	4	100	-	100		
	Total Cred							340	700		

CA - Continuous Assessment, ESE - End Semester Examination, BSC - Basic Science Courses, ESC - Engineering Science Courses, PCC – Professional Core Courses, HSC -Humanities and Social Science Courses, MC- Mandatory courses

	VIVEK A (Autonomo	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205										
Programme	B.TECH			Pro	gramme C	ode	104	Regulati	on	2019		
Department	INFORMATION	TECHN	OLOGY					Semes	ter	VIII		
	CURRICULUM (Applicable to the students admitted from the academic year 2021 - 2022 onwards)											
		Periods / Week Credit Maximum							ximum	Marks		
Course Code	e Course	Name	Category	L	Т	C	CA	ESE	Total			
			TH	EOR	Y							
	Professional Ele	ective-V	PEC	3	0	0	3	40	60	100		
	Professional El VI	ective-	PEC	3	0	0	3	40	60	100		
	_		PRA	CTIC	CAL				-			
U19IT828	Project Work EEC 0 0 16 8 60 40 100									100		
	Total Credit 14 140 160 300											

Cumulative Credits: 165 (Applicable to the students admitted in the academic year 2021-2022) Cumulative Credits: 167 (Applicable to the students admitted in the academic year 2022-2023)

Type of Courses

PCC	:	Professional Core Courses
PEC	:	Professional Elective Courses
OEC	:	Open Elective Courses
ITSP	:	Internship Training and Summer Project
EEC	:	Employability Enhancement Course
MC	:	Mandatory Courses
HSC	:	Humanities And Sciences
ESC	:	Engineering Sciences
BSC	:	Basic Sciences

PROFESSIONAL ELECTIVE COURSES : VERTICALS

Vertical I	Vertical II	Vertical III	Vertical IV	Vertical V
NETWORKS	CYBER SECURITY	ARTIFICIAL INTELLIGENCE & MACHINE LEARNING	INTERNET OF THINGS & CLOUD COMPUTING	PROBLEM SOLVING & SOFTWARE DEVELOPMENT
Mobile Adhoc Networks	Information Security	Advanced Database Systems	Embedded Systems	Design Thinking
Wireless Sensor Networks	Cyber Security	Data Science	Smart Sensor Technologies	Agile Methodologies
Distributed Systems	Cryptography and Network Security	Deep Learning	Security in Computing	Software Project Management
Green Computing	Cyber Law and Ethical Hacking	Natural Language Processing	Software Defined Networks	Blockchain Technology
Java Programming	Social Network Analysis	Soft Computing	Fundamentals of Virtualization	Total Quality Management
Network Programming	Semantic Web	Business Intelligence & Its Applications	Information Storage Management	Building Enterprise Applications
Service Oriented Architecture	Cyber Forensics	Digital Image Processing	Big Data Tools and Techniques	Internet Marketing and E- Commerce
Socket Programming	Biometrics Systems	Knowledge Management	Cloud Computing	Game Theory and its Applications

Full stack Development

Registration of Professional Elective Courses from Verticals: Professional Elective Courses are listed in groups called verticals that represent a particular area of specialisation / diversified group. Students are permitted to choose all the Professional Electives from a particular vertical or from different verticals. Further, only one Professional Elective course shall be chosen in a semester horizontally (row-wise). However, two courses are permitted from the same row, provided one course is enrolled in Semester V to VIII. The registration of courses for B.E./B.Tech (Honours) or Minor degree shall be done from Semester V to VIII. The procedure for registration of courses explained above shall be followed for the courses of B.E/B.Tech (Honours) or Minor degree also.

PROFESSIONAL ELECTIVE COURSES

VERTICAL I: NETWORKS

	VIVEKANANDI (Autonomous I	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205									
Programme	B.Tech.]	Programme C	ode	104		Regula	tion	2019		
Department	INFORMATION TE	CHNOLOG	θY				Seme	ester	-		
(Ap	CURRICULUM (Applicable to the students admitted from the academic year 2021- 2022 onwards)										
Course	Course Nan	ne	Category	Per	iods /	Week	Credit	Max	imum	Marks	
Code			Category	L	Т	Р	C	CA	ESE	Total	
	THEORY										
U19CSV11	Mobile Adhoc Net	works [#]	PEC	3	0	0	3	40	60	100	
U19ITV11	Wireless Sensor Ne	etworks	PEC	3	0	0	3	40	60	100	
U19ITV12	Distributed System	S	PEC	3	0	0	3	40	60	100	
U19CSV14	Green Computing [#]		PEC	3	0	0	3	40	60	100	
U19ITV13	Java Programming		PEC	3	0	0	3	40	60	100	
U19ITV14	Network Programn	ning ^{\$}	PEC	3	0	0	3	40	60	100	
U19ITV15	Service Oriented Architecture ^{\$}		PEC	3	0	0	3	40	60	100	
U19CTV12	Socket Programmin	ng#	PEC	3	0	0	3	40	60	100	

\$ common to CSE and IT

common to CSE,IT and CST

VERTICAL II : CYBER SECURITY

	VIVEKANANDH (Autonomous J	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMI (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205 3. Tech. Programme Code 104 Regul								pamet 0 940 n 01215 2 444 0325
Programme	B.Tech.	P	rogramme C	ode	104		Regulat	tion	20	19
Department	INFORMATION TE	CHNOLOG	Y				Seme	ster	-	I
(Ag	oplicable to the stude	CU ents admitte	U RRICULU d from the a	U M acade	emic y	ear 202	21- 2022	onwa	rds)	
Course	Course Nan	ne	Category	Per	iods /	Week	Credit	Max	kimum	Marks
Code			Category	L	Т	Р	С	CA	ESE	Total
THEORY										
U19ITV21	Information Securi	ty	PEC	3	0	0	3	40	60	100
U19ITV22	Cyber Security		PEC	3	0	0	3	40	60	100
U19CSV23	Cryptography and I Security ^{\$}	Network	PEC	3	0	0	3	40	60	100
U19CSV24	Cyber Law and Eth Hacking [#]	nical	PEC	3	0	0	3	40	60	100
U19CSV25	Social Network An	alysis [#]	PEC	3	0	0	3	40	60	100
U19CSV26	Semantic Web [#]		PEC	3	0	0	3	40	60	100
U19ITV23	Cyber Forensics #		PEC	3	0	0	3	40	60	100
U19CTV23	Biometrics Systems	s [#]	PEC	3	0	0	3	40	60	100

\$ common to CSE and IT # common to CSE,IT and CST

VERTICAL III : ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

	VIVEKANANDI (Autonomous]	A COLLEGE OF ENGINEERING FOR WOMEN astitution, Affiliated to Anna University, Chennai) ayampalayam, Tiruchengode – 637 205Programme Code104Regulation			TÜVRhefand CERTIFED	
Programme	B.Tech.	ech. Programme Code 104 Regulation				
Department	INFORMATION TH	ECHNOLOGY		Semester	-	

	CURRICULUM									
(Ap	pplicable to the students admitte	ed from the a	ncade	mic y	ear 202	1-2022	onwa	rds)		
Course	Course Name	Catagory	Periods / Week			Credit	Max	kimum Marks		
Code		Category	L	Т	Р	С	CA	ESE	Total	
		THEORY								
U19CSV34	Advanced Database Systems	PEC	3	0	0	3	40	60	100	
U19ITV31	Data Science	PEC	3	0	0	3	40	60	100	
U19ITV32	Deep Learning	PEC	3	0	0	3	40	60	100	
U19CTV35	Natural Language Processing	PEC	3	0	0	3	40	60	100	
U19ITV33	Soft Computing	PEC	3	0	0	3	40	60	100	
U19ITV34	Business Intelligence and its Applications ^{\$}	PEC	3	0	0	3	40	60	100	
U19ITV35	Digital Image Processing ^{\$}	PEC	3	0	0	3	40	60	100	
U19CSV36	Knowledge Management ^{\$}	PEC	3	0	0	3	40	60	100	

\$ common to CSE and IT # common to CSE,IT and CST

VERTICAL IV : INTERNET OF THINGS & CLOUD COMPUTING

	VIVEKANANDI (Autonomous I	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205								igement em 301/2015 Avcent esessas
Programme	B.Tech.	I	Programme C	ode	104		Regula	tion	20	19
Department	INFORMATION TE	CHNOLOG	Y				Seme	ester	-	1
CURRICULUM (Applicable to the students admitted from the academic year 2021- 2022 onwards)										
Course	Course Nan	Course NameCategoryPeriods / WeekCredi tMaximum MarksCategoryImage: CategoryImage: CategoryImage: Category								
Code		L T P C CA ESI								Total
			THEORY							
U19CSV41	Embedded Systems	S [#]	PEC	3	0	0	3	40	60	100
U19CSV42	Smart Sensor Tech	nologies [#]	PEC	3	0	0	3	40	60	100
U19CSV43	Security in Comput	ting [#]	PEC	3	0	0	3	40	60	100
U19ITV41	Software Defined N	Networks ^{\$}	PEC	3	0	0	3	40	60	100
U19CTV41	Fundamentals of Virtualization [#]		PEC	3	0	0	3	40	60	100
U19ITV42	Information Storage Management ^{\$}	formation Storage and PEC 3 0 0 3 40							60	100
U19CTV43	Big Data Tools and Techniques [#]	g Data Tools and echniques#PEC30034060100								
U19ITV43	Cloud Computing		PEC	3	0	0	3	40	60	100

\$ common to CSE and IT

common to CSE,IT and CST

Vertical V : PROBLEM SOLVING & SOFTWARE DEVELOPMENT

	VIVEKANANDH (Autonomous I E	IVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205								senert 0.2010 m 0012015 bxom xessize	
Programme	B.Tech.	Р	rogramme C	ode	104		Regula	tion	20	19	
Department	INFORMATION TEC	CHNOLOG	Y				Seme	ster	-		
(Ap	CURRICULUM (Applicable to the students admitted from the academic year 20						21- 2022	onwa	rds)		
Course	Course Nam	e	Catagory	Per	iods /	Week	Credit	Max	kimum	Marks	
Code		L T P C C								Total	
	THEORY										
U19ITV51	Design Thinking		PEC	3	0	0	3	40	60	100	
U19ITV52	Agile Methodologies		PEC	3	0	0	3	40	60	100	
U19ITV53	Software Project Mar	nagement	PEC	3	0	0	3	40	60	100	
U19ITV54	Blockchain Technolog	gy	PEC	3	0	0	3	40	60	100	
U19ITV55	Total Quality Manage	ement	PEC	3	0	0	3	40	60	100	
U19ITV56	Building Enterprise A	ppilcations	PEC	3	0	0	3	40	60	100	
U19ITV57	Internet Marketing a Commerce	iternet Marketing and E - PEC 3 0 0 3							60	100	
U19ITV58	Game Theory and It Applications	Bame Theory and Its ApplicationsPEC30034060									
U19CSV58	Full Stack Developr	nent	PEC	2	0	2	3	40	60	100	





(AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

DEPARTMENT OF INFORMATION TECHNOLOGY

MINOR DEGREE - INTERNET OF THINGS & CLOUD COMPUTING

Course	Course Name	Catagory	Peri	ods /	Week	Credit	Max	imum l	Marks
Code	eourse rvanie	Category	L	Т	Р	С	CA	ESE	Total
		THEORY							
U19CSV41	Embedded Systems	PEC	3	0	0	3	40	60	100
U19CSV42	Smart Sensor Technologies	PEC	3	0	0	3	40	60	100
U19CSV43	Security in Computing	PEC	3	0	0	3	40	60	100
U19ITV41	Software Defined Networks	PEC	3	0	0	3	40	60	100
U19CTV41	Fundamentals of Virtualization	PEC	3	0	0	3	40	60	100
U19ITV42	Information Storage and Management	PEC	3	0	0	3	40	60	100
U19CTV43	Big Data Tools and Techniques	PEC	3	0	0	3	40	60	100
U19ITV43	Cloud Computing	PEC	3	0	0	3	40	60	100





(AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MINOR DEGREE - VERTICAL - CYBER SECURITY

Course	Course Name	Catagory	Peri	ods /	Week	Credit	Max	imum 1	Marks
Code		Category	L	Т	Р	С	CA	ESE	Total
		THEORY							
U19CSV21	Information Security	PEC	3	0	0	3	40	60	100
U19CSV22	Cyber Security	PEC	3	0	0	3	40	60	100
U19CSV23	Cryptography and Network Security	PEC	3	0	0	3	40	60	100
U19CSV24	Cyber Law and Ethical Hacking	PEC	3	0	0	3	40	60	100
U19CSV25	Social Network Analysis	PEC	3	0	0	3	40	60	100
U19CSV26	Semantic Web	PEC	3	0	0	3	40	60	100
U19ITV23	Cyber Forensics #	PEC	3	0	0	3	40	60	100
U19CTV23	Biometrics Systems [#]	PEC	3	0	0	3	40	60	100





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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

MINOR DEGREE - VERTICAL - INSTRUMENTATION & CONTROL

Course	Course Name	Catagory	Peri	ods /	Week	Credit	Max	imum 1	Marks
Code		Calegory	L	Т	Р	С	CA	ESE	Total
THEORY									
U19EEV31	Communication Engineering	PEC	3	0	0	3	40	60	100
U19EEV32	Computer Architecture	PEC	3	0	0	3	40	60	100
U19EEV33	Intelligence Techniques	PEC	3	0	0	3	40	60	100
U19EEV34	Bio Medical Instrumentation	PEC	3	0	0	3	40	60	100
U19EEV35	Robotics and Control	PEC	3	0	0	3	40	60	100
U19EEV36	Modern Control Theory	PEC	3	0	0	3	40	60	100
U19EEV37	PLC & SCADA	PEC	3	0	0	3	40	60	100
U19EEV38	Intellectual Property Rights	PEC	3	0	0	3	40	60	100





(AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

MINOR DEGREE - VERTICAL - ELECTRONICS ENGINEERING AND ADMINISTRATION SYSTEM

Course Code	urse Code Course Name	Cotocom	Per	iods /	Week	Credit	Max	Maximum Mark		
		Calegory	L	Т	Р	С	CA	ESE	Total	
		THEORY								
U19ECV71	Pattern Recognition	PEC	3	0	0	3	40	60	100	
U19ECV72	Medical Electronics	PEC	3	0	0	3	40	60	100	
U19ECV73	Remote Sensing	PEC	3	0	0	3	40	60	100	
U19ECV74	Automotive Electronics	PEC	3	0	0	3	40	60	100	
U19ECV75	Industry 4.0	PEC	3	0	0	3	40	60	100	
U19ECV76	Digital Video Processing	PEC	3	0	0	3	40	60	100	
U19ECV77	Principles of Public Administration	PEC	3	0	0	3	40	60	100	
U19ECV78	Administrative Theories	PEC	3	0	0	3	40	60	100	
U19ECV79	Indian Administrative System	PEC	3	0	0	3	40	60	100	



VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI)



DEPARTMENT OF BIOTECHNOLOGY

Course	Course Name	Perio	ds / V	Veek	Credit	Max	ximum I	Marks
Code	Course maine	L	Т	Р	С	CA	ESE	Total
U19BTV21	Principles of Management	3	0	0	3	40	60	100
U19BTV22	Bio-Entrepreneurship	3	0	0	3	40	60	100
U19BTV23	Industrial Biosafety	3	0	0	3	40	60	100
U19BTV24	Bioethics & IPR	3	0	0	3	40	60	100
U19BTV25	Bioindustries & Entrepreneurship	3	0	0	3	40	60	100
U19BTV26	Total Quality management	3	0	0	3	40	60	100
U19BTV27	Audit and Regulatory Compliance	3	0	0	3	40	60	100
U19BTV28	Biobusiness	3	0	0	3	40	60	100
U19BTV29	Resource Management & Lean Start- up Management	3	0	0	3	40	60	100

MINOR DEGREE - VERTICAL - ENTREPRENEURSHIP



VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI)



DEPARTMENT OF BIOMEDICAL ENGINEERING

Course	Course Name	Perio	ds / V	Veek	Credit	Max	ximum 1	Marks
Code		L	Т	Р	С	CA	ESE	Total
U19BMV61	Clinical Engineering	3	0	0	3	40	60	100
U19BMV62	Hospital Planning and Management	3	0	0	3	40	60	100
U19BMV63	Medical WasteManagement	3	0	0	3	40	60	100
U19BMV64	Economics and Management for Engineers	3	0	0	3	40	60	100
U19BMV65	Bio Statistics	3	0	0	3	40	60	100
U19BMV66	Forensic Science in Healthcare	3	0	0	3	40	60	100
U19BMV67	AI and Its Medical Applications	3	0	0	3	40	60	100
U19BMV68	Health Informatics	3	0	0	3	40	60	100

MINOR DEGREE - VERTICAL - HEALTHCARE MANAGEMENT



VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI)



DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

MINOR DEGREE - VERTICAL - ARTIFICIAL INTELLIGENCE

Course	Course Name	Category	Periods / Week			Credit	Maxi	Marks	
Code		Caregory	L	Т	Р	С	CA	ESE	Total
U19CTV31	Pattern Recognition Techniques	PEC	3	0	0	3	40	60	100
U19CTV32	Deep Learning	PEC	3	0	0	3	40	60	100
U19CTV33	Business Intelligence and its Analytics	PEC	3	0	0	3	40	60	100
U19CTV34	Data Visualization	PEC	3	0	0	3	40	60	100
U19CTV35	Natural Language Processing	PEC	3	0	0	3	40	60	100
U19CTV36	Neuro Fuzzy and Genetic Programming	PEC	3	0	0	3	40	60	100
U19CTV37	Knowledge Based Decision Support System	PEC	3	0	0	3	40	60	100
U19ITV38	Data Science Techniques	PEC	3	0	0	3	40	60	100





(AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

DEPARTMENT OF INFORMATION TECHNOLOGY LIST OF OPEN ELECTIVE COURSES

	COURSE							M	laximun larks	n
S.NO	CODE	COURSE NAME	CATEGORY	L	Т	Р	С	CA	ESE	Т
1	U19ITOE1	Mobile Application Development	OEC	3	0	0	3	40	60	100
2	U19ITOE2	Robotics	OEC	3	0	0	3	40	60	100
3	U19ITOE3	Basics of Cloud Computing	OEC	3	0	0	3	40	60	100
4	U19ITOE4	Introduction to Data Structures	OEC	3	0	0	3	40	60	100
5	U19ITOE5	Cyber Security	OEC	3	0	0	3	40	60	100
6	U19ITOE6	Information Technology Essentials	OEC	3	0	0	3	40	60	100
7	U19ITOE7	Business Intelligence and its Applications	OEC	3	0	0	3	40	60	100
8	U19ITOE8	Internet of Things	OEC	3	0	0	3	40	60	100
9	U19ITOE9	Introduction to Java Programming	OEC	3	0	0	3	40	60	100
10	U19ITOE10	Introduction to R Programming	OEC	3	0	0	3	40	60	100
11	U19ITOE11	Ethical Hacking	OEC	3	0	0	3	40	60	100
12	U19ITOE12	Cyber Forensics	OEC	3	0	0	3	40	60	100
13	U19ITOE13	E Learning Techniques	OEC	3	0	0	3	40	60	100





(AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Course code	Course name	Category	L	Т	Р	С	CA	ESE	Total
U19CSOE1	Introduction to IoT	OEC	3	0	0	3	40	60	100
U19CSOE2	Ethical Hacking	OEC	3	0	0	3	40	60	100
U19CSOE3	Smart Sensor Technologies	OEC	3	0	0	3	40	60	100
U19CSOE4	Web Designing	OEC	3	0	0	3	40	60	100
U19CSOE5	Data Analytics	OEC	3	0	0	3	40	60	100
U19CSOE6	Enterprise Java	OEC	3	0	0	3	40	60	100
U19CSOE7	Open Source Software	OEC	3	0	0	3	40	60	100
U19CSOE8	Python Programming	OEC	3	0	0	3	40	60	100





(AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Course Code		Period	ls / W	eek	Credit	Maximum Marks			
Course Code	Course Name	L	Т	Р	С	CA	ESE	Total	
U19EEOE1	Electron Devices	3	0	0	3	40	60	100	
U19EEOE2	Electrical Safety	3	0	0	3	40	60	100	
U19EEOE3	Energy Auditing	3	0	0	3	40	60	100	
U19EEOE4	Energy Storage Technologies	3	0	0	3	40	60	100	
U19EEOE5	Biomass Energy Systems	3	0	0	3	40	60	100	
U19EEOE6	Energy Efficient Lighting System	3	0	0	3	40	60	100	
U19EEOE7	Soft Computing techniques	3	0	0	3	40	60	100	
U19EEOE8	Electrical Systems in industry	3	0	0	3	40	60	100	





(AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Code	Course Name	Periods / Week			Credit	Maximum Marks		
		L	Т	Р	С	CA	ESE	Total
U19ECOE1	Basics of Electronics in Automation Appliances	3	0	0	3	40	60	100
U19ECOE2	Biomedical Instrumentation	3	0	0	3	40	60	100
U19ECOE3	Automotive Electronics	3	0	0	3	40	60	100
U19ECOE4	Satellite Communication	3	0	0	3	40	60	100
U19ECOE5	VLSI Design and Its Applications	3	0	0	3	40	60	100
U19ECOE6	Digital Image Processing	3	0	0	3	40	60	100
U19ECOE7	Basics of Communication Systems	3	0	0	3	40	60	100
U19ECOE8	Wireless Sensor Networks	3	0	0	3	40	60	100
U19ECOE9	PCB Design and Fabrication	3	0	0	3	40	60	100



(AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

DEPARTMENT OF BIOTECHNOLOGY

Course Code	Course Name	Periods / Week			Credit	Maximum Marks		
		L	Т	Р	С	CA	ESE	Total
U19BTOE1	Biology for Engineers	3	0	0	3	40	60	100
U19BTOE2	Biofuels and Bioenergy	3	0	0	3	40	60	100
U19BTOE3	Bio-Business	3	0	0	3	40	60	100
U19BTOE4	Basics of Bioinformatics	3	0	0	3	40	60	100
U19BTOE5	Human Health and Nutritional Disorders	3	0	0	3	40	60	100
U19BTOE6	Waste Management	3	0	0	3	40	60	100
U19BTOE7	Food Processing and Preservation Technology	3	0	0	3	40	60	100
U19BTOE8	Forensic Technology	3	0	0	3	40	60	100
U19BTOE9	Biodiversity and Bioprospecting	3	0	0	3	40	60	100

LIST OF OPEN ELECTIVE COURSES (OEC)





(AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

DEPARTMENT OF BIOMEDICAL ENGINEERING

Course Code	Course Name	Periods / Week			Credit	Maximum Marks		
		L	Т	Р	С	CA	ESE	Total
U19BMOE1	Biotelemetry	3	0	0	3	40	60	100
U19BMOE2	Virtual Instrumentation	3	0	0	3	40	60	100
U19BMOE3	Hospital Waste Management	3	0	0	3	40	60	100
U19BMOE4	Medical Robotics	3	0	0	3	40	60	100
U19BMOE5	Healthcare Management Systems	3	0	0	3	40	60	100
U19BMOE6	Biometric Systems and Their Applications	3	0	0	3	40	60	100
U19BMOE7	Biomedical Instrumentation	3	0	0	3	40	60	100
U19BMOE8	Medical Informatics	3	0	0	3	40	60	100
U19BMOE9	ICU and Operation Theatre Equipments	3	0	0	3	40	60	100
U19BMOE10	Telemedicine	3	0	0	3	40	60	100


VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN



(AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

LIST OF OPEN ELECTIVE COURSES (OEC)

Course	Course Name	Perio	ds / V	Veek	Credit	Max	ximum Marks	
Code		L	Т	Р	С	CA	ESE	Total
U19CTOE1	Fundamentals of Artificial Intelligence	3	0	0	3	40	60	100
U19CTOE2	Fundamentals of Information Security	3	0	0	3	40	60	100
U19CTOE3	Fundamentals of Data Science	3	0	0	3	40	60	100
U19CTOE4	Fundamentals of Machine Learning	3	0	0	3	40	60	100
U19CTOE5	Fundamentals of Data Visualization	3	0	0	3	40	60	100
U19CTOE6	Computer Forensics	3	0	0	3	40	60	100

Contraction of the second seco	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205												
Programme	B.TECH		Pro	gramm	e Code	104	Regulation		2019				
Department	INFORMA	TION TECHNOL	OGY			S	emester		Ι				
Course Code	Con	Course Name Periods Per Week Credit Maximum Marks											
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		L	Т	Р	C	CA	ESE	Total				
U19MA101	C	alculus	3	1	0	4	40	60	100				
Course Objective	<ul> <li>Provid</li> <li>Unders</li> <li>Demon</li> <li>Identif</li> <li>Recog</li> </ul>	e the information stand maxima an nstrate Integral ca by the problems b nize the Second	n about d minin alculus based or order li	Revie na of n area, near d	ew of li functio surfac ifferen	mits, co ns of tw e and vo tial equa	ontinuity and vo variables. olume. ations.	differe	ntiability.				
	At the end	of the course, th	ne stude	ent sho	ould be	able to,	, ]	Knowl	edge level				
Course	<b>CO1:</b> App	oly Mean value th	neorem	and T	aylor"	s theore	m.	K	.1,K3				
Outcome	CO2: Ana	alyze Total derivation	ative.					K	2,K4				
Outcome	CO3: Formulate Reduction Formulae. K3,K5												
	CO4: Translate Change of order of integration K2,K5												
	<b>CO5:</b> Apply method of variation of parameters.K3,K5												
Pre- requisites	-												

CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak												CO/PSO Mapping			
COs				1	Program	ime Out	comes (	POS)						PSUs	
	PO 1	PO 1         PO 2         PO 3         PO 4         PO 5         PO 6         PO 7         PO 8         PO 9         PO         PO         PO           10         11         12											PSO 1	PSO 2	PSO 3
CO 1	3	3 3											2		
CO 2	3	3											2		
CO 3	3	3 3											2		
CO 4	3 3												2		
CO 5	3	3											2		

<b>Course Assessment N</b>	<b>Aethods</b>
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Direct

- 1. Continuous Assessment Test I, II & III
- Assignment.
   End-Semester examinations

## Indirect

1. Course - end survey

Cont	tent of the syllabus		
Un	it – I DIFFERENTIAL CALCULUS	Periods	12
Limit,	continuity, differentiability, rules of differentiation,	ation of variou	is functions, Rolle"s
theorem	m(excluding proof), Mean value theorem(excluding proof), T	aylor ^s theorem	m(excluding proof),
Maxim	ha and Minima. Physical Applications (Newton's law of cool	ing – Heat flow	w problems, Rate of
electric	c circuit problems)	IIII S law, KIIV	chon's law-Simple
Uni	it - II FUNCTIONS OF SEVERAL VARIABLES	Periods	12
Partial	differentiation - Homogeneous functions and Euler"s th	eorem(excludi	ing proof) – Total
derivat	ive - Change of variables - Jacobians - Partial differentiation	n of implicit f	functions – Taylor"s
series	for functions of two variables(excluding proof) - Maxima	and minima of	of functions of two
variabl		Dariada	12
Diaman	n integral Fundamental theorem of coloulus (avoluding	Periods	hads of integration
(Integr	ation by parts Trigonometric integrals Trigonometric sub	stitutions Inter	egration of rational
functio	ons by partial fraction, Integration of irrational functions) -R	eduction form	ula
$\frac{\pi}{2}$			
	$s^n x dx \int sin^n x dx$		
	$s xax, \int_0^{sm} xax$ .		
Uni	it - IV MUTIPLE INTEGRALS	Periods	12
Double	e integrals – Change of order of integration – Double integration	grals in polar	coordinates – Area
enclose	ed by plane curves – Triple integrals – Volume of solids – C	Change of vari	ables in double and
triple ii	ntegrals.	Dariada	12
Second	l order Linear ordinary differential equations with constant	renous	Cauchy"s - Fuler
equatio	ons (excluding proof)- Legendre's Linear differential equations	ons(excluding	proof) - Method of
variatio	on of parameters.		F
		Total Periods	60
Text B	Books:		
1.	Stewart, J. Calculus: Early Transcendentals (8th Edition), Ce	ngage Learning	g, 2015.
2.	Grewal B.S., "Higher Engineering Mathematics", Khann	a Publishers,	New Delhi, 43rd
D	Edition, 2014.		
Keiere	Reces:	on) John Wild	w (2015)
1.	Kieyszig E, Advanced Engineering Mathematics (10 Edit	on), john whe	y (2013).
2.	Boyce W E and DiPrima R, Elementary Differential Equation (2005)	uations (9 th Ec	lition), John Wiley
	(2005).		
3.	Nishant Shukla, Elementary Integral Calculus		
4.	Anton H, Calculus: Early Transcendentals, 10th Edition, W	iley (2012).	
5	B V Ramana, Higher Engineering Mathematics, Tata McG	raw Hill Educa	ation Pvt Ltd., New
5.	Delhi (2012)		
E-Res	sources:		
1.	https://freevideolectures.com > All Courses > Calculus > UCI	A	
2.	www.learnerstv.com/Free-engineering-Video-lectures		
3.	www.nptel.ac.in		

	VIVEKANA (Autonom	ANDHA COLLEGE WOM ous Institution Affili Elayampalaya	E OF E EN iated to um, Tir	CNGI	NEERII a Univer	<b>NG FOR</b> rsity Chenna 637 205	ui)	VRheinland ENTIFIED				
Programme	B.E/B.TECHProgramme code104Regulation											
Department	INFORMATION T	ECHNOLOGY				Semester			Ι			
	G		Perio	ds per	week	Credit	Max	ximum I	Marks			
Course code	Cours	se name	L	Т	Р	C	CA	ESE	Total			
U19EN101	English for Co	mmunication – I	3	0	0	3	40	60	100			
Objective	<ul> <li>The main objectiv</li> <li>Make learners</li> <li>Make learners</li> <li>Make learners</li> <li>Assist student literacy so that</li> <li>Identify and be and speaking</li> </ul>	e of this course is to: listen to audio files a read widely in order develop vocabulary s in the development they may engage in egin to apply the lang	and rep to pra and str to f ir life-lo guage	blicate ctice rength ntellec ng lea featur	e it in sp writing nen gram ctual flex arning. es of aca	eaking content matical und xibility, creat ademic and p	exts. lerstand ativity, profess	ding and cu sional w	ıltural /riting			
	The students who	complete this course	succe	ssfull	y are exp	pected to:			KL			
	<b>CO1:</b> Speak adeq <b>CO2:</b> Write approvariety of material	opriately based on the second se	he kno	wledg	ge gaine	d through re	eading	of a	K2 K3			
Outcomes	<b>CO3:</b> Use language through their grammatical acquisition and their knowledge about using right word at the right context.											
	CO4: Listen the accents and tones of the language properly.											
	<b>CO5:</b> Comprehen reading.	d and retain the co	ontexti	ıal ar	nd synta	ix understar	nding	from	K4			
Pre- Requisities	Nil											

<b>CO / PO Mapping</b> (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak												CO/PSO	Mapping	
COs	Programme Outcomes (POs)												PS	Os
COS	PO 1 PO 2 PO 3 PO 4 PO5 PO6 PO7 PO8 PO 9 PO10 PO 11 PO 12										PSO1	PSO 2		
CO 1						2			3	3		3		2
CO 2						2			3	3		3		2
CO 3						2			3	3		3		2
CO 4						2			3	3		3		2
CO 5						2			3	3		3		2

#### **Course Assessment Methods**

direct

- 1. Continuous Assessment Test I, II & III
- 2. Assignment
- 3. End-Semester examinations

indirect

1. Course - end survey

Unit - I       Periods       9         Listening-Introduction to Different Types of Listening, Listening to Casual Conversations, Speaking- Introduction to develop the Art of Speaking, Giving Self Introduction, Reading-Understanding the Basics of Reading Skills, Reading Instructions and Technical Manuals, Writing- Introduction to writing strategies, Writing Definitions, Focus on LanguageTechnical terms (Jargon), Word Formation with Prefixes and Suffixes, Using Active Voice and Passive Voice, Basic sentence patterns, Tenses (past, present, perfect and continuous tenses).       Periods       9         Listening-       Listening to lectures, listening to description of equipment, Speaking- Strategies for Developing Conversational Skills, Short Conversations through Role Play Activities, Reading– Reading Comprehension, Reading e-mails, Reading Headlines, Predicting the Content, Writing- Note making, Writing Descriptions, Focus on Language-Collocations, Functional Use of Tenses, Subject - verb agreement       Periods       9         Listening-       Listening to different kinds of interviews (Face - to - face, radio, TV and telephone interviews), Speaking-Describing an Object, Asking Questions, Participating in Discussions Reading- Intensive reading, Reading passages for gist. Writing- Informal writing -short e-mails with emphasis on Brevity, Clarity, Coherence and Cohesion), Focus on Language–Sequential Connectives, Impersonal Passive       9         Unit - IV       Periods       9         Listening-Note Taking, Speaking- Improving Fluency through Narration. Reading-Reading passages for specific information-Phone messages, Reading and Transferring Information. Writing- Effective writing strategies, Informal writing, Writing a Memo, Focus on Language – Pron	Content of the syllabus	
Listening-Introduction to Different Types of Listening, Listening to Casual Conversations, Speaking-Introduction to develop the Art of Speaking, Giving Self Introduction, Reading-Understanding the Basics of Reading Skills, Reading Instructions and Technical Manuals, Writing- Introduction to writing strategies, Writing Definitions, Focus on Language - Technical terms (Jargon), Word Formation with Prefixes and Suffixes, Using Active Voice and Passive Voice, Basic sentence patterns, Tenses (past, present, perfect and continuous tenses).         Unit - II       Periods       9         Listening-       Listening to lectures, listening to description of equipment, Speaking- Strategies for Developing Conversational Skills, Short Conversations through Role Play Activities, Reading – Reading Comprehension, Reading e-mails, Reading Headlines, Predicting the Content, Writing- Note making, Writing Descriptions, Focus on Language-Collocations, Functional Use of Tenses, Subject - verb agreement         Unit - III       Periods       9         Listening-       Listening to different kinds of interviews (Face - to - face, radio, TV and telephone interviews), Speaking-Describing an Object, Asking Questions, Participating in Discussions Reading – Intensive reading, Reading passages for gist. Writing: Informal writing -short e-mails with emphasis on Brevity, Clarity, Coherence and Cohesion), Focus on Language-Sequential Connectives, Impersonal Passive       9         Listening-Note Taking, Speaking- Improving Fluency through Narration. Reading passages for gist. Writing a Memo, Focus on Language- Pronunciation Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types), Usage of Modal Verbs.       Periods       9	Unit - I	Periods 9
Introduction to develop the Art of Speaking, Giving Self Introduction, Reading–Understanding the Basics of Reading Skills, Reading Instructions and Technical Manuals, Writing- Introduction to writing strategies, Writing Definitions, Focus on LanguageTechnical terms (Jargon), Word Formation with Prefixes and Suffixes, Using Active Voice and Passive Voice, Basic sentence patterns, Tenses (past, present, perfect and continuous tenses).         Unit - II       Periods       9         Listening- Listening to lectures, listening to description of equipment, Speaking- Strategies for Developing Conversational Skills, Short Conversations through Role Play Activities, Reading - Reading Comprehension, Reading e-mails, Reading Headlines, Predicting the Content, Writing- Note making, Writing Descriptions, Focus on Language–Collocations, Functional Use of Tenses, Subject - verb agreement         Unit - III       Periods       9         Listening- Listening to different kinds of interviews (Face - to - face, radio, TV and telephone interviews), Speaking-Describing an Object, Asking Questions, Participating in Discussions Reading – Intensive reading, Reading passages for gist. Writing - Informal writing -short e-mails with emphasis on Brevity, Clarity, Coherence and Cohesion), Focus on Language–Sequential Connectives, Impersonal Passive       9         Unit - IV       Periods       9         Listening-Note Taking, Speaking- Improving Fluency through Narration. Reading-Reading passages for specific information - Phone messages, Reading and Transferring Information. Writing- Effective writing strategies, Informal writing, Writing a Memo, Focus on Language – Pronunciation Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if -	Listening-Introduction to Different Types of Listening, Listening to Cas	ual Conversations, Speaking
of Reading Skills, Reading Instructions and Technical Manuals, Writing Introduction to writing strategies, Writing Definitions, Focus on LanguageTechnical terms (Jargon), Word Formation with Prefixes and Suffixes, Using Active Voice and Passive Voice, Basic sentence patterns, Tenses (past, present, perfect and continuous tenses). Unit - II Periods 9 Listening- Listening to lectures, listening to description of equipment, Speaking- Strategies for Developing Conversational Skills, Short Conversations through Role Play Activities, Reading – Reading Comprehension, Reading e-mails, Reading Headlines, Predicting the Content, Writing- Note making, Writing Descriptions, Focus on Language-Collocations, Functional Use of Tenses, Subject - verb agreement Unit - III Periods 9 Listening- Listening to different kinds of interviews (Face - to - face, radio, TV and telephone interviews), Speaking-Describing an Object, Asking Questions, Participating in Discussions Reading – Intensive reading, Reading passages for gist. Writing- Informal writing -short e-mails with emphasis on Brevity, Clarity, Coherence and Cohesion), Focus on Language–Sequential Connectives, Impersonal Passive Unit - IV Periods 9 Listening-Note Taking, Speaking- Improving Fluency through Narration.Reading-Reading passages for specific information- Phone messages, Reading and Transferring Information. Writing- Effective writing strategies, Informal writing a Memo, Focus on Language– Pronunciation Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types), Usage of Modal Verbs. Unit - V Periods 9 Listening- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understanding Segmental and Suprasegmental Features-Practicing Stress, Pause and Intonation, Reading- Reading for a purpose, Reading Business Documents, Interpreting Charts and Graphs, Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synonyms and Antonyms	Introduction to develop the Art of Speaking, Giving Self Introduction, Read	ding–Understanding the Basic
strategies, Writing Definitions, Focus on LanguageTechnical terms (Jargon), Word Formation with Prefixes and Suffixes, Using Active Voice and Passive Voice, Basic sentence patterns, Tenses (past, present, perfect and continuous tenses). Unit - II Periods 9 Listening- Listening to lectures, listening to description of equipment, Speaking- Strategies for Developing Conversational Skills, Short Conversations through Role Play Activities, Reading- Reading Comprehension, Reading e-mails, Reading Headlines, Predicting the Content, Writing- Note making, Writing Descriptions, Focus on Language-Collocations, Functional Use of Tenses, Subject - verb agreement Unit - III Periods 9 Listening- Listening to different kinds of interviews (Face - to - face, radio, TV and telephone interviews), Speaking-Describing an Object, Asking Questions, Participating in Discussions Reading- Intensive reading, Reading passages for gist. Writing- Informal writing -short e-mails with emphasis on Brevity, Clarity, Coherence and Cohesion), Focus on Language-Sequential Connectives, Impersonal Passive Unit - IV Periods 9 Listening-Note Taking, Speaking- Improving Fluency through Narration.Reading-Reading passages for specific information- Phone messages, Reading and Transferring Information Practice (Phometic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types), Usage of Modal Verbs. Unit - V Periods 9 Listening- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understand Modulation, Listening a Process. Focus on Language -Synonyms and Antonyms, Common Errors in English. Total Periods 45 Text Books: 1. Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Communication Skills, Vijay Nicole imprints Pvt.Ltd, 2015.	of Reading Skills, Reading Instructions and Technical Manuals, Wri	ting- Introduction to writin
Prefixes and Suffixes, Using Active Voice and Passive Voice, Basic sentence patterns, Tenses (past, present, perfect and continuous tenses).       Periods       9         Listening-       Listening to lectures, listening to description of equipment, Speaking- Reading Comprehension, Reading e-mails, Reading Headlines, Predicting the Content, Writing- Note making, Writing Descriptions, Focus on Language-Collocations, Functional Use of Tenses, Subject - verb agreement       Periods       9         Listening-       Listening to different kinds of interviews (Face - to - face, radio, TV and telephone interviews), Speaking-Describing an Object, Asking Questions, Participating in Discussions Reading - Intensive reading, Reading passages for gist. Writing- Informal writing -short e-mails with emphasis on Brevity, Clarity, Coherence and Cohesion), Focus on Language-Sequential Connectives, Impersonal Passive       9         Listening-Note Taking, Speaking- Improving Fluency through Narration. Reading-Reading passages for specific information- Phone messages, Reading and Transferring Information. Writing- Effective writing strategies, Informal writing a Memo, Focus on Language- Pronunciation Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types), Usage of Modal Verbs.       9         Unit - V       Periods       9         Listening- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understanding Segmental and Suprasegmental Features-Practicing Stress, Pause and Graphs, Writing- Writing Business e-mails, Describing a Process. Focus on Language - Synonyms and Antonyms, Common Errors in English.       9         Liste	strategies, Writing Definitions, Focus on LanguageTechnical terms (J	Jargon), Word Formation wit
present, perfect and continuous tenses).       Periods       9         Listening- Listening to lectures, listening to description of equipment, Speaking- Strategies for Developing Conversational Skills, Short Conversations through Role Play Activities, Reading- Reading Comprehension, Reading e-mails, Reading Headlines, Predicting the Content, Writing- Note making, Writing Descriptions, Focus on Language-Collocations, Functional Use of Tenses, Subject - verb agreement         Unit - III       Periods       9         Listening- Listening to different kinds of interviews (Face - to - face, radio, TV and telephone interviews), Speaking-Describing an Object, Asking Questions, Participating in Discussions Reading - Intensive reading, Reading passages for gist. Writing- Informal writing -short e-mails with emphasis on Brevity, Clarity, Coherence and Cohesion), Focus on Language–Sequential Connectives, Impersonal Passive       9         Unit - IV       Periods       9         Listening-Note Taking, Speaking- Improving Fluency through Narration. Reading-Reading passages for specific information- Phone messages, Reading and Transferring Information. Writing- Effective writing strategies, Informal writing, Writing a Memo, Focus on Language- Pronunciation Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types), Usage of Modal Verbs.       9         Unit - V       Periods       9         Listening- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understand Modulation, Listening a Process. Focus on Language -Synonyms and Antonation, Reading- Reading for a purpose, Reading Business Documents, Interpr	Prefixes and Suffixes, Using Active Voice and Passive Voice, Basic se	ntence patterns, Tenses (pas
Unit - IIPeriods9Listering- Conversational Skills, Short Conversations through Role Play Activities, Reading- Reading conversational Skills, Short Conversations through Role Play Activities, Reading- Reading conversational Skills, Short Conversations through Role Play Activities, Reading- Reading Descriptions, Focus on Language-Collocations, Functional Use of Tenses, Subject - verb agreementUnit - IIIPeriods9Listening- Listening to different kinds of interviews (Face - to - face, radio, TV and telephone interviews), Speaking-Describing an Object, Asking Questions, Participating in Discussions Reading – Intensive reading, Reading passages for gist. Writing- Informal writing -short e-mails with emphasis on Brevity, Clarity, Coherence and Cohesion), Focus on Language-Sequential Convertives, Impersonal Passive9Unit - IVPeriods9Listeming-Note Taking, Speaking- Improving Fluency through Narration. Reading-Reading passages for specific information- Phone messages, Reading and Transferring Information Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types). Usage of Modal Verbs.Periods9Listening- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Melcome Address, Understand Modulation, Listening a Process. Focus on Language -Spron.urs and Into- ation, Reading – Reading for a purpose, Reading Business Documents, Interpreting Charts and Grap-s, Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synon.yws and Into- ation, Reading – Reading for a purpose, Reading Business Documents, Interpreting Charts and Grap-shy, Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synon.yws and Into	present, perfect and continuous tenses).	
Listening       Listening to lectures, listening to description of equipment, Speaking- Strategies for Developing Conversational Skills, Short Conversations through Role Play Activities, Reading – Reading Comprehension, Reading e-mails, Reading Headlines, Predicting the Content, Writing- Note making, Writing Descriptions, Focus on Language-Collocations, Functional Use of Tenses, Subject - verb agreement         Unit - III       Periods       9         Listering- Listening to different kinds of interviews (Face - to - face, radio, TV and telephone interviews), Speaking-Describing an Object, Asking Questions, Participating in Discussions Reading – Intensive reading, Reading passages for gist. Writing- Informal writing -short e-mails with emphasis on Brevity, Clarity, Coherence and Cohesion), Focus on Language–Sequential Connectives, Impersonal Passive       9         Unit - IV       Periods       9         Listering-Note Taking, Speaking- Improving Fluency through Narration. Reading–Reading passages for specific information- Phone messages, Reading and Transferring Information. Writing- Effective writing strategies, Informal writing, Writing a Memo, Focus on Language – Pronunciation Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types), Usage of Modal Verbs.       9         Unit - V       Periods       9         Listering- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understanding Segmental and Suprasegmental Features-Practicing Stress, Pause and Intonation, Reading – Reading for a purpose, Reading Business Documents, Interpreting Charts and Graphs, Writing- Writing Business e-mails, Describing a Process. Focus on L	Unit - II	Periods 9
Developing Conversational Skills, Short Conversations through Role Play Activities, Reading – Reading Comprehension, Reading e-mails, Reading Headlines, Predicting the Content, Writing- Note making, Writing Descriptions, Focus on Language-Collocations, Functional Use of Tenses, Subject - verb agreement         Unit · III       Periods       9         Listeming- Listening to different kinds of interviews (Face - to - face, radio, TV and telephone interviews), Speaking-Describing an Object, Asking Questions, Participating in Discussions Reading – Intensive reading, Reading passages for gist. Writing- Informal writing -short e-mails with emphasis on Brevity, Clarity, Coherence and Cohesion), Focus on Language–Sequential Connectives, Impersonal Passive         Unit · IV       Periods       9         Listening-Note Taking, Speaking- Improving Fluency through Narration. Reading–Reading passages for specific information- Phone messages, Reading and Transferring Information. Writing- Effective writing strategies, Informal writing, Writing a Memo, Focus on Language– Pronunciation Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types), Usage of Modal Verbs.       9         Unit · V       Periods       9         Listening- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understanding Segmental and Suprasegmental Features-Practicing Stress, Pause and Intonation, Reading – Reading for a purpose, Reading Business Documents, Interpreting Charts and Graphs, Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synonyms and Antonyms, Common Errors in English.       Total Periods       9	Listening- Listening to lectures, listening to description of equipme	ent, Speaking- Strategies for
Comprehension, Reading e-mails, Reading Headlines, Predicting the Content, Writing- Note making, Writing Descriptions, Focus on Language-Collocations, Functional Use of Tenses, Subject - verb agreement         Unit - III       Periods       9         Listening- Listening to different kinds of interviews (Face - to - face, radio, TV and telephone interviews), Speaking-Describing an Object, Asking Questions, Participating in Discussions Reading – Intensive reading, Reading passages for gist. Writing- Informal writing -short e-mails with emphasis on Brevity, Clarity, Coherence and Cohesion), Focus on Language–Sequential Connectives, Impersonal Passive         Unit - IV       Periods       9         Listening-Note Taking, Speaking- Improving Fluency through Narration. Reading-Reading passages for specific information- Phone messages, Reading and Transferring Information. Writing- Effective writing strategies, Informal writing, Writing a Memo, Focus on Language- Pronunciation Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types), Usage of Modal Verbs.       9         Unit - V       Periods       9         Listening- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understanding Segmental and Suprasegmental Features-Practicing Stress, Pause and Intonation, Reading – Reading for a purpose, Reading Business Documents, Interpreting Charts and Graphs, Writing- Writing Business e-mails, Describing a Process. Focus on Language - Synonyms and Antonyms, Common Errors in English.       Total Periods       45         Text Books:       1       Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R	Developing Conversational Skills, Short Conversations through Role Play	Activities, Reading-Readin
Writing Descriptions, Focus on Language-Collocations, Functional Use of Tenses, Subject - verb agreement       Periods       9         Unit - III       Periods       9         Listening- Listening to different kinds of interviews (Face - to - face, radio, TV and telephone interviews), Speaking-Describing an Object, Asking Questions, Participating in Discussions Reading- Intensive reading, Reading passages for gist. Writing- Informal writing -short e-mails with emphasis on Brevity, Clarity, Coherence and Cohesion), Focus on Language-Sequential Connectives, Impersonal Passive         Unit - IV       Periods       9         Listening-Note Taking, Speaking- Improving Fluency through Narration. Reading-Reading passages for specific information- Phone messages, Reading and Transferring Information. Writing- Effective writing strategies, Informal writing, Writing a Memo, Focus on Language- Pronunciation Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types), Usage of Modal Verbs.       9         Unit - V       Periods       9         Listening- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understanding Segmental and Suprasegmental Features-Practicing Stress, Pause and Intonation, Reading- Reading for a purpose, Reading Business Documents, Interpreting Charts and Graphs, Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synonyms and Antonyms, Common Errors in English.         1.       Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Communication Skills,Vijay Nicol	Comprehension, Reading e-mails, Reading Headlines, Predicting the Con-	tent, Writing- Note making
agreement       Periods       9         Listening- Listerning to different kinds of interviews (Face - to - face, radio, TV and telephone interviews),       Speaking-Describing an Object, Asking Questions, Participating in Discussions Reading– Intensive         reading, Reading passages for gist. Writing- Informal writing -short e-mails with emphasis on Brevity,       Clarity, Coherence and Cohesion), Focus on Language–Sequential Connectives, Impersonal         Passive       Periods       9         Listening-Note Taking, Speaking- Improving Fluency through Narration. Reading–Reading passages for specific information- Phone messages, Reading and Transferring Information. Writing- Effective writing strategies, Informal writing, Writing a Memo, Focus on Language– Pronunciation Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types), Usage of Modal Verbs.       9         Unit - V       Periods       9         Listening- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understand Indouge a Puropse, Reading Business Documents, Interpreting Charts and Graphs, Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synonyms and Antonyms, Common Errors in English.       45         Text Books:       Interview Justing Justing Science Market Justing Science J	Writing Descriptions, Focus on Language-Collocations, Functional U	se of Tenses, Subject - ver
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Speaking-Describing an Object, Asking Questions, Participating in Discussions Reading – Intensive reading, Reading passages for gist. Writing- Informal writing -short e-mails with emphasis on Brevity, Clarity, Coherence and Cohesion), Focus on Language–Sequential Connectives, Impersonal Passive         Unit - IV       Periods       9         Listening-Note Taking, Speaking- Improving Fluency through Narration. Reading–Reading passages for specific information- Phone messages, Reading and Transferring Information. Writing- Effective writing strategies, Informal writing, Writing a Memo, Focus on Language– Pronunciation Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types), Usage of Modal Verbs.       Periods       9         Listening- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understanding Segmental and Suprasegmental Features-Practicing Stress, Pause and Intonation, Reading– Reading for a purpose, Reading Business Documents, Interpreting Charts and Graphs,. Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synonyms and Antonyms, Common Errors in English.       Total Periods       45         1.       Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Communication Skills, Vijay Nicole imprints Pvt.Ltd, 2015.       45	Listening- Listening to different kinds of interviews (Face - to - face, radio,	TV and telephone interviews
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Clarity, Coherence and Cohesion), Focus on Language–Sequential Connectives, Impersonal Passive         Unit - IV       Periods       9         Listening-Note Taking, Speaking- Improving Fluency through Narration. Reading–Reading passages for specific information- Phone messages, Reading and Transferring Information. Writing- Effective writing strategies, Informal writing, Writing a Memo, Focus on Language– Pronunciation Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types), Usage of Modal Verbs.         Unit - V       Periods       9         Listening- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understanding Segmental and Suprasegmental Features-Practicing Stress, Pause and Intonation, Reading– Reading for a purpose, Reading Business Documents, Interpreting Charts and Graphs,. Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synonyms and Antonyms, Common Errors in English.       Total Periods       45         Total Periods 145	reading, Reading passages for gist. Writing- Informal writing -short e-ma	ails with emphasis on Brevity
Passive         Unit - IV       Periods       9         Listening-Note Taking, Speaking- Improving Fluency through Narration. Reading–Reading passages for specific information- Phone messages, Reading and Transferring Information. Writing- Effective writing strategies, Informal writing, Writing a Memo, Focus on Language– Pronunciation Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types), Usage of Modal Verbs.       Periods       9         Unit - V       Periods       9         Listening- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understanding Segmental and Suprasegmental Features-Practicing Stress, Pause and Intonation, Reading– Reading for a purpose, Reading Business Documents, Interpreting Charts and Graphs,. Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synon-Jwr and Anton-Jwrs, Common Errors in English.       Total Periods       45         Text Books:       Imprints Pvt.Ltd, 2015.       Imprints Pvt.Ltd, 2015.       Imprints Pvt.Ltd, 2015.	Clarity, Coherence and Cohesion), Focus on Language-Sequential Cont	nectives, Impersonal
Unit - IVPeriods9Listering-Note Taking, Speaking- Improving Fluency through Narration. Reading–Reading passages for specific information- Phone messages, Reading and Transferring Information. Writing- Effective writing strategies, Informal writing, Writing a Memo, Focus on Language– Pronunciation Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types), Usage of Modal Verbs.Periods9Unit - VPeriods9Listening- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understanding Segmental and Suprasegmental Features-Practicing Stress, Pause and Intonation, Reading– Reading for a purpose, Reading Business Documents, Interpreting Charts and Graphs,. Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synonyms and Antonyms, Common Errors in English.45Text Books:1.Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Commication Skills,Vijay Nicole imprints Pvt.Ltd, 2015.45	Passive	
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specific information- Phone messages, Reading and Transferring Information. Writing- Effective writing strategies, Informal writing, Writing a Memo, Focus on Language– Pronunciation Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types), Usage of Modal Verbs. Unit - V Periods 9 Listening- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understanding Segmental and Suprasegmental Features-Practicing Stress, Pause and Intonation, Reading– Reading for a purpose, Reading Business Documents, Interpreting Charts and Graphs,. Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synonyms and Antonyms, Common Errors in English. Total Periods 45 Text Books: 1. Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Communication Skills,Vijay Nicole imprints Pvt.Ltd, 2015.	Listening-Note Taking, Speaking- Improving Fluency through Narration.	Reading–Reading passages for
strategies, Informal writing, Writing a Memo, Focus on Language– Pronunciation Practice (Phonetic sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Conditional Statements (if - clauses and types), Usage of Modal Verbs.           Unit - V         Periods         9           Listening- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understanding Segmental and Suprasegmental Features-Practicing Stress, Pause and Intonation, Reading– Reading for a purpose, Reading Business Documents, Interpreting Charts and Graphs,. Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synonyms and Antonyms, Common Errors in English.         Total Periods         45           Text Books:         1.         Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Communication Skills,Vijay Nicole imprints Pvt.Ltd, 2015.         Vite Process P	specific information- Phone messages, Reading and Transferring Informati	on. Writing- Effective writin
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types), Usage of Modal Verbs.         Unit - V       Periods       9         Listening- Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understanding Segmental and Suprasegmental Features-Practicing Stress, Pause and Intonation, Reading– Reading for a purpose, Reading Business Documents, Interpreting Charts and Graphs,. Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synonyms and Antonyms, Common Errors in English.       Total Periods       45         Image: Speaking Joyce, Shameem.M, Selvarajan.R-English Communication Skills, Vijay Nicole imprints Pvt.Ltd, 2015.	sounds - Vowels, Consonants and Diphthongs), Cause and Effect, Condition	nal Statements (if - clauses an
Unit - V       Periods       9         List=ning- List=ning to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering Welcome Address, Understanding Segmental and Suprasegmental Features-Practicing Stress, Pause and Into-ation, Reading- Reading for a purpose, Reading Business Documents, Interpreting Charts and Graphs,. Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synonyms and Anto-yms, Common Errors in English.       Total Periods       45         Text Books:       1.       Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Communication Skills,Vijay Nicole imprints Pvt.Ltd, 2015.       Vite and Communication Skills,Vijay Nicole	types), Usage of Modal Verbs.	
Listening to understand Modulation, Listening to Welcome Speeches, Speaking- Delivering         Welcome Address, Understanding Segmental and Suprasegmental Features-Practicing Stress, Pause and         Intonation, Reading– Reading for a purpose, Reading Business Documents, Interpreting Charts and         Graphs,. Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synonyms and         Antonyms, Common Errors in English.         Text Books:         1.       Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Communication Skills, Vijay Nicole         imprints Pvt.Ltd, 2015.       Formation Skills, Vijay Nicole	Unit - V	Periods 9
Welcome Address, Understanding Segmental and Suprasegmental Features-Practicing Stress, Pause and Intonation, Reading– Reading for a purpose, Reading Business Documents, Interpreting Charts and Graphs,. Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synonyms and Antonyms, Common Errors in English.         Total Periods         45         Text Books:         1.       Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Communication Skills, Vijay Nicole imprints Pvt.Ltd, 2015.	Listening- Listening to understand Modulation, Listening to Welcome Sp	beeches, Speaking- Deliverin
Intonation, <b>Reading</b> – Reading for a purpose, Reading Business Documents, Interpreting Charts and Graphs,. Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synonyms and Antonyms, Common Errors in English.           Total Periods         45           Text Books:         1.         Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Communication Skills,Vijay Nicole imprints Pvt.Ltd, 2015.	Welcome Address, Understanding Segmental and Suprasegmental Feature	es-Practicing Stress, Pause an
Graphs,. Writing- Writing Business e-mails, Describing a Process. Focus on Language -Synonyms and Antonyms, Common Errors in English.         Total Periods       45         Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Communication Skills,Vijay Nicole imprints Pvt.Ltd, 2015.	Intonation, Reading- Reading for a purpose, Reading Business Docum	nents, Interpreting Charts an
Antonyms, Common Errors in English.       Total Periods       45         Text Books:         1.       Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Communication Skills, Vijay Nicole imprints Pvt.Ltd, 2015.	Graphs,. Writing- Writing Business e-mails, Describing a Process. Focus	on Language -Synonyms an
Text Books:     Total Periods     45       1.     Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Communication Skills,Vijay Nicole imprints Pvt.Ltd, 2015.	Antonyms, Common Errors in English.	
Text Books:         1.       Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Communication Skills, Vijay Nicole imprints Pvt.Ltd, 2015.		Total Periods 45
1.       Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Communication Skills, Vijay Nicole imprints Pvt.Ltd, 2015.	Text Books:	
	1. Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Commimprints Pvt.Ltd, 2015.	nunication Skills,Vijay Nicol
2. Sokkaalingam, S.RM., The Art Of Speaking EnglishVersatile Publishing House, 2018.	2. Sokkaalingam, S.RM., The Art Of Speaking EnglishVersatile Publish	ing House,2018.

Ref	erences:
1	Dr. Padma Ravindran, Poorvadevi, M. Y. AbdurRazack- English for life, English for work, students
1.	Book, Ebek language laboratory pvt ltd, 2011.
2	DuttRajeevan, Prakash. A Course in Communication Skill (Anna University, Coimbatore edition):
۷.	Cambridge University Press India Pvt.Ltd, 2007.
3	S.P. Dhanavel, English and Communication Skills for Students of Science and Engineering, Orient
5.	BlackswanPvt, Ltd, 2009.
4	Technical English I & II Senavorsity Song College of Technology Salam First Edition 2012
т.	rechnical English – r & n, Sonaversity, Sona Conege of rechnology, Salem, First Edition, 2012.
5	Meenakshmi Raman and Sangeeta Sharma- "Technical communication English Skills for Engineers;
5.	oxford University Press, 2008.
E-R	esources:
1	http://www.sparknotes.com/lit/the-alchemist/summary.html
2	https://www.stephencovey.com/7habits/7habits.php
3	http://en.wikipedia.org/wiki/The_Seven_Habits_of_Highly_Effective_People

	VIVEKA (Autonomous	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205											
Programme	B.TECH Programme Code 104 Regulation												
Department	INFORMATION T	ECHNOLOGY				Sem	ester		Ι				
Course	Course	Name	Perio	ds Per	Week	Credit	Maxin	num M	larks				
Code		Vallie	L	Т	Р	C	CA	ESE	Total				
U19PH105	Engineerinį	Engineering Physics         3         0         0         3         40         60         100											
Course Objective Course	<ul> <li>Ine student shou</li> <li>Understand th</li> <li>Gain knowled</li> <li>Identify the d the production</li> <li>Correlate bet temperature in and its uses</li> <li>Categorize th</li> </ul>	Id be made to, ne basic concepting lge about the construction ifferent types of n and application ther understand n a semiconduction e types of laser	ots of production of crystons of under the second s	roperti ion pro al stru ultraso ie car idy the ber op	es of 1 opertie actures nics. rier co e prope tics	matter s of met and cry oncentra erties of	als ystal growth te ution and its modern engir	chnic varia aeerin	ues. Study tions with g materials				
Outcome	At the end of the	course, the stu	dent wi	ill be a	ble to			K	nowledge Level				
	• Understand th	ne elastic prope	erties of	the m	ateria	ls			K2				
	Gain knowled	lge about the co	onducti	ion pro	opertie	s of met	als		K3				
	• Determine packing factor for various unit cells and understand different types of crystal imperfections and learn the engineering, K1 medical applications.												
	• Discuss the basic idea of semiconducting materials and realize the function of modern engineering materials K1												
	• Learn the opt	ical properties	of mate	erials a	nd its	uses			K3				
Pre- requisites													

	<b>CO / PO Mapping</b> (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak													CO/PSO Mapping	
	COs				PSOs										
	005	PO 1	PO 1   PO 2   PO 3   PO 4   PO 5   PO 6   PO 7   PO 8   PO 9   PO 10   PO 11   PO 12												PSO 2
ſ	CO 1	3	3 2 3 1 2												2
	CO 2	3	2	3	3	1									
Ī	CO 3	3	2		3	1									2
Ī	CO 4													3	2
Ī	CO 5	CO 5         3         1         2         2         2         2													
Cot	irse Assessment Methods														

Direct

1.Continuous Assessment Test I, II & III 2.End-Semester examinations

Indirect

1.Course - end survey

Content of the s	yllabus											
Unit – I	PROPERTIES OF MATTER	Periods	9									
Elasticity: Type determination by Viscosity: Co-e	<b>Elasticity</b> : Types of moduli of elasticity - Stress - Strain Diagram – uses. Young"s modulus: Experimental determination by non-uniform bending - Twisting couple on a wire –Application: Torsional pendulum. <b>Viscosity:</b> Co-efficient of viscosity - Poiseuilles' formula - Experimental determination – uses.											
Unit - II	ELECTRONS IN SOLID	Periods	9									
Classical theory: Classical free electron theory of metals- Expressions for electrical conductivity and Thermal Conductivity of metals – Wiedemann-Franz law (Qualitative) - Success and failures. Quantum theory: de Broglie's hypothesis - Schrodinger's time independent and time dependent wave equations (Qualitative) - Particle in a one-dimensional box- Fermi – Dirac Statistics - Density of energy states (Qualitative).												
Unit – III	CRYSTAL PHYSICS AND ULTRASONICS	Periods	9									
Crystallography in cubic lattice- ( for HCP structur <b>Ultrasonics:</b> In Navigation and I	- Unit cell - Crystal systems - Bravais lattices- Lattice planes - Mi Calculation of number of atoms per unit cell- Atomic radius – Coo es. troduction – Magnetostriction and Piezoelectric Oscillator r Ranging (SONAR), Non – Destructive Testing (NDT) and Sonogr	ller indices - I rdination num nethods – Aj ram.	Inter-planar spacing ber- Packing Factor pplications: Sound									
Unit - IV	SEMICONDUCTING & MODERN ENGINEERING MATERIALS	Periods	9									
Intrinsic semico gap determinatio (Qualitative) – V Metallic glasses applications of N	<b>inductor:</b> (Qualitative only) – Carrier concentration – Fermi level on. Extrinsic semiconductors: Carrier concentration in $n - ty$ fariation of Fermi level with temperature. <b>::</b> preparation, properties and applications - Shape memory all first allow	1 - Electrical cpe and p - tloys (SMA):	conductivity - Band ype semiconductor Characteristics and									
Unit – V	LASER AND FIBER OPTICS	Periods	9									
Laser: Characte Semiconductor I Optical fiber: F (Qualitative)-Ty endoscope.	Laser: Characteristics of laser – Derivation of Einstein''s A and B coefficients. Types: Nd-YAG laser -         Semiconductor laser: Homo junction - Applications.         Optical fiber: Principle of propagation of light through optical fiber - Numerical aperture and acceptance angle         (Qualitative)-Types of optical fibers -Fiber optical communication system (block diagram) - Application: Medical endoscope.         Total Periods       45											

Text	Books:										
1.	R.K.Gaur and Gupta. S.L, Engineering Physics, Dhanpat Rai Publishers, 2017.										
2.	S.O Pillai., Solid state physics, New Age International Private Limited.										
3.	. P.Mani, "Engineering Physics", Shri Dhanam publisher, Chennai – 600 042										
Refe	References:										
1.	B.K. Pandey, S. Chaturvedi. "Engineering Physics", 1 st Edition, Cengage Learning India Pvt Ltd, (2012).										
2.	Fundamentals Of Physics Extended 8/Ed 8th Edition, David Halliday, Robert ResnickJearl Walker, Wiley India Pvt Ltd, 2008.										
3.	Lawrence H.Vanvlack, "Elements of materials Science Engineering, 6th Edition, Pearson Publication.										
4.	S.O.Pillai, "Solid State Physics", New Age International Publishers										
5.	Dr.V.Rajendran, "Engineering Physics", Tata McGraw Hill Education Private Limited, New Delhi										
E-R	esources:										
1.	www.e-booksdirectory.com										
2.	Home.iitk.ac.in										
3.	physics.cu.ac.bd/										



#### VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN



(Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205

Pro	ogramn	ne B	8.E./B.	TECH	I				Pro	ograr (	nme Code	10	94	Regulati	on		2019	
De	partme	nt C	CSE, E	EE, E	CE, ľ	T, BT,	CST a	& BM	E					Semes	ter		Ι	
(	Course			Co	ourse N	Jame			Periods Per Week				dit	Ν	<i>I</i> axin	mum Marks		
	Couc						_		L	Т	Р	0	2	CA		ESE	Total	1
U1	9CS1	01   P S	rogra olvin	ımmiı g	ng for	• Prob	olem		3	0	0	3	5	40		60	100	
		Г	The main objective of this course is to:															
	• Learn the fundamentals of computers and acquire problem solving skills												kills					
(	Course • Understand C programming concepts																	
0	<b>Objective</b> • Write the programs using arrays and strings																	
• Write the programs using functions																		
Write the programs using structures																		
		A	At the end of the course, the student should be able to,													K	nowledge Level	e
		С р	<b>CO1:</b> Write the algorithms and to draw flowcharts for solving problems.													К3		
0	Course utcom		<b>CO2:</b> Analyze the basics of C programming language.													K4		
		(	CO3: Implement the C programs using arrays and strings.														K4	
		0	<b>CO4:</b> Develop C programs using the functions and pointers.														K3	
		0	C <b>O5:</b> S	Solve	the re	al tim	e prob	lems	usin	g St	ructi	ires ai	nd un	ion			K3	
						00		•								007		
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak												CO/I Map	280 ping					
Programme Outcomes (POs)											PS	PSOs						
	COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	I	0	PO 10	PO 11	PO 12	PS	01	D1 PSO 2	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$									3									

Course Assessment Methods
DIRECT

1. Continuous Assessment Test I, II & III

2. Assignment

3. End-Semester examinations

INDIRECT

CO 2

CO 3

CO 4

CO 5

1. Course - end survey

Content of	the syllabus											
Unit – I	INTRODUCTION TO PROBLEM SOLVING	Periods	9									
Basic Orga	nization of Computer - Programming Languages- Flowchart – F	'seudocode	e - Compilers-									
Interpreter-	Algorithm - Building Blocks of Algorithm - Algorithmic H	Problem S	olving-Simple									
Strategies f	for Developing Algorithms - Illustrative Problems: Find Minir	num value	e from list of									
elements, G	uess an Integer Number in a Range, Factorial of a given number.											
Unit - II	C PROGRAMMING	Periods	9									
Introduction	n to C – Features - Data Types – Constants – Variables - $I/O$	Statement	- Operators –									
Expressions	s - Decision Making and Branching – Looping Statements - Break	, Goto, Co	ntinue.									
Unit – III	ARRAYS AND POINTERS	Periods	9									
Arrays: Con	cepts – Need – one dimensional array – array declaration – feature	res – array	initialization -									
Two- Dime	nsional Arrays- Multidimensional Arrays.											
Pointers: Ir	troduction, pointer declaration-accessing variable through poin	ter-pointer	's and Arrays,									
Pointers and	d strings – Pointers structures-pointer Arithmetic - Array of Point	iters – dyn	iamic memory									
allocation.			0									
Unit - IV	FUNCTIONS AND STRINGS	Periods	9									
Function: If	troduction, function declaration, defining and accessing function	ns, User-de	stined									
Functions-	storage classes-function prototypes-parameter passing methods-re	cursion.	1 10 0									
Strings: Co	ncepts – Strings manipulation - String Input / Output Functions- S	trings stan	dard functions									
- Allays of	- Arrays of Strings.											
	STRUCTURES AND UNIONS	and Eveneti	, Deintens									
to Structures-I	s - Unions- Type Definition – Bitfields- Enumerated Types.	and Functi	ons - Pointers									
	To	tal Period	is 45									
Text Books	\$											
1.	Kernighan BW and Ritchie DM, "The C Programming La Prentice Hall of India, 2015.	inguage",	2nd Edition,									
2.	E. Balagurusamy, Computer Programming, First Edition, Mc G	raw Hill, 2	016.									
References												
1.	Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th	edition										
2.	Dr.V.Rameshbabu, Dr.R.Samyutha, M.Muni Rathnan, "Compu Publishers Pvt.Ltd,	ter Program	nming", VRB									
3.	E. Balagurusamy, Programming in ANSI C, Seventh Edition, M	lc Graw Hi	ll, 2017.									
E-Resourc	es											
1.	https://www.geeksforgeeks.org/c-language-set-1-introduction/											
2.	https://www.programiz.com/c-programming											
2												

ROMEN ENPON	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205Image: Content of the second se																	
Program	me	<b>B.</b> 7	Tech				Prog	ramm	e Coo	de 1	04	Regu	ilation	1	2	2019		
Departm	ent	INF	ORM	IATI	ON 1	ГЕСН	INOI	JOGY	7			Sem	ester			Ι		
Course C	Code	Cou	rse N	ame					Pe	riods l Week	Per	Credit Max			laxim	imum Marks		
									L	Т	Р		С	C	A	ESE	Total	
U19GE	E101	Eng	ineer	ing G	rapl	nics	•		2	0	3		3	4	0	60	100	
Cour Object	se tive	<ul> <li>Develop skills to enhance their ability to know the concept of engined graphics and to draw the points kept in various positions, lines and plat</li> <li>Project the drawing of various solids.</li> <li>Sketch sectioned views of solids.</li> <li>Draw the development of surfaces.</li> <li>Draw the isometric and orthographic projections for any given ob required standard.</li> </ul>														ering nes. ject to	o the	
At the end of the course, the student should be able to         Course         Course											Knowledge Level nd K2							
Outcon	mes	CO	<b>CO2:</b> Construct projection of solids with various conditions.													K	.4	
		CO	3: Des	sign t	ne se	ction	of sol	t solids and analyze the true shape of the sect									.3	
		CO	4: Des	sign a	nd de	evelop	$\frac{1}{2}$ the $\frac{1}{2}$	liffere	ent so	lid sui	taces.	0.110				K2		
	• /		<b>5:</b> Coi	nstruc	t 180	metric	c and	orthog	graph	ic proj	jection	n of dif	feren	t solids	5.	K	.1	
re - requi	sites	N1I				<u> </u>	DOM	~~~ <b>!</b> ~~	_							0		
		(3/2/1	indica	tes stre	ngth	of corre	elation)	apping ) 3-Stro	<b>;</b> ong, 2 ·	– Medi	um, 1 -	Weak		N	1appir	ng		
						Progra	umme (	Dutcon	nes (PC	Ds)					PSOs			
	COs	PO 1	PO 2	PO	PO	PO 5	PO	PO 7	PO	PO	PO 10	PO 11	PO	PSO 1	PSO	PSO		
	CO 1	3	3	3	3	3	-	-	-	-	-	-	-	3	-	-		
	CO 2	3	3	2	2	2	_	_	-	-	_	_	-	2	2	_	_	
	CO 3	3	2	2	2	3	-	-	-	-	_	_	-	2	-	-	_	
	CO 4	3	2	3	3	2	-	-	-	_	_	_	-	2	2	_	-	
cos       3       3       2       3       3       -       -       -       -       -       3       -       -										-								
Course	Assess	ment	Meth	ode														
Dire	ct	ment		1046														
<ol> <li>Continuous Assessment Test I, II &amp; III</li> <li>Assignment</li> <li>End-Semester examination</li> <li>Indirect</li> </ol>																		
1.	Course	e - end	l surv	ey														

Cont	tent of the	Syllabus								
Con Con N Exa	ncepts & ventions( lot for mination)	Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.	Periods	1						
U	nit – I	PROJECTION OF POINTS, LINES AND PLANE SURFACES	Periods	3+8						
Intro	duction to	Plane curves, Orthographic projection – principles – projection	of points,	straight lines						
	nit II	<b>PROJECTION OF SOLIDS</b>	Dorioda	2+9						
Droig	IIII - II	<b>PROJECTION OF SOLIDS</b>	Perious	J+0						
refer	ence plane	simple sonds like prisms, pyramids, cynnder and cone when the	e axis is inc	timed to one						
Ur	nit - III	SECTION OF SOLIDS	Periods	3+8						
Secti	oning of s	olids - prisms, pyramids, cylinder and cone in simple vertical po	osition by c	utting planes						
inclin	ned to one	reference plane and perpendicular to the other - Obtaining true sha	pe of sectio	n.						
Ur	nit - IV	DEVELOPMENT OF SURFACES	Periods	3+8						
Deve	elopment o	f lateral surfaces of simple solids like prisms, pyramids, c	cylinders a	nd cones –						
deve	lopment of	simple truncated solids involving prisms, pyramids, cylinders and	cones.							
U	nit - V	ISOMETRIC PROJECTIONS, ORTHOGRAPHIC VIEWS FROM PICTORIAL VIEWS	Periods	5+10						
Isom Isom ortho Dem	etric Proj etric scale ographic vi onstration	-Isometric projections of simple solids like prisms, pyramids, ews from pictorial views.	of isometric cylinders a	e projection - and cones &						
Com demo	<b>puter</b> Aid	<b>led Drafting (Auto CAD / Solid Edge):</b> Introduction to of their use.	drafting pa	ckages and						
		Tot	al Periods	60						
Text	Books:									
T1.	Basant A	grawal and C.M Agrawal ,"Engineering Drawing ",Tata McGraw	Hill ,Third l	Edition,2019						
T2	Jain and	Gautam ,"Engineering Graphics & Design ",Khanna Publishing He	ouse, 2018							
Refe	rence Boo	ks:								
R1.	Dr.P.Kan	nan and Dr.J.Bensam Raj, "Engineering Graphics", JBR Tri Sea P	ublishers P	vt. Ltd,2018.						
R2.	K.V Nata	rajan, "Engineering Drawing and Graphics", M/s. N.Dhanalakshm	i, Chennai,	2014.						
R3.	K.Venug	opal and V. Prabhu Raja, "Engineering Graphics"New Age Interna	tional Publi	ishers,2011.						
R4. N.S Parthasarathy and Velamurali, "Engineering Graphics", Oxford University, New Delhi,2015										
R5. Bhatt N.D and Panchal V.M, "Engineering Drawing", Charotar Publishing House, 50 th Edition, 2010										
E-Re	E-Resources:									
E1.	http://npt	el.ac.in/courses/105104148, "Engineering Graphics" - Dr. Nihar R	anjan Patra.	, IIT Kanpur						
E2.	http://cfd	.annauniv.edu/webcontent.htm, "Engineering Graphics" - Dr.Vela	murali							
E3.	http://linl	<u>c.springer.com/</u> "Engineering Graphics"-Springer Nature.								

	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University,Chennai) Elayampalayam, Tiruchengode – 637 205																
Prog	gramme	<b>B.</b>	Гech									Reg	ulatio	n	20	19	
Dep	artment	INF	ORM	ATION	N TECH	INOL	OGY					Se	emeste	er	Ι		
Course	Code		Col	irse Na	me	P	Period	s Per	Week	C	redit		Ma	ximur	n Mark	S	
Course	Coue						L	Т	Р	_	С	(	CA	E	SE	Total	
U19P	H106		LAB	ORAT	S ORY		0	0	4		2		60	4	0	100	
Course Objectiv	<ul> <li>Understand elastic behavior of Materials</li> <li>Predict viscous force in liquids.</li> <li>Gain knowledge in measuring the lowest thickness materials</li> <li>To Identify wavelengths of prominent lines using polychromatic lamp</li> <li>Observe heat conduction in bad conductor</li> <li>Understand the principle of interferometer</li> <li>To learn about the characteristics of Lasers</li> </ul>														)		
• To learn about the characteristics of Lasers       Knowledg         At the end of the course, the student will be able to       Level														wledge			
CO1: Measure the young's modulus of the materials, Rigidity       K3         modulus – Torsion pendulum       K3													}				
Course Outcom	e	CO thir	<b>CO2:</b> Calculate Coefficient of viscosity of liquid and thickness of thin wire using Air wedge													}	
		CO Spe	<b>3:</b> Obsectrum	serve a and di	nd mea spersive	asure t e powe	he dit r of a	ferer prism	nt way	vele	ngths	of me	ercury	1	K3	3	
		CO dete	4: Illu ermine	strate the ve	the con clocity	ductiv of ultra	ity of asoni	bad wav	condu ves in	acto liqu	rs. To id	knov	v how	v to	K3	3	
		CO ord	9 <b>5:</b> To inary l	unders ight	tand th	e impo	ortan	ce of	laser	bear	m con	npare	d to		K2		
	(3/2	/1 indic	cates str	ength of	CO / PC f correlat	<b>) Mapp</b> tion) 3-5	<b>oing</b> Strong	, 2 − N	Лediur	n, 1 ·	- Weak			CO/ Map	PSO oping		
COs					Program	me Out	comes	(POs	)					PSO	s		
<u> </u>	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO	8 P	09	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	
	3	1	1	2	2										2		
CO 3	3	2	1		$\frac{2}{2}$												
CO 4	3	3		1	_												
cos         3         1         1         1         1																	
Course Assessment Methods Direct 1. Prelab and post lab test 2. End-Semester examinations Indirect																	
	1.Cour	se - en	d surve	у													

Conter	nt of the syllabus										
S.No.	Experiments	CO									
1.	Determination of Young"s modulus of the material - Uniform bending method	CO1									
2.	Determination of Young"s modulus of the material - Non uniform bending method	CO1									
3. Determination of Rigidity modulus – Torsion pendulum											
4.Determination of Coefficient of viscosity of a liquid – Poiseuille's methodO											
5.	Determination of thickness of a thin material – Air wedge method	CO2									
6.	Determination of wavelength of mercury spectrum – spectrometer grating	CO3									
7.	Determination of Dispersive power of a prism – Spectrometer	CO3									
8.	Determination of thermal conductivity of metallic glass using Lee"s Disc Method	CO4									
9.	Determination of velocity of sound and compressibility of liquid – Ultrasonic interferometer	CO4									
10.	Determination of Wavelength and particle size using Laser	CO5									
	Total Periods 4	5									
Lab M	lanual										
1.	R. Jayaraman, Engineering Physics Laboratory Manual, Pearson Pub, Edition-202	1.									
2.	K. Katiyar &C.K. Pandey Engineering Physics: Theory and Practical, Wiley Pu Edition.	ub,2 nd									

		VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205														
Programme	B. TEC	H			<u>.,</u>	Progr	amme	e Cod	e	104	]	Regulat	ion	20	)19	
Department	INFOR	MATI	ON T	ECHN	OLOG	Y						Semes	ster		I	
							Pe	riods Wool	Per	C	redit		Max	imum N	Aarks	
Course Code		C	ourse	Name		-	L	T	P		С	CA	ES	E	Total	
U19CS102	CO	MPU LA	TER I BORA	PRAC ATOR	TICE Y	S	0	0	4		2	60	40	)	100	
Course Objective	<ul> <li>se ctive</li> <li>The Main Objective of the course is to</li> <li>Make the students to learn the programming language</li> <li>Understand the basic programming constructs and articulate how they are used</li> <li>Develop a program with a desired runtime execution flow</li> <li>Articulate where computer programs fit in the provision of computer based solutions toreal world problems</li> </ul>															
Course	solutions toreal world problems       Knowledge         At the end of the course, the student should be able to,       Level         Course       CO1:Prepare document using word processor       K3															
Outcome	CO2:S flowch	Sketch arts	flow	of exec	cution	of C p	rogra	ims u	sin	g algo	orithr	n and		K3		
	CO3:V statem	Vrite t ents	he sin	ple C	Progra	ıms us	ing d	ecisi	ona	and lo	oopin	g		K3		
	CO4: functionand po	Demo ons inters. Write		e code	reusal	oility	with	the h		of us	ser de	efined	nac		K4	
	000.	wine		CO/I	PO Maj	oping			15111		Iveu			CO/P	rso	
	(3/2/1 indi	cates st	rength	of corre Progra	lation) 3 mme Oi	3-Stron	g, 2 – s (POs	Mediu s)	ım,	1 - We	ak			Mapp PSC	oing Os	
COs PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	РО	9	PO10	)	PO11	PO 12	PSO1	PSO 2	
<b>CO1</b> 3	3	3	1				3	3		3		3	3	3	1	
$\begin{array}{c c} \mathbf{CO2} & 3 \\ \hline \mathbf{CO3} & 3 \end{array}$	3	3	1				3	3		3		3	3	3	1	
<b>CO 4</b> 3	3	3	3				3	3		3		3	3	3	1	
<b>CO 5</b> 3	3	3	3				3	3		3		3	3	3	1	
Course Asses	Course Assessment Methods															
Direct         1. Prelab and post lab test         2. Record mark         3. End-Semester examinations         Indirect																
	- end su	ivey														

	SUGGESTED LIST OF EXPERIMENTS	Course Outcome
1. Design an algorith and power consur distribution comp Consump	m and flowchart using word processor that reads the customernum med and prints the amount to be paid by the customer. An electric populary charges its domestic consumers as follows pain Units Rate of Charge	nber wer
0-200 201-4 401-6 2. Design an algorit processor forperf	Rs.0.50 per unit00Rs.100 plus Rs.0.65 per unit excess 20000Rs.230 plus Rs.0.80 per unit excess of 400thm and flowchart for a simple calculator program using wordforming various arithmetic operations such as	
"+" - A "-" - S "*"	Addition Subtraction	CO2
Multiplication "/" - I "%" - N	Division Modulus	
3. Design and develo it is a	op a C program to accept a number from the user and check wh	ether CO3
Palindrome or not. Palindrome order is sa Example: :11, 101, Palindrome	e number : (a number is a Palindrome which when read in reve me asread in the right order) Palindrome 151 Not a e:123,100	rse
4. Develop a C pro digits in theinteger Test Case: Sample Input: 15390 Sample Output: Sum of the digits=18	ogram to find the sum of the digits of an integer and the number r that is given as input by the user.	of CO3
No. of digits = 5 For an incorrect ch 5. Develop a program or multi-dimension a. Addit	hoice, an appropriate error message should be displayed. m to perform the following operations using two dimensional nal matrices: tion of two matrices $(3x3)$	CO3
<ul> <li>c. Multi</li> <li>6. Write a program to using onedimension</li> </ul>	plication of two matrices (2x2) of find the maximum and minimum element in a set of inputs onal array.	CO3

7.	Write a program to count the total number of vowels and consonants in a string. For exampleInput string: I am proud to be an Indian $Output$ : Total vowels – 10 and Total consonants – 10	<b>CO4</b>
8.	Develop a program to perform the following string manipulations without	
0.	using stringfunctions:	
	d. String copy	
	e. String Concatenate	<b>CO4</b>
	f. String length	
	g. String Compare	
0	The Fibonacci numbers are defined recursively as	
).	follows:F1=1	<b>CO4</b>
	F2=1	
	Fn = Fn - 1 + Fn - 2, n > 2	
	Write a function that will generate and print the first n Fibonacci	
	numbers.Test the function for n=5,10,15	
10.	Write a function using pointers to exchange the values stored in two locations in the	CO4
	memory. Test Case :	
	Input: $A=10$ , $B=-5$	
11.	Develop a program to build a database of students with the following attribute: Roll no, Name, Course, Stream, Percentage, and Division. Take input for each student in all fields except division. Calculate division of each student such that those students having percentage >=60% are belongs to first division. Similarly, for second and third division students having conditions 50 %< =percentage<60% and 35 %< =percentage<50% respectively. If any student has percentage less than 35% then write "fail" in division field. After building the database display the database of the students.	CO5
	Hint: create database using structure.	
	Total Periods	45
E-R	esources	
1.	https://www.programiz.com/c-programming	
2.	https://www.cprogramming.com/	
3.	https://beginnersbook.com/2015/02/simple-c-programs/	

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VIVEKANANDHA COLLEGE OF ENGINEERING FOR         WOMEN         (Autonomous Institution Affiliated to Anna University Chennai)         Elayampalayam, Tiruchengode – 637 205													TUVInterland CENTIFED			
Programme	<b>B.</b> ]	E /B.1	ГЕСН	I P	rogram	ime co	ode	104	I	Regulat	tion			2019		
Department	IN	FORM	MATI	ON 1	ГЕСН	NOL	OGY			Seme	ster		I			
Course cod	e	Cour	se nar	ne	Peri	iods pe	er wee	ek	k Credit			ximun	n Mar	Marks		
		Cour	se nai	lie	L T F		P	С		CA		ESE	Total			
U19MCFY1		Envir Scie Engi	onme nce ai ineeri	ntal nd ng	3	0		0	0		100		0	100		
Course Objective	Course ObjectiveI he main objective of this course is to: <ul><li>Familiarize basics of ecosystem and creating environmental awareness.</li><li>Congregate quality and standards requirement of water.</li><li>Contrast water management procedures.</li><li>Acquire knowledge on air pollution and its control.</li><li>Summarize Solid waste and its prevention methods.</li></ul>															
	T C kr	he stud <b>O1:</b> I	ed to:	Knowledge Level K1												
Course Outcome	C w	<b>CO2:</b> Recognize quality, standard and control strategies of polluted water.														
	С	<b>03:</b> Iı			K3											
	C di	<b>O4:</b> A	cquire lmetho	Kr od	nowled	ge a	bout	Rac	lioactiv	ve pol	llution	and		K3		
	CO Env	<b>5:</b> Avironm	warene ent	ss at	oout po	opulatio	on gr	owth,	huma	an right	s and			K2		
Pre- requisite	s N	il														
	(.	3/2/1 ine	dicates	strengt	CO / h of corr	<b>PO M</b> relation)	apping 3-Stro	<b>g</b> ong, 2 –	Mediun	n, 1 - We	ak		CC Ma	)/PSO apping		
COs		I _			Progr	amme (	Jutcon	nes (PO	s)		_	1	F	SOs		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	POS	8 PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$											1					
<u> </u>	2	2	-			3	3	1	+		1	2				

2 2

CO 4

CO 5

#### 

Course A	assessment Methods		
Direct			
1. C	ontinuous Assessment Test I, II & III		
2. A	ssignment		
3. E	End-Semester examinations		
Indirect			
1. Co	urse - end survey		
Content o	f the syllabus		
Unit – I	Introduction to Environmental Science and Engineering	Periods	9
Nature and	nd scope of environmental education- Natural Resources – (Fo	orest, Wat	er, Food,
Energy	& Land Resources) problems and remedial measures,	Ecosyst	em and
Biodiver	sity- Ecosystem-Structure, Characteristics and functions	of ecosys	stem (in
general)-	Biodiversity - Definition - Conservation of Biodiversity (in	-situ and I	Ex-situ)-
Environ	nental awareness and sustainable development		
Unit – Il	Water pollution and Waste water treatment process.	Periods	9
Water po	llution-causes, effects and control measures of water pollution	- case stu	dy- Waste
water tre	eatment process- Primary, Secondary, Tertiary and desalination	tion-Wat	er quality
paramete	rs- Hardness, Alkalinity, DO, COD, BOD-Water quality sta	indard-	
WHO an	d BIS.		
Unit – III	Air Pollution and its Control	Periods	9
Air pollut	ion-Types of Air Pollutants- CO2,SO2, NO2, PAN etc Source	es- causes	, effects
(Acid rair	, use eGreen hoffect, Ozone layer depletion and global warmi	ng)- cont	rol
measures	(Electro static precipitator, Gravitational settling chamber, Ba	ghouse fi	lter, Wet
Scrubber	and cyclone separator).		
Unit – IV	Radioactive Pollution and Solid waste management	Periods	9
Radio ad Fission-N working Types of Significa	tive pollutants-sources, effects, Nuclear Energy – Nuclea Nuclear power plant- Light water nuclear power plant- Dia – pollution- impacts-and control measures- case study- soli solid waste- Disposal method and its problem in solid w nce for prevention of hazardous waste management.	r Fusion agram- ill d waste-c aste man	–Nuclean ustration- lefinition- agement-
Unit – V	Human population and the Environment	Periods	9
Population Family v environn Environn	on growth, Human rights, Value education, environment as velfare Program, Women and Child welfare, Role of informa- nent – Satellite, Data base, Geographical Information nental impact Analysis (EIA) and Human health.	nd Huma tion techn System	n health, nology in n (GIA),
	Total	Periods	45
Text boo	ks		
1.	Dr.S. Vairam, "Environment Science and Engineering" Gem	ns publica	tion.
	Gilbert M Masters-"Environmental Science"-Pearson education	ion Editic	on-2-
2.	2013		/ii <i>L</i>

Refere	ence books
1	Linda Williams- "Environmental Science"-Tata McGRAW – Hill Edition.
1.	Edition-I-2008
2	T.G.Miller Jr-"Environmental Science"-Wadsworth publishing Co.
2.	Edition -10-2004
3	William P. Cunningham, Barbara Woodworth Saigo- Tata McGraw
5.	Hill.Edition-4-2011
4.	NPTEL Course Notes
	Cunnighum and cooper-"Environmental Science"-Jaico Publ. House
5.	Edition-4-2007
F-Ros	0117005
L-Res	
1	https://libraries.ou.edu/
2	https://libauides.reading.ac.uk/
	https://https://https://https://https://https://https://https://https://https://https://https://https://https://
3	https://libguides.reading.ac.uk/

	VIVE	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University														
NOMEN EMPOWERMENT	( <i>P</i>	autono	omous	Insti	tution	, AIIII	Cl	i to A ienna	i)	Unive	ersity		CERTIFIED	NAME TO A	cam Mérqis	
				Elay	/ampa	layan	ı, Ti	ruche	ngod	e – 63	37 20	5				
Programme	B.TEC	CH					P	rogran C	nme Code	104	Reg	gulatio	on	20	19	
Department	INFOR	RMAT	ION T	ECHN	OLO	GY				ŝ	Seme	ster		]	Ι	
Course Code		C	ourse l	Name		-	Per	riods H Week	Per	Cre	Credit Maxi			imum Marks		
U19MA202	Linea	Linear Algebra and Ordinary Differential Equations31044060The Main Objective of the server is to														
Course Objective	<ul> <li>Uno of e</li> <li>Pro</li> <li>Den</li> <li>Kno tran</li> <li>Ide</li> </ul>	dersta equation ficien monst ow nsform ntify t	nd Eigons. tly un rate ve about nation he La	dersta ector Car s. place	alues a and the integr rtesiar transf	and E e vect al calo n an	or di culus d	vecto ifferen s. Polar rivati	ors ar ntial co ves a	nd its calcul p-ordin and int	role i lus. nates tegra	in the an ls.	e syster d als	m 80		
At the end of the course, the student should be able to,     Knowledge       Image: Course of the course of the student should be able to,     Image: Course of the course of the student should be able to,													dge l			
Course	CO1: CO2:	Ident	jze m ifv ve	e Red ctor d	iffere	$\frac{101 a}{\text{ntial c}}$	quac alcu	lus.	TOLIU	l <b>.</b>			<u>к.</u> К	2, r 2, k	<u>.4</u> [3	
Outcome	CO3: ApplyGreen's , Stoke's and Gauss DivergenceK1, K5															
	<b>CO4:</b>	Ident	ifying	the a	nalyti	c func	tion	s					K	2, K	35	
	CO5: impul	Reco se fun	gnize ctions	the L	aplac	e tran	sfori	n of i	unit s	step a	nd u	nit	K.	5, K	3	
Pre-requisites	-															
(3/2/1 in	dicates st	rength	CO/	<b>PO M</b>	apping	<b>g</b> ong. 2 -	– Me	dium.	1 - We	eak		CC	)/PSO I	Map	oping	
		0	Progra	amme	Outcon	nes (PC	)s)	,					PSO	Ds		
COs PO PO 1 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PC 10	) )	PO 11	PO 12	PSO	$\begin{array}{c c} \mathbf{PS} \\ 2 \\ 2 \end{array}$	0	PSO 3	
CO1 3 3												2				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$												2				
CO 4 3 3												2				
Course Assess	nent M	ethod	ls									2				
Direct																
<ol> <li>Continuous</li> <li>Assignmen</li> <li>End-Semes</li> </ol>	s Assess t. ster exa	sment ninati	Test I	, II &	III											
Indirect	end	mu	5115													
1. Course - en	d surve	у														

Conte	ent of the syllabus
Unit -	- I MATRICES Periods 12
Chara	cteristic equation – Eigen values and Eigenvectors of a real matrix– Properties of Eigen values
and E	Eigenvectors - Cayley-Hamilton theorem(excluding proof) - Diagonalization of matrices -
Reduc	ction of a quadratic form to canonical form by orthogonal transformation – Nature of quadratic
forms	. Simple application in encoding message using $2 \times 2$ matrix. Simple application in encoding
messa	ge using 2×2 matrix.
Unit -	II         VECTOR DIFFERENTIAL CALCULUS         Periods         12
Vecto	r Differentiation: Vector and Scalar Functions- Derivatives- Curves, Gradient of a Scalar
Field-	Directional Derivative -Divergence of a Vector Field - Curl of a Vector Field – Tangents and
Norm	als.
Unit -	- III VECTOR INTEGRAL CALCULUS Periods 12
Line,	Surface and Volume integrals, Green's theorem in a plane(excluding proof), Gauss Divergence
theore	m(excluding proof), Stokes theorem (Excluding proof) - simple applications involving
rectan	gular parallelepipeds and spheres.
Unit -	IV     ANALYTIC FUNCTIONS     Periods     12
Analy	tic functions – Necessary and sufficient conditions for analyticity in Cartesian and polar
coord	inates - Properties – Harmonic conjugates – Construction of analytic function - Conformal
mappi	Ing – Mapping by functions c+z, cz, 1/z and Bilinear transformation.
Unit -	- V LAPLACE TRANSFORMS Periods 12
Existe	ence conditions – Transforms of elementary functions – Transform of unit step function and unit
impul	se function – Basic properties – Shifting theorems(excluding proof) - Transforms of derivatives
and in	tegrals – Initial and final value theorems(excluding proof) – Inverse transforms –
Convo	olution theorem(excluding proof) – Transform of periodic functions – Application to solution
of line	ear second order ordinary differential equations with constant coefficients.
Trent 1	I otal Periods 60
1 ext 1	
1.	T. Veerarajan, Engineering Mathematics, Tata McGraw Hill Education Pvt. Ltd-2012
2.	Ravish R Sing, Mukul Bhatt, "Engineering Mathematics", Mc Graw Hill Education Pvt. Ltd-
	2018
Refer	rences:
1.	Wylie, R.C. and Barrett, L.C., "Advanced Engineering Mathematics", Tata McGraw Hill
	Education Pvt. Ltd, 6th Edition, New Delhi, 2012.
2.	Kreyszig, E., Advanced Engineering Mathematics (10th Edition), John Wiley (2015).
3.	Alan Jefferis, Advanced Engineering Mathematics, Academic Press- New Delhi-2003
	Yunus A.Cengel, William J.Palm III," Differential equations for Engineers & Scientists",
4.	Tata McGraw Hill Education Pvt. Ltd, 6th Edition, New Delhi, 2012.
5.	John Bird, Higher Engineering Mathematics, Anuradha Agencies(2004)
<b>E-Res</b>	ources:
1.	https://en.wikipedia.org > wiki > Ordinary differential equation
2.	www.learnerstv.com/Free-engineering-Video-lectures
3.	www.nptel.ac.in
э.	w w w .11ptc1.ac.111

	VIVEKANANDHA C (Autonomous Institution . Ela	OLLEGE WOME Affiliated to vampalaya	<b>OF EN</b> CN D Anna m. Tiru	GINEEI Universit	RING FC	DR ai)	Rheinland RTIFIED verei tur C sitoo							
Programme	<b>B.E</b> / <b>B.TECH</b> Programme code 104 Regulation 2019													
Department	INFORMATION TECHNOLOGY Semester II													
Course as de	Course norme	Periods pe	r week		Credit	Maxin	num Ma	arks						
Course code	Course name   I   T   P   C   CA   ESE													
U19EN202	English for Communication - II30034060													
Course Objective	<ul> <li>Provide suitable listenin and professional progress</li> <li>Inculcate channelized re professional writing con</li> <li>Improve learners" vocal professional contexts</li> <li>Assist students in the de cultural literacy so that t</li> <li>Identify and begin to ap writing and speaking</li> </ul>	ading to m ading to m texts. bulary and evelopment hey may en pply the lat	develo nake lea gramm of inte ngage in nguage	p common rners pro- ar to sup llectual f life-long features	unicative ficient in plement lexibility learning of acade	ability the cho their la , creati	for a osen inguag vity, a d prof	cademic e use at nd essional						
	The students who complete <b>CO1:</b> Acquire sufficient con	this course	success r langua	fully are	expected eak at an	to: acaden	nic or	KL						
Course	<b>CO2:</b> Write technically we them to similar readings.	n continuou ll at a pro	s expos fession	ure to sin al contex	nilar liste ts throug	ening ta gh exp	sks. osing	K3						
Outcomes	<b>CO3:</b> Use language at lengtl the enrichment of vocabular	h at technic y and stren	al and p gthenin	profession g of gram	nal situat	ions thi knowle	ough dge.	K3						
	<b>CO4:</b> Students should be able to ethically gather, understand, evaluate and synthesize information from a variety of written and electronic sources.													
	CO5:Students should be pro	oficient in c	oral com	municati	on and w	riting.		K4						
Pre- requisites	Nil													
	<u>CO / PO M</u>	Ianning												

	(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak													CO/PSO Mapping		
COs	Programme Outcomes (POs)													PSOs		
COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2		
CO 1						2			3	3		3		2		
CO 2						2			3	3		3		2		
CO 3						2			3	3		3		2		
CO 4						2			3	3		3		2		
CO 5						2			3	3		3		2		

Course Asse	ssment Methods		
Direct			
1. Continu	ous Assessment Test I, II & III		
2. Assignm	nent		
3. End-Sei	nester examinations		
Indirect			
1. Course –	end survey		
Content of t	ne syllabus		
Unit - I		Periods	9
Listening- I	istening for Cultural Awareness, Listening to Profe	essional Conversatio	ns, Talks,
Interviews an	d Lectures Speaking- Developing Confidence to get rid	of Fear on the Dias, I	Discussion
at a Corpora	te Context. Reading- Inferential Reading, Reading S	Short Messages and	Technical
Articles, Wr	iting- Introduction to Letter Writing, Writing Formal a	and Informal Letters,	Thanking
Letters, Lette	ers Calling for Quotations, Letters Placing an Order, S	eeking clarification,	-
Letters of Co	mplaint. Focus on Language-Adjectives and Degrees of	f Comparisons	
Unit - II		Periods	9
Listening- L	istening to specific information relating to technical co	ontent, Listening for	statistical
information S	Speaking- Expressing opinions, Formal Discussions, De	escribing Role Play a	t Business
Context and	Consolidating Ideas. Reading–Reading Technical Artic	les in Journals and (	Comparing
Articles. Wr	iting- Letter seeking permission to undergo practical tra	aining and to underta	ke project
work. Focus	on Language- Simple, compound and complex sen	tences and Transfor	mation of
Sentences.			
Unit - III		Periods	9
Listening- L	istening to understand the overall meaning, Listening to	Interviews and Pre	sentations.
Speaking- (	biving Instructions and Showing Directions and Reph	rasing Instructions.	Reading-
Skimming an	d Scanning, Reading Job Advertisements. Writing- Ap	olving for a Job. Wri	ting a $\stackrel{\circ}{\mathrm{CV}}$ .
Focus on La	nguage – Pronouns, Phrasal verbs, Restrictive and Non -	restrictive clauses.	U
Unit - IV		Periods	9
Listening- I	istening and retrieving Information. Speaking- Devel	oping fluency and (	Coherence.
Accent Neut	ralization. Voice Modulation and Intonation Improv	ing Voice Quality	Reading_
Reading and	understanding Advertisements Writing- Letters to th	e Editor. Letter of (	Complaint
Various kind	s of Reports Permission to go for Industrial visits <b>Fo</b>	cus on Language-	Countable
Uncountable	nouns Recommendations Discourse Markers and Cor	nparative and Contra	astive
Connectives.	Imperatives.	inputative and control	
Unit - V		Periods	9
Listening- I	istening to Fragmented Texts and Filling in the Blar	iks. Speaking-Mind	Mapping.
Developing (	Coherence and Self-Expression. Making presentations. Pa	ralinguistic and Extr	a linguistic
Features (bo	dy language). <b>Reading</b> – Predicting content. Interpreti	ng Reports. Writing	2- Writing
Proposals, A	genda. Minutes of the Meeting. Focus on Language.	British and America	in
Vocabularv	Editing, Error Detection, and Punctuation		
· · · · · · · · · · · · · · · · · · ·	,,	Total Periods	45

Te	xt books
1.	Sumant.S, Pereira Joyce, English for Communication, Vijay Nicole Imprints Pvt.Ltd., 2014.
2.	Sokkaalingam, S.R.M., The Art Of Speaking English Versatile Publishing House, 2018.
Re	ference books
1.	Norman Whitby - Business Benchmark Pre-Intermediate to Intermediate, Students Book, Cambridge University Press, 2008. , 1997.
2.	Dutt, Rajeevan, Prakash A Course in Communication Skills (Anna University, Coimbatore edition) :. Cambridge University Press India Pvt.Ltd, 2007.
3.	Meenakshi Raman and Sangeeta Sharma-'Technical Communication English Skills for Engineers'; Oxford University Press, 2008.
4.	S.P. Dhanavel, English and Communication Skills for Students of Science and Engineering, Orient BlackswanPvt, Ltd, 2009.
5.	Technical English – I & II, Sonaversity, Sona College of Technology, Salem, First Edition, 2012.
E-l	Resources
1	http://www.kalevleetaru.com/Publish/Book_Review_Who_Moved_My_Cheese.pdf
2	http://www.bookbrowse.com/reviews/index.cfm/book_number/304/who-moved-my-cheese
3	http://www.imdb.com/title/tt0482629/plotsummary

	VIVEKANANDHA CO (Autonomous Institution, A Elayampa	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205												
Programme	В.ТЕСН	Progra	amme c	code	104	Regulation	201	9						
Department	INFORMATION TECHNOL	OGY			Se	emester	II							
Course code	Course name	Periods	s per we	eek	Credit	Maxim	um Marks							
		L	Т	Р	С	CA	ESE	Total						
U19CH207	Engineering Chemistry	3	0	0	3	40	60	100						
Course Objective	<ul> <li>Recognize the basic technology requirements in water treatment</li> <li>Gain knowledge in Polymeric materials towards engineering applications.</li> <li>Enrich the Knowledge of the students with the basics of Nano materials, their properties and applications.</li> <li>Familiarize about the renewable energy and different types of batteries in the engineering application.</li> <li>Gain knowledge in destruction of metals and protection for engineering applications</li> </ul>													
	The students who complete this	course	succes	sfull	y are exp	pected to:		KL						
	<b>CO1:</b> Implement innovative so	lutions	in wast	ewat	er treatr	nent process.		K3						
Course	<b>CO2:</b> Identify the applications	of a spe	cific p	olym	er in the	field of engin	neering.	K2						
Outcomes	<b>CO3:</b> Forecast the information	of Nano	o partic	eles a	nd their	industrial app	olications	K2						
	<b>CO4:</b> Recognize the renewable	energy	device	es for	sustain	able energy.	1.61.1	K3						
	<b>CO5:</b> Identify the rate of corrosion of a metal in a given environment and find out appropriate control techniques to avoid corrosion.													
Pre- Requisities	Nil													

	<b>CO / PO Mapping</b> (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak													CO/PSO Mapping			
	Programme Outcomes (POs)																
COs	PO 1         PO 2         PO 3         PO 4         PO 5         PO 6         PO 7         PO 8         PO 9         PO 10         PO 11         PO												PSO1	PSO 2	PSO 3		
CO 1	3	3	2	2		2	2				1	2	2	1			
CO 2	CO2         3         2         2         1         2         2           Image: Second																
CO 3	3	2	3	2	1	2	1				1	1	1	1			
CO 4	3	3	2	2	2	3	3				1	2	3	2			
CO 5	cos         3         3         2         2         1         3         2         2         2         1         1																
Course	e Asse	ssmer	nt Me	thods													
Direct																	
1.	Conti	nuous	Asse	ssmen	t Test	I, II &	k III										
2.	Assig	nmen	t														
3.	End-S	Semes	ter exa	amina	tions												
Indire	ct																
1. 0	Course	e - end	surve	ey													

Content of the syllabus		
Unit - I WATER TECHNOLOGY	Periods	9
Introduction-Sources and impurities in Water, Soft and Hard water, Water qua	lity parameters, 7	Гуреs of
Hardness - Determination of Hardness by EDTA method, Domestic Water	Treatment. Boil	ler Feed
Water -Requisites, Problems due to hard water in boilers - Scale and Slue	lge formation in	boilers-
Caustic Embrittlement-Boiler corrosion, Treatment of boiler feed Water	– Internal cond	litioning
(Carbonate, Phosphate, and Calgon conditioning) External conditioning -	- Ion exchange p	process,
Zeolite process, Brackish water –Water purification by Reverse osmosis.		-
Unit - II <b>POLYMER CHEMISTRY</b>	Periods	9
Introduction - Occurrence, definitions - Functionality - Degree of Polymer	ization, Classific	ation of
polymers - structure (Linear, Branched & network polymer structure)	block, random	& graft
copolymers, properties of polymers, Tacticity, Tg, molecular weight - nur	nber and weight	average
method. Types of polymerizations: Addition, condensation and copolym	erization. Mecha	nism of
polymerization: Addition - Free radical, cationic and anionic polymerization	). Preparation, pr	operties
and applications of PE, PMMA, PC, nylon6, nylon 66, PET, and Bakelite.	-	
Unit - III NANO CHEMISTRY	Periods	9
Basics- distinction between molecules, nanoparticles and bulk materials; si	ze dependent pro	operties.
Nanoparticles: nanocluster, nanorod, nanotube (CNT) and nanowires. Synthes	is: Sol-gel, Preci	pitation,
Thermolysis - hydrothermal, solvothermal, Electro deposition, Spray Pyre	olysis, Chemical	Vapour
deposition, Laser ablation; Properties and applications of nano materials in n	nedical	
and electronic devices.		
Unit - IV         RENEWABLE ENERGY AND STORAGE DEVICES	Periods	9
Renewable energy and its sources - Solar Energy - Photo voltaic cells, Impo	rtance of Solar ce	ells - p-n
junctions in Solar cells - Working of Photovoltaic cell, Recent advances in s	olar cell material	s, Wind
energy - Types of Wind Power Plants (WPPs), Components and working	of WPPs, Tidal e	energy -
Types of Tidal power plants (TPPs), Barrage and Non-Barrage Tidal power	r systems. Batter	ries and
fuel cells: Types of batteries - Dry cells-Alkaline battery, lead storage batter	y, Ni-Cd battery,	lithium
battery, Fuel cell - H ₂ -O ₂ fuel cell-applications.		
Unit - V CORROSION AND ITS CONTROL	Periods	9
Introduction, Types of corrosion - chemical and electrochemical corrosic	n, mechanism, I	Pilling -
Bedworth rule, Types of electrochemical corrosion – Galvanic corrosion, I	itting corrosion,	Crevice
corrosion, Corrosion on wire tence and Pipeline corrosion, Factors influe	ncing rate of co	prrosion,
corrosion control methods – Sacrificial anode and impressed cathodic curre	nt. Protective co	atıngs –
Paints: constituents and functions, Metallic coatings - steps involved in	cleaning the surf	tace for
Electroplating, Electroplating (Au), Electro less plating (Ni).		
	Total Periods	45

Tex	t Books:									
1.	O.G.Palanna, "Engineering Chemistry "Tata Mc GrawHill PVT,Ltd. Second Edition -2017									
2.	Dr.S.Vairam ,Dr.S.Mageswari,Dr.K.Balachandran, Engineering Chemistry : First Edition, Wiley publication,Reprint-2016									
Ref	erences:									
1.	Engineering Chemistry: Jain & Jain, Dhanpat Rai Publishing Company Edition- 16- 2015.									
2.	Arun Bahl, B.S. Bahl, G.D. Tuli, Essentials of Physical Chemistry, Published by S. Chand & Company Ltd, 2014									
3.	Puri, Sharma and Pathnia, Physical Chemistry-II, Vishal Publishers, Edition- 2019.									
4.	Engineering Chemistry: Sashi Chawla, Dhanpat Rai & Co (pvt.)ltd. Edition- 5- 2013.									
5.	Dr.S.Vairam ,Dr.Suba Ramesh, Engineering Chemistry: First Edition, Wiley publication,Reprint-2016									
E-R	Resources:									
1	https://www.who.int/water_sanitation_health/dwq/arsenicun6.pdf									
2	https://www.schandpublishing.com/books/tech-professional/applied-science/a-textbook-polymer-chemistry/9788121941129/#.XdZ214MzY2w									
3	https://www.elsevier.com/books/nanochemistry/klabunde/978-0-444-59397-9									

	(/	<b>VIVE</b> Autono		NANE s Insti	<b>DHA (</b> tution Elay	COLLI W( Affilia ampala	EGE O OMEN ated to J ayam, T	F ENC Anna V Tiruche	GINEE Univers	E <b>RING</b> sity ,Cl – 637	FOR nennai) 205	TÜVRheinland CERTIFIED			
Programme	B.TEC	H		Pro Co	ogrami ode	ne	104		Regula	ation		2019			
Department	INFOR	RMATI	ION T	TECH	NOLC	OGY	I		Seme	ster		II			
	0	NT	Р	Periods	Per W	/eek	Credit			N	<b>/</b> aximur	um Marks			
Course Code	Cours	se Name	e _	L	Т	Р	С		CA		ESE	E Total			
U19EE201	Basic I and El Engi	Electri lectron neerin	cal lics g	3	0	0	3		40		60		100		
Course Objective	The stud • Lea • Lea • Lea	dents sl arn the arn the arn the	hould basic elect basic	l made c conc rical v cs abo	e to cepts o wiring out ser	of electron methomicond	rical pa ds uctor fa	ramete milies	ers and	l electri gital lo	ical ma	chines			
At the end of the course, the student should be able to,       Knowledge         Level       Level															
Course	Course CO1: Understand the basics of electric circuits and type of the K2														
CourseCO2: Understand the basics of electromagnetic laws and basic working principle of DC and AC machines.												]	K2		
	<b>CO3:</b> Understand the concepts of tariff, energy saving, illumination, electric lamps and safety measures.												K2		
	CO4: semico	Unders onducto	tand or dev	the ba vices.	isic op	erating	g charac	teristi	cs of			K2			
	CO5:	Unders s.	tand	the fu	ndame	entals c	of digita	l logic	es and i	ntegrat	ted	К2			
<b>Pre-requisites</b> Basic concepts and understanding of magnetic fields															
				CC	<b>) / PO</b>	Mappin	g					C	O/PSO		
	(3/2/1 ir	ndicates	streng	th of co	orrelatio	$\frac{(n)}{2}$	rong, 2 -	Mediur	$\frac{n, 1 - W}{(DO)}$	eak		M	apping		
		DO2	<b>PO4</b>	<b>PO5</b>	DO(	Progra		BOO	(POS)	<b>BO11</b>	PO12				
$\begin{array}{c c} COs & PO \\ \hline CO1 & 3 \end{array}$	2	103	104	105	r00	r0/	rus	rUy	1010	rull	3	3	PSO 2		
<b>CO 2</b> 3	2										3	3			
CO 3 3		T									3	3			
CO4	2										3	3			
	-	Math -	da	1	1	1	1	1	1	<u> </u>			 		
Course Ass Direct	essment	Metho	bas												
		amont	Tact	I TI Ø	, TTT										
2 Assignm	ous Asses	sment	Test	Ι, Π α	2 111										
2.Assignin 3 Fnd_Ser	cill lester ev (	minati	one												
Indirect		mmail	5115												
maneet															
1. Course -	end surv	vev													

Content	of the syllabus									
Unit – I	INTRODUCTION OF ELECTRICAL CIRCUITS	Periods	9							
Definition	n of Voltage, Current, Power, Energy, Power factor, C	Circuit parameters, Ohms	s law,							
Kirchoff"s law. Concepts of AC Circuits- RMS value, Average value, Form and Peak factors,										
Concept of real and reactive power.										
Introducti	on to three phase systems - types of connections, relation	ship between line and pha	ise							
values. C	oncept of DC circuits	1								
Unit - II	INTRODUCTION OF ELECTRICAL MACHINESAND MEASUREMENTS	Periods	9							
Faraday	s laws of electromagnetic induction - Lens law - Fleming's	s left hand rule and Rig	hthand							
rule. Wo	rking principle and construction of AC and DC mad	chines -Working princip	le and							
constructi	on of Transformer- Introductionto electrical measuring ir	struments – Analog and l	Digital							
Instrumer	its (Qualitative)	0								
Unit–III	WIRING AND ILLUMINATION Periods	9	2							
Types of	wiring-staircase and corridor wiring - wiring accesso	ries. Different types of	safety							
measures	- Earthing. Electrical tariff - Energy conservation. Simple	a layout of power system-								
	SENACONDUCTION DEVICES. Paris la	es of electrical lamps.								
Unit - IV	SEMICONDUCTOR DEVICES Periods	9								
PN junct	ion diodes - Zener diodes - characteristics. Transistors:	PNP and NPN transistor	s -							
Theory	of operation - Transistor configurations -character	stics - comparison. S	Special							
semicond	uctor devices: FET - SCR - LED – V-I characteristics -	-UPS – SMPS.								
Unit – V	DIGITAL FUNDAMENTALS Periods	9								
Number s	ystems - Boolean Theorems – De Morgan's Theorem -	Logic gates -Implementar	tion of							
Boolean I	Expressionusing Gates - Introduction to Operational Amp	ifier.								
	Total Periods	45								
Text Boo	ks									
1.	D.P. Kotharti and I.J Nagarath, Basic Electrical and Graw Hill, Third Edition, 2016.	l Electronics Engineerin	g, Mc							
2.	M.S. Sukhija and T.K. Nagsarkar, Basic Electrical and E 2016.	Clectronics Engineering, C	Oxford,							
Referenc										
1.	S.B. Lal Seksena and Kaustuv Dasgupta, Fundaments Cambridge, 2016	of Electrical Engineering	5,							
2.	Mittle, Mittal, Basic Electrical Engineering, 2nd Editi 2016.	on, Tata McGraw-Hill E	dition,							
3.	SK Sabdey Basic of Electrical Engineering Pearson 20	)15								
<u> </u>	John Bird — Electrical and Electronic Principles and Te	ochnology Fourth Edition								
<del>т</del> .	Elsevier, 2010.	ennology, Fourth Edition	1,							
5.	K Murugesh Kumar, Elements of Electrical Engineerin Ltd.2011.	g, Vikas Publishing Hou	se Pvt.							
E-Resour	·ces									
1.	https://nptel.ac.in/courses									
_	https://hptel.de.in/courses									
2.	https://www.electrical4u.com/electrical-engineering-arti	cles/illumination-enginee	ring/							

*	NONEN EMPON	A REAL OF A	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205																
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(	Cour Dbject	se tive	Eng The	<ul> <li>Familiarize the materials and measurements used in Civil Engineering.</li> <li>Familiarize the materials and measurements used in Civil Engineering.</li> <li>Provide the exposure on the fundamental elements of civil engineering components and structures.</li> <li>Impart basic knowledge of power plants, pumps &amp; boilers.</li> <li>Study the various types of IC engines and understand the features of IC engine.</li> <li>Enable the students to distinguish the components and working principle of refrigeration and air conditioning system</li> </ul>									ne. le of						
Course Outcomes		se nes	At t CO loca CO qual CO four CO	he end 1: Extion of 2: Ide ities. 3: Cla 4: Coo strok 5: Ela	d of the control of t	the contrast in the response of the second s	urse, usage surve nature variou rk igr	the stu- e of c eying of bu is type ition	udent ivil e ilding es of <u>r</u> and co rincip	shoul ngine comp oower ompro le of	d be a ering ponen plant ession	ible to mater ts, stru , pumj igniti eratior	ials an uctures p, turbi on of t	d me and t ine & wo st	asure f materia boiler roke ar ditioni	he d nd ng	Knowledge Level K2 K1 K2 K2 K2		
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		CO 3	3	2	2	-	2	-	-	-	-	-	-	-	2	3	-	4	
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Cont	tent of the Syllabus										
U	Init – I         CIVIL ENGINEERING MATERIALS AND SURVEYING	Periods	9								
Civil Engineering Materials: Bricks – Stones – Sand – Cement – Concrete – Steel sections.											
Surveying: Introduction to Surveying & Leveling.											
U	nit - II BUILDING COMPONENTS AND STRUCTURES	Periods	9								
Four	ndations: Site selection, Foundation – Types – Requirement of good foundat	ions.									
Supe	Superstructure: Brick masonry – Stone masonry – Beams – Columns – Lintels – Roofing – Flooring -										
r last Ur	nit - III POWER PLANT ENGINEERING	Periods	9								
Intro	duction. Classification of Power Plants – Boiler - Working principle of stea	m . Gas . Di	esel . Hydro-								
elect	ric, Solar, Wind and Nuclear Power plants – Merits and Demerits – Pumps	and turbine	es – Working								
princ	ciple of reciprocating pumps (single acting and double acting) – Centrifugal I	Pump.	0								
Ur	nit - IV IC ENGINES AND AUTOMOTIVE VEHICLES	Periods	9								
Inter	nal combustion engines as automotive power plant - Four stroke and two str	oke cycles -	- Working of								
SI an	d CI engines - Comparison of four stroke and two stroke engines - Introduct	ion to Electr	ic vehicles.								
U	nit - V REFRIGERATION AND AIR CONDITIONING SYSTEM	Periods	9								
Term	ninology of refrigeration and air conditioning. Principle of vapour compression	on and vapo	ur absorption								
refrig	geration system – Layout of typical domestic refrigerator – Window and sp $\therefore$	lit type roor	n air								
conditioner.											
Text Books: 10tal Periods 45											
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Text	Books: Dr.P.Kannan, "Basic Mechanical Engineering", JBR Tri Sea Publishers Pv	t <b>al Periods</b> t. Ltd., 2019	. 45								
<b>Text</b> T1. T2	Books: Dr.P.Kannan, "Basic Mechanical Engineering", JBR Tri Sea Publishers Pv Pravin Kumar, "Basic Mechanical Engineering", Pearson Publishers, New	t. Ltd., 2019 Delhi, 2013.									
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Department         INFORMATION TECHNOLOGY         Semester         II           Course Code         Course Name         Periods Per Week         Credit         Maximum Marks           U191T201         Object Oriented Programming         2         0         2         3         40         60         100           The main objective of this course is to:         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -	Progr	amme	B.T.	B.TECH Programme 104 Regulation								2019					
Course Name         Periods P	Depar	rtment	INF	ORM	ATIO	N TEC	HNO	LOGY	r			S	Semester		II		
L         T         P         C         CA         ESE         Total           U19IT201         Object Oriented Programming         2         0         2         3         40         60         100           The main objective of this course is to: •         Understand the OOP concepts using Classes, Objects and Pointers to Objects in C++         •         Learn the concepts of Memory allocation using constructors and Operator overloading         •         Learn the different types of Member functions, Templates and handling Exceptions         •         Understand the levels of Inheritance, concepts of Streams and File handling methods         •         Learn the fundamentals of Java, Inheritance and Exception Handling in Java           •         Learn the fundamentals of Java, Inheritance and Exception Handling in Java         Kaowledge         Kaowledge           •         Learn the fundamentals of Java, Inheritance and Exception Handling in Java         K4         CO2: Implement OOP concepts using C++ programming language.         K3           COurse         CO2: Implement OOP concepts using C++ Programming language.         K4         K4           CO3: Inplement Inheritance and develop C++ programs using Member functions, Data hiding using Templates and to handle various exceptions         K4           CO4: Implement Inheritance and evelop C++ programs using the streams and member functions to enable File Handling.         K3           CO5: Develop Java Programs to Implem	Course	e Code		Cou	rse Na	me		Peri V	ods Pe Veek	er	Credit		Maxi	mum Ma	n Marks		
U19T201       Object Oriented Programming       2       0       2       3       40       60       100         The main objective of this course is to: Understand the OOP concepts using Classes, Objects and Pointers to Objects in C++         Learn the concepts of Memory allocation using constructors and Operator overloading         Understand the levels of Memory allocation using constructors and handling Exceptions         Understand the levels of Inheritance, concepts of Streams and File handling methods         Learn the different types of Member functions, Templates and handling in thods         Learn the fundamentals of Java, Inheritance and Exception Handling in Java         At the end of the course, the student should be able to,       Knowledge Level         CO1: Analyze the OOP concepts such as Encapsulation, Data abstraction and Polymorphism through C++ Classes and Objects       K4         CO2: Implement OOP concepts such as Message Passing using Member functions, Data hiding using Templates and to handle various exceptions       K4         CO3: Implement Inheritance and develop C++ programm using the streams and member functions to enable File Handling.         CO4: ON PO NOPMO         Overriding and Exception Handling using Try-catch blocks.         CO3: Develop Java Programs to Implement Inheritance using Overriding and Exception Handling using Try-catch blocks.								L	Т	Р	С		CA	ESE	Total		
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K4K4CO5: Develop Java Programs to Implement Inheritance using Overriding and Exception Handling using try-catch blocks.K3CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - WeakCO/PSO MappingCO/PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - WeakCO/PSO MappingCO/PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - WeakCO/PSO MappingCO/PSO Mapping <td cols<="" td=""><td>Cou Outo</td><td>urse come</td><td>At t CO abst CO Mer vari CO</br></br></td><td colspan="10">At the end of the course, the student should be able to,Knowledge LevelCO1: Analyze the OOP concepts using C++ programming language.K3CO2: Implement OOP concepts such as Encapsulation, Data abstraction and Polymorphism through C++ Classes and ObjectsK4CO3: Implement OOP concepts such as Message Passing using Member functions, Data hiding using Templates and to handleK4</td></td>	<td>Cou Outo</td> <td>urse come</td> <td>At t CO abst CO Mer vari CO</br></br></td> <td colspan="10">At the end of the course, the student should be able to,Knowledge LevelCO1: Analyze the OOP concepts using C++ programming language.K3CO2: Implement OOP concepts such as Encapsulation, Data abstraction and Polymorphism through C++ Classes and ObjectsK4CO3: Implement OOP concepts such as Message Passing using Member functions, Data hiding using Templates and to handleK4</td>	Cou Outo	urse come	At t CO abst CO Mer 	At the end of the course, the student should be able to,Knowledge LevelCO1: Analyze the OOP concepts using C++ programming language.K3CO2: Implement OOP concepts such as Encapsulation, Data abstraction and Polymorphism through C++ Classes and ObjectsK4CO3: Implement OOP concepts such as Message Passing using Member functions, Data hiding using Templates and to handleK4												
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3. End-Semester examinations	1. 0 2. 1 3. 1	Contin Assign End-Se	uous A ment emeste	Assess er exar	ment ninati	Test I, ons	11 & 1	111									

## Indirect

1. Course - end survey

Content of the syllabus										
Unit – I INTRODUCTION	Periods	10								
Object oriented approach - Characteristics of Object-oriented languages - C++ Programming basics -										
Loops and Decisions – Structures - Objects and Classes: A Simple class – C++ objects as physical objects										
- Classes, Objects and Memory - Static Class data - Const and classes- Pointers: Memory										
management – Pointers to objects- Pointers to Pointers.	Deviale	0								
Unit - II CONSTRUCTORS AND OPERATOR OVERLOADING	Periods	8								
Constructors – Objects as Function Arguments - Default Copy Constructor	-Assignment and C	opy Doto								
Conversion – Pitfalls	onary Operators – I	Jala								
Unit – III FUNCTIONS, TEMPLATES AND EXCEPTIONS	Periods	8								
Simple Functions – Passing Arguments – Returning Values – Reference Argu	ments – Default									
Arguments – Overloaded Functions – Inline Functions – Friend functions -	Variables and Stor	rage								
Classes – Function Templates – Class Templates – Exceptions		U								
Unit - IV INHERITANCE, STREAMS AND FILES	Periods	10								
Inheritance: Derived and Base Classes - Derived class Constructors - Overrid	ing member functio	ns –								
Class hierarchy – Public and Private Inheritance – Levels of Inheritance –	Multiple Inheritand	ce –								
Ambiguity - Virtual Functions – Static functions- this pointer.	TT 11' ' F''									
Stream Classes – Stream Errors – Disk File I/O wit streams – File pointers –Er.	ror Handling in File	1/0								
- File I/O with member functions	D 1 1	0								
Unit – V INTRODUCTION TO JAVA PROGRAMMING	Periods	9								
Overview of Java - Data Types, Variables, and Arrays - Operators - Control S	tatements - Introdu	cing								
Classes - Methods and Classes. Inheritance: Basics - Using Super – Creating a Method eventiding. Using Abstract Classes Expending. Hendling: Temps	Multilevel Hierarc	shy -								
Finally – User defined exceptions	y and Catch - Thro	)w -								
	Total Periods	45								
Text Books	i otur i crious									
1 Robert Lafore, "Object Oriented Programming in C++" 4 th Edition, SAN	AS. Pearson India									
2 Herbert Schildt Java 2-The Complete Reference. Tata Mc Graw Hill 20	)17									
References	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,									
1. Bhushan Trivedi, "Programming with ANSI C++". Oxford University P	ress.									
2. Paul Deitel & Harvey Deitel, "C++ How to program",8th Edition, PHI.										
E.Balagurusamy, "Object Oriented Programming with C++,5 th Edition	on. Tata McGraw-I	Hill								
^{3.} Education	,									
4. Yashavant P. Kanetkar, "Let Us C++", 2 nd Edition, BPB Publications.										
5. Deitel & Deitel, Java How to Program, Prentice Hall of India, 2010										
E-Resources										
1. https://www.geeksforgeeks.org										
2. https://www.programiz.com										
2. https://www.programiz.com										
3. https://www.cprogramming.com/										

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	VIVEKANAN (Autono	VIVEKANANDHACOLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution Affiliated to Anna University Chennai) Elayampalayam, Tiruchengode – 637 205								
Programme	e B.E./B.Tech.	Programme cod	.e		R	egulat	ion	2019		
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Content of the	e syllabus				I					
அலகு 1	மொழி மற்	றும் இலக்கியம்				Perio	ods	3		
இந்திய எ செவ்விலக்8 அறம் திருச பௌத்த ச சிற்றிலக்கிட பாரதியார் ப	இந்துய ுமாழிக்குடும்பங்கள் – துராவடமொழிகள் – தமிழ ஒரு செம்மொழி - தமிழ செவ்விலக்கியங்கள் – சங்க இலக்கியத்தின் சமயச் சார்பற்றத்தன்மை – சங்க இலக்கியத்தில் பகிர்தல் அறம் திருக்குறளில் மேலாண்மைக்கருத்துக்கள் – தமிழ்க்காப்பியங்கள் – தமிழகத்தில் சமண பௌத்த சமயங்களின் தாக்கம் – பக்தி இலக்கியம்,ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலக்கியங்கள் – தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி – தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிகாசனின் பங்களிப்ப									
அலகு 2	அலகு 2 மரபு – பாறை ஒவியங்கள் முதல் நவீன ஓவியங்கள் வரை – சிற்பக்கலை							3		
நடுகல் முத தயாரிக்கும் நாட்டுப்புற பறை,யாழ்,	5ல் நவீன சிற்பங் கைவினைப்பெ தெய்வங்கள் – குப வீணை,நாதஸ்வர	Iகள் வரை – ஐம்பொ ாருட்கள்,பொம்மைகள் வரிமுனையில் திருவள் ரம் – தமிழர்களின் பொ	ன்சின ா – தே ளுவர் ாருளா	லைகள் 5ர் செ சிலை தார வ	T – பழங்கு ப்யும் கன v – இசைக் வாழ்வில் ே	தடியில ல – ச கருவி காவில	னர் மற் சுடுமண் கள் – மி ல்களின்	றும் ஆ ர சிற்ப Iருதங் பங்கு	அவர்கள் பங்கள் – கம்,	
அலகு 3	நாட்டுப்புற வீரவிளைய	க்கலைகள் பாட்டுக்கள்			மற்றும்	Peric	ods	3		
தெருக்கூத்த சிலம்பாட்ட	த, கரகாட்டம், ( ம், வளரி, புலியாப்	வில்லுப்பாட்டு, கணி டடம் , தமிழர்களின் வி	யான் ளைய	கூத்து, ாட்டுச்	ஒயிலாப் க்கள்.	டம்	,தோல்ட	பாவை	க்கூத்து,	
அலகு 4	தமிழர்களி	ன் திணைக்கோட்	பாடு	கள்		Perio	ods	3		
தமிழகத்தில மற்றும் புற எழுத்தறிவு, மற்றும் இற	தமிழகத்தின் தாவரங்களும் விலங்குகளும்– தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக்கோட்பாடுகள் – தமிழர்கள் போற்றிய அறக்கோட்பாடுகள் – சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவு, கல்வியறிவு – சங்ககால நகரங்களும் துறைமுகங்களும் – சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி – சடல் தடந்த நாடுகளில் சோமர்களின் வெற்றி									
அலகு 5	இந்திய தே பண்பாட்டி	சிய இயக்கம் மற், ற்குத் தமிழர்களில	றும் ( ன் பா	இந்த ங்கஎ	ிய ரிப்பு	Perio	ods	3		
இந்திய விடு தாக்கம் – சு கையெழுத்	)தலைப்போரில் த யமரியாதை இயச துப்படிகள் – தமிழ்	நமிழர்களின் பங்கு – இ நமிழர்களின் பங்கு – இ நகம் – இந்திய மருத்துல பபுத்தகங்களின் அச்சு	ந்தியா பத்திவ் ஈவரல	ாவின் v சித்த ாறு.	பிறப்பகுத நமருத்துவ	களில் த்தின்	ல் தமிழ்ட பங்கு –	பன் கல்வெ	பாட்டின் பட்டுகள்	
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UNIT I	LANGUAGE A	AND LITERATURE				P	eriods		3	
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UNIT II	HERITAGE – I ART – SCULP	ROCK ART PAINTIN TURE	IGS TO	) MOI	DERN	P	Periods		3	
Herostone to -Massive Ter- musical instru- and Economi UNIT III	modern sculptur rracotta sculptur uments -Mridhar c Life of Tamils FOLK AND M	re – Bronze icons – Tr es Village deities, Thi ngam, Parai Veenai, Y ARTIAL ARTS	ibes a iruvall (azh a	nd the uvar S nd Na	ir handicı statue at I dhaswara	afts – Art Kanyakuma m – Role o P	of temp ari, Ma of Tem eriods	ole carr king of ples in	naking f Social 3	
Therukoothu Valari, Tiger	, Karagattam, V dance – Sports a	illu Pattu, Kaniyan K and Games of Tamils.	loothu	, Oyill	lattam, L	eather pup	petry,	Silamb	attam,	
UNITIV	THINAI CON	CEPT OF TAMILS				P	eriods		3	
Flora and Fau Aram Concep Sangam Age	ina of Tamils & ot of Tamils – E –Export and Im	Aham and Puram Co ducation and Literacy port during Sangam A	oncept y durin .ge – C	from ' ng San Oversea	Tholkapp gam Age as Conqu	iyam and s = Ancient est of Chol	Sangan t Cities las.	n Litera and P	ature – orts of	
UNIT V	CONTRIBUTI MOVEMENT	ON OF TAMILS TO I AND INDIAN CULTU	NDIAI JRE	N NAT	IONAL	P	eriods		3	
Contribution other parts of Medicine-Ins	of Tamils to In f India Self-Re scriptions & Ma	ndian Freedom Strug espect Movement –R nuscripts – Print His	ggle – ole of story (	The C Siddh of Tan	Cultural I a Medici nil Books	nfluence of ne in Indig.	of Tan genous	nils ove Syster	er the ms of	

#### **TEXT-CUM-REFERENCE BOOKS**

1	தமிழக வரலாறும் – மக்களும் பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு:
	தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2	கணினித்தமிழ் – முனைவர்இல. சுந்தரம். (விகடன் பிரசுரம்).
3	கீழடி – வைகை நதிக்கரையில் சங்க நகர நாகரிகம் (தொல்லியல் துறை
	வெளியீடு)
4	பொருநை – ஆற்றங்கரை நாகரிகம். (தொல்லியல் வெளியீடு)
5	Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6	Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil
	Studies
7	Historical Heritage of the Tamils (Dr.S.V.Subaramanian, Dr.K.D. Thirunavukkarasu) (Published by: International
	Institute of Tamil Studies).
8	The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil
	Studies.)
9	Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology
	& Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10	Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Publishedby: The Author)
11	Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational
	Services Corporation, Tamil Nadu)
12	Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

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#### LIST OF EXPERIMENTS

1.Estimation of HCL using NaOH by Conductometric titration	CO1
2. Estimation of Mixture of acid using NaOH by Conductometric titration.	CO1
3. Estimation of Barium chloride using sodium sulphate by Conductometric precipitation titration	CO1
4. Estimation of ferrous iron by Potentiometric titration.	CO2
5. Determination of HCL using NaOH by pH metry	CO1
6.Estimation of Ferric ion by Spectrophotometry	CO3
7. Determination of Total, temporary and permanent hardness of water by EDTA method.	CO4
8. Estimation of Dissolved Oxygen content in water by Winkler"s method	CO4
9. Estimation of alkalinity in water sample.	CO5
10. Estimation of available chlorine in bleaching powder.	CO5
Total Periods	45

Lab	Manuals suggested:
1.	Chemistry laboratory I & II by Dr.A.Ravikrishnan,Sri Krishna Pub,Revised Edition-2017
2.	Chemistry laboratory Manual by Dr. Veeraiyan, Revised Edition-2017

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Cours Objec	se tive	Th • • •	ne mai Kno Wel Lean Lean Lean Lean	n obje ow the d lap rn the rn the rn the rn the	ective of pluml joint, l assem resisto basics solder	of this bing li butt jo bling or valu or valu of sig ing te	cours ine as oint an and d ue ide gnal g chniq	se is to sembli id T-jo isman ntifica enerat ues in	o: ies. oint. itling 1 ition the tion in PCB	nethod nrough CRO. board	lology color for des	of hon s coate	ne appl d on re	liances sistor. oiects		
Cours Outco	se omes	Cu re Cu ca Cu m Cu re Cu re Cu pr	<b>O1:</b> Pequirem <b>O2:</b> M rpentry <b>O3:</b> U easure: <b>O3:</b> U sistor. <b>O5</b> : Un ojects.	At the erform nents a fake va y. Inderst ndersta	end o basic nd qua arious and the of basi and the	f the c mach ntify tl joints s he ba c elect resisto solder	course hining he accu such a sics o rical o or valu	, the s opera uracy. s cross of hou puantiti ne iden chniqu	tuden tions s lap jo use w ies. tificati	t should and fin oint and iring t on thro PCB bo	d be al iish th I Tee I echniq ugh co ard for	ole to, e job ap joint ues an lors coa design	to the in the d the ated on ing the		K2 K2 K2 K2 K2 K2 K2 K2	lge
requisi	ites	Ni	1													
	(	(3/2/1 in	ndicates	strengtl	CO n of corr	/ PO M elation)	apping 3-Stron	ng, 2 – N	/ledium,	1 - Weal	k		CO/P	SO Map	oping	
			1		Progr	amme C	Outcome	es (POs)						PSOs		
COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	<b>PO 8</b>	PO 9	PO 10	PO 11	PO12	PSO 1	PSO 2	PSO3	
CO 1	3	2	3	2	2	-	-	-	2	-	-	-	2	3	-	
CO 2	3	2	3	2	2	-	-	-	2	-	-	-	2	-	-	
$CO_3$	3	2	2	3	2	2	-	-	2	-	-	-	2	2	-	
CO 5	3	- 2	3	3	2	2	_	-	2	_	_	_	2	3	_	
Cours	se Ass	essm	ent M	ethod	ls	-		[				<u>   </u>		-1		

Direct

1.Pre lab and Post lab test

2.Record mark

3.End- Semester Examinations

Indirect

1.Course –End survey

<u>GROUP A</u> (CIVIL & MECHANICAL ENGINEERING) <u>(CIVIL ENGINEERING PRACTICE)</u>	
<b>Plumbing :</b> 1. Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers and elbows in household fittings.	CO2
2. Hands-on-exercise: Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components	CO2
Carpentry:	CO2
<ul> <li>4. Hands-on-exercise: Wood work, joints by sawing, planning and</li> </ul>	CO2
MECHANICAL ENGINEERING PRACTICE	
Welding: 5. Preparation of arc welding of butt joints, lap joints and tee joints.	CO1
6. Gas welding practice	CO1
<b>Basic Machining:</b> <b>7.</b> Turning and Facing.	CO1
8.Drilling Practice	CO1
Sheet Metal Work: 9. Forming & Bending	CO1
10. Model making – Tray and Basket.	CO1
<ul> <li>Demonstration on:</li> <li>(a) Foundry operations like mould preparation for gear and step cone pulley.</li> <li>(b) Fitting – Exercises – Preparation of square fitting and vee – fitting models.</li> <li>Study of Air Conditioner &amp; Centrifugal Pump.</li> </ul>	
<u>GROUP B (ELECTRICAL &amp; ELECTRONICS ENGINEERING)</u> III. <u>ELECTRICAL ENGINEERING PRACTICE</u>	
1. Residential house wiring and stair case wiring using switches, fuse, indicator & lamp.	CO3
2. Fluorescent lamp wiring.	CO3
3. Measurement of voltage, current, power & power factor using R-Load.	CO3
4. Measurement of energy using single phase meter.	CO3
5. Measurement of resistance to earth of electrical equipment.	CO3
6. Measurement of illumination to earth of electrical equipment.	CO3
7. Study of batteries.	CO3
IV. <u>ELECTRONICS ENGINEERING PRACTICE</u>	
1. Study of Electronic components and equipments – Resistor, colour coding.	CO4
2. Study of logic gates AND, OR, NOR, NAND and NOT.	CO4
3. Generation of Clock Signal.	CO4

4. So	ldering practice – Components Devices and Circuits – Using general purpose PCB.	CO5
	Total Periods	45
Refer	rence Books :	
R1.	Dr.P.Kannan, Mr.T.Satheeskumar & Mr.K.Rajasekar, "Engineering Practices Laboratory" Ma First Edition, 2017.	inual.
R2.	Mr.T.Jeyapoovan, Mr.M.Saravana Pandian, "Engineering Practices Lab" Manual, Vikas Publi House Pvt Ltd, 2017.	ishing

	VIVEKA	NANDE 18 Institu	IA Contraction, Elay	OLL W Affil	EGE OME iated layam	OF E N to An ı, Tiru	NG na U iche	INEERIN( Jniversity, ngode – 63	<b>G FOR</b> Chennai) 7 205	TÜVReinlind	ISO MOTIONS
Programme	B.TECH		Pr Co	ogran ode	me	10	4	Regulation		2019	
Department	INFORMAT	TION TE	CHNC	OLOG	Y			Semester		II	
Course Code	Cour	se Name		Perioo We	ls Per ek	Cr	edit		Maxim	um Ma	rks
				L T	Р	C		CA	ESE Total		
U19MCFY2	Indi Constitut Universal Valu	an ion and Human ıes	L	3 0	0	0		100	NA	]	00
Course Objective	The main ob • To k • To k • To k	jective o now abo now abo now abo	of this out Incout cer out cer	s cour dian c ntral a dian s	rse is a constitution and state cociety	tution ate go	overi	nment funct	ionalitie	s in Ind	lia
	At the end	At the end of the course, the student should be able to,       Knowledge         level       1									
	• Unde	erstand t	he fu	nctio	ns of t	he Inc	lian	governmer	nt	ŀ	K1
	• Unde	erstand a	ind al	oide t	he rul	es of t	he l	Indian const	titution	ŀ	<b>K</b> 1
Outcome	• Under peop	erstand a	and a	appre	ciate	differ	ent	culture am	ong the	ŀ	<b>K</b> 1
Course	• Unde senti	erstandir ent "I" a	ng hu .nd tł	man ne ma	being terial	as a c	со-е	xistence of	the	]	K1,K2
	<ul> <li>"Boc Abili augn ident and e</li> </ul>	<ul> <li>"Body" and the needs of Self ("I") and "Body" and Ability to utilize the professional competence for augmenting universal human order and Ability to identify the scope and characteristics of people- friendly K2</li> </ul>									
Pre-requisites			•								
(3/2)	/1 indicates stre	Congth of co	<b>O / PC</b> orrelati	<b>) Map</b> on) 3-	<b>ping</b> Strong,	2 – M	ediu	m, 1 - Weak		CO/ Map	PSO pping
COs		Prog	gramm	ne Outo	comes (	POs)	1			PS	Os
PO1 P	PO 2 PO 3 PO	4 PO 5	PO 6	PO 7	PO 8	PO 9	PC	010 PO11	PO12	PSO1	PSO 2
CO 1 CO 2			3		3	2					$\frac{2}{1}$
CO 3			3		3	2					2
CO 4 CO 5			3		3	3					2

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Programme	B.E/B.TECH	Prog	gramme (	Code	Re	egulation	20	)19
Department	CSE/IT/CST				2	Semester	I	II
Course Code	Course Name	Perio	ds Per W	'eek	Credit	Ma	ximum M	larks
		L	Т	Р	C	CA	ESE	Total
U19MA304	Discrete Mathematics	3	1	0	4	40	60	100
Course Objective	<ul> <li>The Main Objective of the Introduce basic tool</li> <li>Provide information program and theory</li> <li>Recognize the connect of Identify the domain and the concetor of the concetor</li></ul>	he course is s and techn about the of inference ection betw and range of spts of grou	s to iiques in concepts e een set, o of a relat ps	Disc need opera ion	erete Mat led to tes tions an	thematic at the log d logic	al Struct ic of a	ure
	At the end of the course,	the studen	t should	be at	ole to,	l lev	Knowled vel	ge
	CO1: Demonstrate the m	nathematic	al reasor	ning a	nd logic	s	K1,K	.2
Course	<b>CO2:</b> Reformulate state	ements fro	m com	non	language	e to	K2,K	.5
Outcome	<b>CO3:</b> Relate logic with	sets					K2,K	3
	<b>CO4:</b> Analyze the c relations.	onnection	betwee	n fu	nctions	and	K3,K	15
-	CO5: Demonstrate Subgroups and Normal s	Algebraic subgroups	facility	y wi	th Gro	oups,	K1,K	3
Pre-requisites	-							
(3/2/1 i	CO / PO Ma ndicates strength of correlation)	<b>pping</b> 3-Strong, 2 –	- Medium,	1 - W	eak	CO	D/PSO Ma	apping
COs PO 1 PO	Programme O 2   PO 3   PO 4   PO 5   PO 6	PO 7   PO 8	s) PO9 P	0 10	PO 11 P	0 12 PSO	PSOs 1 PSO 2	PSO 3
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						2		
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CO 4 3 3						2		
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Course AssessiDirect1. Continuous2. Assignmen3. End-SemesIndirect1. Course - end	Assessment Test I, II & II t ter examinations	I						

Content	t of the syllabus
Unit	-I PROPOSITIONAL CALCULUS Periods 12
Proposit	ions - Logical connectives - Compound propositions - Conditional and biconditional
proposit	ions – Truth tables – Tautologies and contradictions – Contrapositive – Logical equivalences
and imp	blications - DeMorgan"s Laws - Normal forms - Principal conjunctive normal form and
Principa	l disjunctive normal form – Rules of inference – Arguments – Validity of arguments.
Unit - I	IPREDICATE CALCULUSPeriods12
Predicat	es - Statement function - Variables - Free and bound variables - Quantifiers - Universe of
discours	e - Logical equivalences and implications for quantified statements - Theory of inference -
Rules of	funiversal specification and generalization – Validity of arguments.
Unit – I	II SET THEORY Periods 12
Set The	ory: Cartesian product of sets – Relations on sets – Types of relations and their properties –
Matrix 1	representation of a relation - Graph of a relation – Equivalence relations – Partial ordering –
Poset –	Hasse diagram – Lattices – Properties of lattices
Unit - I	V FUNCTIONS Periods 12
Definitio	on – Classification of functions – Composition of functions – Inverse functions –
Characte	eristic function of a set – Recurrence relations – Solution of recurrence relations – Generating
Function	ns – Solving recurrence relation by generating functions.
Unit – V	GROUP THEORY Periods 12
Algebra	ic systems – Definitions – Examples – Properties – Semi groups – Monoids – Sub semi groups
and Sub	monoids - Groups and Subgroups – Homomorphism – Cosets – Lagrange,,s theorem – Normal
subgrou	ps – Normal algebraic system with two binary operations.
0	
	Total Periods     60
Text Bo	Total Periods 60
Text Bo	Total Periods     60       ooks     Tremblay J P and Manohar R., Discrete Mathematical Structures with Applications to
Text Bo	Total Periods     60       ooks     Tremblay J P and Manohar R., Discrete Mathematical Structures with Applications to Computer Science, TMH, New Delhi – 2004.
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<b>Text Bo</b> 1 2	Total Periods60Total Periods60ooksTremblay J P and Manohar R., Discrete Mathematical Structures with Applications to Computer Science, TMH, New Delhi – 2004.Rosen K H, "Discrete Mathematics and its Applications", Sixth Edition, Tata McGraw-Hill Pub.co. Ltd., Delhi, 2006.
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Text Bo           1           2           Referent           1           2           3           4           5	Total Periods60Total Periods60ooksTremblay J P and Manohar R., Discrete Mathematical Structures with Applications to Computer Science, TMH, New Delhi – 2004.Rosen K H, "Discrete Mathematics and its Applications", Sixth Edition, Tata McGraw-Hill Pub.co. Ltd., Delhi, 2006.ccesKenneth H. Rosen, "Discrete Mathematics and its Applications", 7th Edition, Tata McGraw Hill Publishing Company, 2012Singh S.B., Jai Kishore and Ekata, "Discrete Structures", 3rd Edition, Khanna Book 
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Text Bo         1         2         Referent         1         2         3         4         5         E-Reson         1         2	Total Periods         60           oks         Tremblay J P and Manohar R., Discrete Mathematical Structures with Applications to Computer Science, TMH, New Delhi – 2004.         Rosen K H, "Discrete Mathematics and its Applications", Sixth Edition, Tata McGraw-Hill Pub.co. Ltd., Delhi, 2006.           rees         Kenneth H. Rosen, "Discrete Mathematics and its Applications", 7 th Edition, Tata McGraw Hill Publishing Company, 2012           Singh S.B., Jai Kishore and Ekata, "Discrete Structures", 3rd Edition, Khanna Book Publishing, Delhi, 2017           Seymour Lipschutz, Marclars Lipson, "Discrete Mathematics", Tata McGraw Hill.,New Delhi.           Bernard Kolman, Robert Busby, Sharon C.Ross," Discrete Mathematical Structures", Pearson Education, Delhi, 6th Edition, 2015.           D.S.Malik, "Discrete Mathematical Structures Theory and Applications", Thomson Publishers, 2004.           arces           https://en.wikipedia.org > wiki > Discrete mathematics           www.learnerstv.com/Free-engineering-Video-lectures

	VIVEKANA (Autonomous ]	<b>NDH</b> Institu Ela	IA CO ution, yamp	<b>DLLEG</b> <b>WON</b> Affiliat alayam,	E OF EN IEN ted to Ann Tiruchen	<b>GINEERING</b> a University, C gode – 637 205	F <b>OR</b> Chennai)	CERTIFIED ISO MOTIONS					
Programme	B. TECH		Prog Code	ramme	104	Regulation		2019					
Department	INFORMATION	TEC	CHNO	LOGY		Semester		III					
Course Code	Course Name	Course NamePeriods Per WeekCredit Maximu											
		L	Т	Р	С	CA ESE		Total					
U19EC308	Electronic Devices and Circuits	3	0	0	3	40	60	100					
Course Objective	<ul> <li>Expose funda</li> <li>Empower stu</li> <li>Empower stu</li> <li>Understand b</li> <li>Describe the</li> </ul>	<ul> <li>The Main Objective of the course is to</li> <li>Expose fundamental knowledge in Semiconductor Devices.</li> <li>Empower students to understand the design and working of BJT.</li> <li>Empower students to understand the design and working of FET.</li> <li>Understand behavior of Special semiconductor devices.</li> <li>Describe the function and design of power supply.</li> </ul>											
	At the end of the	cour	se, th	e studer	nt would be	e able to,		Knowledge Level					
Course	<b>CO1:</b> Understand semiconductor de	l the	e cu: s	rrent v	oltage ch	naracteristics	of	K2					
Outcome	CO2:Understand	the o	consti	ruction a	and charac	teristics of BJ	Г	K2					
	configurations of	cons FET	struct:	ion, ope	rating prin	ciple and vario	ous	К5					
	<b>CO4:</b> Understand of special semico	l the onduc	const tor de	truction evices a	, working nd their ap	and character plications.	istics	K2					
	CO5:Discuss the	e func	ctioni	ng of int	ternal circu	uits of power s	upply.	K2					
Pre- requisites	-												

	CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak													CO/PSO Mapping		
	Programme Outcomes (POs)													PSOs		
COs	PO 1	PO 2	PO 12	PSO 1	PSO 2											
CO 1	3	3	3	3			1			1		2	2	1		
CO 2	3	2	3	2								2	2			
CO 3	3	2	2	2		1					1	2	2	2		
CO 4	3	2	3	2									1			
CO 5	3		2										2	2		

Cou	rse Assessment	Methods									
	Direct										
	1. Contin	ious Assessment Test I, II & III									
	2. Assign	ment									
	3. End-Se	mester examinations									
	1. Course -	end survey									
Con	tent of the sylla	bus									
I	Jnit – I	SEMICONDUCTOR DIODE	Periods	9							
The	ory of PN junct	ion diode –VI characteristics - Switching char	racteristics – Tem	perature effects-							
Brea	kdown in PN Ju	inction Diodes– Ideal Versus Practical diode-Re	esistance levels– D	viode							
equi	valent circuits -	- Transition and diffusion capacitances- Diode	specifications-Zer	ner diode and its							
char	acteristics.										
Unit	t - II	BIPOLAR JUNCTION TRANSISTOR	Periods	9							
Intro	duction to three	e terminal devices- BJT-construction - Types a	nd different region	s of operations-							
Tran	sistor (BJT) a	s an amplifier Input and Output characte	ristics of transiste	or in Common							
Base	e,Common Emit	ter and Common Collector configuration,Compa	arison of CE,CC ar	nd CB.							
Unit	t – III	FIELD EFFECT TRANSISTOR	Periods	9							
Con	struction and	characteristics of IEET Transfer character	ristics FFT I	Darameters and							
spec	ifications – Den	letion type MOSFET – Enhancement type M	OSFET - FET in C	"S CD and CG							
Con	figurations –FE	$\Gamma$ applications. Comparison of MOSFET with JF	ET.								
TI		SDECIAL SEMICONDUCTOD DEVICES		0							
Uni	t - IV	SPECIAL SEMICONDUCTOR DEVICES	Periods	<b>9</b>							
Tun	nel diodes – Pli	N diode – SCR characteristics and two transist	or equivalent mod	el - UJT - Diac							
	111ac - Laser- v			are certs – LED-							
Unit	t - V	POWER SUPPLIES	Periods	9							
Half	wave Rectifica	ation – Full wave Rectification – Filters(LPF)	– Zener diode as	s voltage							
regu	lator –Discrete '	Fransistor Voltage Regulation - IC Voltage Reg	ulator - SMPS.	8							
		Total Periods	45								
Tex	t Books										
1	Robert L. Boy	estad; Louis Nashelsky,"Electronic Devices and	Circuit Theory",1	1 th Edition,							
1.	Pearson Educa	tion, 2013.	5,	,							
2.	Anil K. Maini,	VarshaAgrawal, "Electronics Devices and Circu	its", Wiley India P	vt.Ltd, 2012.							
Refe	erences										
1.	Jacob .Millma	n&Halkias, —Electronic Devices &Circuits,Tat	a McGraw Hill,3rd	Edition, 2010							
2	Salivahanan. S	, Suresh Kumar. N, Vallavaraj.A, -Electronic	Devices and circu	its, Third							
Ζ.	Edition, Tata N	AcGraw- Hill, 2008.									
3.	R.S.Sedha, —	A Text Book of Applied Electronics S.Chand P	ublications, 2006.								
E-R	esources	**									
1.	https://www.el	ectronicsforu.com/resources/electronic-devices-	and-circuit-theory								
2	https://www.el	ectronics-tutorials ws/									
2.	https://www.cieculonics-tuloniais.ws/										
5.	https://www.sciencedirect.com/topics/engineering/electronic-device										



CO 4

CO 5

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### VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN



(Autonomous Institution Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205

Prog	gramme	B. '	ГЕСН		]	Progran C	nme Code	1(	)4	Regula	tion		2019			
Dep	artment	INI TE	FORM CHNC	ATIO	N Y					Sem	ester		III			
Cours	se Code	;	1	Course name	;	Pe	eriods	s per w	veek	Credit	Maxin	num Mai	:ks			
U19	DIT302	Dat	ta	instian	_	L 3		T 0	P 0	C 3	CA 40	ESE 60	Tota 100	1		
Co Obje	ourse ective	The •	main o Unders Analyz Unders Unders toshare	bjectiv stand th ze analo stand th stand f e netwo stand b	re of the evo og and he ope low c ork bar	nis cour lution of l digital ration of ontrol, ndwidth	rse is to of dat l signa of phy frequent a mo	a com al tran sical a ency ng mu	munic smissi and`d and ti iltiple	cation an on encoo ata link l me divis users.	d transn ding tech ayer pro sion mul	nission n miques. tocols tiplexing	nedium g techn	iques		
		At	t the end of the course, the student should be able to, KL													
		CO1 prote	•O1: Describe the model of data communication and the rotocols used inOSI layers     KL													
Co Out	ourse come	CO2 enco tech	2: Com oding niques.	imunic	ate wi	th digit	tal de	vices	by usi	ing signa	ıl		К3			
		CO3	<b>3:</b> Mak g samp	te devid ling teo	ces to chniqu	Comn les	nunic	ate th	rough	wireles	s by		K3			
		CO4 desig	<b>l:</b> Use gning e	Error	detect	ion and mission	l swit syste	ching em wit	techn th accu	iques fo urate data	r a		K3			
		COS	5: Desc	ribe ab	out th	ne devic	ces us	ed in	netwo	rking			K2			
requ	Pre- iisites								-							
													007	020		
		(3/2/1	indicate	s strengt	CO th of co	/ PO Marrelation)	apping ) 3-Stro	<b>g</b> ong, 2 –	- Mediu	ım, 1 - Wea	ak		CO/P Mappin	g		
							Progra	mme O	utcome	es (POs)			PSOs			
COs	PO1	PO 2	РО 3	PO 4	РО 5	PO 6	РО 7	PO 8	Р О9	PO 10	PO 11	PO12	PSO 1	PSO 2		
CO 1	-	-	3	3	3	2	2	-	-	-	-	-	1	2		
CO 2	3	3	2	2	3	2	2	-	-	-	2	2	3	3		
CO 3	3	3	2	2	3	2	2	-	-	-	2	2	3	3		

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Course Assess	sment Methods		
Direct			
1. Co	ontinuous Assessment Test I, II & III		
2. As	signment		
3. En	d-Semester examinations		
Indirect	1		
I. Cou	rse - end survey		
Content of the	e syllabus	1	1
Unit – I	DATA COMMUNICATIONS AND NETWORKING OVERVIEW	Periods	10
A Communic	ations Model, Introduction to Data Communications, types of	of Networks,	Protocol
Architecture:	Need, A Simple Protocol Architecture, OSI. Analog and Digita	l Data Transi	mission -
Wireless Trans	smission media.	ansinission M	edia,
Unit - II	DIGITAL SIGNAL TRANSMISSION	Periods	9
Digital Transm Unipolar scher Scrambling. A	nission: Introduction, Digital to digital conversion: Line Encoding me, Polar schemes, Biphase: Manchester and differential Manch nalog to Digital Conversion: Pulse code modulation (PCM), Delta	- Types of Lin lester Bipolar modulation (D	e Coding schemes, M).
Unit – III	ANALOG SIGNAL TRANSMISSION	Periods	9
Analog Transı shiftkeying, P Amplitude mo	nission: Introduction, Digital to analog conversion: Amplitude s hase shift keying, Quadrature amplitude modulation. Analog to a dulation, Frequency modulation, Phase modulation	shift keying, l nalog convers	Frequency ion:
Unit – IV	DATA LINK CONTROL & SWITCHING NETWORKS	Periods	10
Asynchronous Introduction, Q X.25, Frame R	and Synchronous Transmission, Types of Errors, Error Detec Circuit Switching Networks, Circuit Switching Concepts, Packet elav	tion, Error Co t Switching P	orrection. rinciples,
Unit – V	INTRODUCTION TO NETWORKING DEVICES	Periods	7
Hub, Switches	, Bridges, Routers, Gateways, Channel Service Unit/Data Servic ISDN adapters Wireless Access Point Modems Transceivers Fi	ce Unit, Netwo	ork
		Total periods	45
Text Books		F	
1	W. Stallings, "Data and Computer Communications", 10th Edn., New Delhi, 2014	Pearson Edn./	PHI,
2	B. A. Forouzan, "Data Communications and Networking", 5th 2013.	Edn. TMH, N	New Delh
References			
1	P.C. Gupta, "Data Communications and Computer Networks", 2 2014.	nd Edn PHI, N	New Delh
2	Computer Networks, Andrew S Tanenbaum, 5th Edition, 2013, P	earson Educati	ion, PHI.
3	Drew Bird, Mike Harwood, "Network Plus", First edition, Pearso	n Education.	
<b>E-Resources</b>			
1	https://nptel.ac.in/courses/106/105/106105082/		
2	https://cse.iitkgp.ac.in/~ksrao/cou-iti-1.html		
3	https://memberfiles.freewebs.com/00/88/103568800/documents/D	Data.And.Com	puter.Co
	mmunications.8e.WilliamStallings.pdf		

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VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205

Prog	gramme	<b>B</b> .	ТЕСН	[				Pr Co	ogran ode	nme	e	104	Regi	Regulation 2019						
Dep	artment	IN	FORM	ATI	ON T	ECH	NOLO	GY					Se	Semester III						
Cour	so Cod		C	oursal	Nama		F	Period	ls Per	W	eek (	Credit		Max	imun	n Marks				
Cour	se Cou	-	C	Jourse	Name			L	Т	I	2	С	CA	]	ESE	Total				
U19	<b>DIT303</b>		Da	ata Str	ructu	res		3	0	(	)	3	40		60	100				
Co Obj	ourse jective	T1 • •	he main Unde Learn Learn Hash Unde Learn Type	n object erstand n the c n the d ing erstand n the f es and	ctive of the s oncep liffere the T undan findin	of this ignific ots and nt type Free A nental gthe M	course cance of applic es of S DT and s of Gr Ainimu	e is to if Da cation ortin d typ raph im sj	o: ata sti ns of g and bes of ADT panni	ruci Sta I Se I bal , va ng	tures icks, ( earchi lancin arious Tree	and I Queud ing Te ng the s Trav	List AI es and echniq e tree versal a	DTs. Dequ ues ar algorit	ie. id thms	,				
	At the end of the course, the student should be able       Knowledge         to,       CO1: Implement List ADT and its types.       K3																			
Course OutcomeCO1: Implement List ADT and its types.K3Course OutcomeCO2: Implement Stack ADT, Queue ADT, Priority Queue and Parsing the Arithmetic Expression in CK3													K3 K3							
		С	<b>03:</b> In	npleme	ent va	rious s	sorting	and	searc	hin	ıg alg	orith	ns in (	$\mathbf{C}$		K3				
		C tre	<b>O4:</b> In ee in C	npleme	ent Tr	ee AD	OT, Bin	ary s	search	n tr	ee, A	VL aı	nd Spl	ay		K3				
		C To A	<b>O5:</b> Do opolog DT	evelop ical or	C Prodering	ogram g and l	s to In Minim	iplen um s	nent t pann	he ing	conce Tree	ept of of a (	Graph			K3				
		(3/2	/1 indicate	es strengt	CO/	PO Map	oping S-Strong, 2	– Mec	lium, 1	- We	ak			CO/F	PSO M	lapping				
COa		(		0	Р	rogramm	e Outcom	es						PS	SOs					
COs	<b>PO</b>	- 1				(P	Os)			- 1		[			T					
	1	PO 2	PO 3	PO 4	PO 5	PO 6	<b>PO 7</b>	PO	8 PC	)9	PO 10	PO 11	PO 12	PSO 1	P	SO 2				
CO 1	3	3	3	3	3	2	1			-		2	2	3		3				
CO 2	3	3	3	3	3	2	1					2	2	3		3				
CO 4	3	3	3	3	3	2	1					2	2	3		3				
CO 5	3	3	3	3	3	2	1					2	2	3		3				
Cours Direct	se Asse t	ssm	ent M	ethod	S															
1. 2. 3	<ol> <li>Continuous Assessment Test I, II &amp; III</li> <li>Assignment</li> <li>End Semester exeminations</li> </ol>																			
Indire	ect	<u>, , , , , , , , , , , , , , , , , , , </u>																		
1.	Course	e - ei	nd surv	vey																

Content of the syllabus		
Unit – I INTRODUCTION	Periods	9
Fundamental ADTs — Singly Linked List – Simple Array based Impl	ementation	- Circular Linked
List – DoublyLinked List – Applications of Linked Lists		
Unit - II STACKS, QUEUES AND DEQUES	Periods	9
Stack ADT - Array based Implementation - List based Implementat	ion – Queu	e ADT – Array
based Implementation - List based Implementation - Parsing Arithmetic	Expressions	s. Deque ADT –
Implementation.		
Unit – III SORTING, SEARCHING AND HASHING	Periods	9
Types of Sorting - Bubble Sort - Selection Sort - Insertion Sort - She	ell Sort – Qu	iick Sort – Radix
Sort – Merge Sort. Linear Search – Binary Search. Hashing – Open Add	ressing – Se	parate Chaining –
Unit - IV TREES	Periods	Q
Tree ADT – Binary Trees – Terminologies- Array based Im	plementatio	n - List based
Implementation – Traversal Algorithms.	-P	
Search Trees – Binary Search Tree – Balancing Trees – AVL Tree – Spla	v Tree.	
Unit – V GRAPHS	Periods	9
Graph ADT – Data Structures for Graphs – Types of Graphs – Gra	ph Traversa	ls – Topological
Ordering – Weighted Graphs – Dijkstra"s Algorithm – Minimum Spann	ning Tree – H	Prim-Jarnik
Algorithm – Kruskal"s Algorithm.		
Tota	l Periods	45
Text Book:		
1 Mark Allen Weiss, "Data Structures and Algorithm Analysis in C"	, Pearson Inc	lia.
References:		
¹ Michael T. Goodrich, Roberto Tamassia and Michael H. G and Algorithms in Java" 6 th Edition, Wiley India. ISBN: 97881265	oldwasser, 51903	"Data Structures
2 Robert Lafore, "Data Structures and Algorithms in Java" ISBN: 9788131718124	2 nd Edition	, Pearson India.
3 Kruse and Leung, "Data Structures and Program Design in C", 1/e,	, Pearson Ind	lia.
4 Robert Sedgewick and Kevin Wayne, "Algorithms", 4 th Edition, Ac	ldison-Wesle	ey.
5 Peter Brass, "Advanced Data Structures", 1 Edition, Cambridge.		
6 Aho, Hopcroft and Ullman, —Data Structures and Algorithms, Pea	rson Educati	on,1983.
E-Resources:		
1 https://www.javatpoint.com/data-structure-tutorial		
2 https://www.geeksforgeeks.org/data-structures		
3 https://www.udemy.com/course/data-structures-and-algorithms-de	ep-dive-usin	g-java

		VIV (Autor	EKAN	<b>NANDI</b> s Institu Elayan	HA Contraction, 1 Intion, 1	OLLEO WOM Affiliate am, Tir	GE C MEN ed to uche	DFE N Ani engo	X <b>NGIN</b> na Uni de – 6	<b>VEERI</b> versity 37 20	<b>NG F</b> ( ,Chen	O <b>R</b> nai)		einland FED	O 9001.2015
Programme	B.TF	ЕСН		•	Prog Code	ramme e		104				Re	egulati	on	2019
Department	INFO	)RMA	TION	ТЕСН	NOL	OGY						Semes	ster	]	III
Course Code		Cours	e Nam	e		Period	s Per	We	ek	Credit			Maxir	nun	n Marks
	C		<u></u>	•	0	L	Т		Р	С	0	ĊA	ESI	Ŧ	Total
U19IT304	Com	puter ( Arcl	Organ hitectu	ization re	X	3	0		0	3	40	)	60		100
Course Objective	<ul> <li>Understanding of the basic structure and operation of a digital computer.</li> <li>Recognize in the operation of the hardwire control and micro programmed control.</li> <li>Illustrate in detail the different types of control and the concept of pipelining.</li> <li>Classify the hierarchical memory system including cache memories and virtual memory.</li> <li>Clarify the different ways of communicating with I/O devices and standard I/O interfaces.</li> </ul>														
Course	Interfaces.         At the end of the course, the student should be able to,       KL         CO1: Design the concepts in modern computer architecture.       K3         CO2: Interpret the operations and instruction sequences in a basic computer.       K3													KL K3 K3	
Outcome	CO3: CO4:	: Illustr : Exam	ine the	data ha	zards	and ins	truct	tion yster	hazaro n inc	ls using luding	g pipel cache	ining mem	ory		K3 K3
Des and side	CO5: standa	Inspeard I/O	ct the also d	differe emonst	nt wa rate th	iys of e memo	com ory f	mun unct	icatin ioning	g with and D	I/O MA C	device ontroll	s and er.		K3
Pre-requisite	1-			CO	/ PO M	apping									
	(3/2	2/1 indica	tes streng	th of corre	elation) (	3-Strong, 2	-Me	dium,	1 - Wea	k			CO/	PSO	Mapping
COs PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	P(	08	PO 9	PO 10	PO 11	PO 12	PSO 1		PSO 2
CO 1 3 CO 2 2	1 2	2													2
CO 3 1	3	3													2
CO 4 1	2	2	1											-	2
Course Ass	essmen	t Meth	nods			1	1			1			I		~
Direct															
1. Con 2. Ass 3. End	ntinuou signmer 1-Seme	is Asse nt ster ex	essmer amina	nt Test ations	I, II &	k III									
Indirect 1. Cour	rse - en	d surv	ey												

Content o	f the syllabus			
Unit – I		BASIC STRUCTURE OF COMPUTERS	Periods	9
Functiona –Multipro sequencin	Il units –Basic op ocessors and Multing –Addressing m	erational concepts –Bus structures –Software Perform computer –Memory Locations and Addresses–Instruct odes –Fixed point and Floating point representations.	mance and tions and in	d metrics struction
Unit - II		BASIC PROCESSING UNIT	Periods	9
Fundamen Control –	tal concepts –Exe Micro programme	cution of a complete instruction –Multiple bus organized control: Micro Instructions-Micro Instructions with n	zation –Ha lext addres	ardwired ss field.
Unit – III	[	PIPELINING	Periods	9
Basic con control co	ncepts –Data haza	ards –Instruction hazards –Influence on instruction s er scalar operation–Performance considerations.	sets –Data	ı path and
Unit - IV		MEMORY SYSTEM	Periods	9
Basic con performan Associativ	ncepts –Semicono nce consideration ve memories –Sec	luctor RAM –ROM –Speed Size and cost –Cache –Virtual memory –Memory management re ondary storage devices.	memories equiremen	_ ts _
Unit – V		I/O ORGANIZATION	Periods	9
I/O device Buses –Int	es -Accessing I/O terface circuits –St	devices –Programmed Input/output –Interrupts –Direct tandard I/O Interfaces (PCI, SCSI, and USB)–processor	t Memory r Families	Access –
		Total	Periods	45
Case Stud study on A	lies: Case study - ALU- Arithmetic a	Instruction sets of some common CPUs, A Recent Ir nd Logic Unit of the computer and IBM5 SYSTEM/36	itel Proce 60-370 Arc	ssor,Acase hitecture.
Text Boo	ks:			
1	Carl Hamacher Organization", N	, Zvonko Vranesic and Safwat Zaky, 5th AcGraw-Hill, November 4, 2011.	Edition	"Computer
2	William Stallin Performance", 9	ngs, "Computer Organization and Architecture th Edition, Pearson Education, March 2012.	– Desi	gning for
Reference	es: M Morris Mano	"Computer System Architecture" Third Edition Pr	entice Ha	I of India
1	2000.	, computer system Atemateture , Time Edition, Tr		
2	David A. Patter Hardware/Softw	son and John L. Hennessy, "Computer Organization are interface", Third Edition, Elsevier, 2005.	and Des	ign: The
3	John P.Hayes, "	Computer Architecture and Organization", 3rd Edition,	McGraw-	Hill, 1998
<b>E-Resour</b>	rces:			
1	https://www.java	atpoint.com/computer-organization-and-architecture-tut	torial	
2	https://www.gee	ksforgeeks.org/computer-organization-and-architecture	-tutorials/	
3	https://tutorialsp	oint.dev/computer-science/computer-organization-and-	architectu	re

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Programme	B. TECH	Prog	gramm	e Code	104	]	Regulation		2019			
Department	<b>INFORMATION T</b>	IATION TECHNOLOGY Semester III										
Course Code	Course Name	F	Period Wee	s Per ek	Credit	t		Maxir	num Marks			
		L	Т	Р	C		CA	ESE	Total			
U19IT305	Professional Ethics and	3	0	0	3		40	60	100			
	Human Values											
Course Objective	<ul> <li>Stimulate critic engineering pra</li> <li>Provide concep</li> <li>Understand the</li> <li>Justify the mora</li> <li>Aware of the d and moralities i</li> </ul>	tual and ctices tual too moral v al judgn lifferent n an org	e to, respo ils nec values nent co t ethic ganiza	onsible r essary fo that oug oncernin cal issues ttion.	eflectio or pursu ht to gu g the pr s, codes	ing th iing th iide th ofess s for	n moral iss hose issues. he engineeri sion. conduct for	ues sur ng profe engine	rounding ession. ers in society			
Course	At the end of the co <b>CO1:</b> Can describe personal reasons w	ourse, the and ex	ne stuc plain I l and p	lent shou historica professio	ıld be al I, legal, nal defi	ble to profe	o, essional, and ns of ethics	ł exist.	Knowledge Level K1			
Outcome	CO2:Can describe ethically.	the ber	nefits 1	that are e	expected	d to a	rise from ac	ting	K2			
	CO3:Stimulate critical and responsible reflections on moral issues surroundingengineering PracticesK3											
	CO4:Provide Conc	eptual t	$\frac{1}{1}$	necessary	tor pur	suing	g those issue	es.	K3			
Dro noguisitos	engineers insociety	and Me	oraliti	es in an	s, codes Organiz	ation	1.		К3			

	CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 – Weak													CO/PSO Mapping		
	Programme Outcomes (POs)													PSOs .		
Cos	PO1	PO2	PO3	PO4	PO5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2		
CO 1	3	2			1	1	2	2			1	2	2	1		
CO 2	2				2			1				2	2			
CO 3	3	3	2		1		2	2		1		2		2		
CO 4	2	2	2		3			2			1	2	3			
CO 5	2							2				2	2			

Course Assessment Methods
Direct
1. Continuous Assessment Test I, II & III
2. Assignment
3. End-Semester examinations
Indirect
1. Course - end survey

Conte	ent of the	syllabus		
Un	it – I	HUMAN VALUES	Periods	9
Mora	ls, values	and Ethics - Integrity - Work ethic - Service learning - C	ivic virtue -	Respect for
others	- Living	peacefully-Caring-Sharing-Honesty-Courage-Value (Courage-Value) (Courage-Val	ing time –Co	poperation –
Comm	nitment –	Empathy - Self-confidence - Character - Spirituality - In	ntroduction t	o Yoga and
Medita	ation for	professional excellence and stress management.	1	
Uni	it – II	ENGINEERING ETHICS	Periods	9
Introd	uction to	engineering ethics-Senses of "Engineering Ethics" – Variety	of moral iss	ues – Types
of inq	uiry – Me	oral dilemmas – Moral Autonomy – Kohlberg [*] s theory	/ – Gilligar	1 s theory –
Virtue	s – Uses	of Ethical Theories	mai ideals a	na
Un	nit – III	ENGINEERING AS SOCIAL EXPERIMENTATION	Periods	9
Engine	eering as	Experimentation - Engineers as responsible Experimentation	ers – Resear	rch Ethics -
Codes	of Ethic	s – Industrial Standards - A Balanced Outlook on Law -	- The Challe	enger of IT
indust	ry Case S	tudy	<b>D</b> • 1	
Uni	t - IV	SAFETY, RESPONSIBILITY AND RIGHTS	Periods	9
Safety	and Ris	k – Assessment of Safety and Risk – Risk Benefit Anal	ysis – Redu	cing Risk -
Diahta	Tive Barg	anning – Confidentiality – Conflicts of Interest – Occupation	nal Crime –	Professional
Rights	s – Empic d Eight o	nd ning Mile Island case study	Case Studie	s and
Uni	$\mathbf{H} = \mathbf{V}$		Pariods	0
Globa	lization of	and MNCs Cross Culture Issues Computer Ethics computer	are as the in	strumont of
Uneth	ical beha	vior-computers as the object of Unethical Acts-autonomy	cis as ule li	rs-computer
codes	of Ethi	cs-Weapons Development-Ethics and Research-Analyzin	g Ethical I	Problems in
Resear	rch-Food	and Drug Adulteration	8	
		Tota	al Periods 4	15
Text I	Books			
1	Mike N	Iartin and Roland Schinzinger, "Ethics in Engineering", 3 ^r	^a edition, M	cGraw Hill,
2	Charles	E Harris, Michael S Pritchard and Michael J Rabins,	"Engineerin	g Ethics –
2	Concep	ots and Cases", Thompson Learning, 2000.	e	0
Refer	ences	al) DC Daisi and Dr. Dai Agrowal "Dysinger Ethics An Ir	dian Danana	+++++++++++++++++++++++++++++++++++++++
1	Biztanti	a, New Delhi, 2004	idian Perspec	, tive ,
2	David E	frmann and Michele S Shauf, "Computers, Ethics and Societ	y", Oxford U	Jniversity
2	Press, (		11	2004
3	Charles	B. Fleddermann, "Engineering Ethics", Pearson Prentice Ha	III, New Jerso	ey,2004
4	Charles	E. Harris, Michael S. Pritchard and Michael J. Rabins, "Eng	gineering Eth	1CS —
E-Res	Concep	is and Cases , Cengage Learning, 2009		
1	https://r	ntel ac in/content/storage2/nntel_data3/html/mhrd/ict/text/1	10105007/1e	c1 ndf
2	https://r	upter.ac.m/content/storage2/npter_datas/ntml/nmrd/corectory r	rosponsib	vility for
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3	http://ol	ermontdd org/wn-content/unloade/2017/02/Dights and Dash	onsibilition .	odf
	nup.//cl	alipoethics org	onsionnes.	<u>, , , , , , , , , , , , , , , , , , , </u>
+ 	www.01	mneeunes.org		
3	www.ns	spe.org		
6	www.gl	obalethics.org		

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Programme	B.TECH	Programme code				Regulation		20	)19					
Department					Sem	nester								
			Pe	riods p	er week	Credit	Ma	ximum ]	Marks					
Course code	Co	urse name	L	Т	Р	C	CA	ESE	Total					
U19TA302	தமிழரும் தெ நுட்பமும்/ TA TECHNOLOGY	தமிழரும் தொழில் நுட்பமும்/ TAMILS AND 2 0 0 1 40 60 TECHNOLOGY												
Content of the Syllabus அலகு 1 நெசவ மற்றும் பானைக்கொழில்நுட்பும் Periods 3														
அலகு 1   நெசவு மற்றும் பானைத்தொழில்நுட்பம்   Periods 3														
சங்ககாலத்தில் நெசவுத்தொழில்– பானைத்தொழில்நுட்பம் – கருப்புசிவப்பு பாண்டங்கள் – பாண்டங்களில் கீறல் குறியீடுகள்.														
அலகு 2 வடிவமைப்பு மற்றும் கட்டிடத்தொழில்நுட்பம் Periods 3														
மேடை அ சோழர்கால நாயக்கர்கா மற்றும் திர சென்னையி	ுமைப்பு பற்ற த்துப் பெ லக்கோயில்கவ நமலை நாயச் ல் இந்தோ-சா(	றிய விவரங்கள்–ம ருங்கோயில்கள் ள்-மாதிரிகட்டமைப்ப கர் மஹால் – செ ரோசெனிக்கட்டிடக்க	ாமல் மற்ழ புகள் சட்டிந கலை	லபுரச றம் பற்றி நாட்டு	ச்சிற்பங்க பிறவ அறிதல் வீடுகள்	sளும் ே பழிபாட்டு மீனாட்சி r – பிரிட	கோவி த்தல அம்ட ட்டிஷ்	ல்களு ங்கள் மன் ஆ . கால	ம் – – ,லயம் பத்தில்					
அலகு 3	உற்பத்தித் ெ	தாழில்நுட்பம்				Pe	eriods		3					
கப்பல் கட்டு வரலாற்றுச் மணி உருவ – சங்குமன மணிகளின்	ிம் கலை – உலே சான்றுகளாக – ாக்கும் தொழி <u>ர்</u> னிகள் – எலுப் வகைகள்.	லாகவியல் – இரும்பு செம்பு மற்றும் தங் 9சாலைகள் – கல்மன ம்புத்துண்டுகள் –	த்தொ பகநான னிகள் தொல்	ழிற்ச னயா , கண் லியல	ாலை – இ ங்கள் – ந ாணாடிமல ல்சான்றுல	)ரும்பை எ ாணயங்ச ணிகள் – ச கள் – ச	உருக் 5ள் அ சுடும லப்ட	குதல் புச்சடித ண்மல பதிகார	எஃகு – ந்தல் – னிகள் ரத்தில்					
அலகு 4	வேளாண்மை நீர்ப்பாசனத்	் தொழில்நுட்பம்			மற்றும்	Pe	eriods		3					
அணை, ஏ கால்நடைப மற்றும் ே முத்துமற்று	அணை, ஏரி, குளங்கள் ,மதகு – சோழர்காலக்குமுழித்தாம் பின் முக்கியத்துவம் – கால்நடைபராமரிப்பு – கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் – வேளாண்மை மற்றும் வேளாண்மைச்சார்ந்த செயல்பாடுகள் – கடல்சார்அறிவு – மீன்வளம் – முத்துமற்றும்முத்துக்குளித்தல் – பெருங்கடல் குறித்த பண்டைய அறிவு – அறிவுசார்சமூகம்.													
அலகு 5	அலகு 5 அறிவியல் தமிழ் மற்றும் கணினித்தமிழ் Periods 3													
அறிவியல் செய்தல் – தமிழ் மின்	தமிழின் வளர் தமிழ் மின் ஏ நாலகம் – இன	ர்ச்சி – கணினித்தட பொருட்கள் உருவா ணயத்தில் தமிழ் ஆ	பிழ் வ ாக்கம் அகரா	பளர்ச 2 – <u>ச</u> கிகல	ச்சி – தமி 5மிழ் இவ ர் – சொர்	ழ்நூல்க ணையக்க றக்குவை	ளை கல்வீ பக்கிட	மின்ட ிக்கழ ட்டம்.	நிப்பு கம் –					
			. ,	-	<b>r</b>	Total Per	riods	1	15					

	(Auton	<b>VIVEKAN</b> <b>COLLEGE OF ENGINER</b> omous Institution Affiliate Elayampalayam, Tiruc	AND ERING d to An hengod	<b>PHA</b> FOR W na Uni [*] e – 63'	<b>OMEN</b> versity ( 7 205	Chennai)		TÜVRheinland CERTIFIED	0 9001:2015				
Programme	B.TECH	Programme code		10	4	Regulatio	n	20	19				
Department	INFORMATION	TECHNOLOGY			S	emester		Ι	I				
			Peri	iods pe	r week	Credit	Maxi	mum M	larks				
Course code	Co	ourse name	L	Т	Р	C	CA	ESE	Tot al				
	TAMILS AND TECHNOLOGY         1         0         0         1         40												
Content of the sy	llabus							-					
UNIT I	WEAVING AN	D CERAMIC TECHNOI	LOGY			P	eriods	3	6				
Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) –Graffiti on Potteries													
UNIT II	UNIT II DESIGN AND CONSTRUCTION TECHNOLOGY Periods 3												
Designing and Structural construction House & Designs in household materials during Sangam Age - Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study (Madurai Meenakshi Temple)-Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period													
UNIT III	MANUFACTU	RING TECHNOLOGY				P	eriods	3	;				
Art of Ship Build of history - Minti beads/ bone beats	ling - Metallurgica ng of Coins – Bea s - Archeological e	al studies - Iron industry - I ads making - industries Sto vidences - Gem stone type	ron sme one bea s descri	elting,s .ds - Gl bed in	teel - Co ass beac Silappat	opper and go ls - Terracot hikaram.	ld- Coi ta bead	ns as so s -Shell	ource				
UNIT IV	AGRICULTUR	E AND IRRIGATION T	ECHNO	OLOG	Y	P	eriods	3	•				
Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society.													
UNIT V	SCIENTIFIC T	AMIL & TAMIL COMP	UTING	T T		P	eriods	3	6				
Development of Software – Tamil	Scientific Tamil - 7	Famil computing – Digitali – Tamil Digital Library –	zation of Online	of Tam Tamil I	il Books	s – Developr ries – Sorku	nent of vai Pro	Tami iect	1				
	neuer reudenny	- anni Digitui Diotui y	<u>e inne</u>		2 10010	Total Pe	eriods	1	5				

#### **TEXT-CUM-REFERENCE BOOKS:**

	தமிழக வரலாறும் – மக்களும்பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு:
1	தமிழ்நாடுபாடநூல்மற்றும்கல்வியியல்பணிகள்கழகம்).
2	கணினித்தமிழ் – முனைவர்இல. சுந்தரம். (விகடன்பிரசுரம்).
3	கீழடி – வைகைநதிக்கரையில்சங்கநகரநாகரிகம்
	(தொல்லியல்துறைவெளியீடு)
4	பொருநை - ஆற்றங்கரைநாகரிகம். (தொல்லியல்வெளியீடு)
5	Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL - (in print)
6	Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International
	Institute of Tamil Studies
7	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by:
	International Institute of Tamil Studies).
8	The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International
	Institute of Tamil Studies.)
9	Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department
	of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10	Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by:
	The Author)
11	Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and
	Educational Services Corporation, Tamil Nadu)
12	Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) - Reference Book.

	VIVEKANA (Autonomou	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205												
Programme	B. TECH	I	Program	mme Code	104	Re	gulation		2019					
Department	INFORMATIO	N TE	CHN	OLOGY		S	Semester		III					
Course Code	Course Name	Pe	riods	Per Week	Cred	it		Maximu	m Marks					
Course Code	Course Maine	ESE	TOTAL											
U19EC309	Circuits and Devices Laboratory	Circuits and Devices00424060100Laboratory00424060100												
Course Objective	<ul> <li>The Main Objec</li> <li>Learn the FET,SCR</li> <li>Study and a</li> <li>Evaluate Phototransi</li> <li>Design and</li> <li>Simulate valuate va</li></ul>	<ul> <li>The Main Objective of the course is to</li> <li>Learn the characteristics of basic electronic devices such as Diode, BJT, FET,SCR</li> <li>Study and analyze BJT configurations.</li> <li>Evaluate the characteristic(s) JFET, MOSFET, Photodiode, Phototransistor,UJT and SCR.</li> <li>Design and analyze rectifiers.</li> </ul>												
Course Outcome	At the end of the CO1: Demonst CO2: Compare CO3: Compare CO4: Compare CO5: Apply P	he co trate e Inp e Cha e Cha -spice	urse, 1 V-I cl ut & ( uracter uracter e & D	the student naracteristi Dutput char ristics of di ristics of re evelop a w	should t cs of PN racteristic ode, trar ctifiers orking n	be abl junc cs of nsisto	le to, tion diode & CB & CE co ors & photo d l of an electro	z Zener di onfigurati liode onic circu	iode on nit					

	CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak														
COs			]	PSOs											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO 2	
CO 1	3	3	3	2											
CO 2															
CO 3	CO 3         3         3         3         2														
<b>CO 4</b>	<b>XO4</b> 3 2 2 2 2														
CO 5	CO 5         3         2         3         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2														
Course Assessment Methods															
irect															
. Prela	ab and	l post ]	lab tes	t											
. Record mark															
. End-Semester examinations															
Indire	Indirect														
1. Cou	rse - e	nd sur	vey												

#### LIST OF EXPERIMENTS

SI No	List of Exporimonts	Course
<b>51.</b> NU	List of Experiments	Outcome
1	Study the V-I characteristics of PN junction diode & Calculate Static &	COI
1.	Dynamic Resistance	cor
2	Study the V-I characteristics of Zener diode & Calculate the Zener break down	CO1
۷.	voltage.	cor
3.	Study and plot the Input & Output characteristics of CB configuration in BJT.	CO2
4.	Study and plot the Input & Output characteristics of CE configuration in BJT.	CO2
5	Study and plot the Intensity Vs photo current Characteristics of Photodiode and	CO3
5.	Phototransistor.	005
6	Study and plot the Characteristics of UJT and calculate the intrinsic standoff	CO3
0.	ratio (η).	COJ
7.	Study and plot the Characteristics of SCR and calculate the $V_{BO}$ , $I_L$ & $I_H$ .	CO3
8.	Study and plot the drain and transfer Characteristics of JFET and MOSFET.	CO2
0	Verify the working of a Half wave rectifier, Full wave rectifier and full wave	CO4
9.	bridge rectifier and to measure the ripple factor.	04
10	Introduction of P-spice Simulation software and characteristics of CB/CE	CO5
10.	configuration in BJT to be performed on P-spice.	005
11	Analyze the drain characteristics and transfer characteristics of MOSFET using	CO5
11.	P-spice.	05
	Total Periods	45



# VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN

(Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205



InorINFORMATION TECHNOLOGYSemesterIIICourse CodeCourse NamePeriods Per WeekCreditMaximum MLTPCCAESE TrU19IT306Data Structures Laboratory00426040The Main Objective of the course is to•Familiarize the operations on Linear Data Structures and Nonlinear Data Structure•Understand the basic operations on Search TreesObjective••Hote stand the basic operations on Search Trees•KICourse••Understand the concepts of various graph Traversal methods•KICourse••Understand the concepts of various graph Traversal methodsKICourseCO2: Suggest appropriate Search Tree for solving a given problemK3CO2: Suggest appropriate Search Tree for solving a given problemK3CO3: Appropriately use the various graph Traversal for a given problemK3CO4: Adopt an appropriate Searching and Sorting method to solve a problemK3CO5: Apply appropriate Searching and Sorting 2 - Medium, 1 - WeakPeoProgramme Outcomes (POs)POPOProgramme Outcomes (POs)PSCO3 3 2 1 11 1 1 1 1 1 1 1CO3 3 2 1 11 1 1 1 1 1CO3 3 2 1 11 1 1 1CO3 3 2 1 11 1 1CO3 3 2 1 11 1 1CO3 3 2 1 11 1 1CO3 3 2 1 1	Programm		R TFC	'H			Program	mme	10/	1	Re	aulation		2010			
$\begin{array}{ c c c c c } \hline \begin{tabular}{ c c c } \hline \begin{tabular}{ c c c } \hline \begin{tabular}{ c c c } \hline \begin{tabular}{ c c c } \hline \begin{tabular}{ c c c } \hline \hline \begin{tabular}{ c c c c } \hline \begin{tabular}{ c c c c } \hline \begin{tabular}{ c c c c c c } \hline \begin{tabular}{ c c c c c c } \hline \hline \begin{tabular}{ c c c c c c c c c c } \hline \begin{tabular}{ c c c c c c c c c c } \hline \hline \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	1 Togramm		DILL	<b>,11</b>			Code		10-	·	KC	guiation	L	2017			
Course NamePeriods Per WeekCreditLTPCCAESEToU19IT306Data Structures Laboratory004260401CourseData Structures Laboratory004260401CourseDifferenceCourseObjectiveDefinition of the course is toFamiliarize the operations on Linear Data Structures and Nonlinear Data StructureUnderstand the basic operations on Search TreesKnown to the basics of various graph Traversal methodsCO1: Implement List based and Array based Linear and Nonlinear Data StructuresCO2: Suggest appropriate Search Tree for solving a given problemK3CO2: Suggest appropriate Searching and Sorting method to solve a problemCO2: Suggest appropriate Searching and Sorting method to solve a problemCO3: Appropriately use the various graph Traversal for a given problemK3CO4: Adopt an appropriate Searching and Sorting method to solve a problemK3CO/ PO MappingCO/PO(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 – WeakMappinCO2A46CO/ PO POPO	Departme	ent	INFOR	MATI	ON TE	CHNOLO	GY				S	Semeste	r II	[			
Course       Data Structures Laboratory       0       0       4       2       60       40       1         Course       Data Structures Laboratory       0       0       4       2       60       40       1         Course       Differentiation and the basic operations on Linear Data Structures and Nonlinear Data Structures       Familiarize the operations on Search Trees       KI         Objective       •       Familiarize the operations on Search Trees       KI         Course       •       Understand the basic operations on Search Trees       KI         Course       •       Indeestand the concepts of various graph Traversal methods       •       KI         Course       At the end of the course, the student should be able to,       KI         CO1: Implement List based and Array based Linear and Nonlinear Data       K3         CO2: Suggest appropriate Search Tree for solving a given problem       K3         CO3: Appropriately use the various graph Traversal for a given problem       K3         CO4: Adopt an appropriate Searching and Sorting method to solve a problem       K3         CO5: Apply appropriate or correlation) 3-Strong, 2 – Medium, 1 – Weak       Mappi         CO1       3       2       1       1       1       1       1       1         CO2	Course Co	ode	C	'ourse l	Name		Perio	ds Per V	Week	Cı	redit	Ma	aximun	n Marks			
U19IT306         Data Structures Laboratory         0         0         4         2         60         40         4           Course Objective	Course Co	oue			vanie		L	, Т	. ]	<b>)</b>	С	CA	ESE	Total			
The Main Objective of the course is toThe Main Objective of the course is toFamiliarize the operations on Linear Data Structures and Nonlinear Data StructureUnderstand the basic operations on Search TreesKnown to the basics of various graph Traversal methodsUnderstand the concepts of various Searching and Sorting TechniquesAt the end of the course, the student should be able to,KICO1: Implement List based and Array based Linear and Nonlinear Data StructuresK3CO2: Suggest appropriate Search Tree for solving a given problemK3CO2: Suggest appropriate Search Tree for solving a given problemK3CO2: Adopt an appropriate Searching and Sorting method to solve a problemK3CO4: Adopt an appropriate hash functions that result in a collision free scenario for data storage and retrievalPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPO<	U19IT306	5	Data St	ructur	es Lab	oratory	C		)	4	2	60	) 40	100			
At the end of the course, the student should be able to,KICO1: Implement List based and Array based Linear and Nonlinear Data StructuresK3CO2: Suggest appropriate Search Tree for solving a given problemK3CO2: Suggest appropriate Search Tree for solving a given problemK3CO4: Adopt an appropriate Searching and Sorting method to solve a problemK3CO4: Adopt an appropriate Searching and Sorting method to solve a problemK3CO4: Adopt an appropriate Searching and Sorting method to solve a problemK3CO/PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 - Medium, 1 - WeakProgramme Outcomes (POs)Programme Outcomes (POs)PSOSCO/PO PO P	Course Objective		Fhe Main • F • U • K • U	n Objec amiliar Indersta Inown t	ctive of ize the and the to the band the	the course is operations o basic operat asics of varie concepts of	s to n Linear ions on S ous graph various S	Data St earch T Traven earchin	ructures rees rsal met ig and S	and No hods orting T	online Sechn	ear Data iques	Struct	ures			
CO2: Suggest appropriate Search Tree for solving a given problemK3CO3: Appropriately use the various graph Traversal for a given problemK3CO4: Adopt an appropriate Searching and Sorting method to solve a problemK3CO4: Adopt an appropriate Searching and Sorting method to solve a problemK3CO4: Adopt an appropriate Searching and Sorting method to solve a problemK3CO5: Apply appropriate hash functions that result in a collision free scenario for data storage and retrievalCO/PSCO/PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 – WeakMappinCO/PSPOPO PO POPS123CO/PS Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 – WeakMappinCO/PSPOPO PO POPS111121CO/PSPO PO PO PO PO PO PO PO PO POPS1CO321111CO/PSPOPO PO P		_	At the e CO1: J Structu	end of the Implem Tres	he cours	se, the stude	nt should Array bas	be able	e to,	Nonline	ar Da	ıta		KL K3			
CO3: Appropriately use the various graph Traversal for a given problemK3CO4: Adopt an appropriate Searching and Sorting method to solve a problemK3CO4: Adopt an appropriate Searching and Sorting method to solve a problemK3CO5: Apply appropriate hash functions that result in a collision free scenario for data storage and retrievalCO/PO MappingCO/PO MappingCO/PS(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 – WeakMappinProgramme Outcomes (POs)PSOSCO1321CO PO	Course	-	<b>CO3:</b> Appropriately use the various graph Traversal for a given problem														
COV: Adopt an appropriate Scatching and Softing include to solve a problemKateling and Softing include to solve a problemCOS: Apply appropriate hash functions that result in a collision free scenario for data storage and retrievalK3CO/PO MappingCO/PS MappingCO/PO MappingCO/PS Mapping(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 – WeakMappinProgramme Outcomes (POs)PSOSCO/PSPSOSCO/PSPSOSCO/PSPOPOPOPOPSI2CO/PSPSOSCO/PSPSOSCO/PSPSOSCO/PSPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOPOCO/POPO	Outcome	_	$\frac{\text{CO3: } 1}{\text{CO4: } 1}$	Approp	natery (	opriate Searc	bing and	Sorting	sai ior a	$\frac{1}{2}$		roblem		K3 V3			
CO / PO Mapping       CO/PS Mapping         (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 – Weak       Mappin         Programme Outcomes (POs)       PS os         PO       PS os         COS       PO       PO       PO       PO       PO       PS os         CO1       3       2       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1         <		_	CO5: scenari	Apply o for d	approp ata stor	riate hash fu	unctions eval	that res	sult in a	a collisi	on fr	ee		К3			
PO         PO<			(3/2/1 i	ndicates	strength	CO / PO Ma of correlation)	apping 3-Strong, 2	2 – Mediu	um, 1 – W	/eak			CO. Maj	/PSO oping			
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CO 5       3       2       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1	<u>CO</u> 4	3	2	1	1			1	1	1	1	1	1	1			
Course Assessment Methods Direct 1. Prelab and post lab test	CO 5	3	2	1	1			1	1	1	1	1	1	1			
<ol> <li>Record mark</li> <li>End-Semester examinations</li> <li>Indirect</li> </ol>	Course A Direct 1. Prela 2. Reco 3. End-	Asse: ab an ord m Sem-	ssment ] d post la aark ester exa	Methoo b test	<b>ds</b> ons												
1. Course - end survey	1. Cour	se - e	end surv	ey													

## LIST OF EXPERIMENTS

EX.NO	EXPERIMENT DESCRIPTION	COs	
1.	Array implementation of Stack and Queue ADTs	CO1	
2.	Array implementation of List ADT	CO1	
3.	Linked list implementation of List, Stack and Queue ADTs	CO1	
4.	Applications of List, Stack and Queue ADTs	CO1	
5.	Implementation of Binary Trees and operations of Binary Trees	CO2	
6.	Implementation of Binary Search Trees	CO2	
7.	Implementation of AVL Trees	CO2	
8.	Graph representation and Traversal algorithms	CO3	
9.	Applications of Graphs	CO4	
10.	Implementation of searching and sorting algorithms	CO4	
11.	Hashing – any two collision techniques	CO5	
	·	Total Periods	45

<b>E</b> - Resources	
1	https://www.programiz.com/c-programming
2	https://www.cprogramming.com/
3	https://beginnersbook.com/2015/02/simple-c-programs/

		(	<b>VIV</b> (Auto	<b>EKA</b>	NAN ous In	N <b>DH</b> ∉ stitut E	<b>A CO</b> l ion, A Elayan	LLE WO ffilia	GE C MEN ited to yam,	<b>)F EN</b> J D Ann Tiruc	NGINI a Univ	EERIN versity ode – 6	<b>IG FO</b> ,Chenr 37 205	<b>R</b> nai)	TUVPReinland	
Programn	ne	<b>B.</b> ′	ГЕСІ	H	Progr	amm	e Cod	e			104	R	egulatio	on		2019
Departme	nt	CS	E, EI	EE, E	CE, I	IT &	BT					Se	emester	•		
Course Co	ode	Со	urse N	Vame				Pe W	eriods ⁷ eek	s Per		Credit	Max	ximum	Marks	<u> </u>
									L	Т	Р	C	C	A	ESE	Total
U19M0	CSY3	NU	NUMERICAL ABILITY   3   0   0   100   -											100		
Objective       accommodate fundamental, mathematical aspects to instill confidence amon expand their knowledge and to develop their logical reasoning thinking ability         At the end of the course, the student will be able to:												g students				
		At	At the end of the course, the student will be able to:													
C		CO	CO1: Develop a proper understanding of the number system													
Outco	rse	CO	CO2: Explain the meaning of ratio, proportion and percentage													
Oute	ome	CO	<b>CO3:</b> Solve complex problems involving speed, distance and time.													
		CO infl	<b>CO4:</b> Understand the relationship between compound interest and its influencing factors													
		CO obj	<b>CO5:</b> Solve surface area and volume of rectangular-prism problems with real objects												K3	
Pre-requi	isites	-														
		(3	/2/1 ind	dicates	strengtl	CO h of co	/ PO M	<b>Iappin</b> 1) 3-Sti	<b>g</b> rong, 2	– Medi	um, 1 - `	Weak		CO/ Maj	/PSO oping	
						Prog	gramme	Outco	mes (P	Os)				PS	SOs	
	COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
	CO 1	3	3											2		
	CO 2	3	3											2		
	CO 3	3	3											2		
	CO 4	3	3											2		
	CO 5	3	3											2		

Unit - INUMBER SYSTEMSPeriods6Number Properties – HCF – LCM - Square root – Cube root – Simplification – Averages.Unit - IIDIRECT PROPORTIONAL PROBLEMSPeriods8Percentage - Profit & Loss –. Ratio & Proportions – Mixture & Allegations - Problem on AgesUnit – IIIINDIRECT PROPORTIONAL PROBLEMSPeriods8Time & Work – Pipes & Cisterns - Time, Speed & Distance – Boats & Streams – Races & Games of Skills.8Unit - IVBANKER'S PROBLEMSPeriods4Simple Interest – Compound Interest – Logarithms – Partnership - Discounts.9Unit - VMISCELLANEOUS PROBLEMSPeriods4Mensuration: Area & perimeter – Volume & Surface Area – Geometry-Trigonometry.30Text Books1.Dinesh Khattar- The Pearson guide to Quantitative Aptitude for Competitive Examinations 3 rd	Content of the syllabus												
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Unit - IV       BANKER'S PROBLEMS       Periods       4         Simple Interest - Compound Interest - Logarithms - Partnership - Discounts.       Image: Composition of the second sec	Time & Games	Time & Work – Pipes & Cisterns - Time, Speed & Distance – Boats & Streams – Races & Comes of Skills											
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Simple Interest – Compound Interest – Logarithms – Partnership - Discounts.         Unit – V       MISCELLANEOUS PROBLEMS       Periods       4         Mensuration: Area & perimeter – Volume & Surface Area – Geometry-Trigonometry.       Total Periods       30         Text Books         1.       Dinesh Khattar- The Pearson guide to Quantitative Aptitude for Competitive Examinations 3 rd	Unit	- I V	BANKER'S PROBLEMS	Periods	4								
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1. Dinesh Khattar- The Pearson guide to Quantitative Aptitude for Competitive Examinations 3 rd	Text Books												
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edition.													
References	Referen	nces											
R.S. Aggarwal - Quantitative Aptitude for Competitive Examinations	1.	R.S. Aggarwal - Quantitative Aptitude for Competitive Examinations											

the second se	ANDNAL JASTRE	THE FOR	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205														
Pro	gramr	ne	B.E/B.	ТЕСН		Pro	gramr	ne Cod	e	104		Re	gulation		2019		
Dep	partme	ent	CSE/I	CSE/IT/CST Semester IV													
Cou	rse Co	ode	Course NamePeriods Per WeekCreditMaximum MaLTPCCAESE												Marks Tot		
U19	9MA4	05	Statisti Metho	ics and ds*	Nume	erical		3	1		0		4	40	60	100	
C	Course Djectiv	ve	<ul> <li>The main objective of the course is to</li> <li>provide the necessary basic concepts of a few statistical and numerical methods and give procedures for solving numerically different kinds of problems occurring in engineering and technology.</li> <li>Acquaint the knowledge of testing of hypothesis for small and large samples whichplays an important role in real life problems.</li> <li>Introduce the basic concepts of solving algebraic and transcendental equations.</li> <li>Introduce the numerical techniques of interpolation in various intervals and numerical techniques of differentiation and integration which plays an important role in engineering and technology disciplines.</li> <li>Introduce the numerical techniques of interpolation in various intervals and numerical techniques of differentiation and integration which plays an important role in engineering and technology disciplines.</li> </ul>														
			At the end of the course, the student should be able to												level		
			samples in real life problems.												K1,K.	3	
C	Course			in the field of agriculture.												3	
0	Outcome		intervals and apply the numerical techniques of differentiation and integration for engineering problems.												K3,K5		
			<b>CO4:</b> Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations												K2,K5		
			<b>CO5:</b> Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications												K3,K4		
Pre-requisites -																	
CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak											pping						
COs	<b>D</b> O 4				Pro	ogramme	Outco	mes (PO	s)	L DO		2.44	<b>D</b> O 10	DCO4	PSOs		
CO 1	<b>PO 1</b> 3	PO 2 3	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO	10 PC	911	PO 12	<b>PSO1</b> 2	PSO 2	PSO 3	
CO 2	3	3												2			
CO 4	3	3								-				2			
CO 5	3	3												2			
Cou	rse A	ssess	ment M	lethod	s												
Dir	Direct																

1. Continuous Assessment Test I, II & III

2.	Assignment										
5. End-Semester examinations											
	1. Course - end survey										
Content of the syllabus											
Unit – I     TESTING OF HYPOTHESIS     Periods     12											
Sampli	ng distributions - Estimation of parameters - Statistical hypothesis - Large sam	ple tests ba	sed on								
Norma	l distribution for single mean and difference of means -Tests based on t.	Chi-square	and F								
distributions for mean, variance and proportion - Contingency table (test for independent) - Goodness of											
fit.		,									
Unit -	II DESIGN OF EXPERIMENTS	Periods	12								
One w	ay and two way classifications - Completely randomized design - Randomized	ed block de	sign –								
Latin s	quare design - 2 ² factorial design.										
Unit–	III   SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS	Periods	12								
Solutio	n of algebraic and transcendental equations - Fixed point iteration method -	Newton Ra	aphson								
method	l - Solution of linear system of equations - Gauss elimination method – Pivoti	ng - Gauss	Jordan								
method	I - Iterative methods of Gauss Jacobi and Gauss Seidel - Eigen values of a	matrix by	Power								
method	and Jacobi's method for symmetric matrices.										
Unit -	IV INTERPOLATION, NUMERICAL DIFFERENTIATION AND NUMERICAL INTEGRATION	Periods	12								
Lagran	ge"s and Newton"s divided difference interpolations – Newton"s forward an	d backward	l								
difference interpolation – Approximation of derivates using interpolation polynomials – Numerical											
single and double integrations using Trapezoidal and Simpson's 1/3 rules.											
Unit –	V NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS	Periods	12								
Single	step methods : Taylor's series method - Euler"s method - Modified Euler"s method	hod - Fourth	order								
Runge-	Kutta method for solving first order equations - Multi step methods : Milne"s a	and Adams	- Bash								
forth p	redictor corrector methods for solving first order equations.										
	Total Periods	60									
Text B	ooks:										
1.	Grewal. B.S. and Grewal. J.S., "Numerical Methods in Engineering and Scien Khanna Publishers New Delhi 2015	ce ", 10th E	dition,								
	Iohnson R A Miller I and Freund I "Miller and Freund"s Probability and Statistics for										
2.	2. Engineers". Pearson Education. Asia. 8th Edition. 2015.										
References:											
1.	1. Burden, R.L and Faires, J.D, "Numerical Analysis", 9th Edition, Cengage Learning, 2016.										
ſ	Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning,										
۷.	New Delhi, 8th Edition, 2014.										
3	3 Gerald. C.F. and Wheatley. P.O. "Applied Numerical Analysis" Pearson Education, Asia, New										
5.	Delhi,2006.										
4.	4. S.C.Gupta & V.K.Kapoor," Fundamentals of Mathematical Statistics", Sultan chand & sons Education Publishers, Newdelhi, 10 th Edition.										
5.	William Navidi,"Statistics for Engineers and Scientists", TMH Publishers, Edition, 2013.	, New Dell	ni, 3 rd								
E-Reso	purces:										
1.	https://www.maths.unsw.edu.au > courses > math2089-numerical-methods.										
2.	www.learnerstv.com/Free-engineering-Video-lectures										
3.	www.nptel.ac.in										

		V	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205												
Pre	ogramm	e 1	B.TEC	СН		P	rograr	nme Co	ode		104	Reg	gulation		2019
De	partmer	nt ]	INFORMATION TECHNOLOGY Semester IV												
Co	urse Coo	le		Cour	se Nai	me		Peri V	ods Pe Veek	r	Credit		Maxi	mum Ma	arks
								L	Т	Р	С		CA	ESE	Total
U	19IT407	7	Li	inear Ci	Integ ircuits	rated s		3	0	0	3		40	60	100
Co Obje	urse ective	T • •	<ul> <li>The student should be made to,</li> <li>Introduce the basic building blocks of linear integrated circuits.</li> <li>Learn the linear and non-linear applications of operational amplifiers.</li> <li>Introduce the theory and applications of analog multipliers and PLL.</li> <li>Learn the theory of ADC and DAC.</li> <li>Introduce the concepts of waveform generation and introduce some special</li> </ul>												special
C Ou Pre-	ourse tcome •requisi	( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	At the CO1: CO2: CO3: CO4: CO5:	end Desig Desig Desig Gene Anal	of the gn line gn app gn AD rate w yze sp	of the course, the student should be able to,Know Levn linear and non linear applications of op – ampsKn applications using analog multiplier and PLLKn ADC and DAC using op – ampsKrate waveforms using op – amp circuitsK/ze special function ICsK							owledge Level K3 K3 K3 K3 K3 K3		
			(3/2/1	indicat	es streng	C( gth of co	<b>) / PO</b> orrelatio	Mappin on) 3-Str	<b>g</b> ong, 2 –	Mediu	m, 1 - Wea	ak		CO/ Map	PSO ping
	Cos				Pro	gramme	Outco	mes (PO	s)					PSOs	
	COS	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12	PSO1	PSO 2
	CO 1 CO 2	3	3	1	1	1							2	$\frac{2}{2}$	
	CO 3	3		3	3	3							2	2	
	CO 4	3	2	3	2	3							2	2	
Course Aggeggment Methods         2         2         2															
Direct         1.       Continuous Assessment Test I, II & III         2.       Assignment         3.       End-Semester examinations         Indirect       1.         1.       Course - end survey															

Content of the syllabus											
Unit – I	BASICS OF OPERATIONAL AMPLIFIERS	Periods	9								
Current mirror and current sources, Current sources as active loads, Voltage sources, Voltage											
References, BJT Differential amplifier with active loads, Basic information about op-amps - Ideal											
Operational Amplifier - General operational amplifier stages -and internal circuit diagrams of IC 741,											
DC and AC performance characteristics, slew rate, Open and closed loop configurations.											
Unit – II	APPLICATIONS OF OPERATIONAL AMPLIFIERS Periods 9										
Sign Changer,	Scale Changer, Phase Shift Circuits, Voltage Followe	er, V-to-I and	I-to-V converters,								
adder, subtrac	tor, Instrumentation amplifier, Integrator, Differen	ntiator, Loga	rithmic amplifier,								
Antilogarithmic	e amplifier, Comparators, Schmitt trigger, Precision rec	tifier, peak de	tector, clipper and								
clamper, Low-p	bass, high-pass and band-pass Butterworth filters.										
Unit – III	ANALOG MULTIPLIER AND PLL	Periods	9								
Analog Multip	lier using Emitter Coupled Transistor Pair – Gilbert M	Aultiplier cell	– Variable								
transconductan	ce technique, analog multiplier ICs and their application	ons, Operation	of the basic PLL,								
Closed loop an	alysis, Voltage controlled oscillator, Monolithic PLL	IC 565, appli	cation of PLL for								
AM detection,	FM detection										
Unit _ IV	ANALOG TO DIGITAL AND DIGITAL TO	Periods	9								
	ANALOG CONVERTERS	I CHOUS	,								
speed sample- Approximation Conversion – C	speed sample-and-hold circuits, A/D Converters – specifications – Flash type – Successive Approximation type – Single Slope type – Dual Slope type – A/D Converter using Voltage-to-Time Conversion – Over-sampling A/D Converters.										
Unit _ V	WAVEFORM GENERATORS AND SPECIAL	Pariods	0								
Unit – V	FUNCTION	I CHOUS	,								
Sine-wave generators, Multi vibrators and Triangular wave generator, Saw-tooth wave generator, ICL8038 function generator, Timer IC 555, IC Voltage regulators – Three terminal fixed and adjustable voltage regulators – IC 723 general purpose regulator – Monolithic switching regulator											
	Т	otal Periods	45								
<b>Text Books:</b>											
1 Roy Choudhury and Shail Jain "Linear Integrated Circuits", Wiley Eastern, New Delhi, 2014.											
2 Sergio Franco, "Design with Operational Amplifiers and Analog Integrated Circuits", 3rd Edition, Tata Mc Graw-Hill, 2007.											
References:											
Ramakant A. Gayakwad, "OP-AMP and Linear ICs", 4th Edition, Prentice Hall/ Pearson1Education, 2001.											
B.S.Sonde, "System design using Integrated Circuits", 2nd Edition, New Age Pub, 2001.											
Robert F Coughlin and Fedrick F Driscoll —Operational amplifiers and linear Integrated Circuits,											
3 Fifth edition, Prentice Hall of India, New Delhi, 2001.											
<b>E-Resources:</b>											
1 http://kaved %20D.%20	liasir.yolasite.com/resources/Linear%20Integrated%200 Roy%20Choudhary.pdf	Circuit%202nd	%20Edition%20-								
2 http://fmcet	http://fmcet.in/ECE/EC2254_uw.pdf										

		VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205																
Prog	gramme	B.TECHProgramme Code104Regulation												ation	2019			
Dep	artment	INFORMATION TECHNOLOGY Semester												ester	IV			
			Course Name Periods Per Week Credit Maxim															
	ourse Code		L T P C CA								Е	SE	Total					
U19	9IT408		0	perat	ing S	ystem	IS		3	0	0	3	40		60	100		
C Ob	<ul> <li>Course</li> <li>Objective</li> <li>To understand the basic concepts and functions of operating systems.</li> <li>To understand Processes and Threads</li> <li>To analyze Scheduling algorithms.</li> <li>To understand the concept of Deadlocks.</li> <li>To analyze various memory management schemes.</li> <li>To understand I/O management and File systems</li> </ul>																	
	At the end of the course, the student should be able to, Level												vledge vel					
		CO	<b>1:</b> Illu	strate	the o	perati	ng sys	stem c	oncept	s and	its fu	nctiona	lities		K	2		
Co	ourse		<b>CO2:</b> Compare various CPU scheduling algorithms													K3 K3		
Out	tcome	<b>CO3:</b> Explain the need for process synchronization														K3 K3		
		CO	5: Co	mpare	e file	and d	isk m	anagen	nent st	rategi	es				K	2		
I	Pre-							0		0								
Req	uisites	Nil																
						C	O/PO	Mappin	g					CO	/PSO	1		
	Cos		(3/2/1	indicate	es streng	gth of co gramme	orrelation	on) 3-Stro mes (PO	ong, 2 –	Mediun	n, 1 - V	Veak		Ma PSO	pping	-		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	0 PO11	PO12	PSO1	PSO 2	,		
	CO 1	2				3								2	1502	-		
	CO 2	2	2	1		2							2	2	1	1		
	CO 3	2	1		2		1							2	1	_		
	CO 4	2	1		1		1						2	2	1	-		
Cos     2     1     1     2       Course Assessment Methods																		
Dire	Direct																	
	<ol> <li>Continuous Assessment Test I, II &amp; III</li> <li>Assignment</li> <li>End-Semester examinations</li> </ol>																	
Indi	irect		1															
1	1. Cours	se - er	id sur	vev														

Cont	ent of the syllabus												
U	nit – I INTRODUCTION	Periods	9										
Intro	luction-History of Operating Systems-Operating System Stru	icture – Opera	ating System										
Operations – Process Management – Memory Management – Storage Management – Protection and													
Secur	ity –Distributed Systems – Computing Environments – System S	Structures: Oper	rating System										
Servi	ces - User Operating System Interface - System Calls - Types	s of System Ca	ulls – System										
Progr	ams.												
•	PROCESS MANAGEMENT AND	<b>.</b>	0										
U	nt - II COORDINATION	Periods	9										
Proc	ess Concept: Process Scheduling – Operations on Processes – I	Inter-process C	ommunication.										
Mult	ithreaded Programming: Overview – Multithreading Models	– Threading	Issues – CPU										
Sche	duling: Basic Concepts – Scheduling Criteria – Scheduling Alg	orithms – Mul	tiple-Processor										
Schee	luling – Synchronization – The Critical-Section Problem – Peter	son,,s Solution	-										
Sync	nronization Hardware – Semaphores – Classic problems of Synchr	onization – Mo	nitors.										
Un	it – III DEADLOCKS AND MEMORY MANAGEMENT	Periods	9										
Dead	<b>locks:</b> System Model – Deadlock Characterization – Methods	for Handling	Deadlocks –										
Dead	lock Prevention – Deadlock Avoidance – Deadlock Detection	– Recovery fr	om Deadlock										
Mem	ory Management Strategies: Swapping – Contiguous Memory	Allocation – P	aging –										
Struc	ture of the Page Table – Segmentation		0										
Ur	it - IV VIRTUAL MEMORY MANAGEMENT	Periods	9										
Virtu	al Memory Management: Demand Paging – Copy on Write –	- Page Replace	ment –										
Alloc	ation of Frames – Thrashing. File System: File Concept – Access	s Methods – Di	rectory										
Struc	ture – File Sharing –Protection		0										
Unit – V         STORAGE MANAGEMENT         Periods         9													
Impl	ementing File Systems: File System Structure – File System	Implementation	n - Directory										
Imple	ementation – Allocation Methods – Free-space Management Sec	condary Storag	ge Structure:										
Disk	Structure – Disk Scheduling – Disk Management – Swap-Space Ma	anagement. Dev	vices – Device										
contr	ollers- Device drivers.												
Case	Study: (Only for Assignment Studies not for End-Semester-Exami	nations)											
1. Ke	ux Schoduling												
2. LII 3 L ir	ux File system Windows 7												
4  RT	OS Mobile OS												
	To	tal Periods 4	15										
Text	Books												
	Abraham Silberschatz, Peter Baer Galvin and Greg Ga	gne, "Operati	ng System										
1.	Principles", John Wiley & Sons (Asia) Pvt. Ltd, Ninth Edition, 20	018	-8 - )										
References													
	Andrew S. Tanenbaum, — Modern Operating Systems, 4 th edition Prentice Hall of India												
1.	Pvt.Ltd, 2016.												
	Gary Nutt, "Operating Systems- A Modern Perspectivel", Pearson Education Pvt.												
2. Ltd,5 th Edition, 2012													
3.	William Stallings, "Operating System", Pearson Education, Sixth	edition, 2012.											
E-Re	sources	7 -											
1.	www.webopedia.com/TERM/O/operating_system.html												
2.	https://www.tutorialspoint.com/operatingsystem/os_overview.htm	n											
3.	www.dictionary.com/browse/operatingsystem												
	VIVEKANANDH (Autonomous El	<b>IVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN</b> (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205       Image: Comparison of Compariso											
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Programme	В.ТЕСН	Progr Code	amme	104	Re	gulation		2019					
Department	INFORMATION T	ECHN	OLOGY		Sem	nester		IV					
Course Code	Course Name	Pe V	eriods Per Veek	Credit		Maximum Marks							
		L	Т	Р	С	CA		ESE	Total				
U19IT409	Design and Analysis of Algorithms	3	1	0	4	40		60	100				
Course Objective	<ul> <li>The student should</li> <li>Analyze the asy</li> <li>Apply importar</li> <li>Acquire knowle</li> <li>Understanding</li> </ul>	<ul> <li>he student should be made to,</li> <li>Analyze the asymptotic performance of algorithms.</li> <li>Apply important algorithmic design paradigms and methods of analysis.</li> <li>Acquire knowledge run time analysis of algorithms.</li> <li>Understanding the computational problems</li> </ul>											
	At the end of the co	ourse, 1	the studen	t should	be able	to,	]	Knowled	ge Level				
	<b>CO1:</b> Analyze the recursive and non-	runnin recursi	g time co ve proble	mplexitie ms.	s for the	e given		Ka	3				
Course Outcome	<b>CO2:</b> Analyze the divide and conquer	executer and g	tion time reedy tech	for the niques.	given p	problems in		Ka	3				
	<b>CO3:</b> Apply the improvement problems.	l iterative ne given		K3	3								
	<b>CO4:</b> Apply the Br solving technique t	anch a solve	and Bound the given	d and Bao n problem	cktracki 1s.	ng problem		K	3				
<b>.</b>	<b>CO5:</b> Analyze the l	P, NP-l	Hard and	NP-Comp	plete pro	oblem.		Ka	3				
Pre-requisite	-												

	CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak Programme Outcomes (POs)												CO/PSO Mapping		
	Programme Outcomes (POs)												]	PSOs	
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO 2	
CO 1	3	1	2										2	2	
CO 2	2	2	3										2	2	
CO 3	1	3	3										2	2	
CO 4	1	2	2										2	2	
CO 5	1	3	2	1									2	2	

C	ourse A	sessment Methods		
	irect	sessment memous		
	1. Co	ntinuous Assessment Test I. II & III		
	2. As	signment		
	3. En	l-Semester examinations		
Ir	ndirect			
	1. Cou	rse - end survey		
Con	tent of t	he syllabus		
Uı	nit — I	INTRODUCTION TO ALGORITHM ANALYSIS	Periods	12
Alg	orithm a	nd its properties-Asymptotic notations and its properties-Ma	thematical An	alysis for
recu	ursive A	gorithms (Binary search, Tower of Hanoi) and Non-Recursive	Algorithms (M	atrix
mu	ltiplicatio	n, Bubble sort)Recurrence relations: Methods for solving recurrence	nce relations.	10
	<u>nit - 11</u>	DIVIDE AND CONQUER AND GREEDY TECHNIQUE	Periods	12
D1V Gre	and and and and a sector of the sector of th	Conquer-Quick sort-Finding Maximum and Minimum-Strassen	's Matrix Mult	iplication-
OIC	cuy Icci	DVANIMIC PROCEAMMING AND ITED ATIVE		
Uni	it – III	IMPROVEMENT	Periods	12
Dyr	namic Pr	ogramming-All pair shortest Path: Floyd's Algorithm-Optimal Bir	nary search Tre	e -0/1
Kna	apsack P	roblem- Iterative Improvement-Maximum Matching in BiPartit	e Graphs-Stab	le Marriage
Pro	blem.			
Uni	it - IV	<b>BRANCH AND BOUND AND BACKTRACKING</b>	Periods	12
Bra	nch and	Bound-Assignment Problem-8 Puzzle Problem-Back Tracking	-8 Queens pro	oblem-
Sub	set-sum	problems-Hamiltonian Circuit Problem.		
Un	nit – V	OTHER TECHNIQUES AND COMPUTATIONAL COMPLEXITY	Periods	12
Dec	rease an	d conquer-Insertion sort-Topological sorting-Transform and co	nquer-Horner's	Rule for
Poly	ynomial-	Introduction to P, NP-Hard and NP-Complete problems- Dete	rministic and	Non
Det	erministi	c Algorithms-Approximation for NP-Hard problems.		<u></u>
		1	otal Periods	60
Tex	t Books			
1.	Anany	Levitin, "Introduction to the Design and Analysis of Algorithm	s", Third Editi	on, Pearson
Ref	Educat	On /111		
ILCI		00,2011		
	E Horc	witz, S Sahni, and S Raisekaran, Fundamentals of Computer Al	gorithms, Gala	rotia
1.	E Horo Publica	witz, S Sahni, and S Rajsekaran, Fundamentals of Computer Al tion, 2008.	gorithms, Galg	gotia
1.	E Horo Publica	witz, S Sahni, and S Rajsekaran, Fundamentals of Computer Al tion, 2008.	gorithms, Galg	gotia PHI Pyt
1. 2.	E Horo Publica T.H. C Ltd., 20	witz, S Sahni, and S Rajsekaran, Fundamentals of Computer Altion, 2008. Dormen, C.E. Leiserson, R.L. Rivest and C. Stein, Introduction t	gorithms, Galg o Algorithms,	gotia PHI Pvt.
1. 2.	E Horo Publica T.H. C Ltd., 20	witz, S Sahni, and S Rajsekaran, Fundamentals of Computer Altion, 2008. brimen, C.E. Leiserson, R.L. Rivest and C. Stein, Introduction t 09.	gorithms, Galg o Algorithms,	gotia PHI Pvt.
1. 2. 3.	E Horce Publica T.H. C Ltd., 20 Sridhar	witz, S Sahni, and S Rajsekaran, Fundamentals of Computer Altion, 2008. prmen, C.E. Leiserson, R.L. Rivest and C. Stein, Introduction t 09. S, "Design and Analysis of Algorithms", Oxford Higher Education	gorithms, Galg o Algorithms, on, First edition	gotia PHI Pvt.
1.         2.         3.         4.	E Horce Publica T.H. C Ltd., 20 Sridhar Thoma Algorit	witz, S Sahni, and S Rajsekaran, Fundamentals of Computer Altion, 2008. ormen, C.E. Leiserson, R.L. Rivest and C. Stein, Introduction t 09. S, "Design and Analysis of Algorithms", Oxford Higher Educations H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Clifforms, Third Edition, PHI Learning Private Limited, 2012.	gorithms, Galg o Algorithms, on, First edition ord Stein, Intr	gotia PHI Pvt. oduction to
1. 2. 3. 4. <b>E-R</b>	E Horce Publica T.H. C Ltd., 20 Sridhar Thoma Algorit	witz, S Sahni, and S Rajsekaran, Fundamentals of Computer Altion, 2008. ormen, C.E. Leiserson, R.L. Rivest and C. Stein, Introduction t 09. S, "Design and Analysis of Algorithms", Oxford Higher Educations B H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Cliffornms, Third Edition, PHI Learning Private Limited, 2012.	gorithms, Galg o Algorithms, on, First edition ord Stein, Intr	gotia PHI Pvt. oduction to
1. 2. 3. 4. <b>E-R</b> 1.	E Horce Publica T.H. C Ltd., 20 Sridhar Thoma Algorit esources https://	witz, S Sahni, and S Rajsekaran, Fundamentals of Computer Altion, 2008. ormen, C.E. Leiserson, R.L. Rivest and C. Stein, Introduction t 09. S, "Design and Analysis of Algorithms", Oxford Higher Educations B H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Cliffornes, Third Edition, PHI Learning Private Limited, 2012.	gorithms, Galg o Algorithms, on, First edition ord Stein, Intr	gotia PHI Pvt. oduction to
1. 2. 3. 4. <b>E-R</b> 1. 2.	E Horce Publica T.H. C Ltd., 20 Sridhar Thoma Algorit esources https://	witz, S Sahni, and S Rajsekaran, Fundamentals of Computer Altion, 2008. ormen, C.E. Leiserson, R.L. Rivest and C. Stein, Introduction t 09. S, "Design and Analysis of Algorithms", Oxford Higher Educations B H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Cliffornes, Third Edition, PHI Learning Private Limited, 2012. www.ics.uci.edu/~goodrich/teach/cs161/notes/ www.tutorialspoint.com/design_and_analysis_of_algorithms/inde	gorithms, Galg o Algorithms, on, First edition ord Stein, Intr x.htm	otia PHI Pvt. oduction to

	VIVEKA (Aut	ANANDHA CO onomous Institut Elayampa	<b>LLEG</b> tion, At	E OF ffiliate , Tiruc	ENC ed to 2 cheng	<b>GINEERI</b> Anna Univ gode – 637	<b>NG FOR WOM</b> versity ,Chennai) 7 205		150 50012015				
Programme	<b>B.TECH</b>	Program	ne Cod	le		104	Regulation		2019				
Department	INFORMA	ATION TECHNO	DLOGY	7				IV					
Course	Cou	ırse Name	Per	iods P Week	Per	Credit	Maxim	num Mai	rks				
Code			L	Т	Р	C	CA	ESE	Total				
U19IT410	Dat Managen	tabase nent System	3	0	0	3	40	60	100				
Course Objective	<ul> <li>To introduct</li> <li>To introduct</li> <li>To construct</li> <li>To construct</li> <li>To ela technique</li> <li>To der</li> <li>To signand Data</li> </ul>	<ul> <li>To infer the essentials of data models to intellectualize and illustrate a database system using ER diagram.</li> <li>To conceptualize the relational database implementation using SQL with effective relational database design concepts.</li> <li>To elaborate the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure</li> <li>To demonstrate Query evaluation and optimization techniques.</li> <li>To signify the concepts of Database Security, Object Oriented, Data Warehousing and Data Mining</li> </ul>											
	At the end	of the course, th	e stude	ent sho	ould b	e able to,			KL				
Course	CO1: Dist models and	inguish database d DBMS archited	systen cture.	ns from	n file	systems a	and describe data		K2				
Outcome	control.	itily the basic iss	ues of	transa	cuon	processin	g and concurrence	;y	K2				
	CO3: Den language a	nonstrate with un and normalization	derstan theor	nding ( y.	of SQ	L Program	mming		K2				
	<b>CO4:</b> Prac familiar w	ctice the basic qu ith basic database	ery eva e stora	aluatio ge stru	n tec cture	hniques, q s and acce	uery optimization ess techniques.	n and	К3				
	<b>CO5:</b> Ana an entity re	lyze and derive a elation diagram a	an info and trai	rmatio 1sform	n mo into	del expres a relation	ssed in the form of al database schen	of na.	K3				
Pre- requisites													

Cos	CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak Cos Programme Outcomes (POs)													PSO oping
	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12											PO12	PSO1	PSO 2
CO 1	2	-	-	1	1	-	-	1	-	1	1	-		
CO 2	-	2	2	-	-	1	1	-	2	1	1	1		
CO 3	1	1	-	1	2	-	1	-	-	-	-	1		
CO 4	3	-	-	-	2	-	1	1	-	-	1	2		
CO 5	1	-	2	2	-	3	-	-	-	1	-	-		

Course Assessment Methods		
Direct		
1. Continuous Assessment Test I, II & III 2. Assignment		
3. End-Semester examinations		
Indirect		
1. Course - end survey		
Content of the syllabus		
Unit – I Introduction	Periods	10
<b>Introduction:</b> Introduction to Database. Hierarchical, Network and Rel Architecture and Data Independence– The Database System Environmen relationship model, network model, relational and object oriented data mod	ational Models t– <b>Data mode</b> els- Embedded	s. Three-Schema els: Entity- SQL.
Unit – II Relational query languages and Database design	Periods	9
Relational algebra, Relational Calculus, SQL Fundamentals -DDL and DM	L constructs.	I
<b>Relational Database Design</b> : Domain and data dependency, Ar Dependencies, Normal forms-1NF, 2NF, 3NF, BCNF.	mstrong's ax	ioms, Functional
Unit – III Query processing & optimization	Periods	8
JOIN operations-Nested-Loop join-Block Nested loop join-Indexed Nested types, Query optimization- Transformation of Relational expression, Heur Cost Estimation.	l loop join- Qu istic optimizat	ion-Statistics of
Unit – IV Transaction Processing and Database Recovery	Periods	8
Concurrency control, ACID property, Serializability of scheduling, Locking schedulers, optimistic Concurrency Control schemes, Database recovery-Algorithm-Remote backup systems- Aries Algorithm.	g and timestam Failure classifi	p based ication-Recovery
Unit – V Database Storage strategies & Security	Periods	10
<ul> <li>RAID – File Organization – Organization of Records in Files – Indexing an</li> <li>B+ tree Index Files – Static Hashing – Dynamic Hashing Datab</li> <li>Authorization and access control.</li> </ul>	nd Hashing –O ase Security:	rdered Indices – Authentication,
	<b>Fotal Periods</b>	45
I       Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database S         1       Tata McGraw Hill, March 2019.	ystem Concep	ts", 7 th Edition,
2 R. Elmasri and S. Navathe, "Fundamentals of Database Systems", Pe	arson 7th Edit	ion,2016.
3 Peter rob, Carlos Coronel, "Database Systems – Design, Implement Edition, Thomson Learning, 2009.	ation and Man	agement", 9th
References		
1 Gupta G K, "Database Management Systems", Tata McGraw Hill I Delhi, 2011.	Education Priv	ate Limited, New
<ul> <li>J. D. Ullman, "Principles of Database and Knowledge – Base System</li> <li>Science Press, Inc. New York, 1998.</li> </ul>	s", Vol 1,Com	puter
3 Serge Abiteboul, Richard Hull, VictorVianu ,"Foundations of Publishing Company, 1995.	Databases",	Addison-Wesley

E-Resou	irces
1.	www.tutorialspoint.com/dbms/
2.	https://alison.com/courses/IT-Management-Software-and-Databases
3.	https://mva.microsoft.com/en-us/training-courses/database-fundamentals-8243?l= TEBiexJy_5904984
4.	http://www.sqlcourse.com/
5.	https://university.mongodb.com/
6.	http://www.edureka.co/mongodb
7.	https://www.lynda.com/NoSQL-training-tutorials/1473-0.html
8.	http://nptel.ac.in/video.php?subjectId=106106093
9.	https://www.udemy.com/database-management-system/
10.	http://www.nptelvideos.in/2012/11/database-management-system.html
11.	https://www.coursera.org/learn/database-management

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	MONEN ENDO	THE BUSY		VI (Aut	<b>VEK</b>	ANANI ous Ins Elava	<b>DHA</b> titutio mpala	C <b>OI</b> n, A vam	LLE WO ffilia	GE C MEN ited to ucher	<b>OF EN</b> Anna ngode	<b>GIN</b> a Un – 63	EERING F iversity ,Che 7 205	OR ennai)	TÜVRhein CERTIFI	and 10 9001:2015		
Pro	ogram	me	B	.TEC	H		Prog	ram	me C	Code	10	4	Regulation		201	.9		
De	partm	ent	IN	IFOR	MATIO	ON TE	CHNO	DLO	GY				Semester		IV	7		
Co	urse (	Code		(	Course	Name		Peri V	ods I Veek	Per	Cre	dit	Ma	aximum	ı Marks			
U1	<b>9IT</b> 4	11	(	Opera La	ting S aborat	System orv	s (	L 0	<u>Т</u> 0	P 4	2 C		CA 60	ESE 40	<u>E Total</u> 100			
Co Ob	<ul> <li>Learn Unix commands and shell programming</li> <li>Implement Deadlock Avoidance and Deadlock Detection Algorithms</li> <li>Implement Page Replacement Algorithms</li> <li>Implement File Organization and File Allocation Strategies</li> </ul>																	
C	Course Outcome			At the end of the course, the student should be able to, <b>CO1:</b> Simulate the basic UNIX Commands using system calls and simulate the utility code using shell programming. <b>CO2:</b> Compare the performance of various CPU Scheduling												Level K3 K2		
			Algorithms CO3:Create processes and implement IPC CO4:Analyze the performance of the various Page Replacement Algorithms												K3 K3			
Pre	e-requ	isite	5 -	05. 11	npiem		e Orga	IIIZa	uioii		THE AI	100a	tion Strategi	5		KJ		
	Cos		1	(3/2	2/1 indicat Pt	tes strengtl rogramme	CO / I h of corre Outcome	PO Ma lation) s (POs	<b>apping</b> ) 3-Stro s)	ong, 2 – 1	Medium,	1 - We	eak		CO/ Map P	<b>PSO</b> pping SOs		
		PO 1	PO 2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12									PO12	PSO1	PSO 2				
	CO 1	2	1	3								<u> </u>						
	CO 2	3	2	3											2			
	CO 4	2	3	1											2	2		
	CO 5	2	3	3												2		
Co	urse	Asses	sme	ent Me	ethods	5			1									
Ι	Direct	t																
	1. l 2. l	Prelat End-S	o Pos Seme	st Lab ster ex	xamina	ations												

Indirect 1.Course - end survey

EX.NO	EXPERIMENT DESCRIPTION	COs
1.	Study of LINUX - Basic Commands	CO1
2.	Shell programming (Using looping, control constructs etc.,)	CO1
3.	Write programs using the following system calls of UNIX operating system: fork, exec, getpid	CO1
4.	Write programs using the I/O system calls of UNIX operating system (open, read, write, etc).	CO1
5.	Implementation of CPU scheduling algorithms: FCFS & SJF	CO2
6.	Implementation of CPU scheduling algorithms: Round Robin & Priority Scheduling	CO2
7.	Implement the Producer – Consumer problem using semaphores.	CO3
8.	Implementation of Banker`s algorithm	CO2
9.	Implement some memory management schemes (First fit, Best fit & Worst fit)	CO4
10.	Implement some page replacement algorithms (FIFO & LRU)	CO5
	TOTAL PERIODS	45
E-Res	ources	-
1.	https://www.hostinger.in/tutorials/linux-commands	
2.	https://maker.pro/linux/tutorial/basic-linux-commands-for-beginners	
3.	https://ubuntu.com/tutorials/command-line-for-beginners#3-opening-a-terminal	
4.	https://www.tutorialspoint.com/unix/unix-useful-commands.htm	

		<b>V</b> (A	<b>IVE</b> utor	E <b>KAN</b> nomou	IANE 18 Inst E	<b>DHA (</b> titutio Elayan	C <b>OLI</b> W n, Aff	LEGE OME filiated	OF EI N to An	NGIN na Ui ngode	NEERIN niversity e – 637	NG FOI y ,Chenn 205	<b>R</b> hai)	VRheinland ERTIFIED www.	9001:2015	
Program	me	<b>B.</b>	ГЕС	CH	Pro	ogram	me C	ode	10	)4	Regu	lation			2019	
Departm	lent	IN	FOR	RMAT	TON 7	ГЕСН	NOL	OGY		Se	emester				IV	
Course (	Code	Co	urse	e Narr	ie		Per	iods P	er Wee	ek	Credit		Ma	aximu	m Mark	(S
							I	<u> </u>	P		С	CA	]	ESE	Tota	<u>ıl</u>
U19IT4	12	Dat Svs	taba tem	aseMa 1 Lab	anage orato	ment rv	(	) 0	4		2	60		40	1	00
Course Objectiv	ve	<ul> <li>Learn to create and use a database</li> <li>Be familiarized with a query language</li> <li>Have hands on experience on DDL Commands</li> <li>Have a good understanding of DML Commands and DCL commands</li> <li>Familiarize advanced SQL queries.</li> <li>Be Exposed to different applications</li> </ul>														
Course	Course       CO1: Design and implement a database schema for a given       KL															
Outcom	e	problem-domainCO2: Populate and query a databaseK3														
		CC	)3: (	Create	and 1	mainta	ain tal	oles us	ing PL	/SQL	•				K3	
		CC	<b>94:</b> I	Prepa	e rep	orts									K3	
Dere			<b>)5:</b> P	repar	e data	bases									K3	
requisit	es	NIL s														
				(3/2/1 in	dicates s	trength a	CO / Po of correls	O Mappin (1) 3-St	<b>1g</b> 170ng, 2.—	Medium	n 1 - Weak			CO/ Mar	PSO pping	
	Cos					Program	nme Out	comes (P	Ds)		,			P	SOs	
		PO 1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO 2	
	CO 1	2	1	-	1	2	-	- 1	-	1	- 2	-	2	2	1	
	CO 2 CO 3	2	-	-	-	2	-	1	- 1	-	-	3	-	2	1	
	CO 4	2	1	-	-	1	1	1	-	-	-	-	1	2	1	
	CO 5	1	-	1	1	-	2	-	-	1	1	-	1	2	1	
Course Assessment Methods         Direct         1. Pre Lab & Post Lab         2. Record         3. End-Semester examinations         Indirect																
	1. Co	ourse	- en	d surv	vey											

EX.NO	EXPERIMENT DESCRIPTION	COs
1.	Creation of a database and writing SQL queries to retrieve information from the database.	CO2
2.	Performing Insertion, Deletion, Modifying, Altering, Updating and Viewing records based onconditions.	CO2
3.	<ul> <li>Mini project (Application Development using Oracle/ Mysql )</li> <li>a) Inventory Control System.</li> <li>b) Material Requirement Processing.</li> <li>c) Hospital Management System.</li> <li>d) Railway Reservation System.</li> <li>e) Personal Information System.</li> <li>f) Web Based User Identification System.</li> <li>g) Timetable Management System.</li> <li>h) Hotel Management System</li> </ul>	CO4 & CO5
4.	Creation of Views, Synonyms, Sequence, Indexes, Save point.	CO2
5.	Creating an Employee database to set various constraints.	CO2
6.	Creating relationship between the databases.	CO1
7.	Study of PL/SQL block.	CO3
8.	Write a PL/SQL block to satisfy some conditions by accepting input from the user.	CO3
9.	Write a PL/SQL block that handles all types of exceptions.	CO3
10.	Creation of Procedures.	CO3
11.	Creation of database triggers and functions	CO3
	TOTAL PERIODS	45

	VIVEKAN	ANDHA COLL W us Institution, At Elayampalaya	EGE O OMEN ffiliated m, Tirua	F EN to An cheng	[ <b>GIN</b> ] ina Ui gode -	EERIN niversit	<b>G FOR</b> y ,Chenn 95	ai)	Rheinland	ISO 8001-2015	
Programme	<b>B.E./ B.TECH</b>	<b>B.E./ B.TECH</b> Programme Code 104 Regula									
Department	CSE, EEE, ECE	, IT & BT						Semeste	er		
Course Code	Course	Name	Periods	Per V	Veek	Credit	М	aximum	Ma	rks	
Course Code	Course	Ivanie	L	Т	Р	C	CA	ESE	Total		
U19MCSY4	VERBAL ABIL		100								
Objective	<ul> <li>Help the sturready for effe</li> <li>Provide a holanguage ski</li> <li>Comprehension</li> </ul>	<ul> <li>Freip the student understand the importance of having ins language skills kept ready for effective use</li> <li>Provide a host of varied opportunities for the student to hone his acquired language skills basic components, namely, Grammar, Vocabulary, Spelling and Comprehension.</li> </ul>									
	At the end of the	course, the stude	ent will b	be abl	e to,					KL	
	CO1:, Identify the	e verb and tense	in a sent	tence	by ci	rcling a	nd labeli	ng		K1	
Course	CO2: State the de	finition of an arti	cle							K1	
Outcome	CO3: Develop writing and speak	their awareness	of corre	ct us	age o	f Englis	sh gramı	nar in		K3	
	CO4: Tests a voo	abulary power a	nd skill	to fol	llow t	he logic	of sente	ences		K4	
	CO5. Discuss has		1	1	1 1					170	
	CO3: Discuss nov	w word root base	a extend	is voc	cabula	ury				K2	

							CO/P	O Mappi	ng					CO/PSO		
				(3/2/1 ir	ndicates s	strength o	of correla	ation) 3-St	trong, 2 -	- Mediun	n, 1 - Weak	5		Mappi	ing	
	COs			1	1	1	Prog	ramme Ou (POs)	utcomes	1		1	-	PSC	Ds	
		PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PS01										PSO1	PSO2			
	CO 1						2			3	3		3		2	
	CO 2						2			3	3		3		2	
	CO 3						2			3	3		3		2	
	CO 4						2			3	3		3		2	
	CO 5						2			3	3		3		2	
Cont	ent o	of the	sylla	abus												
U	nit –	I TENSES Periods 6														
urpose and rules of tenses and its keywords (focus should be given to present continuous, future																
onti erfe	ntinuous, present perfect, future perfect, present perfect continuous, past perfect continuous, future erfect continuous with more examples) - Direct and Indirect Speech – Voices.															

Unit - II	ARTICLES	Periods	6

**Purpose of Articles: Indefinite Article:** If you want to say about ANY item, you should use the articles A / An. A : A European, A One Eyed beggar, A University, A Useful Website. Name of professions, Expressionof quantity, To make a Proper noun a Common noun, With certain numbers, used before the word 'Half' when it follows a whole number. **Exceptions: Choosing A or An** There are a few exceptions to the general rule of using a before words that start with consonants and an before words that begin with vowels. The first letter of the word honor, for example, is a consonant, but it's unpronounced. In spite of its spelling, the word honor begins with a vowel sound. Therefore, we use an. **Example.** 

#### The Definite Article:

Where to use the Definite Article -A specific item, a particular person or thing, Before superlative forms, Before double comparatives, Before musical instruments, Before rank or title, Before name of the political parties, armed forces, physical positions, Before a Proper noun when used as a Common noun, Before some adjectives to make them nouns, Before Ordinal numbers, Before the names of Oceans, Seas, Rivers, Canals, Deserts, Groups of Mountains and Groups of Islands, Before the names of the Things, which are unique in nature, Before the names of Planets and Satellites, Before Holy Books, Before the names of News Papers, Before the names of some countries, measuring expressionsbeginning with by. **Omission of articles**:

Before Plural countable noun, Before proper noun, Before languages, a single item of uncountable noun, Before name of the meals except adjective usage, Double expressions – with wife and fork, withhat and folk, from top to bottom, With the names of meals such as Breakfast, Before predicative nounsdenoting a unique position, After type of / kind of / sort of / post of / title of / rank of / articles are not used. Ex. He is not that sortof man, Articles are not used with material nouns, After di-transitive verb articles should not be used except when it is used as mono transitive verb, Before the names of meals no article should be used in a general way except in particular causes.

## **Repetition of the articles**

1. When two or more adjectives qualify the same noun, the article is used before the first adjective only; but when they qualify different nouns, expressed or understood, the article is used before each adjective.

## PREPOSITIONS

- a. Prepositions Of Time-On, In, At, Since, For, Ago, During, Before, After, Until, Till, To/Past, From/To, By
- b. Prepositions Of Place- In, At, On, Off, By, Beside, Under, Over, Below, Above, Up And Down, Ago
- c. Prepositions Of Directions/ Movements Across, Through, To, Into, Out Of, Onto, Towards, From
- d. Other Prepositions- Of, By, About, For, With
- e. Prepositions Usage with Its Context

Unit – III	SENTENCE CORRECTION	Periods	6
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## SENTENCE CORRECTION

a) In each of the following sentences, four options are given. You are required to identify the best way of writing the sentence in the context of the correct usage of standard written English. While doing so, you haveto ensure the message being conveyed remains the same in all the cases.

b) For each of the following questions, a part or the whole of the original sentence has been

underlined. You have to find the best way of writing the underlined part of the sentence.

c) In the following questions, you have to identify the correct sentence/s. For each of the following questions, find the sentence/s that are correct.

d) In each of the following questions, one or more of the sentences is/are incorrect. You have to

identify the incorrect sentence/s.										
SENTENCE IMPROVEMENT										
a. Subject-Verb Agreement										
b. Parallelism										
c. Redundancy: The error of repeating the same thing.										
d. Modifier										
e. Comparisons										
RULE: (a) When comparative degree is used with than, make sure that we ex	exclude the	thing								
compared from the rest of class of things by using the										
f. Confusing words										
i) Few and Less										
ii) Few and A few										
iii) Little and A Little										
A little tact would have saved the situation (some tact). Lay and Lie Lay,	, laid									
Unit - IVSENTENCE COMPLETIONPe	eriods	6								
SENTENCE COMPLETION: Purpose and usage of proper words. SPOTTING ERR	RORS:									
a. Errors on conjunctions										
b. Errors on "if" clauses										
c. Errors on adverbs										
d. Errors on adjectives										
e. Errors on prepositions										
f. Errors on determiners										
g. Errors on verbs										
h. Errors on nouns										
i. Errors on modifiers										
j. Errors on degrees of comparison										
k. Errors on subject-verb agreement										
1. Errors on infinitives										
m. Errors on pronouns										
n. Errors on tenses										
o. Redundancy errors										
p. Errors on articles										
q. Error on complex sentences										
Unit – V VOCABULARY Pe	eriods	6								
Synonyms: Root Based Word, Suffix Based Word. Antonyms - Contextual Vocabulary	- Verbal									
Total	Periods	30								
Text Book:										
1. Objective General English by SP Bakshi – Arihant Publication										
References:										
. A modern Approach to verbal and non-verbal reasoning by R.S. Agarwal										
2. Word power made easy by Norman Lewis	Word power made easy by Norman Lewis									

Programme	VIVEK (Autonom	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN(Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205Image: Colspan="2">Image: Colspan="2" Image: Colsp												
Department	IINFORMA		V V											
Course Code	Cour	se Name	Per	iods P Week	er	Credit	Maxi	mum N	Marks					
			L	Т	Р	C	CA	ESE	Total					
U19IT513	Data War Data	ehousing and Mining	3	0	0	3	40	60	100					
Course Objective	<ul> <li>The main ob</li> <li>Introduction</li> <li>Familiantiantiantiantiantiantiantiantiantiant</li></ul>	jective of the co the basic cond tize the data min the strengths and	ourse is cepts of ning fui d weaki	to: f data nction nesses	minin alitie	ng s arious da	ta mining tec	hnique	es					
	At the end <b>CO1:</b> Family	of the course, th	ne stude ta ware	ent wil house	l be a	able to: itecture			KL K1					
Course	CO2: Unde	erstand the func	tionalit	ies of	data	mining			K2					
Outcome	CO3: Know	w the different of	lata pre	proce	ssing	techniqu	ies		К3					
	<b>CO4:</b> Iden algorithms	tify the associa	ation r	ıles u	sing	frequent	itemset min	ing	K2					
	CO5: Desc	ribe the classifi	cation	and cl	usteri	ing techn	ique		K2					
<b>Pre-requisites</b>	Database Management Systems													
								_						

	CO / PO Mapping													CO/PSO	
	(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak													Mapping	
COs	Programme Outcomes (POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO 1	3			2	3								2		
CO 2	2	2			2								2		
CO 3	3				2								2		
CO 4	2	2		2	2								2		
CO 5	3	2			3								2		

С	Course Assessment Methods									
	Direct									
	1.Prelab Post Lab									
	2.Record									
	3.End-Semester examinations									
	Indirect									
	1.Course - end survey									

	· ·	Content of the syllabus										
Unit – I	Data Warehousing	Periods	9									
Introduction- Data Warehouse - Multidimensional data model - Data warehouse architecture - Steps for the design and construction of data warehouses, Three-tier data warehouse architecture, Data warehouse back-end tools and utilities, Metadata Repository - Types of OLAP Servers - Data warehouse implementation												
Unit - II	Introduction to Data Mining	Periods	9									
Introduction - The evolution of database system technology – Steps in knowledge discovery from database process - Architecture of a data mining systems - Data mining on different kinds of data – Different kinds of pattern – Technologies used – Applications – Major issues in data mining - Classification of data mining systems– Data mining task primitives - Integration of a data mining system with a database or data warehouse system												
Unit – III	Data Preprocessing	Periods	9									
Data Preprocessing       Prends         Data Objects and attribute types – Basic statistical description of data –Measuring data similarity         and dissimilarity - Data cleaning – Integration - Data reduction – Data transformation and data         discretization.												
Unit - IV	Association Rule Mining	Periods	9									
Basic concepts – Frequent item set mining methods – Apriori algorithm, A pattern growth approach , Vertical data format, Closed and max patterns - Pattern mining in multilevel and multidimensional space – Constraint based frequent pattern miningUnit – VClassification and ClusteringPeriods9General approach to classification - Decision tree induction - Bayes classification methods-Rule Based Classification- Metrics for evaluating classifier performance – Prediction - Cluster Analysis – Partitioning methods – Hierarchical methods- Applications of data mining-Social impacts of data												
mining-Tools												
mining-Tools	ethods – Hierarchical methods- Applications of data min	ing-Social in	apacts of data									
mining-Tools	ethods – Hierarchical methods- Applications of data min	ing-Social im otal Periods	45									
mining-ToolsText Books:1Jiawei Ha1MorganK2Alex Ber1997	ethods – Hierarchical methods- Applications of data min T n, Micheline Kamber and Jian Pai , Data Mining: Conce auffman, 2013 on and Stephen J Smith, Data Warehousing, Data Mining	otal Periods otal Periods pts and Techn g, and OLAP,	45 hiques, Mcgraw-Hill,									
mining-Tools Text Books: Jiawei Ha MorganK Alex Ber 1997 References:	ethods – Hierarchical methods- Applications of data min T n, Micheline Kamber and Jian Pai , Data Mining: Conce auffman, 2013 on and Stephen J Smith, Data Warehousing, Data Mining	ing-Social im otal Periods pts and Techn g, and OLAP,	45 hiques, Mcgraw-Hill,									
mining-ToolsText Books:Jiawei HaMorganKMorganK21997References:1David Ha	ethods – Hierarchical methods- Applications of data min T n, Micheline Kamber and Jian Pai , Data Mining: Conce auffman, 2013 on and Stephen J Smith, Data Warehousing, Data Mining nd, Heikki Manila, Padhraic Symth, Principles of Data M	otal Periods otal Periods pts and Techn g, and OLAP, lining, MIT P	45 hiques, Mcgraw-Hill, ress, 2001									
mining-ToolsText Books:1Jiawei Ha1MorganK21997References:1David Ha2MargaretE-Resources	ethods – Hierarchical methods- Applications of data min T n, Micheline Kamber and Jian Pai , Data Mining: Conce auffman, 2013 on and Stephen J Smith, Data Warehousing, Data Mining nd, Heikki Manila, Padhraic Symth, Principles of Data M H.Dunham, Data Mining: Introductory and Advanced To	otal Periods otal Periods pts and Techn g, and OLAP, lining, MIT P opics, Pearson	45 hiques, Mcgraw-Hill, ress, 2001 Education 2003									
mining-ToolsText Books:1Jiawei Ha1MorganK2Alex Bera1997References:1David Ha2Margaret2MargaretE-Resources11https://en	ethods – Hierarchical methods- Applications of data min T n, Micheline Kamber and Jian Pai , Data Mining: Conce auffman, 2013 on and Stephen J Smith, Data Warehousing, Data Mining nd, Heikki Manila, Padhraic Symth, Principles of Data M H.Dunham, Data Mining: Introductory and Advanced To wikipedia.org/wiki/Data_mining	otal Periods otal Periods pts and Techi g, and OLAP, lining, MIT P opics, Pearson	45 hiques, Mcgraw-Hill, ress, 2001 Education 2003									
mining-ToolsText Books:1Jiawei Ha1MorganK2Alex Berg1997References:1David Ha2Margaret2MargaretE-Resources1https://en2https://en	ethods – Hierarchical methods- Applications of data min T n, Micheline Kamber and Jian Pai , Data Mining: Conce auffman, 2013 on and Stephen J Smith, Data Warehousing, Data Mining nd, Heikki Manila, Padhraic Symth, Principles of Data M H.Dunham, Data Mining: Introductory and Advanced To wikipedia.org/wiki/Data_mining wikipedia.org/wiki/Association_rule_Learning	otal Periods otal Periods pts and Techi g, and OLAP, lining, MIT P opics, Pearson	45 hiques, Mcgraw-Hill, ress, 2001 Education 2003									

	VIVE (Autonor	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205											
Programme	<b>B.TECH</b>	Pr	ogramm	e Code	e	104	Regulation		2019				
Department	INFORMA	INFORMATION TECHNOLOGY Semester											
Course Code	Cou	Periods Week	s Per		Credit	Maxi	Iarks						
			L	Т	Р	C	CA	ESE	Total				
U19IT514	Microp Micro	rocessor and ocontroller	3	0	0	3	40	60	100				
Course Objective	The studen • Unde • Learn • Unde												
	At the end	of the course,	the stud	ent sh	ould	be able t	tO,		KL K2				
Course	CO1: luci CO2: Pro	gramming the 8	3086 to	conne	ct ge	neral-pu	pose interfac	ces	K2 K3				
Outcome	CO3: Und	lerstand the bas	sics of 8	051	0	F	r		K2				
	CO4: Dev	elop skills to w	rite pro	grams	usir	ng 8051 A	ALP		K3				
<b>D</b>	CO5: Und	lerstand the bas	sics of e	mbed	ded s	ystems			K2				
Pre-requisites	Computer	Organization											

	CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak												CO/PSO Mapping	
COs	COs Programme Outcomes (POs)											PSC	PSOs	
	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12							PSO1	PSO2					
CO 1	3	2	1	1									2	2
CO 2	3	2	1	1									2	2
CO 3	3	2	1	1									2	2
CO 4	3	2	1	1									2	2
CO 5	3	2	1	1									2	2

Course Assessment Methods								
Direct								
1. Continuous Assessment Test I, II & III								
2. Assignment								
3. End-Semester examinations								
Indirect								
1. Course - end survey								

Unit - I         8086         Microprocessor         Periods         9           Intel 8086         microprocessor - Architecture -Basic 8086/8088         Configurations: Minimum Mode and Maximum Mode. Instruction set - Addressing modes - Assembly language programming           Unit - II         General Purpose Interfacing Devices         Periods         9           8255A         Programmable Peripheral Interface - IC 8251A         Serial Communication Interface - 8253           Programmable Interrupt Controller.         Periods         9           Introduction to 8051         Microcomputer - Instruction set - Addressing modes - Addressing modes - Example of a 8051 (based Microcomputer - Instruction set - Addressing modes - Timing diagram of 8051 (Opcode fetch, Memory Read/Write, I/O Read/Write).           Unit - IV         Programming the 8051         Periods         9           Counters - Time Delays - Stack and Subroutines - Code conversion - Interrupts- Memory mapped I/O andI/O mapped I/O for 8051.         9         1           Unit - V         Principles of Embedded Systems         Periods         9           Introduction - Embedded system Architecture (CISC and RISC) - Categories of Embedded Systems - Embedded Systems - Embedded processor selection and tradeoffs.         9           1         Yn-cheng Liu,Glenn A.Gibson, "Microcomputer systems: The 8086 / 8088 Family architecture,Programming and Design", Second Edition, Prentice Hall of India , 2006.           2         Win-cheng L	Conte	nt of the	syllabus								
Intel 8086 microprocessor - Architecture -Basic 8086/8088 Configurations: Minimum Mode and Maximum Mode. Instruction set - Addressing modes - Assembly language programming Unit - II General Purpose Interfacing Devices Periods 9 8255A Programmable Interval Timer IC - IC 8279 Programmable Keyboard /Display Interface - 8253 Programmable Interval Timer IC - IC 8279 Programmable Keyboard /Display Interface - 8259A Programmable Interval Tomer IC - IC 8279 Programmable Keyboard /Display Interface - 8259A Programmable Interval Tomer IC - IC 8279 Programmable Keyboard /Display Interface - 8259A Programmable Interval Controller. Unit - III 8051 Microcontroller Periods 9 Introduction to 8051 - Microprocessor architecture and its operations - Example of a 8051 based Microcomputer - Instruction set- Addressing modes- Timing diagram of 8051 (Opcode fetch, Memory Read/Write, I/O Read/Write). Unit - IV Programming the 8051 Periods 9 Counters - Time Delays - Stack and Subroutines - Code conversion - Interrupts- Memory mapped I/O andI/O mapped I/O for 8051. Unit - V Principles of Embedded Systems Periods 9 Introduction -Embedded systems description, definition, design considerations and requirements - Overviewof Embedded systems Architecture (CISC and RISC) - Categories of Embedded Systems - Embedded processor selection and tradeoffs. Text Books: 1. Yn-cheng Liu,Glenn A.Gibson, "Microcomputer systems: The 8086 / 8088 Family architecture,Programming and Design", Second Edition, Prentice Hall of India , 2006. Muhammad Ali Mazidi, Janice Gillispie Mazidi, RolinD.MC Kinlay, "The 8051 Microcontroller and Embedded Systems", Pearson Education,Second Edition,2008. References: 2. Douglas V.Hall, "Microprocessors and Interfacing: Programming and Applications", Third Edition, Pernam international 2004. 3. Douglas V.Hall, "Microprocessors and Microcontrollers: Architecture, Programming and SystemDesign 8085, 8086, 8051, 8096", Prentice Hall of India Pvt. Ltd., 2012. 4. Lyla B. Das, "Embedded Systems: An Integrated Approach", Pearson, 2013.	Un	nit — I	8086 Microprocessor	Periods	9						
Maximum Mode.         Instruction set - Addressing modes – Assembly language programming           Unit – II         General Purpose Interfacing Devices         Periods         9           8255A Programmable Peripheral Interface - IC 8251A Serial Communication Interface – 8253A Programmable Interval Timer IC - IC 8279 Programmable Keyboard /Display Interface – 8259A Programmable Intervupt Controller.         9           Unit – III         8051 Microcontroller         Periods         9           Introduction to 8051 - Microprocessor architecture and its operations – Example of a 8051 based Microcomputer - Instruction set- Addressing modes- Timing diagram of 8051 (Opcode fetch, Memory Read/Write, I/O Read/Write).         9           Ounit – IV         Programming the 8051         Periods         9           Counters – Time Delays – Stack and Subroutines – Code conversion – Interrupts- Memory mapped I/O andI/O mapped I/O for 8051.         9           Unit – V         Principles of Embedded Systems         Periods         9           Introduction - Embedded systems description, definition, design considerations and requirements - Overviewof Embedded system Architecture (CISC and RISC) -Categories of Embedded Systems - Embedded Processor selection and tradeoffs.         9           1         Yn-cheng Liu,Glenn A.Gibson, "Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design", Second Edition, Prentice Hall of India , 2006.           2.         Muhammad Ali Mazidi, Janice Gillispie Mazidi,RolinD.MC Kinlay , "The 8051 Microcontroller and Embedde	Intel 8	8086 mic	roprocessor - Architecture -Basic 8086/8088 Configur	rations: Minir	num Mode and						
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<ol> <li>Muhammad Ali Mazidi, Janice Gillispie Mazidi,RolinD.MC Kinlay ,"The 8051 Microcontroller and Embedded Systems",Pearson Education,Second Edition,2008.</li> <li>References:         <ul> <li>Kenneth J.Ayala, "The 8051 microcontroller Architecture, Programming and Applications", Third Edition, Penram international 2004.</li> <li>Douglas V.Hall, "Microprocessors and Interfacing: Programming and Hardware", TMH,Revised Second Edition, 2006.</li> <li>Krishna Kant, "Microprocessors and Microcontrollers: Architecture, Programming and SystemDesign 8085, 8086, 8051, 8096", Prentice Hall of India Pvt. Ltd., 2012.</li> <li>Lyla B. Das, "Embedded Systems: An Integrated Approach", Pearson, 2013.</li> </ul> </li> <li>E-Resources:         <ul> <li>http://gbcramgarh.in/e-learning-study- materials/BCA/computer/THE% 208086% 20MICROPROCESSOR/9780198079064.pdf</li> <li>http://www.gpcet.ac.in/wp-content/uploads/2018/03/UNIT-5-MPI-LECTURE-NOTES.pdf</li> <li>http://oms.bdu.ac.in/ec/admin/contents/9_P16PVE1_2020051208244932.pdf</li> </ul> </li> </ol>	1.	archited	ture, Programming and Design", Second Edition, Prent	ice Hall of In	dia , 2006.						
<ul> <li>^{2.} Microcontroller and Embedded Systems", Pearson Education, Second Edition, 2008.</li> <li>References:         <ul> <li>Kenneth J.Ayala, "The 8051 microcontroller Architecture, Programming and Applications", Third Edition, Penram international 2004.</li> <li>Douglas V.Hall, "Microprocessors and Interfacing: Programming and Hardware", TMH, Revised Second Edition, 2006.</li> <li>Krishna Kant, "Microprocessors and Microcontrollers: Architecture, Programming and SystemDesign 8085, 8086, 8051, 8096", Prentice Hall of India Pvt. Ltd., 2012.</li> <li>Lyla B. Das, "Embedded Systems: An Integrated Approach", Pearson, 2013.</li> </ul> </li> <li>E-Resources:         <ul> <li>http://gbcramgarh.in/e-learning-study-materials/BCA/computer/THE% 208086% 20MICROPROCESSOR/9780198079064.pdf</li> <li>http://www.gpcet.ac.in/wp-content/uploads/2018/03/UNIT-5-MPI-LECTURE-NOTES.pdf</li> <li>http://oms.bdu.ac.in/ec/admin/contents/9. P16PYE1_2020051208244932.pdf</li> </ul> </li> </ul>	2	Muham	mad Ali Mazidi, Janice Gillispie Mazidi, RolinD.M	C Kinlay ,"	The 8051						
References:         1.       Kenneth J.Ayala, "The 8051 microcontroller Architecture, Programming and Applications", Third Edition, Penram international 2004.         2.       Douglas V.Hall, "Microprocessors and Interfacing: Programming and Hardware", TMH,Revised Second Edition, 2006.         3.       Krishna Kant, "Microprocessors and Microcontrollers: Architecture, Programming and SystemDesign 8085, 8086, 8051, 8096", Prentice Hall of India Pvt. Ltd., 2012.         4.       Lyla B. Das, "Embedded Systems: An Integrated Approach", Pearson, 2013.         E-Resources :       1.         1.       http://gbcramgarh.in/e-learning-study-materials/BCA/computer/THE%208086%20MICROPROCESSOR/9780198079064.pdf         2.       http://www.gpcet.ac.in/wp-content/uploads/2018/03/UNIT-5-MPI-LECTURE-NOTES.pdf         3.       http://oms bdu ac in/ec/admin/contents/9_P16PXE1_2020051208244932.pdf	Ζ.	Microc	ontroller and Embedded Systems", Pearson Education, S	second Edition	n,2008.						
1.       Kenneth J.Ayala, "The 8051 microcontroller Architecture, Programming and Applications", Third Edition, Penram international 2004.         2.       Douglas V.Hall, "Microprocessors and Interfacing: Programming and Hardware", TMH,Revised Second Edition, 2006.         3.       Krishna Kant, "Microprocessors and Microcontrollers: Architecture, Programming and SystemDesign 8085, 8086, 8051, 8096", Prentice Hall of India Pvt. Ltd., 2012.         4.       Lyla B. Das, "Embedded Systems: An Integrated Approach", Pearson, 2013.         E-Resources :       1.         http://gbcramgarh.in/e-learning-study-materials/BCA/computer/THE%208086%20MICROPROCESSOR/9780198079064.pdf         2.       http://www.gpcet.ac.in/wp-content/uploads/2018/03/UNIT-5-MPI-LECTURE-NOTES.pdf         3.       bttp://oms.bdu.ac.in/ec/admin/contents/9_P16PVE1_2020051208244932.pdf	Refere	ences:									
<ul> <li>Applications", Third Edition, Penram international 2004.</li> <li>Douglas V.Hall, "Microprocessors and Interfacing: Programming and Hardware", TMH,Revised Second Edition, 2006.</li> <li>Krishna Kant, "Microprocessors and Microcontrollers: Architecture, Programming and SystemDesign 8085, 8086, 8051, 8096", Prentice Hall of India Pvt. Ltd., 2012.</li> <li>Lyla B. Das, "Embedded Systems: An Integrated Approach", Pearson, 2013.</li> <li>E-Resources :         <ul> <li>http://gbcramgarh.in/e-learning-study- materials/BCA/computer/THE%208086%20MICROPROCESSOR/9780198079064.pdf</li> <li>http://www.gpcet.ac.in/wp-content/uploads/2018/03/UNIT-5-MPI-LECTURE-NOTES.pdf</li> <li>http://oms.bdu.ac.in/ec/admin/contents/9_P16PVE1_2020051208244932.pdf</li> </ul> </li> </ul>	1	Kennet	n J.Ayala, "The 8051 microcontroller Architectur	re, Programi	ning and						
<ul> <li>2. Douglas V.Hall, "Microprocessors and Interfacing: Programming and Hardware", TMH,Revised Second Edition, 2006.</li> <li>Krishna Kant, "Microprocessors and Microcontrollers: Architecture, Programming and SystemDesign 8085, 8086, 8051, 8096", Prentice Hall of India Pvt. Ltd., 2012.</li> <li>4. Lyla B. Das, "Embedded Systems: An Integrated Approach", Pearson, 2013.</li> <li>E-Resources :</li> <li>1. http://gbcramgarh.in/e-learning-study- materials/BCA/computer/THE%208086%20MICROPROCESSOR/9780198079064.pdf</li> <li>2. http://www.gpcet.ac.in/wp-content/uploads/2018/03/UNIT-5-MPI-LECTURE-NOTES.pdf</li> <li>3. http://oms.bdu.ac.in/ec/admin/contents/9_P16PXE1_2020051208244932.pdf</li> </ul>	1.	Applica	tions", Third Edition, Penram international 2004.								
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Krishna Kant, "Microprocessors and Microcontrollers: Architecture, Programming and SystemDesign 8085, 8086, 8051, 8096", Prentice Hall of India Pvt. Ltd., 2012.4.Lyla B. Das, "Embedded Systems: An Integrated Approach", Pearson, 2013.E-Resources :1.http://gbcramgarh.in/e-learning-study- materials/BCA/computer/THE%208086%20MICROPROCESSOR/9780198079064.pdf2.http://www.gpcet.ac.in/wp-content/uploads/2018/03/UNIT-5-MPI-LECTURE-NOTES.pdf3http://oms bdu ac in/ec/admin/contents/9_P16PXE1_2020051208244932.pdf	2.	TMH,R	evised Second Edition, 2006.	-							
<ul> <li>3. SystemDesign 8085, 8086, 8051, 8096", Prentice Hall of India Pvt. Ltd., 2012.</li> <li>4. Lyla B. Das, "Embedded Systems: An Integrated Approach", Pearson, 2013.</li> <li>E-Resources : <ol> <li>http://gbcramgarh.in/e-learning-study- materials/BCA/computer/THE% 208086% 20MICROPROCESSOR/9780198079064.pdf</li> <li>2. http://www.gpcet.ac.in/wp-content/uploads/2018/03/UNIT-5-MPI-LECTURE-NOTES.pdf</li> <li>http://oms.bdu.ac.in/ec/admin/contents/9_P16PXE1_2020051208244932.pdf</li> </ol></li></ul>		Krishna	Kant, "Microprocessors and Microcontrollers: Arch	nitecture. Pro	gramming and						
<ul> <li>4. Lyla B. Das, "Embedded Systems: An Integrated Approach", Pearson, 2013.</li> <li>E-Resources : <ol> <li>http://gbcramgarh.in/e-learning-study- materials/BCA/computer/THE%208086%20MICROPROCESSOR/9780198079064.pdf</li> </ol> </li> <li>2. http://www.gpcet.ac.in/wp-content/uploads/2018/03/UNIT-5-MPI-LECTURE-NOTES.pdf</li> <li>3. http://oms.bdu.ac.in/ec/admin/contents/9_P16PXE1_2020051208244932.pdf</li> </ul>	3.	System	Design 8085, 8086, 8051, 8096", Prentice Hall of India	a Pvt. Ltd., 20	12.						
E-Resources : 1. http://gbcramgarh.in/e-learning-study- materials/BCA/computer/THE%208086%20MICROPROCESSOR/9780198079064.pdf 2. http://www.gpcet.ac.in/wp-content/uploads/2018/03/UNIT-5-MPI-LECTURE-NOTES.pdf 3. http://oms.bdu.ac.in/ec/admin/contents/9_P16PXE1_2020051208244932.pdf	4.	Lyla B.	Das, "Embedded Systems: An Integrated Approach", 1	Pearson, 2013							
<ol> <li>http://gbcramgarh.in/e-learning-study- materials/BCA/computer/THE%208086%20MICROPROCESSOR/9780198079064.pdf</li> <li>http://www.gpcet.ac.in/wp-content/uploads/2018/03/UNIT-5-MPI-LECTURE-NOTES.pdf</li> <li>http://oms.bdu.ac.in/ec/admin/contents/9_P16PXE1_2020051208244932.pdf</li> </ol>	E-Res	ources :	· · · · · · · · · · · · · · · · · · ·								
<ol> <li>materials/BCA/computer/THE%208086%20MICROPROCESSOR/9780198079064.pdf</li> <li>http://www.gpcet.ac.in/wp-content/uploads/2018/03/UNIT-5-MPI-LECTURE-NOTES.pdf</li> <li>http://oms.bdu.ac.in/ec/admin/contents/9_P16PXE1_2020051208244932.pdf</li> </ol>	1	http://g	ocramgarh.in/e-learning-study-								
<ul> <li>http://www.gpcet.ac.in/wp-content/uploads/2018/03/UNIT-5-MPI-LECTURE-NOTES.pdf</li> <li>http://oms.bdu.ac.in/ec/admin/contents/9_P16PXE1_2020051208244932.pdf</li> </ul>	1.	materials/BCĂ/computer/THE%208086%20MICROPROCESSOR/9780198079064.pdf									
3 http://oms.bdu.ac.in/ec/admin/contents/9_P16PVF1_2020051208244932.pdf	2.	http://w	ww.gpcet.ac.in/wp-content/uploads/2018/03/UNIT-5-1	MPI-LECTUI	RE-NOTES.pdf						
5. http://onis.out.uc.in/contents//_11011E1_20200512002++/52.put	3.	http://or	ms.bdu.ac.in/ec/admin/contents/9_P16PYE1_20200512	208244932.pc	lf						

	VIVEKANAN (Autonomous )	<b>DHA</b> Institu Ela	COL V ution, vamp	LEGE ( WOME) Affiliate palayam,	OF ENGI N ed to Anna Tirucheng	NEERING FOR University , Chen ode – 637 205	UVVIbiliard (CETIFIED (D.S.)	001.2015			
Programme	B.TECH	Pro	gramn	ne Code	104	Regulation	20	019			
Department	INFORMATION T	ECH	NOL	OGY		Semester		V			
Course Code	Course Name	Peri	ods Pe	r Week	Credit	Maxim	um Marks				
		L	Т	Р	С	CA	ESE	Total			
U19IT515	Web Technology	3	0	0	3	40	60	100			
Course Objective	<ul> <li>The student should</li> <li>Learn the basics</li> <li>Apply scripting</li> <li>Apply the conce</li> <li>Develop a applied</li> </ul>	student should be made to, Learn the basics of web and XHTML Apply scripting in XHTML for designing interactive web page Apply the concepts of Full Stack Development Develop a application in AngularJS									
	At the end of the co	urse,	the st	udent sh	ould be ab	le to,	Knowle Level	dge			
	<b>CO1:</b> Understand Implement the object	the cts in	inte XHT	ernet ro ML and	elated tec CSS	chnologies and	1	K2			
Course Outcome	CO2:Design dynam Java Script code in	nic ar XHTI	nd int ML	eractive	web pages	s by embedding	]	K3			
	CO3: Apply server using ASP.NET	side	progr	amming	and build	web application	1	K3			
	<b>CO4:</b> Implement th Spring boot	e full	stack	develop	ment using	g AngularJS and	1	K3			
	CO5: Develop a Sin	ngle p	age a	application	on in Angu	ılarJS	]	K3			
Pre-requisites	-										
		CO/PO	) Mappi	ing			CO/PSO	,			

						CO/PC	Mapping	3					CO/P	so	
		(	3/2/1 inc	licates st	rength of	f correlat	ion) 3-Str	ong, 2 – 1	Medium,	1 - Weak			Mapping		
COs				PSOs											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO 1	2	2	1	1	2	-	-	-	3	2	1	-	2	2	
CO 2	3	2	1	1	3	-	-	-	3	2	1	-	3	3	
CO 3	3	2	1	1	3	-	-	-	3	2	1	-	3	3	
CO 4	2	2	1	1	3	-	-	-	3	2	1	-	3	3	
CO 5	3	2	1	1	3	-	-	-	3	2	1	-	3	3	

Course Assessment Methods
DIRECT
1. Continuous Assessment Test I, II & III

- 2. Assignment
- 3. End-Semester examinations

INDIRECT

Content	of the syllabus		
Unit –	I INTRODUCTION TO WEB AND XHTML	Periods	8
Internet -	Basic Protocols - Webpages. Introduction to XHTML and Editing XHT	ML – Head	lings
– Linkin	g - Images - Special characters and Horizon rules - Lists - Tables - F	orms – Int	ernal
Linking-	Meta Elements –Cascading Style Sheets.		
Unit - II	CLIENT SIDE SCRIPTING - JAVA SCRIPT	Periods	9
Introduct Generatio Multidim object – 1	ion to scripting – Control statements I, II – Functions: Definition – R on – Global function – Recursion – Arrays: Declaring and alloc ensional arrays – Objects : Math object – String object – Date object – B Document object –Window object - Events	andom Nu cating arra oolean, Nu	mber ys – mber
Unit – Il	I SERVER SIDE SCRIPTING - ASP . NET	Periods	9
Database	: My SQL - Create Table - Insert, Update and Delete operation. Server	side script	ing -
ASP.NE' Response	Γ - Introduction - Basics - Installing Visual Studio - Creating forms - - Connecting Database. Web services	HTTP Requ	uest/
Unit - IV	FULL STACK DEVELOPMENT	Periods	10
as Front Maven P Restful S	End Framework - Spring Boot as Back End Framework - Installing Sprin roject. Creating Restful Layer : REST - HTTP Methods - CRUD Opera ervice for User Registration Form	g Boot - Sa tions - Bui	mple lding
Unit – V	ANGULARJS	Periods	9
Basic Co	mponents - Life Cycle - MVC Architecture - Setting up AngularJs - Add	ding Bootst	rap -
A Single	Page Application in AngularJS		
	То	tal Periods	s <b>4</b> 5
Text Boo	ks:		
1 I	P.J. Deitel and H.M. Deitel, Internet and World Wide Web – How to Feducation, Fifth Edition, 2012.	Program, Pe	earson
2 <mark>H</mark>	full Stack AngularJS for Java Developers: Build a Full-Featured Web App cratch Using AngularJS with Spring RESTful - Ravi kant Soni - APress -	lication fro 2017	om
Referen	ees:		
1 U	UttamK.Roy, Web Technologies, University Press, 2011.Oxford.		
2 F	ajkamal, Web Technology, Tata McGraw-Hill, 2009.		
E-Resou	rces:		
1.	https://learning.oreilly.com/library/view/full-stack-angularjs/9781484231	982/	
2.	https://www.freecodecamp.org/learn/responsive-web-design/		

	VIVEK	ANANDHA C omous Institutio Elayan	OLLE WO on, Aff	GE C MEN iliatec un, Ti	OF EN I I to A ruche	<b>NGINEH</b> Anna Uni engode –	ERING FOR versity, Chen - 637 205	nai)	150 9001:015
Programme	<b>B.TECH</b>	Pro	ogramm	e Cod	e	104	Regulation		2019
Department	INFORMA	<b>FION TECHNO</b>		V					
Course Code	Cours	e Name	Peri	iods Pe Veek	er	Credit	Max	kimum	Marks
			L	Т	Р	C	CA	ESE	Total
U19IT516	<b>Python Pro</b>	gramming	2	1	0	3	40	60	100
Course Objective	<ul> <li>Understa</li> <li>Understa</li> <li>Handle I</li> <li>Learn fu</li> <li>Use files</li> <li>Understa</li> </ul>	and the fundamist, tuples, sets nction prototyps and modules in and packages in	nentals and D pes and for data n Pytho	of Pyt iction l string a proc on and	hon j aries g fun essin data	program data type ctions g visualiz	ming es ation		
	At the end of	of the course, th	ne stude	ent sh	ould	be able t	0,		Knowledge Level
Course	CO1: Devel statements	lop basic Pytho	on prog	rams	using	g conditio	onal and cont	rol	K1
Outcome	CO2: Perfo	rm operations	on list,	tuples	s, sets	s and Dic	ctionaries		K2
	CO3: Imple	ement function	prototy	pes a	nd st	ring func	ctions		K2
	CO4: Apply	y files and mod	lules ar	nd per	form	operatio	ns on CSV fi	les	K2
	CO5: Perfo	rm data visuali	zation	and a	pply l	Python p	ackages		K2
Pre-requisites	Basics of A	lgorithmic and	С						

		(	3/2/1 inc	licates st	rength of	CO / P	<b>O Mappi</b> tion) 3-Sti	<b>ng</b> rong, 2 –	Medium,	, 1 - Weak			CO/PSO Mapping		
COs	Programme Outcomes (POs)													Ds	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO 1	1	2	2	1	1						1	1	2	3	
CO 2	2	3	3	2	1						1	1	2	3	
CO 3	2	3	3	2	2						1	1	2	3	
CO 4	2	3	3	3	2						1	1	2	3	
CO 5	2	3	3	3	3						1	1	2	3	

## **Course Assessment Methods**

Direct

- 1. Continuous Assessment Test I, II & III
- 2. Assignment
- 3. End-Semester examinations

Indirect

Conte	ent of the	syllabus		
Uı	nit – I	INTRODUCTION TO PYTHON	Periods	9
Introdu data ty statem	uction to ypes, con ients, con	Python, features, installing Python, writing and execution nments, constants, variables, operators, expression, tinue, pass,break.	cuting Pytho , conditional	n program — native statements, control
Ur	nit - II	LISTS, TUPLES, SETS AND DICTIONARIES	Periods	9
Lists: param Dictio	list opera eters; Tu naries: op	tions, list slices, list methods, list loop, mutability, a ples: tuple assignment, tuple as return value; Sets perations and methods.	liasing, clon : methods a	ing lists, list nd operators,
Un	it – III	FUNCTIONS AND STRINGS	Periods	9
Functi metho metho	on defini ds - func ds, string	ition, declaration, arguments, parameters – formal tionprototypes, recursion; Strings: string slices, imr module, regular expressions.	l and local, nutability, s	parameter passing tring functions and
Un	nit - IV	FILES AND MODULES	Periods	9
Files a errors	and excep	tion: Text files, reading and writing files, format ope ptions, handling exceptions, modules, accessing CSV	erator; comn V file.	hand line arguments,
Un	nit — V	PACKAGES AND DATA VISUALIZATION	Periods	9
Text p packaş	processing ge – vecto	g, Numerical processing: NumPy package – mean, or, data frame, data visualization: matplotlib, Time of	, medium an perations.	nd mode, Pandas
		Та	otal Periods	45
Text I	Books:			
1.	Anurag Librarie	Gupta,G.P BISWAS, "Python Programming – Prol s",Edition 1, Tata McGraw Hill, 2018	blem solving	g, packages and
2.	Mark Lı O "Reill	utz, —Learning Python: Powerful Object-Oriented I y,Shroff Publishers and Distributors, 2013	Programmin	g, Fifth Edition,
3.	David B	eazley and Brian K. Jones, "Python Cookbook", Thi	rd Edition, (	O "Reilly, 2013
Refer	ences:			
1.	Allen B Updated	. Downey, "Think Python: How to Think Like a C for Python 3, Shroff/ O Reilly Publishers, 2016.	Computer Sc	cientist, 2nd edition,
2.	Mark Pi	lgrim, —Dive into Python 3, Apress, 2009.		
3.	John V.	Guttag, Introduction to Computation and Programm	ing using Py	thon, PHI, 2014.
4.	Paul Ba	rry, "Head First - Python", Second Edition, O "Reilly	y, 2017	
5.	E Balag	urusamy, "Problem Solving and Python Programmir	ng", Tata Mo	Graw Hill, 2018
E-Res	sources:			
1.	https://n	ptel.ac.in/courses/106/106/106106182/		
2.	https://w	/ww.w3schools.com/python/		
3.	Beginne	rsGuide - Python Wiki		
4.	Free Bo	oks - PythonBooks - Python Wiki		

	VIVEKANAND (Autonomous Insti	<b>DHA COLLEGE</b> <b>WOME</b> tution, Affiliated Elayampalayam,	OF EN N to Anna Tiruch	I <b>GI</b> a Ui ieng	<b>NEI</b> niver gode	E <b>RING F</b> rsity ,Cher – 637 205	OR nnai) 5	TÜVRheinland CERTIFIED	9012015
Programme	<b>B.E. / B.TECH</b>	Programme Code	104	Re	egula	tion		201	19
Department	INFORMATION TH	ECHNOLOGY		Se	mest	er		V	7
Course Code	Course Nan	ne	Peri P V	ods er Veel	C.	Credit	Ma	ximum N	Marks
			L	Т	Р	С	CA	ESE	Total
U19IT517	Web Technology L	aboratory	0	0	3	2	60	40	100
Course Objective	<ul> <li>The main objective of</li> <li>Be familiar with</li> <li>Learn to create</li> <li>Explore the continue</li> <li>Learn about we</li> <li>Implement the second seco</li></ul>	f the course is to: h Web page desig dynamic web pag mectivity of back b services web application u	n using es usin end wi sing Ar	g H7 g se ith f ngul	TML erver Front ar J	/ XHTM side scrip end. S Tool	L and oting.	styleshe	eets
	At the end of the cou	rse, the student w	ill be al	olet	t0				
Course	CO1: Design Web pa	ages using markuj	o langu	age	s and	d style she	ets		K3
Outcome	CO2: Design and Im	plement database	applica	tio	ns.				K3
	CO3: Create dynami	c web pages using	g servei	: sid	le sc	ripting			K3
	CO4:Build a web for	rm for display							K3
	CO5: Create a studer	nt profile in AJS							K3

			(3/2/1 in	dicates st	trength o	CO / F	<b>PO Mapp</b> tion) 3-St	<b>ing</b> rong, 2 –	Medium	ı, 1 - Weak			CO/PSO Mapping			
COs	Programme Outcomes (POs)													PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2		
CO 1	2	2	1	1							1	-				
CO 2	3	2	1	1							1	-				
CO 3	3	2	1	1							1	-	2			
CO 4	2	2	1	1							1	-		2		
CO 5	3	2	1	1							1	-		2		

С	ourse Assessment Methods	
	Direct	
	1. Prelab Post Lab	
	2. Record	
	3. End-Semester examinations	
	Indirect	
	1 Course - end survey	

EX.NO	EXPERIMENT DESCRIPTION	COs
1.	Develop the html program for Creation of web site with forms, frames, links, tables	CO1
	Etc	
2.	Create an XHTML document that has a form with text box, Radio Button,	CO2
	Selection box, Checkbox, Submit and reset buttons along with CSS.	
3.	Creating simple application to access data base using JDBC Formatting HTML with	CO2
	CSS.	
4.	Generate JavaScript for arrays and functions.	CO3
5.	Create a web page with real time clock using Java script event handling mechanism.	CO3
6.	Program with ASP .net by connecting with SQL	CO3
7.	Create login form to enter into website	CO4
8.	Building web form that displays data from a database	CO4
9.	Process XHTML Forms using PHP program by GET and POST methods.	CO4
10.	Write a program to implement web service for calculator application	CO4
11.	Create a form in AngularJS & validate the form and also print the user data	CO5
	given in the form once the form is submitted.	
12.	Create a Student Profile in AngularJS using event handling mechanism.	CO5
	TOTAL PERIODS	45

	VIVEKAN (Autonomou	ANDHA COLLI W( us Institution, Affi Elayampala	EGE OF E DMEN liated to A yam, Tiru	E <b>NGIN</b> .nna Ur chengo	<b>EER</b> I niversi de – 6	T <b>NG FOF</b> ty, Chenr 37 205	R nai)	TÜVRheinland CERTIFIED	01.2015 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000				
Programme	<b>B.E. / B.TECH</b>	Programme Code	104	F	Regula	tion		2019					
Department	INFORMATION	TECHNOLOGY		Seme	ster			V					
CourseCode			Perio	ods Per	Week	Credit	Maxi	mum M	larks				
CourseCode	Con	Course NameLTPCCAvthon Programming Laboratory004260											
U19IT518	Python Program	ython Programming Laboratory 0 0 4 2 60											
Course Objective	<ul> <li>The main objective</li> <li>To write, test</li> <li>To implement</li> <li>Use function</li> <li>Represent complexed and write</li> </ul>	ve of this course is t, and debug simpl nt Python program s for structuring P mpound data usin ite data from/to fil	e Python p s with con ython prog g Python l es in Pytho	orogran ditiona grams ists, tuj on.	ns ls and ples, d	loops ictionarie	es						
	At the end of the	course, the studen	t should be	e able to	о,								
	CO1 :Write, test,	and debug simple	Python pr	rograms	8			k	K3				
Course	CO2: Implement	Python programs	with cond	itionals	and l	oops		K	3				
Outcome	<b>CO3</b> : Develop 1 calling them	Python programs	step-wise	e by d	efinin	g functio	ons and	K	3				
	CO4: Use Python	lists, tuples, dicti	onaries for	r repres	enting	g compou	nd data	K	3				
	CO5: Read and w	$\begin{array}{ c c c c } \hline Periods Per Week & Credit & Maximum Marks \\ \hline L & T & P & C & CA & ESE & Total \\ \hline Programming Laboratory & 0 & 0 & 4 & 2 & 60 & 40 & 100 \\ \hline Programming Laboratory & 0 & 0 & 4 & 2 & 60 & 40 & 100 \\ \hline Programming Laboratory & 0 & 0 & 4 & 2 & 60 & 40 & 100 \\ \hline Programming Laboratory & 0 & 0 & 4 & 2 & 60 & 40 & 100 \\ \hline Programming Laboratory & 0 & 0 & 0 & 4 & 2 & 60 & 40 & 100 \\ \hline Programming Laboratory & 0 & 0 & 0 & 4 & 2 & 60 & 40 & 100 \\ \hline Programming Laboratory & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & $											

		(	3/2/1 inc	licates st	rength of	CO / P	O Mappin tion) 3-Str	<b>ng</b> rong, 2 –	Medium,	, 1 - Weak			CO/PSO Mapping		
COs	COs Programme Outcomes (POs)													Ds	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO 1	3	2	1		1							1			
CO 2	3	2	1		1							1			
CO 3	3	2	1		1							1	2		
CO 4	3	2	1		1							1		2	
CO 5	3	2	1		1							1		2	

## **Course Assessment Methods**

- 1. Prelab Post Lab
- 2. Record

3. End-Semester examinations

## List of Experiments

EX.NO	EXPERIMENT DESCRIPTION	COs
1.	a. Odd or Even	
	b. Simple Calculator	CO1
	c. Leap year	01
	d. Finding the exponentiation of the given number	
2.	a. Finding Factorial of given number	
	b. Armstrong Number	CO2
	c. Finding Fibonacci Series	02
	d. Finding the maximum of the list	
	e. Finding n Prime numbers	
3.	a. Circulating N values of an array	
	b. Summation of n numbers	CO2,CO3
	c. Swapping of two values	
	d. Distance between two points	
4.	a. Linear Search	CO3,CO4
	b. Binary Search	
5.	a. Selection Sort	CO3,CO4
	b. Insertion Sort	
6.	Merge Sort	CO3,CO4
7.	Multiply Matrices	CO3,CO4
8.	Program to take command line arguments (word count)	CO5
9.	Find the most frequent words in a text read from a file	CO5
10.	a. Simulate Elliptical Orbits using PyGame	CO5
	b. Simulate Bouncing Ball using PyGame	
	TOTAL PERIODS	45

	VIVEKAN (Autonomous	ANDHA COLLI Wo Institution, Affil Elayampalayam	EGE OI OMEN iated to a, Tiruch	F <b>EN</b> Anna engo	GINE Univ de – 6	CERI Versity	<b>NG</b> y ,C 05	FOR hennai		ISO 9001: memory too cor ID 9105647		
Programme	B. TECH	Pr	ogramme	Code	e 1	04		Reg	ulation	2	019	
Department	INFORMATIO	N TECHNOLOG	Y					Se	mester			
Course Code	Course Name		Periods	Per V	Veek	Cre	dit	М	aximum	Mar	·ks	
Course Code	Course Maine		L	Т	Р	С	l ,	CA	ESE	Т	'otal	
U19MCTY5	Logical Reason	ning	2	0	0	-		100	-		100	
Content of the	syllabus	VEDDAL D	FASON	INC					Deri	ode	6	
Coding Door	ding(Lattor Co	VERDAL R	EASUN	ng N	Jumb	or/Su	mb		ing D	ogin	0 horing	
<b>Coding – Decoding</b> (Letter Coding, Direct Letter Coding, Number/Symbol Coding, Deciphering Message – Word coding and Numeral coding, Substitution Coding, Crypt coding – crypt addition, subtraction, Information Arrangement Coding), <b>Analogy</b> (Direct and Simple Analogy, Completing the Analogues pair, Choosing the Analogues pair, Choosing the similar word, Number Analogy, Alphabet Analogy), <b>Classification</b> (Choosing the odd words, Choosing the odd pair of words, Choosing the odd letter group, Choosing the odd number and odd pair of numbers), <b>Alphabet</b> Test(Arrangement according to dictionary, Alpha-Numeric sequence, Letter word problems, Rule detection ), Word												
Unit - II	SITTING	<b>ARRANGEME</b>	NT & S	ENSI	E TES	) ST			Peri	ods	6	
Sitting Arrang	ement (Arranger	nent in a line. Ar	rangeme	ent ar	ound	of a	circ	e. sau	are and	rect	angle.	
Arrangement ar	ound pentagonal	and hexagonal,	Directio	n Sei	nse To	est[(]	Maii	n. Card	linal an	d Sł	nortest	
Direction)Final	Detection, Disp	lacement, Direct	ion and	Disp	lacem	ent].	, Nu	mber,	Rank	ing,	Time	
sequence Test	(Number Test, 1	Ranking Test,		1		-		,		U,		
Time Sequence	Test), Puzzles	(Based on classif	fication,	Base	d on	plac	ing	and co	mparis	on,	Family	
Based problems	5)					-			-			
Unit – III	NUMBER A	ND LETTER SE	ERIES						Peri	ods	6	
Number and L not follow the consecutive odd Division, Based subtraction of d	Letter Series[( <u>N</u> pattern, Miscell l / even no's, Ba d on addition / cubes of natural	aneous pattern on ased on addition a subtraction of s numbers). Lett	l'o find a of the se / subtrac squares er Serie	a mis cries ction of na cs (A)	sing ( ( Bas of pri atural lphabo	erm, ed o me r num et Se	Fin n ac numl nbers eries	d the didition ders, N bers, N s, Bas	number / subt /ultipli ed on inuous	tha racti catic addi patt	t does ion of on and tion / ern of	
series)] <b>Inserti</b>	ng the missing	character Age.	Blood (	<u>lum</u> h	led u	n des	scrir	, cont	Relatio	n ni	ızzles	
Coded Relation	s). Clock and ca	lendar (Mathem	atical on	eratio	ons ar	r uua Id No	otati	ons- P	roblem	of se	olving	
by substitution	Interchanging s	signs and number	rs. Deriv	ving 1	the ar	opror	riat	e conc	lusions	). L	ogical	
order of words	S. Clerical antit	nde			ine up	Prop	/IIuu	e cone	14510115	), 1	Gicui	
(Question based	on address, Que	estion based on iss	sues)									
Unit – IV	LOGICA	AL AND ANALY	YTICAI	RE	ASO	NIN(	Ĵ		Peri	ods	6	
Logical venn d	iagrams (Univer	sal positive, Univ	versal N	egativ	ve, Ur	niver	sal A	Affirma	ative or	Neg	gative,	
Miscellaneous, Geometrical Figures on Venn Diagrams), Eligibility test, Syllogisms, Statement												
and Assumptions, Statement and Conclusions, Statement and Arguments, Statement and												
Course of Action, Verification of Truth of the Statement,												
Data Sufficience	су.											

Un	it – V	DATA INTERPRETATION & FLOW CHART	Periods	6
Input –	Outpu	it (Shifting, Arranging), Data Interpretation (Table chart, Bar	chart, Pie	chart,
Miscella	neous c	hart, Mixed chart), Cube(no of sided painted, Full cube, cutting cu	ube), Flow	chart
(Descrip	tion flo	w chart, Value updating flow chart), Quantitative reasoning, Lo	gical dedu	ction,
Deducti	ve reas	oning, Binary logic		
		Tota	al Periods	30
Text Bo	ok:			
1.	How to	o crack Test of Reasoning - Jai kishan and Prem kishan -arihant pub	lication	
Referen	ce:			
1.	How to	p prepare logical reasoning for CAT – Arun Sharma – Mc Graw Hil	l Publicatio	n

		(A	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205													
Drogramm	0	DF	/ <b>D T</b>	FCU	1	Elay		ayam,	1 iruc	cheng	$\frac{104}{104}$	37 205 Rogul	otion	1	2010	
Departmen	e nt	D.E.	/ D.11 8- IT	LCII			1	Tograi		Jue	104	Som	actor		2019 VI	
Departmen	n	COL	x 11						Period	s Per	Week	Credit	Ma	l vimu	n Marks	
Course Coo	de			Cours	se Nai	ne			L	T	P	C	CA	ESF	E Total	
U19CS62	6	Com	piler	Desig	n				3	0	0	3	40	60	100	
Course Objective	e	<ul> <li>The s</li> <li>E</li> <li>D</li> <li>d</li> <li>E</li> <li>C</li> <li>E</li> <li>an</li> </ul>	Enrich the knowledge in various phases of compiler Define the role of lexical analyzer, use of regular expression and transition diagrams Extend the knowledge of parser by parsing LL parser and LR parser. Construct dynamic run-time stack Enrich the knowledge in code optimization techniques, machine code generation, and use of symbol table.													
		At th	and use of symbol table.Knowledge levelAt the end of the course, the student should be able to,Knowledge level													
		CO1	CO1: Explain the various phases of compilerlevelK2													
Course		CO2	: App	ly the	know	vledge	e of too	ols to a	levelo	op a s	canner				K3	
Outcome	e	CO3	CO3: Construct the syntax analyzer for various languages. K3													
		CO4	<b>CO4:</b> Design the Intermediate Code Generator in compiler. K4													
		CO5 perfo	: App rman	oly the transformed set of a transformed by the tra	ne co a prog	ode o gram.	optimiz	zation	tech	nique	es to i	mprove	the		K4	
Pre- requisites	s	-														
						CO/P	O Mappii	ng					0	CO/PSO	)	
		(	(3/2/1 ind	licates st	rength o	of correla	tion) 3-St	rong, 2 –	Medium	n, 1 - We	eak		N	/lappin	g	
COs					1	Progran	nme Outco	omes (PC	Ds)					PSOs		
H	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	0 PO11	PO12	PS	01	PSO2	
CO 1	2	3	3	2	2	2	2	-	2	2	2	2		3	2	
	3	3	3	3	3	3	2	-	3	2	2	3		3	3	
CO 4	3	3	3	3	2	2	2	2	2	2	1	1	2	2	3	
CO 5	3	3	3	2	2	3	2	-	2	3	2	3		3	3	
Course As	sses	smen	t Met	hods						1						
Direct																
1. Co 2. As 3. En	ntir sigr d-S	nuous nment emest	Asses /Quiz, er exa	smen /Semi aminat	t Test nar tions	I, II (	& III									
Indirect1. Con	urse	e - end	l surve	ey												

Content of	of the syllabus		
Unit – I	INTRODUCTION TO COMPILERS	Periods	10
Translator	rs-Compilation and Interpretation-Language processors -The Phases	of Compiler-Er	rors
Encounter	red in Different Phases-The Grouping of Phases-Compiler Construct	ion Tools -	
Programn	ning Language basics		•
Unit - II	LEXICAL ANALYSIS	Periods	· 9
Need and	Role of Lexical Analyzer-Lexical Errors-Expressing Tokens by	Regular Expre	essions-
Analyzer	I EX	or specifying	Lexical
Init – II	I SVNTAX ANALVSIS	Periods	8
Need and	Role of the Parser-Context Free Grammars -Top Down Parsing	-General Str	ategies-
Recursive	Descent Parser Predictive Parser-LL(1) Parser-Shift Reduce Parser-	LR Parser-LR (	0)Item-
Construct	ion of SLR Parsing Table -Introduction to LALR Parser - Error	Handling and	- /
Recovery	in Syntax Analyzer-YACC.	C	
Unit - IV	7 SYNTAX DIRECTED TRANSLATION & RUN TIME ENVIRONMENT	Periods	9
Intermedi	ate Languages -Syntax directed Definitions-Construction of Sy	ntax Tree-Bot	tom-up
Evaluation	n of S-Attribute Definitions. RUN-TIME ENVIRONMENT: Sou	rce Language	Issues-
Storage C	Organization-Storage Allocation-Parameter Passing-Symbol Tables-D	ynamic Storag	e
Allocation			•
Unit - V	CODE OPTIMIZATION AND CODE GENERATION	Periods	9
Principle	Sources of Optimization-DAG- Optimization of Basic Blocks-Globa	I Data Flow A	nalysis-
Algorithm	Data Flow Algorithms-issues in Design of a Code Generator - A S	Imple Code Ge	enerator
Aigonum	Total	Periods	45
Text Boo	ks:	Crious	
1	Alfred V Aho, Monica S Lam, Ravi Sethi & Jeffrey D. Ullman, "Co	mpilers: Princi	ples,
1.	Techniques and Tools", 2nd Edition, Pearson Education, India, 201	4.	
Reference	es:		
1.	O.G. Kakde, "Compiler Design", 5th Edition, An Imprint of Laxmi Ltd., 2015.	Publications P	vt.
2.	V Raghavan, "Principles Of Compiler Design", Tata Mcgraw Hill 2016.	Publishing Co I	Ltd,
3.	Randy Allen, Ken Kennedy,—Optimizing Compilers for Modern A Dependence-based Approachl, Morgan Kaufmann Publishers, 2009	rchitectures: A	
4.	Steven S. Muchnick, —Advanced Compiler Design and Implement Kaufmann Publishers - Elsevier Science, India, Indian Reprint 2007	ation, —Morga 7	n
5.	Charles N. Fischer, Richard. J. LeBlanc — Crafting a Compiler with Education, 2008	n C∥, Pearson	
E-Resour	·ces:		
1	https://nptel.ac.in/courses/106/105/106105190/		
2	https://www.geeksforgeeks.org/compiler-design-tutorials/		
3	https://nptel.ac.in/courses/106/108/106108113/		
4	gatecse.in/category/compiler-design/		
	www.tutorialspoint.com/compiler_design		
Э.	www.tutonaisponit.com/compiler_design		

	VIVEKANA (Autonomous l Ela	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205												
Programme	B.E / B.TECH	<b>3.E / B.TECH</b> Programme Code <b>104</b> Regulation <b>2019</b>												
Department	INFORMATION	INFORMATION TECHNOLOGY Semester VI												
Course Code	Course Name Periods Per Week Credit Maximum Marks													
U19IT619	Introduction to Learnin	LTPCCAESETotalntroduction to Machine Learning30034060100												
Course Objective	<ul> <li>The student show</li> <li>The course to business/soce</li> <li>Machine Le</li> </ul>	ald be made focuses on vietal proble arning para	e to, the m em int digm.	ethodo to an e	logy o	f how to e solution	translate on by usin	a data ang the	ı driven powerful					
	On Completion	of the cours	se, the	studer	it shou	ld be abl	e to,		Knowledge Level					
	<b>CO1:</b> Define A advantages and i	I-based pr ssues.	oblem	is, and	ident	ify its k	ey comp	etitive	K2					
Course Outcome	<b>CO2:</b> Emphasiz mathematics tow	e machine vards mach	learni ine lea	ng bas: trning	ics and method	l the imp ls.	ortance o	of	K2					
	<b>CO3:</b> Apply an learning	d evaluate	the cl	lassific	ation 1	nodels o	of machin	e	К3					
	CO4: Implement Learning	nt and eva	luate	the re	gressio	n mod	els of m	achine	К3					
	<b>CO5:</b> Examine Learning	CO5: Examine and evaluate the unsupervised methods of machine K3												
Pre-requisites	-													

	CO / PO Mapping													CO/PSO	
	(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak													ing	
COs		Programme Outcomes (POs)													
	PO1	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12													
CO 1	2	1	1	-	-	-	-	-	-	-	-	-	3	1	
CO 2	2	1	1	-	-	-	-	-	-	-	-	-	3	1	
CO 3	3	2	1	1	-	-	-	-	-	-	-	-	3	1	
CO 4	3	2	1	1	-	-	-	-	-	-	-	-	3	1	
CO 5	3	2	1	1	-	-	-	-	-	-	-	-	3	1	
			•	•	•		•	•	•			•			

## **Course Assessment Methods**

Direct

- Continuous Assessment Test I, II & III
   Assignment/Quiz/Seminar
- 3. End-Semester examinations

# Indirect

Conte	nt of the syllabus		
Unit –	I Introduction to AI & ML	Periods	9
Introd	uction- Definition, Symbolic and Non-Symbolic Representation,	Research Focu	is of Artificial
Intellig	gence. Artificial Intelligence: History, Applications, Object	ives, Artificia	l Intelligence
Progra	mming and future of AI. Machine Learning- Introduction- T	ypes of Mach	ine Learning-
Applic	ations		
Unit –	II Modelling & Concepts of Probability	Periods	9
Selecti	ng a Model- Training a Model- Model Representation and Inter	pretability- Ev	aluating
Perform	nance of a Model-Concepts of Probability-Random variables-Disc	rete Distributio	ns-Continuous
Distrib	ution-Multiple Random Variables		
Unit –	- III Classification	Periods	9
Baye''s	Theorem-Brute Force Bayesian algorithm-Naïve Bayes classifier-	Applications of	Naïve Bayes
- Exam	ples of Supervised Learning -Classification Model-Classification L	earning Steps,	k-Nearest
Neight	bour (kNN), Random forest model, Support vector machines		
Unit –	IV Regression	Periods	9
Examp	le of Regression-Common Regression Algorithms-Simple linear	regression, M	ultiple linear
regress	ion, Assumptions in Regression Analysis, Main Problems in Reg	gression Analys	sis, Improving
Accura	ky of the Linear Regression Model, Polynomial Regression Model,	Logistic Regre	ssion
$  1^{\circ}$	v Unsupervised Learning	Periods	9
Applic	ation of Unsupervised Learning-Clustering-Clustering as a machine	tive abiast ha	Different types
Of Clus	a pattern using Association Pula Definitions of common terms. As	anve object-bas	sed technique-
Finding	g Pattern using Association Rule-Definitions of common terms, As	sociation rule,	The
apriori		Total Damiad	d <b>15</b>
Tovt B	cooks.	Total Feriou	.8 43
ICAU	Rajendra Akerkar "Introduction to Artificial Intelligence" PHI	Learning Pyt	Itd Second
1.	Edition August,2014.		Liu, Secolu
2	Siakut Dutt, S.Chandramouli, Amit Kumar Das, "Machine Learnin	g" Pearson Edu	acation, 2018
Refere	nce Books:		
1	Subhrajit Bhattacharyya, Sujit Bhattacharyya,"Practical Handbo GKP publishers, 2021	ok of Machine	e Learning",
2	Gopinath Rebala, Ajay Ravi, Sanjay Churiwala, "An Introduct Springer Nature, Switzerland, 1st edition, 2019.	ion to Machin	e Learning",
3	Tom M. Mitchell, "Machine Learning", McGraw Hill Education, H	First edition (1	July 2017).

Q	VIVEKAN (Autonomous	ANDHA COI Institution, A Elayam	LLEGI WOM ffiliate palaya	E <b>OF</b> EN d to A m, Tir	ENGI nna Ui ucheng	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205Image: Image: Ima												
Programme	<b>B.TECH</b>		Prog	amme	Code	104	Regulation		2019									
Department	IT	VI																
Course Code	Course I	Marks Total																
U19IT620	Software Engin	I         I         I         C         CA         ESE           oftware Engineering         3         0         0         3         40         60																
Course Objective	<ul> <li>The student show</li> <li>Defined represent</li> <li>Explain to Know abtem the Know abtem to Know abtem the Know abtem to Know abtem</li></ul>	ald be made to as a simplified as a process from the students the rout the role of rout the essent about the fund	, l repres om a sp e impo f UML ials des amenta	sentation pecific rtance and T sign of sign of s	on of a perspe of Re esting f softwa	a softw ective quirem in Soft are arc re testin	vare process. ents Engined ware Develo hitectural de ng.	Each r ering. opment esign ar	nodel 1d design.									
	At the end of the	e course, the st	udent s	should	l be ab	le to,			KL									
	<b>CO1:</b> Identify v	arious softwar	e devel	lopme	nt moc	lels.			K3									
Course Outcome	<b>CO2:</b> understan requirements for	d the requirem	ent eng rio.	gineer	ing tas	ks to ic	lentify the		K3									
	CO3: Implement	t the design p	oblem	in UN	AI Moo	deling			K3									
	CO4: Predict th	e design conce	pts and	d mod	els				K3									
	CO5: Describe	different types	of soft	ware	testing	in the	software pro	oduct.	K3									
Pre- requisites	Nil																	

						CO/PC	) Mappin	g					CO/PS	50	
		(	3/2/1 ind	licates st	rength of	f correlat	tion) 3-Str	ong, 2 – 2	Medium,	1 - Weak			Mappi	Mapping	
COs		Programme Outcomes (POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO 1	3	2	1										3	3	
CO 2	2	1											3	3	
CO 3	3	2	1										3	3	
CO 4	3	2	1										3	3	
CO 5	3	2	1										3	3	
				-	•		•	•	•	•		•			

# Course Assessment Methods DIRECT 1. Continuous Assessment Test I, II & III

2. Assignment

3. End-Semester examinations

## INDIRECT

Content of the S	yllabus		
Unit – I	PROCESS MODELS	Periods	9
Software process	structure - Process models - Waterfall model, Incremental proc	ess models,	
Evolutionary proc	ess models, Specialized process models – Unified Process - Agile d	levelopment	: Agile
process - Extreme	programming – Other Agile process model: Scrum.		
Unit – II	<b>REQUIREMENT GATHERING AND ANALYSIS</b>	Periods	9
Requirements eng	ineering – Eliciting requirements, Developing use cases – Building	the analysis	model
– Negotiating re	quirements – Requirements monitoring – Validating requirement	ts – Requir	ements
analysis.			
Unit – III	UML MODELING	Periods	9
Introduction – Un	ified Modeling Language – Static model – Dynamic model – UML	diagrams U	ML
class diagram– U	se case diagram – UML dynamic modeling – UML interaction diagr	rams –UML	_ state
chart diagram –	JML activity diagram – Implementation Diagrams –Componentdia	agram –	
Deployment diag	am.	Dariada	0
	SOFTWARE DESIGN	Periods	9
Design concepts	and model – Architectural design: Software architecture, A	nitectural s	tyles –
Architectural des	design User interface design: Designing class-based compo	Interface of	nolucing
-Interface design	stens – Design natterns	- interface a	11119515
Unit – V	SOFTWARE TESTING FUNDAMENTALS	Periods	9
Software testing	strategies: Strategic approach - Issues - Test strategies for conver	ntional and	Object
Oriented software	$\sim$ -Validation and System testing – Debugging – Testing convent	ional applic	conject
offented softwar	vandation and System testing Debagging Testing convent	ionai appile	automo.
White box testin	g – Basis path testing – Control structure testing – Black box t	testing – So	oftware
White box testin configuration man	g – Basis path testing – Control structure testing – Black box t nagement – SCM repository – SCM process.	testing – So	oftware
White box testin configuration man	g – Basis path testing – Control structure testing – Black box t nagement – SCM repository – SCM process. <b>Total Periods</b>	testing – So	oftware 45
White box testin configuration man CASE STUDY:	g – Basis path testing – Control structure testing – Black box t nagement – SCM repository – SCM process. <b>Total Periods</b>	testing – So	oftware 45
White box testin configuration man CASE STUDY: Only for Assignm	g – Basis path testing – Control structure testing – Black box t hagement – SCM repository – SCM process. Total Periods ment not for end semester examination.	testing – So	oftware 45
White box testin configuration man CASE STUDY: Only for Assignr 1. Simple Chat In	g – Basis path testing – Control structure testing – Black box t hagement – SCM repository – SCM process. Total Periods ment not for end semester examination. stant Messaging System	testing – So	oftware 45
White box testin configuration man CASE STUDY: Only for Assignr 1. Simple Chat In 2. GPS Based Au	g – Basis path testing – Control structure testing – Black box t hagement – SCM repository – SCM process. Total Periods nent not for end semester examination. stant Messaging System tomobile Navigation System	testing – So	oftware 45
White box testin configuration man CASE STUDY: Only for Assignr 1. Simple Chat In 2. GPS Based Au 3. Waste Manage	g – Basis path testing – Control structure testing – Black box t hagement – SCM repository – SCM process. Total Periods nent not for end semester examination. stant Messaging System tomobile Navigation System ment Inspection Tracking System (WMITS)	testing – So	oftware 45
White box testin configuration man CASE STUDY: Only for Assignr 1. Simple Chat In 2. GPS Based Au 3. Waste Manager 4. Geographical I	g – Basis path testing – Control structure testing – Black box t hagement – SCM repository – SCM process. Total Periods nent not for end semester examination. stant Messaging System tomobile Navigation System ment Inspection Tracking System (WMITS) nformation System	testing – So	oftware 45
White box testin configuration man CASE STUDY: Only for Assignr 1. Simple Chat In 2. GPS Based Au 3. Waste Manager 4. Geographical In Text Book:	g – Basis path testing – Control structure testing – Black box t hagement – SCM repository – SCM process. Total Periods nent not for end semester examination. stant Messaging System tomobile Navigation System ment Inspection Tracking System (WMITS) nformation System	testing – So	oftware 45
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U	1 <b>9IT</b> (	521	Com Net	ipute work	r Con is	ımun	icatior	<b>)</b> 3	3 C	) 0		3	40	60	100		
0	Cours )bjecti	se ive	•	he student should be able to , Understand the concept of computer networking basics. Understand the different components of computer networks, various protocols, and working Principles of Layers													
			Att	At the end of the course ,the student should be able to,													
(	Cour Dutcor	se ne	con digi	<b>CO1:</b> .Summarize the basic fundamentals of networks for data communication and apply the different line coding schemes for digital-to-digital conversion													
			CO met	2:Den hods	monst and p	rate tl	ne knov ols at d	wledg ata lir	e of e <u>ik lay</u> e	rror d er	etectio	n and	correction		K3		
			CO pro	3: Int tocols	erpret at ne	t the c twork	lifferer layer	nt add	ressin	g sche	emes a	nd app	ply various	routing	K3		
			CO effe	4: III ects of	ustrat adop	e the ting s	differe uitable	ent tra	anspor contre	rt laye ol and	er prot QoS t	ocols echnio	and the be ques	eneficial	K2		
			CO app	<b>5 :</b> E lication	xplor on lay	e the er wit	variou h basic	s pro	tocols d netv	and vorkin	its wo ig .	rking	principles	at	K2		
Pre	e-requi	isites	Dat	a Cor	nmun	icatio	ns										
				2/2/1 :	1:		CO/PO	Mappin	g	M - 1	1 W1			CO/PS	50 		
	COs		(	3/2/1 III(	ineates st	rengui 0	Programm	ne Outco	ong, 2 –	)s)	, 1 - weak	-		PSC	lig Os		
	000	PO1	PO2	РОЗ	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO1	1 PO12	PSO1	PSO2		
	CO 1	3	2	1										3	2		
	CO 2	3	2	1										3	2		
	CO 3	3	2	1										3	2		
	CO 4	2	1	1										3	2		
	CO 5	2	1	1									I	3	2		
Co	ourse A	Asses	smen	t Met	hods	:											
Dir	rect					-		-									
	<ol> <li>Continuous Assessment Test I,II&amp;III</li> <li>Assignment</li> <li>End-Semester examinations</li> </ol>																
Ind	lirect																
	1. Co	ourse-	end s	urvey	7												

Content of the	syllabus								
Unit– I	Network Models and Physical Layer	Periods	9						
Layers in OSI Model- TCP/IP Protocol suite- Addressing - Transmission Modes – Multiplexing:									
FDM-WDM-STDM-Spread Spectrum :FHSS-DSSS-Virtual Circuit Networks.									
Unit- II	Data Link Layer	Periods	9						
Introduction –F	raming-Flow Control and Error Control -HDLC - Po	int-to-point pro	tocol. Media						
Access Control Protocols: Random Access Protocols – Channelization: FDMA-TDMA-CDMA -									
Unit_III	Network I aver	Periods	0						
Notwork Lavor	Sorviges Network layer performance IDV4 addr	I enous	t Drotocol (ID)						
ICMPv4 Unics	set Routing Algorithms: Distance Vector and Link-st	ate routing – R	outing Protocols:						
RIP and OSPF	- IPV6 addressing- IPV6 protocol.	ate routing R	outing i lotocols.						
Unit- IV	Transport Layer	Periods	9						
Introduction – 7	Fransport layer protocols – TCP :Simple – Stop-and-w	ait - Go-back-N	N – Selective						
Repeat - Piggyb	backing – Quality of Service: Data Flow Characteristic	s -Techniques t	to improve QoS						
- UDP.	Annelis diam I among and Classed Natara aking	Denie de	0						
Unit– V	Application Layer and Cloud Networking	Periods	9						
WWW - HTTP-	FTP - Electronic mail -Telnet-SSH-DNS-Network Ma	anagement: Intro	oduction –						
SNMP- Software	e Defined Networking (SDN).								
		<b>Total Periods</b>	45						
TextBook:									
Behrouz A. Forouzan, "Data Communications and Networking with TCP/IP Protocol Suite",									
McGraw	<i>v</i> -Hill, 6 th Edition, 2021								
References:									
1. Kurose . Edition,	Kurose James F. and Ross Keith W., "Computer Networking: A Top-Down Approach", 6th Edition, Pearson Education, New Delhi, 2017.								
2. Stallings	2. Stallings, "Data and Computer Communications", PHI, 10th Edition, 2015.								
<b>E-Resources:</b>									
1. https://n	ptel.ac.in/courses/106/105/106105183/								
2. https://o	nlinecourses.nptel.ac.in/noc22_cs19								
3. https://w	ww.oreilly.com/library/view/sdn-software								
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Programme	В.ТЕСН	Programm	ne Code	e		104	Regulati	on	2019		
Department	INFORMATION TECHNOLOGY Semester							VI			
Course Code	Course Name Periods			ls Per V	Veek Credit Maximum			m Marl	Iarks		
	Course r tunie			Т	Р	C	CA	ESE	Total		
U19IT622	Machine Learning Laboratory		0	0	2	1	60	40	100		
Course Objective	<ul> <li>The student should be made to,</li> <li>Provide hands-on experience in implementing Machine Learning Algorithms for providing solutions to the real world problems.</li> </ul>										
	On Completion of the course, the student should be able to,								Knowledge Level		
	<b>CO1:</b> Apply information theoretic approach for data manipulation and data visualization and to explore different datasets								К3		
Course Outcome	<b>CO2:</b> Implement supervised and unsupervised learning algorithms in modern tools								К3		
	<b>CO3:</b> Model the analyze the resu	К3									
	<b>CO4:</b> Apply the algorithm for linear regression in modern tools								K3		
	<b>CO5:</b> Apply the K-Means, Apriori algorithm for classification in modern tools with different datasets							К3			
Pre- requisites	Python Programming										
		CO/P	O Mappir	ıg					CO/PSO		
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak								Mapping			

CO / PO Mapping									CO/PSO					
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak									Mapping					
COs	Programme Outcomes (POs)									PSOs				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	3	2	1		1							1		
CO 2	3	2	1		1							1		
CO 3	3	2	1		1							1	2	
CO 4	3	2	1		1							1		2
CO 5	3	2	1		1							1		2

Course Assessment Methods					
Direct					
1.	Prelab & Post Lab				
2.	Record				
3.	End-Semester examinations				
Indirect					
1. Course - end survey					

EX.NO	EXPERIMENT DESCRIPTION	COs														
1.	Exploration of UCI repository datasets and tools like WEKA, Rapid Miner, etc.,	CO1														
2.	Perform data manipulation using NumPy and pandas and data visualization using matplotlib.															
Supervis	sed Learning															
3.	Implement Naïve Bayesian classification and predict the class label for the given data	CO2														
4.	Implement k-NN algorithm for the specified data.	CO2														
5.	Implement SVM algorithm for the specified data.	CO4														
6.	Implement linear regression models to approximate the given data	CO4														
Unsupervised Learning																
7.	Implement k-means clustering algorithm for the given data and visualize and interpret the result.	CO5														
8.	Implement apriori algorithm for association rule to predict the result of given dataset.	CO5														
Case Study																
9.	With your own dataset, apply any three algorithms for the same dataset. Calculate and compare the accuracy using Confusion matrix and graph.	CO3														
10.	Predict the Grocery Store sales using Machine learning with the help of kaggle.	CO3														
	TOTAL PERIODS	45														
				VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205 B TECH Programme Code 104 Regulation 2019												
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Pı	rogramı	ne	<b>B.</b> '	ГЕСН	I			Progra	amme	Code	104	Reg	ulation		2019	
D	epartme	ent	INF	ORM	ATIO	N TE	CHNO	DLOGY	ľ			Se	mester		VI	
Co	ourse Co	ode		Co	urse N	ame		Pe	riods F Week	er	Credi	t	Maximum Mar			1
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0	19110	23	Case I dolls Laboratory     0     0     4     2     00     40       The student should be made to:										100			
C	Cours( )bjecti	e ve	<ul> <li>I</li> <li>H</li> <li>r</li> <li>I</li> <li>H</li> <li>H</li> <li>H</li> <li>H</li> <li>i</li> </ul>	<ul> <li>Learn the software engineering process</li> <li>Know and apply appropriate methods, techniques and tools to elicit, document and manage requirements.</li> <li>Learn the role of requirements analysis in system and software development.</li> <li>Be able to define a system that satisfies the requirements.</li> <li>Be able o know about the project requirements, project description and project implementation using UML.</li> </ul>												
			At t	At the end of the course, the student should be able to, Knowled Level												
			CO	CO1: design and implement projects using OO concepts												
	Course	e	CO'	CO2: use UML analysis and design diagrams in various applications K3												
C	Outcom	ie		CO3: apply appropriate design patterns for the given scenarios K3												2
			$CO_{2}$	CO3. apply appropriate design patterns for the given scenarios KS												•
			$CO^2$	CO4: Apply suitable design patterns in system design 3. K3												J
			Orie	ented	Princi	ples	t One	incu a	1141 y 51	s and	system	i ucsign	using	object	K3	I.
	Pre-		<b>N 711</b>			1										
re	equisit	es	N1I													
	-															
						C	CO / PO	Mappir	ıg					CO/	PSO	
		1	(3/2/	1 indica	ates stre	ngth of	correlat	ion) 3-St	rong, 2 -	- Mediu	ım, 1 - W	'eak		Map	ping	
	Cos					P	rogram	me Outco	omes (P	Us)		[		PS	SOs	
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
	CO 1	3	2	1	1									3	2	
	$CO_2$	3	2	1	1									3	2	
	CO 4	3	2	1	1									3	2	
	CO 5	3	2	1	1									3	2	
Cou	rse As	sessm	ent N	<b>leth</b> o	ds											
Dir	rect															
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	2. K 3 F	lecord	l mest	er eva	minat	ions										
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	1. Co	urse -	end s	urvev	7											
ч	1. Course - end survey															

## LIST OF EXPERIMENTS

EX.NO	EXPERIMENT DESCRIPTION	COs
1.	Define problem statement, develop business and domain models with UML diagrams, implement the interfaces and do testing for the Passport Automation system	CO1
2.	Define problem statement, develop business and domain models with UML diagrams, implement the interface and do testing for the Library Management system	CO1
3.	Define problem statement, develop business and domain models with UML diagrams, implement the interface and do testing for the Exam Registration System	CO2
4.	Define problem statement, develop business and domain models with UML diagrams, implement the interface and do testing for the Stock Maintenance system	CO2
5.	Define problem statement, develop business and domain models with UML diagrams, implement the interface and do testing for the Online Course Registration system	CO3
6.	Define problem statement, develop business and domain models with UML diagrams, implement the interface and do testing for the E-ticketing system	CO3
7.	Define problem statement, develop business and domain models with UML diagrams, implement the interface and do testing for the Insurance management system	CO4
8.	Define problem statement, develop business and domain models with UML diagrams, implement the interface and do testing for the Credit card processing system	CO4
9.	Define problem statement, develop business and domain models with UML diagrams, implement the interface and do testing for the Employee Recruitment system	CO5
10.	Define problem statement, develop business and domain models with UML diagrams, implement the interface and do testing for the Bank Management system	CO5
	TOTAL PERIODS	45

A CONTRACTOR OF			VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution Affiliated to Anna University Chennai) Elayampalayam, Tiruchengode – 637 205												TÛVR	ISO 5001.27 heinland IV 51054615	
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Cou	rse code		C	ourse	Name			Pe per	eriods week	_	Credit	t	Max	kimun	n Ma	rks	
U19	EN603	C	omm L	unica abora	tion S atory	kills	(	)	Т 0	Р 3	<u>C</u> 1		CA 100	ES.	E	To 10	tal )0
Ob	jective		<ul> <li>Equip with effective Soft skills in English.</li> <li>Enhance them with intrapersonal skills.</li> <li>Effective management of time and stress.</li> </ul>														
		Th CC	The students who complete this course successfully are expected to: <b>CO1:</b> Able to communicate, present, describe and discuss fluently in English.													Knowledge Level K1	
Out	tcomes	CC atn	<b>CO2:</b> Equipped for an easy transition from studying to working atmosphere.													K1	
		CO3: Accomplished with planning and corporate Managerial skills.														K2	
		<b>CO4:</b> attain professional correspondence and execute the same in professional manner.													K4		
		<b>CO5:</b> employ the professional needs and accomplishments at global standards.													K4		
l req	Pre- uisites	Nil	l														
						C	0 / PO	Mapp	ing					C	O/PS	0	
			(3	3/2/1 ind	icates stre	ength of c	orrelati	ion) 3-9	Strong, 2 -	- Mediun	n, 1 - Weak			M	appir	ng	
	COs			1		P	rogram	1me Ou	tcomes (F	Os)	1		[		PSO	S	
	06.1	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12         PS01		01	PSO2												
	CO1	-	-	-		-	2	-	-	2	3	-	3	-		2	
	CO 2	-	-	-	-	-	2	-	-	2	2	_	3	-		2	
	CO 4	-	-	-	-	-	2	-	-	3	3	-	3	-		2	
	CO 5	-	-	-	-	-	2	-	-	3	3	-	3	-		2	



**English Language Proficiency:** Listening Comprehension, Reading Comprehension, Common Errors in English, Diction and its usage, Framing sentences – Idiomatic Expressions.

**Resume** – Structuring and Drafting the resume – Cover letter- Writing Professional Letters

**Group Discussion:** Introduction – Topic Analysis – Thematic Expressions-Objective and content of discussion – Persuasion – Discussion – Controlling Emotions - Presentation of the group – Offering support – Use of functional Language - Summary and conclusion

Presentation skills: Making Self Introduction effectively-Elements of effective presentation -

Structure of presentation - Presentation tools – Voice Modulation – Audience analysis - Body language – Accents analysis – Stylistics.

**Soft Skills:** Introduction - Change in Today's Workplace: Soft Skills as a Competitive Weapon - Antiquity of Soft Skills - Classification of Soft skills - Ability to work as a team - Innovation, Creativity and Lateral thinking – Flexibility - Personality Traits and Soft Skills for future Career Advancement-Personality and Soft Skills for career growth- Time management.

Total Periods 45

Lab	Lab Manuals suggested:								
1.	Anderson, P.V, Technical Communication, Thomson Wadsworth, Sixth Edition, New Delhi, 2007.								
2.	John Seely, The Oxford Guide to Writing and Speaking, Oxford University Press, New Delhi, 2004.								

	VIVEKANANDHA COLLEO WC (Autonomous Institution, Affiliat Elayampalaya	GE OF DMEN ed to A am. Tir	ENG	INEE Jnivers	<b>RIN</b> sity - 63	<b>IG F</b> ,Che 7 20	OR mnai) 5	TÚVRhei	150 50012015
Programme	B.TECH Pro	gramme	Code	10	4		Regu	lation	2019
Department	INFORMATION TECHNOLOGY	INFORMATION TECHNOLOGY Semester VI							
Course Code	Course Name	Periods Per Week			Cre	Credit N		aximun	n Marks
	L T P C C							ESE	Total
U19MCTY6	PERSONALITY DEVELOPMENT	3	0	0		-	100	-	100
Content of the	syllabus								
Unit – I	NUMERICAL ABILITY	~.						Perio	is 8
Number Proper Proportions – M Compound Inte	Number Properties – Time & Work – Pipes & Cisterns - Time, Speed & Distance – Ratios & Proportions – Mixtures & Alligations – Averages – Percentages – Profit & Loss – Simple & Compound Interest – Problems on Ages – Partnership – Mensuration – Geometry - Miscellaneous								
Unit - II	LOGICAL REASONING							Perio	is 8
Coding Decodin Syllogisms – V Calendars - Mis	ng – Blood Relations –Direction Sens Venn Diagrams – Statements – Dat scellaneous	se Test a Inter	– Sea pretat	ating A ion –	Arrai Dat	ngen ta Sı	nent – ufficier	Numbo ncy –	er Series – Clocks &
Unit – III	SOFT SKILLS & VERBAL ABII	LITY						Perio	is <b>8</b>
Resume Prepara Essay Writing	ation – Mock GD – Interview Etique	tte – M	lock I	ntervie	W –	- Rea	ding C	Compre	hension –
Unit - IV	TECHNICAL SKILLS I							Perio	is 8
Recap of C – V Flow Statement	Variables & Datatypes – Console IO as – Working with Functions – Working	Operating with	tions 1 Arra	– Opei .ys	rato	rs &	Expre	essions	– Control
Unit – V	TECHNICAL SKILLS II	<u> </u>		•				Perio	ds 8
Pointers – Stri Command Line	ng Handling – Structures & Union Arguments & Variables – Searching	s – Fil & Sort	le Ha ting –	ndling Stack	_ ] _ 0	Pre 1 ueue	Proces	sor Di ked Li	rectives – st - Trees
						-	Tota	l Perio	ds 40
<b>REFERENCES:</b> 1. Quantum CAT by Sarvesh Verma – Arihant Publications2. Quantitative aptitude by R.S. Aggarwal3. A Modern Approach to Verbal & Non-Verbal Reasoning by R.S. Aggarwal4. Word Power Made Easy by Norman Lewis5. Let us C By Yashavant P Kanetkar									
6. Program	6. Programming in ANSI C By E. Balaguruswamy								

	C			VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN       Image: Color of the second se												
I	Program	nme	<b>B.</b> T	ECH			Pr	ogram	me Co	ode	104	Regulati	on	2	2019	
Ι	Departn	nent	INF	ORM	ATIO	N TEC	CHNC	DLOG	Y			Semes	ter	,	VII	
	Cours	se		Cour	se Nar	ne		Perio W	ds Per eek		Credit	Maximum Mar			rks	
	Cour	6						L	Т	Р	С	CA I		ESE T		otal
1	U <b>19IT</b> '	724	Bi	g Data	a Ana	lytics		3	0	0	3	40		60	1	00
	Cour Object	se tive	The • •	<ul> <li>Fhe student should be made to</li> <li>Understand the competitive advantages of big data analytics.</li> <li>Understand the big data frameworks.</li> <li>Learn data analysis methods.</li> <li>Learn stream computing</li> </ul>												
			At th	At the end of the course- the student will be able to:												(L
			CO1: Describe the concepts- characteristics of big data and apply for real applications.													ζ3
	Cour	se	CO2	: Imp	lemen	ıt Map	) Redi	uce pr	ogran	ns in	Hadoop	framewo	ork.		H	ζ3
	Outco	me	CO3	: Util	ize M	ongoE	)B an	d Cas	sandra	a to s	olve rea	l world p	roblems		ł	ζ3
			CO4: Develop solutions for big data problems using MR and Hive, Apach spark and Apache kafka.												H	ζ3
			CO5 scen	: Rec arios.	ogniz	e the	need	1 for	archi	tectu	re and	apply it	in rea	l case	ŀ	ζ3
]	Pre- requisi	- ites	Data	ware	housi	ng										
			CO/PO Mapping CO/PSO													
	COs		(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak Mapping Programme Outcomes (POs) PSOs										ing Os			
	005	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO	PO10	PO11	PO12	PSO1	PSO2	
	CO 1	3	2	2	1	-								3	3	1
	CO 2	3	2	2	2	2								3	3	1
	CO 3	3	2	2	2	2			<u> </u>					3	3	-
1	CO 4	3	2													
1	005	5	2	~					1					5	5	

(	Course Assessment Methods						
	Direct						
	1. Continuous Assessment Test I- II & III						
	2. Assignment						
	3. End-Semester examinations						
	Indirect						
	1. Course - end survey						

Content of the Syllabus										
Unit	– I	INTRODUCTION TO BIG DATA AND ANALYTICS	Periods	9						
BIG DA	ATA: 1	Introduction - Types of Digital Data – Characteristics – Evolu	ution – Definit	ion – Challenges –Need						
for Big	Data	-Traditional BI versus Big data – Typical Data warehouse	environment.	ANALYTICS: Greatest						
Challen	Challenges that prevent Business from Capitalizing on Big data –Top Challenges Facing Big data –Importance									
of Big (	ata ar	halytics – Data science – Terminologies used in Big Data envi	ronments– An	alytics 100ls.						
	- 11	BIG DATA AND HADOOP FRAMEWORK	Periods	9						
BIG DA	BIG DATA LANDSCAPE TECHNOLOGY: NoSQL –Types of NOSQL Databases – Need for NOSQL –Use of									
nosQi of Hade	in ma	usity-SQL VS NOSQL-New SQL .HADOOP: Hadoop Illitodi	and application	n with Hadoon						
YARN	-Inter	acting with Hadoop Ecosystem.	and application	ni witii madoop						
Unit -	- III	MONGO DB AND CASSANDRA	Periods	9						
MONG	O DB	: Introduction to MongoDB – Terms used in MongoDB– D	Data types in N	MongoDB – MongoDB						
Query	Langu	age. CASSANDRA: Introduction to Cassandra - Features	of Cassandra	a – CQL Data types –						
CQLSH	I– CR	UD operations - Collections - Alter commands - Import and	Export – Quer	ying System tables.						
Unit -	·IV	MAP REDUCE and HIVE, APACHE	Periods	9						
INTRO	INTRODUCTION TO MAP REDUCE PROGRAMMING : Introduction -Map task - Searching -Sorting -									
Compre	ession	.HIVE: Introduction to Hive – Hive Architecture – Data types	s – File format	– Hive Query Language						
- RCFi	ile imj	plementation. Apache spark and Apache kafka, Messaging	Queues on A	synchronous						
Event d	Iriven	development.	Darioda	0						
	- v	RECENT TRENDS IN PIG AND CASE STUDY	of Dia Data	y tumos Dunning Dig						
Frecuti	iroduc	cuon to Pig – Pig on Hadoop – Pig Philosophy -Use case	01 Pig - Data	types – Running Pig –						
process	ino	Jues of Tig – TIDI'S commands–Eval function . CASE 51		ount in The-Retail log						
process		,	Total Periods	45						
Text B	ooks									
1.	Seem	a Acharya and Subhashini Chellappan. "Big Data and Analyti	cs".2 nd Editior	.Wiley.2019.						
2.	Dr.A	nil Maheshwari, "Big Data", 1st Edition, McGraw Hill Educati	on. 2017	,						
Refere	nces		,							
	EMC	Education Services "Data science and Big data Analytics: D	Discovering Ar	alyzing Vieualizing						
1.	1. and Presenting Data" John Wiley and Sons 2015									
E-Reso	urces									
1.	https	://www.xenonstack.com/blog/big-data-platform/								
2.	https	://www.tutorialspoint.com/managerial_economics/regression_	_technique.htm	1						
3.	3. https://www.geeksforgeeks.org/frequent-item-set-in-data-set-association-rule-mining/									

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Programme	<b>B.TECH</b>	B.TECH Programme Code 104 Regulation								
Department	INFORMATIO	N TECHNO	OLOGY	7			Semester		VII	
Course Code	rse Code Course Name		Periods Per Week			Credit	Maxi	mum M	n Marks	
			L	Т	Р	C	CA	ESE	Total	
U19IT725	Building of In Thing	3	0	0	3	40	60	100		
Course Objective	The student sho • Understand • Build simpl	uld be able Smart Obj e IoT Syste	to, ects and ems usi	d IoT . ng Are	Archi duinc	itectures and Ras	and configur spberry Pi.	ations		
	At the end of th	e course, th	ne stude	ent sho	ould b	be able to	),	]	Knowledge Level	
Course	<b>CO1:</b> Understat	ata	K2							
Outcome	CO2: Understan	nd IoT tran	saction	s and	confi	guration	S		K2	
	CO3: Program	the sensors	and co	ntroll	ers as	part of I	loT.		K3	
	CO4: Understan	nd the IoT	protoco	ols					K2	
	CO5: Implement	nt basic Io7	۲ applic	ations	s on e	mbedde	d platform		K3	
<b>Pre-requisites</b>										

	CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak												CO/PSO Mapping		
COs		Programme Outcomes (POs)											PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO 1	2	1	1	1	1	1							2		
CO 2	2	1	2	1	1	1							2		
CO 3	3	2	3	2	3	2						2	3	1	
CO 4	2	1	2	1	1	1							2		
CO 5	3	2	3	2	3	2						2	2	1	

# **Course Assessment Methods**

Direct

- 1. Continuous Assessment Test I, II & III
- Assignment
   End-Semester examinations

Indirect

1. Course - end survey

Conter	nt of the syllabus									
Uni	t – I INTRODUCTION TO IoT		Periods	9						
Definir	ng IoT, Characteristics of IoT, Physical design of IoT, Log	ical de	sign of IoT,	Functional						
blocks	of IoT, Communication models & APIs, Challenges in designi	ng an I	Embedded Sys	stem.						
Uni	t - II IoT CONFIGURATION		Periods	9						
Introdu	ction, M2M, Difference between IoT and M2M, difference b	etween	SDN and NH	FV for IoT,						
Softwa	Software defined networks, network function virtualization, Basics of IoT System Management with									
NETCO	OZF, YANG- NETCONF, YANG, SNMP NETOPEER									
Unit – IIIIoT PHYSICAL DEVICES AND ENDPOINTSPeriods9										
Introduction to Arduino and Raspberry Pi- Installation, Interfaces (serial, SPI, I2C), Programming –										
C prog	ram with Arduino with focus on interfacing external gadgets, c	controll	ing output, re	ading input						
from pi	ns									
Unit	- IV IoT PROTOCOLS		Periods	9						
IoT Ac	ccess Technologies- Physical and MAC layers, topology an	nd Secu	urity of IEEE	E 802.15.4,						
802.11	ah and Lora WAN, Network Layer: IP versions, Constra	ained	Nodes and C	Constrained						
Networ	ks,6LoWPAN, Application Transport Methods: SCADA, Ap	pplicati	on Layer Pro	tocols:						
CoAP a	and MQTT.									
	CASE STUDIES AND APPLICATION									
Unit	t – V DEVELOPMENT FOR IoT USING EMBEDDEI	D	Periods	9						
	SYSTEMS									
Home .	Automation- Smart Lighting-Smart Appliance-Theft Detection	n, Sma	rt cities - Sma	art parking-						
Smart	Road, Smart Environment-Air pollution monitoring-weath	ner mo	nitoring, Hea	alth fitness						
monito	ring, Techniques for writing Embedded code - Examples for A	Applica	ation develop	ment cloud						
service	s for IoT.									
	r 	Total F	Periods	45						
Text B	ooks:									
1.	Arshdeep Bahga and Vijay Madisetti, "Internet of Thin Universities Press Pvt. Ltd., 2015.	gs -A	Hands-on A	Approach",						
2	Olivier Hersent, David Boswarthick, Omar Elloumi, -	The Int	ernet of Thi	ngs – Key						
2.	applications and Protocols ^{II} , Wiley, 2012.									
Referen	nces:									
1.	Charalampos Doukas, "Building Internet of Things with Independent Publishing Platform, April 2012.	h the	Arduino", Ci	reateSpace						
2	2 Adrian McEwen, Hakim Cassimally, "Designing the Internet of Things", Wiley									
	Publications, 2012.									
3.	Matt Richardson & Shawn Wallace, "Getting Started with I 2014.	Raspbe	rry Pi", O'Re	illy (SPD),						
4.	Peter Friess, Internet of Things – From Research and Innovat River Publishers, 2014.	tion to l	Market Deplo	yment',						
5.	Peter Waher, 'Learning Internet of Things', Packt Publishing,	2015.								
L										

E-Reso	urces:
1.	file:///C:/Users/ITLAB/Downloads/Internet%20of%20Things%20A%20Hands- On%20Approach%20by%20Arshdeep%20Bahga,%20Vijay%20Madisetti%20(z- lib.org).pdf
2.	https://nasrinword.files.wordpress.com/2018/05/olivier-hersent-david-boswarthick-omar- elloumi-e28095the-internet-of-things-e28093-key-applications-and-protocols-ref-5.pdf
3.	https://madsg.com/wp-content/uploads/2015/12/Designing_the_Internet_of_Things.pdf
4.	https://ptgmedia.pearsoncmg.com/images/9781587144561/samplepages/9781587144561_C H08.pdf
5.	https://dhananjaypawar.files.wordpress.com/2019/05/unit-1.pdf
6.	https://www2.deloitte.com/content/dam/insights/us/articles/iot-primer-iot-technologies- applications/DUP_1102_InsideTheInternetOfThings.pdf
7.	https://mrcet.com/downloads/digital_notes/EEE/IoT%20&%20Applications%20Digital%20 Notes.pdf
8.	https://www.tutorialspoint.com/internet_of_things/internet_of_things_tutorial.pdf

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Program	mme		B.TE	CH		210	Progra	amme	Code	104	Reg	ulation		2019	
Departi	ment	IN	FOR	MAT	ION T	ECH	NOLO	GY			Se	mester		VII	
Course	Code		C	ourse l	Name		Pe	riods I Week	Per	Credit	t	Max	kimum I	Marks	
							L	Т	Р	С	(	CA	ESE	Tota	ıl
U19IT	726	A	Io nalyt	T and tics La	Data abora	tory	0	0	2	1		50	40	100	)
Course	rse tives		he ma Lear Ana Real Fam	ain obj n to pr lyze bi lize sto iliarize	ective rocess g data orage e the u	e of the s the b a usin of big usage	e cour oig data g class g data u of dist	se is to using ificati sing N ribute	o: g Had on an Mongo d fran	oop fra d cluste oDB an nework	mework ering tec d Hbase s for ha	and M chnique e. ndling	lapRedus. s.	uce nous data	a
At the er	Surse Outcomes       Knowledge         the end of the course- the student will be able to:       Knowledge         Level       Level         O1: To Demonstrate the Raspberry Pi /Arduino installation       K2														
СО1: Т	D1: To Demonstrate the Raspberry Pi /Arduino installation.   K2														
CO2: To on input	D1: To Demonstrate the Raspberry Pi /Arduino installation.       K2         D2: To Interface the LED with Raspberry Pi/Arduino for sensing the data based inputs.       K3														
<b>CO3:</b> To	inputs.K3O3: To Perform data analysis using classification and clustering techniquesK3														
CO4: To	o Imp	leme	nt Ma	ap Rec	luce fi	ramev	vork fo	or proc	cessin	g big da	ata			K2	
СО5: Т	o Per	form	grap	hical c	lata ar	nalysi	S							K3	
						CO / P	0 Manni	20					C0	/050	1
			(3/2/1 iı	ndicates s	trength o	of correla	ation) 3-St	irong, 2 -	- Mediun	n, 1 - Weak	:		Maj	pping	
COs						Program	me Outco	mes (PO	s)			T	F	SOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO 1	2	1											2	2	
CO 2	3	2	1	1									3	3	-
CO 3	2	1	1	1									2	2	1
CO 5	3	2	1	1									3	3	-
Course Direct	Direct       1. Prelab & Post Lab         2. Record       3. End-Semester examinations         Indirect       1. Course - end survey														

## LIST OF EXPERIMENTS

EX NO	EXPERIMENT DESCRIPTION	COs
1.	Create a simple LED bargraph using Arduino	CO1
2.	Design a system to find the obstacle distance using Arduino	CO1
3.	Design a project to count the number of visitors using Arduino	CO2
4.	Interface a gas sensor and find the Gas level using NODEMCU	CO2
5.	Control an LED via a webpage with the help of NODEMCU	CO2
Hadoop		
6.	Install, configure and run Hadoop	CO3
7.	To implement the following file management tasks in Hadoop System (HDFS):	CO3
	Adding files and directories, Retrieving files, Deleting files.	
8.	To run a basic Word Count Map Reduce program to understand Map Reduce	CO4
	Paradigm: To count words in a given file, To view the output file, and To	
	calculate execution time.	
9.	To study and implement basic functions and commands in R Programming.	CO5
	TOTAL PERIODS	45

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DOMEN EN	POWERMEN		(1 1400	,	<b>u</b> b <b>m</b>	Ela	ayamp	alayar	n, Tir	ucheng	ode - 63	, enem 37 205	iui)		
Progra	mme		<b>B.TE</b>	CH			Progr	amme	Code	104	Regi	ulation		2019	
Depar	tment	IN	NFOR	MAT	ION 7	TECH	NOLO	GY			Se	mester		VII	
Course	Code		С	ourse	Name		Pe	riods l Week	Per	Credi	t	Max	kimum l	Marks	
							L	Т	Р	C	0	CA	ESE	Tota	ıl
U19I	Г727	I	nterr an	nship Id Sui Proj	Trai nme ect	ning r	0	0	8	4	1	00	-	100	)
	The main objective of the course is to:														
Cou Objec	<ul> <li>Course</li> <li>Objectives</li> <li>Advance from an intellectual student to a creator and an industry professional.</li> <li>Apply communication skills to explain technical problem solving techniques and solutions.</li> <li>Collaborate within and across disciplinary boundaries to solve problems.</li> <li>Exercise computational thinking over the entire software life cycle.</li> </ul>														
Course	Course Outcomes														
At the e	At the end of the course, the student should be able to, Level														
CO1:	Gain i	ndus	trial e	experie	ence a	and to	apply	them i	in prac	ctical fo	orm			K2	
CO2: I develop	dentif ment	icatio	on of	mode	rn too	ols use	d in th	e field	d of I7	engin	eering f	or		K3	
<b>CO3:</b> <i>A</i>	Ability	v to fi	nd ef	fective	e solu	tions f	for rea	l life p	roble	ms				K3	
<b>CO4:</b> <i>A</i>	Apply	engir	neerin	g and	mana	igemei	nt valu	les to	accom	plish p	roject a	mbition	IS	K2	
<b>CO5:</b>	Evalu	ate th	e per	forma	nce of	f Inter	nship	& Sun	nmer l	Project				K3	
															_
						CO/P	O Mappi	ng					CO	/PSO	
			(3/2/1 ii	ndicates s	strength	of correla	tion) 3-S	trong, 2 -	- Mediun	n, 1 - Weak	<u> </u>		Ma	pping	-
COs						Program	me Outco	omes (PC	s)					250s	
<b>CO 1</b>	PO1 2	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	P011	PO12	PSO1	PSO2	-
correction correctio	3	2	3	3	2	2	2			5	3	3	3	3	_
$CO_2$	2	2	2	2	3 1	2		1	3	2	2		3	3	
CO 4	3	1	2	2	2	2	1	1	3			1	3	3	-
CO 5	3	3	2	2	1	3	1	2	2	1	3	2	3	3	1
Course	Course Assessment Methods														
Dire	ect														
1	<ol> <li>Internship Training &amp; Certification</li> <li>Summer Project Development &amp; Viva</li> </ol>														
Indi	rect	irse -	end	SURVAS	7										

	NAL ASTRE	)	VI (Aut	VEK.	ANA] ous Ii	NDH nstitu F	<b>A CO</b> tion, <i>A</i> Elavan	LLE W Affilia	GE O OME ted to	OF EN N O Anna Firuch	<b>GINE</b> a Univ	ERING I ersity ,Ch	F <b>OR</b> ennai)	TÜVRheinland	ISO 9001:2015
Progra	amme		B.TI	ECH			Pro	gram	ne Co	de	104	Regulation	on	20	19
Depar	rtment	I	NFO	RMA'	ΓΙΟΝ	TEC	HNOL	OGY				Semest	er	VI	II
Course	e Code	e	(	Course	e Nam	e		Perioc We	ls Per æk	C	credit	N	Maximu	m Mark	S
							Ι		Т	P	С	CA	ES	E	Total
U19I	<b>T82</b> 8	3	PRO	JEC	T W	ORK		)	0	16	8	60	40	)	100
Coı Obje	ırse ctives	5	The m • F c • T • T • T	ain ol Exploi curren Unde Demo oractic Demo	bjectiv re the t prob rstand nstrat cal un nstrat	ve of ir fiel olems l of te e orig dersta e self	the co d of k and/o chniqu ginality anding -direct	urse i mowl r new ues ap y in tl g. tion a	s to: edge, insig oplica ne ap nd or	whicl thts at ble to plicati	n inclu the fo their o on of ty in ta	ides a crit refront of own area c knowledg ackling an	ical aw that fie of profe e, toge d solvi	vareness eld. essional ther wi ng prob	of practice. th a plems.
Course	e Out	come	es												
At the e	end of	f the	course	e, the	stude	ent she	ould b	e able	e to,					Kno	wledge
<b>CO1:</b>	Dem	onst	rate a	a sou	nd te	chni	cal kn	lowle	edge	of the	eir sel	ected pro	oject	L	K2
CO2:	Appl	y en	ginee	ring	Kno	wled	ge, S	kills	and	mana	geme	ent princi	ples		K3
CO3:	Imple	emer	t har	dwar	e and	/or se	oftwa	re too	ols wi	ith Te	st Sol	utions			К3
CO4:	Test/	verif	v the	mod	ules o	of im	pleme	ented	proje	ect.	50201				K2
CO5:E Evalua	xpres ation	s the met	e engi rics.	ineeri	ng ac	tiviti	es wit	h eff	ective	e pres	entatio	on, report	and		К3
						CO/P	O Mappi	ing					CO/	PSO	
		(	3/2/1 ind	licates st	rength o	of correla	ation) 3-S	trong, 2	– Mediu	ım, 1 - W	/eak		Map	ping	
COs			[			Program	me Outco	omes (PC	Ds)	[			P	SOs	
	PO 1	РО 2	РО 3	РО 4	РО 5	PO 6	РО 7	РО 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	
CO 1	2	3	2	2	3			2	2	2	3	3	3	3	
CO 2	1	3	3	3	3	2	2	2	2	2	2	3	3	3	
CO 3	1	3	3	2	3			2	2	2	2	3	2	2	
CO 4				3	3			2	2	2	3	3	2	2	
CO 5	cos     1     3     3     2     2     3     2     3														
Course	Course Assessment Methods														
	1. Project Reviews       2. End Semester Examinations														
Ind	irect														
	1. Co	ourse	- end	surve	ey										

# **PROFESSIONAL ELECTIVE COURSES (PEC)**

# VERTICAL I – NETWORKS

			-													
	Î	*		VIV	EKAN (Au	VANDI tonomo	HA CC us Instit	DLLEG	<b>EOF</b> ffiliated	ENGIN l to Anna	EER a Unive	ING FC ersity ,Cl	<b>R WOME</b> nennai)	EN	TUVRestard	Managament Spaten 80 98012019 Week Australia A constants
-	Program	nme	B.F	<b>. / B.</b>	Гесh.		P	rograr	nme c	ode	-037	203	Regulat	ion		2019
-	Departi	nent	CSE	E, IT &	CST						Sen	nester	8			-
	Course	Code			Cou	rse na	me		I	Period	s per	week	Credit	Max	imum	Marks
	U19CS	V11	Mo	bile A	dhoc N	Netwoi	rks			L 3	T 0	P 0	C 3	CA 40	ESE 60	Total 100
	Cour Object	rse tive	Th • \$ • pro • I	e stude Study t Under otocols Learn t inderst	ent sho he bas stand that c he con tand th	vuld be ic and the fu an be un cepts of the role	made emerg nction used fc of Secu	to, ing tec ing of or ad-he urity is oss lave	chnolo differ oc net sues fo r desig	gies in rent M works. or desig	the co fedium gning nhanc	ontext on Acce a routing the	of ad-hoc r ess Protocong protoco network r	networks ols and ol	routing	r
			At t	he end	of the	cours	e, the s	student	shoul	d be ab	le to,	0	1			KL
	Cour	se	CO toda	<b>1:</b> R ay''s In	ternet	ber an and M	d und Iobile	erstand ad-hoc	l the p Netwo	orincip orks	les or	how :	mobility i	s dealt v	with in	K2
	Outco	me	CO	2: Dise	cuss va	arious l	MAC	routing	g proto	cols fu	nctior	ı				K2
			CO	<b>3:</b> App	oly diff	erent r	outing	g techn	ologie	s for de	esigni	ng a roi	uting proto	ocol.		K3
			CO	<b>4:</b> Illus	strate t	he sect	urity is	ssues in	1 adho	c netwo	orks					K2
			CO	CO5: exposed to the advances in adhoc network design concepts       K3												
P	re-requis	sites	-													
		(	(3/2/1 i	ndicate	es stren	<b>(</b> gth of	C <b>O / P</b> correla	O Map tion) 3	<b>ping</b> -Strong	g, 2 – N	/lediui	n, 1 – V	Veak	CO/P	SO Ma	pping
				1		P	rogram	nme Ou	itcome	s (POs)					PSOs	
	COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	) PC 11	PO 12	PSO	1 F	SO 2
	CO 1	3	3	3	2	3			2			2	3	3		3
	CO 2	3	2	3	3	3			1			2	3	3		3
	CO 3	3	3	2	3	3						3	3	3		3
	CO 4	3	3     3     3     2     2     2     2     3     3													
	CO 5	3	1	2	1	2						3	3	3		3
	Course A Direc 1. 2. 3. Indir	ssessm et Cont Assig End- ect	inuou gnmer Seme	<b>1etho</b> s Assents / Q ster ex	ds essmer uiz / S camina	nt Tes Semina ations	t I, II ar	& III								
1	1 1.	Cour		a bur v	· • y											

Conten	t of the sy	/llabus		
Un	it – I	INTRODUCTION	Periods	9
Introduc channel,	tion to ad- , ad-hoc mo	hoc networks – definition, characteristics features, applications. Characteristicy models: indoor and outdoor models.	ristics of wireless	
Uni	it - II	MEDIUM ACCESS PROTOCOLS	Periods	9
MAC Pa algorithm	rotocols: D ms, protoco	esign issues, goals and classification. Contention based protocols – with ols using directional antennas. IEEE standards: 802.11a, 802.11b, 802.11g	reservation, school, 802.15. HIPERI	eduling LAN
Unit	t – III	NETWORK PROTOCOLS	Periods	9
Routing Multicas aware ro	Protocols: st routing a outing.	Design issues, goals and classification. Proactive Vs reactive routing, un lgorithms, hybrid routing algorithm, energy aware routing algorithm, h	icast routing algorithms in the second se	rithms, g, QoS
Unit	t - IV	END – END DELIVERY AND SECURITY	Periods	9
Transpo adhoc ne	rt Layer: Is etworks: iss	ssues in designing – Transport layer classification, adhoc transport protous and challenges, network security attacks, secure routing protocols.	ocols. Security is	sues in
Uni	t - V	CROSS LAYER DESIGN	Periods	9
Cross la layer cau	yer Design utionary pe	Need for cross layer design, cross layer optimization, parameter optimiz rspective. Integration of adhoc with Mobile IP networks.	ation techniques,	cross
		r	Fotal Periods	45
Textbo	oks:			
1.	C.Siva R Pearson	am Murthy and B.S.Manoj, Ad hoc Wireless Networks Architectures and Education. 2011 (For units1,2 and 3)	protocollsll, 2 nd e	edition,
2.	Charles I	E. Perkins, Ad hoc Networking, Addison – Wesley, 2000 (For units 4 and	5)	
Referen	ces:			
1.	Mohamm	ad Ilyas, The handbook of adhoc wireless networks 1st Edition, CRC pres	s, 2002.	
2.	Erdal Qay and Sons,	virci and Chunming Rong c, Security in Wireless Ad Hoc and Sensor Net Ltd.	works 2009, John	wiley
3.	Stefano Ba IEEE pres	asagni, Marco Conti, Silvia Giordano and Ivan stojmenovic, Mobile ad- ss, 2004	hoc networking,	Wiley-
4.	Xiuzhen C 2004.	Cheng, Xiao Hung, Ding-Zhu Du: Ad-hoc Wireless Networking, Kluwe	er Academic Pub	lishers,
E-Resou	arces:			
1.	Research, Research,	"Wireless Communication and Mobile Comp.Special Issue on Mob Trends and Applications, Vol.2, no. 5, 2002, pp. 483 – 502.	ile Ad-hoc Netw	vorking
2	A survey	of integrating IP mobility protocols and Mobile Ad-hoc networks,	Fekri M. bdulja	lil and

	VIVE	CKANANDH (Autonomou I	<b>A COL</b> s Institu Elayam	LEG WO ution, palaya	<b>E OF B</b> MEN Affiliat am, Tiru	ENGINEERIN ted to Anna Un achengode – 63	I <b>G FOR</b> iiversity 37 205	,Chenr	TUVRheinland CERTIFED aai)	001:2015	
Programme	<b>B.TECH</b>		Progr	amme	e Code	104	Regu	lation	20	19	
Department	INFORMA	TION TECH	NOLO	GY			Ser	nester		-	
Course Code	Cours	e Name	Pe	riods Week	Per	Credit	Ν	Iaximu	m Mark	.s	
	L T P C CA ESE										
U19ITV11	WIRELESS SENSOR30034060NETWORKS30034060										
Course Objective	To the cou and function manageme	rse aims to un onalities of dif nt strategies a	ndersta ferent l nd prov	nd the ayers. vides 1	fundar It also knowle	nental concept helps to devise dge on sensor 1	s of wire appropri- networks	eless se iate noo s securi	ensor ne le and n ty.	tworks etwork	
	At the end	of the course,	the stu	ident s	should l	be able to,				KL	
	<b>CO1:</b> App	ly the basic co	oncepts	of wi	reless s	ensor networks	8			K3	
Course	CO2:Ident Protocols	ify the basic	archite	ctural	framev	vork using phy	vsical an	d MAG	C layer	K3	
Outcome	<b>CO3:</b> Develop various network layer protocols for inter and intra communication Pattern										
	<b>CO4:</b> Sketch the different synchronization algorithms for managing node and network level functions										
	<b>CO5:</b> Discover the challenges in Security and Sensor Network Programming K.										
Pre-requisites	•requisites   Computer Networks										
	CO/PO Mapping CO/PSO										

						<b>CO</b> /1	PO Map	ping					CO/PSO	
	(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak													
COs			PS	Os										
	PO1	PO2	PO12	PSO1	PSO2									
CO 1	3													3
CO 2	3	2	1	1									3	3
CO 3	3	2	1	1									3	3
CO 4	3	3 2 1 1												3
CO 5	5 3 2 1 1													3

#### **Course Assessment Methods**

Direct

- 1. Continuous Assessment Test I, II & III
- 2. Assignment.
- 3. End-Semester examinations

Indirect

1.Course - end survey

Conte	ent of th	ne syllabus		
Unit -	- I	Introduction	Periods	9
Introd	uction-l	Motivation and Wireless Sensor Nodes: Definitions and Backgroun	d, Challer	nges and
Const	raints - A	Applications: Structural Health Monitoring, Traffic Control, Health Care, F	Pipeline Mo	onitoring,
Precis	ion Agr	iculture, Active Volcano, Underground Mining - Node Architecture: The	e	
Sensir	ng Subs	ystem, The Processor Subsystem, Communication Interfaces, Prototypes.		
Unit -	II	<b>Basic Architectural Framework and Medium Access Control</b>	Periods	9
Physic	cal Laye	er: Basic Components, Source Encoding, Channel Encoding, Modulation,	Signal Pro	pagation.
Mediu	ım Acce	ess Control: Overview, Wireless MAC Protocols, Characteristics of MAC	Protocols	in Sensor
Netwo	orks, Co	ntention-Free MAC Protocols, Contention-Based MAC Protocols, Hybrid	d MAC Pro	otocols.
Unit -	- III	Routing Protocols	Periods	9
Netwo Routin	ork Lay 1g, Hier	er: Overview, Routing Metrics, Flooding and Gossiping, Proactive Ro archical Routing, Location-Based Routing, QoS-Based Routing Protocols	outing, On-	-Demand
Unit -	IV	Power Management and Time Synchronization	Periods	9
Power	· Manag	gement: Local Power Management Aspects-Dynamic Power Management	gement-Co	nceptual
Archit	ecture-	Time Synchronization: Clocks and the Synchronization Problem, Time	Synchroni	zation in
Wirele	ess Sens	or Networks, Basics of Time Synchronization, Time Synchronization Pro	otocols.	
Unit -	- V	Security and Sensor Network Programming	Periods	9
Securi	ty: Fun	damentals of Network Security, Challenges of Security in Wireless Sense	or Network	ïs,
Securi	ity Attac	cks in Sensor Networks, Protocols and Mechanisms for Security, IEEE 8	02.15.4 and	d ZigBee
Securi	ity. Sens	sor Network Programming: Challenges in Sensor Network Programming.		
		Tota	al Periods	45
Text l	Book:			
1.	Walter and Pr	negus Dargie, Christian Poellabauer, "Fundamentals of Wireless Sensor actice", 1 st Edition, John Wiley & Sons , 2011.	Networks	: Theory
Refer	ences:			
1.	Mohar Cambr	nmad S. Obaidat, Sudip Misra, "Principles of Wireless Sensor Networks' ridge University Press, 2014.	", 1 st Editio	on,
2.	Feng Z	Zhao, Leonidas Guibas, "Wireless Sensor Networks", 1st Edition, Elsevier,	, 2004.	
E-Res	ources			
1.	https://	/www3.nd.edu/~cpoellab/teaching/cse40815/Chapter3.pdf		
2.	https://	/www.cse.wustl.edu/~jain/cse574-06/ftp/energy_mgmt/index.html		
3.	https://	/www.intechopen.com/chapters/71586		

	VIVE (Auton	KANANDHA CO omous Institution, 2 Elay	<b>DLLEC</b> <b>WON</b> Affiliat ampala	GE O MEN ted to ayam,	F EN Anna Tiru	GINEE	RING FOR sity, Chennai) e–637 205		50 9001:2015				
Programme	<b>B.TECH</b>	Programme Co	ode			104	Regulation	20	19				
Department	INFORMA	Semester           Periods Per         Credit         Maximum Mark											
Course Code	Co	urse Name	Per	iods P Week	er	Credit	Maxi	mum Marks	>				
			L	Т	Р	С	CA	ESE	Total				
U19ITV12	DISTRIBU	J <b>TED SYSTEMS</b>	3	0	0	3	40	60	100				
Course Objective	The student Under Under Under Under Under	<ul> <li>The students should made to:</li> <li>Understand foundations of Distributed Systems</li> <li>Understand the idea of peer-to-peer services and file system</li> <li>Understand in detail the system level and support required for distributed system</li> <li>Understand the issues involved in studying process and resource management</li> </ul>											
	At the end	of the course, the s	tudent	s shou	ıld be	e able to,			KL				
	CO1:Unde	erstand the various	trends	and m	odel	s in distr	ibuted systems		K2				
Course	CO2:Illust	trate the role of con	nmunic	cation	1n di	stributed	systems.		K2				
Outcome	CO3:Make	e use of the peer- implement in dist	to-peer	syste	em a m	nd file s	system concept	s that are	K3				
	CO4:Dem involved in	onstrate how the ti n distributed system	me and	l glob	al sta	ates and	fault tolerant se	ervices are	K2				
	CO5:Summarize the management of process and resources in distributed K2         Systems												
Pre- requisites	Data structures and Algorithms												
	l												

		(3/2	2/1 indic	ates stro	ength of	CO/2	PO Map ation) 3-S	<b>ping</b> Strong, 2	2 – Med	ium, 1 - V	Veak		CO/F Mapp	'SO bing
COs						Program	nme Outco	omes (PC	s)				PS	Os
	PO1	01 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO1												PSO2
CO 1	2	2 1												2
CO 2	2	1											2	2
CO 3	3	2	1										3	3
CO 4	2	2 1											2	2
CO 5													2	2

**Course Assessment Methods** Direct

Continuous Assessment Test I, II & III 1.

- 2.
- Assignment End-Semester examinations 3.

# Indirect

1. Course - end survey

Con	tent of the	syllabus		
τ	U <b>nit– I</b>	INTRODUCTION	Periods	9
Intro shari mod three	oduction to ing and the els,client se	Distributed systems, Characterization of DS- Examples of e web- challenges, System model-Physicalmodel-Archi erver communication-group communication, Operating s nication and invocation	f distributed s tectural mode system suppor	ystems- resource els- Fundamental ts-Processes and
	Unit–II	COMMUNICATION IN DISTRIBUTED SYSTEM	Periods	9
Inter comm reply Case	process Co nunication- protocols – study: Java	mmunication – The API for internet protocols – External Network visualization: Overlay networks-Case study: M Remote procedure call – Remote method invocation. RMI – Group communication – Message queues – Shared	data represen PI - Remote l l memory appr	itation and Multicast Invocation: Request- roaches.
U	nit– III	PEER TO PEER SYSTEM AND FILE SYSTEM	Periods	9
Intro Pastry syster	duction - N y, Tapestry- n, Name se	apster and its legacy - Peer-to-peer – Middleware - Rout Distributed File Systems: Introduction - File service arch rvice and domain name system-Directory services.	ing overlays- nitecture –Cas	Overlay case studies: e study: Andrew File
U	nit-IV	SYNCHRONIZATION AND REPLICATION	Periods	10
Intro clock trans prote	saction - C sactions – 1 socols -Distr	states – Distributed debugging-Transactions and Concurre Locks – Optimistic concurrency control - Timestamp of ibuted deadlocks – Replication –fault tolerant services- Ca	al clocks- Log ency Control: ' rdering – Ato ase study :Cod	Transactions - Nested mic Commit a.
ι	J <b>nit– V</b>	DISTRIBUTED MULTIMEDIA SYSTEMS	Periods	8
Distr mana torre	ributed mul agement-str ent.	timedia system-Characteristic of multimedia data-Quality ream adaption-Sensing and context awareness-Security a	y of service m nd privacy-Ca	anagement-Resource ase study: Tiger, Big
			<b>Total Period</b>	s 45
Text	t Book:			-
1.	George Co Fifth Edition	oulouris, Jean Dollimore and Tim Kindberg, "Distributed on, Pearson Education, 2012.	d Systems Co	oncepts and Design",
Refe	erences:			
1.	Pradeep k	K Sinha, "Distributed Operating Systems: Concepts and De	esign", Prentic	e Hall of India, 2007.
2.	Tanenbau 2007.	m A.S., Van Steen M., "Distributed Systems: Principles a	nd Paradigms'	', Pearson Education,
E-R	esources:			
1.	https://ww	w.slideshare.net/sunitasahu101/introduction-to-distributed	-system-12742	20140
2.	https://ww	w.slideshare.net/mjagadeeshmtech/peer-to-peer-services-a	nd-file-system	<u>18</u>
3.	https://ww	w.slideshare.net/SHATHAN/synchronization-34088991		
4.	https://ww	w.slideshare.net/sandpoonia/10-resource-management		
5.	https://npte	el.ac.in/courses/106/106/106106168/		

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205       Image: Construction of the second seco													Management Spitten 80 KKI (211) 9 KKI (211		
Prog	gramme	<b>B.</b>	E./B.	Tech.			Prog	gramme	e Code		Re	gulation	1 2	2019	
Depa	artment	CSI	e, it s	& CST							S	emester	•	-	
Course	Code		Со	ourse Na	ame		Perio L	ds Per	Week P	Credi	t C	Maxi	mum Ma ESE	rks Total	
U19C	SV14	Gre	en Co	mputin	g		3	0	0	3	4	0	60	100	
Course Objectiv	7e	The	<ul> <li>The Main Objective of the course is to</li> <li>acquire knowledge to adopt green computing practices</li> <li>minimize negative impacts on the environment</li> <li>learn about energy saving practices</li> <li>understand the impact of e-waste and carbon waste.</li> <li>describe green IT in relation to technology</li> </ul>												
		At the end of the course, the student should be able to,       Knowledge level													
CO1: Explain the necessity of green IT. K2													K2		
Course Outcom	e	CO man	2: Ou nageme	tline n ent.	nethod	lologie	s for	creatii	ng gre	en ass	ets &	their	]	K2	
		CO	<b>3:</b> Ass	ociate tl	he use	of gric	l in gre	en IT.					]	K3	
		CO	4: Out	line the	proto	cols, st	andard	s & auc	lits ava	ilable fo	or green	IT.	]	K2	
Pre-real	uisites	-	<b>5</b> : App	ny the E		mnenta	iny res	ponsibi	le dusii	less stra	legies			N3	
	(3)	/2/1 ind	licates	strength	CO/	POM	apping	ng 2 - 1	Medium	1 - We	ak		CO/PS Mannir	) Jg	
COs	(3/	2/1 1110	ireates	, areing an v	Prog	amme (	Outcom	es (POs	3)	., 1	un		PSOs		
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	<b>PO 7</b>	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	
CO 1	3	3	3										3	2	
CO 2 CO 3	3	3	2										3	3	
CO 4	3	3	3										3	2	
CO 5	3	3	3										3	2	
Course A	Course Assessment Methods														
Direct															
1. 2. 3.	Continu Assign End-Se	uous A ment / emester	ssessm Quiz / r exami	nent Test Seminations	t I, II & r	& III									

Indirect

1. Course - end survey

### Content of the syllabus

Unit – I	FUNDAMENTALSPeriods9										
Green IT Fundamentals: Business, IT, and the Environment - Benefits of a Green Data Centre - Green											
Computing: Carbon Foot Print, Scoop on Power – Green IT Strategies: Drivers, Dimensions, and Goals –											
Environmentally	Responsible Business: Policies, Practices, and Metrics.										
Unit - II	Unit - II         GREEN ASSETS AND MODELING         Periods         9										
Green Assets: Buildings, Data Centers, Networks, Devices, Computer and Earth Friendly peripherals,											
Greening Mobile devices – Green Business Process Management: Modeling, Optimization, and Collaboration											

- Green l	- Green Enterprise Architecture - Environmental Intelligence - Green Supply Chains .										
Unit -	III GRID FRAMEWORK	Periods	9								
Virtualiz	ng of IT Systems - Role of Electric Utilities, Telecommuting, Tele	conferencing an	d Teleporting –								
Materials	Recycling - Best Ways for Green PC - Green Data Center - Gree	n Grid Framew	ork. Optimizing								
Compute	Power Management, Seamless Sharing Across Systems. Collabora	ting and Cloud	Computing,								
Virtual P	resence.	1	-								
Unit ·	IV GREEN COMPLIANCE	Periods	9								
Socio-Cu	Socio-Cultural Aspects of Green IT – Green Enterprise Transformation Roadmap – Green Compliance:										
Protocols Compute	, Standards, And Audits – Emergent Carbon Issues: Technologies Greener.	and Future. Be	st Ways to Make								
Unit	- V GREEN INITIATIVES	Periods	9								
Green In	tiative Drivers and Benefits with IT - Resources and Offerings to	Assist Green In	nitiatives Green								
Initiative Green Ini	Strategy with IT - Green Initiative Planning with IT - Green Initiative Assessment with IT. The Environmentally Responsible Busi	tiative Impleme	ntation with IT -								
Total Periode 45											
Text Boo	ks:										
1.	Bhuvan Unhelkar, Green IT Strategies and Applications-Using I Press, June 2011.	Environmental 1	Intelligence, CRC								
2.	Carl Speshocky, Empowering Green Initiatives with IT, John Wile	ey and Sons, 201	0.								
3.	Alin Gales, Michael Schaefer, Mike Ebbers, Green Data Center: S rebook, 2011.	Steps for the Jo	urney, Shoff/IBM								
Reference	es:										
1.	John Lamb, The Greening of IT, Pearson Education, 2009.										
2	Jason Harris green Computing and Green IT- Best Practices	on Regulation	ns and Industry,								
۷.	Lulu.com, 2008.	C	•								
3.	Woody Leonhard, Katherrine Murray, Green Home computing for	dummies, Aug	ust 2009.								
E-Resou	rces:										
1	http://dte.karnataka.gov.in/Institutes/gptbellary/FileHandler/4-db	0424c3c-c2e7-4	a <u>3f-9337-</u>								
1.	<u>ba1618da73e8</u>										
2.	https://shareok.org/bitstream/handle/11244/11105/Letcher_oksta	te_0664M_125	44.pdf?sequence=								
	<u>1</u>										

Constant and the second	VIVEKAN (Autonomou	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205											
Programme	B.TECH.	<b>B.TECH.</b> Programme Code 104 Regulation											
Department	INFORMATIO	N TECI	HNOLOG	Y		Semeste	er		-				
Course Code	Course Name	Periods Pe	er Wee	k	Credit	Maximu	m Marks	S					
	Course Maine		L	Т	Р	C	CA	ESE	Total				
U19ITV13	Java Program	3	0	0	3	40	60	100					
Course Objective	<ul> <li>The student shoul</li> <li>Impart the fu</li> <li>Enable the s</li> <li>Be able to us java program</li> </ul>	d be mad undamen tudents t se the Jav ns.	de to, ital concept o gain prog va SDK en	ts of c gramn vironr	ore J. ning s nent	AVA. skills in J to create	JAVA. , run and	execute	the simple				
	At the end of the	e course,	the student	t shou	ld be	able to,	<b>T</b> 1		Knowledge Level				
Course Outcome	CO1: Understan	d the syn programs	using OOl	ntics a PS coi	nd cl ncept	asses in s.	Java lang	uage.	K2 K3				
	CO3: Use the co		K3 K3										
Pre- requisites	U19IT201 - Ob	ject orie	CO5: Understand Applet, AWT and Event handlers in Java.       K2         J19IT201 - Object oriented Programming.										

CO / PO Mapping											CO/PSO				
	(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak											Mapp	ing		
COs	COs Programme Outcomes (POs)												PSG	PSOs	
	PO1	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12										PSO1	PSO2		
CO 1	3	3	3		3							2	2		
CO 2	3				2							2	2		
CO 3	3		2									2	2		
CO 4	3	2										2	2		
CO 5	3											2	2		

## **Course Assessment Methods**

#### Direct

- 1. Continuous Assessment Test I, II & III
- 2. Assignment
- 3. End-Semester examinations

Indirect 1. Course - end survey

Conten	t of the syllabus									
Unit –	I Basics of Java		Periods	9						
The Ger Control Super –	nesis of Java - Overview of Java - Data Types, Statements - Introducing Classes - Methods and Creating a MultilevelHierarchy - Method overr	Variables, and Arr Classes. Inheritanc iding – Using Abstr	ays - Opera ce: Basics - cact Classes	ators - Using						
Unit -	II Errors and Exception Hand	dling	Period	s 9						
Package Definiti Handlin	es and Interfaces: Packages - Access Protectio ons and Implementations - Compile time err g: Types - Try and Catch -Throw - Finally – Us	n - Importing Pack ors –Run time erro er defined exceptio	tages- Inter ors – Excej ns.	faces ption						
Unit –	III Streams and Threads	Periods		9						
File - T threads threads	he Byte Streams - The Character Streams - Us – Priorities – Synchronization – Thread class – Multiple threads – Inter thread communicatio	ing Stream I/ O - S and Runnable inter n.	erialization	. Java eating						
Unit -	IV String Handling		9							
String Handling: Special String operations and Methods - String Buffer - Exploring java.lang Simple type Wrappers - System - Math - Collections Framework: Collections Interfaces and Classes - Utility Classes:String Tokenizer - Date and Time.										
Unit – '	Unit - VApplets, Event Handling and AWTPeriods9									
Applet Handlin Control	Basics - Applet Architecture - Applet Display g Mechanisms - Event Classes and Listener – C s - Layout Managers and Menus.	Methods - Paramet Graphics , Colors an	d Fonts - A	- Event WT						
		Total P	eriods	45						
Text Bo	ooks:		1 <b>2</b> 010 (T							
1	Herbert Scheldt, Java The Complete Reference I,II,III & IV)	e, Tata Mc Graw Hil	II, 2019. (U	NIT						
2	Deitel & Deitel, Java How to Program, Prentice	e Hall of India, 201	7. (UNIT V	)						
Referen			1 D 0	015						
1	D.1. Editorial Services, Java 8 Programming B	ain Love, How Even	ech Press, 2	2015. miguag						
2	ImproveYour Java Programs, Dreamtech Press	g in Java: How Fund s, 2017.	ctional Tech	iniques						
3	Raoul-Gabriel Urma & Mario Fusco & Alan M Press, 2014.	Iycroft, Java 8 in Ao	ction, Drear	ntech						
4	Anita Seth & B.L. Juneja, Java: One Step Ahea	ad, Oxford Universi	ty Press, 20	)17.						
E-Reso	urces:									
1	https://www.geeksforgeeks.org/java/									
2	https://www.w3schools.com/java/									
3	https://www.codecademy.com/learn/learn-java	l								

	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205												150 8001.2015
Programme	B.TI	ECH			Pro	gramme	e Code	104		Regula	tion 201	9	
Department	INFO	RMA	TION	TECI	INO	LOGY				Seme	ester	_	
<b>*</b>					Per	iods Pe	r Week	Cre	dit	Ν	Aaximum	Marks	
Course Code	Cour	se Na	me		L	Т	Р	0		CA	ES	E '	Total
U19ITV14	Ŧ	Net Progr	work ammi	nø	3	0	0	3	;	40	60	)	100
Course Objective Course Outcome	<ul> <li>The student should be made to,</li> <li>Study the basics of TCP/IP protocols and sockets.</li> <li>Develop the applications of TCP echo client and server, I/O model. socket methods options and elementary UDP socket options.</li> <li>To know about the difference between IPV4 and IPV6 protocols, raw socket.Study the basic simple network management system.</li> <li>At the end of the course, the student should be able to,</li> <li>CO1: Demonstrate advanced knowledge of networking understand the keyprotocols which support the Internet</li> <li>CO2: Be familiar with several common programming interfaces fornetwork communication.</li> <li>CO3: Demonstrate advanced knowledge of programming fornetwork communications.</li> <li>CO4: Make use of different types of I/O such as non-blocking I/O and event driven I/O, have a detailed knowledge of the TCP/UDP Sockets.</li> </ul>										d	nce the ions of owledge evel K3 K2 K3 K2 K2 K2 K2	
Pre- requisites	Com	puter	Netw	orks									
COs		(3/2/1 in	ndicates	strength o	CO / F of correl Program	<b>PO Mappi</b> ation) 3-S nme Outco	<b>ng</b> trong, 2 – omes (POs	Mediun	n, 1 - Wea	k		CO/P Mapp PSC	SO ing Os
PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>CO 1</b> 2	1	3		3							2	2	
CO 2				2								2	
CO 3	2	2											1
CO 4	2				2						-	2	
Course As	sessm	ent N	letho	ds	I		1	I		1	<u>I</u>	-	
Direct           1. Cor           2. Ass           3. End           Indirect           1. Cour	Direct         1. Continuous Assessment Test I, II & III         2. Assignment         3. End-Semester examinations         Indirect         1. Course - end survey												

Content o	f the syllabus		
Unit – I	ELEMENTARY TCP SOCKETS	Periods	9
Introducti	on to socket programming - Overview of TCP / IP prot	tocols – Introduction to s	sockets –
Socket ad	dress structures - Byte ordering functions - Address conve	ersion functions – Elemen	tary TCP
sockets -	Socket - Connect - Bind - Listen - Accept - Read - V	Vrite – Close functions –	Iterative
server – C	oncurrent server.	1	
Unit – II	APPLICATION DEVELOPMENT	Periods	9
TCP echo	server - TCP echo client - POSIX signal handling - Serve	er with multiple clients – I	Boundary
conditions	- Server process crashes- Server host crashes - Server cras	shes and reboots – Server	shutdown
– I/O mul	tiplexing – I/O models – Select function – Shutdown fund	ction – TCP echo server	
(with mult	tiplexing) – Poll function – TCP echo client (with multiplex	xing)	
Unit – III	SOCKET OPTIONS, ELEMENTARY UDP	Periods	9
Socket on	tions Gatsockat and sat sockat functions Ganaria soc	kat options ID sockat	ontions
ICMP soc	ket options TCP socket options Elementary LDP socket	ster UDP echo server I	DP echo
client $-$ N	fultiplexing TCP and UDP sockets – Domain Name System	stem – Gethosthyname fu	inction –
IPV6 supr	port in DNS – Gethostbyadr function – Getserybyname and	getservbyport functions	metion
Unit –IV	ADVANCED SOCKETS	Periods	9
IPV4 and	IPV6 interoperability – Threaded servers – Thread creater	ation and termination– T	CP echo
server using	ng threads – Mutexes – Condition variables – Raw sock	ets – Raw socket creatio	n – Raw
socket out	put – Rawsocket input – Ping program – Trace route progr	am.	
Unit – V	SIMPLE NETWORK MANAGEMENT	Periods	9
SNMP ne	twork management concepts - SNMP management inform	nation – Standard MIB,,s	- SNMP
V1protoco	ol and practical issues – Introduction to RMON, SNMP V2	and SNMP V3.	
		<b>Total Periods</b>	45
Text Bool	<b>κs:</b>		
1.W. Ricl	hard Stevens, —Unix Network Programming Vol – I, 3r	^d Edition, Prentice Hall of	of India /
Pearson	Education, $2003$ .		A 11'
2. William Wesley	1999.	I and 21, 3rd Edition,	Addison
3. D. E. C Prentice	Comer, —Internetworking with TCP/IP Vol – IIII, (BSI Hall of India, 2003.	D Sockets Version), 2nd	Edition,
Reference	25:		
1.D. E. C	Comer, -Internetworking with TCP/IP Vol - IIII, (BSI	O Sockets Version), 2nd	Edition,
Prentice	Hall of India, 2003		
<b>E-Resour</b>	ces:		
1, https://r	otes.shichao.io/unp/ch4/		
2. https://w	www.masterraghu.com/subjects/np/introduction/unix_netw	ork_programming_v1.3/c	h08.html
2 1. the ar // a	a a a a a a a a a a a a a d / E 26502 01 / b t = 1/E 25200 / a a a b a t a 2202 /	<b>A</b> 1 1	
5. https://c	locs.oracle.com/cd/E20502_01/ntml/E55299/sockets-2295.	2.html	

	NAL TASTILLIONS ON A	\$	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN       Image: Content of the second												Rheinland httiFED	11:2015 	
Prog	gramm	ne I	B.TE(	CH			Pr	ogram	me (	Code		104	l	Regula	tion	202	19
Dep	artme	nt I	NFOI	RMAT	TION	ТЕСН	NOL	.OGY						Seme	ster	-	
C	ourse		(	Course	e Nam	ne Periods Per Credit		Maximum Marl		n Mark	S						
	0040							L	Т	P		C		CA	]	ESE	Total
U19	ITV1	15	SERV AR	VICE ( CHIT	ORIE ECTU	NTED URE		3	0	0		3		40	100		
Co Obj	ourse jectiv	re	<ul> <li>The student should be made to,</li> <li>Study the importance of Service Oriented Architecture.</li> <li>Learn to implement SOA in the J2EE and .Net environment</li> <li>Study the advanced features of SOA and web services for SOA</li> </ul>														
		A	At the	end o	f the	course	, the	stude	nt sh	oul	l be	able to	,				KL
		0	CO1: Relate how the components are interrelated in SOA.														K1
Co	ourse		CO2: Classify simple web services using SOA principles.														K2
Ou	tcom	e (	CO3: Apply various activity management and a series of composition techniques for SOA												lues	K3	
		(	CO4: I	Exper	iment	the va	rious	s serv	ices	usin	g Mo	etadata	•				K3
		(	CO5: \$	Select	the a	dvance	ed fea	atures	of v	veb s	servi	ices sec	curity.				K3
I req	Pre- uisite	s V	Web T	echno	ology												
																	_
			(2/2	/1 in d:-	otog at-	moth of	CO/]	PO Ma	pping	; ~ )	Mal		Vaalt		CO/I	PSO	
	<u> </u>		(3/2)		ates stre	ength of	correla	(10n) 3	-Stron	g, 2 -	wied	ium, 1 - V	veak		Map	ping	-
	COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO	(FUS) 8	PO9	PO10	P011	PO12	PSO1	PSO2	
	CO 1	1						1							1	1	7

Indirect
1. Course - end survey

**Course Assessment Methods** 

Assignment
 End-Semester examinations

1. Continuous Assessment Test I, II & III

CO 2

CO 3

CO 4

CO 5

Direct

Conte	nt of the syllabus							
Unit	- I INTRODUCTION TO SOA WITH WEB SERVICES	Periods	9					
Servic	e Oriented Enterprise - Service Oriented Architecture (SOA) - SO	A and Web Serv	vices – Multi-					
Chanr	el Access – Business Process management – Extended Web Services	Specifications.						
Unit	- II SOA AND WEB SERVICES	Periods	9					
Web S	ervices Platform – Service Contracts – Service-Level Data Model –	Service Discove	ery – Service-					
Level	Security – Service-Level Interaction patterns – Atomic Services and	Composite Servi	ices – Proxies					
	THE SOA AND MULTICIANNEL ACCESS	Derio de	vices.					
Umt -	SUA AND MULTICHANNEL ACCESS	Fellous	9					
Multi-	Channel Access – Business Benefits – SOA for Multi Channel Acce	ess – Tiers – Bus	siness Process					
Manag	gement – Concepts – BPM - SOA and Web Services – WS- BPEL – V	Web Services Co	mposition					
Unit -	IV EXTENDED WEB SERVICES SPECIFICATION	Periods	9					
Metad	ata Management - Metadata Specification – XML-WSDL 2.0-UDDI-	Addressing-Polic	cy-WS policy-					
WSPI	-WSDL 2.0 features and properties-comparing the policy specification	ons-WS Metadat	a Exchange.					
			-					
Unit	Unit - VWEB SERVICES SECURITYPeriods							
Overa	rching concern, Core Concepts, Summary of Challenges, Threats	and Remedies,	Securing the					
Comn	unications Layer, Message Level Security-Data Level Security.							
	Total Per	iods	45					
Text	Sooks:							
1.	Eric Newcomer, Greg Lomow, "Understanding SOA with Web Set Education, 2005	rvices", First Edi	ition, Pearson					
Refer	ences:							
1	James McGovern, Sameer Tyagi, Michael E Stevens, Sunil Mathew	, "Java Web Serv	vices					
1.	Architecture", Elsevier, 2003							
2.	Thomas Erl, "Service Oriented Architecture", Pearson Education, 20	)05.						
3.	Eric Pulier, Hugh Taylor, "Understanding Enterprise SOA", Dreamt	ech Press, 2007.						
E- Re	sourses:							
1.	https://www.tutorialspoint.com/soa/soa_business_processes.htm							
2.	https://www.informit.com/articles/article.aspx?p=357691&seqNum	=6						
3.	https://docs.oracle.com/cd/E13209_01/wlcp/wlng22/devext/wespa_	using.html						
4.	https://www.coursera.org/learn/service-oriented-architecture							

Ç			VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai)Elayampalayam, Tiruchengode – 637 205												
Progr	ramme	•	<b>B.E./ B.</b>	TECH	•		Pro	ogramn	ne Code		Regul	lation	2019	)	
Depa	rtment	t	CSE,IT	' & CS'	Г						Sem	lester	-		
a	G		G				Period	s Per V	Veek	Credit		М	aximun	n Marks	
Cour	rse Co	de	Cou	rse Nai	ne		L	Т	Р	C	CA		ESE T	`otal	
U190	CTV12	2	Socket P	rogran	nming		3	0	0	0	4	0	60	100	
<ul> <li>To learn different socket function and implement client server applicat using sockets</li> <li>To conduct experiments to know how different internet protocols like TC works</li> <li>To analyze various application program like TELNET, DNS, DHCP</li> <li>Build different application like Routing, Load balancing &amp; Security</li> <li>To apply protocols get adapted to emerging technologies</li> </ul>												lications e TCP/IP			
The students who complete this course successfully are expected to: Knowledg level											vledge				
Co	ourse	-	CO1:B	ecome	familiar	with e	element	tary so	cket fun	ctions.	ingSo	late		KI K2	
Out	tcome	-	CO3:Learn about functions that convert between names and numeric values and protocolsK2CO4: Analyze network protocol functionsK3												
		F	CO4://	earn ab	out the a	dvanc	col run	ket fur	ctions					K3	
Pre-re	quisite	es	-											_	
	(3/2/]	l inc	licates str	rength o Pro	<b>CO / F</b> of correl gramme	<b>O Ma</b> ation) Outco	apping 3-Stro omes (1	ng, 2 – POs)	Mediu	n, 1 - W	/eak		CO/ Mapp PSO	PSO bing	
COs	PO 1	PC 2	) PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	
CO1	3	3	3	3	3	2	1				2	2	3	3	
CO2	3	3	3	3	3	2	1				2	2	2	2	
CO3	3	3	3	3	3	$\frac{2}{2}$	1				2	2	3	3	
CO4 CO5	3	3	3	3	3	2	1				2	2	3	3	
Course	Asses	sme	ent Meth	ods		-	1 -	1	1	<u>I</u>					
Direct <ol> <li>Continuous Assessment Test I, II &amp; III</li> <li>Assignment.</li> <li>End-Semester examinations</li> </ol> Indirect <ol> <li>Course - end survey</li> </ol>															

Content o	f the syllabus								
Unit – I	Introduction to Network Security	Periods	9						
Introduction Roadmap TCP state port number by commo	on, simple daytime client, protocol independence, Error handl to client/server, Overview of TCP/IP protocol- TCP connection est transition diagram – Time-wait state, SCTP association establish ers and concurrent servers, Buffer size and limitations, standard intern, Internet applications.	ing, simple stablishment nment and te ernet services	daytime server, and termination, rmination, TCP , protocol usage						
Unit – I	I Socket Functions	Periods	9						
Socket fur	ction, connect function, bind function, listen function, accept fu	nction, Fork	function, exec						
function, c client, nor Terminatio	oncurrent servers, close function-get sock name and get peer name, mal startup and termination, POSIX signal handling, Wait and on of server process. Crashing and rebooting of server host.	TCP Echo se l Waitpid fu	rver, TCPEcho nctions,						
Unit - Il	I Protocol Functions	Periods	9						
Get sock o	pt function, set sock opt function, IPV4, ICMP, TCP socket optic	ons, UDP Ec	ho server and						
client, rec	vfrom function, send to function, Connect function with UDP	, dg_cli fund	ction, lack of						
Unit – I	V DNS Socket Functions	Periods	9						
DNS, res	olvers and name servers, gethostbyname function, gethos	stbyaddr fund	ction,						
getservbyr udp_conne	name, getservbyport function, tcp_connect function- tcp_lect, udp_server function, BOOTP, DHCP.	isten functi	on, udp_client,						
Ūnit – V	Unit - VAdvanced Socket FunctionsPeriods9								
Internet Pr	otocol, IPV4, IPV6 interoperability, Daemon processes, Daemo	n processes	and the						
inetdsuper	server, Advanced I/O functions								
	To	otal Periods	45						
Text Book									
1.	Douglas.E.Comer "Internetworking with TCP/IP " principles, pro Edition, Volume 1, Pearson Education, 2013	otocols and a	rchitecture, 6th						
2.	Behrouz A.Forouzan, "TCP/IP protocol suite", 4th edition, Mc privatelimited, 2010.	Graw Hill e	ducation						
3.	Adam Woodbeck, Network Programming with Go, Code Secur Services from Scratch, No Starch Press, ISBN-10 : 1718500882.	e and Reliab 2021	le Network						
4.	Douglas.E.Comer "Internetworking with TCP/IP " principles, pre-	otocols and a	architecture, 6th						
References									
×	W.Richard Stevens, Bill Fenner, Andrew M. Rudoff "Unix Networ	k programm	ing "3 rd edition,						
1.	Volume – 1, Pearson Education, 2015 R.F.Gilberg, B.A.Forouz	an, Data Str	uctures,2nd ed.,						
,	Thomson India, 2005								
2.	Wendell Odom, " IP networking ", 1st edition, Pearson Education	2012							
3.	NPTEL Course Notes								
E-Resour	ces:								
1.	https://dev.to/sanjayrv/a-beginners-guide-to-socket-programming	g-in-c-5an5							
2.	https://www.cs.rpi.edu/~moorthy/Courses/os98/Pgms/socket.htm	าใ							
3.	https://www.tutorialspoint.com/unix_sockets/index.htm								

# VERTICAL II - CYBER SECURITY

	TIONAL INS		VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam,Tiruchengode– 637 205												i)	VRheinland ERTIFIED WWW.Tho	01:2015				
Prog	gran	nme	B.TF	ECH				Programme 104 Regulation Code							20	2019					
Dep	artn	nent	INFC	ORMA	TION	TEC	HNO	LOGY	- -				Sem	nester		-					
Cour	rse (	Code			Cours	se Nai	ne		Perio	ds Pe	r We	ek	С	Credit	Maximum Marks						
									L		Т	Р		С	CA	ESE	Total				
U1	9IT	V21	INFORMATION SECURITY30034							40	60	100									
Co Ob	ours	e ive	<ul> <li>Understand the basics of Information Security</li> <li>Know the legal, ethical and professional issues in Information Security.</li> <li>Know the aspects of risk management.</li> <li>Become aware of various standards in this area</li> <li>Know the technological aspects of Information Security</li> </ul>																		
			At t	he end	d of th	ie cou	irse, tl	ne stud	ents s	hould	l be a	ble to	),			Level					
			СО	<b>1:</b> Unc	lersta	nd the	basic	es of in	forma	tion s	secur	ity				K2					
			<b>CO2:</b> Illustrate the legal, ethical and professional issues in												K	2					
Co	urs	e	information security												K2						
Out	tcor	nes	development												1/2						
			CO	<b>CO4</b> :Understand the various standards in the Application Security												<u>K2</u>					
			CO	<b>CO5:</b> Understand and implementation of Security Techniques.												K2					
Pre- Requi	isite	S	Nil												·						
<b>CO / PO Mapping</b> (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak									C C Ma	D/PSO apping											
C	COs	PO1	Programme Outcomes (POs)     PSOs       PO2     PO3     PO4     PO5     PO6     PO7     PO8     PO14     PO11     PO12     PSO1     PSO2									12									
C	01	2	1	105	104	105	100	10/	100	109	10	PO10         PO11         PO12         PSO1         PSO2           2         2         2         2									
C	0 2	2	1								1				2	2					
CO	03	2	2	1											2	2					
CO	04	2	1												2	2					
C	05	2	1												2	2					

**Course Assessment Methods** 

Direct

1. Continuous Assessment Test I, II & III

2. Assignment

3. End-Semester examinations

Indirect

1. Course - end survey

Content of	f the	syllabus							
Unit–l	[	INTRODUCTION	Periods	9					
History-Information Security- Information Security Overview-Risk Analysis-Compliance with Standards,									
Regulations, and Laws - Secure Design Principles - Security Policies, Standards, Procedures, and Guidelines									
Security Organization -Authentication and Authorization									
Unit–I	Ι	DATA SECURITY AND NETWORK SECURITY	Periods	9					
Securing	Uns	tructured Data-Information Rights Management – I	Encryption-Stor	age Security –					
DatabaseS	ecur	ity-storage security, Network Security:Secure Network De	sign-Network I	Device Security -					
Firewalls-V	Virtu	al Private Networks - Wireless Network Security - Intrusion	n Detection and	Prevention					
Systems -V	/oice	e over IP (VoIP) and PBX Security.							
Unit–I	Π	<b>COMPUTER SECURITY</b>	Periods	9					
Operating	Syst	em Security Models -Unix Security - Windows Security -S	ecuring Infrastr	ructure Services -					
Virtual Ma	ichin	es and Cloud Computing -Securing Mobile Devices.	1						
Unit–I	V	APPLICATION SECURITY	Periods	9					
Secure Ap	plica	ation Design-Writing Secure Software-J2EE Security-Wind	dows .NET Sec	curity-Controlling					
Application	n Be	ehavior Security Operations -Security Operations Managem	ent-Disaster Re	covery, Business					
Continuity	, Ba	ckups, and High Availability -Incident Response and Forens	c Analysis.						
Unit–V	V	DATABASE SECURITY AND SECURITY	Periods	9					
		OPERATIONS							
Database s	ecur	ity: Security requirements, Reliability and integrity, Sensitiv	e data, Inference	e, Multilevel					
database, F	Prop	osal for Multi level security.							
Security O	)pera	tions: Security operation Management - Disaster recovery	, Business com	munity, Backups					
and High A	Avail	ability - Forensic Analysis.							
			<b>Fotal Periods</b>	45					
Text Book	S								
1.	Ma	rk Rhodes-Ousley,Information Security- The Complete Refer	ice eBook Secor	<i>id Edition, 2015.</i>					
Reference	S								
1	Mi	cki Krause, Harold F. Tipton, - Handbook of Information	Security Manag	gementl, Vol 1-3					
1.	CR	CPress LLC, 2004.							
2.	Stu	art McClure, Joel Scrambray, George Kurtz, -Hacking Exp	osedI, Tata Mc	Graw- Hill, 2003					
E-Resourc	ces								
1.	http	ps://nptel.ac.in/courses/106/ 06/106106129/							
2.	http	ps://nptel.ac.in/noc/courses/noc16/SEM1/noc16-cs01/							
3.	http	ps://slideplayer.com/slide/5127731/							

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Programme	B.TECHProgramme Code104Regulation2019										
Department	INFORMATION TECHNOLOGY Semester -										
Course Code	Course	Name	Periods Per Week			Credit	Max	ximum Mark	.S		
		L	Т	Р	С	CA	ESE	Total			
U19ITV22	CYBER SEC	URITY	3	0	0	3	40	60	100		
Course Objective	<ul> <li>Provide</li> <li>Provide</li> <li>Provide</li> <li>To dete</li> <li>Provide</li> <li>cyber t</li> </ul>	es the skills es the skills es the skills et frauds in techniques errorism	in cyb in cyb mobi for h	per se per of le and andli	curit fenc d win ng c	ty in vie es. reless de ybercrin	w of cyberc evices. ne, organiza	rime. ttional impl	ications and		
	At the end of	Knowledge Level									
	CO1:Outline	K2									
Course	CO2:Identify wireless device	the frauds,	attack	ts and	1 sec	urity iss	ues in mobi	le and	K2		
Outcome	CO3:Know th	ne methods	used i	n cył	ber c	rime			K2		
	CO4:.Apply t	he phishing	; techn	ique	s and	l organiz	zational imp	olications.	К3		
	CO5:.Descrit Dimensions of	gical	K2								
Pre- requisites	Computer Ne	tworks									

	CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak													'SO Jing
COs	s Programme Outcomes (POs)												PSOs	
	PO 1	PO 2	РО 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO 1	3	3	2	2	3			2	2			3	3	2
CO 2	3	3	2	2	3			2	2			3	3	2
CO 3	3	3	2	2	3			2	2			3	3	2
CO 4	3	3	2	2	3			2	2			3	3	2
<b>CO 5</b>	3	3	2	2	3			2	2			3	3	2

## **Course Assessment Methods Direct**

Direct

- 1. Continuous Assessment Test I, II & III
- Assignment.
   End-Semester examinations

Indirect

1.Course - end survey

Content of th	e syllabus							
Unit– I	INTRODUCTION	Periods	9					
Introduction: Definition and Origins of the Word - Classifications of Cybercrimes- Installing a Configuring Kali Linux-Pre-penetration Testing Checklist, Information Gathering-External Petersting, Website Penetration Testing-Internal Network Penetration Testing and Wi-Fi Penetration Testing-Network Sniffing, Exploitation- Social Engineering.								
Unit-II	CYBERCRIME: MOBILE AND WIRELESS DEVICES	Periods	9					
Trends in M Service Secur Mobile Devic Unit – III Introduction Passwords. I Antikeylogger Attacks on W	<b>ability:</b> Credit Card Frauds in Mobile and Wireless Computing ity-Attackson Mobile/CellPhone. <b>ces:</b> Security Implications for Organizations-Organizational Measures -Laptops: Physical Security Counter measures.         Image: Tools AND METHODS USED IN CYBERCRIME <b>ces:</b> Password Cracking: Online Attacks, Offline Attacks - Strong,         Keyloggers and Spywares: Software Keyloggers - Hardwart - Spywares.         Virus and Worms:Trojan Horses and Backdoors-Bireless Networks.	Era- Authe es for Hand Periods Weak and are Keylog uffer Overf	ntication lling 9 Random ggers – low-					
Unit-IV	PHISHING AND ORGANIZATIONAL IMPLICATIONS	Periods	9					
for Organization. Unit–V	ions, Social Computing and the Protecting People's Privacy in th	Periods	10 Periis 9					
Introduction: – Trade Name Other Cyber c	Intellectual Property in the Cyberspace - Copyright, Patent, Trader e Domain Name. Ethical Hackers: The Psychology Mindset and Striminals –Sociology of Cyber criminals- Information Warfare.	narks - Trac kills of Hac	le Secret kers and					
Text Books:	10	tai i crious						
1.	Abhinav Ojha,"Beginners Guide To Ethical Hacking and Cyber Se ,2020.	curity", Firs	stEdition					
2.	RogerGrimes, "HackingtheHacker', WileyIndia, 2017.							
References:       1	Stuart McClure, Joel Scambray and Goerge Kurtz, "Hacking Ex Security" Secrets & amp Solutions", Tata Mcgrawhill Publishers 2012.	xposed 7 :N s, Seventh	Vetwork Edition,					
2	Donaldson,S.,Siegel,S.,Williams,C.K.,Aslam,A.,,EnterpriseCybers Build a Successful Cyber defence Program against AdvancedThrea	ecurity- H ts`,A-press,	low to 2015.					
E-Resources	s:							
1.	Udemy.com,,TheCompleteCyberSecurityCourse:HackersExposed labe:https://www.udemy.com/the-complete-internet-security-privac olume1/,[Accessed:May2019]	`,2018.[onli cy-course-	ne].Avai					

		VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205											TRANSPORT		
Programm	ne l	B.E. / B.Tech. Programme Code										lation	2	2019	
Departmen	nt (	CSE & IT Semester												-	
Course			(		Nomo			Perio	ds Per	Week	Credit	Ma	aximum	imum Marks	
Code			Ċ	Jourse	Name			L	Т	Р	C	CA	ESE	Total	
U19CSV2	3	Cryptography and Network Security300340											60	100	
Course Objective	e	<ul> <li>Understand the fundamentals of networks security, security architecture, threats and vulnerabilities</li> <li>Learn various cryptographic algorithms.</li> <li>Understand necessary Approaches and Techniques to build protection mechanisms in order to secure computer networks.</li> </ul>													
	1	At the end of the course, the student should be able to, Know lev											wledge evel		
		CO1: Classify the Encryption techniques												K2	
Course Outcome		<b>CO2:</b> Apply the different cryptographic operations of symmetric and public cryptographic algorithms.												К3	
		<b>CO3:</b> Evaluate the authentication and hash algorithms.											K3		
	(	<b>CO4:</b> Differentiate Computer security and network security and develop a system for remote user authentication												К3	
		CO5:	Identif	y how t	o secur	e their s	systems	5						K4	
Pre- requisites	(	Comput	ter Netv	works											
	(3	3/2/1 in	dicates	strength	CO / of corre	PO Map elation) 3	o <b>ping</b> 3-Strong	g, 2 – M	edium,	1 - Weak			CO/PSO Mapping		
Cos					Progr	amme O	utcome	s (POs)					PSOs		
Р	01	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 1 11	PO 12	PSO1	PSO 2	
CO 1	3	2	2	2	2			2					2	3	
CO 2	3	3	2	2	2			2					2	2	
CO 4	2	3	2	2	2			2					3	2	
CO 5	3	3	2	2	2			2					2	2	
Course As	Course Assessment Methods														
DIRECT         1. Continuous Assessment Test I, II & III         2. Assignment         3. End-Semester examinations															
INDIREC	Т														
1	. C	ourse -	end sur	rvey											

Content of t	ne syllabus		
Unit – I	COMPUTER SECURITY BASICS	Periods	9
Computer S	ecurity Concepts, OSI Security Architecture, Security Attacks, Sec	urity Services,	Security
Mechanisms	, Model for Network Security, Classical Encryption techniques- Substi	tution and Trans	position

methods, E	Block Cipher Principles															
Unit - II	ENCRYPTION STANDARDS	Periods	9													
Data Encry	ption Standard- DES Encryption- Key Generation- DES Decryption,	Advanced Enc	ryption													
Standard (A	AES)- AES Transformation Functions, Multiple Encryption and Triple DE	S- Triple DES wi	ith Two													
Keys- Trip	le DES with Three Keys.	<b>D</b> 1 1	0													
Unit – III	AUTHENTICATION AND HASH FUNCTION	Periods	9													
Authentica	tion requirement – Authentication function – MAC – Hash function – S	ecurity of hash f	unction													
and MAC	- SHA –Digital signature and authentication protocols - Entity Authentication challenge Region Representation of the second seco	tion: Biometrics,														
Passwords,	Chanenge Response protocols- Authentication applications – Kerberos, A		0													
Cummetrie	NETWORK SECURITY	Ferious	9													
Symmetric	Dublic Key Distribution Dublic Appoundement of Dublic Key Distribution	oly ovoilable Dir	metric													
Public-Key	Authority Public-Key Certificates Remote User Authentication princip	inles. Remote us	er													
Authentica	tion Using Symmetric Encryption Kerberos Remote user Authentication prince	ation using Asvi	mmetric													
Encryption		ation using risy	linnetite													
Unit – V	SYSTEM SECURITY	Periods	9													
Secure Soc	ket Laver and Transport Laver Security Secure Electronic Transaction Ir	truders Intrusion	1													
Detection,	Password Management, Malicious Software, Firewalls, Trusted Systems.		•													
, , ,	Tota	l Periods	45													
Text Book	S															
1.	Behrouz A. Forouzan, "Cryptography and Network Security" 3rd Edition Publications, 2016.	, McGraw Hill														
2.	William Stallings, "Cryptography and Network Security - Principles and PEARSON, 8 th Edition, 2023.	Practice Paperbac	:k"-													
Reference	S															
1.	Mohammad Amjad, "Cryptography and Network Security", Wiley, 2019															
2.	Bruce Schneier, "Applied Cryptography, Second Edition", John Wiley & S	Sons Inc, 2007.														
3.	AtulKahate, "Cryptography and Network Security", Tata McGraw-Hill, 2	2003														
4.	Charles B. Pfleeger, Shari Lawrence Pfleeger, "Security in Computing", "Education, 2003.	Third Edition, Pea	arson													
Resources																
1.	http://nptel.ac.in/courses/106105031/1															
2.	http://nptel.ac.in/courses/106102064/23															
3.	https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/ system-engineering-spring-2009/video-lectures/ lecture by Prof. Robert 1 Madden MIT	/6-033-computer- Morris and Prof.	Samuel													
4.	https://www.brainkart.com/article/Remote-User-Authentication-Using-A Encryption 8476/	symmetric-														
5.	http://nptel.ac.in/courses/106105031/lecture by Dr. DebdeepMukhopadhy	ayIITKharagpur														
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			A	t the en	d of th	e cours	se, the	studen	t shou	uld be a	ble to,					KL
	a		С	01: De	fine C	yber C	rime a	nd exp	lain t	ypes of	Cyber	Crime				K2
	Cou	rse	С	<b>O2:</b> Re	cite lav	ws and	Acts i	in India	a for c	yber C	rime					K2
	Juic	ome	С	<b>O3:</b> Ex	plain t	he basi	ics and	l phase	s of E	thical h	acking	5				K3
			С	<b>O4:</b> Ide	ntify 7	Types of	of Atta	icks an	d thei	r counte	er mea	sures				K2
			С	<b>05:</b> Wo	ork wit	h pen	testing	g tools								K3
Pre-r	equi	isites	-													
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						P	rogran	nme Ou	tcome	es (POs)					PSOs	
C	Os	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PS	02
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CC	) 2	2					2	2		_			2	2		2
CC	) 3	2					2	3					2			2
CC	)4	2					2	3								2
CC	) 5	2				3	2	3					2			2
Cou	rse A Dire	Assess ect	ment	Meth	ods				-							
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	Indi	rect														
		1. Coi	ırse -	end su	rvey											
Con	tent	of the	e sylla	ibus												1
1	Unit	– I					C	YBER	CRI	ME				Peri	iods	9
Intro Cracl Tech	ducti king, nolo	ion to Viruse gy. Soc	Cyber es, Vir vial Er	r Crime rus Atta ngineeri	es –Na ucks, P ng. M	ature a ornogi ail Bor	ind Sc aphy, nbs. B	cope of Softwa	f Cyb are Pi ploits.	er Crin racy, In and Cy	ne- Ty tellect ber Se	ypes of ual prop curity e	Cyber C perty, Legate.	rime: In al Syster	nternet, 1 m of Info	Hacking, ormation
I	Unit	- II		0	0,		LA	WS A	ND A	CTS	~ •	., .		Per	iods	9
Laws	s and	Ethics	s - Dig	gital Evi	dence	Contr	ols - E	videnc	e Hai	ndling F	Proced	ures - B	asics of Ir	dian Ev	idence A	ACT IPC
and C	CrPC	- Elec	tronic	Comm	unicati	ion Pri	vacv A	ACT - 1	Legal	Policie	s.					

Uni	t – III	ETHICAL HACKING BASICS	Periods	9					
Introduc	ction to E	thical Hacking – Types of hacking – Phases of Ethical hacking	Reconnaissan	ce And					
Scanni	ng:Footpr	inting with DNS – Determining Network Range – Google Hacking	g. Scanning for	targets:					
Identify	y Active n	nachines - Port Scanning. Enumeration: Windows Security basics	s – Enumeratio	n					
Technie	ques.								
Unit –	IV	SYSTEM ATTACK & WEB ATTACKS	Periods	9					
Sniffing	g: Commun	ications basics – Sniffing techniques and tools – Network Roadblocks: Int	rusion Detection	_					
Session	hijacking,	System Attack: Windows system hacking - Password Cracking - Explo	oiting privilege	s. Social					
Enginee	ering: Huma	an Based attack – Computer based attack. Web Server Hacking: Web serv	vice architecture						
Uni	Unit – V         MALWARES AND PENETRATION TESTING           Web attacks. Web Applications: Web applications attack – Web resources protection. Wireless Attacks. Malware Attacks: Trojans, viruses and worms. Penetration Testing: Types of Penetration testing methodologies – Penetration test tools.								
Web att	acks. Web	Applications: Web applications attack – Web resources protection. Wirel	ess Attacks – Bl	uetooth					
attacks.	Malware	Attacks: Trojans, viruses and worms. Penetration Testing: Types of	of Penetration te	sting –					
Penetra	tion testing	methodologies – Penetration test tools.	Total Dariada	15					
Toytho	oke		I otal I el lous	43					
1	Dama datt	LI Scholl Clamona Martin "Cubararina" ABC CLIO Inc. California 2004							
1.	D	e H Schen, Clemens Martin, Cyberchine, ABC – CLIO Inc, California, 2004.							
2.	R K Jha, .	Digital Forensic and Cyber Crime Hardcover – 2016,							
Engineering: Human Based attack - Computer based attack. Web Server Hacking: Deporting - printig       Engineering: Human Based attack - Computer based attack. Web Server Hacking: Web service architecture         Unit - V       MALWARES AND PENETRATION TESTING       Period         Web attacks. Web Applications: Web applications attack – Web resources protection. Wireless Attacks – E       attacks. Malware Attacks: Trojans, viruses and worms. Penetration Testing: Types of Penetration       Period         Penetration testing methodologies – Penetration test tools.       Total Periods         1.       Bernadette H Schell, Clemens Martin, "Cybercrime", ABC – CLIO Inc, California, 2004.       7         2.       R K Jha, .Digital Forensic and Cyber Crime Hardcover – 2016,       7         3.       Matt Walker, "CEH- Certified Ethical Hackers Guide ", 4th Edition, McGraHill Education, 2019       4         4.       Michael Gregg," Certified Ethical Hacker (CEH) Version 9 Cert Guide", 2nd Edition, Education, 2018       7         References       1.       Partick Engebretson, "The Basics of Hacking and Penetration Testing: Ethical Hacking and P         1.       Partick Engebretson, "The Basics of Hacking and Penetration Testing: Ethical Hacking and P         1.       Parteek Sharma," Hacking Revealed", 1st Edition, White Falcon Publishing, 2018.         3.       Reginald Wong, "Mastering Reverse Engineering: Re-engineer your ethical hacking skill Publishing, 2018.         4.       DafyddStuttard, Marcus Pinto									
<ol> <li>Bernadeue II Schen, Clemens Martin, Cybererinie , ABC – CERO Inc, Cantorna, 2004.</li> <li>R K Jha, .Digital Forensic and Cyber Crime Hardcover – 2016,</li> <li>Matt Walker, "CEH- Certified Ethical Hackers Guide ", 4th Edition, McGraHill Education, 2019</li> <li>Michael Gregg," Certified Ethical Hacker (CEH) Version 9 Cert Guide", 2nd Ed Education, 2018</li> <li>References</li> </ol>									
Referer									
1.	Patrick E Testing	Engebretson, "The Basics of Hacking and Penetration Testing: Ethical Made Easy", 2 nd Edition, Syngress, Elseveir, 2013.	Hacking and Per	netration					
2.	Parteek S	harma," Hacking Revealed", 1st Edition, White Falcon Publishing, 2018.							
3.	Reginald Publishi	Wong, "Mastering Reverse Engineering: Re-engineer your ethical	hacking skills"	, Packt					
4.	DafyddSt Security	tuttard, Marcus Pinto, "The Web Application Hacker"s Handbook: Flaws", 2 nd Edition, John Weily& Sons, 2011	Finding and Ex	ploiting					
5.	Monnapp	a K A, "Learning Malware Analysis: Explore the concepts, tools, and to ate Windows malware", 1st Edition, Packt Publishing, 2018.	echniques to ana	lyze and					
E-Reso	urces	,,							
1.	https://do	oc.lagout.org/security/ceh-official-certified-ethical-hacker-review-guid	le-exam-312-						
	50.97807	$\frac{1}{2} \frac{1}{2} \frac{1}$	Haaling Carry	auton C					
2.	nups://wv	ww.ineuranre.com/me/uyewnoi5r50muw/A_Beginners_Guide_10_	<u>Com</u>	<u>puter_5</u>					
	ystems.z1	<u>p/111e</u>							
3.	https://w	ww.pdfdrive.com/hacking-beginner-to-expert-guide-to-computer-hack on-testing-computer-science-series-e175287729 html	king-basic-secur	ity-and-					

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U	19CSV2	5	Socia	l Net	work	Anal	ysis			3	0	0	3	40	60	100
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			At the	end o	f the c	ourse.	the st	tudent s	shoul	d be at	ole to.					KL
	a		CO1:	Distir	nguish	WWV	N from	n sema	ntic v	veb	,					K2
	Course		<b>CO2:</b>	Disco	ver th	e kno	wledg	ge usir	g on	tology	<i>.</i>					K2
	Jutcome	;	CO3:	Identi	fy the	com	munit	ies in s	socia	l netw	orks.					K3
			CO4:	Predic	et hun	nan be	ehavio	or in so	ocial	web a	nd re	lated c	ommuni	ties.		K2
			CO5:	Apply	/ repre	esentat	ion te	chnique	es for	visual	izing	social r	etworks.			K3
Pre-r	equisite	s	-													
		(3	5/2/1 inc	licates	streng	C th of c	O / Pe	O Map tion) 3-	p <mark>ing</mark> Stron	g, 2 − 1	Mediu	m, 1 – `	Weak	CO Ma	/PSO pping	
						Pr	ogram	me Out	come	s (POs	)		1	P	SOs	
	COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO	2
	CO 1	3	2	1	2	2	2	1	1		1		1	2	1	
	CO 2	3	2		2	2							1	2	1	
	CO 3	3	2		2	2	2	1	1		1		1	2	1	
	CO 4	3	2		2	2							1	2	1	
	CO 5	3	2	2	2	2	2	1	1		1		1	2	1	
Cou	rse Asse	ssme	ent Me	thods	5											
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Cont	ent of th	e syl	labus													
Unit	<b>-I</b>						INTI	RODU	CTI	ON				Peri	ods	9
Intro Web analy Appl	duction to - Social vsis - Elections of the second second second	o Sem Netwo etroni of Soc	antic Work ana ork ana c source vial Net	Veb: L Ilysis: es for work A	imitati Devel netwo Analys	ions of opmer ork an sis.	f curre nt of S alysis	ent Web Social I : Electi	) - De Netwo onic	velopr ork An discus	nent o alysis sion n	f Sema - Key ietwork	ntic Web concepts s- Web-b	- Emerge and mea based net	nce of the sures in works -	he Social network

Unit - I	I	MODELLING, AGGREGATING AND KNOWLEDGE	Period	ls	9
Ontolog	r and thain	REPRESENTATION	Ontology	100 00	ages for
the Sem	y and their antic Web.	Resource Description Framework - Web Ontology Language - Modelin	o and ago	Tangu Tegatin	ages for
network	data: State	e-of-the-art in network data representation - Ontological representation	of social	indiv	iduals -
Aggrega	ting and re	asoning with social network.			
I Init	тт	EXTRACTION AND MINING COMMUNITIES IN WEB	Deriod	10	0
Unit – I		SOCIAL NETWORKS	1 01100	15	,
Extracti	ing evoluti	on of Web Community from a Series of Web Archive - Detecting	commun	ities in	n social
network	ks - Defin	ition of community - Evaluating communities - Methods for com	nmunity o	letecti	on and
mining	- Applicat	ions of community mining algorithms - Tools for detecting comm	iunities so	ocial r	ietwork
infrastru	uctures and	a communities - Decentralized online social networks - Multi-Rela	tional cha	racter	ization
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Distribu	tion - Enab	ling new human experiences - Context - Awareness - Privacy in online s	ocial netw	orks -	Trust in
online en	nvironment	- Trust models based on subjective logic - Trust derivation based on tru	ist compar	isons -	· Attack
spectrun	n and count	ermeasures.	^		
Unit _ `	V	VISUALIZATION AND APPLICATIONS OF SOCIAL	P	eriods	9
Omt	•	NETWORKS	1	ciious	
Graph th	heory - Ce	ntrality - Clustering - Node-Edge Diagrams - Matrix representation - V	/isualizing	onlin	e social
network	s, Visualizi	ng social networks with matrix-based representations - Matrix and Node-	Link Diag	rams -	Hybrid
represen		spirearions - cover networks - community wenare.	Fotal Per	iods	45
Textbo	oks:				
1.	Peter Mik	a, "Social Networks and the Semantic Web", First Edition, Springer 2007	7.		
2.	BorkoFur	ht, "Handbook of Social Network Technologies and Applications", 1st E	dition, Spri	inger, i	2010.
3	Guandon	gXu, Yanchun Zhang and Lin Li, "Web Mining and Social Network	king – Te	chniqu	ies and
5.	applicatio	ns", First Edition Springer, 2011.			
4.	Dion Gol	and Schubert Foo, "Social information Retrieval Systems: Emergences for Searching the Web Effectively" IGI Global Snippet 2008	ging Tech	nologi	es and
Referen	ces:	Silo for Searching are wee Enteentery , for croour chipper, 2000			
1	Max Che	valier, Christine Julien and Chantal Soule-Dupuy, "Collaborative and S	Social Info	rmatic	n
1.	Retrieval	and Access: Techniques for Improved user Modeling", IGI Global Snipp	et, 2009.		
2.	John G. E	reslin, Alexander Passant and Stefan Decker, "The Social Semantic Web	", Springer	r, 2009	).
3.	Stanley V June 2012	Vasserman, "Social Network Analysis Methods and Applications", Cam 2.	bridge Uni	iversit	y Press,
E-Resou	irces:				
1.	Social N	etwork Analysis and Mining   Home (springer.com)			
2.	Social ne	etwork analysis - Wikipedia			
3.	Social ne	twork analysis: An approach and technique for the study of inform	ation excl	nange	_
	SCIEncel	<u>Direct</u>			
4.	<u>SINA-10</u>				
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Uni	t - II	<b>RESOURCE DESCRIPTION FRAMEWORK</b>	Periods		9
RDFand RDF re element Browsin	dSemantic elation Rl ts– RDF ng, RDF/	Web–BasicIdeas-RDFSpecification–RDFSyntax:XMLandNon-XM DFandSemanticWeb–BasicIdeas-RDFSpecification–RDFSyntax:XI relationship: Reification, Container, Collaboration – RDF Scher XML-RQL-RDQL	4L-RDF MLandNon na –Editing	ele -XM g, Pa	ments– L-RDF arsing,
Unit	– III	ONTOLOGY	Periods		9
Why C and Co Reusin	Ontology– omplex – ig Ontolog	Ontology movement–OWL–OWLSpecification-OWLElements– O Ontology Engineering : Introduction –Constructing Ontologies – gies – On-To KnowledgeSemantic Webarchitecture	WL constru	icts:	Simple
Unit – I	IV	LOGIC AND INFERENCE	Periods		9
Logic – Rules – Rules	Descripti Motivati	on Logics - Rules – Monotonic Rules: Syntax, Semantics and Examon, Syntax and Examples – Rule Markup in XML: MonotonicRule	nples – Nor es and Non	i moi -Moi	notonic notonic
Uni	t - V	APPLICATIONS OF SEMANTIC WEBTECHNOLOGIE	S Per	iods	9
RDF U Web mi	ses: Com ining – Ho	mercial and Non-Commercial use – Sample Ontology – E-Learn prizontal information – Data Integration – Future of SemanticWeb	ing –Web	Servi	ices –
			<b>Fotal Perio</b>	ds	45
Textbo	oks:	and and an and an and an and an			
1.	Grigoris	Antoniou, Frank van Harmelen," A Semantic Web Primer "MIT, 2 nd Edr	tion, Press,20	)20	0.7
2.	Spinning	the Semantic Web: Bringing the world wide web to its full potential – Th	e MIT Press	-20	05
3.	Shelley F	owers – "Practical RDF" – O'reilly publishers – First Indian Reprint : 20	)3		
Referen	ces:	Anastrach Descal Hitzlan and Cabastian Dudalph " Foundations of Como	atio Wah		
1.	Technolo	gies", CRC press, 2009	nic web		
2.	Michael XML, W	C. Daconta, Leo J. Obrst, and Kevin T. Smith, "The Semantic Web: A Veb Services, and Knowledge Management", Fourth Edition, Wiley Public	Guide to the Guide to the Guide shing, 2003.	ne Fi	iture of
3.	John Da Ontolog	vies, Rudi Studer, and Paul Warren John, "Semantic Web Technologies: 7 y-based Systems", Wiley and Son"s, 2006.	Frends and R	eseai	ch in
E-Resou	irces:				
1.	https://w	/www.w3.org/standards/semanticweb/			
2.	https://w	/ww.w3.org/RDF/			
3.	https://c	se.iitkgp.ac.in/~tkmishra/files/SEMANTIC%20WEB%20report.pdf			
4.	https://o	bitko.com/tutorials/ontologies-semantic-web/			
5.	https://w	www.geektonight.com/web-technologies-notes-pdf/			



#### VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode - 637 205



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- Assignment 2. 3.
- End-Semester examination

Indirect

Content o	f the syllabus		
Unit – I	Computer Investigations	Periods	9
Computer	Investigations: Preparing a Computer investigation - Taking a systematic app	roach –	
Assessing	the case - Planning Investigation - Securing evidence. Procedures for Con-	rporate Hi	igh:
Tech invest	stigations – Conducting an Investigation – Completing the case.		
Unit – II	Data Acquisition	Periods	9
Understan	ding storage formats for digital evidence - Determining the best acquisit	ion metho	od -
Contingen	cy planning for image acquisitions - Using Acquisition tools: Windows XP Wr	ite- protect	tion
with USB	Devices - Validating Data Acquisitions: Windows Validation Methods - Perfe	orming RA	AID
Data Acq	uisitions – Using Remote Network Acquisition tools – Using other		
Forensics	Acquisition tools.	-	
Unit – III	Processing Crime and Incident Scenes	Periods	9
Identifying	g Digital Evidence – Collecting Evidence in Private Sector Incident Scenes – Pro	ocessing L	law
Enforcem	ent Crime Scenes – Preparing for a Search –Securing a Computer Incident or C	rime Scen	e –
Seizing D	igital Evidence at the Scene –Storing Digital Evidence –Obtaining a Digital H	ash —	
Reviewing	g a Case.		
Unit – IV	Computer Forensic Tools, Analysis and Validation	Periods	9
Evaluating	g Computer Forensics Tool Needs -Computer Forensics Software Tools	– Comp	uter
Forensics	Hardware Tools – Validating and Testing Forensic Software - Computer Forer	sics Anal	ysis
and Valid	ation: Determining Data Collection and Analysis –Validating Forensic Data	-Address	sing
Data-Hidi	ng Techniques –Performing Remote Acquisitions.		
Unit – V	Recovering Graph Files, Email Investigations	Periods	9
Recognizi	ng Graph File- Understanding Data Compression- Locating And Recovering (	Graphic Fi	iles-
Identifying	g Un known File Formats- Understanding Copyright Issues- Investigating	Email Cri	mes
And Viola	tions- Understanding Email Servers- Using Specialized Email Forensic Tools.		
	Total	Periods	45
CASE ST	UDY:		
Only for A	Assignment not for end sem examination.		
1. Illegal	money transfer 2. Network data reveals theft of trade secrets 3. Data	from vehi	icle
infotainm	ent, telematics and black box systems 4. Intellectual property theft		
Text Bool	KS		
1.	Nelson Bill, Phillips Amelia and Steuart Christopher, "Guide to Computer F	orensics a	ind
	Investigations", 4 th Edition, Cengage Learning, 2020.		
Reference	es l		
1.	Marie-Helen Mara, "Computer Forensics", 2 nd Edition, Jones and Bartle 2015.	ett Learni	ng,
2.	Albert Marcella Jr, "Cyber Forensics", 2 nd Edition, Auerbach Publications, 2	2007.	
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E-Resour	rces		

1	https://www.slideshare.net/sumeetpatel21/data-acquisition-system-40835631
2	https://samsclass.info/121/ppt/ch05.ppt
3	https://resources.infosecinstitute.com/topic/7-best-computer-forensics-tools/
4	https://www.guru99.com/computer-forensics-tools.html
5	https://www.tutorialspoint.com/python_digital_forensics/python_digital_forensics_investi gation_using_emails.htm

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Unit – I		INTRODUCTION TO BIOMETRICS	Periods	9
History of Bio Characteristic Measures- Do Biometrics, B	ometrie cs- Bas esign enefits	cs, Types of Biometric Traits, General Architecture of Bio ic working of Biometric Matching, Biometric System of Biometric Systems, Identification and Verification of Biometrics versus Traditional Authentication Methods	ometric Systen Error and Concepts-Aj	em, Biometric Performance oplications of
Unit - II		FACE, FINGERPRINT, RETINA AND IRIS BIOMETRICS	Periods	9
Introduction t Network for Recognition System, Minu Iris Segment Applications	to Face I Face I Methoutiae E tation of Iris	e, Finger Print Retina and Iris biometrics-Design of Fac Recognition-Face Detection in video sequences, Challen ds, Advantages and Disadvantages8Fingerprint Biome xtractionDesign of Retina and Iris Recognition System, Method Determination of Iris Region, Experiment s Biometrics, Advantages and Disadvantages.	e Recognition ages in Face strics, Finger al Results	on System, Neural Biometrics, Face rprint Recognition of Iris Location,
Unit - III		PRIVACY ENHANCEMENT AND CRYPTOGRAPHY FOR BIOMETRICS	Periods	9
Introduction deployment, i biometrics in attacks Sym architecture o and ear, Char	to pr identity terms nmetric f multi racteris	ivacy enhancement and biometric cryptographyPriva y and privacy, privacy concerns, biometrics with privacy of privacy, soft biometricsGeneral purpose crypto sys c key ciphers, cryptographic algorithms-Introduction to modal biometrics-Multimodal biometrics using face tic and advantages of multimodal biometrics.	cy concerns enhancemer stem, Model Multimodal	s associated with nt Comparison of cryptography and biometrics, Basic
Unit - IV		IMAGE ENHANCEMENT TECHNIQUES	Periods	9
Introduction 1 Techniques- I Experimental	to Ima Image I results	ge Enhancement Techniques, Current Research in Imag Enhancement, Frequency Domain Filters, Databases and Ir s of Image Enhancement Techniques.	e Enhancen nplementatio	nent Dn
Unit - V		BIOMETRICS: SCOPE AND FUTURE, REPOSITORIES FOR DATABASE AND BIOMETRICSTANDARDS	Periods	9
Scope and fut infrastructure, technology an various biome	ture m , Role nd bion etric teo	arket of biometrics-Applications of biometrics, Biometric of biometrics in enterprise security, Role of biometrics netrics, Radio frequency identification biometrics, DNA bio chniques. Biometric Databases and BiometricStandards.	es and inform in border se ometrics, Con	nation technology curity-Smart card mparative study of
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Text Books:				
	G.R.Si New D	nha, Sandeep B Patil,"Biometrics:Concepts and Applicatio elhi,2013.	ons",Wiley p	ublications,
2. l	Robert Cengaş	Newman" Security and Access control using B geLearning,,2010.	iometric T	echnologies",
<b>References:</b>				
1. J	Jain, A	K., Flynn, P. and Ross, A. Handbook of Biometrics. 2008	3.	
2. <b>H</b>	Ruud N 'Guide	1.Bolle, Sharath Pankanti, Nalini K. Ratha, Andrew W. S to Biometrics ",Springer ,2009.	enior, Jonatl	han H. Connell,
3. H	Rafael 2 nd Edit	C. Gonzalez, Richard Eugene Woods," Digital Image Pro ion,Tata McGraw-Hill Education ,2010.	ocessing usi	ng MATLAB",
<b>E-Resources:</b>				
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### VERTICAL III : ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

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Course	e Code		(	Course	Name		Per	riods P	er W T	Veek P	Cre	dit	Max CA	imum N ESE	Marks E Total
U19C	SV34	Ad	vanced	Datab	ase Sys	stems	3	3	0	0	3	;	40	60	100
Course Objecti	ve	Th	e studer Ur A _I Le Li En	nt shoul nderstar oply ind carn the stening nrich the	ld be m nd the b lexing a concep the cor e knowl	ade to, asics of and hash ats of Ob acept of ledge of	Query ing tec bject O Databa NoSQ	proces hnique riented use secu L, Mor	ssing es in data urity ngoI	g. the d abase 7. DB.	esign	of re	lational o	latabase	9.
		At	the end	of the o	course,	the stud	ent sho	ould be	able	e to,				Kno	wledge Level
		CO	01: Ou op	utline t eration	he featı s	ures of	Query	proce	ssin	g and	l rela	ationa	l algebra	a	K2
Course Outcom	ne	CO	<b>2:</b> Aj da	pply ind tabase	dexing	and has	hing te	echniqu	ies i	in the	desig	gn of	relationa	al	K3
		CO Dat	<b>3:</b> Extabase T	kplain t Fechnol	he con ogies	cepts of	Objec	t Orie	nted	and	Exter	nded ]	Relation	al	K2
		CO	<b>4:</b> A1	nalyze a	& tune	the Data	ibase se	ecurity							K4
		CO	<b>5:</b> Aj	pply the	e princij	ples & te	echniqu	ues of a	Adva	anced	Data	bases			K3
Pre-requ	iisites	-													
	(3	/2/1 inc	dicates s	trength	CO / I of correl	PO Mapp lation) 3-	<b>ping</b> Strong,	2 – Me	ediur	n, 1 - `	Weak			CO/PS Mappi	O ng
Cos					Progra	mme Ou	tcomes	(POs)						PSOs	
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	Р	09	PO 10	PO 11	PO 12	PSO1	PSO 2
CO 1	2	3	3	3	2								2	2	3
CO 2	1	3	3	2	2								3	2	2
CO 3	2	2	3	3	2								2	2	3
CO 4	2	2	3	2	2								2	2	3
CO 5	2	2	3	3	2								3	2	2
C			lathada												
Course	Assessn	nent M	iemous												
Direct           1.           2.           3.	Assessn Contin Assign End-S	nuous A nment/ emeste	Assessm Quiz/Se er exami	ent Tes minar inations	t I, II &	III									
Direct     1.     2.     3.   Indirect	Assessn Contin Assign End-S	nuous A nment// emeste	Assessm Quiz/Se er exami	ent Tes minar inations	t I, II &	III									
Direct     1.     2.     3.   Indirect	Assessn Contin Assign End-S	nuous A nment// emeste	Assessm Quiz/Se er exami end sur	ent Tes minar nations wey	t I, II &	III									
Direct       1.       2.       3.   Indirect	Assessn Contin Assign End-S	nuous A nuous A nment/( emeste	Assessm Quiz/Se er exami end sur	ent Tes eminar inations evey	t I, II &	III									

Conte	ent of the sy	llabus		
U	nit – I	QUERY PROCESSING	Periods	9
Basic	concepts	of query processing - converting SQL queries into Rela	tional Algebr	a - Basic
Algo	rithms for	executing query operations - Query tree and query graph - H	Heuristic optir	nization of
query	tree.			
U	nit – II	INDEXING, HASHING AND CURRENT ISSUES	Periods	9
Orde	red indices	B - B tree index files $-B + T$ ree index files $-Multiple key acce$	ess – Static an	d Dynamic
Hash	ing – Bitm	ap indices- Active Database Concepts – Introduction to Deduc	tive Database	es – Clausai
Oper	and $1011$	ultimedia Databases		
Open		OBJECT ORIENTED AND EXTENDED		
Un	nit - III	RELATIONAL DATABASE TECHNOLOGIES	Periods	9
Over	view of O	bject oriented database - OO Concepts - Encapsulation of O	perations and	methods -
Inher	itance - O	bject Model - Object definition language - Object Query La	nguage - Obj	ect
Relat	ional Con	cepts.	<u>.                                    </u>	
Un	it – IV	DATABASE SECURITY	Periods	9
Intro	duction to	Database Security Issues- Discretionary Access Control	Based on Gr	anting and
Revo	king Privi	leges- Mandatory Access Control and Role-Based Access	Control for	Multilevel
Secu	rity- Introc	luction to Statistical Database Security- Encryption and Put	blic Key Infra	structures-
	enges to N	ADVANCED DATADASE TECHNIQUES	Dorioda	0
NoS	$\frac{\mathbf{m}\mathbf{l} - \mathbf{v}}{\mathbf{N} \mathbf{o} \mathbf{t} \mathbf{O}}$	ADVAILED DATABASE TECHNIQUES	IS and Mongy	DR Data
Type	s in Mon	xoDB – MongoDB Query Language- MongoDB Atlas –	Introduction	to Anache
Cassa	andra – CO	DL Data Types – COLSH – CRUD operations –Collections –	Using a cour	ter – Time
to Liv	ve – Alter	Commands – Import and Export – Querying System Tables.	8	
		Tota	al Periods	45
Text	Books:			
1.	Elmasri &	x Navathe Fundamentals of Database Systems, Pearson Education,	7th Edition,20	16
2.	Rini Chal Dreamtec	krabarti, Shilbhadra Dasgupta Advanced Database Manageme h press,2014	ent System (N	AISL-DT),
3.	Silberscha McGraw	atz Abraham, Korth Henry F. and Sudarshan S., —Database Syste Hill, New York, 2019.	em Concepts ^I , '	7th Edition,
Refere	ences:			
1.	Database	Illuminated, Catherine Ricarso, Second Edition, Jones & Bartleft L	earning.2013	
2.	Database	Management System, S K Sinha, Second Edition, Pearson Publica	tion 2011	
3.	Data Base	Management System, Leon & Leon, Vikas Publications ,2010		
4.	Introducti	on to Database Systems, Bipin C Desai, Galgotia, 2012		
Resour	ces:			
1.	https://ww ation.htm	vw.tutorialspoint.com/distributed_dbms/distributed_dbms_relationa	<u>ıl_algebra_que</u> ı	ry_optimiz
2.	https://ph	penixnap.com/kb/object-oriented-database		
3	https://ww	vw.analyticsvidhya.com/blog/2020/09/different-nosql-databases-ev	very-data-scien	tist-must-
5.	<u>know/</u>	-		

Q	VIVEKANANDHA ( (Autonomous Institution	COLLE W(	EGE O DMEN ated to	F ENC	GINEEF Univers	RING FO	<b>R</b> nai)	ISO 9001-2015			
Programme	Eldy BTECH Program	ampaia	ayam,	TITUCIO		- 03 / 203 Regulatio	on	2019			
Department	INFORMATION TECHN	INFORMATION TECHNOLOGY Semester									
Department		- ks									
Course Code	Course Name	L	T	P	C	CA	ESE	Total			
U19ITV31	Data Science	3	0	0	3	40 60		100			
Course Objective	<ul> <li>The student should be made to,</li> <li>Building the fundamentals of data science.</li> <li>Imparting design thinking capability to build big-data</li> <li>Developing design skills of models for big data problems</li> <li>Gaining practical experience in programming tools for data sciences</li> <li>Empowering students with tools and techniques used in data science</li> </ul>										
	At the end of the course, t	he stud	ent sho	ould be	able to,			Knowledge Level			
	<b>CO1:</b> Make use of data applications	K2									
Course	<b>CO2:</b> Apply machine leadata	e K2									
Outcome	<b>CO3:</b> Experiment with H applications	Iadoop	and S	park p	latform	for data s	scienc	e K2			
	<b>CO4:</b> Apply the data science using NoSQL database a	ence pr nd Gra	rocess aph dat	to solv abase	ve real v	world pro	blem	К3			
	<b>CO5:</b> Make use of text an text mining problem	alytics	techni	ques fo	or buildir	ng solution	ns for	K3			
Pre- requisites	-										

	CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak													'SO bing
COs	COs Programme Outcomes (POs)												PSC	Ds
	PO1	01 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12										PSO1	PSO2	
CO 1	3	2	1	-	-	-	-	-	-	-	-	-	3	2
CO 2	3	2	1	-	-	-	-	-	-	-	-	-	3	2
CO 3	3	3 2 1								3	2			
CO 4	3	2	1	-	-	-	-	-	-	-	-	-	3	2
CO 5	3	2	1	-	-	-	-	-	-	-	-	-	3	2

Direct

- Continuous Assessment Test I, II & III
   Assignment.
   End-Semester examinations.

### Indirect

Conten	t of th	e syllabus							
Unit – I	[	Introduction to data science	Periods	9					
Benefits	s of D	ata Science - Facets of Data - Data Science Process -	Big Data Ecos	system and Data					
Science	–Exan	nple using Hadoop. The Data Science Process: Overview	v – Defining R	lesearch Goals –					
Retrievi	ing Da	ata – Data Preparation – Exploratory Data Analysis –	Building Mo	dels – Building					
Applica	tions.								
Unit – I		Machine learning and handling big data	Periods	9					
Applica	tions f	for Machine Learning in Data Science – Machine Learn	ing in Data So	cience Process –					
The Mo	odeling	g Process. Handling Large Data: Problems in Handling	g Large Data -	- General					
I echniq	jues –	Programming Tips – Case Studies.	Desiteda	0					
Unit - I	uii vii T	Distributed data storage and processing	Periods	9					
Distribu	iting L	Data Storage and Processing with Frameworks: Hade	pop – Spark	– Case Study:					
Assessi	ng Kis	k with Loaning Money – OwASP Introduction.	Dominda	0					
	and a	Data and Storage API Service	The DAC	9 E. Dringinlag, of					
NOSQL	ana Doto	graph database: Introduction: ACID- CAP Theorem	1 - 1 ne BAS.	E Principles of that? Graph					
Databas	Dala	values - NOSQL Database Types - Case Study. W	nat uisease i	s that? – Oraph					
Databas	- V Text Mining and Text Analytics Periods 9								
Toot Mi	<b>v</b> ining i	in Deal World Text Mining Techniques: Dec of W	rda Stamm	y					
Lemma	tizatio	n Decision Tree Classifier Case Study: Classifying R	Peddit Posts	ing and					
Lemma	iizaiio		Cotol Domioda	45					
Toyt Bo	nok.	1	otal I erious	43					
I CAL D	Dovu	Ciolon Arno D. P. Moveman Mahamad Ali "Introdu	aina Data Saia	maa Dig Data					
1	Davy Macl	vine Learning and more Using Python Tools" First e	dition Manni	ng Publications					
1.	2016	inc Learning and more, Using Tython Tools, Thist e		ing 1 ublications,					
Referer	ices:								
	"Data	a Science and Big data Analytics: Discovering Analyzi	ng. Visualizing	and Presenting					
1.	Data	"- http://education.EMC.com/academicalliance. Kindle.	EMC Education	n Services.2015.					
2.	Joel	Grus, "Data Science from the Scratch", Second edition, C	D"Reilly,2019	,					
E-Reso	urces:								
1.	https	://www.datacamp.com/							
2.	https	://www.udacity.com/							
3.	https scien	://nathancarter.github.io/MA346-course-notes/_build/htr ce.html	nl/chapter-1-ir	tro-to-data-					
4.	https	://owasp.org/							

	VIVEF (Autonor	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205										
Programme	<b>B.TECH</b>		Programme Code 104 Regulation									
Department	INFORMA	ATION TECHNOL		-								
Course Code	Co	ourse Name	Perio	ds Per	Week	Credit	Maxim	um Ma	ırks			
		Jurse rvanne	L	Т	Р	С	CA	ESE	Total			
U19ITV32	DEEP	LEARNING	3	0	0	3	40	60	100			
Course Objective	<ul> <li>To understand the concepts of machine learning algorithms and neural network and regularization</li> <li>To understand the convolutional networks and case studies of deep learning techniques</li> </ul>								learning			
	At the end	]	KL									
	<b>CO1:</b> Und	]	K2									
Course	CO2: Und challenges	]	K2									
Outcome	CO3: Des	ign basic deep learr	ning mo	odels				]	K3			
	CO4: Opt networks	imize deep networ	ks and	under	stand t	he conv	volutional	]	K3			
<b>CO5:</b> Explore the knowledge in deep learning applications like computer vision, speech recognition and natural language processing								;	K2			
Pre- requisites	-	-										

	CO / PO Mapping													SO	
	(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak													oing	
COs	Programme Outcomes (POs)													PSOs	
	PO1	PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12										PSO1	PSO2		
CO 1	2	1	1	1	1	1							2		
CO 2	2	2 1 1 1 1 1							2						
CO 3	3	2	2	2	3	2						2	3	1	
CO 4	3	2	2	1	3	2							3		
CO 5	2	2 1 2 3 1 2 2										2	1		

DIRECT

- 1. Continuous Assessment Test I, II & III
- 2. Assignment
- 3. End-Semester examinations

INDIRECT

Conter	nt of the	syllabus							
Uni	it – I	INTRODUCTION	Periods	9					
Introdu Learnin Estima	uction- H ng Algor utors, Bias	listorical Trends in Deep Learning, Applied Math an ithms, Capacity, Overfitting and Underfitting, Hyper pa s and Variance, Maximum Likelihood Estimation, Baye	nd Machine rameters and sian Statistic	Learning Basics, I Validation Sets, s.					
Uni	t – II	LEARNING ALGORITHMS	Periods	9					
Superv Buildir	vised Lea	rning Algorithms, Unsupervised Learning Algorithms, hine Learning Algorithm, Challenges Motivating Deep	Stochastic C Learning	radient Descent,					
Unit	t – III	DEEP NETWORKS	Periods	9					
Deep F	Feed forw	vard Networks, Gradient-Based Learning, Hidden Unit	s, Architectu	re Design, Back-					
Propag	gation and	l Other Differentiation Algorithms.							
Unit	t - IV	<b>REGULARIZATION AND OPTIMIZATION</b>	Periods	9					
Parame	eter Norn	n Penalties - Norm Penalties as Constrained Optimiza	tion - Regula	arization and					
Under-	Under-Constrained Problems - Dataset Augmentation -Noise Robustness - Semi-Supervised								
Learnin	Learning - Multitask Learning, Pure Optimization - Challenges in Neural Network Optimization.								
Uni	Unit - VCONVOLUTIONAL NETWORKS AND APPLICATIONSPeriods9								
Convolutional Networks: Convolution Operation –Pooling – Functions - Random or Unsupervised									
Feature. Application: Large-Scale Deep Learning - Computer Vision - Speech Recognition - Natural									
Langua	age Proce	essing.	-	-					
		Te	otal Periods	45					
Text B	ooks :								
1.	Ian Goo	dfellow, YoshuaBengio, Aaron Courville, Deep Learnir	g, MIT Press	s, 2016.					
2.	Deng &	Yu, Deep Learning: Methods and Applications, Now P	ublishers, 20	13.					
Refere	ences :								
1.	Simon I 2009	Haykin, Neural Networks and Learning Machines, 3r	d ed, Pearso	on Prentice Hall,					
2.	Michael	Nielsen, Neural Networks and Deep Learning, Determi	nation Press,	2015.					
E-Res	sources :								
1.	http://ww	ww.deeplearningbook.org/							
2	https://www.microsoft.com/en-us/research/wp-content/uploads/2016/02/DeepLearning-								
2.	NowPublishing-Vol7-SIG-039.pdf								
3.	https://www.math.univ-toulouse.fr/~besse/Wikistat/pdf/st-m-hdstat-rnn-deep-learning.pdf								
4.	http://faculty.neu.edu.cn/yury/AAI/Textbook/Deep%20Learning%20with%20Python.pdf								
5.	http://de	eplearning.net/tutorial/deeplearning.pdf							
6.	http://dai.fmph.uniba.sk/courses/NN/haykin.neural-networks.3ed.2009.pdf								

Ç			VIV	EKAN (Autono ,Chen	ANDHA omous I nai)Elay	A COI nstituti yampal	LEGI WOM ion, Af layam,	E OF E EN filiatec Tiruch	NGIN l to Ann nengode	EERIN na Unive e – 637 2	<b>G FOR</b> ersity 205		CO 200 200 EVentual Control	
Prog	ramme	e	<b>B.E.</b> /	<b>B.TEC</b>	H. Pr	ogram	me Co	de			Regulation	201	9	
Depa	rtmen	t (	CSE, I	Г & CS	т						Semester		-	
Cour	rse Co	de	Cou	rse Nai	me		Period L	s Per V	Veek P	Credit C	CA N	laximu ESE	m Marks Total	
U190	CTV3	5 N Pi	atural rocess	Lang ing	uage		3	0	0	3	40	60	100	
Co Obj	ourse jective	7	<ul> <li>Provide the student with knowledge of various levels of analysis involved in NLP.</li> <li>Understand the applications of NLP.</li> <li>Gain knowledge in automated Natural Language Generation and Machine Translation.</li> </ul>											
		I	At the e	nd of th	ne cours	e, the s	student	should	i be abl	e to,		Kno	owledge Level	
<b>CO1:</b> Extract information from text automatically using concepts and methods from natural language processing (NLP) including stemming, n-grams, POS tagging, and parsing.											K2			
Co Out	ourse tcome	(	CO2 : phonet	Develogics, spe	p speec	h-base	d appl n, and	ication synthe	s that sis).	use spee	ch analysis		K3	
		( V	CO3:	Analyze in a nat	e the synutria the synutria the synutrical termination of the synutrical sector is the synutrica	ntax, so guage.	emanti	cs, and	l pragm	atics of	a statement		K2	
		I	CO4 : process	Apply 1 ing.	machine	e learn	ing alg	gorithm	is to na	tural lar	nguage		K3	
		(	C <b>O5 :</b> I	Evaluate	e the per	rforma	nce of	NLP to	ools and	l system	8.		K4	
Pre-re	quisit	es -												
	(3/2/	1 indio	cates st	rength o	CO/I of correl	<b>PO Ma</b> lation)	<b>pping</b> 3-Stro	ng, 2 –	Mediu	m, 1 - W	/eak	CO/PSO Mapping		
				Pro	gramme	Outco	omes (l	POs)	_	-		PSC	Os	
COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO         PO           11         12	PSO 1	PSO 2	
CO1	1	2	2	1								2	1	
CO2	1	2	2	1						2		2	2	
CO3		2	2	1			-			1		2	1	
C04 C05	1	1											1	
05	1	1	Z	1								2		
Course Assessment Methods Direct														
Di	Direct <ol> <li>Continuous Assessment Test I, II &amp; III</li> <li>Assignment.</li> <li>End-Semester examinations</li> <li>Indirect</li> </ol>													
1.Course - end survey														

Content	of the	syllabus		
Unit	t – I	OVERVIEW AND MORPHOLOGY	Periods	9
Introduc –Finite State M	ction - State A lorpho	- Models -and AlgorithmsRegular Expressions Basic Automata-Morphology -Inflectional Morphology - Derivat logical ParsingPorter Stemmer.	Regular Explored	pression Patterns blogyFinite-
Unit	t - II	WORD LEVEL AND SYNTACTIC ANALYSIS	Periods	9
-N-gran Deleted Rule Ba Based T	ns Mo I Interp ased P Faggin	odels of Syntax - Counting Words - Unsmoothed N-gram oolation – Entropy - English Word Classes - Tagsets for Er art of Speech Tagging - Stochastic Part of Speech Tagg g.	ns-Smoothing nglish-Part of ing - Transfo	g- Back off Speech Tagging- prmation-
Unit	- III	CONTEXT FREE GRAMMARS	Periods	9
Context Constru Structur	t Free actions res – P	Grammars for English Syntax- Context- Free Rules and Tr –Agreement – Sub Categorization-Parsing – Top-down – robabilistic Context-Free Grammars.	eesSentenc - Earley Par	e- Level sing -feature
Unit	- IV	SEMANTIC ANALYSIS	Periods	9
Represe Represe Attachr Structur	enting enting nents re - W	Meaning - Meaning Structure of Language - Firs Linguistically Relevant Concepts -Syntax- Driven S -Syntax- Driven Analyzer Robust Analysis - Lexeme Yord Sense Disambiguation -Information Retrieval.	et Order Pro emantic Ana s and Their	edicate Calculus- alysis - Semantic Senses - Internal
Unit	t - V	LANGUAGE GENERATION AND DISCOURSE ANALYSIS	Periods	9
Discour Convers Generat Metaph	rse -Re sationa tion – or–Int	eference Resolution - Text Coherence - Discourse Struct al Agents - Dialog Acts – Interpretation - Conver- Architecture -Surface Realization-Discourse PlanningI erlingua – Statistical Approaches.	ture – Coher sational Machine Tra	ence-Dialogand Agents-Language nslation -Transfer
		T	otal Periods	45
Text B	ooks:			
1. I i S	Daniel introd Speecł	Jurafsky and James H Martin, "Speech and Lang action to Natural Language Processing, Computational I Recognition", PrenticeHall, 2nd Edition, 2008.	uage Proces Linguistics an	sing: An nd
2. P	C. M rocess	anning and H. Schutze, "Foundations of Statis ing",MIT Press. Cambridge, MA:,1999.	tical Natur	al Language
Reference	ces:			
1. J	James	Allen, Bejamin/cummingsx, "Natural Language Understan	ding", 2nd ec	lition, 1995.
E-Resou	rces:			
1. ł	https://	www.techtarget.com/searchenterpriseai/definition/natural-	language-pro	ocessing-NLP.
2. ł	https://	/www.sas.com/en_us/insights/analytics/what-is-natural-lan	guage-proces	ssing-nlp.html
3. ł	https://	towardsdatascience.com/your-guide-to-natural-language-p	rocessing-nlp	p-48ea2511f6e1
4. ł	https://	github.com/oxford-cs-deepnlp-2017/lectures/blob/master/l	README.m	d
5.   ł	https:// 2022- v	www.analyticsvidhya.com/blog/2022/01/master-natural-la/ with-best-resources/	nguage-proc	essing-in-

Q	VIVEKAN (Autonomous	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205										
Programme	B.TECH	Programme Code	10	4		F	Regulation		2019	)		
Department	INFORMATION T	ECHNOLOGY					Semester					
Course Code	Course Name			Periods Per WeekCreditLTPC			Credit C	Max CA	kimum ESE	Marks Total		
U19ITV33	SOFT COMPUT	TING		3	0	0	3	40	60	100		
Course Objective	<ul> <li>Ine main objective of the course is to:</li> <li>Study an overview of soft computing techniques</li> <li>Understand the neural networks</li> <li>Introduce the applications of soft computing</li> </ul>											
	At the end of the o	course, the student v	vill b	e able	to:				Knov Le	wledge evel		
	CO1 : Demonstra	te different types of	artif	ïcial r	neural	networ	ks		]	K3		
Course	CO2 : Understand	d the concept of fuzz	zy sy	stems					]	K2		
Outcome	CO3 : Summarize	e the various special	netv	vorks					]	K2		
	CO4 : Use genetic	c algorithms to deve	$\frac{1}{1}$	the sol	utions				]	<u>K3</u>		
Pre-	COS: Analyze the soft computing applications K3											
requisites	-											
	(3/2/1 indicates stre	CO / PO Mappi ength of correlation) 3-Stro	<b>ng</b> ng. 2 -	– Mediu	m. 1 - W	/eak		CC Ma	)/PSO pping			

CO/ I O Mapping												00/1	50		
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak													Mapping		
	Programme Outcomes (POs)												Os		
PO1	PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12											PSO1	PSO2		
3	2	1	1									2	2		
2	1											2	2		
2	1											2	2		
3	2	1	1									2	2		
3	2	1	1									2	2		
	PO1 3 2 2 3 3	(3/2/           PO1         PO2           3         2           2         1           2         1           3         2           3         2           3         2           3         2           3         2           3         2	(3/2/1 indica           PO1         PO2         PO3           3         2         1           2         1         1           2         1         1           3         2         1           3         2         1           3         2         1           3         2         1           3         2         1	(3/2/1 indicates street           PO1         PO2         PO3         PO4           3         2         1         1           2         1         1         1           2         1         1         1           3         2         1         1           3         2         1         1           3         2         1         1           3         2         1         1	(3/2/1 indicates strength of a strength of	(3/2/1 indicates strength of correlat       Program       PO1     PO2     PO3     PO4     PO5     PO6       3     2     1     1     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     -     - <td>COLUTIONING           COLUTIONING           (3/2/1 indicates strength of correlation) 3-St           Programme Outco           PO1         PO2         PO3         PO4         PO5         PO6         PO7           3         2         1         1        </td> <td>(3/2/1 indicates strength of correlation) 3-Strong, 2       Programme Outcomes (PO       PO1     PO2     PO3     PO4     PO5     PO6     PO7     PO8       3     2     1     1    </td> <td>COLO Interpring       (3/2/1 indicates strength of correlation) 3-Strong, 2 – Mediu       Programme Outcomes (POs)       PO1     PO2     PO3     PO4     PO5     PO6     PO7     PO8     PO9       3     2     1     1     -     -     -     -       2     1     -     -     -     -     -     -       2     1     -     -     -     -     -     -       3     2     1     1     -     -     -     -       3     2     1     1     -     -     -     -</td> <td>Colspan="5"&gt;Colspan="5"&gt;Colspan="5"&gt;Colspan="5"&gt;Colspan="5"&gt;Colspan="5"&gt;Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspa</td> <td>COULT O Mupping         (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak         Programme Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO11         3       2       1       1       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -<!--</td--><td>COULT O Mupping         (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak         Programme Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO11       PO12         3       2       1       1       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -</td><td>Colspan="6"&gt;Colspan="6"       (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak     Mapping       Programme Outcomes (POs)     PSO       PO1     PO1     PO1     PO1     PO1     PO1     PO10     PO11     PO12     PSO1       3     2     1     1     PO10     PO11     PO12     PSO1       3     2     1     1     PO3     PO4     PO5     PO8     PO9     PO10     PO11     PO12     PSO1       3     2     1     1     1     1     1     2     2       3     2     1     1     1     1     1     2     2       3     2     1     1     1     1     1     2     2       3     2     1     1     1     1     2     2</td></td>	COLUTIONING           COLUTIONING           (3/2/1 indicates strength of correlation) 3-St           Programme Outco           PO1         PO2         PO3         PO4         PO5         PO6         PO7           3         2         1         1	(3/2/1 indicates strength of correlation) 3-Strong, 2       Programme Outcomes (PO       PO1     PO2     PO3     PO4     PO5     PO6     PO7     PO8       3     2     1     1	COLO Interpring       (3/2/1 indicates strength of correlation) 3-Strong, 2 – Mediu       Programme Outcomes (POs)       PO1     PO2     PO3     PO4     PO5     PO6     PO7     PO8     PO9       3     2     1     1     -     -     -     -       2     1     -     -     -     -     -     -       2     1     -     -     -     -     -     -       3     2     1     1     -     -     -     -       3     2     1     1     -     -     -     -	Colspan="5">Colspan="5">Colspan="5">Colspan="5">Colspan="5">Colspan="5">Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspan="5"Colspa	COULT O Mupping         (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak         Programme Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO11         3       2       1       1       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       - </td <td>COULT O Mupping         (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak         Programme Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO11       PO12         3       2       1       1       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -</td> <td>Colspan="6"&gt;Colspan="6"       (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak     Mapping       Programme Outcomes (POs)     PSO       PO1     PO1     PO1     PO1     PO1     PO1     PO10     PO11     PO12     PSO1       3     2     1     1     PO10     PO11     PO12     PSO1       3     2     1     1     PO3     PO4     PO5     PO8     PO9     PO10     PO11     PO12     PSO1       3     2     1     1     1     1     1     2     2       3     2     1     1     1     1     1     2     2       3     2     1     1     1     1     1     2     2       3     2     1     1     1     1     2     2</td>	COULT O Mupping         (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak         Programme Outcomes (POs)         PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO11       PO12         3       2       1       1       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	Colspan="6">Colspan="6"       (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak     Mapping       Programme Outcomes (POs)     PSO       PO1     PO1     PO1     PO1     PO1     PO1     PO10     PO11     PO12     PSO1       3     2     1     1     PO10     PO11     PO12     PSO1       3     2     1     1     PO3     PO4     PO5     PO8     PO9     PO10     PO11     PO12     PSO1       3     2     1     1     1     1     1     2     2       3     2     1     1     1     1     1     2     2       3     2     1     1     1     1     1     2     2       3     2     1     1     1     1     2     2		

Direct

- 1. Continuous Assessment Test I, II & III
- 2. Assignment
- 3. End-Semester examinations

Indirect

1. Course - end survey

## Content of the syllabus

content of th	c symmetry						
Unit – I	Artificial Neural Networks	Periods	9				
Fundamental	Concept - Basic Model of ANN - Terminologies of ANN - Su	pervised Le	arning Neural				
Networks: Perception Networks - Adaptive Linear Neuron – Multiple Adaptive Linear Neurons – Back							
Propagation 1	Network-Unsupervised Learning Neural Networks:Kohenenself-	organizing l	Feature Maps-				
Learning vec	tor Quantization.						

Uni	t - II	Fuzzy Systems	Periods	9
Classic	cal sets	- Fuzzy sets - Classical relation - Fuzzy relations - Defuzzifica	tion – Fuzz	y rule base and
approx	imate	reasoning: Fuzzy reasoning – Fuzzy Inference Systems - Fuzzy	decision m	aking – Fuzzy
logic c	ontrol	systems.		
Unit	t – III	Special Networks	Periods	9
Counte	er prop	agation Networks – Adaptive Resonance Theory Network – Sim	ulated Anne	ealing Network
– Boltz	zmann	Machine - Gaussian Machine - Cauchy Machine - Probabilis	stic Neural	Net – Cascade
Correla	ation N	letwork.		
Unit	t - IV	Genetic Algorithms	Periods	9
Introdu	action -	Basic operators and terminologies in GA - Traditional Vs Gene	tic Algorith	m - Simple GA
– Gene	eral Ge	enetic Algorithm - Classification of Genetic Algorithm - Holla	nd classifier	r systems –
Geneti	c Prog	camming.		
Uni	$\mathbf{t} - \mathbf{V}$	Applications of Soft Computing	Periods	9
Image	Fusior	- Neural network classification - Traveling salesman problem	using Gene	tic algorithm -
Geneti	c algor	ithm based Internet searching technique - Soft Computing Based	l Hybrid Fu	zzy Controllers
– Soft	Compu	ting Based Rocket Engine Control.		
	-	Te	otal Periods	45
TEXT	BOO	KS :		
1.	S.N.Si	vanandam and S.N.Deepa, Principles of Soft Computing, Wiley	India (P) Lto	l, 2011.
REFE	RENC	ES:		
1.	Timot	ny J.Ross, Fuzzy Logic with Engineering Applications, McGraw-	Hill, 2000.	
2.	Davis	E.Goldberg, Genetic Algorithms: Search, Optimization and Mach	nine Learnin	g, Addison
	Wesle	y, N.Y., 1989.		
3.	Jang.J. 2010.	S.R.Sun.C.T.andMizutami.E, Neuro fuzzy and Soft computing, I	Prentice Hal	l, New Jersey-

)	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN       (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205         B TECH       Programma Code       104       Pagulation       2010									
Programme	В.ТЕСН	Progra	mme (	Code	104	Regulation		2019		
Department	INFORMATION TECHNOLO	OGY				Semester		-		
Course Code	Course Name	Periods Per Week			Credit	Maximum		Marks		
		L	Т	Р	C	CA	ESE	Total		
U19ITV34	BUSINESS INTELLIGENCE AND ITS APPLICATIONS	3	0	0	3	40	60	100		
Course Objective	<ul> <li>Understand and critically</li> <li>Identify, model and solve</li> <li>Interpret results/solutions managerial situation whet</li> </ul>	apply th decisio and ic her a pr	ne con n prol dentify coblem	cepts olems / app i or a	and met in differ propriate n opport	thods of busin rent settings courses of a unity	ness a	nalytics for a given		
Course Outcome	At the end of the course ,the s <b>CO1:</b> Know about enterprise different types of digital data <b>CO2:</b> Understand BI conc process <b>CO3:</b> Compare and Contrast dimensional model <b>CO4:</b> Experiment an model Management <b>CO5:</b> Apply BI to mobile, clc	student view of epts ar t OLTI of Da oud, ER	should TT ap nd tec P with shboa P and	l be a plica chniq n OL rd C socia	ible to, tions and ues to AP syst freation	l identify the experiment tems and de for Performa ystems	ETL sign ance	Knowledge Level K2 K2 K3 K3 K3		
Pre- requisites	Database Management System									

						СО	/ PO Ma	apping					CO/F	SO
		(3/2	2/1 indic	ates stre	ength of	f correla	tion) 3-S	Strong, 2	2 - Med	ium, 1 - V	Veak		Mapping	
COs		Programme Outcomes (POs)											PSOs	
Ī	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	2	1											2	2
CO 2	2	1											2	2
CO 3	3	2	1	1									3	3
<b>CO 4</b>	3	2	1	1									3	3
CO 5	3	2	1	1									3	3

#### Direct

- Continuous Assessment Test I, II&III
   Assignment
   End-Semester examinations

#### Indirect

Content of	f the syllabus		
Unit –I	<b>Business View of IT Applications</b>	Periods	9
Introduc	ion to Business View of Information -Core Business Pr	ocesses – B	aldrige Business
Excellen	ce Framework – Purpose of using IT in Business – Chara	cteristics of l	Internet-ready IT
Applicat	ions – Enterprise Applications – Information users and their r	equirements	Types of Digital
Data: In	troduction – Structured Data – Unstructured Data – Semi-	Structured D	ata – Difference
between	semi-structured and structured data.		
Unit - II	<b>Business Intelligence and Data Integration</b>	Periods	9
Business	Intelligence: Definition – Evolution – Need for BI – BI Value	e Chain – Bus	iness Analytics –
BI Frame	work – BI Users – BI Applications – BI Roles and Responsibi	lities – Data I	ntegration : Need
for Data	Warehouse – Definition of Data Warehouse – Data mart – I	Ralph Kimbal	l's Approach vs.
W.H.Inm	on's Approach – Goals of Data Warehouse – ETL Process –	Data Integrati	ion Technologies
–Data Qu	ality – Data Profiling.		
Unit –III	OLTP, OLAP and Multidimensional Data	Periods	9
	Modeling		
OLTP - C	DLAP – OLAP Architectures – Data Models – Role of OLAP T	cools in BI - C	OLAP Operations
- Basics	of Data Modeling – Types of Data Model – Data Modelin	ig Techniques	s – Fact Table –
Dimensio	n Table – Dimensional Models – Dimensional Modeling Life	e Cycle – Des	igning the
Dimensio	nal Model.	<b>D</b> · 1	
Unit - IV	Performance Management and Enterprise Reporting	Periods	9
Measures	, Metrics, KPIs and Performance Management: Understandin	ig Measures a	nd Performance –
Measuren	ient System – Role of metrics – KPIs – Enterprise Reporting: I	Reporting Per	spectives – Report
Standard	zation and Presentation Practices – Enterprise Reporting Ch	aracteristics -	- Balanced
Scorecard	– Dasndoards – Creating Dasndoards – Scorecards vs. Dasn	$\frac{1}{1}$	ysis.
Unit –V	BI Applications	Periods	9
Understar	iding Business Intelligence and Mobility– the need for busine	ess intelligenc	te on the move $-$
BI Mobil	ity time line – Data Security Concerns for Mobile $BI - Bu$	isiness Intelli	gence and Cloud
Computin	g – Business Intelligence for ERP systems – Social CRM and	a Business Int	elligence
Text Boo	KS:		
1.	Prasad R.N. and Seema Acharya, "Fundamentals of Bus	iness Analyti	cs", 2 nd Edition,
-	Wiley, 2016.		
Referenc	es:		
1.	Ramesh Sharda, Dursun Delen, Efraim Turban, "Business I	ntelligence, A	Analytics, and
	DataScience: A Managerial Perspective", 4 th Edition, Pearson	n Education, 2	2017.
2.	David Loshin, "Business Intelligence: The Savvy Manager	's Guide", 2 nd	¹ Edition, Morgan
	Kautmann , 2012.		
E-Resour	ces:		
1.	https://www.coursera.org/learn/business-intelligence-tools		

	VIVEI (Au	KANANDHA CO tonomous Institut Elayamp	DLLEC WON ion, Af alayam	<b>FE OF</b> <b>MEN</b> filiate Chenna , Tiru	F EN d to A ai) cheng	G <b>INEE</b> Anna Un gode – 6	<b>RING FOR</b> iversity , 37 205	TÜVRein CEATIFI	ISO 90012015
Programme	B.TECH		Program	nme C	ode	104	Regulation		2019
Department	INFORM	ATION TECHNO	LOGY			Semest	er		-
Course Code	Course N	ame	Periods Per Week C			Credit	Max	imum 1	Marks
	Course I	ane	L	Т	Р	С	CA	ESE	Total
U19ITV35	Digital I Process	3	0	0	3	40	60	100	
Course Objective	<ul> <li>The student</li> <li>Learn</li> <li>Be explicitly</li> <li>Be far</li> <li>Learn</li> <li>Learn</li> </ul>	nt should be made digital image fund posed to simple in niliar with image Wavelets and ima to represent imag	e to, dament nage pr compre age con ge in for	als. ocession ssion npress m of t	ing te and s sion to featur	chnique segments echnique res	s. ation techniq es	ues.	
	At the en	d of the course, th	ne stude	ent sho	ould b	be able to	0,		KL
	<b>CO1:</b> Ar	alyze general terr	ninolog	gy of c	ligita	l image j	processing		K3
Course	CO2: Ex spatial fil	amine various typ tering and develo	bes of in p for in	mages nage <u>p</u>	, inte	nsity tra ssing in	nsformations frequency do	and main.	K2
Outcome	CO3: Ev	aluate the method on etc.	lologies	s for in	nage	segmen	tation and		K3
	CO4: Im	plement image pr	ocess a	nd an	alysis	and alg	orithms		K2
<b>D</b>	<b>CO5:</b> Apply image processing algorithms in practical applications K3								K3
Pre-requisites	Linear si	gnais, Fourier trar	istorms	s, Prot	adili	ty theory	/		

			(3/2/1 ir	ndicates s	strength	CO / I	PO Mappa ation) 3-St	<b>ing</b> trong, 2 -	- Mediur	n. 1 - Weal	ζ.		CO/PSO Mapping	
COs	COs Programme Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	3	2											2	
CO 2	1	1	1											2
CO 3		1	1		2	1								2
CO 4			1	1		1			2					
CO 5		1						1					2	2

Direct

1. Continuous Assessment Test I, II & III

- Assignment
   End-Semester examinations

Indirect

Conte	ent of the	syllabus		
Unit -	- I	DIGITAL IMAGE FUNDAMENTALS	Periods	8
Introdu	ction – Or	igin – Steps in Digital Image Processing – Components – Ele	ements of Vi	sualPerception
– Imag	e Sensing	and Acquisition - Image Sampling and Quantization - Rela	tionships	
betwee	n pixels -	color models.		
Unit -	- II	IMAGE ENHANCEMENT	Periods	10
Spatia	al Domain	<b>n:</b> Gray level transformations – Histogram processing – E	Basics of Spa	atial Filtering–
Smoo	thing and	Sharpening Spatial Filtering – Frequency Domain: Introd	duction to F	ourier
filtor	torm– Sm	oothing and Sharpening frequency domain filters – Ideal, B	utterworth a	nd Gaussian
Inters	•			
Unit -	- III	IMAGE RESTORATION AND SEGMENTATION	Periods	9
Noise	models -	- Mean Filters – Order Statistics – Adaptive filters – Band	reject Filter	rs – Band pass
Filters	s - Notch I	Filters – Optimum Notch Filtering – Inverse Filtering – Wier	her filtering	Segmentation:
Detec	tion of Di	scontinuities – Edge Linking and Boundary detection – Re	gion	
Junit		WAVELETS AND IMACE COMPRESSION	Darriada	0
Unit -	- IV	WAVELETS AND IMAGE COMPRESSION	Periods	9 ntolo Imogo
Compr	assion m	dala Counig - Munifesolution expansions - Compression	ing Bit D	ana Coding
Lossles	s Predicti	ve Coding – Lossy Compression – Lossy Predictive Coding	ing – Dit-H	ion
Standar	rds	ve couning – Lossy compression – Lossy r realeuve couning	- Compress	1011
		IMACE DEDDESENTATION AND DECOCNITION		_
Unit -	- V	IMAGE REPRESENTATION AND RECOGNITION	Periods	9
Bound	lary repres	sentation – Chain Code – Polygonal approximation, signatu	re, boundary	segments –
Bound	lary descr	iption – Snape number – Fourier Descriptor, moments- Reg	ional Descri	ptors –
Торог	ogical lea	ture, Texture - Fatterns and Fattern classes - Recognition of	Doriodo 45	anng.
Toyt	Rooks	10tai	renous 43	,
Телі	Rafael (	Gonzales Richard F. Woods "Digital Image Processing"	Third Editio	on Pearson
1	Educatio	on, 2010.		n,i carson
	Deitel an	nd Deitel and Nieto, "Internet and World Wide Web - How	to Program	", Prentice
2	Hall,5th	Edition, 2011.		
3	Herbert	Schildt, "Java-The Complete Reference", Eighth Edition, M	lc Graw Hill	Professional,
Refer	2011.			
Kelei	Rafael (	Gonzalez Richard F Woods Steven L Eddins "Digital L	mage Proces	ssing Using
1	MATLA	AB", Third Edition Tata Mc Graw Hill Pvt. Ltd., 2011.	innage i roce.	Ssing Using
2	Anil Jair	n K. "Fundamentals of Digital Image Processing", PHI Lear	ning Pvt. Lto	1. 2011.
3	Willliam	n K Pratt, "Digital Image Processing", John Willey, 2002.		
4	Malay K	. Pakhira, "Digital Image Processing and Pattern Recognition	on", First Ed	ition, PHI
4	Learning	g Pvt. Ltd., 2011.		
E-Res	sources:			
1	http://ee	web.poly.edu/~onur/lectures/lectures.html.		
2	https://w	/ww.caen.uiowa.edu/~dip/LECTURE/lecture.html		

VIVEKANANDHA COLLEGE OF ENGL						GINE	ERIN	N	Brogerent Setter 50 KDT 2715					
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Pro	oramme	BE	/B TEC	'H		Prog	ramm	<u>goae –</u> e code	637 20	5	Regul	ation	,	2019
Der	artmen	t CSE.	/ <u>D. I L C</u> IT			1105	<u>, anni </u>	e couc	Se	mester	Regu	ution		-
Course	e Code		C	ourse	name			Perio	ods pe	r week	Credi	t Ma	ximum I	Marks
U19C	SV36	Knov	vledge	Mana	geme	nt		L	T	P	C 3	CA 40	ESE 60	Total
		The	student s	should	be ma	de to.		5	0	U	5	10	00	100
		• S	tudy the	basic of	concep	ots of k	nowle	dge ma	anagen	nent.				
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Obje	ctive	• \$	tudy the	basic	concep	ots of H	Expert	Knowl	edge.	C				
Ŭ		• E	e famili	ar with	tools.		•		C					
		• I	Learn the	Know	ledge	Transf	fer and	Sharin	ng of K	nowled	ge Mana	gement.		
		At	the end	of the	course	, the st	tudent	should	be abl	e to,				KL
Car		CO1:	CO1: Implement knowledge management concepts, in all aspect.										K2	
	irse	<b>CO2</b> :	Demonst	trate th	e knov	wledge	e mana	gemen	t life c	ycle.				K2
Out	ome	CO3:	Compute	e the fu	ızzy lo	gic in	design	ing exp	pert sy	stem.				K3
		<b>CO4</b> :	Analyze	the kn	owled	ge mai	nagem	ent sys	tem us	ing tool	s & testi	ng techniq	ues.	K2
		CO5:	Infer the	knowl	edge t	ransfe	r & she	earing	in knov	vledge	managen	nent applic	ation.	K3
Pre-requ	isites	-												
	(3/2	2/1 indica	ates stren	C gth of o	CO / Po correla	<b>O Map</b> tion) 3	oping -Strong	g, 2 – N	/ledium	1 - W	eak	CO/PSO	Mappin	g
				Pı	ogram	ime Ou	itcomes	s (POs)				PS	Os	
COs	PO 1	$\begin{array}{c c} PO & PO \\ 2 & 3 \end{array}$	$\begin{array}{c c} \mathbf{D} & \mathbf{PO} \\ 0 & 4 \end{array}$	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	2
CO 1	3	2 1						3		2		3	2	
CO 2	3	3 2	1	1				2				3	1	
CO 3	2	3 3			2						2	2	2	_
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CO 5	3	2 2						1	l		2	2	2	
Direct	Assessn	nent Me	etnods											
1	Contini		sessmen	t Test	ШЯ	è III								_
2.	Assign	nents /	Quiz / S	emina	r, 11 c	~								
3.	End-Se	mester e	xamina	tions										
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1. 0	Course -	end sur	vey											
Content	of the	syllabus	5											
					<b>XX77</b>	FDCE		NACE	EMEN	Т		Pet	inde	9
Unit – I				KNC	JWL	LDGI		AGL				1 01	1005	-
Unit – I KM Mytl – Cogniti	hs – KM on and k	Life Cy KM – Tv	cle – Un bes of K	KNC derstar nowlec	ding l	E <b>DGI</b> Knowl Expert	edge – Know	Know	ledge, - Hum	intellig n Thinl	ence –Ex sing and	perience - Learning	- Commo	on Sense
Unit – I KM Mytl – Cogniti Unit - II	hs – KM on and k	Life Cy KM – Ty KN	cle – Un pes of K <b>DWLE</b> I	KNC derstar nowled DGE I	ding l lge – I MAN	Knowl Expert AGEN	edge – Know	Know ledge –	ledge, - Huma TEM	intellig in Thinl	ence –Ex king and CYCLE	perience - Learning.	- Commo	on Sense 9
Unit – I KM Mytl – Cogniti Unit - II Challeng	hs – KM on and k [ es in Bu	Life Cy KM – Ty <b>KN</b> ilding K	cle – Un pes of Ki <b>DWLEI</b> M Syste	KNC derstar nowled DGE I ms – C	nding 1 lge – H MAN Conve	Knowl Expert AGEN ntional	edge – Know MEN I vs K	Know ledge – <b>FSYS</b> M Syst	eledge, - Huma <b>TEM</b> tem Li	intellig an Thinl <b>LIFE</b> fe Cycl	ence –Ex king and CYCLF e (KMSI	Learning. Learning. Per LS) – Kno	- Commo riods	on Sense 9 Creation

Unit – l	III	KNOWLEDGE CAPTURING	Periods	9
Evaluati	ng the Exp	ert – Developing a Relationship with Experts – Fuzzy Reasoning and the	Quality of Know	/ledge –
Knowled	lge Captur	ing Techniques, Brain Storming – Protocol Analysis – Consensus Decis	ion Making – Re	epertory
Grid-Co	oncept Map	ping – Blackboarding.		
Unit – l	IV	KNOWLEDGE CONVERSION AND TESTING	Periods	9
Modes of	of Knowle	dge Conversion - Codification Tools and Procedures - Knowledge D	Developer"s Skill	Sets –
System 7	Testing and	l Deployment – Knowledge Testing – Approaches to Logical Testing, Us	ser Acceptance T	esting –
KM Syst	tem Deploy	ment Issues – User Training – Post implementation.		
Unit – V	V	KNOWLEDGE TRANSFER AND SHARING	Periods	9
Transfer	Methods -	- Role of the Internet – Knowledge Transfer in e-world – KM System Te	ools – Neural Ne	twork –
Associat	tion Rules -	- Classification Trees – Data Mining and Business Intelligence – Decisio	n Making Archit	ecture –
Data Ma	inagement -	- Knowledge Management Protocols - Managing Knowledge Workers.		
		,	<b>Total Periods</b>	45
Textbo	oks:			
1.	Elias. M.	Award & Hassan M. Ghaziri "Knowledge Management" Pearson, Educa	ation 2003.	
2.	Guus Sch Velde and	reiber, Hans Akkermans, Anjo Anjewierden, Robert de Hoog, Nigel S l Bob Wielinga, "Knowledge Engineering and Management", Universitie	Shadbolt, Walter s Press, 2001.	Van de
Referen	ces:			
1.	Holsapp Vol 1 and	ole, "Handbooks on Knowledge Management", International Handbooks 2, 2004	on Information S	ystems,
2.	Ronald n Edition,2	naiser "Information and Communication Technologies for Knowled 2007	lge Managemei	nt" 3rd
E-Resou	irces:			
1.	Knowled	ge Management - Course (nptel.ac.in)		
2.	www.cs.u	nibo.it/~gaspari/www/teaching/slides_KM2.pdf		
3.	What is 1	Knowledge Management? The 2022 Guide   Guru (getguru.com)		

## VERTICAL IV : INTERNET OF THINGS & CLOUD COMPUTING

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	Pro	gramme	e B.F	. / B.T	ech.	Elayal	npalaya	Progr	amme	-0372 Code	05	Re	gulati	ion	2	019
	Dep	partmen	t CS	E <b>, IT 8</b>	cST			U				S	Semes	ter		-
	Course	Code		Co	urse Na	ime		Period	s Per V	Credit	t Maximu			m Ma	rks	
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			Ine	• Main (	objective arm the	ve of th archite	e cours	se is to nd prov	oramm	ng of	ARM nr	ocess	or			
a				Be	familia	ar with	the em	hedded		uting n	latform	desim	n and	analys	is	
	ourse	0		• Le	arn the	svstem	design	techni	i comp	nd nets	vorks fo	r emh	edder	anarys 1 svete	me	
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				• Im	nlemen	t small	nrogra	ms to	solve u	///stitut	Fined pro	hlem	s on a	n emh	edded	nlatform
				• 111	premen	t sman	progre			cii-uci	incu pro	Joienn	3 011 a		Kn	owledge
At the end of the course, the student should be able to,									111	level						
			CO	1: Dese	cribe the	e archit	ecture	& prog	rammi	ng of A	ARM pro	ocesso	or.			K1
	ourse		CO	2: Disc	uss diff	erent n	nemory	manag	gement	schem	nes.					K2
U	acom		CO	3: Ana	lyze em	bedded	l core t	based d	esign &	k real t	ime OS					K3
			CO	<b>CO4:</b> Use the system design techniques to develop software for embedded											K4	
			syst	em 5. Forr	nulata r	agl tim	a avam	nlagui	ing or	boddo	1 evetor					
Pr	e-reau	isites	-	5.1011			e exam	ipies us	sing en	Deuder	i system	1				<u>K2</u>
Г							<b>N</b>	•						CO	050	
		(3/2	2/1 indi	cates str	ength of	correlat	J Map tion) 3-	p <b>ing</b> Strong,	2 – Me	dium, 1	– Weak				ping	
	COs				I	Program	me Out	comes (	(POs)					PSOs		
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO 2	
	CO 1	3	3	2		2								2	2	
	$\frac{\text{CO 2}}{\text{CO 3}}$	2	$\frac{1}{2}$	2		1								3	2	
-	CO 4	2	3	3		2								2	2	
	CO 5	2	2	2		1								3	2	
Co	ourse A	ssessme	ent Me	thods												
D	irect															
	1	Continu		sessme	nt Test I	11 & 1	n									
	2.	Assignr	nent / $\zeta$	Duiz / Se	eminar	, n œ n										
	3.	End-Sei	mester e	examina	ations											
I	Indirect															

1. Course - end survey

### Content of the syllabus

Unit – I	EMBEDDED COMPUTING	Periods	9						
Introduction to Embedded Systems –Structural units in embedded processor, selection of processor & amp;									
memory manageme	ent methods devices- Embedded system design process. Embedded	led processors	. – 8051						

roller, A	RM processor – Architecture, Instruction sets and programming.		
II	MEMORY AND INPUT / OUTPUT MANAGEMENT	Periods	9
ing Inpu	t and Output - Memory system mechanisms - Memory and I/O d	evices and inte	erfacing –
handling			
III	PROCESSES AND OPERATING SYSTEMS	Periods	9
sks and	processes - Context switching - Scheduling policies - Inter process c	ommunication	
ns – Perf	ormance issues.		
IV	EMBEDDED SOFTWARE	Periods	9
Product	Development Life Cycle- objectives, different phases of EDLC, Mod	leling of EDLC	,
Hardwai	e-software Co-design, Data Flow Graph, state machine model, Se	equential Progr	am Model,
Model,	object oriented Model.		
V	EMBEDDED SYSTEM APPLICATION AND	Periods	0
•	DEVELOPMENT	Terrous	,
y of W	ashing Machine- Automotive Application- Smart card System App	olication-ATM	machine -
e camer	a		
	Total	Periods	45
s:		·	
Wayne	Wolf, "Computers as Components - Principles of Embedded Comput	ting System De	sign",
Third	Edition "Morgan Kaufmann Publisher (An imprint from Elsevier), 201	2	-
Micha	el J. Pont, "Embedded C", Pearson Education, 2007		
NCE BO			
1			
Steve	Jeath "Embedded System Design" Elsevier 2005		
Steve	Heath, "Embedded System Design", Elsevier, 2005.		
Steve Muhar	Heath, "Embedded System Design", Elsevier, 2005. nmed Ali Mazidi, Janice GillispieMazidi and Rolin D. McKinlay, "T	he 8051 Micro	controller
Steve Muhan and Er	Heath, "Embedded System Design", Elsevier, 2005. nmed Ali Mazidi, Janice GillispieMazidi and Rolin D. McKinlay, "T nbedded Systems", Pearson Education, Second edition, 2008	he 8051 Micro	controller
Steve Muhan and Er	Heath, "Embedded System Design", Elsevier, 2005. nmed Ali Mazidi, Janice GillispieMazidi and Rolin D. McKinlay, "T nbedded Systems", Pearson Education, Second edition, 2008	he 8051 Micro	controller
	roller, Al II Ing Inpu- nandling III sks and as – Perf IV Product Hardwar Model, V y of Wa e camera s: Wayne Third I Michae	weight of the second s	roller, ARM processor – Architecture, Instruction sets and programming.           II         MEMORY AND INPUT / OUTPUT MANAGEMENT         Periods           ing Input and Output – Memory system mechanisms – Memory and I/O devices and internandling.         Processes and processes – Context switching – Scheduling policies – Inter process communication as – Performance issues.           IV         EMBEDDED SOFTWARE         Periods           Product Development Life Cycle- objectives, different phases of EDLC, Modeling of EDLC         Pariods           Hardware-software Co-design, Data Flow Graph, state machine model, Sequential Progr         Periods           V         EMBEDDED SYSTEM APPLICATION AND DEVELOPMENT         Periods           y of Washing Machine- Automotive Application- Smart card System Application-ATM e camera         Total Periods           S:         Wayne Wolf, "Computers as Components - Principles of Embedded Computing System Development Life dition "Morgan Kaufmann Publisher (An imprint from Elsevier), 2012         Michael J. Pont, "Embedded C", Pearson Education, 2007

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Pro	gramme	e <b>B</b> .	E. / B.'	Tech.			Progra	amme	Cod	e		F	Regula	tion	20	19
Dep	partmen	t CS	E,IT &	CST									Seme	ester		-
Course	e Code			Course	Name		Pe	riods I L	Per V T	Veek P	Cre	dit		Aaxim	um Ma ESE	rks Total
U19C	CSV42	Sm	art Se	ensor T	Techno	logies		3	0	0	3	;	40	C	60	100
Course Objecti	ive	The	e stude • Se • De • Si	nt shou elect the esign ba mulate,	ld be m e right s asic circ synthe	ade to, ensor fe cuit bui size, an	or a giv Iding bl id layou	en app locks. it a con	olica mple	tion. ete ser	isor o	r sen	sor sy	stem.		
		At	the end	of the	course,	the stu	dent sh	ould be	e abl	le to,	1		1'		Knowl L	edge evel
~		rec	JI: Ai quireme	halyze ent and	the se	ensors Ising m	availat ethods	$\frac{1}{1}$	10		sed o	on a		tion	I	K2
Course Outcon	ne	rec	<b>J2:</b> Ai quireme	nalyze ent and	the set	ensors Ising m	availat ethods	ole in	lo	r bas	sed o	on a	pplica	tion	H	<b>K</b> 3
CO3: Interfacing different types of Sensors with MCU										K3						
<b>CO5:</b> Design a real-time application for landslide monitoring and hazard											K4 K3					
-requisit	-requisites -															
CO / PO Mapping (2/2/1 indicates strength of correlation) 2 Streng 2 Madium 1 Wash																
COs	(3/2				Progran	nme Out	tcomes (	(POs)		I, I ,	Veak			PSO	s	
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	P	09	PO	РО	РО	PSO	PSO 2	
<u>CO 1</u>											10	11	12	1		2
CO 2	2	2	2	2							3			2		2
CO 3	1	3	2	2							2			2		2
CO 4	3	2	2	2							3			2		2
CO 5	2	3	2	2							2			2		2
Course Assessment Methods         Direct         1. Continuous Assessment Test I, II & III         2. Assignment/Seminar         3. End-Semester examinations         Indirect         1. Course - end survey																
Uni	t - 1	Sensor	Ve	Franch	BAS	ature	of Ser	ISOTS	Sei	nsor	Outo	nt (	Pe: Tharac	r10ds teristi	<u> </u>	9 nsing
muouu	Introduction- Sensor Vs Transducer, Nature of Sensors, Sensor Output Characteristics, Sensing Technologies, Digital Output Sensors.															

Un	nit - II	APPLICATION SPECIFIC SENSORS	Periods	9							
Occup	bancy and	motion detectors: ultrasonic - microwave - capacitive detectors	- optical prese	ence sensor,							
Light	Detectors:	Photo diodes - photo transistor - photo resistor- CCD and CMC	S image sense	ors,							
Temp	erature Sen	sors: thermos-resistive sensors – thermoelectric contact sensor									
Un	it - III	SENSOR WITH MICROCONTROLLER	Periods	9							
Introd	uctions,	Amplification and Signal Conditioning, Integrated Signa	Conditionin	ng, Digital							
Conve	Conversion, MCU Control, MCUs for Sensor Interface, Techniques and Systems Considerations, Sensor										
	$\frac{11-11}{1}$	WIKELESS SENSING	Periods	<u> </u>							
RF Se	ess Data ai ensing Tele	metry REMEMS Complete System Consideration	reless Sensing	g Networks,							
	, ibilig, i ele	SMART APPLICATIONS AND SYSTEM									
Ur	nit – V	REQUIREMENTS	Periods	9							
Auton	notive App	lications, Industrial (Robotic) Applications, Consumer Applicat	ions, Future	Sensor Plus							
Semic	Semiconductor Capabilities, Future System Requirements.										
Total Periods45											
Text l	Book:										
1.	Frank, R	andy, "Understanding smart sensors", Artech House integrat	ed microsyst	ems series,							
	3rd Editi	on, 2013.									
Refere	ences:										
1.	Jacob Fra Springer,	iden, "Handbook of Modern Sensors: Physics, Designs, and Ap 2016	plications", 5	th Edition,							
	VlasiosTs	iatsis, Stamatis Karnouskos, Jan Holler, David Boyle, Catherin	e Mulligan, "	Internet of							
2.	Things: T 2018	echnologies and Applications for a New Age of Intelligence", A	Academic Pre	ss, 16-Nov-							
3.	Henry Le	ung, Subhas Chandra Mukhopadhyay, "Intelligent Environmenta	l Sensing", S	pringer, 22-							
Jan-2015.											
E-R	esources:										
1.	https://w	ww.techbriefs.com/component/content/article/tb/pub/features/artic	<u>les/33212</u>								
2.	https://w	ww.azosensors.com/article.aspx?ArticleID=1289									
3.	https://3	50digitmg.com/iot-smart-sensors									

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Programme	B.E./B.Tech.	ch. Programme Code Regulatio							20	19	
Department	CSE, IT & CST							Semester	r –		
Course Code	Course	Name	Period	s Per V	Veek	Crea	dit	Max	mum Ma	rks	
	Course	Name	L	Т	Р	C		CA	ESE	Total	
U19CSV43	Security in Computing         3         0         0         3         40							60	100		
Course Objective	<ul> <li>Understand s</li> <li>Understand t</li> <li>Know the s authenticity.</li> <li>Understand t</li> </ul>	security design pr the mathematics l tandard algorith	rinciples behind c ms used rements	and serve to pr	ecure p raphy. ovide rating	confi syster	mmi dent ms a	ing techni iality, int nd databa	ques. egrity an ses.	d	
	At the end of the c	ourse, the studen	t should	be abl	e to,			<u>k</u> r	owledge	Level	
	<b>CO1:</b> Illustrate the	у.	K2	,							
Course	CO2: Discuss on v		K3								
Outcome	CO3: Apply symm	ity	K3								
	CO4: Implement a	symmetric encry	ption tec	hniqu	es.				K4		
	<b>CO5:</b> Design a secure OS.										
-requisites	-										

	CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 – Weak													CO/PSO Mapping	
Cos	Programme Outcomes (POs)													PSOs	
	PO 1	O 1         PO 2         PO 3         PO 4         PO 5         PO 6         PO 7         PO 8         PO 9         PO 10         PO 11         12											PSO1	PSO 2	
CO 1	1	2	2	2	3	2							2	2	
CO 2	1	3	2	2	3	2							2	2	
CO 3	2	2	2	2	2	2							2	2	
CO 4	2	2 3 2 3 2 2											2	2	
CO 5	2	2	2	3	2	2							2	2	

#### Direct

- 1. Continuous Assessment Test I, II & III
- Assignment.
   End-Semester examinations

#### Indirect

1.Course - end survey

### Content of the syllabus

Unit – I	SECURITY DESIGN PRINCIPLES	Periods	9
Security Goals -	Secure System Design - Understanding Threats - Designing-In Se	curity - Conv	enience and
Security - Securi	ty in Software Requirements - Security by Obscurity - Secure De	sign Principle	s – Defense
in Depth – Divers	sity in Defense – Securing the Weakest Link – Fail-Safe Stance.		

Ur	nit — II	SECURE PROGRAMMING TECHNIQUES	Periods	9						
Worm	ns and Othe	er Malware – Buffer Overflows – Client State Manipulation – S	QL Injection	– Password						
Secur	ity – Cross	Domain Security in Web Applications - Attack Patterns - Preve	enting XSRF -	- Preventing						
XSSI	- Preventin	g XSS.	1							
Un	uit - III	SYMMETRIC CIPHERS & INTRODUCTION TO NUMBER THEORY	Periods	9						
Overv	view - Clas	sical Encryption Techniques - Block Ciphers and the Data Enc	ryption Stand	ard – Basic						
Conce	epts in Nun	ber Theory and Finite Fields – Advanced Encryption Standard –	Block Cipher	Operation –						
Ferma	it's and Eul	er's Theory – CRT – Discrete Logarithms.								
Un	Unit – IV         PUBLIC-KEY ENCRYPTION AND HASH FUNCTIONS         Periods         9									
Public	e Key Cryp	tography and RSA – Diffie-Hellman Key Exchange – Elgamal	Cryptographi	ic System –						
Ellipti	ic Curve C	ryptography – Cryptographic Hash Functions – Message Auth	entication Cod	de - Digital						
Signa	ture - Certif	icates.								
U	nit - V	SECURITY APPLICATIONS	Periods	9						
Secur	ity in Opera	ating Systems - Security in the Design of OS – Rootkit- Open W	eb Application	n Security –						
Wireless Network Security – Introduction to Mobile Security.										
		Tota	al Periods	45						
Text 1	Books:									
1.	Neil Das	wani, Christoph Kern, and Anita Kesavan, Foundations of	f Security: V	Vhat Every						
	Program	ner Needs to Know, First Edition, Apress, 2008.								
2.	William S Education	tallings, Cryptography and Network Security: Principles and Pract, 2023.	tices ^{II} , 8 th Editi	ion, Pearson						
Refer	ences:									
1.	Charles P Edition, P	. Pfleeger, Shari Lawrence Pfleeger and Jonathan Margulies, Sec earson Education, 2015.	curity in Comp	outing, Fifth						
2.	AtulKaha	te, Cryptography and Network Security, Tata McGraw Hill, 2003.								
3.	Reshetova Publishers	a, Ahmad-Reza Sadeghi, Mobile Platform Security, First Editions Series, 2014.	on, Morgan ar	nd Claypool						
Resou	rces:									
1.	http://inde %20Progr	ex-of.co.uk/Hacking-Coleccion/Foundations%20of%20Security%2 ammer%20Needs%20to%20Know.pdf	20- % 20 What	% 20 Every						
2.	https://ww	vw.tutorialspoint.com/computer_security/index.htm								
3.	https://ww	vw.javatpoint.com/cyber-security-tutorial								
4.	https://ww	vw.brainkart.com/subject/Security-in-Computing_156/								

MUNICIPAL INC.	<b>VIVEKANANDHA</b> (Autonomous Institutio Ela	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205										
Programme	B.TECH	Program	nme Co	de	104	Regulati	on	2019				
Department	INFORMATION TECHN	OLOGY	Z		Semeste	er		-				
Course Code	Course Name	Periods	Per We	eek	Credit	Maximu	m Marks	-				
Course Code		L	Т	Р	C	CA	ESE	Total				
U19ITV41	SOFTWARE DEFINED NETWORKS	3	0	0	3	40	60	100				
Course Objective	<ul> <li>Understand the concepts of software defined networks</li> <li>Explore modern approaches like openflow, openstack</li> <li>Learn the interface between networking devices and the software controlling them</li> <li>Know about SDN in data centers.</li> <li>Study about the various applications of SDN.</li> </ul>											
	At the end of the course,	the stude	ent sho	uld be	able to,			Knowledge Level				
	<b>CO1:</b> Differentiate between etworks.	een tradi	itional	netwo	rks and s	software o	defined	K2				
Course	CO2: Understand advance	ced and e	emergi	ng netv	vorking	technolog	gies.	K2				
Outcome	<b>CO3:</b> Learn how to u networking tasks.	ise SDI	N cont	rollers	to pe	rform co	mplex	К2				
	<b>CO4:</b> Demonstrate the s programming.	urch and	K3									
<b>CO5:</b> Apply the knowledge on SDN and measures to solve real world problems												
Pre- requisites	Computer Networks											

	CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak											CO/PSO Mapping		
COs	COs Programme Outcomes (POs)											PSOs		
	PO1	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12										PSO1	PSO2	
CO 1	2	-	-									-	2	2
CO 2	2	1	-									-	2	2
CO 3	2	1	-									-	2	2
CO 4	3	2	2									1	2	3
CO 5	3	3	2									1	2	3

Direct

1. Continuous Assessment Test I, II & III

2. Assignment.

3. End-Semester examinations.

Indirect

Conte	nt of the syllabus									
Unit –	I Introduction to SDN	Periods	9							
Introdu	action to SDN: Basic packet switching terminology - The m	odern data cen	ter – Traditional							
switch	architecture - Autonomous and dynamic forwarding table. W	hy SDN?: Evolu	ution of switches							
and co	ntrol planes - Cost-Data center innovation - Data center ne	eds. The Genes	sis of SDN: The							
evolut	on of networking technology – Forerunners of SDN									
Unit –	II SDN and OpenFlow	Periods	9							
How S	SDN works: Fundamental characteristics of SDN – SDN op	eration – SDN	devices - SDN							
contro	lers - Alternate SDN methods. The OpenFlow specification	n: OpenFlow o	verview –							
OpenF	low 1.0 and OpenFlow basics – OpenFlow 1.1 Additions – Op	enFlow 1.2 Ad	ditions –							
OpenF	low 1.3 Additions – OpenFlow Limitations.	-								
Unit –	III SDN Interfaces	Periods	9							
SDN I	nterfaces: Alternative definitions of SDN: Potential drawback	s of open SDN	– SDN via APIs							
- SDN	V via hypervisor based overlays - SDN via opening up th	e device – Ne	twork Functions							
virtual	ization – Alternatives overlap and ranking. SDN open source	Open source li	icensing issues –							
OpenF	low source code – Switch implementation – Controller imple	ementations – C	Drchestration and							
Netwo	rk virtualization – Simulation, Testing and Tools – OpenStack	<ul> <li>Applying SD</li> </ul>	N open source							
Unit –	IV SDN in Data Center	Periods	9							
Data c	Data center definition – Data center demands – Tunneling technologies for the data center- Path									
technologies in the data center – SDN and shortest path complexity – Ethernet fabrics in the data center										
- SDN use cases in the data center - Open SDN versus Overlays in the data center - Real-										
world	data center implementation.									
Unit –	V SDN Environments and Applications	Periods	9							
SDN i	n other environment: Wide area networks – Service provider	and carrier net	works – Campus							
networ	ks – Hospitality networks – Mobile networks – In-Line netwo	rk functions – C	Optical networks.							
SDN A	Applications: Reactive versus Proactive applications – A sin	ple reactive Ja	va application –							
Creatin	ng network virtualization tunnels – offloading flows in the dat	a center – Acce	ss control for the							
campu	s – Traffic engineering for the service providers.		1							
		Total Periods	45							
Text E	ook:									
1	Paul Goransson and Chuck Black, "Software Defined	Networks: A	Comprehensive							
1.	Approach",2 nd Edition, Morgan Kaufmann, 2016.									
Refere	ences:									
1.	Siamak Azodolmolky, "Software Defined Networking with OPublishing, 2017.	OpenFlow", 2nd	l Edition, Packet							
2	Thomas D. Nadeau, Ken Gray, "SDN: Software Defined N	letworks", 1 st I	Edition, O'Reilly							
۷.	Media, 2013.									
E-Res	ources:									
1.	https://www.cs.tau.ac.il/~msagiv/courses/rsdn/SDN-TAU.pdf									
2.	https://www.cse.wustl.edu/~jain/tutorials/ftp/sd_hs14.pdf									
3.	https://networklessons.com/cisco/ccna-routing-switching-icnosoftware-defined-networking	2-200-105/intro	oduction-to-sdn-							

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Progr	amme	•	<b>B.E.</b> /	B.TEC	H.		Pr	ogram	me Cod	e	Regul	ation	2019	)	
Depar	rtment	t	CSE, I	Г & СS	Т						Sem	ester		-	
Court		da	Con	ngo Nor			Period	s Per V	Veek	Credit		Μ	aximun	n Marks	
Cour	se Co	ue	Cou	rse mai			L	Т	Р	С	CA		ESE I	otal	
U190	CTV4	1	Virtuali		01		3	0	0	3	40	C	60	100	
CourseThe main objective of this course is to:ObjectiveUnderstand about Computing Virtualization tools, applications and techniquesObjectiveUnderstand CPU virtualization, memory virtualizationObjectiveHow to configure VM CPU and memory optionsUnderstand storage and network virtualizationAcquire knowledge about virtualization securityLearn about many case studies												,			
The students who complete this course successfully are expected to:											wledge evel				
Co	ourse		CO1:Able to define, distinguish Computing Virtualization tools,       K1         applications and techniques       K1												
Out	tcome		CO2: Able to configure virtual machine CPU and memory options K2												
		-	$\frac{\text{CO3: }A}{\text{CO4: }A}$		K3										
		-	CO5:Id	lentify t	hreats a	nd able	e to sec	ure vir	tualized	l enviroi	iment		K3		
Pre-re	quisite	es	-	2											
				.1	CO/I	PO Ma	pping			4	, 1		CO/	PSO	
	(3/2/	l ind	licates sti	rength or Pro	of correl	e Outco	3-Stro	ng, 2 – POs)	Mediui	n, I - W	eak		Mapp PSO	s	
COs	PO	PC	) PO	PO	PO	РО	PO	PO	PO	PO	PO	PO	PSO	PSO	
<u>CO1</u>	1	2	3	4	5	6	7	8	9	10	11	12	1	2	
CO1	3	3	3	3	3	2	1				2	2	2	2	
CO3	3	3	3	3	3	2	1				2	2	3	3	
CO4	3	3	3	3	3	2	1				2	2	2	2	
CO5	3	3	3	3	3	2	1				2	2	3	3	
Course	Asses	sme	nt Meth	ods Di	rect										
In	Direct <ol> <li>Continuous Assessment Test I, II &amp; III</li> <li>Assignment.</li> <li>End-Semester examinations</li> </ol> Indirect <ol> <li>Course - end survey</li> </ol>														

Conte	nt of the syllabus										
Ur	it – I Introduction	Periods	9								
Overv	view Of Virtualization -Basics of Virtualization - Virtualization	Types – Desk	top Virtualization,								
Stora	ge Virtualization – System-level Operating Virtualization	- Applicatio	on Virtualization-								
Virtua	alization Advantages, Understanding Hypervisors, Understanding	y Virtual									
Mach	ines, Assignment-Installing, windows, Linux on virtual machine.										
Un	it – II Concepts in Creating Virtual Machines	Periods	9								
Creat	ing a Virtual machine- Performing P2V Conversions, Loading yo	ur Environme	nt, Building a new								
Virtu	al machine, Managing CPUs for a virtual machine-Understanding	CPU Virtualiz	ation, Configuring								
VM C	CPU options, Tuning practices for VM CPUs, Managing Mem	ory for a vir	ual								
Mach	ine-Understanding memory virtualization, Configuring VM memo	ory options, Tu	ining practices for								
VMr	nemory		0								
Un	it - III Storage Management in Virtual Machine	Periods	9								
Mana	ging Storage for a virtual machine-Understanding storage virtuali	zation, Config	uring VM Storage								
, opti	Channel Cables Eiber Channel Herdware Daviess iSCSI Arebi	ig SCSI buses	- Fiber Channel -								
virtus	lization concepts Introduction to server virtualization. Types of s	erver virtualiz	ation technologies								
Limit	ations of server virtualization Managing Networking for a virtual	machine- unde	erstanding network								
virtua	lization. Configuring VM network options. Tuning practices for V	/irtual networ	ks.								
Uni	t – IV Network Device Virtualization s	Periods	9								
Theor	Theory Network Device Virtualization - VLANs, VRF Instances- VFIs -Virtual Firewall Contexts										
Netw	ork Device Virtualization, Fundamentals of Virtualization security	-Virtualizatio	n architecture,								
Threa	ts to a virtualized environment.	<u> </u>									
Un	it – V Security Virtualization	Periods	9								
How	security must adapt to virtualization, Securing hypervisors-Hyperv	isor configura	tion and security,								
Desig	ning virtual networks for security-comparing virtual and	l physical i	networks, Virtual								
netwo	ork security considerations, Configuring virtual switches for securi	ty									
To	tal Periods		45								
Text	Books	-									
1.	Virtualization Security: Protecting Virtualized Environme publications,2013	nts, Dave	shackleford, sybex								
2.	Matthew Portnoy, Virtualization Essentials, WILEY INDIA, 2 nd E	dition, 2016									
Refere	nces										
1.	William von Hagen, Professional Xen Virtualization, Wrox Publi	cations, Janua	ry, 2008								
2. David Marshall, Wade A. Reynolds, Advanced Server Virtualization: VMware and Microsoft Platform in the Virtual Data Center, Auerbach Publications, 2006											
3.	NPTEL Course Notes										
E-Res	Durces										
1.	https://www.youtube.com/watch?v=ZogZwbyPO_4										
2	https://www.oreilly.com/library/view/vmware-vsphere										
۷.	virtualization/9780133442090/Lesson_5_2.html										
3.	https://www.redhat.com/en/topics/virtualization										
	VIVEKAN (Autonomous	ANDHA CO s Institution, . Elaya	DLLEC WO Affiliat mpalay	<b>GE OF</b> <b>MEN</b> ed to <i>J</i> vam, T	F <b>EN</b> I Anna Tiruch	GINEER Univers	RING FOR ity ,Chennai) - 637 205	TÜVRIM	ISO 90012015		
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Programme	<b>B.TECH</b>		Progr	amme	Code	104	Regulation		2019		
Department	INFORMATIO	N TECHNOI	LOGY				Semester		-		
Course Code	Course	Name	Per	riods P Week	er	Credit	Maxi	mum N	larks		
	L T P C CA ESE										
U19ITV42	INFORM STORA MANAG	AATION GE AND EMENT	3	0	0	3	40	60	100		
Course Objective	<ul> <li>The student shou</li> <li>To understand</li> <li>To examine</li> <li>To describe disaster reconditional statements</li> </ul>	ald be made and the basic co emerging tech the different b wery and busin	omponer nologie ackup a ness con	nts of S s inclu nd recontinuity	Storag ding l overy capa	e System IP-SAN. topologie bilities.	Environment. es and their rol	e in pro	oviding		
Course	At the end of the <b>CO1:</b> Understand <b>CO2:</b> Understand	e course, the stu 1 the storage sy 1 storage comp	ident she stem arc	ould be chitectund its a	able and an	to, d RAID to	echniques.		Knowledge Level K2 K2		
Outcome	CO3: Infer the di	fferent backup	and rec	overy					K2		
	CO4: Demonstra	te information	and stor	age ne	twork	ting securi	ty		K3		
	CO5: Identify pa	rameters for ma	anaging	and m	onitor	ing storag	e infrastructure	•	K2		
<b>Pre-requisites</b>	-										

		(3/2	/1 indic	ates stre	ength of	CO / P	O Mapp tion) 3-S	<b>ing</b> trong, 2	2 – Med	ium, 1 - V	Veak		CO/PSO Mapping	
COs	COs Programme Outcomes (POs)												PSOs	
	PO1	D1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12												PSO2
CO 1	2	1											2	2
CO 2	2	1											2	2
CO 3	2	1											2	2
CO 4	3	3 2 1 1										2	2	
CO 5	2	1			2	2								

## Course Assessment Methods Direct

- 1. Continuous Assessment Test I, II & III
- Assignment
   End-Semester examinations

# Indirect

Cont	ent of the s	yllabus		
	Unit – I	INTRODUCTION TO STORAGE SYSTEM	Periods	9
Intro comp	duction to e outing – Hos	volution of storage architecture - key data center elements (or compute), connectivity, storage. RAID implement	nents - virtuali entations, tech	zation, and cloud niques and levels
along	g with the in	pact of RAID on application performance- Componen	nts of intellige	nt storage
syste.	Unit - II	STORAGE NETWORKING TECHNOLOGIES	Periods	9
Fibre Zonii Conv	channel SA ng - SAN-b rerged proto	N components, connectivity options - FC protocol sta ased virtualization - iSCSI and FCIP protocols for s col FCoE and its components	ck - FC addre torage access	ssing operations - over IP network,
U	J <b>nit – III</b>	BACKUP, ARCHIEVE AND REPLICATION	Periods	9
Busir - BC for b envir	ness continu: Technology ackup - bac onments, Re	ity terminologies - BC planning life cycle - Failure ana solutions- Backup and recovery – methods, targets and kup in virtualized environment - Data archive - Loc mote replication and migration in a virtualized enviror	lysis - Busines l topologies, D cal replication iments.	ss impact analysis ata Deduplication in classic virtual
τ	Unit - IV	SECURING STORAGE INFRASTRUCTURE	Periods	9
Infor SAN	mation secu – NAS – IP	rity Framework – Risk Triad – Security Implementatie SAN – Securing storage infrastructure in Virtualized a	ons in Storage and Cloud envi	Networking: FC ronments.
I	Unit – V	MANAGING STORAGE INFRASTRUCTURE	Periods	9
Moni infras - Stoi	structure ma	age infrastructure – Storage Infrastructure Man nagement challenges – Developing Idea solutions - Inf	formation lifec	ycle management
	4 D 1 .	1	<b>Cotal Periods</b>	45
Tex	t BOOK:	dien Gemeinen III. Gemeentien Grennen die Menseeren	4. Staring Ma	
1.	Protecting 1 Wiley, 2015	Digital Information in Classic, Virtualized, and Clou	id Environme	nts", 2 nd Edition,
Ref	erences:			
1.	Anthony T 2009.	Velte, "Cloud Computing: A practical Approach", 1	st Edition, Ta	ta McGraw-Hill,
2.	Mark Lippi Edition, EM	tt and Erik Smith, "Networked Storage Concepts an IC Tech books, 2014.	d Protocols T	ech book", V2.3
3.	Soren Laue Professiona	sen, "Software Requirements: Styles & Techniques", I publications, 2002	First edition,	Addison Wesley
E-R	lesources:			
1.	https://vdo	cument.in/cccloud-computing-a-practical-approach.htm	nl?page=46	
2.	https://ww	w.slideshare.net/SudarshanDhondale/storage-area-netv	vorks-unit-1-n	otes

Ç			VIV	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai)Elayampalayam, Tiruchengode – 637 205												
Progr	amme	;	<b>B.E.</b> /I	B.TEC	H. Prog	ramm	ne Cod	e			Regul	ation	201	9		
Depar	rtment	t	CSE, I	Г & CS	Т						Sem	ester		-		
C	C		C	NT		]	Period	s Per W	/eek	Credit		М	aximu	m Marks		
Cour	se Co	de	Cou	rse Nar	ne		L	Т	Р	C	CA		ESE	Fotal		
U190	CTV4	3 B T	ig Dat 'echniq	a Tool: [ues	s and		3	0	0	3	4	0	60	100		
Co Obj	urse ective		• • •	<ul> <li>Gain knowledge about the various tools and techniques used in big data analytics</li> <li>Learn the fundamentals of Hadoop and the related technologies</li> <li>Understand the basics of development of applications using MapReduce, HDFS,YARN</li> <li>Learn the basics of Pig, Hive and Sqoop</li> <li>Learn the basics of Apache Spark, Flink and understand the importance of NoSQL databases</li> <li>the end of the course, the student should be able to, Knowledge level</li> </ul>												
			CO1: U	Jse the	various t	$\frac{0}{00 \text{ s}}$	ind tec	hnique	$\frac{1}{s \text{ in big}}$	g data an	alytics	;	kiiowii F	Cl		
		(	CO2: A	Apply H	adoop ai	nd rel	ated te	chnolo	gies to	big data	analy	tics	ŀ	3		
Co Out	urse come	(	CO3: A	Apply 1 tions	MapRed	uce,	HDFS	and	YARN	develo	p big	data	ŀ	<b>K</b> 3		
		(	C <b>O4:</b> E	Develop	applicat	ions u	ising F	Pig, Hiv	ve and	Sqoop			ŀ	K3		
		1	CO5: A understa	Apply A and the	pache S importa	park nce of	and Fl f NoS	ink to QL dat	applica abases	tions ar	nd		ŀ	K3		
Pre-re	quisite	es ·	-													
	(3/2/2	l indi	cates st	rength o	<b>CO / PO</b> of correla	<b>O Ma</b> tion)	pping 3-Stroi	ng, 2 –	Mediu	m, 1 - W	'eak		CO Map	/PSO ping		
COa	DO	DO	DO	Prog	gramme (	Outco	mes (I	POs)	DO	DO	DO	DO	PSC PSC			
CUS	ru 1	2	3	4	5	го 6	PU 7	8	9	10	ru 11	12	1	2		
CO1	1	3	3	2		-		-		-			1	2		
CO2	2	2	2	3								1	2	2		
CO3	2	2	3	2									3	2		
<b>CO4</b>	2	3	2	3									2	3		
<b>CO5</b>	2	3	2	3									3	3		

#### **Course Assessment Methods Direct**

## Direct

- 1. Continuous Assessment Test I, II & III
- 2. Assignment.
- 3. End-Semester examinations

# Indirect

Conten	nt of the	e syllabus		
Unit	t – I	OVERVIEW OF BIG DATA ANALYTICS	Periods	9
Introd platfor Funda	uction rm, An mentals	to data analytics and big data, Big data mining, Technic alytics Toolkit, Components of the analytics toolkit. Intra- of Hadoop, Hadoop Ecosystem, The core modules of Ha	al elements of the roduction to Hadoo doop, MapReduce,	Big Data p,
Unit	t – II	INTRODUCTION TO HADOOP YARN	Periods	9
Analy Strean Data I Applie	zing dat ning, Hl ntegrity cation	ta with Unix tools and Hadoop, Scaling Out – Data Flow, DFS, Hadoop file systems, Java Interface to Hadoop, YARN r, Compression, Serialization, File based Data Structures, D	Combiner Function I, Job Scheduling, H eveloping a MapRe	ns, Hadoop Jadoop I/O, duce
Unit	– III	INTRODUCTION TO TOOLS	Periods	9
Install to Hiv	ing and eQL, Ii	running pig, Basics of Pig, Introduction to Hive, Installing ntroduction to Zookeeper, Installing and running Zookeep	and running Hive, per, TheZookeeper	Introduction Service.
Unit	t - IV	BIG DATA DATABASE TOOLS	Periods	9
Introd compo Big D	ucing ( onents a pata Mir	Dozie, Apache Spark, Limitations of Hadoop and overcomi and architecture of Spark, Introduction to Apache Flink, ning with NoSQL, Why NoSQL?, NoSQL databases, Intro	ng the limitations, C Batch analytics us oduction to Mongo	Core ing Flink, DB
Unit	t - V	ENTERPRISE DATA SCIENCE OVERVIEW	Periods	9
Data S Enterp Big D	Science prise In ata Vis	• Solutions in the enterprise, Enterprise data science – frastructure solutions, Visualizing Big Data, Using Pytl ualization Tools	Machine Learning hon and R for visu	g and AI, alization,
0		Тс	otal Periods 45	
Text	Books:			
1	Natara	j Dasgupta, Practical Big Data Analytics, Packt, 2018.		
2	Tom V	Vhite, Hadoop:The Definitive Guide,3rd Edition, O"Reilly	r, 2012	
3	Sridha	r Alla,Big Data Analytics with Hadoop 3,Packt, 2018.		
Refer	ences:			-
1.	G. Suc	lha Sadasivam, R. Thirumahal, BIG DATA ANALYTICS	, Oxford Press, 202	.0
2	DT Ec	litorial Services, Big Data: Black Book,2016.		
E-Res	ources			
1	https:// roadm	/www.researchgate.net/publication/339363557_Big_Data_T ap_for_Predictive_Analytics	ools_and_Techniqu	es_A_
2	https:/	/nptel.ac.in/courses/106104189		
3	https:/	/www.simplilearn.com/what-is-big-data-analytics-article	2	



VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN

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Programme	<b>B.TECH</b>	Prog	gramme (	Code	104	Regulatio	on	2019						
Department	INFORMATIO	N TECHNOLOGY				Seme	ster	-						
Course Code		Course Name	Perio	ods Per	Week	Credit	Ma	Maximum Marks						
			L	Т	Р	С	CA	ESE	Total					
U19ITV43	Cloud Comp	uting	ing <u>3</u> 0 0 3											
	The student sho	uld be made to,	$\begin{array}{c c c c c c c c c c c c c c c c c c c $											
	Introduce t	Introduce the broad perceptive of cloud architecture and model												
Course	• Understand	I the concept of Virtualization	on and f	eature	s of clo	ud simulat	tor							
Objective	• Familiar w	ith the lead players in cloud	•											
	Apply diffe	erent cloud programming m	odel as j	per nee	ed									
	At the end of	the course, the student shou	uld be al	ole to,				]	KL					
	CO1: Enumer	ate the broad perspective of	f cloud a	archite	cture &	z model.		]	K1					
Course	CO2: Analyze	the tools and mechanisms	for impl	ementi	ing virt	ualization.		]	K2					
Outcome	CO3: Design t	he cloud storage architectur	re along	with r	esource	e managen	nent	]	K3					
	CO4: Choose	the appropriate programmir	ng mode	ls and	apply			]	K3					
	CO5: Identify	the core issues of cloud co	mputing	5				]	K3					

			(3/2/1 in	ndicates s	trength	CO / P	O Mappi ation) 3-S	<b>ng</b> trong, 2 -	- Mediun	n, 1 - Weal	k		CO/PSO Mapping	
COs	COs Programme Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	2	2	1		1								2	2
CO 2	3	2	2		2								1	1
CO 3	3	2	2		2								2	2
CO 4	3	2	2		2								2	2
CO 5												2	2	

**Course Assessment Methods** 

Direct

1. Continuous Assessment Test I, II & III

- 2. Assignment
- 3. End-Semester examinations

Indirect

Cont	ent of the syllabus		
U	nit- I CLOUD COMPUTING BASICS	Periods	9
Techno	ologies for Network-Based System – System Models for Distributed and Cloud C	Computing – N	IST Cloud
Compu	ting Reference Architecture. Cloud Models:-Characteristics - Cloud Services	s – Cloud mod	dels (IaaS,
PaaS,	SaaS)-Public vs Private Cloud-Cloud Solutions-Cloud ecosystem-Service m	lanagement-	
Compu	iting on demand.		
Un	it - II VIRTUALIZATION	Periods	9
Basics	of Virtualization - Types of Virtualization - Implementation Levels of Virtualiz	ation - Virtual	ization
Structu	res - Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices	s - Virtual Cl	usters and
Resour	ce management – Virtualization for Data-center Automation.		
Uni	t – III CLOUD ARCHITECTURE	Periods	9
Archit	ectural Design of Compute and Storage Clouds – Layered Cloud Architecture De	evelopment – I	Design
Challe	nges - Inter Cloud Resource Management - Resource Provisioning and Platform	m Deploymen	t – Global
Excha	nge of Cloud Resources.		
Unit	- IV SECURITY IN CLOUD	Periods	9
Securi	y Overview-Cloud Security Challenges and Risks-Software-as-a-Ser	vice Security	y–Security
Gover	ance- Risk Management-Security Monitoring-Security Architecture	Design–Data	Security-
Applic	ation Security- Virtual Machine Security-Identity Management and Access	Control-Autor	nomic
Securi	у.		
Uni	t – V APPLICATIONS OF CLOUD	Periods	9
Scienti	fic Applications – Healthcare –Biology – Geo science – Business and Consumer	Applications	- Cloud
Compu	ting Collaboration - Multimedia – Storage – Corporate – Communication.		
	Te	otal Periods	45
TEX	f BOOK:		
1	Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Prac	tical Approac	h", TMH,
1	2009.		
REFE	RENCES:		
	DAVID E.Y. SARNA, "Implementing and Developing Cloud Computing Appli	cations", CRC	Press,
1	2010.		
-	Ronald L. Krutz, Russell Dean Vines, "Cloud Security – A comprehensive Guid	te to Secure C	loud
2	Computing", Wiley – India, 2010.		
3	Rajkumar Buyya, Christian Vecchiola, S.Tamarai Selvi, "Mastering Cloud Corr	puting", TMC	H, 2013.
4	Michael Miller, Cloud Computing, Que Publishing,2008		

# VERTICAL V: PROBLEM SOLVING & SOFTWARE DEVELOPMENT

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Prograt	nme	ВЛ	ГЕСН				Elayar	npalay	vam, T	iruche	ngoo	$\frac{16-63}{Regul}$	7 205 ation		2010	
	IIIIe	D. 1				~					4	Regui	ation		2019	
Departi	nent	INI	FORN	/IATI(	ON TEO	CHN	OLOG	τΥ				Sem	ester	E	LECTIV	E
~	~ .			~		F	Periods	Per W	'eek	Cre	dit		Maxi	mum	Marks	
Course	Code		(	Course	Name		L	Т	Р	0		CA	E	SE	Total	L
U19IT	V51		Desig	gn Thi	nking		3	0	0	3	5	40	6	0	100	
Cour Objec Cou Outco	CourseThe student should be able to,ObjectiveKnowledge in Design Thinking and Brief explanation of activity systemsObjectiveEffective Learning in Mind Mapping with an Team Building activity• Analyzing an Brain storming activity with redefining sessions• Learn about Engaging Phase and bring the ideas into Reality• May consider the real time feedback at evolve phases.CourseKnowledge LevelOutcomeC01:Apply the basic concepts of design thinking.K3CO3:Develop many creative ideas through structured brainstorming sessions.K3CO4:.Develop rapid prototypes to bring the ideas into realityK3													dge		
Pre-requ	uisites	P1	robler	n Solv	ving an	d Pro	gram	ning								
		(3/2	2/1 indio	cates str	ength of	C <b>O / P</b> correla	O Map	p <b>ing</b> Strong, 2	2 – Medi	um, 1 - V	Weak			CC Ma	D/PSO apping	]
COs	DO1	DOT	DO2	PO4	F POF	rogram	me Outc	omes (PC	)s)	<b>DO1</b> 0	DC	11 12	112	I PEOI	PSOs PSO2	4
<u>CO 1</u>	3	2	1	1	2	PU6	PU7	P08	2	2	PC		3	3	2	4
CO 2	3	2	1	1	2				2	2			3	3	2	1
CO 3	3	2	1	1					2	2			3	3	2	]
<b>CO</b> 4	3	2	1	1					2	2			3	3	2	]
<b>CO</b> 5	3	2	1	1					2	2			3	3	2	]
Course A	Direct         1. Continuous Assessment Test I,II&III         2. Assignment															

- 3. End-Semester examinations
- Indirect
  - 1. Course- end survey

Conte	ent of the	syllabus		
Uı	nit— I	Introduction and Explore Phase	Periods	9
Introd	uction – l	Need for design thinking – Design and Business – The D	Design Process	s – Design Brief –
Visua	lization –	Four Questions, Ten Tools – Explore – STEEP An	nalysis – Stra	tegic Priorities –
Activi	ty System	- Stakeholder Mapping – Opportunity Framing	D 1	0
Un	nit- II	Empathize Phase	Periods	9
Visua tools -	lization – Observati	Journey Mapping – Value Chain Analysis – Mind Map ons–Deep user Interview- Need Finding–User Persona	ping–Empath s –Team build	ize– Methods and ling activity
Un	it–III	Experiment Phase	Periods	9
Brains	storming-	reasons for brainstorming- Zen of brainstorming –B	rainstorming	Activity-Concept
Devel	opment-E	Experiment-Ideation-different ways of ideation-Prototy	ping –Idea Ro	efinement.
Un	it- IV	Engage Phase	Periods	9
Assun	nption Te	sting – Need for assumption testing- steps - Rapid Prote	otyping – forr	ns of prototyping-
Engag	ge – Story	boardingpurpose and case study		-
Un	nit– V	Evolve Phase	Periods	9
Custo	mer Co-C	Creation Learning Launch- Leading Growth and Inn	ovation- Evo	olve-Concept
Synth	esis – Stra	tegic Requirements – Evolved Activity Systems – Qui	ck Wins.	
		,	<b>Fotal Periods</b>	45
Text l	Book:			
1.	Jeanne Li	edtka and Tim Ogilvie, "Designing for Growth: A Desi	ign Thinking '	Fool Kit for
-	Managers	", Columbia University Press, 2011.		
Refer	ences:			
1.	Lee Cho Bhutan.	ong Hwa "Design Thinking The Guidebook", Desigr 2017.	n Thinking M	laster Trainers of
2	Jeanne I	iedtka, Tim Ogilvie, and Rachel Brozenske, "The Des	signing for Gr	owth Field Book:
۷.	A Step-l	by-Step Project Guide", Columbia University Press, 20	14	
3.	Tim Bro innovati	own, "Change by Design: How design thinking transfo on", HarperCollins Publishers, 2009.	orms organiza	tions and inspires
E-Res	sources:			
1.	https://w	www.interaction-design.org/literature/article/design-thin	king-a-quick-	overview
2.	https://n	ptel.ac.in/courses/110/106/110106124/		

	<b>VIVEKANANDHA</b> (Autonomous Institutio Ela	COLLE W n, Affilia yampala	GE O OME ated to yam, ⁷	F EN N Ann Firucl	GINEE a Univer hengode	RING FOR sity ,Chennai – 67 205		ISO 5001 2015
Programme	<b>B.TECH</b>	Progra	mme (	Code	104	Regulation		2019
Department	INFORMATION TECHN	NOLOGY	ľ			Semester		
Course Code	Course Name	Periods	Per W	'eek	Credit	Maxi	mum N	larks
Course Coue	Course i vanie	L	Т	Р	С	CA	ESE	Total
U19ITV52	Agile Methodologies	3	0	0	3	40	60	100
Course Objective Course	<ul> <li>The student should be may</li> <li>To provide students v</li> <li>To provide a good us</li> <li>To do test with Scrure</li> <li>To understand the be</li> <li>At the end of the course,</li> <li>CO1: Understand the course</li> <li>CO2: Use of Scrum fragmentation</li> </ul>	ade, with a ba se of mar n tools mefit of i the stude ore values amework	sic kn naging mpler ent sho s and j s on	owled the p nentin ould t orinci Proje	dge on A project ng differe pe able to ples of A ect mana	Agile ent methodol o, Agile agement and	ogies self	Knowled ge Level K2 K3
Outcome	<b>CO3:</b> Test the projects u	sing diffe	erent t	oolsı	used in s	crum		K3
	<b>CO4:</b> Model software d pair programming	esign an	d arch	itecti	ure with	XP practices	s like	K3
	<b>CO5:</b> Make use of Lear Coach helps in deliver go	n thinkin ood softw	g and vare	Kanl	oan's pra	ectices with A	Agile	K3
Pre- requisites	Software Engineering							

	(3	3/2/1 ind	licates s	trength	CO / F of corr	<b>O Map</b> relation)	<b>ping</b> 3-Stro	ng- 2 –	Mediur	n- 1 - V	Veak		CO/PSO Mapping		
COs	Programme Outcomes (POs)													PSOs	
	PO 1	PO 1         PO 2         PO 3         PO 4         PO 5         PO 6         PO7         PO8         PO 9         PO 10         PO 11         PO12											PSO1	PSO 2	
CO 1	2	1	-		-		-		-		-		2	2	
CO 2	3	2	2		2		-		1		-		3	3	
CO 3	3	2	2		2		1		1		-		3	3	
<b>CO 4</b>	3 2 2 2 1 1 -													3	
CO 5	3	2	2		2		1		1		1		3	3	

#### **Course Assessment Methods** Direct

- 1. Continuous Assessment Test I, II & III
- Assignment
   End-Semester examinations

Indirect

Conte	ent of the	syllabus						
Un	it — I	UNDERSTANDING AGILE VALUES AND PRINCIPLES	Periods	9				
Prefac	e to Agil	e, Understanding Agile Values - No Silver Bullet -	Agile to Resc	ue – A fractured				
perspe	ective – A	gile Manifesto – Understanding the Elephant – Starting	with New Me	ethodology, Agile				
Princip	ples –The	principles – Delivering the project – Communicating	and working	together –				
Projec	t Executi	on – Constantly improving the project and the team – $A$	Agile Project					
Uni	it – II	SCRUM AND SELF-ORGANISING TEAMS	Periods	9				
Under	standing	Scrum, Rules of Scrum , Scrum Team owns the p	roject, Daily	Scrum , Sprint,				
Planni	ng and R	etrospective –Iterative or Incremental – Makes or Brea	aks of Sprint b	by product owner				
– Visi	bility and	Value - Plan and run effective Scrum Sprint.						
Uni	t – III	SCRUM PLANNING AND COLLECTIVE	Periods	9				
		COMMITMENT	1 chious	,				
User S	Stories –	Make software useful – Build features –Condition o	f satisfaction,	Story point and				
velocit	ty – Burn	-down chart – Planning and Running a Sprint –Genera	ally Accepted	Scrum Practices,				
Scrum	Value R							
Unit – IVXP, SIMPLICITY AND INCREMENTAL DESIGNPeriods9								
Prima	ry Practic	es of XP, An effective Mindsets starts with XP, Unders	standing XP p	rinciples, Code				
an Des	sign, Mak	te Code and Design decisions at the last responsible mo	oment, Incren	nental Design				
and the	e Holistic	XP practices						
Uni	it – V	LEAN, KANBAN AND AGILE COACH	Periods	9				
Lean t	hinking -	- Lean values – Commitment, Option thinking and Se	t based devel	opment, Creating				
Heroes	s and Ma	gical thinking – Eliminate Waste –Gain a deeper und	erstanding - I	Deliver as fast as				
possib	le, Princi	ples of Kanban, Improving process with Kanban, Em	ergent behavi	ior with Kanban,				
Overv	iew of Ag	gile coach- Principles of Coaching.						
		1	otal Periods	45				
Text E	300k:							
1.	Andrew and Kar	Stellman and Jennifer Greene, "Learning Agile: Un ban", 1 st Edition, O'Reilly Media, 2014	derstanding S	Scrum, XP, Lean				
Refere	ences:							
1.	Eric Bre	echner, "Agile Project Management with Kanban", Mic	crosoft Press,	1 st Edition, 2015				
2.	Ken Sch	waber, "Agile Project Management with Scrum", 1st Ed	dition,Microso	oft Press,2004				
E-Resources:								
1.	https://w Scrum/w	ww.agileleanhouse.com/lib/lib/People/KenSchwaber/A ww.itworkss.com.pdf	gileProjectM	anagementWith				
2.	https://w	ww.scrum.org/						
3.	https://w	ww.atlassian.com/agile						

	<b>VIVEKANANDHA</b> (Autonomous Institution Eli	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205											
Programme	B.TECH Progr	2019											
Department	INFORMATION TECHN	-											
Course Code	Course Name	S Total											
U19ITV53	Software Project Management	100											
Course Objective	<ul> <li>The student should be made to,</li> <li>Learn project management activities</li> <li>Learn cost benefit analysis for project evaluation</li> <li>Learn risk management techniques</li> <li>Organize the people and complete the task by team basis</li> </ul>												
	On Completion of the cou	Knowledge Level											
	<b>CO1:</b> Learn the basis o problems and concerns of	K2											
Course Outcome	<b>CO2:</b> Describe the project evaluation and selection of economic criteria.	К3											
	<b>CO3:</b> Identify the factor prioritize actions for risk e	s putting eliminatior	a proj 1 or co	ect at ntainm	risk and ent.	l categori	ze and	K3					
	<b>CO4:</b> Monitor the progress project, revise targets to co	ss of proje prrect or co	cts, vi ountera	sualize act drif	and asso t.	ess the sta	ate of a	K3					
	<b>CO5:</b> Comprehend the best methods for organizational behavior and management. K3												
Pre- requisites	•												

	<b>CO / PO Mapping</b> (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak												CO/PSO Mapping		
COs Programme Outcomes (POs)												PSOs			
	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12										PSO1	PSO2			
CO 1	2	1	1	-	-	-	-	-	-	-	-	-	3	2	
CO 2	3	2	1	-	-	-	-	-	-	-	-	-	3	2	
CO 3	3	2	1	-	-	-	-	-	-	-	-	-	3	2	
CO 4	3	2	1	-	-	-	-	-	-	-	-	-	3	2	
CO 5	3	3	2	-	-	-	-	-	-	-	-	-	3	2	

Direct

- 1. Continuous Assessment Test I, II & III
- 2. Assignment/Quiz/Seminar
- 3. End-Semester examinations

# Indirect

Conter	nt of the syll	abus		
Unit –	Ι	Introduction To Software Project Management	Periods	9
Project	Definition	- Contract Management - Activities covered By Sol	ftware Project	Management -
Overvi	ew of Projec	t Planning – Stepwise Project Planning.		
Unit –	II	Project Evaluation and Estimation	Periods	9
Strateg	ic Assessme	nt – Technical Assessment – Cost Benefit Analysis –	Cash Flow For	recasting – Cost
Benefit	Evaluation	Techniques – Risk Evaluation. Basis for software estimat	ing-Software	effort estimation
techniq	ues – Estin	nating by analogy – Albercht function point analysis	– A Procedur	al code-oriented
approa	ch - COCOI	MO: a parametric Model		
	Unit – III	Activity Planning and Risk Management	Periods	9
Object	ives – Proje	ect Schedule – Sequencing and Scheduling Activities	-Network Plan	nning Models –
Forwa	rd Pass – B	ackward Pass - Activity Float - Shortening Project I	Duration – Act	tivity on Arrow
Netwo	rks. Nature	Of Risk – Types Of Risk – Managing Risk – Hazard Ide	entification – H	Hazard Analysis
– Risk	Planning A	nd Control- Evaluation Risk to the schedule.		
Unit –	IV	Monitoring and Control	Periods	9
Creatin	g Framewon	k – Collecting The Data – Visualizing Progress – Cost	Monitoring –	Earned Value –
Prioriti	zing Monito	oring – Getting Project Back To Target. Change Cor	ntrol – Manag	ing Contracts –
Introdu	ction – Typ	es Of Contract – Stages In Contract Placement – Ty	pical Terms C	Of A Contract –
Contra	ct Managem	ent – Acceptance.		
Unit –	V	Managing People and Organizing Teams	Periods	9
Introdu	ction – Und	erstanding Behavior – Organizational Behavior: A Bacl	kground – Sele	ecting The Right
Person	For The Jo	b - Instruction In The Best Methods - Motivation -	The Oldham	– Hackman Job
Charac	teristics Mo	del – Working In Groups – Becoming A Team –Dec	cision Making	– Leadership –
Organiz	zational Stru	ctures – Stress –Health And Safety – Case Studies.		
		1	otal Periods	45
Text B	ook:			
1.	Bob Hughe	es, Mike Cotterell, Rajib Mall, Software Project Manage	ement, Sixth E	dition, McGraw
	Hill, 2017			
Refere	nce Books:		<u> </u>	
1	Greg Horin	e-Project Management Absolute Beginner's Guide, 3/E-	Que Publishing	g,2012
2	Richard H.	Thayer, "Software Engineering Project Management",	Second Edition	n, John Wiley &
	Sons, 2001			
E-Reso	ources:			
1.	http://bls.b	uu.ac.th/~se888321/2556/00BaseInfo/software-project-m	anagement-bo	b-hughes-and-
	mike-cotter	ell-tata-mcgraw-hill-edition.pdf		
2.	https://fit.in	nstructure.com/courses/523154/files/38788449/download	l?verifier=e0fjj	1346csQB7J4Q
	CmvsQxb1	7Rx21YPNNufpZfk&wrap=1		

Programme	VIVEKAN (Autonomou B TECH	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN(Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205Image: Colspan="2">Image: Colspan="2" Image: Colsp											
Department	INFORMATI	INFORMATION TECHNOLOGY Semester											
Department													
Course Code	Course	ximum N	um Marks										
			L	Т	Р	C	CA	ESE	Total				
U19ITV54	<b>Block Chain</b>	Block Chain Technology         3         0         0         3         40         60											
Course Objective	<ul> <li>The student sl</li> <li>To acquire</li> <li>To unders</li> <li>To unders</li> <li>To familia</li> <li>To illustra</li> </ul>	nould be made e the basic know stand the mech stand the current arize about the ate mining con	, owled; anism nt tren netw cepts	ge and is of E ids of orking of bit	l und Bitcoi Bloc g basi coin	erstandii n. k chain cs behin	ngs of Bitco d bitcoin	oin					
	At the end of	the course, the	stude	ent sho	ould b	be able t	0,		Knowledge Level				
Course	CO1: Compre	ehend the foun	datio	ns of l	Block	chain			K2				
Outcome	CO2: Discove	er the secure a	nd eff	ïcient	trans	actions	with Bitcoi	n	K2				
	CO3: Confer	the core conce	epts of	f Key,	addr	ess and	transaction		K2				
	CO4: Expert	ise about the n	etwor	king o	conce	epts depl	oyed in Bit	coin	K2				
	CO5: Experi	CO5: Experiment with Bitcoin mining K3											
Pre- requisites	Cryptography	and Network	Secur	ity									

	CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak												CO/PSO Mapping		
COs	Ds Programme Outcomes (POs)										PSOs				
	PO1	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12									PSO1	PSO2			
CO 1	2	1											2	3	
CO 2	2	1											2	3	
CO 3	2	1											2	3	
CO 4	2	1											2	3	
CO 5	3													3	

Direct

- 1. Continuous Assessment Test I, II & III
- 2. Assignment
- 3. End-Semester examinations

Indirect

Unit – IBlock ChainPeriods9Blockchain - FeriodsSecurity - Smart contracts - blockchain implementation: Bitcoin – Wallets - Hashing - Minin Consensus – Bitcoin Ecosystem.Security - Smart contracts - blockchain implementation: Bitcoin – Wallets - Hashing - Minin Consensus – Bitcoin Ecosystem.Unit - IIBitcoin – Bitcoin - History – Uses - Sending and receiving bitcoins – Bitcoin Worf Bitcoin Transactions - Transaction Forms - Constructing a Transaction - Bitcoin - Mining - Minin											
Blockchain - Features and challenges - Decentralization - Tamper-resistant – Transparency -         Security - Smart contracts - blockchain implementation: Bitcoin – Wallets - Hashing - Minin         Consensus – Blockchain Ecosystem.         Unit - II       Bitcoin       Periods       8         Introduction to Bitcoin - History – Uses - Sending and receiving bitcoins – Bitcoin Worl Bitcoin Transactions - Transaction Forms - Constructing a Transaction - Bitcoin Mining - Min											
Security - Smart contracts - blockchain implementation: Bitcoin – Wallets - Hashing - Minit Consensus – Blockchain Ecosystem.Unit - IIBitcoinPeriods8Introduction to Bitcoin - History – Uses - Sending and receiving bitcoins – Bitcoin Worf Bitcoin Transactions - Transaction Forms - Constructing a Transaction - Bitcoin Mining - M transactions in blocks - Spending the transaction											
Consensus – Blockchain Ecosystem.Unit - IIBitcoinPeriods8Introduction to Bitcoin - History – Uses - Sending and receiving bitcoins – Bitcoin WordBitcoin Transactions - Transaction Forms - Constructing a Transaction - Bitcoin Mining - Mtransactions in blocks - Spending the transaction	ng –										
Unit - IIBitcoinPeriods8Introduction to Bitcoin - History – Uses - Sending and receiving bitcoins – Bitcoin WorfBitcoin Transactions - Transaction Forms - Constructing a Transaction - Bitcoin Mining - Mtransactions in blocks - Spending the transaction											
Introduction to Bitcoin - History – Uses - Sending and receiving bitcoins – Bitcoin Work Bitcoin Transactions - Transaction Forms - Constructing a Transaction - Bitcoin Mining - M transactions in blocks - Spending the transaction											
Bitcoin Transactions - Transaction Forms - Constructing a Transaction - Bitcoin Mining - N transactions in blocks - Spending the transaction	king -										
transactions in blocks - Spending the transaction	<b>/</b> ining										
Unit – IIIKey, Address and TransactionPeriods9											
Key, Address: Public key cryptography and crypto-currency - Private and Public – Bitcoin											
Addresses - Implementing Keys and Addresses in Python/Java.											
Transactions: Introduction - Transaction Lifecycle - Structure - Outputs and Inputs - Chain	ning –										
Script Language – Standard Transaction.											
Unit - IVNetworkPeriods9											
Peer-to-Peer Network Architecture - Nodes Types and Roles - Extended Bitcoin Network - Network	twork										
Discovery - Full Nodes - Inventory - Simplified Payment Verification Nodes Bloom Filter	rs and										
Inventory Updates - Transaction Pools - Alert Messages.											
Unit - VMiningPeriods10											
Mining: Introduction - Bitcoin Economics and Currency Creation - Decentralized Consensus -											
Independent Verification of Transactions - Mining Nodes - Aggregating Transactions into Bl	ocks -										
Constructing the Block Header - Mining the Block - Validating a New Block - Assembling	g and										
Selecting Chains of Blocks - Hashing Race - Consensus Attacks											
Total Periods 45											
Text Books:											
Nascimento S. Pólvora A., Anderberg A., Andonova E., Bellia M., Calès L., Inamora	to dos										
Santos A., Kounelis I., Nai Fovino I., Petracco Giudici M., Papanagiotou E., Sobolews	ki M.,										
1. Santos A., Kounelis I., Nai Fovino I., Petracco Giudici M., Papanagiotou E., Sobolews Rossetti F., Spirito L., "Blockchain Now And Tomorrow: Assessing Multidimension	ski M., al										
<ol> <li>Santos A., Kounelis I., Nai Fovino I., Petracco Giudici M., Papanagiotou E., Sobolews Rossetti F., Spirito L., "Blockchain Now And Tomorrow: Assessing Multidimension Impacts of Distributed Ledger Technologies" European Union, 2019</li> </ol>	ski M., al										
<ol> <li>Santos A., Kounelis I., Nai Fovino I., Petracco Giudici M., Papanagiotou E., Sobolews Rossetti F., Spirito L., "Blockchain Now And Tomorrow: Assessing Multidimension Impacts of Distributed Ledger Technologies"European Union, 2019</li> <li>Andreas M Antonopoulos, "Mastering Bitcoin: Unlocking Digital Cryptocurrencies",</li> </ol>	ski M., al										
1.       Santos A., Kounelis I., Nai Fovino I., Petracco Giudici M., Papanagiotou E., Sobolews Rossetti F., Spirito L., "Blockchain Now And Tomorrow: Assessing Multidimension Impacts of Distributed Ledger Technologies"European Union, 2019         2.       Andreas M Antonopoulos, "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O''Reilly Media,2018	ski M., al										
1.       Santos A., Kounelis I., Nai Fovino I., Petracco Giudici M., Papanagiotou E., Sobolews         Rossetti F., Spirito L., "Blockchain Now And Tomorrow: Assessing Multidimension         Impacts of Distributed Ledger Technologies"European Union, 2019         2.       Andreas M Antonopoulos, "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O"Reilly Media, 2018         References:	ski M., al										
1.       Santos A., Kounelis I., Nai Fovino I., Petracco Giudici M., Papanagiotou E., Sobolews Rossetti F., Spirito L., "Blockchain Now And Tomorrow: Assessing Multidimension Impacts of Distributed Ledger Technologies"European Union, 2019         2.       Andreas M Antonopoulos, "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O''Reilly Media,2018         References:         Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Gold	ski M., al										
1.       Santos A., Kounelis I., Nai Fovino I., Petracco Giudici M., Papanagiotou E., Sobolews Rossetti F., Spirito L., "Blockchain Now And Tomorrow: Assessing Multidimension Impacts of Distributed Ledger Technologies"European Union, 2019         2.       Andreas M Antonopoulos, "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O''Reilly Media,2018         References:         1.       Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Gold "Bitcoin and cryptocurrency technologies: a comprehensive introduction", Princeto	ski M., al feder, n										
1.       Santos A., Kounelis I., Nai Fovino I., Petracco Giudici M., Papanagiotou E., Sobolews Rossetti F., Spirito L., "Blockchain Now And Tomorrow: Assessing Multidimension Impacts of Distributed Ledger Technologies"European Union, 2019         2.       Andreas M Antonopoulos, "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O"Reilly Media,2018         References:         1.       Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Gold "Bitcoin and cryptocurrency technologies: a comprehensive introduction", Princeto University Press, 2016.	ski M., al lfeder, on										
1.       Santos A., Kounelis I., Nai Fovino I., Petracco Giudici M., Papanagiotou E., Sobolews Rossetti F., Spirito L., "Blockchain Now And Tomorrow: Assessing Multidimension Impacts of Distributed Ledger Technologies"European Union, 2019         2.       Andreas M Antonopoulos, "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O"Reilly Media,2018         References:         1.       Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Gold "Bitcoin and cryptocurrency technologies: a comprehensive introduction", Princeto University Press, 2016.         2.       Imran Bashir, "Mastering Blockchain Distributed ledgers, decentralization and	ski M., al lfeder, n smart										
1.       Santos A., Kounelis I., Nai Fovino I., Petracco Giudici M., Papanagiotou E., Sobolews Rossetti F., Spirito L., "Blockchain Now And Tomorrow: Assessing Multidimension Impacts of Distributed Ledger Technologies"European Union, 2019         2.       Andreas M Antonopoulos, "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O''Reilly Media,2018         References:         1.       Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Gold "Bitcoin and cryptocurrency technologies: a comprehensive introduction", Princeto University Press, 2016.         2.       Imran Bashir, "Mastering Blockchain Distributed ledgers, decentralization and contracts Explained", 2 Edition, Packt Publishing, 2018.	ski M., al lfeder, on smart										
1.       Santos A., Kounelis I., Nai Fovino I., Petracco Giudici M., Papanagiotou E., Sobolews Rossetti F., Spirito L., "Blockchain Now And Tomorrow: Assessing Multidimension Impacts of Distributed Ledger Technologies"European Union, 2019         2.       Andreas M Antonopoulos, "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O'Reilly Media,2018         References:         1.       Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Gold "Bitcoin and cryptocurrency technologies: a comprehensive introduction", Princeto University Press, 2016.         2.       Imran Bashir, "Mastering Blockchain Distributed ledgers, decentralization and contracts Explained", 2 Edition, Packt Publishing, 2018.	ski M., al lfeder, on smart										
1.       Santos A., Kounelis I., Nai Fovino I., Petracco Giudici M., Papanagiotou E., Sobolews Rossetti F., Spirito L., "Blockchain Now And Tomorrow: Assessing Multidimension Impacts of Distributed Ledger Technologies"European Union, 2019         2.       Andreas M Antonopoulos, "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O"Reilly Media,2018         References:       Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Gold "Bitcoin and cryptocurrency technologies: a comprehensive introduction", Princeto University Press, 2016.         2.       Imran Bashir, "Mastering Blockchain Distributed ledgers, decentralization and contracts Explained", 2 Edition, Packt Publishing, 2018.         E-Resources:       1.         1.       https://www.coursera.org/learn/blockchain-basics	ski M., al Ifeder, on smart										
1.       Santos A., Kounelis I., Nai Fovino I., Petracco Giudici M., Papanagiotou E., Sobolews Rossetti F., Spirito L., "Blockchain Now And Tomorrow: Assessing Multidimension Impacts of Distributed Ledger Technologies"European Union, 2019         2.       Andreas M Antonopoulos, "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O'Reilly Media,2018 <b>References:</b> 1.       Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Gold "Bitcoin and cryptocurrency technologies: a comprehensive introduction", Princeto University Press, 2016.         2.       Imran Bashir, "Mastering Blockchain Distributed ledgers, decentralization and contracts Explained", 2 Edition, Packt Publishing, 2018. <b>E-Resources:</b> 1.         1. <u>https://www.coursera.org/learn/blockchain-basics</u> 2. <u>https://www.tutorialspoint.com/blockchain/basics</u>	ski M., al Ifeder, on smart										

	VIVEKANAN (Autonomous Ir	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205 B TECH Programme Code 104 Regulation 2019										
Programme	<b>B.TECH</b>	Program	ne Code	e		104	Regulati	on	2019			
Department	INFORMATION T	-										
Course Code	Course Name	m Mark	S									
			L	Т	Р	C	CA ESE		Total			
U19ITV55	Total Quality Management         3         0         0         3         40         60								100			
Course Objective	<ul> <li>Ine student should be made to,</li> <li>Understand the concept of the quality</li> <li>Study principles and philosophies of quality management</li> <li>Understand the different quality systems.</li> <li>Learn the tools and techniques for management</li> <li>Learn the quality system and implementation</li> </ul> On Completion of the course, the student should be able to Knowledge											
	CO1: Learn the TQ	M framew	ork an	d quali	ty state	ements			K2			
Course Outcome	CO2: Understand Management(TQM)	the philos	ophy a	and pr	inciple	s of To	tal Quali	ty	K2			
	CO3: Interpret Stat	istical Pro	cess Co	ontrol	And Pr	ocess Ca	apability		K3			
	<b>CO4:</b> Discover the	tools and t	echniq	ues to	enhanc	e Manag	gement pr	ocess	К3			
	CO5: Distinguish Quality systems and Implementation K3											
Pre- requisites	-											
CO/PO Manning CO/PSO												

	CO / PO Mapping												CO/PSO		
	(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak												Mapping		
COs	COs Programme Outcomes (POs)												PSOs		
	PO1	01 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12										PSO1	PSO2		
CO 1	2	1	-	-	-	-	-	-	-	-	-	-	3	2	
CO 2	2	1	-	-	-	-	-	-	-	-	-	-	3	2	
CO 3	3	2	1	-	-	-	-	-	-	-	-	-	3	2	
CO 4	3	2	1	-	-	-	-	-	-	-	-	-	3	2	
CO 5	3	2	1	-	-	-	-	-	-	-	-	-	3	2	

Direct

- Continuous Assessment Test I, II & III
   Assignment/Quiz/Seminar
- 3. End-Semester examinations

Indirect

Conte	ent of the	syllabus		
Unit –	- I	Introduction to Quality Management	Periods	9
Defini	itions – T	QM framework, benefits, awareness and obstacles. Quali	ty – vision, mi	ission and policy
statem	nents. Cus	tomer Focus – customer perception of quality, Transla	ating needs in	to requirements,
custon	ner retenti	on. Dimensions of product and service quality	I	T
Unit –	- II	Principles and Philosophies of Quality Management	Periods	9
Overv	view of the	contributions of Deming, Juran Crosby, Masaaki Imai,	Feigenbaum, I	shikawa,
Taguc	chi techniq	ues - introduction, loss function, parameter and toleranc	e design, signa	al to noise ratio.
Conce	epts of Qu	ality circle, Japanese 5S principles	1	1
Unit –	- III	Statistical Process Control and Process Capability	Periods	9
variab concej produc	bles and a pts of pro	ttributed. Process capability – meaning, significance at cess capability. Reliability concepts – definitions, reliability cacteristics curve. Total productive maintenance (TMP)	nd measureme ability in serie	ent – Six sigma es and parallel,
Unit –	- IV	<b>Tools and Techniques for Quality Management</b>	Periods	9
of qua of reli (statis	llity (HOQ ability, fa tical) tool	(), building a HOQ, QFD process. Failure mode effect an ilure rate, FMEA stages, design, process and documents s. Seven new management tools.	alysis (FMEA) ation. Seven o	) – requirements ld
Unit –	- V	Quality Systems Organizing and Implementation	Periods	9
Introd	uction to	IS/ISO 9004:2000 - quality management systems -	guidelines f	or performance
impro	vements.	Quality Audits. TQM culture, Leadership – quality con	uncil, employe	ee involvement,
motiva	ation, employed	powerment, recognition and reward, Business process	re-engineering	g (BPR) –
princi	pies, appi	rections, recing meeting process, benefits and minitations.	Total Pariods	45
Text I	Rooks.	1	otal I crious	
1	Dale H	Besterfiled et at "Total Quality Management" Fifth Fo	dition Pearson	2019
2.	James R Edition.	. Evans and William M. Lindsay, "The Management and South- Western (Thomson Learning), 2011.	Control of Q	uality", 8th
Refer	ence Bool	KS:		
1.	Oakland 2003.	, J.S. "TQM – Text with Cases", Butterworth – Heinema	ann Ltd., Oxfo	rd, 3 rd Edition,
2.	Suganth Ltd.,200	i,L and Anand Samuel, "Total Quality Management", Pr 6.	entice Hall (In	dia) Pvt.
3.	Janakira (India) I	man, B and Gopal, R.K, "Total Quality Management – 7 Pvt. Ltd., 2006.	Fext and Cases	s", Prentice Hall
E Res	ources:			
1.	http://w 20Beste	ww.uop.edu.pk/ocontents/Total%20Quality%20Manager rfield,%20Carol%20BesterfieldMichna,%20Glen%20H.	nent%20by%2 %20Besterfield	20Dale%20H.% 1,%20Mary%20
	Besterfi	eldSacre,%20Hemant%20Urdhwareshe,%20Rashmi%20	Urdhwarshe%	20(zlib.org).pdf
2.	https://b	ooks.google.co.in/books?id=n67M3XJB91IC&printsec= r&cad=0#v=onepage&g&f=false	frontcover&so	ource=gbs_ge_s

C:			<b>VIV</b> (Auto	<b>EKA</b> nomo	. <b>NAN</b> ous Ins	<b>DHA</b> stitutio Elay	COLI V on, Aff yampa	LEGE VOMI iliatec layam	E <b>OF I</b> E <b>N</b> l to Ai , Tiru	ENGIN nna Un chengo	<b>EERI</b> iversity ode – 63	<b>NG FOR</b> ,Chennai 37 205		Rheinland RTIFIED ISO	9001:2015
Program	me	B.TE	СН				Prog	ramme	e Code	1	04	Regulati	on	2019	)
Departm	ent	INFO	)RMA	TIO	N TEO	CHNO	LOGY	7			S	emester		-	
Course C	ode		Со	urse N	Jame		Pe	eriods l Week	Per	Cr	edit	М	aximur	n Mar	ks
							L	Т	P	(	С	CA	E	SE '	Total
U19ITV	/56	BUI	LDIN APP	G EN LICA	TERI TION	PRISE V	3	0	0		3	40	6	50	100
Cours Objecti	e ve	<ul> <li>1</li> <li>1</li></ul>	<ul> <li>Introduces the concepts, architecture, different design modeling techniques of Enterprise applications and different issues related to their implementation</li> <li>Understand the importance of application framework and designing other application components.</li> <li>Introduce the different testing techniques for Enterprise application and methodologies used to roll out these applications.</li> </ul>												
		At t	he en	d of th	ne cou	ırse, th	ne stud	ent sh	ould b	be able	to,				KL
Cours	se	CO1 mode	CO1: Identify challenges in building an enterprise applications and build a K2 model												K2
Outcom	lle	CO2	<b>CO2:</b> understand a logical ,technical and data architecture of an application											K2	
		CO3: understand application framework components and perform code K2 review and analysis											K2		
		appli	cation	scribe is ly diff	Vari	ous to	esting	me	thods	and	rolling	out an	enterp	orise	K2
Pre-requi	sites	Obj	ect O	riente	d Prog	gramn	ning	compe	ments			aprise apr	Jiicatic	/115	K.
						~ ~ ~ ~							~~~~	- ~ ~	
		(3/2	/1 indic	ates stro	ength of	f correla	PO Map tion) 3-S	ping Strong, 2	2 – Med	ium, 1 - V	Veak		CO/I Map	PSO ping	
COs		、 		L		Program	me Outco	omes (PO	s)				PS	Os	
CO 1	2 POI	PO2 1	PO3	PO4	P05	PO6	<b>PO</b> 7	PO8	PO9	POI0	POII	PO12	2 PSOI	<b>PSO</b>	2
CO 2	2	1											2	2	
CO 3	2	1											2	2	
CO 4	2	1	1										2	2	
<u>CO 5</u>	3	2	1	<u> </u>									Z	Z	
Direct1. Co2. A:3. EiIndirect	Direct         1. Continuous Assessment Test I, II & III         2. Assignment         3. End-Semester examinations         Indirect         1. Course - end survey														
1. 00	1. Course - end survey														

Conten	t of the	e syllabus		
Un	it – I	INTRODUCTION	Periods	9
Introdu	ction to	enterprise applications - Software engineering methodolog	ies - Life cyc	le of raising an
enterpri	ise appl	ication - Key determinants of successful enterprise application	ions - Measur	ing the success
of enter	prise a	pplications. Inception of enterprise applications: Enterprise	analysis- busi	ness modeling-
requirer	nents e	licitation and analysis-requirements validation- planning and	estimation.	0
Un	it - 11	ARCHITECTURE AND DESIGNING	Periods	9
Archite	cture, v	iew and viewpoints-Enterprise application architecture persp	pective - Logi	cal architecture
Technic	cal arcl	hitecture and Design - Data architecture - Infrastruct	ure architect	ure and design
Infrastru	ucture a	remiecture and building blocks – Networking, internetworking	g and Commu	lowmont Stratogy
-11 has $-10$	nentatio	and software – Mudieware – Foncies for inflastructure mana	gement – Dep	noyment strategy
Uni	$\frac{1}{t - III}$	CONSTRUCTING ENTERPRISE APPLICATION	Periods	9
			1	
Constru	iction re	eadiness - code review – objective – Process - static code and	alysis – Codin	ig style – Logical
ougs – a		vulnerabilities – Code quality -build and testing-build proces	ss – unit testing	g - Dynamic code
anarysis	s – Cou		1	
Uni	it - IV	TESTING AND ROLLING OUT	Periods	9
Testing	entern	ise applications – enterprise application environments - inter-	gration testing	- system testing
– Perfo	rmance	Penetration. Usability. Globalization. Interface Testing - us	ser acceptance	e testing - rolling
out ent	erprise	application	· · · · · · · · · · · · · · · · · · ·	6 6
Uni	it – V	<b>APPLICATION IMPLEMENTATION</b>	Periods	9
Infrastr	ucture s	services Layer Framework components – Presentation Lay	ver Framewor	k components –
Busines	s Layer	Framework components – Data Access Layer Framework c	omponents	1
			<b>Fotal Periods</b>	45
Text <b>B</b>	Book:			
1	Anubha	avPradhan, Satheesha B. Nanjappa, Senthil K. Nallasa	my, Veeraku	marEsakimuthu
1.	"Raisin	g Enterprise Applications", 1 st Edition, Wiley India Pvt. Ltd,	2010.	
Refere	ences:			
1.	Brian	Berenbach, Daniel J. Paulish, JuergenKazmeier, Arnold	Rudorfer, "So	oftware Systems
	Require	ements and Engineering: In Practice", 1st Edition, McGraw-H	Iill Education,	, 2009.
2	Sriniva	sanDesikan, Gopalaswamy Ramesh, "Software Testing P	rinciples and	Practices ", 1 st
2.	Edition	, Pearson Education, 2006.		
3.	Soren 1	Lauesen, "Software Requirements: Styles & Techniques",	First edition,	Addison Wesley
	Profess	tional publications, 2002		
E-Res	ources			
1.	https:/	//slideplayer.com/slide/15865992/		
2.	https:/	//slideplayer.com/slide/14417244/		

	VIVEKANANE (Autonomous E	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205											
Programme	<b>B.TECH</b>	Programme Code	10	4		I	Regulation		2019	)			
Department	INFORMATION	TECHNOLOGY					Semester		-				
~ ~ .	~	Course NamePeriods Per WeekCreditMLTPCCA											
Course Code	Со	Course Name     L     T     P     C     CA       INTERNET MARKETING AND											
U19ITV57	INTERNET	Course IvaliteLIPCCAINTERNET MARKETING AND E-COMMERCE300340											
Course Objective	<ul> <li>Recognize ho provide comp</li> <li>Gain knowled</li> <li>Identify desira</li> <li>Know about n</li> </ul>	w information technol etitive advantages. ge about various ele able properties of sec- nanagement's role in	ologie ectron cure c infoi	es (IT ic pay ommu rmatic	) influe ment i unicati	ence b method on and irity	usinesses ls. l ways to a	and ho achiev	ow the	y 1.			
	At the end of the c CO1 : Demonstrat	ourse, the student wi	ill be	able t the N	o: etworl	c and I	nternet co	ncept	Kno L	wledge Level K3			
Course	CO2 : Understand	the methodologies f	for on	line b	usines	s deali	ngs.	Pt	-	K2			
Outcome	CO3: Understand	the role of Internet t	techno	ology	in E-C	Comme	erce.			K2			
3 <b>2 2 2 0 1 1 0</b>	CO4 : Understand	various aspects of E	E-Con	nmerc	e.	·	1			K2			
	achieve them.	sirable properties o	or sec	ure c	ommu	nicatio	on and wa	ays to		KI			

#### Prerequisites

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	CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak Programme Outcomes (POs)												CO/PSO Mapping		
COs						Program	nme Outco	omes (PO	s)				PS	Os	
	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO 1	3	2													
CO 2	2	1													
CO 3	2	1											2	2	ĺ
<b>CO 4</b>	2	1											2	2	ĺ
CO 5	1												2	2	ĺ
ourse As	ssessr	nent	Meth	ods											
irect															
1. Co	ntinu	ous A	ssess	ment '	Test I.	II &	III								
2. As	signm	nent			,										
3. En	d-Sen	nester	exar	ninatio	ons										
direct	lirect														
1. Cou	ırse -	end s	urvey	/											

1

Content of the	syllabus		
Unit – I I	ntroduction to Electronic commerce	Periods	9
Introduction to	Electronic commerce Benefits of Electronic commerce Imp	act of Elect	ronic
commerce Clas	sification of Electronic commerce Application of Electronic	c commerce	
Unit - II	<b>Electronic Commerce: Business Models</b>	Periods	9
Electronic Com	merce: Business Models Electronic Data Interchange EDI,	Layered Ar	chitecture,
Benefits of ED	, Applications of EDI Electronic Commerce: Architectural	Framework	Network
Infrastructure L	AN, ELAN, WAN, TCP/IP Reference Model, Domain Nan	ne System I	nformation
Distribution and	d Messaging FTP, WWW server, HTTP, Web Server Inform	nation Publ	ishing
Technology Inf	ormation publishing, Web Browsers, HTML, Common Gat	eway, VRN	1L
Unit – III	<b>Electronic Commerce: Securing the Business on</b>	Periods	9
	Internet		
Electronic Co	mmerce: Securing the Business on Internet Why infor	rmation on	internet is
vulnerable, Sit	e Security, Protecting the Network, HTTP services Electron	ic Commer	ce: Securing
Network Tran	saction Transaction Security, Cryptology, Cryptographic	Algorithms	Public Key,
Algorithms, D	igital Signature, Email Security Influence on supply chain		
Management I	Electronic Payment System Online, Pre Paid, Post paid payr	nent system	1
Unit - IV	Electronic Commerce: Influence on Marketing	Periods	9
Electronic Co	mmerce: Influence on Marketing Product, Physical Distr	ibution Pri	ce Promotion
Electronic Co	mmerce: Search Engine and Directory Services Search	engines, So	earch engines
marketing, Int	ernet Advertising Mobile Commerce: Introduction, Framew	ork and Mo	odels
Unit – V	Agents in Electronic Commerce	Periods	9
Agents in Ele	ctronic Commerce Need for Agents Types of Agents, S	Standards a	nd Protocols,
Application.			
	Tot	al Periods	45
TEXT BOOK	:		
1 Bharath E 4eMcGrav	Baskar ,"Electronic Commerce: Framework, Technologies w-Hill Education, 2013	and Applie	cations ",Tata
REFERENC	ES:		
1 "Kamesh McGrawł	K.Bajaj and Debjani Nag, E-Commerce the Cutting Edge of Iill, 2005	of Business	", Tata
2 Ravi Kala	kota and Andrew B.Whinston,"Frontiers of E-Commerce"	, Pearson E	ducation
3 Gary Schr	neider, "Electronic Commerce", 12th Edition, Cengage Lear	ming, 2016	

	<b>VIVE</b> (Aut	KANANDHA onomous Instit Ela	COLLE W ution, A yampala	GE OF EN OMEN ffiliated to A ayam, Tiruc	NGINE Anna U hengod	ERING I niversity e – 637 2	F <b>OR</b> ,Chennai) 05	VRheinland ERTIFIED	2015 03.50 0.55 1115			
Programme	<b>B.TECH</b>			Programn	ne Code	104	Regulation	201	19			
Department	INFORMA	TION TECHN	OLOGY			Se	emester		-			
Course Code	Cour	Course Name Periods Per Week Credit Maximum Mark										
Course Coue	Cours	Course NameLTPCCA										
U19ITV58	GAME TH ITS APPI	ME THEORY AND S APPLICATIONS300340										
Course Objective	<ul><li>To exp therefo</li><li>To fam</li></ul>	lain and predic re help improv iliarize with th	t how in e decisio e process	dividuals b on making s of game d	ehave in lesign a	n a specif nd develo	fic strategic s	situatio	on and			
	At the end	of the course, t	he stude	nt should b	e able t	о,		K	L			
	CO1: App	ly the strategies	s of gam	es to the rea	al world	l problem	IS	K	3			
Course	CO2: Solv	e the problems solution	s of Non	-cooperativ	e static	games a	nd present it	s Ka	3			
Outcome	CO3: App certainty of	ly the concept f games.	of Equi	libria and c	lynamic	e games t	o identify th	e Ka	3			
	<b>CO4:</b> Solv	e problems in	coopera	tive games	and re	late to m	ulti objectiv	e Ka	3			
	CO5: Solv	e real world pr	oblems ı	using the pr	inciples	of game	theory	K	3			
Pre-requisites	-											

		(3/)	2/1 indic	ates str	ength of	CO/	PO Map	ping	) – Med	ium 1 - V	Veak		CO/F Manr	'SO
COs	Programme Outcomes (POs)           P01         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12											PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	3	2	1	1	-	-	-	-	-	-	-	-	3	3
CO 2	3	2	1	1	-	-	-	-	-	-	-	-	3	3
CO 3	3	2	1	1	-	-	-	-	-	-	-	-	3	3
CO 4	3	2	1	1	-	-	-	-	-	-	-	-	3	3
CO 5	3	2	1	1	-	-	-	-	-	-	-	-	3	3

Direct

1. Continuous Assessment Test I, II & III

2. Assignment

3. End-Semester examinations

Indirect

Conter	t of the syllabus		
Unit –	I Introduction to Game Theory	Periods	09
Reaso	ning about Behavior in Game- Best responses and Dominant Strateg	ies -Nash Ec	quilibrium-
Mixed	Strategies-Pareto Optimality -Dominated strategies and dynamic games	5	
Unit -	II Non-cooperative Games	Periods	09
Discre optimi	te static games- Continuous static games- Relation to other Mathematic zation Fixed point-problems.	al Problems:	Nonlinear
Unit -	- III Equilibria and Dynamic Games	Periods	09
Existe -Repe	nce of Equilibria -Computation of Equilibria- Special matrix games- Us ated and Dynamic games- Games under uncertainty	niqueness of	Equilibria
Unit -	IV Cooperative Games	Periods	09
Solution Social	ons based on characteristic function -Conflict Resolution - Multi obje choice.	ctive optimiz	zation-
Unit -	- V Case studies	Periods	09
A sale Interna	sman"s Dilemma- Oligopoly in water management -A forestry managetional fishing Water-distribution problem	gement proble	em-
	Tot	al Periods	45
Text B	ook:		
1.	David Easley and jon Kleinberg, "Networks, Crowds and Markets: Re Connected World", Cambridge University, 2010 (UNIT - I)	easoning abo	ut a highly
2.	Matsumoto A., Szidarovszky F, "Game Theory and Applications", Sj II,III,IV,V)	pringer, 2016	5. (UNIT –
Refer	ences:		
1.	E.M.Barron, "Game Theory: An Introduction", Wiley, 2009.		
2.	Leon Petrosjan, Vladimir.Mazalov, "Game Theory & Applications", N Inc, 2015.	ova Science	Publishers,
E Res	ources :		
1.	https://www.cs.cornell.edu/home/kleinber/networks-book/networks-bo	ook.pdf	
2.	https://ocw.mit.edu/courses/economics/14-126-game-theory-spring-20 notes/MIT14_126S16_gametheory.pdf	16/lecture-	

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		At t	<ul> <li>create responsive, dynamic, and robust web applications.</li> <li>he end of the course, the students will be able to,</li> <li>1: Create Web Pages Using HTML and CSS</li> </ul>												L
		CO	the end of the course, the students will be able to, <b>D1:</b> Create Web Pages Using HTML and CSS <b>D2:</b> Develop Interactive Web Applications Using JavaScript												2
Cou	rse	CO	CO1: Create Web Pages Using HTML and CSSCO2: Develop Interactive Web Applications Using JavaScriptCO3: Deploy Web Applications Using Cloud Services												3
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		CO end	4: Dev	elop R	ESTfu	ıl APIs	and m	anage	data fl	ow betw	een front-	end an	d back-	. K	34
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Unit	- I			Int	roduc	tion to	Full S	tack I	Develo	oment		F	Periods	1	2
Overvie	w of w	eb de	velopr	nent -	Unders	tandin	g front	-end, ł	oack-er	d, and f	ull stack d	evelop	ment -	<b>.</b>	
Teele	nd tach	nolog	ries use	d in u	eh des	elonm	ent – I	Inders	tanding	the Fra	mework s	tructur	e - HT	MI &	CSS

Tools and technologies used in web development – <u>Understanding the Framework structure</u> - HTML & CSS Basics -Structure of HTML documents - Common HTML tags - Introduction to CSS - Styling HTML elements - JavaScript Basics - Introduction to JavaScript - Variables, data types, and operators - Basic syntax and control structures - Introduction to Version Control with Git - Understanding version control systems - Basic Git

command	ls - Using GitHub for collaboration - Building Your First Webpage - Combin	ing HTML, (	CSS, and
JavaScrip	ot - Creating a simple static webpage - Introduction to responsive design		
Unit –	II Self-Paced Learning	Periods	12
Bundle 1:	Front-End Focus: HTML and CSS(Bootstrap/Tailwind) - JavaScript	– Git & C	hitHub -
React.js/A	ngular/Vue.js/Next.js		
Bundle 2: ]	Back-End Focus: <u>Nodejs/Django or Flask– JavaScript/Python - Git &amp; GitHub</u>	- MySQL/Mo	ongoDB
Bundle 3:	Comprehensive Full Stack: <u>HTML and CSS - JavaScript - Git -React.js/Next.j</u>	<u>s - Firebase</u>	
Bundle 4:	MERN-Focused Full Stack Development: H1ML, CSS(Bootstrap/1ailwir	id), JavaScrij	<u>pt – Git</u>
			10
Unit –	III         Advanced Front-End Development	Periods	12
Advanced Vue.js) - S	JavaScript (ES6+ features) Industry Expert - Introduction to frameworks (R tate management in front-end development - Building dynamic and interactive	leact or Angue user interfact	ular, or xes.
Unit –	IV Back-End Development and Databases	Periods	12
Server-side Database r	e programming with Node.js ( <u>Express.js) or Python (Django/Flask)</u> - RESTfenanagement (SQL and NoSQL) - Integrating front-end and back-end	ul API develo	opment -
Unit -	V Deployment and DevOps	Periods	12
Introductic Monitoring	on to cloud services (AWS, Azure, Google Cloud) -Deploying web application g and maintaining web applications.	ns - CI/CD pi	pelines -
	Τα	otal Periods	60
Text Boo	ks	I	
1.	JavaScript – The Definitive Guide – David Flanagan – 6 edition		
2.	Mastering Nodejs – Sandro Pasquali		
3.	The Complete Reference HTML & $CSS - 5^{Th}$ edition – Thomas A Powell		
4.	The complete reference SQL - James R. Groff and Paul N. Weinberg -		
E-Resour	rces		
1.	pepa.holla.cz/wp-content/uploads/2016/08/JavaScript-The-Definitive-Guide-	6th-Edition.p	<u>odf</u>
2.	dl.ebooksworld.ir/sooth3r/javascript/PP.Mastering.Node.js.Nov.2013.www.E	BooksWorld	<u>l.ir.pdf</u>
3.	the-complete-reference-html-css-fifth-edition.pdf (dcpehvpm.org)		
4.	Free Python Tutorial for Beginners from Basics to Advanced (guvi.in)		
5.	Free JavaScript Tutorial for Beginners from Basics to Advanced (guvi.in)		
6.	Welcome to AWS Documentation (amazon.com)		
7.	MongoDB Documentation		

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		CO2: C tools	Compa	re and	con	trast sc	me p	opula	mobi	le ap	p develop	oment	t	K2	
		<b>CO3:</b> [	Develo	p the C	GPS 1	functio	nality							K3	
		CO4: D	emon	strate t	he i	OS Prog	gramn	ning						K2	
		<b>CO5:</b> P	ractic	e the St	torył	board I	ntegra	tion						K2	
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1	. Cou	rse - end	survey	7											
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# **OPEN ELECTIVES**

Content of th	e syllabus		
Unit – I	Introduction	Periods	9
Introduction	to Mobile Telephony - Mobile device - communicati	on standards	: GSM, CDMA,
UMTS, Intr	oduction to 1G/2G/3G/4G - LTE - Mobile application	ons – catego	ries – Factors in
Developing	Mobile Applications - Mobile application development -	- software are	chitecture –
application n	nodels – Framework and tools - HTML 5 - Java script - AJ	JAX	
Unit – II	Android	Periods	9
Introduction 1	o Android - Installation - Android Architecture - App	olication Fund	lamentals - SDK
features – Dev	velopment framework – Android Applications and Activit	ties – creating	g user interfaces –
layouts – view	vs – resources – menu – graphics – animation – intents	1	_
Unit – III	Android File management tool	Periods	9
Android File	management tool – database storage – working with S	SQLite – GP	S functionality –
location based	l API – creating map based activities - geocoding – loca	tion-based se	rvices – handling
audio and vid	eo services - networking : using Bluetooth – managing co	onnectivity –	telephony –
SMS.Andriod	implementation tools: xcode, Android studio, Appcode.	D 1	0
$\frac{\text{Unit} - 1\text{V}}{1000}$	108 programming	Periods	9
iOS programi	ning - introduction to Objective C: class-objects-method	ods – interfac	e -  inheritance -
Introduction to	Foundation Framework Classes - File Handling - Property	y Lists, NSCo	py, and Archiving
- Selectors and	1 Targets - Dynamic Typing and Dynamic Binding. Introd	luction to iPh	one Architecture -
Introduction	to Development IDE - XCODE, Interface Builder -	Creating and	building simple
applications -	Handling Basic Interaction - Creating basic view controll	ers - Monitor	ing events
and actions	Cuesting a devenue deview controlland		
and actions –	Creating advanced view controllers	Dorioda	0
and actions – Unit – V	Creating advanced view controllers  Storyboarding Integration Integration Integration	Periods	9 sorrioss Emoil
and actions – Unit – V Storyboarding	Creating advanced view controllers  Storyboarding Integration Integration - Programmatic Interface creation - Integrati ta actions preferences files and addresses Camera V	Periods ing with core	9 services – Email,
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Programme	<b>B.TECH</b>	Progr	amme	Code		104	Regulation		2019
Department	INFORMAT	ION TECHNO	LOGY				Semester	EI	OPEN LECTIVE
Course Code	Cours	aximum	Marks						
			L	Т	Р	С	CA	ESE	Total
U19ITOE2	ROI	BOTICS	3	0	0	3	40	60	100
Course Objective	• This cou design	urse provides th	e know	vledge	abou	ıt industria	al robots and	d their co	ontrol and
	At the end of	f the course, the	e studer	nt sho	uld b	e able to,			Knowledge Level
Course	CO1: interpr	et the features	of an ir	ndustri	al ro	bots with o	end effector		K2
Outcome	CO2: perfor	m kinematic an	ld dyna	mic an	nalys	es with sir	nulation		K3
Outcome	CO3:design	control laws fo	r a robo	ot					K3
	CO4: integra of robotic de	ate mechanical vice	and ele	ectrica	ıl har	dware for	a real proto	otype	K3
	CO5: select a	a robotic system	n for gi	ven aj	oplica	ation			K3
Pre- requisites	Nil								
·									

						CO/	PO Ma	pping					CO/P	SO
		(3	3/2/1 ind	icates sti	rength o	f correla	ation) 3-S	Strong, 2	– Mediu	m, 1 - We	ak		Марр	oing
COs						Program	nme Outc	omes (PO	s)				PSC	Os
	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	3	2	1	1									3	2
CO 2	3	2	1	1									3	2
CO 3	3	2	1	1									3	2
<b>CO 4</b>	3	2	1	1									3	2
CO 5	3	2	1	1									3	2
Course	e Asses	ssmer	nt Met	thods										
<b>D'</b>	. 4													

Direct

- 1. Continuous Assessment Test I, II & III
- 2. Assignment
- 3. End-Semester examinations

Indirect

Content	of the	syllabus									
Unit	– I	Introduction to Robotics	Periods	9							
Types ar	Types and components of a robot, Classification of robots, closed-loop and open-loop control systems.										
Kinemat	Kinematics systems; Definition of mechanisms and manipulators, Social issues and safety.										
Unit -	- II	Robot Kinematics and Dynamics	Periods	9							
Kinematic Modelling: Translation and Rotation Representation, Coordinate transformation, DH											
paramete	ers, Jac	obian, Singularity, and Statics. Dynamic Modelling: Equ	ations of motic	on: Euler-							
Lagrange	e formı	ilation.									
Unit –	- III	Sensors and Vision System	Periods	9							
Sensor:	Contac	t and Proximity, Position, Velocity, Force, Tactile etc.	Introduction to	Cameras, Camera							
calibratio	on, Geo	ometry of Image formation, Euclidean/Similarity/Affine/	Projective trans	sformations.							
Vision applications in robotics.											
Unit –	- IV	Robot Control and Actuation Systems	Periods	9							
Basics of	f contro	ol: Transfer functions, Control laws: P, PD, PID. Non-lin	near and advance	ced controls.							
Actuator	s: Elec	tric, Hydraulic and Pneumatic, Transmission: Gears, T	Timing Belts an	nd Bearings,							
Paramete	ers for	selection of actuators.									
Unit -	– V	Control Hardware and Interfacing	Periods	9							
Embedd	ed syste	ems: Architecture and integration with sensors, actuators	s, components,	Programming for							
Robot A	pplicat	ions.									
			<b>Total Periods</b>	45							
Text Bo	ok:										
1	Saha S	S.K., "Introduction to Robotics", 2nd Edition, McGraw-I	Hill Higher Edu	cation, New							
1	Delhi,	2014.									
Referen	ces:										
1	Niku S	Saeed B., "Introduction to Robotics: Analysis", PHI Least	rning, New Del	hi, 2011.							
2	Ghosa	l A., "Robotics", Oxford, New Delhi, 2006.									
I											

	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN       (Autonomous Institution, Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205         P. TECH       Programme Code       104       Programme Code       2010												
Programme	<b>B.TECH</b>		Progra	mme (	Code	<b>104</b> Regulation <b>2019</b>							
Department	INFORMAT	ION TECHNOLOG	Y			Semester OPEN ELECTIV							
Course Code	Co	urse Name	Periods Per Week		er	Credit	Maxi	mum M	larks				
			L	Т	Р	С	CA	ESE	Total				
U19ITOE3	BASICS OF COMPUTIN	3	0	0	3	40	60	100					
Course Objective	<ul> <li>Acquire develop</li> </ul>	a basic understandin a simple cloud servi	ng of cl	loud c	ompı	iting and	services in o	order to	) design and				
Course	At the end o CO1: expla	of the course, the stund $\frac{1}{100}$ in the concepts, challed	dent sh aracter	ould b	be abl	e to, benefits	of Distribut	ed	Level K2				
Outcome	CO2: Apply	v virtualization tech	nology	, to vi	rtual	resource	managemen	t	К2				
	CO3: use at	nd evaluate various	cloud c	ompu	ting s	ervices		-	K3				
	CO4: explo Environmen	ore the elements of its	Cloud	Prog	ramm	ning and	Software		K3				
	CO5: develop strategies for Ubiquitous Clouds and the Internet of K3												
Pre- requisites	Operating S	Systems & Compute	er Netw	vorks									
			Mannin	σ				CO/P	so				

	<b>CO / PO Mapping</b> (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak													SO
COs	COs Programme Outcomes (POs)													
	PO1	D1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12												PSO2
CO 1	2	1	1										2	2
CO 2	2	1	1										2	2
CO 3	3	2	1	1									3	3
<b>CO 4</b>	3	2	1	1									3	3
CO 5	3	2	1	1									3	3

Direct

1. Continuous Assessment Test I, II & III

2. Assignment

3. End-Semester examinations

Indirect

Unit – I	Distributed System Models	Periods	9							
Scalable com Distributed an	outing – Network Based Systems – System Models d Cloud computing – Performance – Security – Energy Ef	– Software E ficiency.	Environment for							
Unit - II	Virtualization	Periods	9							
Implementat	ion levels of Virtualization – Virtualization Structures – 7	Fools and Med	chanisms – CPU,							
Memory, I/C	) devices Virtualization – Virtual Clusters and Resource M	lanagement –	Virtualization							
forData-Cent	ter Automation.									
Unit – II	I Cloud Platform Architecture over Virtualized Data Centers	Periods	9							
Cloud compu	ting Service models – Data-Center Design and Interconne	ction Network	s – Architectural							
Design of Co	ompute and Storage Clouds. Public Cloud Platforms : Goog	le App Engine	e – AWS – Azure							
– Inter-cloud	Resource Management – Cloud Security – Trust Manager	nent.								
Unit - IV	Cloud Programming and Software Environments	Periods	9							
Cloud and C	rid Platforms – Parallel and Distributed Programming Pa	radigms – Pro	ogramming							
Support: Goo	ogle App Engine – Amazon AWS – Microsoft Azure – Cl	oud Framewor	rks : Eucalyptus –							
Nimbus – Oj	penNebula – Sector – Sphere – OpenStack – Manjrasoft Ar	neka Cloud an	d Appliances.							
Unit – VUbiquitous Clouds and the Internet of ThingsPeriods9										
Cloud Trend	ls in supporting Ubiquitous Computing Performance of	Distributed S	Systems and the							
Cloud – Ena	bling technologies for the Internet of Things – Innovative	Applications	of the Internet of							
Things – On	Total	Dorioda	15							
Text Books	10tai	renous	43							
Kai H	Iwang Geoffrey C Fox and Jack G Dongarra "Distribu	ted and Cloud	Computing, From							
1. Paral	lel Processing to theInternet of Things" First –reprint ,Mo	rgan Kauffma	nn Place -2017							
References										
1. Thon and $A$	nas Erl, ZaighamMahood and Richard Puttini,"Cloud Con Architecture", First Prentice Hall, Place,2013.	nputing, Cond	cept, Technology							
2. Rajk Parac	umarBuyya, James Broberg and Andrzej M. Goscinski "C ligms" First,John Wiley&sons,2013	loud Computi	ng: Principles and							
<b>E-Resources</b>	3									
1. https://	//www.javatpoint.com/virtualization-in-cloud-computing									
2. https://	//slideplayer.com/slide/16594496/									
3. https://	//unearth.blog/2020/06/02/ubicomp/									

	VIVEKA (Autonomou	VIVEKANANDHA COLLEGE OF ENGINEERING FO WOMEN (Autonomous Institution, Affiliated to Anna University, Chenna Elayampalayam, Tiruchengode – 637 205												
Programme	<b>B.TECH</b>		Progra	amme	Code	104	Regulation		2019					
Department	INFORMATIO	EI	OPEN LECTIVE											
Course Code	Course	Name	Per	riods P Week	er	Credit	Max	imum N	Marks					
		L	Т	Р	С	CA	ESE	Total						
U19ITOE4	INTRODUC DATA STR	3	0	0	3	40	60	100						
Course Objective	<ul> <li>The student sh</li> <li>Impleme</li> <li>Apply the</li> <li>Critically</li> </ul>	ould be made nt abstract dat e different lin analyze the v	to, ta types ear and various	s for li   non l   sortin	near o inear g algo	data struc data stru orithms	cture cture to prob	lem so	olutions.					
	At the end of	the course, th	e stude	nt sho	uld b	e able to	,		Knowledge Level					
Course	CO1 : underst	and the conce	pts of A	ADTs					K2					
Outcome	CO2 : outline	linear data str	ructures	s – sta	cks				K2					
	CO3 : describ	CO3 : describe linear data structures – queues												
	CO4 : underst	CO4 : understand searching and sorting algorithms												
	CO5 : illustrat	e non linear	data str	ucture	es - tre	ees			K2					
<b>Pre-requisites</b>	-							·						

	CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak												CO/PSO Mapping		
COs	COs Programme Outcomes (POs)												PSO	Ds	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO 1	2	1											2	2	
CO 2	2	1											2	2	
CO 3	2	1											2	2	
CO 4	2	1											2	2	
CO 5	2	1		1									2	2	

Direct

- 1. Continuous Assessment Test I, II & III
- 2. Assignment
- 3. End-Semester examinations

# Indirect

Content of the	syllabus			
Unit – I	INTRODUCTION TO DATA STRUCTURES	Periods	9	
Time and space c list – singly lin circular linked lis operations. Appli	omplexity, Data Structures – Introduction to Data Structures – Introduction to Data Structures – Introduction, and searst implementation, Double linked list implementation, incations of linked lists	etures, abstrac rching operat insertion, dele	t data types, Linear ions on linearlist, ption and searching	
Unit – II	LINEAR DATA STRUCTURES - STACK	Periods	9	
Stacks-Operation conversion, postf	s, array and linked representations of stacks, stack ap ix expression evaluation, recursion implementation.	plications -in	fix to postfix	
Unit – III	LINEAR DATA STRUCTURES - QUEUE	Periods	9	
Queues-operation Applications of c	ns, array and linked representations. Circular ( ueues.	Queue opera	tions, Dequeues,	
Unit - IV	Periods	9		
Searching and So sort, radix sort, methods	orting – Sorting- selection sort, bubble sort, insertion s Searching-linear and binary search methods, compa	ort, quick sor rison of sort	t, merge sort, shell ing and searching	
Unit – V	NON LINEAR DATA STRUCTURE TREES	Periods	9	
Trees – Definition binary tree prope	ons, tree representation, properties of trees, Binary trees, binary tree traversals, binary tree implementation	ree, Binary tr , applications	ree representation, of trees.	
	ſ	<b>Total Periods</b>	45	
Text Book:				
1. Data struct	tures A Programming Approach with C, D.S.Kushwaha	a and A.K.Mi	sra, PHI,2014	
<b>References Boo</b>	oks :			
1. Thomas H Algorithm	I. Cormen, Charles E. Leiserson, Ronald L.Rivest, C s", Second Edition, Mcgraw Hill, 2002.	lifford Stein,	—Introduction to	
2. Aho, Hopo	croft and Ullman, —Data Structures and Algorithms ^I , F	Pearson Educa	ation,1983.	

			VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN         (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205															
Prog	gram	me	B	.TEC	H			Prog	ramme	e Coo	le	10	4 F	Regulation		2019		
Depa	artm	ent	INF	ORM	ATIO	N TEO	CHNC	OLOG	Y					Semester	E	OPEN LECTIV	/E	
Cours	se C	ode			Co	urse N	ame		Perio We	ds Pe eek	er	Cre	dit		Maximu	timum Marks		
T1101	ΙΤΟ	F5		CVRI	FRSI	TUE	TTV			0	P 0	3	;	$\frac{CA}{40}$	ESE 60		)	
Ca Obj	ours jecti	e ve	<ul> <li>The student should be made to,</li> <li>Provides the skills in cyber security in view of cybercrime.</li> <li>Provides the skills in cyber offences.</li> <li>Detect frauds in mobile and wireless devices.</li> <li>Provide techniques for handling cybercrime, organizational implications and cyber terrorism.</li> </ul>															
At the end of the course, the student should b											e able	able to, Knowledg Level						
			CC	<b>01</b> :Ou	tline t	he thr	eats a	nd risl	cs in o	cybe	rcri	me an	d cybe	r offences	5.	K2		
C	ours	se	CC wir	<b>CO2</b> : Identify the frauds, attacks and security issues in mobile and wireless devices.														
Out	tcon	ne	CC	CO3: Know the methods used in cybercrime												<b>K</b> 2		
				<b>CO4</b> : Apply the phishing techniques and organizational implications.												K3		
			Dir	CO5:Describe about Social, Political, Ethical and Psychological Dimensions of Cybercrime.K2														
Pre-re	equi	sites	Co	mpute	er Net	works	5											
							<b>CO</b> /	PO Mai	nning						CO/	PSO	1	
			(3/2/	1 indica	ates stre	ngth of	correla	tion) 3-S	trong,	2 – M	ediur	n, 1 - W	/eak		Map	ping		
С	COs				1 2 4 4		Program	me Outco	omes (P	Os)		2010	2011		PS	Os		
C	01	PO1 3	<b>PO2</b>	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	PC	9	PO10	PO11	PO12	PSO1	PSO2 1	-	
C	02	2	2				1	1	2					1			1	
C	03	2	3				1	1	1					1	2	2	]	
C	04	2	3				1	1	1					1		2	1	
C	05	1	1				1	1										
	Direct       1. Continuous Assessment Test I, II & III       2. Assignment       3. End-Semester examinations       Indirect       1. Course - end survey																	
	· · · · · · · · · · · · · · · · · · ·																	

Conte	nt of the	syllabus								
Un	it – I	INTRODUCTION	Periods	9						
Introd Config testing Testing	l <b>uction</b> : I guring Ka , Website g - Netwo	Definition and Origins of the Word - Classifications o li Linux - Pre-penetration Testing Checklist, Informati Penetration Testing - Internal Network Penetration T ork Sniffing ,Exploitation - Social Engineering.	f Cybercrime on Gathering Testing and V	es- Installing and g - External Pen- Vi-Fi Penetration						
Un	it - II	CYBERCRIME: MOBILE AND WIRELESS DEVICES	Periods	9						
Trends	in Mobi	ity: Credit Card Frauds in Mobile and Wireless Comput	ting Era- Aut	hentication						
Service	Security	Attacks on Mobile/Cell Phone. Mobile Devices: Secur	ity Implication	ons for						
Organizations - Organizational Measures for Handling Mobile Devices - Laptops: Physical Security										
Counter	measures			0						
Uni	t – 111	CYBERCRIME	Periods	9						
Introd	uction:	Password Cracking: Online Attacks, Offline Attacks	- Strong, We	eak and Random						
Passwo	ords. <b>Key</b>	loggers and Spywares: Software Keyloggers - Hardwar	e Keyloggers	– Antikeylogger						
- Spyv	- Spywares. Virus and Worms: Trojan Horses and Backdoors - Buffer Overflow -Attacks on									
Wirele	ss Netwo	rks.								
Uni	9									
Phishi	ng and Io	lentity Theft: Phishing - Spear Phishing - Types of Phisl	hing Scams -	Phishing Toolkits						
and Sp	y Phishin	g - Phishing Countermeasures. Social Media Marketin	g: Security R	isks and Perils for						
Organi	zations, S	Social Computing and the Protecting People's Privacy in	the Organizat	tion.						
Uni	it – V	CYBER TERRORISM	Periods	9						
Introd	luction: I	ntellectual Property in the Cyberspace - Copyright, Pate	nt, Trademar	ks - Trade Secret						
- Trade	e Name -	Domain Name. Ethical Hackers: The Psychology - M	Mindset and S	Skills of Hackers						
and Ot	her Cybe	rcriminals - Sociology of Cybercriminals - Information V	Warfare.							
		Т	otal Periods	45						
Text B	Book:									
1	Abhinav	Ojha,"Beginners Guide To Ethical Hacking and Cyber	Security", Fin	rst Edition, 2020.						
Refere	ence:									
1	Roger C	rimes, ,Hacking the Hacker', Wiley India, 2017.								
2 Donaldson, S., Siegel, S., Williams, C.K., Aslam, A., Enterprise Cyber security - How to Build aSuccessful Cyber defence Program against Advanced Threats', A-press, 2015.										
E-Res	ource:									
Udemy.com, ,The Complete Cyber Security Course: Hackers Exposed', 2018. [online].1.Availabe:https://www.udemy.com/the-complete-internet-security- privacy-course-volume-1/, [Accessed: May2019]										

HORE CROMENUM	VIVEKA (Autonomou	NANDHA COLLE W( us Institution, Affilia Elayampalayam, Tir	GE OMI ated t uche	OF EN EN to Ann engode	N <b>GIN</b> a Uni – 637	EERIN versity 205	NG FOR ,Chennai)		TÜVRheinland CERTIFIED WWW ID 91	9001:2015	
Programme	<b>B.TECH</b>	Programme Code	10	4		F	Regulation		2019	)	
Department	INFORMATION	N TECHNOLOGY		·			Semester	E	OPE LECT	N IVE	
Course Code	Co	urse Name		Perio	ds Per	Week	Credit	Max	kimum (	Marks	
Course Code				L	Т	Р	С	CA	ESE	Total	
U19ITOE6	INFORMATI ESS	ON TECHNOLOG SENTIALS	Ϋ́	3	0	0	3	40	60	100	
Course Objective	<ul> <li>The main objective of this course is to:</li> <li>Introduce the principles required for building web applications</li> <li>Know about scripting languages.</li> <li>Understand the principles of database access and storage and various applications related to Information Technology.</li> </ul>										
	At the end of the	e course, the student	sho	uld be	able to	Э,					
Course	CO1: Understan	d the basics of web	deve	lopme	nt.					K2	
Outcome	CO2: Understan	d the basics of Java	Scrip	ot and I	PHP.					K2	
outcome	CO3: Create sim	ple database application	ation	s.						K3	
	CO4: Describe the basics of networking.										
	CO5: Design simple and interactive applications. K3										
Pre- requisites	Basics of web technology, database management & networking concepts										

	CO / PO Mapping													SO
		(3/2/	1 indica	ates stre	ength of	correlat	tion) 3-S	trong, 2	– Medi	um, 1 - W	/eak		Mapping	
COs Programme Outcomes (POs)													PSOs	
	PO1	PO1         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO12										PO12	PSO1	PSO2
CO 1	1												2	1
CO 2	1		1	1									2	1
CO 3	3	2											3	3
<b>CO 4</b>	2	1											2	2
CO 5	3	2	1	1									3	3

Direct

- 1. Continuous Assessment Test I, II & III
- 2. Assignment
- 3. End-Semester examinations

Indirect

Content of the syllabus													
Unit - I	WEB ESSENTIALS	Periods	9										
Creating a We of servers: Ap use	bsite - Working principle of a Website - Browser fundamentals plication Server - Web Server - Database Server – HTML basi	- Authoring cs – HTML	tools - Types tags and their										
Unit - II	SCRIPTING ESSENTIALS	Periods	9										
Need for Scripting languages - Types of scripting languages - Client side scripting - Server side scripting - Introduction to JavaScript - Arrays - Strings - Functions - PHP - Working principle of PHP - PHP Variables - Constants - Operators													
Unit – III	DATABASE ESSENTIALS	Periods	9										
Database man Accessing My	Database management - Database terms - MySQL - commands – Data types – Indexes – Functions – Accessing MySQL using PHP.												
Unit - IV	NETWORKING ESSENTIALS	Periods	9										
Fundamental computer network concepts - Types of computer networks Network layers - TCP/IP model - Wireless Local Area Network - Ethernet - WiFi - Network Routing - Switching - Network components													
Unit – V	APPLICATION ESSENTIALS	Periods	9										
Creation of sin Design and de system – Socia	nple interactive applications - Simple database applications – velopment of information systems – Personal Information System of networking applications	Multimedia em – Inform	applications - ation retrieval										
5	Te	otal Periods	45										
TEXT BOOK	S:												
1. Robin O'REILI	Nixon, "Learning PHP, MySQL, JavaScript, CSS & LY,2019.	HTML5" F	ifth Edition,										
2. James Pearson,	F. Kurose, "Computer Networking: A Top-Down Appro 2017.	ach", Seve	nth Edition,										
REFERENC	ES:												
1. Gary Co	rnell and Cay S.Horstmann, Core Java Vol.1 and Vol.2, Sun Mi	crosystems I	Press, 2008.										
E Resources:	· 10 /1 · 1 · 1 · · · / // · · ·												
1. https://or	. https://onput.com/nearning-pnp-mysql-javascript-5th-edition												
2. https://w 0_%20A	%20Top%20Down%20Approach,%207th,%20converted.pdf	puter%20ine	tworking%2										
Q	VIVEKANANDHA ( (Autonomous Institutio Elayampa	C <b>OLLEGI</b> WOM on , Affilia alayam, Ti	E OF I EN ted to ruchei	E <b>NGI</b> Anna 1gode	<b>NEERI</b> 1 Univers 2 – 637 2	NG FOR sity, Chennai) 05	TÜVR	ISO 601:2015					
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Programme	B.TECH	Progra	amme (	Code	104	Regulation		2019					
Department	INFORMATION TECHNO	DLOGY				Semester	E	OPEN LECTIVE					
Course Code	Course Name	Per	riods P Week	er	Credit	Maxi	mum	Marks					
		L	Т	Р	С	CA	ESE	, Total					
U19ITOE7	BUSINESS INTELLIGENCE AN ITS APPLICATIONS	BUSINESS INTELLIGENCE AND ITS APPLICATIONS30034060100he student should be able to,											
Course Objective	<ul> <li>Understand and critically apply the concepts and methods of business analytics</li> <li>Identify, model and solve decision problems in different settings</li> <li>Interpret results/solutions and identify appropriate courses of action for a given managerial situation whether a problem or an opportunity</li> </ul>												
	At the end of the course ,t	he student	shoul	d be a	ible to,			Knowledge Level					
Course	different types of digital d	ise view oi lata	t II ap	plica	tions and	1 identify the		K2					
Outcome	CO2:Understand BI co process	oncepts a	nd te	chniq	ues to	experiment	ETL	K2					
	CO3:Compare and Cont dimensional model	trast OLT	P wit	h OL	AP syst	tems and de	sign	К3					
	<b>CO4:</b> Experiment an mo Management	del of Da	ashboa	urd C	reation	for Performa	ance	K3					
	CO5:Apply BI to mobile,	cloud, ER	P and	socia	l CRM s	systems		K3					
Pre- requisites	es Database Management System												
	C	O / PO Mapp	ing				CO	/PSO					
	(3/2/1 indicates strength of corre	elation) 3-Stro	ng, 2 – 1	Medium	n, 1 - Weak		Ma	pping					
COs	Progr	amme Outcome	s (POs)				F	2SOs					

		(3/2	2/1 indic	ates stre	ength of	CO f correla	/ PO Ma ation) 3-S	<b>pping</b> Strong, 2	2 – Med	ium, 1 - V	Veak		CO/PSO Mapping		
COs			PSOs												
	PO1	PO2	PO12	PSO1	PSO2										
CO 1	2	2 1													
CO 2	2	1											2	2	
CO 3	3	2	1	1									3	3	
<b>CO 4</b>	3	2	1	1									3	3	
CO 5	3	2		3	3										
												•			

## **Course Assessment Methods**

## Direct

- Continuous Assessment Test I, II&III
   Assignment
   End-Semester examinations

Indirect

1. Course-end survey

Content of the syllabus			
Unit –I Business Vie	w of IT Applications	Periods	9
Introduction to Business View of Excellence Framework – Purpose Applications – Enterprise Application Data: Introduction – Structured D	f Information -Core Business Pr of using IT in Business – Chara ons – Information users and their r ata – Unstructured Data – Semi- ured data	rocesses – E acteristics of equirements -Structured D	Baldrige Business Internet-ready IT - Types of Digital Pata – Difference
Unit - II Business Intellige	nce and Data Integration	Periods	9
Business Intelligence: Definition – H BI Framework – BI Users – BI Appl for Data Warehouse – Definition of W.H.Inmon's Approach – Goals of I Data Quality – Data Profiling.	Evolution – Need for BI – BI Valu- ications – BI Roles and Responsib f Data Warehouse – Data mart – Data Warehouse – ETL Process – I	e Chain – Bus ilities – Data Ralph Kimba Data Integratio	siness Analytics – Integration : Need .ll's Approach vs. on Technologies –
Unit –III OLTP, OLAP and M	Iultidimensional Data	Periods	9
OLTP – OLAP – OLAP Architecture – Basics of Data Modeling – Type Dimension Table – Dimensional Mo Dimensional Model.	es – Data Models – Role of OLAP es of Data Model – Data Modelin odels – Dimensional Modeling Life	Fools in BI – ng Technique e Cycle – Des	OLAP Operations s – Fact Table – igning the
Unit - IV Performance Managem	ent and Enterprise Reporting	Periods	9
Measurement System – Role of metri Standardization and Presentation Pr Scorecard – Dashboards – Creating I	ics – KPIs – Enterprise Reporting: H actices – Enterprise Reporting Ch Dashboards – Scorecards vs. Dashb	Reporting Pers aracteristics - poards – Anal	spectives – Report - Balanced ysis.
Unit –V BI A	Applications	Periods	9
Understanding Business Intelligence –BI Mobility time line – Data Sec Cloud Computing – Business Intelligence f	e and Mobility– the need for busir urity Concerns for Mobile BI – 1 or ERP systems – Social CRM and	tess intelliger Business Inte Business Inte	ace on the move lligence and elligence
Text Books:		· • • • • •	" and
n.Wiley, 2016.	Acharya, "Fundamentals of Bush	iness Analyti	Editio
References:			
1. Ramesh Sharda, DursunD DataScience: A Manageria	elen, Efraim Turban, "Business Ir al Perspective", 4 th Edition, Pearson	ntelligence, A	nalytics, and 2017.
2. David Loshin, "Business Morgan Kaufmann, 2012.	Intelligence: The Savvy Manager,	,s Guide", 2 nd	^a Edition,
E-Resources:			
1. https://www.coursera.org/	learn/business-intelligence-tools		
2. https://www.udemy.com/c a tions	ourses/search/?src=ukw&q=busine	ess+intelligen	ce+andits+applic

	A REAL PROPERTY AND A REAL	(	VIV Autor	EKA I	NANI 1s Ins E	<b>DHA</b> titutic lavan	COL Von, Af	LEO VOI filiat	GE ( MEN ted to Tiruo	<b>)F E</b> N o Ar chen	CNGI Ina U	NEERIN niversity, -637 205	IG F Che	' <b>OR</b> ennai		ISO 9001:2015	
Program	nme	B.T	ECH			Progra	amme	Code	e	1	.04	Regulatio	on		20	19	
Departr	nent	INFO	RMA	TION	TEC	HNO	LOGY	ζ			1	Semes	ter		OP ELEC	EN TIVE	
Course	Code		Co	urse N	ame		Perio W	ds Pe ′eek	er	Cre	edit	Ν	laxin	num I	Marks		
							L	Т	Р		С	CA	E	ESE		Total	
U19IT	OE8		INTE T	CRNE HING	T OF S	,	3	0	0		3	40		60		100	
Course Objectiv	e re	<ul> <li>To study the fundamentals about IoT.</li> <li>To study about IoT Access technologies and networking.</li> <li>To study the paradigms, challenges and future.</li> </ul> At the end of the course, the students should be able to.															
	At the end of the course, the students should be able to, Level																
Cours	0	CO1·	O1: Understand the basics of IoT.     K2														
Outcon	e ne	CO2:	CO1: Understand the basics of IoT.K2CO2: Illustrate the Architecture of networking and IoT protocols in DT.K2														·
	IoT.     K2       CO3: Understand IoT technologies     K2																
		CO4:	Dem	onstra	te the	para	digms	, cha	allen	ges,	and f	utures			ŀ	K2	
		<b>CO5</b> :	Com	pare I	OT A	pplic	ations	in I	ndus	trial	& re	al world.			I	K2	
Pre requis	- ites	Comp	outer 1	netwo	rks												
						<b>CO</b> /		nning	-						CO/	80	1
		(3/2/	1 indica	tes strei	ngth of	correlat	100  Ma	Strong	s g, 2 – 1	Mediu	ım, 1 -	Weak			Map	oing	
COs		X			0	Program	nme Out	comes	(POs)		,				PS	Os	
<u>CO 1</u>	PO1	<b>PO2</b>	PO3	PO4	PO5	PO6	PO7	PC	08	PO9	PO1	) PO11	PO	12	PSO1 2	<b>PSO2</b>	-
$\frac{1}{1}$	2	1						-							2	2	-
CO 3	2	1	1												2	2	1
<b>CO 4</b>	2	1													2	2	]
CO 5	2	1													2	2	]
Course	Asse	essme	nt Me	ethods	5												
Direc	et																
1.	Coi	ntinuo	ous $As$	sessm	hent $\overline{T}$	est I,	II & I	II		_				_			
2.	Ass	signm	ent														
3. India	Enc	1-Sem	lester	exami	natio	ns											-
	Con	rse - e	end su	rvev													-
1.		130 - 0	ina su	плед													

Conter	nt of the	syllabus		
Uni	it– I	FUNDAMENTALS OF IoT	Periods	9
Introdu Actuati sensing	ction- E on: IoT g- IoT Co	volution of IoT-Networking Components-Addressing Sensing and Actuation-Sensors-Sensor Characteristics onnectivity Technologies: Bluetooth-wifi.	Strategies i -Types -Scal	n IoT-Sensing and ar sensing- Virtual
Uni	t-II	NETWORKING AND IoT PROTOCOLS	Periods	9
Networ cryptog Comm	k types graphy-as unication	-Connection Type-Network reachability-Physical top symmetric key cryptography-M2M communication-Arc technologies: Infrastructure protocols-Multicast DNS-I	bology-Secur chitecture con Data protocol	ity-Symmetric key mponents of M2M- -COAP-MQTT.
Unit	t – III	IoT TECHNOLOGIES	Periods	9
Cloud Service Fog Co	computine - Fog co omputing	ng-Virtualization- Advantages of virtualization-Types of mputing applications: Fog nodes-Fog deployment mode in IoT.	of virtualizat el -Fog Comp	ion-Cloud Models- outing Architecture-
U	nit—IV	PARADIGMS, CHALLENGES, AND THE FUTURE	Periods	9
Evoluti of dron	on of Ne es (IoD)	w IoT- Paradigms Internet of battle eld things (IoBT)-In -Internet of space (IoSpace)-Internet of services (IoS) -I	iternet of veh nternet of pe	icles (IoV)-Internet ople (IoP).
Uni	t– V	CASE STUDIES/ INDUSTRIAL APPLICATIONS	Periods	9
Agricult transpor	ural Io] tation sys	C-Smart irrigation management-Vehicular IoT-Crime stem Healthcare IoT.	e assistance	in a smart IoT
		Т	otal Periods	45
Text B	ooks		~	
1	Sudip M Introduc	isra; Anandarup Mukherjee; Arijit Roy and published by tion to IoT,2021.	y Cambridge	e UniversityPress
Refere	nces			
1	Internet	Of Things: A Hands-On Approach Arshdeep bahga,Vija	y madisetti,2	015.
2	Architec (Eds), S _l	ting the Internet of Things,DieterUckelmann, Mark Hapringer,2011.	rrison, Mich	ahelles and Florian
3	Recipes Cookboo	to Begin, Expand, and Enhance Your Projects, 2nd Edi ok and O"Reilly Media,2011.	tion, Michae	lMargolis, Arduino
E-Reso	ources			
1	https://	www.arduino.cc/		
2	https://	www.slideshare.net/jaswindersinghthind/a-basic-ppt-on-	internet-of-th	ningsiot
3	https://	www.ibm.com/smarterplanet/us/en/?ca=v_smarterplanet		

	VIVEKANA (Autonomous In Elay	NDHA COLLEGE WOM stitution, Affiliated ampalayam, Tiruch	OF E EN to Ani engode	NGIN na Uni e – 63	<b>VEERI</b> iversity 7 205	<b>NG FOR</b> ,Chennai	)	TÜVRheinland CERTIFIED	8001:2015				
Programme	B.E. / B.TECH	Programme Code	104		F	Regulation		2019					
Department	INFORMATION TH	CHNOLOGY				Semester	E	OPEN CLECTI	I VE				
Course Code	Course	Name	Perio	ds Per	Week	Credit	Ma	ximum N	/larks				
Course code	Course		L	Т	Р	C	CA	ESE	Total				
U19ITOE9	INTRODUCTION PROGRAMMING	TO JAVA	3	0	0	3	40	60	100				
Course Objective	<ul> <li>The main objective</li> <li>Impart the funda</li> <li>Enable the stude</li> <li>Be able to use t programs.</li> </ul>	of this course is to: mental concepts of nts to gain program he Java SDK enviro	core JA ming s onmen	AVA. kills i t to c	n JAV. reate, 1	A. run and ex	ecute t	he simp	ole java				
	At the end of the co	urse, the students sh	ould b	e able	to,			KL					
	CO1: Understand th	e syntax, semantics	and cl	asses	in Java	language		K2					
Course	CO2: Discuss the pr	ograms using OOPS	S conc	epts.				K2					
Outcome	CO3: Use the conce	pt of Input and Outp	out in J	Java				K3					
	CO4: Create the pro	<b>O4</b> : Create the programs using strings. K3											
	CO5: Develop Appl	<b>CO5</b> : Develop Applet, AWT and Event handlers in Java K3											
Pre- requisites	Object Oriented Pro	gramming											

		(3/2/1	indicates	s strengt	CO/I h of cor	PO Map relation)	<b>ping</b> 3-Stron		Iedium-	1 - Weal	¢		CO/PSO Mapping		
~ ~	Programme Outcomes (POs)														
COs	PO 1	PO 2	PO12	PSO1	PSO 2										
CO 1	2	2 2											2	1	
CO 2	2	2	-		-				-				2	2	
CO 3	3	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$											3	3	
CO 4	3	3		3	3										
CO 5	3	3	3		2				1				3	3	

**Course Assessment Methods** 

DIRECT

- 1. Continuous Assessment Test I, II & III
- 2. Assignment
- 3. End-Semester examinations

INDIRECT

1. Course - end survey

Cont	ent o	f the syllabus		
Unit	-I	<b>Basics of Java</b>	Periods	9
The G	lenesi	s of Java - Overview of Java - Data Types, Variables, and	Arrays - C	Operators - Control
Statem	nents	- Introducing Classes - Methods and Classes. Inheritance: Basi	ics - Using	Super – Creating a
Multile	evel I	Hierarchy - Method overriding – Using Abstract Classes		
Unit ·	- II	Errors and Exception Handling	Periods	9
Packag	ges ar	nd Interfaces: Packages - Access Protection - Importing Package	ges- Interfa	ces Definitions and
Impler	nenta	tions - Compile time errors –Run time errors – Exception Hand	dling: Type	es - Try and Catch -
Throw	/ - Fin	ally – User defined exceptions		
Unit –	- III	Streams and Threads	Periods	9
File - '	The 1	Byte Streams - The Character Streams - Using Stream I/ O -	Serializatio	on. Java threads –
Priorit	ies –	Synchronization – Thread class and Runnable interfaces –	Creating th	nreads – Multiple
threads	s – In	ter thread communication		
Unit -	- IV	String Handling	Periods	9
String	Hand	lling: Special String operations and Methods - String Buffer	- Exploring	g java.lang: Simple
type W	Vrapp	ers - System - Math - Collections Framework: Collections Ir	nterfaces ar	nd Classes - Utility
Classe	s: Str	ing Tokenizer - Date and Time		
Unit -	$-\mathbf{V}$	Introducing GUI Programming with JavaFX	Periods	9
Introdu	ucing	Java FX GUI Programming: Java FX Basic ConceptsA Ja	va FX Ap	plication Skeleton-
Compi	iling	and Running a JavaFX Program-The Application Thread-A	simple Java	aFX Control:Label-
Using	butto	ns and Events-Exploaring JavaFX Controls:Using image and in	nageview-7	Toggle button-
Radio	butto	n-Checkbox-list view-Combo Box-Text Field.		
		Tot	al Periods	45
Text b	book :			
1.	Hei	bert Schildt, Java – The Complete Reference, Tata Mc Graw Hi	ll, Tenth Eo	dition,2018
Refere	ences			
1.	Dei	tel & Deitel, Java How to Program, Prentice Hall of India, 2010	)	
2.	Gaı	ry Cornell and Cay S.Horstmann, Core Java Vol.1 and Vol.2, Su	in Microsys	stems Press, 2008.
E-Res	ource	28:		
1.	https	s://www.tutorialspoint.com/java/index.htm		
2.	https	s://www.programiz.com/java-programming		

	<b>VIVEKANANDHA (</b> (Autonomous Institution Elayampalaya	C <b>OLLE</b> W( n, Affili am, Tir	EGE O DMEN lated to ucheng	F ENO Anna gode –	GINEEI Univers 637 205	RING FO	P <b>R</b> nai)	TOWNeeman CATIFIED						
Programme	В.ТЕСН	Program	mme C	ode	104	Regulati	on	2019						
Department	INFORMATION TECHN	OLOG	Y		Semeste	er		OPEN ELECTIVE						
Course Code	Course Name	Periods Per Week         Credit         Maximum Marks           L         T         P         C         CA         ESE         Total												
Course Code		L	Т	Р	С	CA	ESE	Total						
<b>U19ITOE10</b>	INTRODUCTION TO R PROGRAMMING	3	0	0	3	40	60	100						
Course Objective	<ul> <li>The student should be may</li> <li>Building the fundament</li> <li>Imparting design think</li> <li>Developing design skit</li> <li>Gaining practical expension</li> <li>Empowering students</li> </ul>	de to, ntals of king cap ills of n erience with to	data so pability nodels in prog ols and	cience. to bui for big gramm l techn	ild big-d data pro ing tools iques us	ata oblems s for data s ed in data	sciences							
	At the end of the course, t	he stud	ent sho	ould be	e able to,			Level						
Course	<b>CO1:</b> Create artful graphs functions	s to visi	ualize o	comple	ex data se	ets and		K3						
Outcome	<b>CO2:</b> Write more efficien	it code	using p	arallel	R and v	ectorizati	on	K3						
Outcome	<b>CO3:</b> Interface R with C/ functionality	C++ an	d Pyth	on for	increase	d speed o	r	K2						
	<b>CO4:</b> Find new packages and perform statistical and	for text alysis of	t analy f the sa	sis, im ame	age man	ipulation,		K2						
	CO5: Develop interfacing	g R to o	ther La	anguag	jes			K3						
<b>Pre-requisites</b>	Basics of any programmir	ng langi	uage											

	CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong- 2 – Medium- 1 - Weak													/PSO pping	
~~~					Progra	amme O	utcomes	(POs)					PSOs		
COs	PO 1	PO 1 PO 2 PO 3 PO 4 PO 5 PO 6 PO7 PO8 PO 9 PO 10 PO 11 PO1												PSO 2	
CO 1	3	3	2		-				2			2	3	3	
CO 2	3	3	2		2				2			2	3	3	
CO 3	2	2	2		2				1			-	3	3	
CO 4	CO4 2 2 2 - 1 -														
CO 5	3	3	3		-				2			2	3	3	

Course Assessment Methods

- 1. Continuous Assessment Test I, II & III
- 2. Assignment.
- 3. End-Semester examinations.
 - 1. Course end survey

Content of	the syllabus		
Unit-	Introducing to R	Periods	9
Introducing	to R - R Data Structures - Help functions in R - Vector	ors – Scalars –	- Declarations –
recycling -	Common Vector operations - Using all and any - Ve	ctorized operat	tions – NA and
NULL valu	es – Filtering –Vectorised if-then else – Vector Equality –	Vector Elemen	t names
Unit –	I Matrices, Arrays And Lists	Periods	9
Matrices, A	rrays And Lists Creating matrices - Matrix operations -	Applying Fun	ctions to Matrix
Rows and C	olumns – Adding and deleting rows and columns – Vector	Matrix Distinc	tion – Avoiding
Dimension	Reduction – Higher Dimensional arrays – lists – Creatir	g lists – Gener	al list
operations	- Accessing list components and values – applying functio	ns to lists – rec	ursive lists.
Unit – I	II Data Frames	Periods	9
Creating D	ata Frames – Matrix-like operations in frames – Merg	ing Data Fram	es – Applying
functions to	Data frames - Factors and Tables - factors and levels -	- Common fund	ctions used with
factors – W	orking with tables - Other factors and table related function	ns	
Unit – I	V Control statements, Functions, R graphs	Periods	9
Control sta	ements - Arithmetic and Boolean operators and values -	Default values	for arguments -
Returning	Boolean values – functions are objects – Environment and	Scope issues –	Writing Upstairs
- Recursior	- Replacement functions - Tools for composing function	code – Math an	d Simulations in
R Creating	Graphs – Customizing Graphs – Saving graphs to files – C	Creating three-d	imensional plots
TT •4		Daniala	•
Unit –	Interfacing	Periods	9
Interfacing	R to other languages – Parallel R – Basic Statistics – Line	ar Model – Gei	neralized Linear
models – N	on-linear models – Time Series and Auto-correlation – Cr	ustering	17
		Total Periods	45
Text Book			
1. Not	man Matloff, "The Art of R Programming: A Tour of St	atistical Softwa	are Design", No
Sta	ch Press, 1 st Edition ,2011.		
References		1 1 .	
1. $\begin{bmatrix} Jare \\ & A \end{bmatrix}$	d P. Lander, "R for Everyone: Advanced Analytics and G nalytics Series,2 nd Edition, 2017.	raphics", Addis	on-Wesley Data
2. Rot and	ert Knell, "Introductory R: A Beginner's Guide to Data Vi Programming in R", Amazon Digital South Asia Services	sualisation, Sta Inc, Kindle Ed	tistical Analysis ition, 2013.
E-Resourc	25:		
1. http	s://www.tutorialspoint.com/r/		
2. http	s://www.javatpoint.com/r-tutorial		

C.	ANAL MONTH		VI (Auto	VEK.	ANA ous Ii	NDH. nstitut E	A CC tion, A	DLLE W Affilia npala	GE (OME ated to yam,)F EN 2 N 25 Anr Tiruc	NGINI a Univ	E ERIN versity , de – 63'	G FO Chen 7 205	PR nai)	CERTIFIED ISO 900		
Prog	ramme]	B.TEC	H						Progra	amme Code	104	Reg	gulation	20	19	
Depa	artment	;]	NFOI	RMAT	TION	TEC	HNOI	LOGY	7				S	emester	OP ELEC	EN TIVE	
Cour	se Cod	le		(Course	e Nam	e		I	Period We	s Per ek	Credit		Maximu	ım Marl	KS	
1110	TTOT	44 1			TTAC		<u></u>		I	<u>, T</u>	P	C		CA	ESE	Total	
U19	TTOE		ETHI	CAL	HAC		G ,		3	0	0	3		40	60	100	
C Ob	ourse ojectiv	e	 Explore the concepts of security testing and the knowledge required to pro against the hacker and attackers. Understand the publicly available tools used to gather information on poter targets and identify network system vulnerabilities and confirm t exploitability. Identify the techniques for wireless hacking. 														
		At the end of the course, the student should be able to, Image: Construction of the course is the student should be able to,															
		(CO1: Define about penetration testing, vulnerabilities and risks available in a														
		system													K1		
C	ourse	(CO2: I	Expla	in the	vario	ous ty	pes of	f Info	rmati	on gatl	nering r	netho	ds.	ls. K2		
Οι	itcom	e (CO3: 1 carry c	Deter	nine iffing	the va	rious e netv	vulno vorks	erabil	ities a	and em	ploy su	itable	tools to		K3	
			CO4: clients	Make , serv Identi	e use o ices a fy the	of the and U	explo SBs.	ontatio	$\frac{1}{\alpha \tan^2}$		1000000000000000000000000000000000000	work p	rotoco	ols, serve	ers,	K3	
	Pre-		.05.1	lucini	iy the	wite	1055 11	ackin	gitter	iiiqu	-5.					K1	
re	auisite	es]	Netwo	orks, C)pera	ting S	ysten	ns, Da	itabas	e and	Web '	Techno	logy				
	1					CO/	PO M	apping						CO/DSO	Monnin		
		(3	/2/1 ind	icates s	trength	of corr	elation) 3-Stro	ng, 2 -	Mediu	m, 1 - W	eak					
	COs	PO 1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	s) PO9	PO10	PO11	PO 12	PSO1	PSO 2	_	
	CO 1	3												1	1		
	CO 2	3	2											2	2	_	
	CO 3	3	2	1	1									2	2		
	CO 4	3	2	1	1									3	3		
	CO 5	3												1	1		
Cou	rse As	sessr	nent I	Metho	ods												
Dir	rect																
1. Continuous Assessment Test I, II & III 2. Assignment 3. End-Semester examinations																	
Inc	lirect																
	1. Co	urse	- end s	surve	ý												

Conte	nt of the sy	llabus		
U	nit – I	Introduction to Hacking	Periods	9
Impor	rtant Termir	nologies – Penetration Test – Vulnerability Assessments	s versus Pe	netration Test
– Pre-	Engagemen	t - Rules of Engagement - Penetration Testing Metho	odologies -	- OSSTMM -
NIST	– OWASP	- Categories of Penetration Test - Types of Penetrati	on Tests –	Vulnerability
Assess	sment Sumr	nary – Reports.		
Uı	nit - II	Information Gathering and Target Enumeration	Periods	10
Active	e, Passive a	nd Sources of information gathering - Copying Websit	es Locally	-Traceroute -
NeoTr	ace - Cheop	os-ng - Intercepting a Response –WhatWeb –Netcraft - I	Basic Para	meters -Xcode
Exploi	it Scanner -	Interacting with DNS Servers –Nslookup – DIG - Fierce,	, Zone Tran	sfer with Host
Comm	and and Au	tomation - DNS Cache Snooping-Attack Scenario - Aut	omating At	tacks - SNMP
–Probl	lem - Sniffi	ng Passwords - SolarWinds Toolset -Sweep, Brute Forc	e and Dicti	onary
- Tool	s - Attack -	- Enumeration - Intelligence Gathering Using Shodan.		-
Un	it – III	Vulnerability Assessment & Network Sniffing	Periods	9
Introdu	uction to V	Inerability Assessment - Pros and Cons – Nmap - Updat	ion of data	base - Testing
SCAD	A Environn	nents with Nmap – Nessus. Sniffing: Types - Hubs versus	s Switches	- Promiscuous
versus	Nonpromis	cuous Mode - MITM Attacks - ARP Protocol Basics –	working –	Attacks -DoS
Attack	ts –Dsniffto	ol - Using ARP Spoof to Perform MITM Attacks - Si	iffing the	G 100 11
Traffic	c with Dsn	iff - Sniffing Pictures with Drifnet - Urlsnarf and	webspy -	Sniffing with
Wirest	hark.	Design of Earsheite them	Destala	0
		Basics of Exploitation	Periods	9
Introd	uction to k	temote Exploitation -Understanding Network Protoco	ds - Serve	er Protocols -
Attack	ing Networ	Attacking SMTD Attacking SQL Seguera Client Side	Dis for crac	n Mathada E
Moile	Londing to	Autacking SMIP - Autacking SQL Servers - Chem She I Maligious Attachments & Maligious Links - Compromi	Exploitatio	Side
Undate	Malwara	Loaded on USB Sticks	sing Chem	Side
Upuan	$\mathbf{c} = \mathbf{W} \mathbf{a} \mathbf{W} \mathbf{a} \mathbf{c}$	Wireless Hacking	Poriode	8
Wirele	ni – v Vog Uggleing	Introducing Aircrack Creating the WED Creating		DA2 Wireless
Notwo	ess Hacking	- Introducing Alicrack - Cracking the wEP - Cracking	a wPA/w	PA2 wireless
INCLWO	A Using A	Tota	le on me c	11ginal Al
Toyt F	Rook.	1012	II I CI IOUS	43
ICALL	Dofay Bal	och Ethical Hacking and Danatration Testing Guide	CPC Dras	a 1st Edition
1.	2015	och, Eulicai Hacking and Felletration Testing Oulde –	CIC FIES	s, 1st Luition,
Refere	2013. ences:			
	Sean-Phili	n Orivano, CEH v9: Certified Ethical Hacker Version	Wiley n	ublication 3rd
1.	Edition 2)16	, whey pe	ioneation, sid
	Stuart Mc	Clure Ioel Scambray and Goerge Kurtz "Hacking	Exposed '	7 · Network
2.	Security"	Secrets & Solutions". Tata Mcgrawhill Publishers, Seve	nth Edition	. 2012.
-	EC- Cour	cil Ethical Hacking and Countermeasures: Attack Pha	ases. Ceng	age Learning
3.	2009.	in, Duncar Hacking and Countermeasures, Haack In	uses, cong	uge Leaning,
E-Res	ources:			
1.	https://pu	rplesec.us/types-penetration-testing/		
2.	https://wv	ww.sciencedirect.com/topics/computer-science/vulnerab	ility-assess	ment
3.	https://ww	vw.aircrack-ng.org/doku.php		

	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205															
Programme	e	B.TEC	СН			Pro	gram	ne Co	de	104	Regul	ati on		2019		
Departmen	t I	NFOR	MAT	ION	rechi	NOL	OGY				Semes	ter	(EL	OPEN ECTIVI	£	
Course Cod	e	C	Course	Name	;		Perioc We	ls Per ek		Credit		Maxi	mum N	Marks		
U19ITOE	2	CYBER FORENSICS			1 3	3	T 0	P 0	C 3	CA 40	E	SE 50	Tota 100	<u>մ</u>)		
Course Objective		 The student should be made to, Learn about computer investigation Understanding and determining data acquisition methods and tools. Familiar about identifying the crime scenes and digital evidence. Learn about computer forensics tools and Analyze and Validation. Know about Email investigation and recovaring the graph files. 														
	A	At the end of the course, the student should be able to,													Knowledge Level K3	
Course Outcome		 CO1.apply digital forensic investigation with a systematic approach CO2:make use of various tools for data acquisition CO3 :identify the digital evidence in a crime scene CO4: apply forensic tools in forensic examination CO5:build the recovery of graph files and investigating E-mail 												K3 K3 K3 K3		
Pre- requisites		erimes Nil												K3		
Cos		(3/2/1	indicate	es streng	CO / th of corre Prog	PO Ma elation) ramme	apping 3-Stron	g, 2 – M es (POs)	edium,	1 – Weak			C M	CO/PSO Mapping PSOs		
	PO 1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PSO 1	PSO 2		
CO1 3 2 1 1							-									
Course Ass Direct 1. Co 2. As 3. En Indirect 1. Cou	ntinu signm d-Sen	ent M ous As nent nester end su	ssessn exam	ls nent T inatio	°est I, ∃ n	II & 1	III									

Con	tent of	f the syllabus							
Uni	t – I	Computer Investigations	Periods	9					
Con	nputer]	Investigations: Preparing a Computer investigation – Taking a systematic app	roach –						
Asse	essing	the case – Planning Investigation – Securing evidence. Procedures for Con-	rporate Hi	gh:					
Ieci	n invest	Dete Acquisition	Dorioda	0					
Und	erstand	Data Acquisition	ion metho	9					
Con	tingenc	xy planning for image acquisitions – Using Acquisition tools: Windows XP Wr	ite- protect	tion					
with	USB I	Devices – Validating Data Acquisitions: Windows Validation Methods – Perfo	orming R/	AID					
Data	a Acqu	isitions – Using Remote Network Acquisition tools – Using other	U						
Fore	ensics A	Acquisition tools.	-						
Uni	t – III	Processing Crime and Incident Scenes	Periods	9					
Iden	tifying	Digital Evidence – Collecting Evidence in Private Sector Incident Scenes – Pr	ocessing L	aw					
Enfo	orceme	nt Crime Scenes – Preparing for a Search –Securing a Computer Incident or C	rime Scen	e –					
Seiz Dou	ing Dig	gital Evidence at the Scene –Storing Digital Evidence –Obtaining a Digital H	ash —						
Lini	1000000000000000000000000000000000000	a Case.	Periods	9					
Eval	luatino	Computer Forensics Tool Needs -Computer Forensics Software Tools	- Comp	Juter					
Fore	ensics F	Hardware Tools – Validating and Testing Forensic Software - Computer Foren	usics Analy	vsis					
and	Valida	tion: Determining Data Collection and Analysis –Validating Forensic Data	-Address	ing					
Data	a-Hidin	g Techniques –Performing Remote Acquisitions.		0					
Uni	t - V	Recovering Graph Files, Email Investigations	Periods	9					
Rec	ognizin	g Graph File- Understanding Data Compression- Locating And Recovering G	Graphic Fi	les-					
Iden	tifying	Un known File Formats- Understanding Copyright Issues- Investigating	Email Cri	mes					
And	Violat	ions- Understanding Email Servers- Using Specialized Email Forensic Tools.		45					
0.40		Tota	al Periods	45					
CA: Onl	SE SIU v for A	JDY: ssignment not for and sam avamination							
	y IOL A legal m	honey transfer 2 Network data reveals theft of trade secrets 3 Data from year	nicle						
info	tainme	nt, telematics and black box systems 4. Intellectual property theft	nore						
Tex	t Book	:							
1		Nelson Bill, Phillips Amelia and Steuart Christopher, "Guide to Computer	r Forensic	s					
1.		and Investigations", 4 th Edition, Cengage Learning, 2020.							
Ref	erences	S:							
1.		Marie-Helen Mara, "Computer Forensics", 2 nd Edition, Jones and Bartlett 2015.	Learning,	1					
2.		Albert Marcella Jr, "Cyber Forensics", 2 nd Edition, Auerbach Publications,	2007.						
E-	Resour	rces							
1	https:/	//www.slideshare.net/sumeetpatel21/data-acquisition-system-40835631							
2	2 https://samsclass.info/121/ppt/ch05.ppt								
3	https:/	//resources.infosecinstitute.com/topic/7-best-computer-forensics-tools/							
4	4 https://www.guru99.com/computer-forensics-tools.html								
5	5 https://www.tutorialspoint.com/python_digital_forensics/python_digital_forensics_investigation_								

6 https://www.slideshare.net/edwardbel/email-investigation

	VIVI (Autonc		TOWINHING CENTIFIED							
Programme	в.тесн	2019								
Department	INFORMA	INFORMATION TECHNOLOGY Semester								
			Period	s Per V	Week	Credit	Ma	Aaximum Marks		
Course Code		Course Name	L	Т	Р	С	CA	ESE	Tot	
U19ITOE13	E LEARN	ING TECHNIQUES	3	0	0	3	40	60	100	
Course Objective	 Analyze and compare different on-line E-Learning tools- design course content for specific subject from different perspective- plan and design the instruction Support needs of learners of various backgrounds- levels and situations based on different learning methodologies At the end of the course- the student should be able to, 									
	CO1:Unders	stand the broad perspective	of e-lear	ming	techni	ques.		K2		
	CO2:Analyz	ze the tools and mechanisms	s for imp	oleme	nting v	virtualizatio	on.		K3	
Course	CO3:Illustra management	urce	e K2							
Outcome	CO4:Choose		-	K3						
	CO5:Unders		-	K2						
Pre- requisites	Nil									
		00 / 00 - 5								

CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 – Weak										CO/PSO Mapping				
Programme Outcomes (POs)										PSOs				
Cos	PO 1	PO 2	PO 3	PO 4	PO5	PO6	P07	PO8	PO 9	PO10	PO 11	PO 12	PSO 1	PSO 2
CO 1	2	1											2	2
CO 2	3	2	1										3	3
CO 3	2	1											2	2
CO 4	2	1											2	2
CO 5	2	1											2	2
1 - Sli	1 – Slight, 2- Moderate, 3 – Substantial, BT- Bloom"s Taxonomy													

Direct	
1	. Continuous Assessment Test I, II & III
2	2. Assignment
3	3. End-Semester examinations
Indire	ct
1	L. Course - end survey

Conte	nt of the syllabus		
Unit –	I INTRODUCTION	Periods	9
E-Learn	ing – E-Learning cycle – E-Learning types – challenges and opportunities	– cognitive p	presence -
Approad	hes to design E-Learning – E-Learning framework – 6C framework –E-Lear	ning Tools	
Unit -	II E-LEARNING STRATEGY	Periods	9
Role of	utor – E-Learning strategy – Blended E-Learning – M-Learning- problem bas	ed learning-	Enterprise
learning	- Corporate Learning - Web based Learning - Pod casting - Learning M	<i>A</i> anagement	systems -
Content	development process - E-Learning standards SCORM standard - managin	g e-learning	
quality -	- case studies		
Unit –	III PRINCIPLES OF E-LEARNING	Periods	9
Philosop	by of E-Learning – theory of learning – Applying principles of multimedia	– Applying	principles
of conti	guity – Applying principles of modality – Applying principles of redundancy	v – Applying	principles
of cohe	rency - Applying principles of personalization - web-based learning com	munities – k	cnowledge
sharing	and Knowledge management in e-learning – social networks and social medi	a in e-learnir	ıg
Unit -	IV DESIGN	Periods	9
On line	E-Learning technologies - visual communication techniques - Computer	r-based techn	ologies -
Comput	er-mediated communication (CMC) - Assessment and evaluation Organizi	ng and desig	ning
learning	sequences- Characteristics of Interactive Online Learning Media		
Unit –	V E LEARNING PLATFORMS	Periods	9
Leverag	es example in E-Learning – collaborative E-Learning – Learner control in E	-Learning gu	idelines to
solve iss	ues in E-Learning - Implementation of an E-Learning Course Content for a c	complete onli	ne course
Researc	n in content retrieval and generation for E-Learning- Role of cloud and sema	intic Grid in	E-
Learnin			
	To	otal Periods	45
Text B	ook:		
1	D.Randy Garrison "E-Learning in the 21st century a framework for researed tition- Taylor and Francis- 2016.	ch and prac	tice"- 2nd
Refere	nces:		
1	ohn Gardner- Bryn Holems- "E-Learning : Concepts and practice" SAGE Pu	ublications- 2	.006.
2	R.C.Clark and R.E.Mayer- "E-Learning and the science of instruction"- Pfeif	fer Wiley- 20)11.
	Mark J Rosenberg- "E-Learning: strategies for delivering knowledge in the D	Digital Age"-	McGraw-
3	Hill- 2001.	0 0	
]	Kjell E. (Erik) Rudestam - Judith Schoenholtz-Read- "Handbook of Or	nline Learnii	ng"- Sage
4	Publications Inc Second Edition- 2009.		0 0
E-Res	purces:		
1 1	nttps://engineering.futureuniversity.com/BOOKS%20FOR%20IT/E%20learr	ning%20%20	(2).pdf
2	http://www.fao.org/3/i2516e/i2516e.pdf		