VIVEKANADHA

COLLEGE OF ENGINEERING FOR WOMEN

(An Autonomous Institution Affiliated to Anna University-Chennai Approved by AICTE – Accreditedby NAAC and ISO 9001:2015 Certified)
Elayampalayam, Tiruchengode –637205,
Namakkal District, Tamilnadu.

CURRICULAM AND SYLLABI - 2023 FOR UNDER GRADUATE (UG)

B.E. COMPUTER SCIENCE AND TECHNOLOGY

REGULATION 2023

(After 6th BoS)

CHOICE BASED CREDIT SYSTEM

(Applicable to the students admitted from the academic year 2023-2024 onwards)

VIVEKANANDHACOLLEGEOFENGINEERINGFORWOMEN
(Autonomous)

Elayampalayam, Tiruchengode – 637205

B.E.-COMPUTER SCIENCE AND TECHNOLOGY
Regulations 2023
CHOICE BASED CREDIT SYSTEM

COLLEGE VISION

- To impart value based education in Engineering and Technology to empower youngwomen 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 co-curricular 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

- To impart knowledge in cutting edge technologies in par with current industrial standards
- To create a platform for strong communication skills and possess the ability to design computing systems individuals as well as part of a multidisciplinary terms
- To instill societal, safety and ethical responsibilities in professional activities
- To be collaborate with industries to uplift innovative research and development

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO 1: Able to perform in technical/managerial roles ranging from design, Development, Problem solving, support software industries and R&D sectors

PEO 2: The ability to adapt, contribute and innovative new technologies and systems inthe key domains of Computer Science and Technology

PEO 3: To Societal responsible solution provider and entrepreneur in Computer Scienceand Technology

PROGRAMME SPECIFIC OUTCOMES (PSOS):

PSO1	**Ideal Solutions:** Demonstrate basic knowledge of computer real applications and apply standard practices in software project development.
PSO2	**Research Capability:** Students at the time of graduation will be able to apply domainknowledge and expertise for enhancing research capability to transform innovative ideas into reality.

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PROGRAMME OUTCOMES (POs):

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

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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

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Mapping of Program Educational Objectives with Program Outcomes

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

Programme Educational	Programme Outcomes											
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
I	√	√	√		√	√		√	√			
II		√		√			√	√	√	√		
III		√	√		√		√		√	√	√	√

CURRICULUM BREAKDOWN STRUCTURE									
Summary of Credit Distribution									
Category	Semester								Total No. of Credits
	SEM 1	SEM 2	SEM 3	SEM 4	SEM 5	SEM 6	SEM 7	SEM 8	
HSC									
BSC	8	8	4	4					24
ESC	7	8							15
PCC			15	15	14	15	7		66
PE					3	3	6	6	18
OE					3	3	3		9
EEC	1		2	3	1	1	4	8	20
MC									
CTC					1	1			2
HSMC	4	4							8
Semester wise total	**20**	**20**	**21**	**22**	**22**	**23**	**20**	**14**	**162**

HS-Humanities and Social science, BSC- Basic Science courses, ES- Engineering Science courses, PCC-Professional Core, PE-Professional Elective, OE-Open Elective, EEC-Employability Enhancement courses, MC- Mandatory Courses, CTC-Career Track Courses, HSMC- Humanities and social science including management courses. CA-Continuous Assessment ESE-End Semester Examination

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Programme	**B. E./B.Tech.**	Programme Code	**107**	Regulation	**2023**
Department	**COMPUTER SCIENCE AND TECHNOLOGY**			Semester	**I**

CURRICULUM

(Applicable to the students admitted from the academic year 2023 - 2024 onwards)

Course Code	Course Name	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P	C	CA	ESE	Total
THEORY									
U23MA101	Matrices and Calculus*	BSC	3	1	0	4	40	60	100
U23EN101	English For Communication*	HSMC	3	0	0	3	40	60	100
U23PH101	Engineering Physics[$]	BSC	3	0	0	3	40	60	100
U23CS101	Programming for Problem Solving*	ESC	3	0	0	3	40	60	100
U23TA101	Heritage of Tamils*	HSMC	1	0	0	1	40	60	100
THEORY INTEGRATED WITH PRACTICAL									
U23GE101	Engineering Graphics*	ESC	2	0	3	3	50	50	100
PRACTICAL INTEGRATED WITH THEORY									
U23GE102	Design Thinking*	EEC	1	0	2	1	50	50	100
PRACTICAL									
U23PH102	Physics Laboratory[$]	BSC	0	0	3	1	60	40	100
U23CS102	Programming for Problem Solving Laboratory*	ESC	0	0	3	1	60	40	100
MANDATORY COURSES									
-	Induction Programme*	3 Weeks				0	-	-	-
U23MCFY1	Environmental Science and Engineering[$]	MC	2	0	0	0	100	-	100
					Total	**20**	**520**	**480**	**1000**

[#]Common for BT, CSE, CST, IT, AI & DS
*Common for all branches
[@]Common for AI & DS, CSE, IT & CST
[$]Common for CSE, CST, IT, BT, AI & DS

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Programme	**B. E./B.Tech.**	Programme Code	**107**	Regulation	**2023**
Department	**COMPUTER SCIENCE AND TECHNOLOGY**			Semester	**II**

CURRICULUM

(Applicable to the students admitted from the academic year 2024 - 2025)

Course Code	Course Name	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P	C	CA	ESE	Total
THEORY									
U23MA202	Complex Analysis and Ordinary Differential Equations*	BSC	3	1	0	4	40	60	100
U23CH201	Engineering Chemistry$	BSC	3	0	0	3	40	60	100
U23EE201	Basic Electrical and Electronics Engineering#	ESC	3	0	0	3	40	60	100
U23TA202	தமிழரும்தொழில்நுட்பமும் / Tamils and Technology*	HSMC	1	0	0	1	40	60	100
THEORY INTEGRATED WITH PRACTICAL									
U23CS204	Object Oriented Programming@	ESC	3	0	2	4	50	50	100
U23EN202	Professional Communication*	HSMC	2	0	3	3	50	50	100
PRACTICAL									
U23CH202	Chemistry Laboratory$	BSC	0	0	3	1	60	40	100
U23GE204	Engineering Practices Laboratory*	ESC	0	0	3	1	60	40	100
MANDATORY COURSES									
U23MCFY2	Indian Constitution$	MC	2	0	0	0	100	-	100
						Total	**20**	**480**	**420**	**900**

*Common for all branches

#Common for BT, CSE, CST, IT, AI & DS

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Programme	B. E./B.Tech.	Programme Code	107	Regulation	2023
Department	COMPUTER SCIENCE AND TECHNOLOGY			Semester	III

CURRICULUM

(Applicable to the students admitted from the academic year 2023-2024 onwards)

Course Code	Course Name	Category	Periods/ Week			Credit	Maximum Marks		
			L	T	P	C	CA	ESE	Total
THEORY									
U23MA304	Discrete Mathematics*	BSC	3	1	0	4	40	60	100
U23CT301	Python Essentials	PCC	3	0	0	3	40	60	100
U23IT302	Data Structures*	PCC	3	0	0	3	40	60	100
U23CS305	Computer Organization and Architecture*	PCC	3	0	0	3	40	60	100
U23CTCP1	Verbal , Quantitative Aptitude and Reasoning - I	EEC	2	0	0	1	40	60	100
THEORY INTEGRATED WITH PRACTICAL									
U23CT302	Artificial Intelligence*	PCC	3	0	2	4	50	50	100
PRACTICAL									
U23CT303	Python Essentials Laboratory	PCC	0	0	2	1	60	40	100
U23IT303	Data Structures Laboratory*	PCC	0	0	2	1	60	40	100
U23CTCP2	Personality Development	EEC	1	0	2	1	60	40	100
					Total	**21**	**430**	**470**	**900**

*Common for CSE, IT & CST

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Programme	B. E./B.Tech.	Programme Code	107	Regulation	2023
Department	COMPUTER SCIENCE AND TECHNOLOGY			Semester	IV

CURRICULUM

(Applicable to the students admitted from the academic year 2023-2024 onwards)

Course Code	Course Name	Category	Periods/ Week			Credit	Maximum Marks		
			L	T	P	C	CA	ESE	Total
THEORY									
U23MA405	Probability and Statistics*	BSC	3	1	0	4	40	60	100
U23IT404	Database Management systems*	PCC	3	0	0	3	40	60	100
U23CT404	Computer Networks*	PCC	3	0	0	3	40	60	100
U23CT405	Artificial Intelligence and its Applications	PCC	3	0	0	3	40	60	100
U23ADL01	Additional Language	EEC	3	0	0	2	40	60	100
THEORY INTEGRATED WITH PRACTICAL									
U23CT406	Operating Systems*	PCC	3	0	2	4	50	50	100
PRACTICAL									
U23IT406	Database Management systems Laboratory*	PCC	0	0	2	1	60	40	100
U23CT407	Computer Networks Laboratory*	PCC	0	0	2	1	60	40	100
CAREERTRACK COURSE									
	Career Track Course - I	EEC	2	0	0/2	1	40/60	60/40	100
Total						**22**	**410/ 430**	**490/ 510**	**900**

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Programme	B. E./B.Tech.	Programme Code	107	Regulation	2023
Department	COMPUTER SCIENCE AND TECHNOLOGY			Semester	V

CURRICULUM
(Applicable to the students admitted from the academic year 2023-2024 onwards)

Course Code	Course Name	Category	Periods/ Week			Credit	Maximum Marks		
			L	T	P	C	CA	ESE	Total
THEORY									
U23CT508	Compiler Design	PCC	3	0	0	3	40	60	100
U23CT509	Machine Learning*	PCC	3	0	0	3	40	60	100
U23CT510	Software Engineering	PCC	3	0	0	3	40	60	100
U23CS513	Microprocessor and Embedded System*	PCC	3	0	0	3	40	60	100
	Professional Elective – I	PEC	3	0	0	3	40	60	100
	Open Elective -I	OEC	3	0	0	3	40	60	100
PRACTICAL									
U23CT511	Machine Learning Laboratory*	PCC	0	0	2	1	60	40	100
U23CS514	Microprocessor and Embedded System Laboratory*	PCC	0	0	2	1	60	40	100
U23CT512	Mini Project – I	EEC	0	0	2	1	60	40	100
CAREER TRACK COURSE									
	Career Track Course - II	EEC	2/0	0	0/2	1	40/60	60/40	100
Total						**22**	**420/ 440**	**480/ 460**	**1000**

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Programme	B. E./B.Tech.	Programme Code	107	Regulation	2023
Department	COMPUTER SCIENCE AND TECHNOLOGY			Semester	VI

CURRICULUM

(Applicable to the students admitted from the academic year 2023-2024 onwards)

Course Code	Course Name	Category	Periods/ Week			Credit	Maximum Marks		
			L	T	P	C	CA	ESE	Total
THEORY									
U23IT608	Internet Programming$	PCC	3	0	0	3	40	60	100
U23CT613	Foundation of Data Science	PCC	3	0	0	3	40	60	100
U23CT614	Cloud Computing	PCC	3	0	0	3	40	60	100
	Professional Elective– II	PEC	3	0	0	3	40	60	100
	Open Elective–II	OEC	3	0	0	3	40	60	100
THEORY INTEGRATED WITH PRACTICAL									
U23CT615	Deep Learning	PCC	3	2	0	4	40	60	100
PRACTICAL									
U23IT610	Internet Programming Laboratory$	PCC	0	0	2	1	60	40	100
U23CT616	Data Science Laboratory	PCC	0	0	2	1	60	40	100
U23CT617	Mini Project – II	EEC	0	0	2	1	60	40	100
CAREER TRACK COURSE									
	Career Track Course - III	EEC	2/0	0	0/2	1	40/60	60/40	100
					Total	**23**	**460/ 480**	**540/ 520**	**1000**

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Programme	B. E./B.Tech.	Programme Code	107	Regulation	2023
Department	COMPUTER SCIENCE AND TECHNOLOGY			Semester	VII

CURRICULUM

(Applicable to the students admitted from the academic year 2023-2024 onwards)

Course Code	Course Name	Category	Periods/ Week			Credit	Maximum Marks		
			L	T	P	C	CA	ESE	Total
THEORY									
U23CT718	Internet of Things*	PCC	3	0	0	3	40	60	100
U23CT719	Professional Ethics and Human values	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									
U23CT720	Internet of things Laboratory*	PCC	0	0	2	1	60	40	100
U23CT721	Internship Training	EEC	0	0	4	2	60	40	100
U23CT722	Project Phase-I	EEC	0	0	4	2	60	40	100
					Total	**20**	**380**	**420**	**800**

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Programme	**B. E./B.Tech.**	Programme Code	**107**	Regulation	**2023**				
Department	**COMPUTER SCIENCEAND TECHNOLOGY**			Semester	**VIII**				
CURRICULUM (Applicable to the students admitted from the academic year 2023-2024 onwards)									
Course Code	Course Name	Category	Periods/ Week			Credit	Maximum Marks		
			L	T	P	C	CA	ESE	Total
TIIEORY									
	Professional Elective – V	PEC	3	0	0	3	40	60	100
	Professional Elective – VI	PEC	3	0	0	3	40	60	100
PRACTICAL									
U23CT823	Project Phase - II	EEC	0	0	16	8	60	40	100
					Total	**14**	**140**	**160**	**300**

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$- Common for IT & CSE

Cumulative Credits: 162

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Career Track Courses										
Sem	Course Code	Course Name	Category	Periods/Week			Credit	Maximum Marks		
				L	T	P	C	CA	ESE	Total
Track 1 – Entrepreneurship										
IV	U23CTCE1	Entrepreneurial Mindset and Business Model Canvas	EEC	-	-	2	1	60	40	100
V	U23CTCE2	Product Innovation, Commercialization and Finance	EEC	2	-	-	1	40	60	100
VI	U23CTCE3	Intellectual Property Rights	EEC	2	-	-	1	40	60	100
Track 2 - Competitive Examination										
IV	U23CTCP3	Verbal , Quantitative Aptitude and Reasoning -II	EEC	2	-	-	1	40	60	100
V	U23CTCG1	History & Culture of India and Indian Geography	EEC	2	-	-	1	40	60	100
VI	U23CTCG2	Indian economy and Freedom struggle in India & Tamil Nadu	EEC	2	-	-	1	40	60	100
Track 3 - Higher Studies										
IV	U23CTCP3	Verbal, Quantitative Aptitude and Reasoning -II	EEC	2	-	-	1	40	60	100
V	U23CTCH1	Higher Studies in Abroad & India	EEC	2	-	-	1	40	60	100
VI	U23CTCH2	Social Networking for Higher Studies	EEC	2	-	-	1	40	60	100
Track 4 – Placement										
IV	U23CTCP3	Verbal , Quantitative Aptitude and Reasoning -II	EEC	2	-	-	1	40	60	100
V	U23CTCP4	Leveraging Arithmetic and Codes Snippet	EEC	2	-	-	1	40	60	100
VI	U23CTCP5	Integrated Reasoning and Pseudo Code	EEC	2	-	-	1	40	60	100

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Programme	B.E	Programme Code		107	Regulation		2023	
Department	COMPUTER SCIENCE AND TECHNOLOGY				Semester		I	
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23MA101	**Matrices and Calculus**	3	1	0	4	40	60	100

Course Objective

The Main Objective of the course is

- To develop the use of matrix algebra techniques that is needed by engineers for practical applications.
- To familiarize the students with differential calculus.
- To familiarize the student with functions of several variables. This is needed in many branches of engineering.
- To make the students understand various techniques of integration.
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their applications.

Course Outcome

At the end of the course the students will be able to	Knowledge level
CO1: Use the matrix algebra methods for solving practical problems.	K3
CO2: Apply differential calculus tools in solving various application problems.	K4
CO3: Able to use differential calculus ideas on several variable functions.	K5
CO4: Apply different methods of integration in solving practical problems.	K5
CO5: Apply multiple integral ideas in solving areas, volumes and other practical problems.	K3

Pre-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	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	PSO 3
CO 1	3	2		1	1								2		
CO 2	3	3	2		1								2		
CO 3	3		2	1									2		
CO 4	3	2	2	1	1								2		
CO 5	3		1	1	1								2		

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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	**MATRICES**	Periods	9+3
Characteristic equation – Eigen values and Eigenvectors of a real matrix– Properties of Eigen values and Eigenvectors – Cayley-Hamilton theorem (excluding proof) – Diagonalization of matrices – Reduction of a quadratic form to canonical form by orthogonal transformation – Nature of quadratic forms. Simple application in encoding message using 2×2 matrix.			
Unit - II	**DIFFERENTIAL CALCULUS**	Periods	9+3
Limit, Continuity, Differentiability, Rules of differentiation, Differentiation of various functions, Rolle's theorem (excluding proof), Mean value theorem (excluding proof), Taylor's theorem (excluding proof), Maxima and Minima. Applications: Newton's law of cooling – Heat flow problems.			
Unit – III	**FUNCTIONS OF SEVERAL VARIABLES**	Periods	9+3
Partial differentiation – Homogeneous functions and Euler's theorem (excluding proof) – Total derivative – Change of variables – Jacobians – Partial differentiation of implicit functions – Taylor's series for functions of two variables (excluding proof) – Maxima and minima of functions of two variables. Applications: Lagrange's method of undetermined multipliers.			
Unit - IV	**INTEGRAL CALCULUS**	Periods	9+3
Definite and Indefinite Integrals- Methods of integration: Integration by parts, Trigonometric integrals, Trigonometric substitutions, Integration of rational functions by partial fraction, Integration of irrational functions -Reduction formula on $\int_0^{\frac{\pi}{2}} \cos^n x dx$, $\int_0^{\frac{\pi}{2}} \sin^n x dx$.			
Unit - V	**MUTIPLE INTEGRALS**	Periods	9+3
Double integrals – Change of order of integration – Double integrals in polar coordinates – Area enclosed by plane curves – Triple integrals – Volume of solids – Change of variables in double and triple integrals.			
		Total Periods	**45+15=60**
Text Books			
1.	Stewart, J. Calculus: Early Transcendentals (8th Edition), Cengage Learning, 2015.		
2.	Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 43rd Edition, 2014.		
References			
1.	Reyszig E, Advanced Engineering Mathematics (10th Edition), John Wiley (2015).		
2.	Bali. N., Goyal. M. and Watkins. C., "Advanced Engineering Mathematics", Firewall Media (Animprint of Lakshmi Publications Pvt., Ltd.,), New Delhi, 7th Edition, 2009.		
3.	Thomas. G. B., Hass. J, and Weir. M.D, "Thomas Calculus ", 14th Edition, Pearson India, 2018		
4.	Anton H, Calculus: Early Transcendentals, 10th Edition, Wiley (2016).		
5.	B V Ramana, Higher Engineering Mathematics, Tata McGraw Hill Education Pvt Ltd., New Delhi (2016)		
E-Resources			
1.	https://freevideolectures.com › All Courses › Calculus › UCLA		
2.	www.learnerstv.com/Free-engineering-Video-lectures		
3.	www.nptel.ac.in		

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	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205							
Programme	B.E.	Programme Code		107	Regulation		2023	
Department	Computer Science and Technology				Semester		I	
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23EN101	English for Communication	3	0	0	3	40	60	100

Course Objective	The main objective of this course is to: • Improve the communicative ability of learners. • Make learners read widely in order to practice writing • Make learners develop vocabulary and strengthen grammatical understanding • Assist students in the development of intellectual flexibility, creativity, and cultural literacy so that they may engage in life-long learning. • Identify and begin to apply the language features of academic and professional writing and speaking	
Course Outcome	At the end of the course, student should be able to,	Knowledge Level
	CO1: Use appropriate vocabulary in a professional context	K1
	CO2: Write appropriately based on the knowledge gained through reading of a variety of materials	K1
	CO3: Use language through their grammatical acquisition	K2
	CO4: Read and infer meanings of technical texts	K2
	CO5: Comprehend and retain the contextual and syntax understanding from Reading.	K3
Pre-requisites	-	

CO /PO Mapping
(3/2/1indicates strength of correlation) 3-Strong, 2–Medium, 1–Weak

CO/PSO Mapping

COs	Programme Outcomes (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	PSO2
CO 1						2			3	3		3		1
CO 2						2			3	3		3		1
CO 3						2			3	3		3		1
CO 4						2			3	3		3		1
CO 5						2			3	3		3		1

Course Assessment Methods

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

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Content of the syllabus			
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 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, One word substitution, 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**- Writing short & lengthy 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**–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 Supra-Segmental Features-Practicing Stress, Pause and Intonation, **Reading**– Reading for a purpose, Reading Business Documents, Interpreting Charts and Graphs, **Writing**- Describing a Process. **Focus on Language** -Synonyms and Antonyms, Common Errors in English.			
		Total Periods	45
Text Books:			
1	Dr. S. R. Kannan & Faculty from the Department of English -English for Communication, Karun Printers Pvt. Ltd, 2023.		
2	Sokkaalingam, S.RM., The Art Of Speaking English Versatile Publishing House,2018.		
REFERENCE BOOKS			
1	Dr. Padma Ravindran, Poorvadevi, M. Y. Abdur Razack- English for life, English for work, students Book, Ebek language laboratory pvt ltd, 2011.		
2	Dutt Rajeevan, Prakash. A Course in Communication Skill (Anna University, Coimbatore edition): Cambridge University Press India Pvt.Ltd, 2007.		
3	S.P. Dhanavel, English and Communication Skills for Students of Science and Engineering, Orient Blackswan Pvt, Ltd, 2009.		
4	Technical English – I & II, Sonaversity, Sona College of Technology, Salem, First Edition, 2012.		
5	Meenakshmi Raman and Sangeeta Sharma- ' Technical communication forEnglish Skills for Engineers; oxford University Press, 2008.		
E-Resources			
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		

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Programme	B.E.	Programme Code	107	Regulation	2023
Department	Computer Science and Technology			Semester	I

Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23PH101	Engineering Physics	3	0	0	3	40	60	100

Course Objective

The student should be made to,

- Understand the basic concepts of properties of matter
- Gain knowledge about the conduction properties of metals
- Identify the different types of crystal structures and crystal growth techniques. Study the production and applications of ultrasonic.
- Correlate better understanding the carrier concentration and its variations with temperature in a semiconductor. Study the properties of modern engineering materials and its uses
- Categorize the types of laser and fiber optics

Course Outcome

At the end of the course, the student will be able to	Knowledge Level
CO1: Understand the elastic properties of the materials	K2
CO2: Gain knowledge about the conduction properties of metals	K3
CO3: Determine packing factor for various unit cells and understand different types of crystal imperfections and learn the engineering, medical applications.	K1
CO4: Discuss the basic idea of semiconducting materials and realize the function of modern engineering materials	K1
CO5: Learn the optical properties of materials and its uses	K3

Pre-requisites ---

CO / PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak

COs	Programme Outcomes (POs)												CO/PSO Mapping 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	2	3	1	2									2
CO 2	3	2	3	3	1									
CO 3	3	3		3	1									2
CO 4	3		2	1	1								3	2
CO 5	3			1	2	2								2

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

Content of the syllabus

Unit – I	PROPERTIES OF MATTER	Periods	9

Elasticity: Types of moduli of elasticity - Poisson's ratio - Stress - Strain Diagram – uses - Hooke's law. Young's modulus: Uniform bending (qualitative) Experimental determination by non-uniform bending - Twisting couple on a wire – Application: I shape girders, Torsional pendulum.
Viscosity: Co-efficient of viscosity - Poiseuilles' formula - Experimental determination – uses.

Unit - II	ELECTRICAL PROPERTIES OF METALS	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 - Fermi – Dirac Statistics - Density of energy states (Qualitative).

Unit – III	CRYSTAL PHYSICS AND ULTRASONICS	Periods	9

Crystallography: Unit cell - Crystal systems - Bravais lattices- Lattice planes - Miller indices - Inter-planar spacing in cubic lattice- Calculation of number of atoms per unit cell- Atomic radius – Coordination number- Packing Factor for HCP structures - Crystal defects – point and line defects (qualitative).
Ultrasonics: Introduction - Properties and Generation of Ultrasonics – Magnetostriction and Piezoelectric Oscillator methods – Applications: Sound Navigation and Ranging (SONAR), Non – Destructive Testing (NDT) and Sonogram.

Unit - IV	SEMICONDUCTING & MODERN ENGINEERING MATERIALS	Periods	9

Semiconductors: Elemental and Compound semiconductors - Intrinsic semiconductor: (Qualitative only) – Carrier concentration – Fermi level – Electrical conductivity - Band gap determination. Extrinsic semiconductors: Carrier concentration in n – type and p – type semiconductor (Qualitative) – Variation of Fermi level with temperature. Application; Construction and working of LED.
Metallic glasses: preparation, properties and applications - Shape memory alloys (SMA): Characteristics and applications of NiTi alloy.

Unit – V	LASER AND FIBER OPTICS	Periods	9

Laser: Interactions of Radiations with matters - Characteristics of laser – Derivation of Einstein's A and B coefficients. Types: CO_2 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: Temperature sensor.

	Total Periods	45

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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.	Dr.A.Paneerselvam and Dr.P.Mani, "Engineering Physics", Dhanam publisher, Chennai – 600 042.(2024).
References	
1.	B.K. Pandey, S. Chaturvedi. "Engineering Physics", 1st Edition, Cengage Learning India Pvt Ltd, (2012).
2.	David Halliday, Robert Resnick Jearl Walker, Fundamentals of Physics Extended 8/Ed 8th Edition, 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-Resources	
1.	www.e-booksdirectory.com
2.	Home.iitk.ac.in
3.	physics.cu.ac.bd

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Programme	B.E.	Programme Code		107	Regulation		2023	
Department	CSE,EEE,ECE,IT,BT,CST&BME				Semester		I	
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CS101	**Programming for Problem Solving**	3	0	0	3	40	60	100
Course Objective	The main objective of this course is to: • Learn the fundamentals of computers, languages, number systems and acquire problem solving skills in C Programming							

Course Outcome	At the end of the course, the student should be able to,	Knowledge Level
	CO1: Examine number systems and to apply problem solving Techniques	K3
	CO2: Learn the basics of C programming with branching and looping Statements	K2
	CO3: Experiment the C programs using Arrays and Pointers for simple Applications	K3
	CO4: Solve C programs with the Functions and Strings	K3
	CO5: Apply Structures, Union and File concepts to solve simple real world problems	K3
Pre-requisites	-	

CO / PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 – Weak

COs	Programme Outcomes (POs)												**CO/PSO Mapping** 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	2	1	1	2							2	3	3
CO 2	2	1	1		2							2	2	2
CO 3	3	2	1	1	2							2	3	3
CO 4	3	2	1	1	2							2	3	3
CO 5	3	2	1	1	2							2	3	3

Course Assessment Methods Direct

Direct
1. Continuous Assessment Test I, II & III 2. Assignment / Quiz / Seminar 3. .End-Semester examination
Indirect
1.Course - end survey

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Content of the syllabus			
Unit – I	**INTRODUCTION TO PROBLEM SOLVING**	Periods	9
Basic organization of Computer - Programming languages - Compilers – Interpreter - Flowchart – Pseudocode – Algorithm. **Number Systems** – Decimal, Binary, Octal and Hexadecimal conversions			
Unit – II	**BASICS OF C PROGRAMMING**	Periods	9
Introduction to C – Features - Data Types – Constants – Variables - I/O Statement - Operators –Expressions - Decision Making and Branching – Looping Statements - Break, Go to, Continue.			
Unit – III	**ARRAYS AND POINTERS**	Periods	9
Arrays: Concepts – Need – one dimensional array – array declaration – features – array initialization - Two-Dimensional Arrays- Multidimensional Arrays. **Pointers**: Introduction, pointer declaration-accessing variable through pointer- Pointers and Arrays, Pointers and strings – Pointers structures - Pointer Arithmetic - Array of Pointers – dynamic memory allocation - malloc, realloc, free.			
Unit – IV	**FUNCTIONS AND STRINGS**	Periods	9
Functions: Introduction, function declaration, defining and accessing functions, User-defined Functions- storage classes-function prototypes-parameter passing methods-recursion. **Strings**: Concepts – Strings manipulation - String Input / Output Functions- Strings standard functions - Arrays of Strings.			
Unit – V	**STRUCTURES, UNIONS AND FILE SYSTEMS**	Periods	9
Structures: Introduction- nested structures- Arrays of Structures - Structures and Functions - Pointers to Structures – Unions. **File**: opening, defining, closing, File Modes, File Types , Writing contents into a file, Reading file contents, Appending an existing file, File permissions and rights, Changing permissions and rights.			
		Total Periods	45

Text Books	
1.	S.Kuppuswami, S.Malliga, C. S. Kanimozhi and K.Kousalya, "Problem Solving and Programming",McGraw Hill, 2019.
2	E. Balagurusamy, "Programming in ANSI C", 8th Edition, Mc Graw Hill, 2019.
References	
1.	Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th Edition, 2017
2.	Kernighan BW and Ritchie DM, "The C Programming Language", 2nd Edition, Prentice Hall of India, 2017.
3.	Dr.V.Rameshbabu, Dr.R.Samyutha, M.Muni Rathnan, "Computer Programming", VRB Publishers Pvt.Ltd, 2016.
Tools Required	
1.	Codetandra/HackerRank/ HackerEarth / Any online Problem Solving Platforms
E-Resources	
1.	https://www.geeksforgeeks.org/c-language-set-1-introduction/
2.	https://www.programiz.com/c-programming
3.	https://www.cprogramming.com/

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Programme	B.E	Programme code		107	Regulation		2023	
Department	COMPUTER SCIENCE AND TECHNOLOGY				Semester		I	
Course code	Course name	Periods per week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23TA101	Heritage of Tamils / தமிழர் மரபு	1	0	0	1	40	60	100
	Content of the syllabus							
அலகு 1	மொழி மற்றும் இலக்கியம்				Periods		3	
இந்திய மொழிக்குடும்பங்கள் – திராவிடமொழிகள் – தமிழ் ஒரு செம்மொழி - தமிழ் 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 பாரதிதாசனின் பங்களிப்பு.								
அலகு 2	மரபு – பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை – சிற்பக்கலை				Periods		3	
நடுகல் முதல் நவீன சிற்பங்கள் வரை – ஐம்பொன்சிலைகள் – பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப்பொருட்கள்,பொம்மைகள் – தேர் செய்யும் கலை – சுடுமண் சிற்பங்கள் – நாட்டுப்புறதெய்வங்கள் – குமரிமுனையில் திருவள்ளுவர் சிலை – இசைக்கருவிகள் – மிருதங்கம், பறை,யாழ்,வீணை,நாதஸ்வரம் – தமிழர்களின் பொருளாதார வாழ்வில் கோவில்களின் பங்கு.								
அலகு 3	நாட்டுப்புறக்கலைகள் மற்றும் வீரவிளையாட்டுக்கள்				Periods		3	
தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான்கூத்து, ஒயிலாட்டம் ,தோல்பாவைக்கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம் , தமிழர்களின் விளையாட்டுக்கள்.								
அலகு 4	தமிழர்களின் திணைக்கோட்பாடுகள்				Periods		3	
தமிழகத்தின் தாவரங்களும் விலங்குகளும்– தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக்கோட்பாடுகள் – தமிழர்கள் போற்றிய அறக்கோட்பாடுகள் – சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவு, கல்வியறிவு – சங்ககால நகரங்களும் துறைமுகங்களும் – சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி – கடல் கடந்த நாடுகளில் சோழர்களின் வெற்றி.								

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அலகு 5	இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்கு	Periods	3
இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு – இந்தியாவின் பிறப்பகுதிகளில் தமிழ்ப்பண்பாட்டின் தாக்கம் – சுயமரியாதை இயக்கம் – இந்திய மருத்துவத்தில் சித்தமருத்துவத்தின் பங்கு – கல்வெட்டுகள் கையெழுத்துப்படிகள் – தமிழ்ப்புத்தகங்களின் அச்சுவரலாறு.			
		Total Periods	15

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Programme	B.E	Programme code		107	Regulation		2023	
Department	COMPUTER SCIENCE AND TECHNOLOGY				Semester		I	
Course code	Course name	Periods per week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23TA101	Heritage of Tamils / தமிழர் மரபு	1	0	0	1	40	60	100
	Content of the syllabus							
UNIT I	LANGUAGE AND LITERATURE				Periods		3	
Language Families in India – Dravidian Languages–Tamil as a Classical Language-Classical Literature in Tamil–Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature-Management Principles in Thirukural- Tamil Epics and Impact of Buddhism & Jainism in Tamil and -Bakthi Literature Azhwars and Nayanmars – Forms of minor Poetry– Development of Modem literature in Tamil-Contribution of Bharathiyar and Bharathidhasan.								
UNIT II	HERITAGE-ROCK ART PAINTINGS TO MODERN ART–SCULPTURE				Periods		3	
Herostone to modern sculpture - Bronzeicons- Tribes and their handicrafts- Art of temple car making—Massive Terracotta sculptures Villagedeities , Thiruvalluvar Statue at Kanyakumari, Making of musical instruments-Mridhangam,Parai Veenai,Yazhand Nadhaswaram – Role of Temples in Social and Economic Life of Tamils.								
UNIT III	FOLK AND MARTIAL ARTS				Periods		3	
Therukoothu, Karagattam, VilluPattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance- Sports and Games of Tamils.								
UNIT IV	THINAI CONCEPT OF TAMILS				Periods		3	
Flora and Fauna of Tamils & Ahamand Puram Concept from Tholkappiyam and Sangam Literature- Aram Concept of Tamils- Education and Literacy during Sangam Age- Ancient Cities and Portso Sangam Age-Export and Import during Sangam Age- Overseas Conques to Cholas.								
UNIT V	CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE				Periods		3	
Contribution of tamils to Indian Freedom Struggle-The Cultural Influence of Tamils over the other parts of India-Self-Respect Movement- Role of Siddha Medicine in Indigenous Systems of Medicine–Inscriptions & Manuscripts— Print History of Tamil Books.								
					Total Periods		15	

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TEXT-CUM-REFERENCE BOOK

1	தமிழகவரலாறும் – 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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Programme	B.E	Programme Code	107		Regulation	2023		
Department	Computer Science and Technology				Semester	I		
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23GE101	Engineering Graphics	2	0	3	3	50	50	100

Course Objective

The main objective of this course is to:

- Develop skills to enhance their ability to know the concept of engineering graphics and to draw the points kept in various positions, lines and planes.
- Project the drawing of various solids.
- Sketch sectioned views of solids.
- Draw the development of surfaces.
- Draw the isometric and orthographic projections for any given object to the required standard.

Course Outcomes	At the end of the course, the student should be able to	Knowledge Level
	CO1: Construct plane curves and develop projection of points , lines and plane surfaces	K2
	CO2: Construct projection of solids with various conditions.	K4
	CO3: Design the section of solids and analyze the true shape of the section	K3
	CO4: Design and develop the different solid surfaces.	K2
	CO5: Construct isometric and orthographic projection of different solids.	K2

Pre - requisites: -

CO / PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak

COs	Programme Outcomes (POs)												CO/PSO Mapping 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	PSO 1	PSO 2
CO 1	3	3	3	3	3	-	-	-	-	-	-	-	3	2
CO 2	3	3	2	2	2	-	-	-	-	-	-	-	2	-
CO 3	3	2	2	2	3	-	-	-	-	-	-	-	2	2
CO 4	3	2	3	3	2	-	-	-	-	-	-	-	3	3
CO 5	3	3	2	3	3	-	-	-	-	-	-	-	2	2

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Course Assessment Methods

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

Content of the Syllabus

Concepts & Conventions (Not for Examination)	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**
Unit – I	**PROJECTION OF POINTS, LINES AND PLANE SURFACES**	**Periods**	**3+8**
Introduction to Plane curves, Orthographic projection – principles – projection of points, straight lines (only first angle projections) and plane surfaces (polygonal and circular).			
Unit - II	**PROJECTION OF SOLIDS**	**Periods**	**3+8**
Projections of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane.			
Unit - III	**SECTION OF SOLIDS**	**Periods**	**3+8**
Sectioning of solids - prisms, pyramids, cylinder and cone in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other - Obtaining true shape of section.			
Unit - IV	**DEVELOPMENT OF SURFACES**	**Periods**	**3+8**
Development of lateral surfaces of simple solids like prisms, pyramids, cylinders and cones – development of simple truncated solids involving prisms, pyramids, cylinders and cones.			
Unit - V	**ISOMETRIC PROJECTIONS, ORTHOGRAPHIC VIEWS FROM PICTORIAL VIEWS**	**Periods**	**5+10**
Isometric Projection and Introduction to AutoCAD / Solid Edge: Principles of isometric projection - Isometric scale -Isometric projections of simple solids like prisms, pyramids, cylinders and cones & orthographic views from pictorial views.			
Demonstration only: **Computer Aided Drafting (Auto CAD / Solid Edge):** Introduction to drafting packages and demonstration of their use.			
		Total Periods	**60**

Text Book:

1.	Basant Agrawal and C.M Agrawal ,"Engineering Drawing ",Tata McGraw Hill ,Third Edition,2019
2.	Jain and Gautam ,"Engineering Graphics & Design ",Khanna Publishing House, 2018

Reference Book :

1.	Dr.P.Kannan and Dr.J.Bensam Raj, "Engineering Graphics", JBR Tri Sea Publishers Pvt. Ltd,2018.
2.	K.V Natarajan, "Engineering Drawing and Graphics", M/s. N.Dhanalakshmi, Chennai,2014.
3.	K.Venugopal and V. Prabhu Raja, "Engineering Graphics"New Age International Publishers,2011.
4.	N.S Parthasarathy and Velamurali, " Engineering Graphics", Oxford University, New Delhi,2015
5.	Bhatt N.D and Panchal V.M, "Engineering Drawing", Charotar Publishing House,50th Edition,2010

E-RESOURCES:

1.	http://nptel.ac.in/courses/105104148, "Engineering Graphics" - Dr. Nihar Ranjan Patra , IIT Kanpur
2.	http://cfd.annauniv.edu/webcontent.htm, "Engineering Graphics" - Dr.Velamurali
3.	http://link.springer.com/ "Engineering Graphics"-Springer Nature.

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Programme	B.E	Programme code	107	Regulation	2023			
Department	Computer Science and Technology		Semester		I			
Course Code	Course name	Periods per week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23GE102	Design Thinking	1	0	2	1	50	50	100

Course Objective

The student should be made to,

- Familiarize with design thinking concepts and principles
- Practice the methods, processes and tools of design thinking.
- Apply the design thinking approach and have ability to model real world situations.

Course Outcome

At the end of the course, the student should be able to,	KL
CO1: Understand and apply the concept of team building activity	K2
CO2: Understand Design Thinking and apply the design thinking approach to empathize situations in real world	K3
CO3: Identify various methods of empathy and define the problem	K3
CO4: Develop creative ideas through design thinking	K4
CO5: Understand benefits of learning through observation, experience and application	K5

Pre-requisites -

CO / PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 – Weak

COs	Programme Outcomes (POs)												CO/PSO Mapping 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	PSO 1	PSO 2
CO 1	2	3	3	3	3	2	2	3	3	3	2	2	3	3
CO 2	3	3	3	3	3	3	3	3	3	3	3	3	2	2
CO 3	3	3	1	2	2	2	2	1	2	1	-	-	2	2
CO 4	3	3	3	3	3	2	2	2	2	2	2	1	2	2
CO 5	3	3	3	3	1	2	2	2	1	2	2	1	2	2

Course Assessment Methods

Direct

1. Continuous Assessment Test through activities, assignment & Quiz
2. Models (Chart/paper/3D)
3. Prototype & Presentation

Indirect

1. Course - end survey

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Content of the Syllabus		
SESSION - I	Periods	6
Introduction – Team Building - Types – 4 C's of Team Building – Levels of Team Building – Benefits of Team Work – Team Building Activity.		
SESSION - II	Periods	9
Introduction to Design Thinking – Purpose of Design Thinking – Design Thinking Framework, Empathy and related case studies		
SESSION - III	Periods	6
Define: Examine and Reflect on the problem.		
SESSION - IV	Periods	12
Generating Ideas – Identifying ideas – Bundling the ideas and create concepts – Rapid Prototyping – Idea Refinement.		
SESSION - V	Periods	12
Importance & testing the design with people - Retest and redefine results		
	Total Periods	45

Textbooks	
1.	Solving Problems with Design Thinking - Ten Stories of What Works by Jeanne Liedtka 2013.
2.	Idris Mootee, "Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School", John Wiley & Sons 2013.
3.	Yousef Haik and Tamer M.Shahin, "Engineering Design Process", Cengage Learning, 2nd edition, 2011
4.	Design of Business: Why Design Thinking is the Next Competitive Advant age by Roger L. Martin 2009.
5.	Change by Design: How Design thinking transforms organizations and empires Innovation, 2009, Harper Business, Brown, Tim and Berry.

References	
1.	Design thinking toolbox by Michael Lewick, Wily 2020
2.	Design thinking playbook by Michael Lewrick , Wily 2019
3.	Creative Confidence: Unleashing the Creative Potential Within Us All by by Tom 2014
4.	The Design of Everyday Things: by Don Norman 2013

E-Resources	
1.	https://www.collectivecampus.io/blog/6-resources-to-help-you-learn-design-thinking
2.	https://thisisdesignthinking.net/on-design-thinking/design-thinking-resources/
3.	http://hs.griet.ac.in/pdf/studymaterialsgr20/Design%20Thinking%20Lab%202020-21.pdf
4.	https://www.mindtools.com/brainstm.html
5.	https://www.quicksprout.com/. /how-to-reverse-engineer-your-competit
6.	https://www.youtube.com/watch?v=2mjSDIBaUlM
7.	thevirtualinstructor.com/foreshortening.html

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Activity Based Learning/Practical Based Learning	
http://dschool.stanford.edu/dgift/	
Online Course	
1	https://onlinecourses.nptel.ac.in/noc19_mg60/preview
2	https://www.ibm.com/design/thinking/page/badges/core-skills

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Programme	B.E.	Programme Code	107	Regulation	2023			
Department	Computer Science and Technology			Semester	I			
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23PH102	PHYSICS LABORATORY	0	0	3	1	60	40	100

Course Objective

- Understand elastic behavior of Materials
- Predict viscous force in liquids.
- Gain knowledge in measuring the lowest thickness materials
- To Identify wavelengths of prominent lines using polychromatic lamp
- Observe heat conduction in bad conductor
- Understand the principle of interferometer
- To learn about the characteristics of Lasers

Course Outcome

At the end of the course, the student will be able to	Knowledge Level
CO1: Measure the young's modulus of the materials, Rigidity modulus – Torsion pendulum	K3
CO2: Calculate Coefficient of viscosity of liquid and thickness of thin wire using Air wedge	K3
CO3: Observe and measure the different wavelengths of mercury Spectrum and dispersive power of a prism	K3
CO4: Illustrate the conductivity of bad conductors. To know how to determine the velocity of ultrasonic waves in liquid	K3
CO5: To understand the importance of laser beam compared to ordinary light	K2

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	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	1											2	
CO 2	3	3	1	2	2								2	
CO 3	3	2			2								3	
CO 4	3	3		1									1	
CO 5	3	1	1		1								2	

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Course Assessment Methods
Direct
1. Prelab and post lab test 2. Execution of experiment and Viva-Voce 3. End-Semester examinations
Indirect
Course - end survey

Content 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	CO1
4.	Determination of Coefficient of viscosity of a liquid – Poiseuille's method	CO2
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	30

Lab Manual

1.	R. Jayaraman, Engineering Physics Laboratory Manual, Pearson Pub, Edition - 2021.
2.	A.K.Katiyar & C.K.Pandey Engineering Physic: Theory and Practical, Wiley Pub, 2nd Edition.
3.	Dr.P.Mani, "Physics laboratory manual ", Dhanam publisher, Chennai – 600 042. (2024)
4.	Dr.G.Senthil Kumar, "Physics laboratory manual", VRB Publishers Private Limited, Chennai. (2024).

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Programme	B.E. / B.Tech.,	Programme Code			Regulation	2023		
Department	CSE, EEE, ECE, IT, BT, CST & BME				Semester	I		
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CS102	**Programming for Problem Solving Laboratory**	0	0	2	1	60	40	100

Course Objective	The main objective of the course is to • Develop simple C programs to illustrate the applications of User Defined and Derived Data Types such as Arrays, Pointers, Structures, and Functions.	
Course Outcome	At the end of the course, the student should be able to,	Knowledge Level
	CO1: Develop C programs for computer based solution of simple real world problems using Conditional and Looping statements	K3
	CO2: Implement simple C Programs using Strings and Arrays	K3
	CO3: Implement C program for simple applications using Pointers	K3
	CO4: Write C programs that perform operations on File	K4
	CO5: Demonstrate C Programs using Structures	K3

CO / PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak

COs	Programme Outcomes (POs)												**CO/PSO Mapping** 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	2	1	1	2							2	3	3
CO 2	3	2	1	1	2							2	3	3
CO 3	3	2	1	1	2							2	3	3
CO 4	3	2	1	1	2							2	3	3
CO 5	3	2	1	1	2							2	3	3

Course Assessment Methods

Direct

1. Pre lab and post lab test
2. End-Semester examination

Indirect

1. Course - end survey

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List of Experiments	CO's
1. Write a C program that accepts an employee's ID, total worked hours in a month and the amount he received per hour. Print the ID and salary (with two decimal places) of the employee for a particular month.	CO1
2. Write a program in C to calculate the sum of three numbers with input on one line separated by a comma.	CO1
3. Write a program in C to find the sum of the series [x - x^3 + x^5 + ...].	CO1
4. Write a program in C to find the number and sum of all integers between 100 and 200 which are divisible by 9.	CO1
5. Write a program in C to count the total number of duplicate elements in an array.	CO2
6. You are given an input string 'S'. Your task is to find and return all possible permutations of the input string. **Note:** 1. The input string may contain the same characters, so there will also be the same permutations. 2. The order of permutation does not matter. **Sample Input** xyz sample Output xyz, xzy, yxz, yzx, zxy, zyx **Sample Output :** All the possible permutations for string "XYZ" will be "XYZ", "XZY", "YXZ", "YZX", "ZXY" and "ZYX".	CO2
7. Find the Smallest and Largest Element in an Array **Method 1:** Traverse the array iteratively and keep track of the smallest and largest element until the end of the array. **Method 2:** Traverse the array recursively and keep track of the smallest and largest element until the end of the array. **Method 3:** Sort the array using STL and return the first element as the smallest element and the last element as the largest element. **For example, consider the array.** arr = {1, 2, 3, 4, 5} **Sample output:** Smallest element: 1 Largest element: 5	CO2
8. Write a C program to find the sum of all the multiples of 3 and 5 below 100 using pointers. We have to find the number of numbers which are multiples of both 3 and 5 in the first 100 natural numbers. Multiples of both 3 and 5 in the first 100 natural numbers are the multiples of LCM of 3 and 5. LCM of 3 and 5 =3×5=15 **Sample output:** Multiples of 15 below 100 are 15, 30, 45, 60, 75 and 90.	CO3

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9. Write a C program to count number of characters, words and lines in a text file. Logic to count characters, words and lines in a file in C program. How to count total characters, words and lines in a text file in C programming. **Example Source file** I love programming. Working with files in C programming is fun. I am learning C programming at VCEW. **Sample output** Total characters = 100 Total words = 18 Total lines = 3	CO4
10. Write a C program to implement Student database using Structure **Sample output:** **Enter details of student:** Name :abi RollNo:101 Percentage :89.7 **Entered details:** Name: abi RollNo: 101 Percentage: 89.70	CO5

Total Periods	45
Tools Required	
Codetandra / HackerRank / HackerEarth / Any online Problem Solving Platforms	
E-Resources	
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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Programme	B.E.	Programme Code		107	Regulation	2023		
Department	Computer Science & Technology				Semester	I		
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23MCFY1	Environmental Science and Engineering	2	0	0	0	100	0	100

Course Objective	The main objective of this course is to: • Familiarize basics of ecosystem and creating environmental awareness. • Congregate about environmental pollution. • Contrast on solid waste and social issues. • Acquire knowledge in environmental legislation and protection. • Summarize population growth, human rights and Environment

Course Outcome	At the end of the course, the student should be able to	Knowledge Level
	CO1: Acquire knowledge about Eco-system, Natural resources and Bio-diversity.	K1
	CO2: Be aware of Environmental Pollution and its control.	K3
	CO3: Infer and express Solid waste management and Social issues.	K3
	CO4: Acquire Knowledge about Environmental legislation and protection.	K3
	CO5: Aweraness about population growth, human rights and Environment	K2

Pre-requisites	-

CO / PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak

COs	Programme Outcomes (POs)												CO/PSO Mapping 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	1	2	2			2	3					2	2	
CO 2	3	2	2		1	2	3				1	3	3	
CO 3	3	2	2		1	3	3				1	2	3	
CO 4	1	1	1			2	3				1	2	2	
CO 5	1	2	1			2	2				1	3	1	

Course Assessment Methods Direct

Direct
1.Continuous Assessment Test I, II & III 2. Assignment
Indirect
1.Course - end survey

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Content of the syllabus			
Unit – I	**INTRODUCTION TO ENVIRONMENTAL SCIENCE AND ENGINEERING**	Periods	6
Nature and scope of environmental education- natural resources – (forest, water, food, & land resources) problems and remedial measures. Ecosystem-Structure, characteristics and functions of ecosystem. Biodiversity – definition – conservation of biodiversity (in-situ and Ex-situ)-environmental awareness and sustainable development.			
Unit – II	**ENVIRONMENTAL POLLUTION AND ITS CONTROL**	Periods	6
Water pollution-causes, effects and control measures of water pollution- waste water treatment process (secondary-BOD,COD) . Air Pollution – types of air pollutants-CO_2, SO_2, NO_2, PAN-sources- control measures (electro static precipitator, bag house filter, wet scrubber and cyclone separator).			
Unit – III	**SOCIAL ISSUES AND SUSTAINABILITY**	Periods	6
Solid waste Management-Types (E-Waste, Hazardous waste, Bio-waste)-Disposal method. Sustainability-Definition-Sustainable development Goals-Environmental issues-global warming and Ozone depletion, Climate change, Acid rain, Carbon foot print-Possible solutions to Environmental issues.			
Unit – IV	SUSTAINABILITY PRACTICES AND ENVIRONMENTAL LEGISLATION	Periods	6
Zero waste and R-concept-circular economy, material life cycle assessment- energy efficiency and management-environmental legislation-air act, water act-wildlife protection act-environmental protection act.			
Unit – V	HUMAN POPULATION AND THE ENVIRONMENT	Periods	6
Population growth, human rights, value education, environment and human health, family welfare program, women and child welfare, role of information technology in environment – satellite, database, Geographical Information System (GIS), Environmental impact Analysis (EIA) and human health.			
		Total Periods	30
Text Books			
1.	**Dr.S. Vairam - "Environment Science and Engineering" Gems publication. Edition 2018**		
2.	Gilbert.M.Masters-"Environmental Science"-Pearson education. Edition-2-2013		
3.	Dr.S.Mageswari, Dr.G.Vijayakumar, Ms. A.Preethi – " Environment Science and Engineering" RK Publication. Edition 2022.		
References			
1.	Linda Williams- "Environmental Science"-Tata McGRAW – Hill Edition. Edition-I-2008		
2.	T.G.Miller Jr-"Environmental Science"-Wadsworth publishing Co. Edition -10-2004		
3.	William P. Cunningham, Barbara Woodworth Saigo- Tata McGraw Hill.Edition-4-2011		
4.	NPTEL Course Notes		
5.	Cunnighum and cooper-"Environmental Science"-Jaico Publ, House Edition-4-2007		
E-Resources			
1.	https://libraries.ou.edu/		
2.	https://libguides.reading.ac.uk/		
3.	https://www.loc.gov/, https://rdl.lib.uconn.edu/		

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	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205							
Programme	B.E	Programme Code		107	Regulation		2023	
Department	COMPUTER SCIENCE AND TECHNOLOGY				Semester		II	
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23MA202	Complex Analysis and Ordinary Differential Equations	3	1	0	4	40	60	100

Course Objective	The Main Objective of the course is to • Understand the Analytic functions and Bilinear transformations. • Proficiently understand the Complex Integration. • Demonstrate Vector Differentiation and Integration. • Know about the Ordinary Differential Equations. • Identify the Laplace Transform of Derivatives and Integrals.	
Course Outcome	At the end of the course, the student should be able to,	Knowledge level
	CO1: Analyze the construction of analytic functions.	K4
	CO2: Understand the concepts of cauchy's integral theorem and residue theorem in evaluation of complex integrals.	K3
	CO3: Explore the concepts of Green's , Stoke's and Gauss Divergence theorems in real life problems.	K5
	CO4: Understand the concepts of solving second order differential equations.	K5
	CO5: Apply the concepts of Laplace transform in solving ODE.	K3
Pre-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	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	PSO 3
CO 1	3	2	1	1	1								2		
CO 2	3	2	1	1									2		
CO 3	3	2		1									2		
CO 4	3	2		1	1								2		
CO 5	3	2	1	1									2		

Course Assessment Methods

Direct

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

Indirect

1.Course - end survey

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Content of the syllabus			
Unit – I	**ANALYTIC FUNCTIONS**	Periods	9+3
Analytic functions – Necessary and sufficient conditions for analyticity in Cartesian and polar coordinates - Properties – Harmonic conjugates – Construction of analytic function - Conformal mapping – Mapping by functions c+z, cz, 1/z and Bilinear transformation.			
Unit - II	**COMPLEX INTEGRATION**	Periods	9+3
Problem solving using Cauchy's integral theorem and integral formula- Taylor's and Laurent's expansions- Residues- Cauchy's residue theorem- Application: Contour integration over unit circle.			
Unit – III	**VECTOR DIFFERETIATION & INTEGRATION**	Periods	9+3
Vector Differentiation: Vector and Scalar Functions- Derivatives- Curves, Gradient of a Scalar Field- Directional Derivative -Divergence of a Vector Field - Curl of a Vector Field – Line, Surface and Volume integrals (concepts only), Green's theorem in a plane(excluding proof), Gauss Divergence theorem(excluding proof), Stoke's theorem (Excluding proof).			
Unit - IV	**ORDINARY DIFFERENTIAL EQUATIONS**	Periods	9+3
Second order Linear ordinary differential equations with constant coefficients, Cauchy's - Euler equations (excluding proof)- Legendre's Linear differential equations(excluding proof) - Method of variation of parameters.			
Unit – V	LAPLACE TRANSFORMS	Periods	9+3
Existence conditions – Transforms of elementary functions – Transform of unit step function and unit impulse function – Basic properties – Shifting theorems (excluding proof) -Transforms of derivatives and integrals – Initial and final value theorems (excluding proof) Inverse transforms Convolution theorem (excluding proof) – Transform of periodic functions – Application to solution of linear second order ordinary differential equations with constant coefficients.			
		Total Periods	45+15=60
Text Books			
1.	Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 45th Edition, 2024.		
2.	Ravish R Sing , Mukul Bhatt, "Engineering Mathematics", Mc Graw Hill Education Pvt. Ltd-2018		
3.	Sivaramakrishna Das. P, Vijayakumari.C, " Engineering Mathematics – II", Pearson India Education Pvt. Ltd-2022.		
References			
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		
4	Yunus A.Cengel, William J.Palm III," Differential equations for Engineers & Scientists", Tata McGraw Hill Education Pvt. Ltd, 6th Edition, New Delhi, 2012.		
5	John Bird, Higher Engineering Mathematics, Anuradha Agencies(2004)		
E-Resources			
1	https://en.wikipedia.org › wiki › Ordinary_differential_equation		
2	w.learnerstv.com/Free-engineering-Video-lectures		
3	w.nptel.ac.in		

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Programme	B.E	Programme Code		107	Regulation		2023	
Department	COMPUTER SCIENCE AND TECHNOLOGY				Semester		II	
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CH201	Engineering Chemistry	3	0	0	3	40	60	100

Course Objective

The main objective of this course is to:

- Recognize the basic technology requirements in water treatment
- Gain knowledge in basics and preparations, properties and applications of Polymers.
- Enrich the Knowledge of the students with the basics of Nano materials, their propertiesand applications.
- Familiarize about the Nonrenewable, renewable energy and different types of storage devices in the engineering application.
- Gain knowledge in destruction and protection of metals for engineering applications.

Course Outcome

At the end of the course, the student should be able to.	Knowledge level
CO1: Implement innovative solutions in wastewater treatment process.	K3
CO2: Familiarize with the applications of polymers in the field of engineering.	K3
CO3: Identify the synthesis methods of Nanoparticles and their industrial applications	K2
CO4: Recognize the renewable, non renewable energy and storage devices for domestic and industrial applications.	K3
CO5: Categorize the metal corrosion in different environment and find out appropriate control techniques to avoid corrosion.	K3

Pre-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	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	PSO 3
CO 1	3	3	3	2	1	2	2	2					1	1	3
CO 2	3	2	2	2		2	2	1					2	2	3
CO 3	3	2	2	3	2	1	2	1					2	1	3
CO 4	3	3	2	2	1	1	3	2					3	2	3
CO 5	3	3	3	2	1	2	2	1					2	1	3

Course Assessment Methods

Direct

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

Indirect

1. Course - end survey

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Content of the syllabus			
Unit - I	**WATER TECHNOLOGY**	Periods	9
Introduction-sources and impurities in water-soft and hard water- water quality parameters. Types of hardness. Determination of hardness by EDTA method. Domestic water treatment. Boiler feed water –requisites, scale and sludge formation in boilers-caustic embrittlement- boiler corrosion- treatment of boiler feed water. Internal conditioning (carbonate, phosphate, and calgon conditioning), external conditioning – ion exchange process, zeolite process, Electro dialysis. Brackish water –water purification by reverse osmosis.			
Unit - II	**POLYMER CHEMISTRY**	Periods	9
Introduction - occurrence, definitions – functionality - degree of polymerization- classification of polymers – structure (linear, branched & network polymer structure) block, random & graft copolymers, tacticity, Tg (Factors influencing Tg), molecular weight - number and weight average method. Types of polymerizations - addition, condensation and copolymerization. Mechanism of polymerization (Free radical). Preparation, properties and applications of PE, nylon6, nylon 66, Poly Urethane, poly isoprene and Vulcanization of rubber, TEFLON ,PET, and Bakelite			
Unit - III	**NANO CHEMISTRY**	Periods	9
Basics- distinction between molecules, nanoparticles and bulk materials; size dependent properties. Nanoparticles: nanocluster, nanorod, nanotube (CNT) and nanowires. Synthesis: Top down process- laser ablation, spray pyrolysis, chemical vapor deposition, electro deposition. Bottom up process- precipitation, sol-gel, thermolysis - hydrothermal, solvothermal -properties and applications of nano materials in medical and electronic devices.			
Unit - IV	**ENERGY RESOURCES AND STORAGE DEVICES**	Periods	9
Nonrenewable energy - nuclear energy, nuclear reaction and its types; Nuclear power plant and its working (light water nuclear power plant & breeder reactor).Renewable energy and its sources - solar Energy - photo voltaic cells-working of photovoltaic cell, recent advances in solar cell materials; wind energy - types of wind power plants (WPPs), components and working of WPPs. Batteries and fuel cells: types of batteries -alkaline battery, lead storage battery, 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 corrosion, mechanism, pilling -bedworth rule, types of electrochemical corrosion – galvanic corrosion, pitting corrosion, crevice corrosion, corrosion on wire fence and pipeline corrosion, factors influencing rate of corrosion. Corrosion control methods sacrificial anode and impressed cathodic current. Protective coatings – paints: constituents and functions, metallic coatings - steps involved in cleaning the surface for electroplating, electroplating (Au), and electro less plating (Ni)..			
		Total Periods	**45**

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Text Books	
1.	Dr.S.Mageswari, Dr.K.Balachandran, M.S.Viswaksenan, Engineering Chemistry : First Edition, RK publication, Edition-2022.
2.	O.G.Palanna, "Engineering Chemistry "Tata Mc GrawHill PVT,Ltd. Second Edition -2017
References	
1.	P. C. Jain and Monica Jain, "Engineering Chemistry", 17th Edition, DhanpatRai Publishing company (P) Ltd, New Delhi, 2018.
2.	Arun Bahl, B.S. Bahl, G.D. Tuli, "Essentials of Physical Chemistry" Published by S. Chand & Company Ltd, 2014
3.	Sashi Chawla, Dhanpat Rai & Co (pvt.)Ltd."Engineering Chemistry" Edition- 5- 2013.
4.	Dr.S.Vairam ,Dr.Suba Ramesh, "Engineering Chemistry" First Edition, Wiley publication,Reprint-2016
E-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

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Programme	**B.E.**	Programme Code			**107**	Regulation	**2023**	
Department	**Computer Science & Technology**					Semester	**II**	
Course Code	**Course Name**	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23EE201	**Basic Electrical and Engineering**	3	0	0	3	40	60	100

Course Objective

The students should made to

- Introduce the basics of electric circuits and analysis
- Impart knowledge in the basics of working principles and application of electrical machines
- Learn the electrical wiring methods
- Analyze the characteristics of Semiconductor devices
- Educate on the fundamental concepts of digital electronics and introduce the functional elements and working of measuring instruments

Course Outcome	At the end of the course, the student should be able to,	Knowledge Level
	CO1: Understand the basics of electric circuits and type of the connection	K2
	CO2: Understand the basics of electromagnetic laws and basic working principle of DC and AC machines.	K2
	CO3: Understand the concepts of tariff, energy saving, illumination, electriclamps and safety measures.	K2
	CO4: Understand the basic operating characteristics of semiconductor devices	K2
	CO5: Understand the fundamentals of digital logics and measuring instruments	K2

Pre-requisites Basic concepts and understanding of magnetic fields

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	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	PSO 3
CO 1	3	2	1					1				3	3		
CO 2	3	2	1					1				3	3		
CO 3	3	1	1					1				3	3		
CO 4	3	2	1					1				3	3		
CO 5	3	2	1					1				3	3		

Course Assessment Methods Direct

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

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Content of the syllabus			
Unit – I	**INTRODUCTION OF ELECTRICAL CIRCUITS**	Periods	9
Definition of Voltage, Current, Power, Energy, Power factor, Circuit parameters, Ohm's law, Kirchhoff's law Introduction to AC Circuits and Parameters: Waveforms, Average value, RMS Value, Real power, Reactive power and Apparent power, Power factor. Introduction to three phase systems - types of connections Concept of DC circuits.			
Unit – II	**ELECTRICAL MACHINES AND ITS APPLICATIONS**	Periods	9
Faraday's laws of electromagnetic induction - Lens law - Fleming's left hand rule and Right hand rule. Working principle and construction of AC and DC machines - Construction, Working principle and Applications of single phase Transformer. Motor used for domestic applications.			
Unit – III	**WIRING AND ILLUMINATION**	Periods	9
Types of wiring-staircase and corridor wiring - wiring accessories. Different types of safety measures - Earthing. Electrical tariff -Energy conservation. Simple layout of power system-various energy resources, The Laws of Illumination- Different types of electrical lamps.			
Unit – IV	**SEMICONDUCTOR DEVICES**	Periods	9
PN junction diodes - Zener diodes - characteristics. Transistors: PNP and NPN transistors - Theory of operation - Transistor configurations -characteristics - comparison. Special semiconductor devices: FET - SCR - LED – V-I characteristics – Rectifier and Inverters -UPS – SMPS.			
Unit – V	**DIGITAL FUNDAMENTALS AND MEASUREMENTS**	Periods	9
Number systems - Boolean Theorems – DeMorgan's Theorem - Logic gates -Implementation of Boolean Expression using Gates - SOP and POS forms- Functional elements of an instrument, Standards and calibration, Operating Principle of Ammeters and Voltmeters.			
		Total Periods	45

Text Books	
1.	S.K.Bhattacharya, "Basic Electrical and Electronics Engineering",Pearson,2017
2	D.P. Kotharti and I.J Nagarath, "Basic Electrical and Electronics Engineering", Mc Graw Hill, Third Edition, 2020.
References	
1.	Lal Seksena and Kaustuv Dasgupta, "Fundaments of Electrical Engineering", Cambridge, 2016
2.	Mittle,Mittal, Basic Electrical Engineering, 2nd Edition, Tata McGraw-Hill Edition, 2016.
3.	T.K. Nagsarkar and M.S. Sukhija, "Basic Electrical Engineering", Oxford, 2017.
4.	John Bird, "Electrical and Electronic Principles and Technology", Fourth Edition, Elsevier, 2010.
5.	K MurugeshKumar, "Elements of Electrical Engineering", Vikas Publishing House Pvt. Ltd.2011.
E-Resources	
1.	https://nptel.ac.in/courses
2.	https://www.electrical4u.com/electrical-engineering-articles/illumination-engineering/
3.	https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-002-circuits-and-electronics-spring-2007/lecture-notes
4.	https://www.google.co.in/books/edition/_/4nJROSC7iK8C?hl=en&gbpv=1

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Programme	B.E	Programme code		107	Regulation		2023	
Department	COMPUTER SCIENCE AND TECHNOLOGY				Semester		II	
Course code	Course name	Periods per week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23TA202	தமிழரும் தொழில் நுட்பமும்/ TAMILS AND TECHNOLOGY	1	0	0	1	40	60	100
	Content of the syllabus							
அலகு 1	நெசவு மற்றும் பானைத்தொழில்நுட்பம்				Periods		3	
சங்ககாலத்தில் நெசவுத்தொழில்– பானைத்தொழில்நுட்பம் – கருப்புசிவப்பு பாண்டங்கள் – பாண்டங்களில் கீறல் குறியீடுகள்.								
அலகு 2	வடிவமைப்பு மற்றும் கட்டிடத்தொழில்நுட்பம்				Periods		3	
சங்ககாலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு சங்ககாலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் – சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் மாமல்லபுரச்சிற்பங்களும் கோவில்களும் – சோழர்காலத்துப் பெருங்கோயில்கள் மற்றும் பிறவழிபாட்டுத்தலங்கள் – நாயக்கர்காலக்கோயில்கள்-மாதிரிகட்டமைப்புகள் பற்றி அறிதல் மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் – செட்டிநாட்டு வீடுகள் – பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ-சாரோசெனிக்கட்டிடக்கலை.								
அலகு 3	உற்பத்தித் தொழில்நுட்பம்				Periods		3	
கப்பல் கட்டும் கலை – உலோகவியல் – இரும்புத்தொழிற்சாலை – இரும்பை உருக்குதல் எஃகு – வரலாற்றுச்சான்றுகளாக - செம்பு மற்றும் தங்கநாணயங்கள் – நாணயங்கள் அச்சடித்தல் – மணி உருவாக்கும் தொழிற்சாலைகள் – கல்மணிகள், கண்ணாடிமணிகள் – சுடுமண்மணிகள் – சங்குமணிகள் – எலும்புத்துண்டுகள் – தொல்லியல்சான்றுகள் – சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.								
அலகு 4	வேளாண்மை மற்றும் நீர்ப்பாசனத்தொழில்நுட்பம்				Periods		3	

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அணை, ஏரி, குளங்கள் ,மதகு – சோழர்காலக்குமுழித்தூம் பின் முக்கியத்துவம் – கால்நடைபராமரிப்பு – கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் – வேளாண்மை மற்றும் வேளாண்மைச்சார்ந்த செயல்பாடுகள் – கடல்சார்அறிவு – மீன்வளம் – முத்துமற்றும்முத்துக்குளித்தல் – பெருங்கடல் குறித்த பண்டைய அறிவு – அறிவுசார்சமூகம்.			
அலகு 5	அறிவியல் தமிழ் மற்றும் கணினித்தமிழ்	Periods	3
அறிவியல் தமிழின் வளர்ச்சி – கணினித்தமிழ் வளர்ச்சி – தமிழ்நூல்களை மின்பதிப்பு செய்தல் – தமிழ் மின் பொருட்கள் உருவாக்கம் – தமிழ் இணையக்கல்விக்கழகம் – தமிழ் மின்நூலகம் – இணையத்தில் தமிழ் அகராதிகள் – சொற்க்குவைத்திட்டம்.			
		Total Periods	15

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Programme	B.E	Programme code	107	Regulation	2023
Department	COMPUTER SCIENCE AND TECHNOLOGY			Semester	II

Course code	Course name	Periods per week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23TA202	TAMILS AND TECHNOLOGY	1	0	0	1	40	60	100

Content of the syllabus

UNIT I	WEAVING AND CERAMIC TECHNOLOGY	Periods	3

Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) –Graffiti on Potteries

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	MANUFACTURING TECHNOLOGY	Periods	3

Art of Ship Building - Metallurgical studies - Iron industry - Iron smelting,steel - Copper and gold- Coins as source of history - Minting of Coins – Beads making - industries Stone beads - Glass beads - Terracotta beads -Shell beads/ bone beats - Archeological evidences - Gem stone types described in Silappathikaram.

UNIT IV	AGRICULTURE AND IRRIGATION TECHNOLOGY	Periods	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 TAMIL & TAMIL COMPUTING	Periods	3

Development of Scientific Tamil - Tamil computing – Digitalization of Tamil Books – Development of Tamil Software – Tamil Virtual Academy – Tamil Digital Library – Online Tamil Dictionaries – Sorkuvai Project.

		Total Periods	15

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TEXT-CUM-REFERENCE BOOKS

1	தமிழகவரலாறும் – மக்களும்பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு: 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.

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	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205							
Programme	B.E. / BT.ech.	Programme Code			Regulation	2023		
Department	CSE, IT & CST				Semester	II		
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CS204	**Object Oriented Programming**	3	0	2	4	50	50	100

Course Objective	The main objective of the course is to, • Provide the concepts of object oriented programming with a comprehensive introduction to C++. • Learn Java programming and its basic packages including GUI programming.	
Course Outcome	At the end of the course, the student should be able to,	Knowledge Level
	CO1: Apply the concepts of classes and objects to solve simple problems using C++	K3
	CO2: Develop simple applications using basic Java constructs	K3
	CO3: Build applications making use of packages, interfaces and exception handling in Java	K3
	CO4: Make use of multithreading and I/O streams	K3
	CO5: Develop simple event based GUI applications in Java using AWT classes and controls	K3
Pre-requisites	Nil	

CO / PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 – Weak

Cos	Programme Outcomes (POs)												CO/PSO Mapping 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	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. Assignments / Quiz/Model lab
3. End-Semester examinations

Indirect

1. Course - End survey

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Content of the syllabus			
Unit – I	INTRODUCTION TO OOP AND C++	Periods	9
Object Oriented Programming - Features – Merits & Demerits- Applications – Difference –Structure of C++ - Input and Output statements- Classes and Objects– Constructors – Destructors			
Unit - II	INTRODUCTION TO JAVA	Periods	9
Structure of Java - Data Types - Variables – control statements - Arrays –Classes – Fundamentals – Declaring Objects - Assigning Object Reference Variables - Methods –Constructors - this keyword - Overloading Methods - Access Control – Static – Inheritance – Basics – Super keyword			
Unit – III	PACKAGES, INTERFACES AND EXCEPTION HANDLING	Periods	9
Abstract Classes - final with Inheritance. Packages - Access Protection - Importing Packages – Interfaces - Exception Handling basics – Multiple catch Clauses- Nested Try Statements – Java's Built-in Exceptions – User defined Exception			
Unit - IV	MULTITHREADING AND I/O	Periods	9
Java Thread Model - Creating a Thread –Creating Multiple Threads – Synchronization – Enumerations –Type Wrappers - Auto Boxing. I/O Basics - Reading and Writing Console I/O – Reading and Writing Files.			
Unit – V	STRINGS AND EVENT HANDLING	Periods	9
String Class – operations – String Buffer Class. Event Handling – Mechanisms – Event Classes – Action Event - Action Listener. AWT Classes - Window Fundamentals - Frame Windows – AWT Controls - Layout Managers.			
		Total Periods	45

Suggested List of Experiments	CO's
1. Develop a simple C++ application using operator overloading and function overloading	CO1
2. Develop simple Java programs using control statements and arrays	CO2
3. Demonstrate polymorphism using Java programs	CO3
4. Develop Java applications using interfaces and packages	CO3
5. Demonstrate exception handling in Java	CO3
6. Develop multithreaded applications in Java	CO4
7. Develop programs in Java using java.io packages	CO4
8. Demonstrate string manipulation in Java	CO5
9. Develop applications in Java using collections classes	CO5
10. Design a GUI based simple application using AWT classes	CO5
Lecture 45: Practical 30; Total: 75	

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Text Books		
1.	Reema Thareja, "Object Oriented Programming with C++", Third Edition, Oxford University Press, NewDelhi,2018 (UNIT 1)	
2.	Herbert Schildt, "Java: The Complete Reference", 12th Edition, McGraw Hill Education, New Delhi, 2022.(UNIT 2 to 5)	
References		
1.	Buyya Rajkumar, ThamaraiSelvi S. and Xingchen Chu, "Object Oriented Programming with Java Essentials andApplications", 1st Edition, McGraw Hill, New Delhi, 2009.	
2.	Cay S. Horstmann, "Core Java: Volume I Fundamentals", 11th Edition, Addison Wesley, New Delhi, 2019.	
3.	Deitel Paul and Deitel Harvey, "Java How to Program", 11th Edition, Pearson Education, New Delhi, 2018.	
Tools Required		
1.	Codetandra / HackerRank / HackerEarth / Any online Problem Solving Platforms	
Resources		
1.	www.nptel.ac.in	
2.	https://www.javatpoint.com/cpp-oops-concepts	
3.	https://www.javatpoint.com/java-tutorial	

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Programme	B.E.	Programme Code	107	Regulation	2023
Department	COMPUTER SCIENCE AND TECHNOLOGY			Semester	II

Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23EN202	**Professional Communication**	2	0	3	3	50	50	100

Course Objective

The main objective of this course is to:

- Provide suitable reading &writing tasks to develop communicative ability for academic and professional progress
- Inculcate channelized reading to make learners proficient in the chosen professional writing contexts.
- Improve learners' vocabulary and grammar to supplement their language use at professional contexts
- Assist students in the development of intellectual flexibility, creativity, and cultural literacy so that they may engage in life-long learning.
- Identify and begin to apply the language features of academic and professional writing and speaking

Course Outcome	At the end of the course, the student should be able to.	Knowledge Level
	CO1: Acquire sufficient command over language to speak at an academic or professional context	K1
	CO2: Write technically well at professional contexts through exposing them to similar readings.	K1
	CO3: Use language at length at technical and professional situations through enrichment of vocabulary and strengthening of grammatical knowledge.	K2
	CO4: Ethically gather, understand, evaluate and synthesize information from a variety of written and electronic sources.	K2
	CO5: Be proficient in oral communication and writing.	K3
Pre-requisites	-	

CO / PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak

Cos	Programme Outcomes (POs)												CO/PSO Mapping 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	PSO 1	PSO 2
CO 1						2			3	3		3		
CO 2						2			3	3		3		
CO 3						2			3	3		3		
CO 4						2			3	3		3		
CO 5						2			3	3		3		

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Course Assessment Methods
Direct
1. Continuous Assessment Test I & II 2. Continuous Assessment Test III in the Communication Skills Lab 3. Assignments 4. End-Semester examinations
Indirect
1. Course - end survey

Content of the syllabus			
Unit – I		Periods	15
Listening- Listening for Cultural Awareness, Listening to Professional Conversations, Talks, Interviews and Lectures **Speaking**- Developing Confidence to get rid of Fear on the Dias, Discussion at a Corporate Context. **Reading**– Inferential Reading, Reading Short Messages and Technical Articles, **Writing**- Introduction to Letter Writing, Writing Formal and Informal Letters, Thanking Letters, Letters Calling for Quotations, Letters Placing an Order, Seeking clarification, Letters of Complaint. **Focus on Language**–Adjectives and Degrees of Comparisons			
Unit – II		Periods	15
Listening- Listening to specific information relating to technical content, Listening for statistical information **Speaking**- Expressing opinions, Formal Discussions, Describing Role Play at Business Context and Consolidating Ideas. **Reading**–Reading Technical Articles in Journals and Comparing Articles. **Writing**- Letter seeking permission to undergo practical training and to undertake project work. **Focus on Language**– Simple, compound and complex sentences and Transformation of Sentences.			
Unit – III		Periods	15
Listening- Listening to understand the overall meaning, Listening to Interviews and Presentations. **Speaking**- Giving Instructions and Showing Directions and Rephrasing Instructions. **Reading** Skimming and Scanning, Reading Job Advertisements. **Writing**- Applying for a Job, Writing a CV. **Group Discussion:** Introduction – Topic Analysis – Thematic Expressions-Objective and content of discussion.			
Unit – IV		Periods	15
Listening- Listening and retrieving Information. **Speaking**- Developing fluency and Coherence, Accent Neutralization, Voice Modulation, and Intonation, Improving Voice Quality. **Reading**–Reading and understanding Advertisements. **Writing**- Letters to the Editor, Letter of Complaint, Various kinds of Reports, Permission to go for Industrial visits. **Presentation skills:** Making Self Introduction Effectively-Elements of effective presentation – Structure of presentation - Presentation tools – Voice Modulation – Audience analysis - Body language – Accents analysis – Stylistics.			
Unit – V		Periods	15
Listening- Listening to Fragmented Texts and Filling in the Blanks. **Speaking**-Mind Mapping, Developing Coherence and Self-Expression, Making presentations, Paralinguistic and Extra linguistic Features (body language), **Reading**– Predicting content, Interpreting Reports. **Writing**- Writing Proposals, Agenda, Minutes of the Meeting. **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.			
		Total Periods	75

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Text Books	
1.	Dr. S. R. Kannan, Sumant. S, Pereira Joyce, Professional Communication, Vijay Nicole Imprints Pvt. Ltd., 2023.
2.	Sokkaalingam, S.RM., The Art Of Speaking, English Versatile Publishing House, 2019.
References	
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 Blackswan Pvt, Ltd, 2009.
5.	Technical English – I & II, Sonaversity, Sona College of Technology, Salem, First Edition, 2012.
E-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

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Programme	B.E	Programme Code	107	Regulation	2023
Department	Computer Science and Technology			Semester	II

Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CH202	CHEMISTRY LABORATORY	0	0	2	1	60	40	100

Objective

The main objective of this course is to:

- Gather basic simple acid-base reactions and study the mechanism of acid mixture with base.
- Learn pH and potential of hydrogen in a sample solution.
- Study the redox reaction through potential difference.
- Infer iron forms complex with thiocyanate.
- Gather knowledge on hardness producing salts and removal of hardness through estimation.
- Collect data required for dissolved oxygen present in water sample.
- Understand alkalinity and available chlorine present in water sample.

Course Outcomes

The students who complete this course successfully are expected to:	Knowledge Level
CO1: Infer knowledge on neutralization reaction between acid, acid mixture with base and identify the concentrations.	K3
CO2: Identify the concentration of sample using pH.	K3
CO3: Spot the concentration of sample solution through redox reaction by potentiometric method	K4
CO4: Estimate Iron by complexation reaction spectrometrically.	K4
CO5: Determine hardness and dissolved oxygen present in domestic water supply and Identify alkalinity and available chlorine present in the given sample.	K4

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	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	1	1						2	2
CO 2	3	3		2	2	2	2						2	1
CO 3	3	3		2	2	1							1	2
CO 4	3	3	1	2	2	1							2	2
CO 5	2	3	1	2		2	3						2	2

Pre-requisites	Nil

Direct

1. Pre lab and Post lab
2. Execution of Experiment and Viva-voce
3. End semester examination

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Indirect	
Course - end survey	

Content of the syllabus		
S.No	**Name of the Experiment**	**Course Outcome**
1.	Estimation of HCl using NaOH by Conductometric titration	CO1
2.	Estimation of Mixture of acid [standard HCl+ unknown CH_3COOH] using NaOH by Conductometric titration.	CO1
3.	Estimation of Barium Chloride using sodium sulphate by Conductometric precipitation titration	CO1
4.	Determination of HCl using NaOH by pH metry	CO2
5.	Estimation of Ferrous iron by Potentiometric titration	CO3
6.	Estimation of Ferric ion by Spectrophotometry	CO4
7.	Determination of Total, Temporary and Permanent hardness of water by EDTA method.	CO5
8.	Estimation of Dissolved Oxygen content in water by Winkler's method	CO5
9.	Estimation of Alkalinity in water sample.	CO5
10.	Estimation of available Chlorine in bleaching powder.	CO5
	Total Periods	30

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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Programme	B.E	Programme Code	107	Regulation		2023	
Department	**Computer Science and Technology**			Semester		II	
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks	
		L	T	P	C	CA	ESE	Total
U23GE204	**Engineering Practices Laboratory**	0	0	3	1	60	40	100

Course Objective

The main objective of this course is to:
The students should made to

- Know the plumbing line assemblies.
- Weld lap joint, butt joint and T-joint.
- Learn the assembling and dismantling methodology of home appliances.
- Learn the resistor value identification through colors coated on resistor.
- Learn the basics of signal generation in CRO.
- Learn the soldering techniques in PCB board for designing the projects.

Course Outcomes

At the end of the course, the student should be able to,	Knowledge Level
CO1: Perform basic machining operations and finish the job to the requirements and quantify the accuracy.	K2
CO2: Make various joints such as cross lap joint and Tee lap joint in the carpentry.	K2
CO3: Understand the basics of house wiring techniques and the measurements of basic electrical quantities.	K2
CO4: Understand the resistor value identification through colors coated on resistor.	K2
CO5: Understand the soldering techniques in PCB board for designing the projects.	K2

Pre -requisites Nil

CO / PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak

COs	Programme Outcomes (POs)												**CO/PSO Mapping** 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**	**PSO 1**	**PSO 2**
CO 1	3	2	3	2	2	-	-	-	2	-	-	-	2	2
CO 2	3	2	3	2	2	-	-	-	2	-	-	-	3	2
CO 3	3	2	2	3	2	2	-	-	2	-	-	-	2	-
CO 4	3	2	2	3	2	2	-	-	2	-	-	-	2	-
CO 5	3	2	3	3	2	2	-	-	2	-	-	-	3	3

Course Assessment Methods

Direct

1.Pre lab and Post lab
2.Record mark
3.End- Semester Examinations

Indirect

1.Course –End survey

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Content of the Syllabus	
GROUP A (CIVIL & MECHANICAL ENGINEERING)	
CIVIL ENGINEERING PRACTICE:	COs
1.Plumbing: a) Single Tap G.I / PVC pipe connection involving the fitting like valves, taps & bends. b) Two Tap G.I / PVC pipe connection involving the fitting like valves, taps & bends.	CO2
2.Carpentry: a) To make a Cross Lap Joint from the given work piece. b) Preparation of ' T' Lap Joint from the given work piece.	CO2
MECHANICAL ENGINEERING PRACTICE:	
3.Welding: a) To join the metal plates by a Butt Joint in arc welding machine. b) To join the metal plates by a Lap Joint in arc welding machine.	CO1
4.Basic Machining: a) To perform simple facing & turning operation. b) To perform of step turning operation.	CO1
5.Sheet Metal: a) To make a rectangular tray from the given sheet metal. b) To make a basket from the given sheet metal.	CO1
STUDY EXPERIMENT: 6. Study of 3D Printing machine and its applications. 7. Study of CO2 Laser engraving & cutting machine and its applications. 8. Study of Wood routing machine and its applications.	CO1
GROUP B (ELECTRICAL & ELECTRONICS ENGINEERING)	
ELECTRICAL ENGINEERING PRACTICE	
1. Residential house wiring and stair case wiring using switches, fuse, indicator & lamp.	CO3
2. LED lamp assembly.	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
ELECTRONICS ENGINEERING PRACTICE	
1. Study of Electronic components and equipment's – Resistor color-coding, Inductor, Capacitor and CRO.	CO4
2. Logic gates AND, OR, NOR, NAND and NOT.	CO4
3. Generation of Clock Signal.	CO4
4. Soldering practice – Components Devices and Circuits – Using general purpose PCB.	CO5
Total Periods	**45**

Reference Book :

1. Dr.P.Kannan, Mr.T.Satheeskumar & Mr.K.Rajasekar, "Engineering Practices Laboratory" Manual. First Edition, 2017.
2. Mr.T.Jeyapoovan, Mr.M.Saravana Pandian, "Engineering Practices Lab" Manual, Vikas Publishing House Pvt Ltd, 2017.

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Programme	B.E	Programme Code			107	Regulation	2023	
Department	COMPUTER SCIENCE AND TECHNOLOGY					Semester	II	
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23MCFY2	Indian Constitution	2	0	0	0	100	NA	100

Course Objective	The main objective of this course is to: • To know about the basic structure of Indian constitution. • To know about our Central Government Executive system of India • To know about our State Government Executive system of India • To learn the Election system, Amendments and Emergency Provisions given by the constitution. • To know about the Special Constitutional Provisions in India	
Course Outcome	At the end of the course, the student should be able to,	Knowledge level
	• Understand the functions of the Indian government	K1
	• Know about our Central Government, political structure & codes, procedures	K1
	• Understand our State Executive & Elections system of India.	K1
	• Remember the Election system, Amendments and Emergency Provisions given by the constitution.	K2
	• Understand our Special Constitutional Provisions in India	K2
Pre-requisites	---	

Course Assessment Methods

Direct
1. Continuous Assessment Test I, II & III 2. Assignment
Indirect
Course - end survey

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Content of the syllabus			
Unit – I	INTRODUCTION	Periods	6
Historical Background – Constituent Assembly of India – Fundamental Rights – Citizenship – Constitutional Remedies for citizens			
Unit - II	STRUCTURE AND FUNCTION OF CENTRAL	Periods	6
Union Government – Structures of the Union Government and Functions – President – Vice President – Prime Minister – Cabinet – Parliament – Supreme Court of India			
Unit – III	STRUCTURE AND FUCTION OF STATE	Periods	6
State Government – Structure and Functions – Governor – Chief Minister – Cabinet – State Legislature – Judicial System in States – High Courts and other Subordinate Courts			
Unit - IV	ELECTION PROVISIONS, EMERGENCY PROVISIONS, AMENDMENT OF THE CONSTITUTION	Periods	6
Election Commission of India-composition, powers and functions and electoral process. Types of emergency-grounds, procedure, duration and effects. Amendment of the constitution- meaning, procedure and limitations.			
Unit – V	SPECIAL CONSTITUTIONAL PROVISIONS	Periods	6
Directive Principles of State Policy: Importance and its relevance. Special Constitutional Provisions for Schedule Castes, Schedule Tribes & Other Backward Classes, Women & Children.			
		Total Periods	30

Text Books	
1.	Durga Das Basu, "Introduction to the Constitution of India ", Prentice Hall of India, New Delhi.
2.	The Constitution of India (Coat Pocket Edition) by Gopal Sankaranarayanan - 17th Edition, (2024)
References	
1.	R.C.Agarwal, (1997) "Indian Political System", S.Chand and Company, New Delhi.
2.	M.Laksmikanth, Indian polity, Tata mchraw hill publications.
E-Resources	
1.	https://mhrd.gov.in/
2.	https://niti.gov.in/content/niti-aayog-library
3.	www.drishtiias.com/

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VIVEKANANDHA
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Elayampalayam, Tiruchengode – 637 205

Programme	B.E	Programme Code	107	Regulation	2023
Department	COMPUTER SCIENCE TECHNOLOGY			Semester	III

Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23MA304	DISCRETE MATHEMATICS	3	1	0	4	40	60	100

Course Objective

. The Main Objective of the course is to

- Introduce basic tools and techniques in Discrete Mathematical Structure.
- Provide information about the concepts needed to test the logic of a program and Theory of inference.
- Recognize the connection between set, operations and logic.
- Identify the domain and range of a relation.
- Recognize the concepts of groups.

Course Outcome

At the end of the course, the student should be able to,	Knowledge level
CO1: Demonstrate the mathematical reasoning and logics	K2
CO2: Reformulate statements from common language to formal language	K5
CO3: Posses knowledge in relations and lattices.	K3
CO4: Solve recurrence relations by applying appropriate function.	K5
CO5: Understand the concepts various algebraic Structures.	K3

Pre-requisites -

CO / PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2 -- Medium, 1 - Weak

COs	Programme Outcomes (POs)												CO/PSO Mapping 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	PSO 1	PSO 2	PSO 3
CO 1	3	2	1	1									2	1	
CO 2	3	2		1	1								2	1	
CO 3	3	2	1	1									2	1	
CO 4	3	2	1		1								2	1	
CO 5	3	2	1	1	1								2	1	

Course Assessment Methods

Direct

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

Indirect

1. Course - end survey

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content of the syllabus			
Unit – I	**PROPOSITIONAL CALCULUS**	Periods	9+3
Propositions – Logical connectives – Compound propositions – Conditional and biconditional propositions – Truth tables – Tautologies and contradictions – Contrapositive – Logical equivalences and implications – DeMorgan's Laws – Normal forms – Principal conjunctive normal form and Principal disjunctive normal form – Rules of inference – Arguments – Validity of arguments.			
Unit - II	**PREDICATE CALCULUS**	Periods	9+3
Predicates – Statement function – Variables – Free and bound variables – Quantifiers – Universe of discourse – Logical equivalences and implications for quantified statements – Theory of inference – Rules of universal specification and generalization – Validity of arguments.			
Unit – III	**SET THEORY**	Periods	9+3
Set Theory: Cartesian product of sets – Relations on sets – Types of relations and their properties – Matrix representation of a relation - Graph of a relation – Equivalence relations – Partial ordering – Poset – Hasse diagram – Lattices – Properties of lattices.			
Unit - IV	FUNCTIONS	Periods	9+3
Definition – Classification of functions – Composition of functions – Inverse functions – Characteristic function of a set – Recurrence relations – Solution of recurrence relations – Generating Functions – Solving recurrence relation by generating functions.			
Unit – V	GROUP THEORY	Periods	9+3
Algebraic systems – Definitions – Examples – Properties – Semi groups – Monoids – Sub semi groups and Sub monoids - Groups and Subgroups – Homomorphism – Cosets Lagrange's theorem – Normal subgroups – Normal algebraic system with two binary operations.			
		Total Periods	45+15=60

Text Books	
1.	Tremblay J P and Manohar R., Discrete Mathematical Structures with Applications to Computer Science, TMH, New Delhi – 2004.
2.	Rosen K H, "Discrete Mathematics and its Applications", Sixth Edition, Tata McGraw-Hill Pub.co. Ltd., Delhi, 2006.
References	
1.	Kenneth H. Rosen, "Discrete Mathematics and its Applications", 7th Edition, Tata McGraw Hill Publishing Company, 2012
2.	Singh S.B., Jai Kishore and Ekata, "Discrete Structures", 3rd Edition, Khanna Book Publishing, Delhi, 2017
3.	Seymour Lipschutz, Marclars Lipson, "Discrete Mathematics", Tata McGraw Hill.,New Delhi.
4.	Bernard Kolman, Robert Busby, Sharon C.Ross," Discrete Mathematical Structures", Pearson Education, Delhi, 6th Edition, 2015.
5.	D.S.Malik, "Discrete Mathematical Structures Theory and Applications", Thomson Publishers, 2004.
E-Resources	
1.	https://en.wikipedia.org › wiki › Discrete_mathematics
2.	www.learnerstv.com/Free-engineering-Video-lectures
3.	www.nptel.ac.in

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	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205							
Programme	B.E.	Programme Code		107	Regulation		2023	
Department	Computer Science and Technology				Semester		III	
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CT301	Python Essentials	3	0	0	3	40	60	100

Course Objective

The Main objective of this course is to:

- Know about the basics of Python programming
- Understanding the data structures of python programming
- Knowing Functions, Strings and Files in python programming
- Applying python libraries for machine learning
- Learn basic libraries for data visualization

Course Outcome	At the end of the course, the student should be able to,	Knowledge level
	CO1: Read, write, execute by hand simple Python programs and Structure simple Python programs for solving problems	K1
	CO2: Represent compound data using Python lists, tuples, dictionaries	K2
	CO3: Implement function prototypes string functions and manipulate file processing	K2
	CO4: Identify and process different python libraries for machine learning applications	K3
	CO5: Apply different basic libraries used for data visualization	K3
Pre-requisites	-	

CO /PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2–Medium, 1–Weak

COs	Programme Outcomes (POs)												CO/PSO Mapping 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	PSO2
CO 1	3	3	2	1	3	1			3	1	3	3	3	3
CO 2	3	3	2	1	3	1			3	1	3	3	3	3
CO 3	3	3	2	1	3	1			3	1	3	3	3	3
CO 4	3	3	2	1	3	1			3	1	3	3	3	3
CO 5	3	3	2	1	3	1			3	1	3	3	3	3

Course Assessment Methods

Direct

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

Indirect

1. Course - end survey

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Content of the syllabus			
Unit – I	**INTRODUCTION TO PYTHON PROGRAMMING**	Periods	9
Introduction to Python – features of python -Downloading and installing python- writing and executing Python program - native data types – comments – variables – operators – expression - conditional statements – control statements – continue – pass – break-Mutable vs immutable datatypes			
Unit - II	**PYTHON DATA STRUCTURES**	Periods	9
Lists: list operations - list slices - list methods and functions – aliasing – Dictionaries: operations ,functions and methods -Tuples: tuple assignment - tuple as return value - Sets: methods and operators			
Unit – III	**FUNCTIONS , STRINGS AND FILES**	Periods	9
Strings: String Indexing-Traversing a string-string slices-string functions and methods – Functions-Basics of functions-Function definition - declaration, arguments, parameters – formal and local, parameter passing methods - function prototypes - recursion; Files Basics of file operations-Text files, reading and writing files			
Unit - IV	**PYTHON LIBRARIES FOR MACHINE LEARNING**	Periods	9
Dataset- Load dataset - Read the dataset - display dataset - Basic Libraries – Numpy- N dimensional array in Numpy-Numpy methods and properties-Scipy –Constants in Numpy- pandas –Basics of pandas-Working on files in various formats			
Unit – V	**PYTHON LIBRARIES FOR DATA VISUALIZATION**	Periods	9
Data visualization – Basics of confusion matrix - Basic Libraries – Matplotlib- Key Features of Matplotlib-Matplotlib Figure- Basic Components or Parts of Matplotlib Figure- Different Types of Plots in Matplotlib-Exploring Different Plot Styles with Matplotlib- Introduction to Seaborn- Different categories of plot in Seaborn-Installation of Seaborn Library- Dependencies for Seaborn Library- Some basic plots using seaborn			
		Total Periods	45

Text Books:	
1.	Anurag Gupta, G.P BISWAS ," Python Programming – Problem solving, packages and Libraries, Edition 1, Tata McGraw Hill, 2018
2.	Reema Thareja, "Python Programming using Problem Solving Approach", OXFORD University Press, 2017
REFERENCE BOOKS	
1.	E Balagurusamy, "Problem Solving and Python Programming", Edition1 ,Tata McGraw Hill, 2018
2.	Allen B. Downey, "Think Python: How to Think Like a Computer Scientist,,,,, 2nd edition, Updated for Python 3, Shroff /O,,Reilly Publishers, 2016
3.	John V. Guttag,, Introduction to Computation and Programming using Python1, Prentice Hall of India,2014.
E-Resources	
1.	http://greenteapress.com/wp/think- python/
2.	http://greenteapress.com/wp/think- python/
3.	https://beginnersbook.com/2018/03/python-tutorial-learn-programming/
4.	https://www.tutorialspoint.com/python/index.html
5.	www.udemy.com/PythonVideos/Online-Course

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Department	Computer Science and Technology				Semester	III		
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23IT302	Data Structures	3	0	2	4	50	50	100

Course Objective	The main objective of this course is to: • Understand the significance of Data structures and List ADTs. • Learn the concepts and applications of Stacks, Queues • Understand the Tree ADT and types of balancing the tree • Learn the fundamentals of Graph ADT, various Traversal algorithms, Types and finding the Minimum Spanning Tree • Learn the different types of Sorting and Searching Techniques and Hashing	
Course Outcome	At the end of the course, the student should be able to,	Knowledge level
	CO1: Implement List ADT and its types.	K1
	CO2: Implement Stack ADT, Queue ADT, Priority Queue and Parsing the Arithmetic Expression in C	K2
	CO3: Implement Tree ADT, Binary search tree, AVL and Splay tree in C	K3
	CO4: Develop C Programs to Implement the concept of Topological ordering and Minimum spanning Tree of a Graph ADT	K4
	CO5: Implement various sorting and searching algorithms in C	K4
Pre-requisites	-	

CO / PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2–Medium, 1–Weak

COs	Programme Outcomes (POs)												CO/PSO Mapping 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	PSO2
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 3	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

Course Assessment Method

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

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Content of the syllabus			
Unit – I	**INTRODUCTION**	Periods	9
Abstract Data Types (ADTs) – List ADT – Array-based implementation – Linked list implementation – Singly linked lists – Doubly-linked lists - Circularly linked lists – Applications of lists – Polynomial ADT			
Unit - II	**STACKS, QUEUES AND DEQUES**	Periods	9
Stack ADT – Array based implementation – List based implementation – Balancing Symbols Evaluating arithmetic expressions - Infix to Postfix conversion – Queue ADT – Array based implementation – List based implementation – Circular Queue ADT – Priority Queue- Double Ended Queue.			
Unit – III	**TREES**	Periods	9
Tree ADT –Binary Trees – Binary Search Tree - Tree- Traversal Algorithms -Search Trees — AVL Tree – Splay Tree- Balancing Tree- B+.			
Unit - IV	**GRAPHS**	Periods	9
Graph ADT –Types of Graphs – Graph Traversals – Topological Ordering – Dijkstra's Algorithm – Minimum Spanning Tree – Prims Algorithm – Kruskal's Algorithm.			
Unit – V	**SORTING, SEARCHING AND HASHING**	Periods	9
Types of Sorting - Bubble Sort – Selection Sort – Insertion Sort – Shell Sort – Quick Sort – Radix Sort – Merge Sort- Linear Search Binary Search- Heap Search -. Hashing – Open Addressing – Separate Chaining –Hash Functions.			
		Total Periods	45

Text Books:	
1.	Reema Thareja ," Data structure in c " ,Oxford University Press ,2023.
2.	Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Pearson India ,2002
REFERENCE BOOKS	
1.	Charles E. Leiserson, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein ,"Introduction to Algorithms " , Fourth Edition , MIT Press , 2022
2.	Narasimha Karumanchi - Data structures and algorithms made easy,2016
3.	R. Venkatesan and S. Lovelyn Rose,"Data Structures ",2nd Edition, Wiley Publications , 2019
4.	Robert Sedgewick and Kevin Wayne, "Algorithms".4th Edition, Addison-Wesley, 2011.
5.	Peter Brass, "Advanced Data Structures". 1 Edition, Cambridge,2008.
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-deep-dive-using-java
4.	https://dl.ebooksworld.ir/books/Introduction.to.Algorithms.4th.Leiserson.Stein.Rivest.Cormen.MIT. Press.9780262046305.EBooksWorld.ir.pdf

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Programme	B.E. /B.Tech.	Programme code	107	Regulation	2023
Department	CSE, IT & CST			Semester	III

Course code	Course name	Periods per week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CS305	**Computer Organization and Architecture**	3	0	0	3	40	60	100

Course Objective

The student should be made to,

- Discuss the basic concepts and structure of computers
- Understand concepts of computer processing units and addressing modes
- Know the logic and arithmetic operations
- Explain different types of I/O and memory organization.
- know about the Parallelism concepts in Programming

Course Outcome

At the end of the course, the students will be able to,	KL
CO1: Examine various concepts of basics of computer organization and architecture	K2
CO2: Identify the difference between RISC and CISC architectures	K2
CO3: Demonstrate various arithmetic operations	K3
CO4: Analyze the various performance measures for memory and I/O organization	K3
CO5: Interpret performance of different pipelined processors and multi core architectures.	K3

Pre-requisites -

CO / PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2 = Medium, 1 = Weak

COs	Programme Outcomes (POs)												**CO/PSO Mapping** PSOs	
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12	PSO1	PSO2
CO 1	3	2	2							1		1	3	2
CO 2	2	3	1	2						1			2	2
CO 3	2	2	1	2				2		1			2	2
CO 4	2	2	2							1		2	3	2
CO 5	2	2	1		2			1		1		1	3	2

Course Assessment Methods

Direct

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

Indirect

1. Course - end survey

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Content of the syllabus			
Unit - I	BASIC STRUCTURE OF COMPUTERS	Periods	9
Digital Computers: Definition of Computer Organization - Computer Design and Computer Architecture - Bus and memory transfers. **Basic Computer Organization and Design**: Instruction codes- Computer Registers - Computer instructions -Timing and Control - Instruction cycle - Memory Reference Instructions- Input – Output and Interrupt.			
Unit – II	BASIC PROCESSING UNIT	Periods	9
Central Processing Unit: General Register Organization - Instruction Formats-Addressing modes- Data Transfer and Manipulation - Program Control **Reduced Instruction Set Computer:** CISC Characteristics -RISC Characteristics			
Unit – III	ARITHMETIC FOR COMPUTERS	Periods	9
Signed and Unsigned number representations - **Arithmetic operations**: Addition and Subtraction – Fast Adders – Binary Multiplication – Booth algorithm-Binary Division – Floating Point Numbers – **Representation and operations:** Arithmetic Micro operations- logic micro operations- shift micro operations- Arithmetic logic shift unit.			
Unit – IV	I/O AND MEMORY ORGANIZATION	Periods	9
Input-Output Organization: Input-Output Interface- Asynchronous data transfer- Modes of Transfer- Priority Interrupt - Direct memory Access. **Memory Organization**: Memory Hierarchy -Main Memory - Auxiliary memory - Associate Memory- Cache Memory.			
Unit - V	PIPELINING AND MULTI CORE ARCHITECTURE	Periods	9
Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processor. **Multi core architecture:** Introduction to Multi-core Processors- Multi-core Processor Architecture- Multi-core Processor Machines - Applications of using Multi-core Processors			
		Total Periods	**45**

Text Books	
1.	M. Morris Mano and Rajib Mall, "Computer System Architecture", Pearson Education, Revised third edition, 2017
2.	Carl Hamacher, Zvonko Vranesic and Safwat Zaky, "Computer Organization", Fifth Edition, McGraw Hill Education, 2017.
References	
1.	William Stallings, "Computer Organization and Architecture – Designing for Performance", 10th Edition, Pearson Education, 2022.
2.	John L. Hennessey and David A. Patterson, "Computer Architecture – A Quantitative Approach", Morgan Kaufmann / Elsevier Publishers, 6th Edition, 2017.
3.	John P. Hayes, "Computer Architecture and Organization", Third Edition, McGraw Hill, 2017
4.	V.P. Heuring, H.F. Jordan, "Computer Systems Design and Architecture", Second Edition, Pearson Education, 2003.
5.	Shyamala Devi M, "Multi-Core Architectures and Programming", Vijay Nicole Imprints, 2018.

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E-Resources	
1.	https://www.javatpoint.com/computer-organization-and-architecture-tutorial
2.	https://www.studytonight.com/computer-architecture/memory-organization
3.	http://home.ustc.edu.cn/~louwenqi/reference_books_tools/Computer%20Organization%20and%20Architecture%2010th%20-%20William%20Stallings.pdf
4.	https://medium.com/@adityasinghz/multi-core-processor-architecture-7580bc347042
5.	https://www.mbit.edu.in/wp-content/uploads/2020/05/computer-systems-Architecture.pdf

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Programme	B.E.	Programme code	107	Regulation	2023		
Department	Computer Science and Technology		Semester		III		
Course Code	Course Name	Periods per week			Credit	Maximum Marks	
		L	T	P	C	CA	ESE	Total
U23CTCP1	Verbal, Quantitative Aptitude and Reasoning - I	2	0	0	1	40	60	100

Course Objective

The student should be made to,

- Identify and begin to apply the language features
- Understand the mathematical techniques for solving the real life problems
- Use number theory arguments to justify relationships involving divisors, multiples and factoring
- Help in preparation of competitive exams

Course Outcome

At the end of the course, the student should be able to,	Knowledge Level
CO1: Use language through acquisition of grammar rules	K2
CO2: Demonstrate the use of mathematical reasoning by justifying the patterns and relationships	K2
CO3: Face external competitive exams	K3
CO4: Solve a question in a fraction of minute using shortcut methods	K3
CO5:Enhance their problem solving skills and logical Skills	K4

Pre-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	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
CO 1		2		3	2					3		3	1	1
CO 2	3	3		2	2					3		3	2	1
CO 3	3	3		3	2					3		3	3	1
CO 4	3	3		2	3					2		2	3	2
CO 5		2		2	2					2		2	3	1

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Course Assessment Methods

Direct

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

Indirect

1.Course -end survey

Content of the syllabus

Unit -I	VERBAL ABILITY (ERROR SPOTTING)	Periods	5

CONJUNCTIONS: Error on coordinative conjunction: The seven coordinating conjunctions are (**fan boys**): **for, and, nor, but, or, yet, so, Errors on Subordinate Conjunction** After, although, as soon as, because, before, by the time, in case, now that, since, unless, when, whether or not, while, yet...., **Errors on correlative conjunction** (Either.....or, neither.....nor, not only.... but also, as....as, both....and, whether.... or, so...as, such...that, the)

CONDITIONAL CLAUSES: Errors on Zero condition, Errors on first condition of If clauses, Errors on second condition of If clauses, Errors on third condition of If clauses

ADVERBS: Errors on conjunctive adverb, Errors on adverbs of frequency, Errors on adverbs of time, Errors on adverbs of manner, Errors on adverbs of place, Errors on adverbs of degree

ADJECTIVES: Errors on descriptive adjectives, Errors on demonstration adjectives, Errors on distributive adjectives, Errors on interrogative adjectives, Errors on numeral, Errors on quantitative adjectives, Errors on proper adjectives, Errors on possessive adjectives

DETERMINERS: Definite Article, Indefinite Article, Quantifying Article – few, many, Possessive Article, (my, your, his, her, its, our, your, their….)

NOUNS: Pronoun, Common Noun, Collective Noun, Abstract Noun, Material Noun

SUBJECT – VERB AGREEMENT:

Singular Subjects and Singular Verbs, Errors on plural subjects with plural verbs, Errors on indefinite pronouns, Errors on compound subjects, Errors on collective noun, Errors on singular or plural verb

Unit–II	NUMBER SYSTEMS	Periods	6

NUMBER SYSTEMS (Divisibility Rule, Unit Digit, Remainder Theorem(1 Or -1, Cancellation, Wilson, Fermets), Progressions(Arithmetic, Geometric, Harmonic), Log, Surds And Indices, Simplification)

Unit – III	AVERAGE AND LCM & HCF PROBLEMS	Periods	8

AVERAGE (Basic Model, Partial Average, 3. Overall Average, Inclusion/Exclusion of A Value in a Group, Increased or Included or Added or More and Replaced, Substituted, Cricket Based Model, Misread Model, Allegation and Mixture, Mean, Median and Mode, Miscellaneous)

LCM and HCF (Find The LCM, HCF and Its fractions, Product of Two Numbers Model, LCM, HCF with Remainders Model, Smallest/Largest Based Model, Tolling Together Model, HCF Related Questions (Keyword: Distinct, Divided, Equal Number of Rows (Distributed Equally)), Mensuration Related Questions, No. of Pairs Model, LCM, HCF With Ratios Model, Algebraic Expressions Model, Reduce To Lowest Terms

Unit– IV	RATIO AND PROPORTION	Periods	5

RATIO (Zig Zag Model, Finding The Individual Component, Coins & Values Based Ratios, Number Based Ratios, Increment/Decrement Based Ratios, Miscellaneous)- PROPORTION (Continuous, Third, Fourth, Mean)

Unit-V	LOGICAL REASONING	Periods	6

CODING-DECODING- Types of Coding and Decoding (Letter Coding, Conditional Coding, Crypt arithmetic –Addition, Crypt arithmetic – Subtraction)

BLOOD RELATION (Type 1: Pointing or Introducing, Type 2: Family Tree or Relational Puzzle, Type 3: Coded Relation)

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NUMBER SERIES (Pattern 1: Perfect Square Series, Pattern 2: Perfect Cube Series, Pattern 3: Geometric Series, Pattern 4: Ratio series, Pattern 5: Multi Stage Series) **SYLLOGISM** (Type 1: BASIC SYLLOGISM, Type 2: Either or Neither nor, Type 3: Only – Only a few)	
Total Periods	**30**
Text books	
1.	Rajeev Varma, "Fast Track Objective Arithmetics", Arihant Publications, 2024
2.	R.S. Aggarwal, "Modern Approach to Logical Reasoning", S Chand Publishing, 2022
3.	SP Bakshi, "Objective General English", Arihant Publications, 2024
References	
1.	R.S. Aggarwal, "Quantitative Aptitude for Competitive Examinations", S Chand Publishing, 2013
2.	Dinesh Khattar, "The Pearson guide to Quantitative Aptitude for Competitive Examinations", 3rd edition, 2016
3.	Arun Sharma, "How to Prepare for Logical reasoning for CAT", McGraw Hill Education; 2014
4.	Jaikishan and Premkishan, "How to Crack Test of Reasoning", Arihant Publications,2016
5.	R.S. Agarwal, "A modern Approach to verbal and non-verbal reasoning", S Chand Publishing,2018
E-Resources	
1.	Aptitude: https://www.indiabix.com
2.	Reasoning: https://placement.freshersworld.com
3.	Verbal: https://testbook.com

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	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution Affiliated to Anna University, Chennai) Elayampalayam, Tiruchengode – 637 205						
Programme	B.E. /B.Tech.	Programme code	107	Regulation	2023		
Department	COMPUTER SCIENCE AND TECHNOLOGY			Semester	III		

Course code	Course name	Periods per week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CT302	**Artificial Intelligence**	3	0	2	4	50	50	100

Course Objective	The main objective of this course is to: • Know about the basic concepts of Artificial intelligence • Understanding different search strategies in AI • Analyzing the Concept of AI in Game playing • Identifying the different representation of Knowledge using Logic Programming • Expertise knowledge in Expert system and Uncertainty	
Course Outcome	At the end of the course, the students will be able to,	KL
	CO1: To know the basics of Artificial intelligence and intelligent agents.	K1
	CO2: To know the basics of Artificial intelligence and intelligent agents.	K2
	CO3: To apply the concepts of AI in Game playing techniques	K3
	CO4: To carry out and apply the concept of Logic programming and represent the different knowledge representation techniques for various AI applications	K2
	CO5: Interpret performance of different pipelined processors and multi core architectures.	K2
Pre-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	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12	PSO1	PSO2
CO 1	3	2	2							1		1	3	2
CO 2	2	3	1	2						1			2	2
CO 3	2	2	1	2				2		1			2	2
CO 4	2	2	2							1		2	3	2
CO 5	2	2	1		2			1		1		1	3	2

Course Assessment Methods

Direct

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

Indirect

1. Course - end survey

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Content of the syllabus			
Unit – I	INTRODUCTION TO ARTIFICIAL INTELLIGENCE AND PROBLEM SOLVING	Periods	9
Introduction - History - Intelligent Systems – Foundation of AI – Sub areas of AI – Applications - Intelligent agents - Classification of agents - Problem Solving - General problem solving - characteristics of Agents			
Unit – II	SEARCHING TECHNIQUES	Periods	9
Exhaustive Searches – DFS - Heuristic Search Techniques - Branch and Bound Search - A*algorithm - Iterative-Deepening A* - Constraint Satisfaction			
Unit – III	INTRODUCTION TO PROBLEM REDUCTION AND GAME PLAYING	Periods	9
Introduction - Problem reduction - Game Playing - Bounded Look-ahead Strategy and use of Evaluation Functions - Alpha- Beta Pruning			
Unit – IV	LOGIC PROGRAMMING AND KNOWLEDGE REPRESENTATION	Periods	9
Logic Concepts and Logic Programming: Introduction - Natural Deduction System - Semantic Tableau System, Resolution refutation - Predicate Logic-Logic Programming Introduction - Approaches to Knowledge Representation - Knowledge Representation using Semantic Network, Extended Semantic Networks for KR - Knowledge Representation using Frames			
Unit – V	EXPERT SYSTEM AND HANDLING UNCERTAINTY	Periods	9
Introduction - Phases in Building Expert Systems - Expert System Architecture - Expert Systems Vs Traditional Systems - Rule based expert Systems - Application of Expert Systems - List of Shells and Tools – Uncertainty Measure- Probability Theory - :Introduction - Probability Theory, Bayesian Belief Networks			
		Total Periods	45

	SUGGESTED LIST OF EXPERIMENTS	CO'S
1	Study of Software Architectures	CO1
2	Basic Implementation of Breadth First Search and Depth First Search using Python.	CO2
3	Basic Implementation of A* Algorithm using python	CO2
4	Basic Implementation of Constraint satisfaction problem using python	CO2
5	Basic Implementation of Missionaries-Cannibals Problems using Python	CO2
6	Basic Implementation of Water-Jug problem using Python.	CO2
7	Basic Implementation of Tic-Tac-Toe game using Python.	CO3
8	Basic Implementation of Hill Climbing using python	CO3
9	Basic Implementation of Alpha-Beta Pruning using Python.	CO3
10	Study of Prolog Programming language and write some simple facts for the statement using prolog	CO4
11	Design a Chatbot in Python	CO5

Lecture 45: Practical 30; Total: 75

Text Books:

1.	SarojKaushik.ArtificialIntelligence.CengageLearning.2011
2.	S.RussellandP.Norvig,"ArtificialIntelligence:AModernApproach‖,PrenticeHall,ThirdEdition,2015

REFERENCE BOOKS

1.	Mark Allen Weiss, Data Structures and Algorithm Analysis in C, 2nd Edition, Pearson Education, 2005.
2.	Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, —Data Structures and Algorithms‖, Pearson Education, Reprint 2006.

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3.	Introduction to Artificial Intelligence and expert systems DanW.Patterson.PHI.
4.	Artificial Intelligence by George Flugerrearson fifth edition
5.	NPTEL Course Notes
E-Resources	
1.	https://www.geeksforgeeks.org/advanced-data-structures/
2.	https://www.coursera.org/
3.	https://www.unesco.org/en/artificial-intelligence
Text Books:	
1.	SarojKaushik.ArtificialIntelligence.CengageLearning.2011
2.	S.RusscllandP.Norvig,"ArtificialIntclligcnce:AModcrnApproachl,PrenticeIIall,ThirdEdition,2015
REFERENCE BOOKS	
1.	Mark Allen Weiss, Data Structures and Algorithm Analysis in C, 2nd Edition, Pearson Education, 2005.
2.	Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, —Data Structures and Algorithmsll, Pearson Education, Reprint 2006.

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Programme	B.E.	Programme Code			107	Regulation	2023
Department	Computer Science& Technology					Semester	III

Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CT303	Python Essentials Laboratory	0	0	2	1	60	40	100

Course Objective	The Main objective of this course is to: • Learn and understand Python programming basics and control statements. • Discover the use of supported data structures like lists, dictionaries and tuple in Python. • Knowing Functions, Strings and Files in python programming • Learn basic libraries for Machine learning • Understand the use of basic libraries for data visualization

Course Outcome	The students who complete this course successfully are expected to:	Knowledge Level
	CO1:Understand the basic concepts of scripting and the contributions of scripting language.	K1
	CO2:Explore and implement python data structures like Lists. Tuples, Sets and dictionaries.	K2
	CO3:Create practical and contemporary applications using Functions, Strings and Files	K3
	CO4: Use different python libraries for machine learning applications	K3
	CO5: Display the datasets using different basic libraries in data visualization	K3

Pre-requisites	-

CO / PO Mapping
(3/2/1indicates strength of correlation) 3-Strong, 2–Medium, 1–Weak

CO/PSO Mapping

COs	Programme Outcomes (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	PSO2
CO 1	3	3	2	1	3	1			3	1	3	3	3	3
CO 2	3	3	2	1	3	1			3	1	3	3	3	3
CO 3	3	3	2	1	3	1			3	1	3	3	3	3
CO 4	3	3	2	1	3	1			3	1	3	3	3	3
CO 5	3	3	2	1	3	1			3	1	3	3	3	3

Course Assessment Methods Direct

Direct
1.Prelab and Post Lab 2.Record 3.End-Semester Examinations
Indirect
1.Course - end survey

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	LIST OF EXPERIMENTS	
	BASIC PYTHON PROGRAMS	
1	Factorial of n number and generating Fibonacci series	CO1
2	Calculating student grade	
3	Printing a pattern	
	LISTS, TUPLES, SETS AND DICTIONARIES	
4	Find minimum number in a list and list operations	CO2
5	Create and insert elements into a dictionary	
6	Operations on sets and Tuples	
	STRINGS,FUNCTIONS AND FILES	
7	Counting the vowels and consonants in a given string	CO3
8	Word count, file copy, file operations in python	
	PYTHON LIBRARIES	
9	Implement a python program for illustrating Numpy, Scipy ,pandas libraries in machine library	CO4
10	Display a Dataset in bar chart, Pie chart, Scatterplot, Histogram using basic libraries	CO5
	Total Periods	**45**

E-Resources	
1.	https://www.python.org/about/gettingstarted/
2.	https://beginnersbook.com/2018/03/python-tutorial-learn-programming/
3.	https://www.tutorialspoint.com/python/index.html
4.	https://www.google.com/www.udemy.com/PythonVideos/Online-Course

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Programme	**B.E./B.Tech.**	Programme Code			Regulation	**2023**		
Department	**IT,CSE,CST,BME,ECE,EEE**				Semester	**III**		
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23IT303	**Data Structures Laboratory**	0	0	2	1	60	40	100

Course Objective	The Main Objective of the course is to • Familiarize the operations on Linear Data Structures and Nonlinear Data Structures • Understand the concepts of various Searching and Sorting Techniques • Understand the basic operations on Search Trees • Known to the basics of various graph Traversal methods.	
Course Outcome	At the end of the course, the student should be able to:	KL
	CO1: Implement List based and Array based Linear and Nonlinear Data Structures	K3
	CO2: Implement Stack ADT, Queue ADT, and Parsing the Arithmetic Expression in C	K3
	CO3: Suggest appropriate Search Tree for solving a given problem	K4
	CO4: Appropriately use the various graph Traversal for a given problem	K4
	CO5: Implement various sorting and searching algorithms in C.	K3
Pre-requisites	-	

CO /PO Mapping (3/2/1indicatesstrengthofcorrelation)3-Strong,2-Medium,1-Weak													CO/PSO Mapping	
Cos	Programme Outcomes(POs)												PSOs	
	PO 1	PO 2	PO 3	PO 4	PO5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
CO 1	3	2	1	1	2			1	1	1	1	1	1	1
CO 2	3	2	1	1	2			1	1	1	1	1	1	1
CO 3	3	2	1	1	2			1	1	1	1	1	1	1
CO 4	3	2	1	1	2			1	1	1	1	1	1	1
CO 5	3	2	1	1	2			1	1	1	1	1	1	1

Course Assessment Methods

Direct
1. Prelab and Post Lab / Viva Questions 2. Record 3. End-Semester Examination
Indirect
1. Course - end survey

Suggested List of Experiments	CO's
1. Consider a scenario where a firm wants to maintain the data of its employees. The data containing employee number, name, and salary and department are saved in a	CO1

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singly linked list. Create following functions for the employee list. i. Insert at Front: Insertion of a record at the front. ii. Insert at End: Insertion of a record at the end. iii. Delete First: Deletion of first record. iv. Delete Last: Deletion of last record. v. Search. Searching any record based on employee number and dept no. vi. Display: Displaying all records.	
2. Write a C program to add two polynomials using Linked List.	CO1
3. Write a C program to implement different operations on Stack and Queue using Arrays.	CO2
4. Write a C program that implements push(), pop(), display(), isEmpty() and peek() functions of Stack using Linked List.	CO2
5. Write a C program that implements enqueue(), dequeue(), size(), isEmpty() and display() functions of Queue using Linked List.	CO2
6. Write a C program to convert an Infix expression : a + b * c + (d * e + f) * g into the Postfix expression.	CO2
7. Write a C program to perform the following BST Operations - Creating node, insertion, in-order traversal and pre-order traversal.	CO3
8. Write a C program which results the implementation of Insertion, Deletion and Search operations in AVL Tree	CO3
9. Write a C program to perform Depth First Search and Breadth First Search traversal on a graph.	CO4
10. Write a C program for constructing a minimum cost spanning tree of a graph using Prim's Algorithm.	CO4
11. Write a C program to Search an element using Linear Search process and Sort given elements using Insertion sort.	CO5
12. Write a C program to implement Linear Probing and Separate Chaining Collision resolution technique.	CO5
Total Periods	45

E-Resources:	
1.	https://www.programiz.com/c-programming
2.	https://www.cprogramming.com/
3.	https://beginnersbook.com/2015/02/simple-c-programs/
Tools / Software Required:	
1.	Codetandra / HackerRank / HackerEarth / Any online Problem Solving Platforms

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Programme	B.E.	Programme code	107	Regulation	2023			
Department	Computer Science and Technology			Semester	III			
Course code	Course name	Periods per week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CTCP2	Personality Development	1	0	2	1	60	40	100

Course Objective

The student should be made to,

- Equip comprehensive understanding of various psychological and cognitive assessment tools
- Analyze, interpret, and apply these tools to improve personal and professional development
- Enhance communication
- Manage stress effectively

Course Outcome

At the end of the course, the student should be able to,	Knowledge Level
CO1: Enhance Self-Awareness	K2
CO2: Improve Communication Skills	K1
CO3: Acquire Better Academic and Life Satisfaction	K2
CO4: Enhance Problem-Solving Abilities	K3
CO5: Effective Stress Management	K3

Pre-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	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			2	2		2	1	2
CO 2						2			2	2		2	2	3
CO 3						2			1	2		2	2	3
CO 4						2			2	1		2	3	3
CO 5						2			2	1		2	1	2

Course Assessment Methods

Direct

1. Self Assessment
2. Viva-Voce
3. End-Semester Examination

Indirect

1.Course -end survey

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Content of the Syllabus

S.No.	List of Experiments	CO
1.	Rosenberg's and Hare's Self Esteem tool	CO1
2.	Myers Brigg's 16 types of Personality	CO1
3.	Social Functioning scale	CO3
4.	Huebner, Laughlin, Ash, & Gilman's Multidimensional Students Life Satisfaction Scale	CO3
5.	Body language Assessment	CO2
6.	Fleming's VARK Learning Theory, bloom's taxonomy based on learners' queries	CO2
7.	Alexi's Presentation Secrets Assessment	CO2
8.	Deductive and inductive logical reasoning assessment	CO4
9.	Procter and Gamble Assessment Gamified Tests	CO4
10.	Psychometric Test	CO3
11.	Stress buster Assessment	CO5

Total Periods : 30

References

1. Allan Pease, "Body language – how to read other's thoughts by their gestures", Sheldon press, London publication, Tenth Impression 1988
2. Alexei Kapterev, "Presentation Secrets", John Wiley and Sons, 2011

E-Resources

1. https://scales.arabpsychology.com
2. http://DOMWebserver.Hitchcock.org/mbti/
3. https://www.assessmentday.com/free/deductive-reasoning-1/DeductiveFreeTest-Solutions.pdf
4. www.prepinsta.com

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Programme	B.E	Programme Code		107	Regulation		2023	
Department	COMPUTER SCIENCE AND TECHNOLOGY				Semester		IV	
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23MA405	**Probability and Statistics**	3	1	0	4	40	60	100

Course Objective	The main objective of the course is to • Proficiently understand the expected value, variance, and higher-order moments ofrandom variables (for both discrete and continuous types). • Analyze and interpret statistical data using appropriate probability distribution • Identify testing of hypothesis for all size of samples. • Acquaint the knowledge of analysis of variance, this plays an important role in reallife problems. • Introduce the basic concepts of statistical quality control.	
Course Outcome	At the end of the course, the student should be able to,	Knowledge level
	CO1: Translate the density and distribution functions fordiscrete and continuous variables.	K3
	CO2: Enable to identify various probability distributions.	K3
	CO3: Ability to test the hypothesis using suitable statistical test.	K5
	CO4: Apply the basic concepts of classifications of design of experiments in the field of agriculture and computer science.	K4
	CO5: Have the notion of sampling distributions and statistical techniques used in engineering and management problems.	K5
Pre-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	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	PSO3
CO 1	3	2	1		1								2	1	
CO 2	3	2	1	1									2	1	
CO 3	3	2	1		1								2	1	
CO 4	3	2		1									2	1	
CO 5	3	2	1	1	1								2	1	

Course Assessment Methods

Direct

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

Indirect

1. Course - end survey

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Content of the syllabus			
Unit – I	**INTRODUCTION TO PROBABILITY**	Periods	**9+3**
Introduction to Probability, Axioms of Probability: Sample spaces and events, axioms of Probability, sample spaces having equally likely outcomes – Conditional Probability and independence- Baye's theorem (without proof) and its applications.			
Unit - II	**RANDOM VARIABLES AND SPECIAL DISTRIBUTIONS**	Periods	**9+3**
Random variables-Probability mass function- Probability generating function-moments-moment generating functions. Special discrete and continuous distributions: Binomial, Poisson, Geometric, Uniform, Exponential and Normal distributions.			
Unit – III	**TESTING OF HYPOTHESIS**	Periods	**9+3**
Basic Definitions – Testing of Hypothesis: Large sample tests based on Normal distribution for single mean and difference of means -Tests based on t, Chi-square and F distributions for mean, variance and proportion - Test for Independence of Attributes & Goodness of Fit.			
Unit - IV	**DESIGN OF EXPERIMENTS**	Periods	**9+3**
One way and two way classifications - Completely Randomized design – Randomized block design – Latin square design – 2^2 factorial design.			
Unit – V	**STATISTICAL QUALITY CONTROL**	Periods	9+3
Control charts for measurements ($\bar{X}$ and R charts)- Control charts for attributes (p,c and np charts) – Tolerance limits – Acceptance sampling.			
		Total Periods	**45+15=60**
Text Books			
1.	Montgomery, D.C. and Runger, C.G., Applied Statistics and Probability for Engineers, 7th Edition, Wiley Students Edition, Wiley, 2020.		
2.	Ravichandran, J., Probability and statistics for Engineers, 1st Edition, Wiley India Ltd, 2012.		
References			
1.	Gupta S.C. and Kapoor V.K, Fundamentals of Mathematical Statistics, 12th Edition, Sultan an Sons, 2020.		
2.	Devore, J.L., Probability and Statistics for Engineering and the Sciences, 8th Edition, Cengage Learning, 2014.		
3.	Johnson, R.A., Miller, I. and Freund, J., Miller & Freund's Probability and Statistics for Engineers 9th Edition, Pearson Education, 2016.		
4.	Ronald E.Walpole; Raymond H.M.yers; Stiaron L. Myers,"Probability and Statistics for Engineering and the Scientists",Pearson Publishers, 9th Edition,2010.		
5.	Ross, S.M., "Introduction to Probability and Statistics for Engineers and Scientists", 5th Edition, Elsevier, 2004.		
E-Resources			
1.	https://online.stanford.edu		
2.	www.learnerstv.com/Free-engineering-Video-lectures		
3.	www.nptel.ac.in		

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Programme	**B.E/B.Tech.**	Programme Code			Regulation	**2023**		
Department	**CSE , IT & CST**				Semester	**III / IV**		
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23IT404	**Database Management Systems**	3	0	0	3	40	60	100

Course Objective	The Main Objective of the course is to, • Learn the fundamentals of data models, relational algebra and SQL • Understand a database system using ER diagrams and to learn normalization techniques • Understand the fundamental concepts of transaction, concurrency control and recovery • Analyze how the internal storage structures using different file and indexing techniques which will help in physical DB design • Learn the concepts of Distributed databases, Database Security and NoSQL.	
Course Outcome	At the end of the course, the student should be able to,	KL
	CO1: Construct SQL Queries using relational algebra	K1
	CO2: Design database using ER model and normalize the database	K3
	CO3: Understand how to handle transactions and maintain consistency of the database	K2
	CO4: Compare and contrast various indexing strategies and apply the knowledge to tune the performance of the database	K2
	CO5: Understand the concepts of Distributed databases, Database Security and NoSQL	K2
Pre-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	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
CO 1	3	2	2	2	2								3	2
CO 2	3	2	2	1	2								3	2
CO 3	3	2	2	2	2								3	2
CO 4	3	2	2	1	2								3	2
CO 5	3	2	2	1	2								3	2

Course Assessment Methods

Direct
1.Continuous Assessment Test I, II & III 2.Assignment / Quiz / Seminar 3.End Semester Examination
Indirect
1.Course - end survey

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Content of the syllabus			
Unit – I	**Relational Databases**	Periods	10
Purpose of Database System – Views of data – Data Models – Database System Architecture – Relational Algebra Introduction to relational databases – Relational Model – Keys – Entity-Relationship model - SQL fundamentals – DML - DDL – DCL – TCL – DQL - Procedures, Functions, Triggers and Views			
Unit – II	**Database Design**	Periods	8
E-R Diagrams – Enhanced-ER Model – ER-to-Relational Mapping – Functional Dependencies – Non-loss Decomposition – First, Second, Third Normal Forms, Dependency Preservation – Boyce/Codd Normal Form – Join Dependencies and fifth Normal Form			
Unit – III	**Transactions**	Periods	9
Transaction Concepts – ACID Properties – Schedules – Serializability - Need for Concurrency – Concurrency control –Two Phase Locking- Timestamp – Multiversion – Validation and Snapshotisolation – Multiple Granularity locking – Deadlock Handling – Recovery Concepts – Shadow Paging – ARIES Algorithm			
Unit – IV	**Implementation Techniques**	Periods	9
RAID – File Organization – Organization of Records in Files – Data Dictionary Storage – Column Oriented Storage– Indexing and Hashing – Ordered Indices -Static Hashing – Dynamic Hashing – Query Optimization – Cost Estimation			
Unit – V	**Advanced Topics**	Periods	9
Distributed Databases: Architecture - Data Storage - Transaction Processing- Query processing – Database Security: Authentication – Authorization and Access Control – SQL Injection - Introduction to NoSQL: CAP Theorem – Sharding - MongoDB Implementation			
		Total Periods	45

TEXT BOOKS:	
1.	Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concepts", 7th Edition, McGraw Hill, 2021.
2.	M. Tamer Özsu Patrick Valduriez, "Principles of Distributed Database Systems" , 4th Edition, Springer , 2020.
3.	Michael Kaufmann, SQL and NoSQL Databases: Modeling, Languages, Security and Architectures for Big Data Management,2nd Edition ,Springer 2023.
REFERENCE BOOKS:	
1.	C.J.Date, A.Kannan, S.Swamynathan, "An Introduction to Database Systems", 8th Edition, Pearson Education, 2006.
2.	Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", 7th Edition, Pearson Education, 2017
E-RESOURCES:	
1.	https://www.geeksforgeeks.org/
2.	https://archive.nptel.ac.in/courses/106/105/106105175/
3.	https://www.khoury.northeastern.edu/home/kathleen/classes/cs3200/20-NoSQLMongoDB.pdf

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	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205							
Programme	**B.E/B.Tech.**	Programme Code	**107**	Regulation	**2023**			
Department	**Computer Science and Technology**			Semester	**IV**			
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CT404	**Computer Networks**	3	0	0	3	40	60	100

Course Objective	The main objective of this course is to: • To build an understanding among students about the fundamental concepts of computer networking, protocols, architectures, and applications • To help students to acquire knowledge in design, implement and analyze performance of OSI and TCP-IP based Architectures • To identify the suitable application layer protocols for specific applications and its respective security mechanisms	
Course Outcome	At the end of the course, the student should be able to,	**Knowledge level**
	CO1: Interpret the different building blocks of Communication network and its architecture	K2
	CO2: Contrast different types of switching networks and analyze the performance of network	K3
	CO3: Identify and analyze error and flow control mechanisms in data link layer	K3
	CO4: Design sub-netting and analyze the performance of network layer with various routing protocols	K4
	CO5: Compare various congestion control mechanisms and identify appropriate transport layer protocol for real time applications with appropriate security mechanism	K3
Pre-requisite	-	

CO / PO Mapping
(3/2/1indicates strength of correlation) 3-Strong, 2–Medium, 1–Weak

COs	Programme Outcomes (POs)												**CO/PSO Mapping** 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	PSO2
CO 1	2	2	3	2	1	-	-	-	2	1	1	1	2	1
CO 2	3	1	1	1	1	-	-	-	2	3	3	3	3	1
CO 3	3	2	3	2	1	-	-	-	2	1	1	2	2	3
CO 4	1	2	3	2	-	-	-	-	3	2	3	3	1	2
CO 5	1	1	3	3	2	-	-	-	1	3	3	1	2	2

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Course Assessment Method

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

Content of the syllabus			
Unit – I	INTRODUCTION TO NETWORKING PRINCIPLES AND LAYERED ARCHITECTURE	Periods	9
Data Communications and Networking: A Communications Model - Data Communications- Evolution of network, Requirements, Applications, Network Topology (Line configuration, Data Flow), Protocols and Standards, Network Models (OSI, TCP/IP)			
Unit - II	CIRCUIT AND PACKET SWITCHING	Periods	9
Switched Communications Networks Circuit Switching Packet Switching - Comparison of Circuit Switching and Packet Switching - Implementing Network Software, Networking Parameters (Transmission Impairment, Data Rate and Performance)			
Unit – III	DATA LINK LAYER	Periods	9
Error Detection and Correction - Hamming Code, CRC, Checksum- Flow control mechanism - Sliding Window Protocol - Go Back-N-Selective Repeat - Multiple Access Aloha - Slotted Aloha - CSMA, CSMA/CD - IEEE Standards (IEEE802.3 (Ethernet), IEEE802.11(WLAN))- RFID-Bluetooth Standards			
Unit - IV	NETWORK LAYER & ROUTING PROTOCOLS	Periods	9
IPV4 Address Space - Notations - Classful Addressing - Classless Addressing – Problems in VLSM & FLSM-Network Address Translation - IPv6 Address Structure - IPv4 and IPv6 header format Static Routing, Dynamic Routing: Distance Vector Routing Protocol RIP, Link State Protocol: OSPF, Hybrid Protocol - EIGRP- Implementation-Performance Analysis using Packet Tracer.			
Unit – V	TRANSPORT LAYER & APPLICATION LAYER	Periods	9
Transport Layer : TCP and UDP-Congestion Control-Effects of Congestion-Traffic Management- TCP Congestion Control- Congestion Avoidance Mechanisms-Queuing Mechanisms- QoS Parameters Application Layer : Domain Name Systems, Protocols – HTTP, FTP, SMTP,SNMP			
		Total Periods	45

Text Books:	
1.	Behrouz A. Forouzan, "Data communication and Networking", Fourth Edition, TMH, 2011.
2.	Todd Lammle, "CCNA Study Guide", Edition7, Publication Date: April 5, 2011| ISB: 10:0470901071 ISBN:13: 9780470901076
REFERENCE BOOKS	
1	James F. Kurose and Keith W.Ross, Computer Networking: A Top-Down Approach, 6th Edition, 2017, Pearson Education
2	William Stallings, "Data and Computer Communication", 10th Edition, 2017, Pearson, United Kingdom.
3	Nader. F. Mir, "Computer and Communication Networks", Pearson Prentice Hall Publishers, 2010.
4	Ying-Dar Lin, Ren-Hung Hwang, Fred Baker, "Computer Networks: An Open Source Approach", Mc Graw Hill Publisher, 2011.
E-Resources	
1.	https://www.youtube.com/watch?v=qiQR5rTSshw

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2.	https://www.youtube.com/watch?v=DNG7QLyCiEc
3.	https://www.youtube.com/watch?v=i83qrFq3BYQ
4.	https://www.youtube.com/watch?v=PQJzPkwPlhk
5.	https://www.youtube.com/watch?v=rmFX1V49K8U&list=PLW8hTPfXNGdAZIKv-y9v_XLXtEqrPtntm

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Programme	**B.E/B.Tech.**	Programme Code		107	Regulation		2023	
Department	**Computer Science and Technology**				Semester		**IV**	
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CT405	**Artificial Intelligence and its applications**	3	0	0	3	40	60	100

Course Objective

The main objective of this course is to:

- To know the basic concept of intelligent agents and objects
- To Understand the basics of bayesian networks and inference
- To know the different probabilistic model
- To explore the basics of Machine learning and explore the techniques in Reinforcement Learning
- To know about the Natural Language processing and Neural networks

Course Outcome	At the end of the course, the student should be able to,	Knowledge level
	CO1: Understand the concepts of Agents and objects	K1
	CO2: Apply the probabilistic reasoning using Bayesian Models	K2
	CO3: Analyze and use various probabilistic models for various use cases.	K3
	CO4: Understand the basics of machine learning and apply various reinforcement models	K3
	CO5: Understand the apply the techniques of NLP and Neural networks in AI domain	K2
Pre-requisites	Foundation of Artificial Intelligence	

CO /POMapping
(3/2/1 indicates strength of correlation) 3-Strong, 2–Medium, 1–Weak

COs	Programme Outcomes (POs)												CO/PSO Mapping 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	PSO2
CO 1	3	3	3	3	2	3	1					3	3	3
CO 2	3	3	3	3	3	3	1					3	2	3
CO 3	3	3	3	3	3	3	1					3	3	3
CO 4	3	3	3	3	3	3	1					3	3	3
CO 5	3	3	3	3	3	3	1					3	3	3

Course Assessment Method

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

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Content of the syllabus			
Unit – I	**INTRODUCTION TO AGENTS AND OBJECTS**	Periods	9
Software Agents-Architecture for Intelligent Agents-Agent communication-Negotiation and Bargaining-Argumentation among Agents-Trust and Reputation in Multi-agent systems – Ontological engineering–categories and objects- reasoning systems for categories - reasoning with default information			
Unit - II	**PROBABILISTIC REASONING**	Periods	9
Acting under uncertainty-basic probability notations-Bayes rule- Probabilistic reasoning-Representing knowledge in uncertain domain- Bayesian networks -semantics of Bayesian networks- -Exact inference-Approximate inference in Bayesian networks Probabilistic reasoning over time – time and uncertainty			
Unit – III	**PROBABILISTIC REASONING OVER TIME MODELS**	Periods	9
Probabilistic Models– Inference in temporal models – Hidden Markov Models –Kalman filters Statistical learning theory–Learning with complete data-Maximum likelihood parameter learning- discrete model—naïve bayes models – maximum-likelihood parameter learning continuous model- Gaussian mixture models			
Unit - IV	INTRODUCTION TO MACHINE LEARNING AND REINFORCEMENT LEARNING MODELS	Periods	9
Machine Learning: Introduction-Types of Machine Learning- Machine Learning Process, Feature Engineering-Feature Extraction, Feature Selection, Feature Engineering Methods **Reinforcement Learning:** Learning from rewards – passive reinforcement learning – active reinforcement learning.			
Unit – V	INTRODUCTION TO NLP AND NEURAL NETWORKS	Periods	9
Introduction to Natural Language Processing-Language Model-Text Classification-Information retrieval in NLP Neural Networks: Basic concepts of Neural Networks, Fundamentals of Biological Neural Network and Artificial Neural Network, Characteristics of Neural Networks, Taxonomy of Neural Network Architectures, Terminologies – Applications of Neural Networks.			
		Total Periods	45

Text Books	
1.	Stuart Russel and Peter Norvig, "Artificial Intelligence: A Modern Approach", Fourth Edition, Pearson Education, 2020.
1.	Dr.Nilakshi Jain, Artificial Intelligence, As per AICTE: Making a System Intelligent, Wiley Publications, 1st Edition, 2019
2.	Ameet V Joshi, Machine Learning and Artificial Intelligence, Springer Publications,2020
3.	Dr.S.LovelynRose, Dr.L.AshokKumar, Dr.D.KarthikaRenuka, Deep Learning using Python, Wiley IndiaPvt. Ltd 2019.

References	
1.	Saroj Kaushik, Artificial Intelligence,CengageLearningIndia,2011.
2.	Machine Learning Dummies, John Paul Muller,Luca Massaron,WileyPublications,2021.
3.	Kevin Night,ElaineRich,andNairB.,"ArtificialIntelligence",McGrawHill,2008
4.	Deepak Khemani,"Artificial Intelligence",TataMcGrawHillEducation,2013

E-Resources	
1.	https://www.ibm.com/topics/artificial-intelligence
2.	https://cloud.google.com/learn/what-is-artificial-intelligence
3.	https://www.coursera.org/articles/ai

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Programme	B.E. / B.Tech.	Programme Code	107	Regulation	2023			
Department	CSE , IT & CST			Semester	IV			
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CT406	Operating Systems	3	0	2	4	50	50	100

Course Objective	• To understand the operating system structures. • To learn Processes, Threads and analyze Scheduling algorithms. • To have a basic understanding of Deadlocks and analyze memory management schemes. • To be familiar with File system management. • To be familiar with the basics of virtual machines	
Course Outcome	At the end of the course, the student should be able to,	Knowledge Level
	CO1: Gain knowledge on operating system structures.	K2
	CO2: Analyze various scheduling algorithms and process synchronization.	K3
	CO3: Investigate deadlock prevention and avoidance algorithms and compare various memory management schemes.	K3
	CO4: Illustrate the functionality of file systems.	K3
	CO5: Understand the basic concepts of virtual machines.	K2
Pre-requisites	--	

CO / PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 – Weak

Cos	Programme Outcomes (POs)												CO/PSO Mapping 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	1	1	1					1	1	1	2	2	2
CO 2	2	3	1	3	1				3	2	2	3	2	2
CO 3	2	2	3	3	2				3	1	1	2	2	1
CO 4	2	2	1	2	1				1	3	2	1	2	1
CO 5	2	3	3	2	1				3	1	2	1	2	2

Course Assessment Methods

Direct

1. Continuous Assessment Test I, II & III
2. Assignments /seminar/ Quiz/ Model Lab
3. End-Semester examinations

Indirect

1. Course - End survey

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Content of the syllabus			
Unit – I	INTRODUCTION AND OPERATING SYSTEM STRUCTURES	Periods	9
Introduction - Computer System organization - Computer-System Architecture- Operating-System Operations – Operating System Services - User Operating System Interface - System Calls – System Services - Operating-System Design and Implementation- Operating-System Structure.			
Unit - II	PROCESS MANAGEMENT	Periods	9
Process Concept - Process Scheduling -Operations on Processes - Inter-process Communication; Threads - Multithread Models - Threading issues; CPU Scheduling -Basic Concepts - Scheduling Criteria - Scheduling Algorithms; Process Synchronization - Critical-Section Problem - Synchronization Hardware - Semaphores - Monitors -Classic problems of Synchronization.			
Unit – III	DEADLOCKS AND MEMORY MANAGEMENT	Periods	9
System Model - Deadlock Characterization -Methods for handling Deadlocks - Deadlock Prevention - Deadlock avoidance - Deadlock detection - Recovery from Deadlocks; Main Memory- Swapping - Contiguous Memory allocation - Paging - Structure of the Page Table - Intel 32- and 64-bit Architectures: Virtual Memory - Demand Paging - Page Replacement - Allocation of frames - Thrashing.			
Unit - IV	FILE SYSTEM MANAGEMENT	Periods	9
File-System Interface - File Concept - Access Methods - Directory Structure - File System Mounting - Protection; File System Implementation - Directory Implementation - Allocation Methods - Free-space Management.			
Unit – V	STORAGE MENAGEMENT AND VIRTUALIZATION	Periods	9
Mass-Storage Structure – Disk Scheduling and Management - Swap-Space Management; Virtual Machines – History - Benefits and Features - Building Blocks –Introduction to types of Virtual Machines and their implementations - Virtualization and Operating-System Components.			
		Total Periods	45

Suggested List of Experiments	CO's
1. Installation of windows operating system	CO1
2. Illustrate Shell Programming	CO1
3. Process Management using System Calls : Fork, Exec, Getpid, Exit, Wait, Close	CO1
4. Simulation of CPU scheduling algorithms :FCFS, SJF, Priority and Round Robin	CO2
5. Implement process synchronization using semaphores	CO2
6. Simulation of Banker s algorithm to check whether the given system is in safe state or unsafe state	CO3
7. Implementation of Dynamic memory allocation algorithms: First-fit, Best-fit, Worst-fit	CO3
8. Implementation of Page Replacement Algorithms : FIFO, LRU and Optimal	CO3
9. Implement the following File Allocation Strategies : Sequential, Indexed, Linked	CO4
10. Install Linux operating system using VMware	CO5
Lecture 45: Practical 30; Total: 75	

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Text Books	
1	Andrew S Tanenbaum, "Modern Operating Systems", Pearson, 5th Edition, 2022 New Delhi.
2	Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", 10th Edition, John Wiley and Sons Inc., 2018

References	
1.	William Stallings, "Operating Systems: Internals and Design Principles", 7th Edition,PrenticeHall, 2018.
2.	Ramaz Elmasri, A. Gil Carrick, David Levine, "Operating Systems – A Spiral Approach",TataMcGraw Hill Edition, 2010.
Tools Required	
1.	PC, Linux / Windows OS, C Compiler, VMWare / VirtualBox
E-Resources	
1.	https://www.geeksforgeeks.org/operating-systems
2.	https://www.tutorialspoint.com/operating_system/ index.htm
3.	youtube.com/playlist?list=PLDW872573QAb4bj0URobvQTD41IV6gRkx

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Programme	B.E./ B.Tech.	Programme Code				Regulation	2023	
Department	CSE,IT &CST				Semester		IV	
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23IT406	Database Management Systems Laboratory	0	0	2	1	60	40	100

Course Objective

The student should be made to,

- Learn and implement important commands in SQL.
- Learn the usage of nested and joint queries.
- Understand functions, procedures and procedural extensions of databases.
- Understand design and implementation of typical database applications.
- Familiar with the use of a front end tool for GUI based application development.

Course Outcome

At the end of the course, the student should be able to,	KL
CO1: Create databases with different types of key constraints.	K3
CO2: Construct simple and complex SQL queries using DML and DCL commands.	K4
CO3: Use advanced features such as stored procedures and triggers and incorporate in GUI based application development	K4
CO4: Create and manipulate data using NoSQL database	K3
CO5: Create a Simple Projects using real life database applications	K3

Pre-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	PO 2	PO 3	PO 4	PO5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
CO 1	3	3	3	3	2					2	1		3	2
CO 2	3	3	3	3	2					2	1		1	1
CO 3	3	2	2	3	2					2	1		3	1
CO 4	2	2	2	2	2					2	1		1	1
CO 5	3	3	2	2	2					2	1		2	2

Course Assessment Methods

Direct
1. Prelab and Post Lab / Viva Questions 2. Record 3. End-Semester Examination
Indirect
1. Course - end survey

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<table>
<tr><th colspan="2">Suggested List of Experiments</th><th>CO's</th></tr>
<tr><td>1.</td><td>Create a table called Employee with the following structure.
<table><tr><th>Name</th><th>Type</th></tr><tr><td>Empno</td><td>Number</td></tr><tr><td>Ename</td><td>Varchar2(10)</td></tr><tr><td>Job</td><td>Varchar2(10)</td></tr><tr><td>Mgr</td><td>Number</td></tr></table>a. Add a column commission with domain to the Employee table.
b. Insert any five records into the table.
c. Update the column details of job
d. Rename the column of Employ table using alter command.
e. Delete the employee whose Empno is 105.</td><td>CO1</td></tr>
<tr><td>2.</td><td>a. Create a user and grant all permissions to the user.
b.Insert the any three records in the employee table and use rollback. Check the result.
c.Add primary key constraint and not null constraint to the employee table.
d.Insert null values to the employee table and verify the result.</td><td>CO1</td></tr>
<tr><td>3.</td><td>Queries using Aggregate functions, GROUP BY, HAVING and Creation and dropping of Views.</td><td>CO2</td></tr>
<tr><td>4.</td><td>Create a row level trigger for the customers table that would fire for INSERT or UPDATE or DELETE operations performed on the CUSTOMERS table. This trigger will display thesalary difference between the old values and new values.
<table><tr><th>ID</th><th>NAME</th><th>AGE</th><th>ADDRESS</th><th>SALARY</th></tr><tr><td>1</td><td>Alive</td><td>24</td><td>Khammam</td><td>2000</td></tr><tr><td>2</td><td>Bob</td><td>27</td><td>Kadappa</td><td>3000</td></tr><tr><td>3</td><td>Catri</td><td>25</td><td>Guntur</td><td>4000</td></tr><tr><td>4</td><td>Dena</td><td>28</td><td>Hyderabad</td><td>5000</td></tr><tr><td>5</td><td>Eeshwar</td><td>27</td><td>Kurnool</td><td>6000</td></tr><tr><td>6</td><td>Farooq</td><td>28</td><td>Nellur</td><td>7000</td></tr></table></td><td>CO2</td></tr>
<tr><td>5.</td><td colspan="2">Write user defined functions and stored procedures in SQL.</td><td>CO3</td></tr>
<tr><td>6.</td><td colspan="2">Execute complex transactions and realize DCL and TCL commands.</td><td>CO3</td></tr>
</table>

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7.	Create Document, column and graph based data using NoSQL database tools.	CO4
8.	Case Study using any of the real life database applications from the following list 1) Inventory Management for a EMart Grocery Shop 2) Society Financial Management 3) Cop Friendly App – E-seva 4) Property Management – e-Mall 5) Star Small and Medium Banking and Finance i) Build Entity Model diagram. The diagram should align with thebusiness and functional goals stated in the application. Apply Normalization rules in designing the tables in scope. ii) Prepared applicable views, triggers (for auditing purposes), functions for enabling enterprise grade features. iii) Build PL SQL / Stored Procedures for Complex Functionalities, ex EOD Batch Processing for calculating the EMI for Gold Loan for each eligible Customer. iv) Ability to showcase ACID Properties with sample queries with appropriate settings	CO5
	Total Periods	45

E-RESOURCES	
1.	https://www.javatpoint.com/
2.	https://www.geeksforgeeks.org/

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Programme	**B.E./ B.Tech.**	Programme Code			Regulation	**2023**		
Department	**CSE,IT &CST**				Semester	**IV**		
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CT407	**Computer Networks Laboratory**	0	0	2	1	60	40	100

Course Objective	The Main objective of this course is to: • Relate the theoretical and practical base in computer networks issues. • Have hands on experience on various networking protocols like FTP, DNS, SNMP. • Understand the basic concepts of application layer protocol design; including client/server models, peer to peer models, and network naming. • Compare the performance of various routing protocols	
Course Outcome	At the end of the course, the student should be able to,	KL
	CO1: Design computer networks using sub netting and routing concepts	K4
	CO2: Understand Router Configuration	K3
	CO3: Design a Network with Static Routing	K6
	CO4: Design a Network with Dynamic Routing	K6
	CO5: Understand the bandwidth calculations and configurations	K6
Pre-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	PO 2	PO 3	PO 4	PO5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
CO 1	2	2	3	2	2	2			2	2	1	3	2	2
CO 2	3	2	2	2	3	3			2	2	1	3	3	2
CO 3	2	2	2	2	1	3			2	2	1	3	2	1
CO 4	2	2	3	2	2	3			2	2	1	3	2	1
CO 5	3	2	3	2	3	3			2	2	1	3	2	2

Course Assessment Methods

Direct
1.Prelab and Post Lab / Viva Questions 2.Record 3.End-Semester Examination
Indirect
1.Course - end survey

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	Suggested List of Experiment	CO'S
1	Introduction to packet tracer	CO1
2	Types of Network topology	CO2
3	IP addressing and Sub netting (VLSM)	CO2
4	Router Configuration (Creating Passwords, Configuring Interfaces)	CO2
5	Static and Default Routing	CO3
6	RIP ver1	CO4
7	RIP ver2	CO4
8	Single Area OSPF link costs and Interfaces	CO4
9	Multi Area OSPF with Stub Areas and Authentication	CO5
10	EIGRP Configuration, Bandwidth and Adjacencies	CO5
11	EIGRP authentication and Timers	CO5
	Total Periods	45
E-Resources		
1	https://www.cisco.com	
2	https://www.netcad.com	
3	https://study-ccna.co	

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TRACK 1- Entrepreneurship

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Elayampalayam, Tiruchengode – 637 205

Programme	B.E. / B.TECH	Programme code	107	Regulation	2023
Department	Computer Science and Technology			Semester	IV

Course code	Course Name	Periods per week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CTCE1	**Entrepreneurial Mindset and Business Model Canvas**	0	0	2	1	60	40	100

Course Objective

The student should be made to,

- Cultivate an entrepreneurial mindset that embraces innovation and risk-taking.
- Learn the components of the Business Model Canvas and develop skills using the Business Model Canvas as a tool for business planning.
- Design innovative business models based on customer needs and market opportunities.
- Understand the process of transforming a business model into a comprehensive business plan.
- Understand the application processes and legal implications of business licenses and permits.

Course Outcome

At the end of the course, the student should be able to,	KL
CO1: Explain the key traits and behaviors of successful entrepreneurs.	K2
CO2: Identify and describe the components of the Business Model Canvas.	K2
CO3: Design innovative business models tailored to specific customer needs and market conditions.	K6
CO4: Demonstrate the ability to write comprehensive business plans, incorporating elements such as market analysis, financial projections, and operational strategies.	K4
CO5: Identify different types of licenses and permits necessary for various types of businesses.	K2

Pre-requisites -

CO / PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak

COs	Programme Outcomes (POs)												**CO/PSO Mapping** PSOs	
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO1	PSO2
CO 1	1	1	2	1	1			1	2	1	3	3	1	1
CO 2	2	1	3	3	2			1	2	1	3	3	1	1
CO 3	2	1	3	2	3			1	2	1	3	3	2	2
CO 4	1	1	3	1	2			1	2	1	3	3	2	2
CO 5	1	1	3	1	2			1	2	1	3	3	1	1

Course Assessment Methods

Direct

1. Continuous Assessment through Reviews
2. End Semester Examinations

Indirect

1. Course - end survey

Signature of BoS Chairman

BoS Chairman,
Faculty of Computer Science and Engineering,
Vivekanandha College of
Engineering for Women,
Elayampalayam, Tiruchengode - 637 205.

Content of the syllabus			
Unit - I	**Introduction to Entrepreneurial Mindset**	Periods	6
Introduction-Evolution of the Concept of Entrepreneur - Characteristics of Successful Entrepreneurs - The Charms of Becoming an Entrepreneur - The Entrepreneurial Decision Process –Need and types of Entrepreneur – Role of Entrepreneurship in Economic Development -Women Entrepreneurship and Rural Entrepreneurship – Case Study – Opportunities Identification and Selection			
Unit – II	**Understanding the Business Model Canvas**	Periods	6
Definition of a Business Model- Types of Business Models -Customer Segments - Value Propositions – Channels and Partners - Customer Relationships - Revenue Model and Streams			
Unit – III	**Designing and Testing Business Models**	Periods	6
Key Resources - Key Activities - Key Partnerships - Cost Structure - Prototyping Business Models - Evaluating Business Models			
Unit – IV	**Business Model to Business Plan**	Periods	6
Business Plan - reasons for writing a Business Plan - who reads a business plan and what they're looking for - guidelines for writing an effective business plan - business plan Outline - present a business plan to potential investors.			
Unit - V	**Licenses, Permits and Funding**	Periods	6
Ethical culture in the entrepreneurial ventures – Dealing Effectively with legal Issues - Obtaining business licenses and permits – forms of Business Organization – Creating new-venture team – Skill Profile – case study – Need for Funding –Sources of Personal Funding, equity funding, debt financing			
		Total Periods	30

Text Books	
1	Khanka. S.S., "Entrepreneurial Development" S.Chand and Co. Ltd.. New Delhi, 2011, Revised Edition
2	Osterwalder, A., & Pigneur, Y. "Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers" John Wiley & Sons, Inc., 2010
3.	R. Duane Ireland Bruce R. Barringer "Entrepreneurship: Successfully Launching New Ventures", Pearson Education. 2020, 6th Edition
References	
1.	Donald F Kuratko, "Entrepreneurship – Theory, Process and Practice", Cengage Learning, 2016. 10th Edition
2.	Ries, E." The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses " , Currency, 2017, 9th Edition
E-Resources	
1.	https://fastercapital.com/content/Entrepreneurship-Education-via-Business-Model-Canvas.html
2.	https://online.bath.ac.uk/articles/business-models
3.	https://creately.com/guides/business-model-canvas-explained/

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Track II / III / IV – Competitive Examination / Higher Studies / Placement

	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution Affiliated to Anna University, Chennai) Elayampalayam,Tiruchengode– 637205						
Programme	**B.Tech.**	Programme code	**107**	Regulation	**2023**		
Department	**Computer Science and Technology**			Semester	**IV**		
Course Code	Course Name	Periods per week			Credit	Maximum Marks	
		L	T	P	C	CA	ESE	Total
U23CTCP3	**Verbal, Quantitative Aptitude and Reasoning - II**	2	0	0	1	40	60	100

Course Objective	The student should be made to, • Identify and begin to apply the language features • Understand the mathematical techniques for solving the real life problems • Use number theory arguments to justify relationships involving divisors, multiples and factoring • Perform well in all competitive exams	
Course Outcome	At the end of the course, the student should be able to,	Knowledge Level
	CO1: Use language through acquisition of grammar rules	K2
	CO2: Demonstrate the use of mathematical reasoning by justifying the patterns and relationships	K2
	CO3: Face external competitive exams	K3
	CO4: Solve a question in a fraction of minute using shortcut methods	K3
	CO5:Enhance their problem solving skills and logical Skills	K4
Pre-requisites	-	

CO / PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 – Weak

COs	Programme Outcomes (POs)												CO/PSO Mapping 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	PSO2	PSO3
CO 1		2		3	2					3		3	1	2	
CO 2	3	3		2	2					3		3	2	3	
CO 3	3	3		3	2					3		3	3	3	
CO 4	3	3		2	3					2		2	3	3	
CO 5		2		2	2					2		2	3	3	

Course Assessment Methods

Direct

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

Indirect

1. Course -end survey

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Content of the syllabus			
Unit -I	VERBAL ABILITY	Periods	4
Verbal Analogy, Sentence completion, Gen-Z lexis **STATEMENT ANALYSIS:** Statements and Conclusions, Statements and Assumptions, Statements and Agreements, Cause and effect, Making Judgements.			
Unit–II	PROFIT AND LOSS	Periods	8
PROBLEMS ON PROFIT AND LOSS PERCENTAGE: Profit Percentage, Cost Price and Selling Price are equal, Cost Price and Selling Price are different, Selling Price alone, Selling Price same for two objects, Selling Price and Cost Price are compared, Mixture, Profit Percentage and Loss Percentage are equal, False rate, Problems on Cost Price, Selling Price, Profit, Discount, Successive Discount and Discount Percentage. **SIMPLE AND COMPOUND INTEREST:** Simple Interest: Find Principal, Amount, Rate of Interest, Number of Years, Simple Interest based on lend into two parts, in case of instalments. Compound Interest: Find Principal, Amount, Rate of Interest, Number of Years, Compound Interest, Simple Interest in co-relation with Compound Interest, Instalments, Population, Present Worth.			
Unit – III	TIME AND WORK	Periods	6
Chain Rule, Combination of people working together, Individuals working together, Joining and Relieving, Efficiency Ratio Model, Works and Wages, Pipes open together: Doubling, Efficiency Ratio Model, Pipes opening and Closing, Capacity based model.			
Unit– IV	TIME, SPEED AND DISTANCE	Periods	6
Basic models, Ratio based model, Average speed based model, Relative speed based model, Algebra based model, Problems on Trains, Boats and Streams, Race and Games, Circular Track, Game based model.			
Unit-V	LOGICAL REASONING	Periods	6
DIRECTION SENSE: Direct yourself, based on Angle, Directional reference point, correct map based on wrong map, Direction in Clocks, Shadowing. **SEATING ARRANGEMENT:** Linear Seating Arrangement, Single row Uni-Directional and Bi-Directional, Dual row, Triple row, Square, Rectangular and Triangular Arrangement, Seating Arrangement in photograph, Circular Arrangement, Inside and Outside (Linear and Circular), Concentric Arrangement.			
		Total Periods	30

Text books	
1.	Rajeev Varma, "Fast Track Objective Arithmetics", Arihant Publications, 2024
2.	R.S. Aggarwal, "Modern Approach to Logical Reasoning", S Chand Publishing, 2022
3.	SP Bakshi, "Objective General English", Arihant Publications, 2024
References	
1.	R.S. Aggarwal, "Quantitative Aptitude for Competitive Examinations", S Chand Publishing, 2013
2.	Dinesh Khattar, "The Pearson guide to Quantitative Aptitude for Competitive Examinations", 3rd edition, 2016
3.	Arun Sharma, "How to Prepare for Logical reasoning for CAT", McGraw Hill Education, 2014
4.	Jaikishan and Premkishan, "How to Crack Test of Reasoning", Arihant Publications, 2016
5.	R.S. Agarwal, "A modern Approach to verbal and non-verbal reasoning", S Chand Publishing, 2018
E-Resources	
1.	Aptitude: https://www.indiabix.com
2.	Reasoning: https://placement.freshersworld.com
3.	Verbal: https://testbook.com

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