VIVEKANANDHA

COLLEGE OF ENGINEERING FOR WOMEN

(An Autonomous Institution Affiliated to Anna University – Chennai)
(Approved by AICTE - Accredited by NBA New Delhi and ISO 9001:2015 Certified)
Elayampalayam, Tiruchengode – 637 205, Namakkal District, Tamilnadu.

B.E. ELECTRONICS AND COMMUNICATION ENGINEERING

CURRICULA & SYLLABI

REGULATION 2023

(After 16th BoS)

Curriculum and Syllabus (1st &2nd Semester)

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

CHOICE BASED CREDIT SYSTEM
[CBCS]

COLLEGE VISION

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

COLLEGE MISSION

- To provide holistic education through innovative teaching-learning practices
- To instill self confidence among rural students by supplementing with 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 Produce Innovative, Creative, Ethical and Socially responsible Electronics and Communication women engineers to meet the global challenges

DEPARTMENT MISSION

- To create a unique learning environment in Electronics and Communication Engineering to mould a strong engineer with professional ethics
- To provide practical exposure to compete in the global market
- Fostering culture of innovation, research and lifelong learning

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

B.E. ELECTRONICS AND COMMUNICATION ENGINEERING

Regulation 2023

CHOICE BASED CREDIT SYSTEM

PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

PEO1: To offer strong theoretical and practical knowledge with managerial skills and entrepreneurial competencies.

PEO2: To impart analytic and questioning skills to broaden innovative ideas for Research and Development based on Industry requirements.

PEO3: To achieve a high level technical expertise in Electronics and Communication Engineering and inculcate professional ethics and social concern

PROGRAM SPECIFIC OUTCOMES (PSOs):

At the end of this program, graduate will be able to:

PSO 1: Comprehend the basic concepts of electronics and communication and apply in the day to day life to design and execute complete engineering systems.

PSO2: Design, verify and validate electronic functional elements for numerous applications including signal processing, communications, computer networks and VLSI.

PSO 3: Demonstrate the intellectual level with peer engineers and others to work together to arrive at a cost-effective, appropriate solution for various problems.

PROGRAM OUTCOMES (POs):

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

PO 2.   Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3.   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.

PO 4.   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.

3

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

PO 5. 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.

PO 6. 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.

PO 7. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
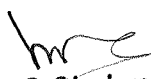
PO 8. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 9. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10. 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.

PO 11. 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.

PO 12. 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.

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

4

Programme	B. E	Programme Code	103	Regulation	2023
Department	ELECTRONICS AND COMMUNICATION ENGINEERING			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
U23CH101	Engineering Chemistry$	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									
U23CH102	Chemistry 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	-	-	-
U23MCFY2	Indian Constitution$	MC	2	0	0	0	100	-	100
					Total	20	520	480	1000

BSC - Basic Science Courses, ESC- Engineering Science Courses, MC-Mandatory courses, HSMC- Humanities and Social Sciences including management courses, EEC – Employability Enhancement courses, CA- Continuous Assessment, ESE - End Semester Examination.
*Common for all branches
$Common for ECE, EEE, BME, CIVIL& AGRI

BoS Chairman,
Faculty of Electronics and Communication Engineering.
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

Programme	B.E.		Programme Code	103	Regulation	2023
Department	ELECTRONICS AND COMMUNICATION ENGINEERING				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
U23PH201	Engineering Physics $^\$$	BSC	3	0	0	3	40	60	100
U23EC201	Circuit Analysis	PCC	3	0	0	3	40	60	100
U23TA202	தமிழரும்தொழில்நுட்பமும் / Tamils and Technology*	HSMC	1	0	0	1	40	60	100
THEORY INTEGRATED WITH PRACTICAL									
U23CS203	Python Programming$^@$	ESC	3	0	2	4	50	50	100
U23EN202	Professional Communication*	HSMC	2	0	3	3	50	50	100
PRACTICAL									
U23PH202	Physics Laboratory$^\$$	BSC	0	0	3	1	60	40	100
U23GE204	Engineering Practices Laboratory*	ESC	0	0	3	1	60	40	100
MANDATORY COURSES									
U23MCFY1	Environmental Science and Engineering$^\$$	MC	2	0	0	0	100	-	100
					Total	20	480	420	900

BSC - Basic Science Courses, ESC Engineering Science Courses, MC - Mandatory courses, HSMC- Humanities and Social Sciences including Management courses, PCC – Professional Core Courses, CA- Continuous Assessment, ESE - End Semester Examination.
*Common for all branches
$^@$Common for ECE, EEE, BME, BT, CIVIL & AGRI
^{S}Common for ECE, EEE, BME, CIVIL & AGRI

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

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

Programme	B.E.	Programme Code	103	Regulation	2023
Department	Electronics and Communication Engineering			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									
U23MA303	Transforms and Partial Differential Equations*	BSC	3	1	0	4	40	60	100
U23EC301	Semiconductor Physics and Technology	PCC	3	0	0	3	40	60	100
U23EC302	Signals and Systems	PCC	3	0	0	3	40	60	100
U23IT302	Data Structure#	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									
U23EC303	Digital Logic Circuit Design	PCC	3	0	1	4	40	60	100
PRACTICAL									
U23EC304	Devices and Circuits Laboratory	PCC	0	0	2	1	60	40	100
U23IT303	Data Structures Lab#	PCC	0	0	2	1	60	40	100
U23CTCP2	Personality Development@	EEC	1	0	2	1	60	40	100
					Total Credits	21	420	480	900

CA - Continuous Assessment, ESE - End Semester Examination, BSC - Basic Science Courses, PCC – Professional Core Courses, EEC - Employability Enhancement Courses.
Common for IT, CSE, CST, BME, ECE, EEE
* Common for BME, CIVIL, AGRI, Bio-Tech, ECE, EEE
@ Common for all branches

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

7

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

Programme	B.E.	Programme Code	103		Regulation		2023
Department	Electronics and Communication Engineering				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									
U23MA406	Probability and Random Processes	BSC	3	1	0	4	40	60	100
U23EC401	Electromagnetics and Transmission Lines	PCC	3	0	0	3	40	60	100
U23EC402	Electronic Circuits	PCC	3	0	0	3	40	60	100
U23EC403	Analog Integrated Circuits	PCC	3	0	0	3	40	60	100
U23ADL01	Additional Language[@]	EEC	3	0	0	2	40	60	100
THEORY INTEGRATED WITH PRACTICAL									
U23EC404	Digital Signal Processing	PCC	3	0	1	4	40	60	100
PRACTICAL									
U23EC405	Electronic Circuits Laboratory	PCC	0	0	2	1	60	40	100
U23EC406	Analog Integrated Circuits Laboratory	PCC	0	0	2	1	60	40	100
CAREAR TRACK COURSES									
	Career Track Course I[@]	EEC	2/0	0	2/0	1	40/60	60/40	100
	Total Credits					22	400/420	500/480	900

CA - Continuous Assessment, ESE - End Semester Examination, BSC - Basic Science Courses, PCC – Professional Core Courses , EEC - Employability Enhancement Courses.
[@] Common for all branches

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

8

Programme	B.E.	Programme Code	103		Regulation	2023
Department	Electronics and Communication Engineering				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									
U23EC501	Control System Engineering	PCC	3	0	0	3	40	60	100
U23EC502	Processor and Embedded Systems Design	PCC	3	0	0	3	40	60	100
U23EC503	Analog and Digital Communication	PCC	3	0	0	3	40	60	100
U23EC504	Antenna's and Waveguides	PCC	3	0	0	3	40	60	100
PRACTICAL									
U23EC505	Processor and Embedded Systems Design Laboratory	PCC	0	0	2	1	60	40	100
U23EC506	Analog and Digital Communication Laboratory	PCC	0	0	2	1	60	40	100
U23EC507	Mini project-I	EEC	0	0	3	1	100	-	100
PROFESSIONAL ELECTIVES									
	Professional Elective I	PEC	3	0	0	3	40	60	100
OPEN ELECTIVES									
	Open Elective I	OEC	3	0	0	3	40	60	100
CAREAR TRACK COURSE									
	Career Track Course III	EEC	3	0	0	1	100	-	100
			Total Credits			22	560	440	1000

CA - Continuous Assessment, ESE - End Semester Examination, PCC – Professional Core Courses, PEC - Professional Elective Courses, EEC - Employability Enhancement Courses, OEC-Open Elective Courses.

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
fc. ...omen (Autonomous),
Tiruchengode. Namakkal - 637 205.

| Programme | B.E. | Programme Code | 103 | Regulation | 2023 |
| Department | Electronics and Communication Engineering | | | 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									
U23EC601	VLSI and Chip Design	PCC	3	0	0	3	40	60	100
U23EC602	Computer and Communication Networks	PCC	3	0	0	3	40	60	100
U23EC603	Management Quality and Ethical Values	PCC	3	0	0	3	40	60	100
U23EC604	Internet of Things	PCC	3	0	0	3	40	60	100
PRACTICAL									
U23EC605	VLSI and Chip Design Laboratory	PCC	0	0	2	1	60	40	100
U23EC606	Computer and Communication Networks Laboratory	PCC	0	0	2	1	60	40	100
U23EC607	Mini Project -II	EEC	0	0	2	1	100	-	100
PROFESSIONAL ELECTIVES									
	Professional Elective II	PEC	3	0	0	3	40	60	100
OPEN ELECTIVES									
	Open Elective II	OEC	3	0	0	3	40	60	100
CAREAR TRACK COURSE									
	Career Track Course IV	EEC	3	0	0	1	100	-	100
			Total Credits			22	560	440	1000

CA - Continuous Assessment, ESE - End Semester Examination, PCC – Professional Core Courses , PEC - Professional Elective Courses , EEC - Employability Enhancement Courses, OEC-Open Elective Courses.

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

Programme	B.E.	Programme Code	103	Regulation	2023
Department	Electronics and Communication Engineering			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									
U23EC701	RF and Microwave Engineering	PCC	3	0	0	3	40	60	100
U23EC702	Digital Image Processing	PCC	3	0	0	3	40	60	100
PRACTICAL									
U23EC703	Project Phase I	EEC	2	0	0	2	100	–	100
U23EC704	RF and Microwave Engineering Laboratory	PCC	0	0	2	1	60	40	100
PROFESSIONAL ELECTIVES									
	Professional Elective III	PEC	3	0	0	3	40	60	100
	Professional Elective IV	PEC	3	0	0	3	40	60	100
OPEN ELECTIVES									
	Open Elective III	OEC	3	0	0	3	40	60	100
CAREAR TRACK COURSE									
	Career Track Course V	EEC	3	0	0	1	100	–	100
			Total Credits			19	460	340	800

CA - Continuous Assessment, ESE - End Semester Examination, PCC – Professional Core Courses , PEC - Professional Elective Courses , EEC - Employability Enhancement Courses, OEC-Open Elective Courses.

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

11

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

Programme	B.E.	Programme Code	103	Regulation	2023
Department	Electronics and Communication Engineering			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
PROFESSIONAL ELECTIVES									
	Professional Elective IV	PEC	3	0	0	3	40	60	100
	Professional Elective V	PEC	3	0	0	3	40	60	100
PRACTICAL									
U23EC801	Project Phase II	EEC	0	0	16	8	60	40	100
				Total Credits		14	140	160	300

CA - Continuous Assessment, ESE - End Semester Examination, PEC - Professional Elective Courses, EEC - Employability Enhancement Courses, OEC-Open Elective Courses

Cumulative Course Credit: **160 (2023-2027 Batch)**

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode, Namakkal - 637 205.

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

13

Programme	B.E.		Programme Code	103	Regulation	2023
Department	ELECTRONICS AND COMMUNICATION ENGINEERING			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		

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, 45th Edition, 2024.

References

1.	Kreyszig E, Advanced Engineering Mathematics (10th Edition), John Wiley (2015).
2.	Bali. N., Goyal. M. and Watkins. C., "Advanced Engineering Mathematics", Firewall Media (An imprint 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

BoS Chairman,
Faculty of Electronics and Communication Engineering.
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

15

<table>
<tr><td colspan="2" rowspan="3"></td><td colspan="7">VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
(Autonomous Institution, Affiliated to Anna University, Chennai)
Elayampalayam, Tiruchengode – 637 205</td><td colspan="2"></td></tr>
</table>

Programme	B.E.		Programme Code		103	Regulation		2023
Department	ELECTRONICS AND COMMUNICATION ENGINEERING					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, the 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	Nil

<table>
<tr><td colspan="14">CO / PO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak</td><td colspan="3">CO/PSO Mapping</td></tr>
<tr><td rowspan="2">Cos</td><td colspan="12">Programme Outcomes (POs)</td><td colspan="3">PSOs</td></tr>
<tr><td>PO 1</td><td>PO 2</td><td>PO 3</td><td>PO 4</td><td>PO 5</td><td>PO 6</td><td>PO 7</td><td>PO 8</td><td>PO 9</td><td>PO 10</td><td>PO 11</td><td>PO 12</td><td>PSO 1</td><td>PSO 2</td><td>PSO 3</td></tr>
<tr><td>CO 1</td><td></td><td></td><td></td><td></td><td></td><td>2</td><td>·</td><td></td><td>3</td><td>3</td><td></td><td>3</td><td></td><td></td><td>1</td></tr>
<tr><td>CO 2</td><td></td><td></td><td></td><td></td><td></td><td>2</td><td></td><td></td><td>3</td><td>3</td><td></td><td>3</td><td></td><td></td><td>1</td></tr>
<tr><td>CO 3</td><td></td><td></td><td></td><td></td><td></td><td>2</td><td></td><td></td><td>3</td><td>3</td><td></td><td>3</td><td></td><td></td><td>1</td></tr>
<tr><td>CO 4</td><td></td><td></td><td></td><td></td><td></td><td>2</td><td></td><td></td><td>3</td><td>3</td><td></td><td>3</td><td></td><td></td><td>1</td></tr>
<tr><td>CO 5</td><td></td><td></td><td></td><td></td><td></td><td>2</td><td></td><td></td><td>3</td><td>3</td><td></td><td>3</td><td></td><td></td><td>1</td></tr>
</table>

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		Periods	9

Listening-Introduction to Different Types of Listening, Listening to Casual Conversations, **Speaking-**

16

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

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, 2019.

References

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 English Skills for Engineers; oxford University Press, 2008.

E-Resources

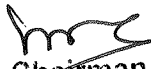| 1.	http://www.sparknotes.com/lit/the-alchemist/summary.html
2.	https://www.stephencovey.com/7habits/7habits.php
3.	http://en.wikipedia.org/wiki/The_Seven_Habits_of_Highly_Effective_People

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

Programme	B.E		Programme Code	103	Regulation	2023
Department	Electronics and Communication Engineering				Semester	I

Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CH101	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 properties and applications. • Familiarize about the Non renewable, 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	The students who complete this course successfully are expected 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	Nil	

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

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

The "CO/PSO Mapping" header spans the PSOs columns.

Course Assessment Methods

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

Indirect

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

1. Course - end survey

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, Electrodialysis. 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 vapour 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

Non renewable 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

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

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

Programme	B.E./B.Tech.		Programme Code	103	Regulation	2023
Department	Electronics and Communication Engineering				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

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

COs	Programme Outcomes (POs)												PSOs			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
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

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

Indirect

1. Course - end survey

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, Goto, Continue.

Unit – III	ARRAYS AND POINTERS	Periods	9

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode, Namakkal - 637 205.

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.Maliga, C. S. Kanimozhiand K.Kousalya, "Problem Solving and Programming", Tata McGraw Hill, 2019.
2.	E. Balagurusamy, "Programming in ANSI C", 8thEdition, McGraw Hill, 2019.

References

1.	Herbert Schildt, C: The Complete Reference, McGraw 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.MuniRathnan, "Computer Programming", VRB Publishers Pvt.Ltd, 2016.

Tools Required

	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/

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

21

Programme	B.E		Programme code	103	Regulation		2023
Department	ELECTRONICS AND COMMUNICATION ENGINEERING			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.

அலகு 5	இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்கு	Periods	3

இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு – இந்தியாவின் பிறபகுதிகளில் தமிழ்ப்பண்பாட்டின் தாக்கம் – சுயமரியாதை இயக்கம் – இந்திய மருத்துவத்தில் சித்தமருத்துவத்தின் பங்கு – கல்வெட்டுகள் கையெழுத்துப்படிகள் – தமிழ்ப்புத்தகங்களின் அச்சுவரலாறு.

		Total Periods	15

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

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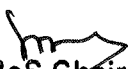### (Autonomous Institution Affiliated to Anna University Chennai)
Elayampalayam, Tiruchengode – 637 205

Programme	B.E	Programme code		103	Regulation		2023	
Department	ELECTRONICS AND COMMUNICATION ENGINEERING			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 Modern 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**

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tuchengode, Namakkal - 637 205.

23

TEXT-CUM-REFERENCE BOOKS

1	தமிழகவரலாறும் – மக்களும் பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2	கணினித்தமிழ் – முனைவர் இல. 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.

BoS Chairman,
Faculty of Electronics and Communication Engineering.
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

24

Programme	B.E		Programme Code	103	Regulation	2023	
Department	Electronics and Communication Engineering				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	Nil

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

Course Assessment Methods

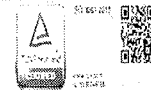| Direct |
|---|
| 1. Continuous Assessment Test I, II & III |
| 2. Assignment |
| 3. End-Semester examination |
| Indirect |
| 1. Course - end survey |

25

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

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 ,2019
2.	Jain and Gautam ,"Engineering Graphics & Design ",Khanna Publishing House, 2020

Reference Book :

1.	Dr.P.Kannan and Dr.J.Bensam Raj, "Engineering Graphics", JBR Tri Sea Publishers Pvt. Ltd,2024
2.	K.V Natarajan, "Engineering Drawing and Graphics", M/s. N.Dhanalakshmi, Chennai,2020
3.	K.Venugopal and V. Prabhu Raja, "Engineering Graphics"New Age International Publishers,2016
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,2014

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.

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

26

Programme	B.E		Programme code	103	Regulation		2023
Department	Electronics and Communication Engineering			Semester			1
Course Code	Course name		Periods per week		Credit	Maximum Marks	

Course Code	Course name	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.	
	At the end of the course, the student should be able to,	KL
Course Outcome	**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												CO/PSO Mapping	
	Programme Outcomes (POs)												PSOs	
COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	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

BoS Chairman,

Faculty of Electronics and Communication Engineering,

Vivekanandha College of Engineering

for Women (Autonomous),

Tiruchengode, Namakkal - 637 205.

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=2mjSDIBaUIM
7.	thevirtualinstructor.com/foreshortening.html

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

28

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

Programme	B.E		Programme Code	103	Regulation	2023
Department	Electronics and Communication Engineering				Semester	I

Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CH102	CHEMISTRY LABORATORY	0	0	2	1	60	40	100

Course 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 Outcome	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 spectrometric ally.	K4
	CO5: Determine hardness and dissolved oxygen present in domestic water supply and Identify alkalinity and available chlorine present in the given sample.	K4

Pre-requisites	Nil	

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

Course Assessment Methods

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

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

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	

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
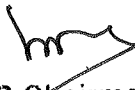Tiruchengode. Namakkal - 637 205.

Programme	B.E.		Programme Code	103	Regulation	2023
Department	ELECTRONICS AND COMMUNICATION ENGINEERING			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													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	PSO 3	PSO4
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
2. End-Semester examinations

Indirect
1. Course - end survey

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:	CO2

31

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".	

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 and Largest element: 5
	CO2

8. Write a C program to find the sum of all the multiples of 3 and 5 below 100using 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

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
      Roll No: 101
      Percentage: 89.70
	CO5

	Total Periods	**30**

Tools Required

Code tandra /Hacker Rank/Hacker Earth/ 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/

Programme	B.E		Programme Code	103	Regulation	2023
Department	Electronics and Communication Engineering				Semester	I

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: i) To know about the basic structure of Indian constitution. ii) To know about our Central government Executive system of India iii) To know about our State government Executive system of India iv) To learn the Election system, Amendments and Emergency Provisions given by the constitution. v) 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	---

CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak												CO/PSO Mapping		
COs	Programme Outcomes (POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1						3		3	2						
CO 2						3		3	3						
CO 3						3		3	2						
CO 4						3		3	3						
CO 5						3		3	3						

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
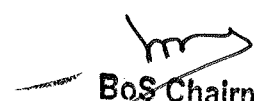Tiruchengode. Namakkal - 637 205.

33

Course Assessment Methods

Direct

1. Continuous Assessment Test I, II & III
2. Assignment

Indirect

Course - end survey

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/

34

BoS Chairman,
Faculty of Electronics and Communication Engineering.
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

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

Programme	B.E		Programme Code	103	Regulation	2023
Department	ELECTRONICS AND COMMUNICATION ENGINEERING				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
4. Continuous Assessment Test I, II & III
5. Assignment.
6. End-Semester examinations

Indirect
2. Course - end survey

Content of the syllabus

Unit – I	ANALYTIC FUNCTIONS	Periods	9+3

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

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

3.	Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 45th Edition, 2024.
4.	Ravish R Sing , Mukul Bhatt, "Engineering Mathematics", Mc Graw Hill Education Pvt. Ltd-2018
5.	Sivaramakrishna Das. P, Vijayakumari.C, " Engineering Mathematics – II", Pearson India Education Pvt. Ltd-2022.

References

6.	Wylie, R.C. and Barrett, L.C., "Advanced Engineering Mathematics" , Tata McGraw Hill Education Pvt. Ltd, 6th Edition, New Delhi, 2012.
7.	Kreyszig, E., Advanced Engineering Mathematics (10th Edition), John Wiley (2015).
8.	Alan Jefferis , Advanced Engineering Mathematics, Academic Press- New Delhi-2003
9.	Yunus A.Cengel, William J.Palm III," Differential equations for Engineers & Scientists", Tata McGraw Hill Education Pvt. Ltd, 6th Edition, New Delhi, 2012.
10.	John Bird, Higher Engineering Mathematics, Anuradha Agencies(2004)

E-Resources

4.	https://en.wikipedia.org › wiki › Ordinary_differential_equation
5.	www.learnerstv.com/Free-engineering-Video-lectures
6.	www.nptel.ac.in

Programme	B.E.		Programme Code	103	Regulation		2023
Department	Electronics and Communication Engineering				Semester		II

Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23PH201	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 ultrasonics. • 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
	• understand the elastic properties of the materials	K2
	• gain knowledge about the conduction properties of metals	K3
	• determine packing factor for various unit cells and understand different types of crystal imperfections and learn the engineering, medical applications.	K1
	• discuss the basic idea of semiconducting materials and realize the function of modern engineering materials	K1
	• 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													CO/PSO Mapping	
COs	Programme Outcomes (POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	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

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

37

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

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

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.Panneerselvam 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

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode, Namakkal - 637 205.

Programme	B.E.		Programme Code		103	Regulation	2023

Department	Electronics and Communication Engineering					Semester	II

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

Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23EC201	Circuit Analysis	3	0	0	3	40	60	100

Course Objective	The students should made • To introduce electric circuits and its analysis • To Impart knowledge on solving circuits using network theorems • To know the phenomenon of resonance and coupled circuits. • To study the transient response of circuits for various inputs • To learn about two port networks and its parameters.

Course Outcome	At the end of the course, the student should be able to,	Knowledge Level
	CO1: Understand the basic laws & network theorems and its applications to solving networks for DC inputs.	K1
	CO2: Explain the basic network theorems and its applications to solving networks for AC inputs.	K2
	CO3: Illustrate the concepts of Transient Circuits.	K2
	CO4: Observe the concepts of series & parallel resonance and coupled circuits.	K3
	CO5: Classify the two-port networks, parameters and its interconnections.	K2

Pre-requisites	Basic concepts of physics, particularly about Electricity and Magnetism.

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

CO/PSO Mapping

COs	Programme Outcomes (POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	2	1									3	3		2
CO 2	3	2	1									3	3		2
CO 3	3		1		1							3	3		3
CO 4	3	2	1									3	3		2
CO 5	3	2	1									3	3		2

Course Assessment Methods

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

Indirect
1. Course - end Survey

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

Content of the Course

Unit – I	DC Circuits	Periods	9
Fundamentals of DC circuits and basic Kirchoff's Laws- Star-Delta Transformation -Mesh Analysis-Nodal Analysis - Superposition Theorem-Thevenin Theorem, Norton Theorem-Maximum Power Transfer Theorem.			
Unit - II	AC Circuits	Periods	9
Fundamentals of AC circuits -Mesh Analysis-Nodal Analysis – Star-Delta Transformation-Superposition Theorem-Thevenin Theorem, Norton Theorem-Maximum Power Transfer Theorem			
Unit – III	Transient Analysis	Periods	9
DC response of RL, RC and RLC Circuits – Sinusoidal response of RL, RC and RLC circuits-Impulse response of RL, RC and RLC circuits.			
Unit - IV	Resonance and Coupled Circuits	Periods	9
Series Resonance-Impedance, resonant frequency, Quality Factor (Q), Bandwidth, power dissipation and half power frequency. Parallel Resonance-Impedance, resonant frequency, Quality Factor (Q), Bandwidth, power dissipation and half power frequency. Self and Mutual Inductances, Coefficient of coupling.			
Unit – V	Two Port Network	Periods	9
Two-port Network-Open-Circuit Impedance (Z) Parameters-Short-Circuit Admittance (Y) Parameters-Transmission (ABCD) Parameters-Hybrid (H) Parameters, Relationship between two port parameters, interconnections of Two port networks			
		Total Periods	45

Text Books

1.	Charles K. Alexander, Matthew N. O. Sadiku, 'Fundamentals of Electric Circuits', McGraw-Hill Publications, Reprint 2022.
2.	Sudhakar A. and Shyammohan S. Palli, "Circuits and Networks Analysis and Synthesis", 5th Edition, McGraw-Hill Education, New Delhi, 2017.

References

1.	Hayt W.H., Kemmerly J.E., Durbin S.M., "Engineering Circuit Analysis", 9th Edition, Tata McGraw-Hill, New Delhi, 2020.
2.	Ravish R. Singh, "Network Analysis and Synthesis", McGraw-Hill Education, New Delhi, 2017.

E-Resources

1.	https://nptel.ac.in/courses/117106108/
2.	http://www.ee.iitm.ac.in/videolectures/doku.php?id=ec1010_2014nk:start
3.	https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-002-circuits-and-electronics-spring-2007/lecture-notes

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

40

Programme	B.E	Programme code		103	Regulation		2023
Department	ELECTRONICS AND COMMUNICATION ENGINEERING			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 – கல்மணிகள்இ கண்ணாடிமணிகள் – சுடுமண்மணிகள் – சங்குமணிகள் – எலும்புத்துண்டுகள் – தொல்லியல்சான்றுகள் – சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.

அலகு 4	வேளாண்மை மற்றும் நீர்ப்பாசனத்தொழில்நுட்பம்	Periods	3

அணை ஏரிஇ குளங்கள் இமதகு – 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 – சொற்குவைத்திட்டம்.

		Total Periods	15

BoS Chairman,
Faculty of Electronics and Communication Engineering.
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode, Namakkal - 637 205.

Programme	B.E	Programme code		103	Regulation		2023
Department	ELECTRONICS AND COMMUNICATION ENGINEERING			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**

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

TEXT-CUM-REFERENCE BOOKS

1	தமிழகவரலாறும் – மக்களும்பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடுபாடநூல்மற்றும்கல்வியியல்பணிகள்கழகம்).
2	கணினித்தமிழ் – முனைவர்இல. சுந்தரம். (விகடன்பிரசுரம்).
3	கீழடி – வைகைநதிக்கரையில்சங்ககநகரநாகரிகம் (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.

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

Programme	B.E		Programme Code	103	Regulation	2023
Department	ELECTRONICS AND COMMUNICATION ENGINEERING				Semester	II

Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23CS203	Python Programming	3	0	2	4	50	50	100

Course Objective	The student should be made to, Understand the fundamentals of Python programming Handle list, tuples, sets and Dictionaries data types Learn function prototypes and string functions. Use files and modules for data processing Understand packages in Python and data visualization

Course Outcome	At the end of the course, the student should be able to,	Knowledge Level
	CO1: Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.	K3
	CO2: Perform operations on list, tuples, sets and Dictionaries using python.	K3
	CO3: Implement function prototypes and string functions.	K3
	CO4: Apply files and modules and perform operations on CSV files.	K3
	CO5:Perform data visualization and apply Python packages for CSV files	K3

Pre-requisites	Nil

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

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	PS O1	PSO 2	PSO 3	PSO 4
CO 1	3	2	1	-	1	-	-	-	-	-	-	2	3	2	-	-
CO 2	3	3	1	1	2	-	-	-	-	-	-	2	3	2	-	-
CO 3	3	3	1	2	2	-	-	-	-	-	-	2	3	2	-	-
CO 4	3	3	1	2	2	-	-	-	-	-	-	2	3	2	-	-
CO 5	3	3	1	2	2	-	-	-	-	-	-	2	3	2	-	-

Course Assessment Methods

Direct

Continuous Assessment Test I, II & III
Assignments / Quiz
End-Semester examinations

Indirect

Course - End survey

Content of the syllabus

Unit – I	INTRODUCTION TO PYTHON	Periods	9

Introduction to Python, features, installing Python, writing and executing Python program — native data types, comments, constants, variables, operators, expression, conditional statements, control statements, continue, pass, break.

Unit - II	LISTS, TUPLES, SETS AND DICTIONARIES	Periods	9

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Sets: methods and operators, Dictionaries: operations and methods.

44

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal – 637 205.

Unit – III	FUNCTIONS AND STRINGS	Periods	9

Functions definition, declaration, arguments, parameters – formal and local, parameter passing methods – function prototypes, recursion; Strings: string slices, immutability, string functions and methods, string module, regular expressions.

Unit - IV	FILES AND MODULES	Periods	9

Files and exception: Text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, accessing CSV file.

Unit – V	PACKAGES AND DATA VISUALIZATION	Periods	9

Text processing, Numerical processing: numpy package – mean, medium and mode, pandas package – vector, dataframe, data visualization: matplotlib, Time operations.

	Total Periods	45

Suggested List of Experiments

List of Experiments	CO's
Write a program to demonstrate different number data types in Python.	CO1
Write a program to perform different Arithmetic Operations on numbers in Python.	CO1
Write a program to create, append and remove lists and demonstrate the tuples in python.	CO2
Write a program to demonstrate working with dictionaries in python.	CO2
Write a program to create, concatenate and print a string and accessing sub-string from a given string.	CO3
Write a Python function to calculate the factorial of a number (a non-negative integer). The function accepts the number as an argument.	CO3
Write a program to compute the number of characters, words and lines in a file.	CO4
To write a Python program to find the most frequent words in a text read from a file.	CO4
Find mean, median, mode for the given set of numbers in a list.	CO5
Draw a horizontal bar chart with Matplotlib	CO5

Lecture 45: Practical 30;Total: 75

Text Books

	AnuragGupta,G.P BISWAS ,” Python Programming – Problem solving, packages and Libraries, Edition 1, McGraw Hill, 2019	
	E Balagurusamy, “Problem Solving and Python Programming”, Edition1, McGraw Hill, 2018	
	ReemaThareja, “Python Programming using Problem Solving Approach”, OXFORD University Press, 2017.	

References

	Allen B. Downey, “Think Python: How to Think Like a Computer Scientist‟, 2nd edition, Updated for Python 3, Shroff/O‘Reilly Publishers, 2016.
	John V Guttag, ―Introduction to Computation and Programming Using Python‟, Revised and expanded Edition, MIT Press , 2021
	Guido van Rossum (Author), The Python Development Team (Author),An Introduction to Python Tutorial and What's New ,2022,Shroff Publishers first edition

E-Resources

1.	http://greenteapress.com/wp/think- python/)
2.	https://www.python.org/about/gettingstarted/
3.	https://beginnersbook.com/2018/03/python-tutorial-learn-programming/
4.	https://www.tutorialspoint.com/python/index.htm
5.	https://www.learnpython.org/
6.	https://www.udemy.com/topic/python/free

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

Programme	B.E.		Programme Code	103	Regulation		2023
Department	ELECTRONICS AND COMMUNICATION ENGINEERING				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	Nil

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						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
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

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

Programme	B.E.		Programme Code	103	Regulation	2023
Department	Electronics and Communication Engineering (ECE)				Semester	II

Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23PH202	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
Pre-requisites	Nil	

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	

BoS Chairman,
Faculty of Electronics and Communication Engineering.
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

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

PHYSICS LABORATORY

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 Physics: Theory and Practical, Wiley Pub,2 nd 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.

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

Programme	B.E		Programme Code	103	Regulation		2023
Department	Electronics and Communication Engineering				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 1. Know the plumbing line assemblies. 2. Weld lap joint, butt joint and T-joint. 3. Learn the assembling and dismantling methodology of home appliances. 4. Learn the resistor value identification through colors coated on resistor. 5. Learn the basics of signal generation in CRO. 6. 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													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	3	2	2	-	-	-	2	-	-	-	2	3	-
CO 2	3	2	3	2	2	-	-	-	2	-	-	-	2	-	-
CO 3	3	2	2	3	2	2	-	-	2	-	-	-	2	-	-
CO 4	3	2	2	3	2	2	-	-	2	-	-	-	2	3	-
CO 5	3	2	3	3	2	2	-	-	2	-	-	-	2	-	3

Course Assessment Methods

Direct

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

Indirect

1. Course –End survey

Content of the Syllabus

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

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

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.

Programme	B.E		Programme Code	103	Regulation	2023
Department	Electronics and Communication Engineering				Semester	II

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: Awareness about population growth, human rights and Environment	K2

Pre-requisites	NIL	

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

Course Assessment Methods

Direct
1. Continuous Assessment Test I, II & III 2. Assignment

Indirect
1. Course - end survey

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode, Namakkal - 637 205.

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, data base, GeographicalInformation 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/

\mathcal{W\!r\!\mathcal{S}}

BoS Chairman,
Faculty of Electronics and Communication Engineering,
Vivekanandha College of Engineering
for Women (Autonomous),
Tiruchengode. Namakkal - 637 205.