VIVEKANANDHA

COLLEGE OF ENGINEERING FOR WOMEN

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

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.E- ELECTRICAL AND ELECTRONICS ENGINEERING

(CURRICULUM & SYLLABI -2023)

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

(Regulation 2023)

VIVEKANANDHA
COLLEGE OF ENGINEERING FOR WOMEN
(An Autonomous Institution Affiliated to Anna University-Chennai)

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

The Vision of Electrical and Electronics Engineering Department is to be a center of excellence in technical education and research by producing world-class graduates to meet future challenges of the country.

DEPARTMENT MISSION

The Mission of the Electrical and Electronics Engineering Department is

- To impart quality education to our students and provide a comprehensive understanding of Electrical & Electronics Engineering and produce a new generation of knowledgeable, skilled, innovative engineers.
- To stabilize the students to understand the responsibility as an engineer who prove to be good citizens having concern for society, environment and ethical issues.
- To evolve the student community to adapt appropriate sustainable technologies through remarkable contribution for rural needs.

PROGRAM EDUCATIONAL OBJECTIVES (PEO’s)

PEO1: To provide students with the knowledge of Basic Sciences in general and Electrical and electronics Engineering in particular so as to acquire the necessary skills for analysis and synthesis of problems in generation, transmission and distribution.

PEO2: To provide technical knowledge and skills to identify, comprehend and solve complex tasks in industry and research and inspire the students to become future researchers / scientists with innovative ideas.

PEO3: To prepare the students for successful employment in various Industrial and Government organizations, both at the National and International level, with professional competence and ethical administrative acumen so as to handle critical situations and meet deadlines.

PEO4: To train the students in basic human and technical communication skills so that they may be good team-members, leaders and responsible citizen

PROGRAM SPECIFIC OUTCOMES (PSO's):

PSO 1. Basic Knowledge: Apply fundamental knowledge to identify, formulate, design and investigate various problems of electrical, electronic circuits and power systems.

PSO 2. Software Tools: Apply modern software tools for design, simulation and analysis of electrical systems to engage in life- long learning and to successfully adapt in multi-disciplinary environments.

PSO 3. Electrical Engineering Problem Solved: Solve ethically and professionally various Electrical Engineering problems in societal and environmental context and communicate effectively.

PSO 4. Understand Recent Technology: Ability to understand the recent technological developments in Electrical & Electronics Engineering and develop products/software to cater the societal & Industrial needs.

PROGRAM OUTCOMES (PO's)

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
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Elayampalayam, Tiruchengode – 637 205

Programme	**B. E**	Programme Code	102	Regulation	**2023**
Department	**ELECTRICAL AND ELECTRONICS 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[$]	BSC	3	0	0	3	40	60	100
U23CS101	Programming for Problem Solving*	ESC	3	0	0	3	40	60	100
U23TA101	தமிழர்மரபு / Heritage of Tamils*	HSMC	1	0	0	1	40	60	100
THEORY INTEGRATED WITH PRACTICAL									
U23GE101	Engineering Graphics*	ESC	2	0	3	3	50	50	100
PRACTICAL INTEGRATED WITH THEORY									
U23GE102	Design Thinking*	EEC	1	0	2	1	50	50	100
PRACTICAL									
U23CH102	Chemistry Laboratory[$]	BSC	0	0	2	1	60	40	100
U23CS102	Programming for Problem Solving Laboratory*	ESC	0	0	2	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

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

Programme	**B.E.**	Programme Code	102	Regulation	**2023**
Department	**ELECTRICAL AND ELECTRONICS ENGINEERING**			Semester	**II**

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									
U23MA202	Complex Analysis and Ordinary Differential Equations*	BSC	3	1	0	4	40	60	100
U23PH201	Engineering Physics [$]	BSC	3	0	0	3	40	60	100
U23EE202	Electric Circuit Theory	ESC	3	0	0	3	40	60	100
U23TA202	தமிழரும்தொழில்நுட்பமும்/ Tamils and Technology*	HSMC	1	0	0	1	40	60	100
THEORY INTEGRATED WITH PRACTICAL									
U23CS203	Python Programming[@]	ESC	3	0	2	4	50	50	100
U23EN202	Professional Communication*	HSMC	2	0	3	3	50	50	100
PRACTICAL									
U23PH202	Physics Laboratory[$]	BSC	0	0	2	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, CA- Continuous Assessment, ESE - End Semester Examination.

*Common for all branches

[@]Common for EEE, ECE, BME & BT

[$]Common for ECE, EEE & BME

	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205								
Programme	**B.E**	Programme Code		**102**	Regulation	**2023**			
Department	**ELECTRICAL AND ELECTRONICS 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

- 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.	K1,K3
CO2: Apply differential calculus tools in solving various application problems.	K2,K4
CO3: Able to use differential calculus ideas on several variable functions.	K3,K5
CO4: Apply different methods of integration in solving practical problems.	K2,K5
CO5: Apply multiple integral ideas in solving areas, volumes and other practical problems.	K3,K5

Pre-requisites -

CO / PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2 – Medium, 1 - Weak													**CO/PSO Mapping**		
COs	Programme Outcomes (POs)												PSOs		
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**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	**12**
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	**12**
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	**12**
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	**12**
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	**12**
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	**60**

Text Books	
1.	Stewart, J. Calculus: Early Transcendentals (8th Edition), Cengage Learning, 2015.
2.	Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 43rd Edition, 2014.
References	
1.	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

Programme	B.E	Programme code	102	Regulation	2023
Department	**ELECTRICAL AND ELECTRONICS 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

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	
Outcomes	The students who complete this course successfully are expected 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-Requisities	**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	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO 2**	**PSO 3**	**PSO4**
CO 1						2			3	3		3		2		
CO 2						2			3	3		3		2		
CO 3						2			3	3		3		2		
CO 4						2			3	3		3		2		
CO 5						2			3	3		3		2		

	Course Assessment Methods **Direct** 1. Continuous Assessment Test I, II & III 2. Assignments 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**-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 Suprasegmental 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.	Sumant. s, Pereira Joyce, Shameem.M, Selvarajan.R-English Communication Skills,Vijay Nicole imprints Pvt.Ltd, 2015.
2.	Sokkaalingam, S.RM., The Art Of Speaking EnglishVersatile Publishing House,2018.
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

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Elayampalayam, Tiruchengode – 637 205

Programme	B.E	Programme code	102	Regulation	2023
Department	**Electrical and Electronics 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

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.

Outcomes

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 Nano particles 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-Requisities: **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**	**PSO 4**
CO 1	3	3	3	2	1	2	2	2					1	1	1	1
CO 2	3	2	2	2		2	2	1					2	2	1	1
CO 3	3	2	2	3	2	1	2	1					2	1	2	2
CO 4	3	3	2	2	1	1	3	2					3	2	1	1
CO 5	3	3	3	2	1	2	2	1					2	1	1	1

	Course Assessment Methods **Direct** Continuous Assessment Test I, II & III Assignment End-Semester examinations **Indirect** 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, Problems due to hard water in boilers - 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, 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, 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, PMMA, PC, 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
Nonrenewable energy - Nuclear energy, nuclear reaction and its types, nuclear power plant and its working (Light water nuclear power plant & Breeder reactor).Renewable energy and its sources - Solar Energy - Photo voltaic cells, Importance of Solar cells - p-n junctions in Solar 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), Electro less plating (Ni).			
		Total Periods	**45**

Text Books:

1.	O.G.Palanna, “Engineering Chemistry “Tata Mc GrawHill PVT,Ltd. Second Edition -2017
2.	Dr.S.Vairam ,Dr.S.Mageswari,Dr.K.Balachandran, Engineering Chemistry : First Edition, Wiley publication,Reprint-2016

References:	
1.	Engineering Chemistry: Jain & Jain, Dhanpat Rai Publishing Company Edition- 16- 2015.
2.	Arun Bahl, B.S. Bahl, G.D. Tuli, Essentials of Physical Chemistry, Published by S. Chand & Company Ltd, 2014
3.	Engineering Chemistry: Sashi Chawla, Dhanpat Rai & Co (pvt.)ltd. Edition- 5- 2013.
4.	Dr.S.Vairam ,Dr.Suba Ramesh, Engineering Chemistry: First Edition, Wiley publication,Reprint-2016
E-Resources.	
1	https://www.who.int/water_sanitation_health/dwq/arsenicun6.pdf
2	https://www.schandpublishing.com/books/tech-professional/applied-science/a-textbook-polymer-chemistry/9788121941129/#.XdZ214MzY2w
3	https://www.elsevier.com/books/nanochemistry/klabunde/978-0-444-59397-9

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Programme	**B.E./B.Tech.**	Programme Code	**102**	Regulation	**2023**				
Department	**CSE, EEE, ECE, IT, BT, CST & BME**			Semester	**I**				
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks			
		L	T	P	C	CA	ESE	Total	
U23CS101	**Programming for Problem Solving**	3	0	0	3	40	60	100	

Course Objective	The main objective of this course is to: • Learn the fundamentals of computers, languages , number systems and acquire problem solving skills in C Programming	
Course Outcome	At the end of the course, the student should be able to,	Knowledge Level
	CO1: Examine number systems and to apply problem solving techniques	K3
	CO2: Learn the basics of C programming with branching and looping statements	K2
	CO3: Experiment the C programs using Arrays and Pointers for simple applications	K3
	CO4: Solve C programs with the Functions and Strings	K3
	CO5: Apply Structures, Union and File concepts to solve simple real world problems	K3

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**	**PSO 4**
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**
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 - mallaoc, 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”, 8th Edition, 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/

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

Programme	B.E.	Programme code	102	Regulation	2023
Department	**ELECTRICAL AND ELECTRONICS ENGINEERING**			Semester	I

Course code	Course name	Periods per week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23TA101	***தமிழர்மரபு*** **Heritage of Tamils**	1	0	0	1	40	60	100

	Content of the syllabus		
அலகு 1	**மொழி மற்றும் இலக்கியம்**	**Periods**	3

இந்திய மொழிக்குடும்பங்கள் - திராவிடமொழிகள் - தமிழ் ஓர செம்மொழி–தமிழ் செவ்விலக்கியங்கள் - சங்க இலக்கியத்தின் சமயச் சார்பற்றதன்மை–சங்க இலக்கியத்தில் பகிர்தல் அறம் திருக்குறளில் மேலாண்மைக் கருத்துக்கள் தமிழ்க் காப்பியங்கள் தமிழகத்தில் சமண பௌத்த சமயங்களின் தாக்கம் - பக்தி இலக்கியம்,ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலக்கியங்கள் - தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி - தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

அலகு 2	**மரபு–பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை–சிற்பக் கலை**	**Periods**	3

நடுகல் முதல் நவீனசிற்பங்கள் வரை–ஐம்பொன் சிலைகள் பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள்,பொம்மைகள் - தேர் செய்யும் கலை - சுடுமண் சிற்பங்கள் - நாட்டுப்புறத் தெய்வங்கள் - குமரிமுனையில் திருவள்ளுவர் சிலை - இசைக் கருவிகள் - மிருதங்கம்,பறை,வீணை. யாழ்,நாதஸ்வரம் - தமிழர்களின் சமூகபொருளாதாரவாழ்வில் கோவல்களின் பங்கு.

அலகு 3	**நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள்:**	**Periods**	3

தெருக்கூத்து,கரகாட்டம்,வில்லுப்பாட்டு,கணியான் கூத்து,ஒயிலாட்டம்,தோல்பாவைக்கூத்து,சிலம்பாட்டம்,வளரி,புலியாட்டம்,தமிழர்களின் விளையாட்டுகள்.

அலகு 4	**தமிழர்களின் திணைக் கோட்பாடுகள்:**	**Periods**	**3**
தமிழகத்தின் தாவரங்களும்,விலங்குளும் - தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் - தமிழர்கள் போற்றியஅறக்கோட்பாடு - சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவும்,கல்வியும் - சங்ககாலநகரங்களும் துறைமுகங்களும் - சங்ககாலத்தில் ஏற்றுமதிமற்றும் இறக்குமதி–கடல்கடந்தநாடுகளில் சோழர்களின் வெற்றி.			
அலகு 5	**இந்தியதேசிய இயக்கம் மற்றும் இந்தியபண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு:**	**Periods**	**3**
இந்தியவிடுதலைப்போரில் தமிழர்களின் பங்கு - இந்தியாவின் பிறப்பகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் - சுயமரியாதை இயக்கம் - இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு–கல்வெட்டுகள், கையெழுத்துப்படிகள் - தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.			
		Total Periods	**15**

TEXT-CUM-REFERENCE BOOKS

1	தமிழக வரலாறும் – மக்களும்பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு: தமிழ் நாடு பாட நூல் மற்றும் கல்வியியல்பணிகள்கழகம்).
2	கணினித்தமிழ் – முனைவர்இல. சுந்தரம். (விகடன்பிரசுரம்).
3	கீழடி – வைகை நதிக்கரையில் சங்க நகரநாகரிகம் (தொல்லியல்துறைவெளியீடு)
4	பொருநை - ஆற்றங்கரைநாகரிகம். (தொல்லியல்வெளியீடு)

	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	ELECTRICAL AND ELECTRONICS ENGINEERING		Semester		I

Course code	Course name	Periods per week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23TA101	தமிழர்மரபு /Heritage of Tamils	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 TamilL and-Bakthi Literature Azhwarsand Nayanmars- Forms of minor Poetry- Development of Modem literature in Tamil-Contribution of Bharathiyar and Bharathidhasan.

UNIT II	HERITAGE-ROCKARTPAINTINGSTOMODERNART–SCULPTURE	Periods	3

Hero stone to modern sculpture -Bronzeicons- Tribe sandtheir hand crafts- Artof templecar making— Massive Terracotta sculptures Village deities, Thiruvalluvar Statueat Kanyakumari ,Making of musicalinstruments- Mridhangam ,Parai Veenai, Yazhand Nadhaswaram-Roleof Temple sin Social and Economic Life of Tamils .

UNIT Il1	FOLK AND MARTIAL ARTS	Periods	3

Therukoothu, Karagattam, VilluPattu, Kaniyan Koothu, Oyillattam, Leatherpuppetry, Silambattam, Valari, Tigerdance –Sportsand Games of Tamils.

UNIT IV	THINAI CONCEPT OF TAMILS	Periods	3

Flora and Fauna of Tamils &Ahamand Puram Concept from Tholkappiyamand Sangam Literature- Aram Concept of Tamils –Educationand Literacy during Sangam Age –Ancient Cities and Ports of Sangam Age-Exportand Importduring Sangam Age- Over seas Conquestof Cholas.

UNIT V	CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE	Periods	3

Contribution of amils to Indian Freedom Struggle –The Cultural Influence of Tamils over theother parts of India –Self –Respect Movement- Role of Siddha Medicine in Indigenous Systems of Medicine–Inscriptions &Manuscripts–Print History of Tamil Books.

Total Period: 15

1	Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
2	Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies
3	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
4	The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
5	Keeladi - 'Sangam City C ivilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
6	Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Publishedby: The Author)
7	Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Bookand Educational Services Corporation, Tamil Nadu)
8	Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
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Elayampalayam, Tiruchengode – 637 205

Programme	**B.E**	Programme Code	**102**			Regulation	**2023**		
Department	**Electrical & Electronics 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.	K1
Pre - requisites	Nil	

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

Course Assessment Methods

Direct

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

Indirect

1. Course - end survey

Content of the Syllabus				
Concepts & Conventions(Not for Examination)		Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.	**Periods**	**1**
Unit – I		**PROJECTION OF POINTS, LINES AND PLANE SURFACES**	**Periods**	**3+8**
Introduction to Plane curves, Orthographic projection – principles – projection of points, straight lines (only first angle projections) and plane surfaces (polygonal and circular).				
Unit - II		**PROJECTION OF SOLIDS**	**Periods**	**3+8**
Projections of simple solids like prisms, pyramids, cylinder and cone when the axis isinclined 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:				
T1.	Basant Agrawal and C.M Agrawal ,“Engineering Drawing ”,Tata McGraw Hill ,Third Edition,2019			
T2	Jain and Gautam ,“Engineering Graphics & Design ”,Khanna Publishing House, 2018			
Reference Book :				
R1.	Dr.P.Kannan and Dr.J.Bensam Raj, “Engineering Graphics”, JBR Tri Sea Publishers Pvt. Ltd,2018.			
R2.	K.V Natarajan, "Engineering Drawing and Graphics", M/s. N.Dhanalakshmi, Chennai,2014.			
R3.	K.Venugopal and V. Prabhu Raja, “Engineering Graphics”New Age International Publishers,2011.			
R4.	N.S Parthasarathy and Velamurali, “ Engineering Graphics”, Oxford University, New Delhi,2015			
R5.	Bhatt N.D and Panchal V.M, “Engineering Drawing”, Charotar Publishing House,50th Edition,2010			
e-RESOURCES:				
E1.	http://nptel.ac.in/courses/105104148, “Engineering Graphics” - Dr. Nihar Ranjan Patra , IIT Kanpur			
E2.	http://cfd.annauniv.edu/webcontent.htm, “Engineering Graphics” - Dr.Velamurali			
E3.	http://link.springer.com/ “Engineering Graphics”-Springer Nature.			

	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205				
Programme	**B.E/B.Tech**	Programme code	**101**	Regulation	**2023**
Department	**All Branches**		Semester		**I**

Course Code	Course name	Periods per week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23GE102	**Design Thinking**	1	0	2	1	50	50	100

Course Objective

The student should be made to,

- familiarize with design thinking concepts and principles
- practice the methods, processes and tools of design thinking.
- apply the design thinking approach and have ability to model real world situations.

Course Outcome

At the end of the course, the student should be able to,	**KL**
CO1: Understand and apply the concept of team building activity	K2
CO2: Understand Design Thinking and apply the designthinking 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**	
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**
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

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.	IdrisMootee, "Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School", John Wiley & Sons 2013.
3.	YousefHaik 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 CreativePotential Within Us All by by Tom 2014
4.	The Design of Everyday Things: by Don Norman 2013

E-Resources

1.	https://www.collectivecampus.io/blog/6-resources-to-help-you-learn-design-thinking

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

	VIVEKANANDHA **COLLEGE OF ENGINEERING FOR WOMEN** (Autonomous Institution Affiliated to Anna University Chennai) Elayampalayam, Tiruchengode – 637 205				
Programme	B.E	Programme code	102	Regulation	2023
Department	**Electrical and Electronics 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

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.	
Outcomes	The students who complete this course successfully are expected to:	Knowledge Level
	CO1: Infer knowledge on neutralization reaction between acid, acid mixture with base and identify the concentrations.	K3
	CO2: Identify the concentration of sample using pH.	K3
	CO3: Spot the concentration of sample solution through redox reaction by potentiometric method	K4
	CO4: Estimate Iron by complexation reaction 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	PSO 4
CO 1	3	3		2	2	1	1						2	2	1	1
CO 2	3	3		2	2	2	2						2	1	1	2
CO 3	3	3		2	2	1							1	2	1	1
CO 4	3	3	1	2	2	1							2	2	2	1
CO 5	2	3	1	2		2	3						2	2	1	1

Course Assessment Methods

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

S.No	Name of the Experiment	Course Outcome
1.	Estimation of HCl using NaOH by Conductometric titration	CO1
2.	Estimation of Mixture of acid using NaOH by Conductometric titration.	CO1
3.	Estimation of Barium Chloride using Sodium Sulphate by Conductometric precipitation titration	CO1
4.	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	20

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

	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205								
Programme	**B.E.**	Programme Code	**102**	Regulation		**2023**			
Department	**ELECTRICAL AND ELECTRONICS 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 test
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	CO1

	comma.	
3.	Write a program in C to find the sum of the series [x - x^3 + x^5 + ...].	CO1
4.	Write a program in C to find the number and sum of all integers between 100 and 200 which are divisible by 9.	CO1
5.	Write a program in C to count the total number of duplicate elements in an array.	CO2
6.	You are given an input string 'S'. Your task is to find and return all possible permutations of the input string. **Note:** 1. The input string may contain the same characters, so there will also be the same permutations. 2. The order of permutation does not matter. **Sample Input** xyz sample Output xyz, xzy, yxz, yzx, zxy, zyx **Sample Output :** All the possible permutations for string "XYZ" will be "XYZ", "XZY", "YXZ", "YZX", "ZXY" and "ZYX".	CO2
7.	Find the Smallest and Largest Element in an Array **Method 1:** Traverse the array iteratively and keep track of the smallest and largest element until the end of the array. **Method 2:** Traverse the array recursively and keep track of the smallest and largest element until the end of the array. **Method 3:** Sort the array using STL and return the first element as the smallest element and the last element as the largest element. **For example, consider the array.** arr = {1, 2, 3, 4, 5} **Sample output:** Smallest element: 1 Largest element: 5	CO2
8.	Write a C program to find the sum of all the multiples of 3 and 5 below 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/	

	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205								
Programme	**B.E**	Programme Code			**102**	Regulation		**2023**	
Department	**ELECTRICAL AND ELECTRONICS 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

Outcome Course

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			
	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**	**PSO 4**
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							

Course Assessment Methods

Direct
1. Continuous Assessment Test I, II & III 2. End-Semester examinations
Indirect
1. 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.	Tanu shukla,Human Values and professional Ethics, Cengage publications.
References	
1.	R.C.Agarwal, (1997) “Indian Political System”, S.Chand and Company, New Delhi
2.	Indian polity, M.Laksmikanth,Tatamchrawhill publications
3.	R R Gaur, R Sangal, G P Bagaria, A foundation course in Human Values and professional Ethics, Excel books, New Delhi, 2010, ISBN 978-8-174-46781-2
E-Resources	
1.	https://mhrd.gov.in/
2.	https://niti.gov.in/content/niti-aayog-library
3.	www.drishtiias.com/

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Programme	**B.E./B.Tech**	Programme Code		**102**	Regulation		**2023**	
Department	**ELECTRICAL AND ELECTRONICS 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..
- To 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: Apply the concepts of cauchy’s integral theorem and residue theorem in evaluation of complex integrals.	K3
CO3: Apply Green's , Stoke's and Gauss Divergence theorems.	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	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	PSO 4
CO 1	3		2	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	12

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	12

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	12
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	**12**
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	**12**
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	**60**

Text Books

1.	Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 43rd Edition, 2014.
2.	Ravish R Sing , Mukul Bhatt, "Engineering Mathematics", Mc Graw Hill Education Pvt. Ltd-2018
3.	Sivaramakrishna Das. P, Vijayakumari.C, " Engineering Mathematics – II", Pearson India Education Pvt. Ltd-2022.

References

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

E-Resources

1.	https://en.wikipedia.org › wiki › Ordinary_differential_equation
2.	www.learnerstv.com/Free-engineering-Video-lectures
3.	www.nptel.ac.in

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Programme	**B.E.**	Programme Code	**102**	Regulation	**2023**
Department	**Electrical and Electronics 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 thefunction 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			
	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**	**PSO 4**
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

1.Course - end survey

Content of the syllabus			
Unit – I	**PROPERTIES OF MATTER**	Periods	**9**
Elasticity: Types of moduli of elasticity - Stress - Strain Diagram – uses. Young's modulus: Uniform bending (qualitative) Experimental determination by non-uniform bending - Twisting couple on a wire – Application: 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 (Qualitative) - Particle in a one-dimensional box - 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. **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.P.Mani, "Engineering Physics", Shri Dhanam publisher, Chennai – 600 042

References

1.	B.K. Pandey, S. Chaturvedi. "Engineering Physics", 1st Edition, Cengage Learning India Pvt Ltd,2012
2.	Fundamentals Of Physics Extended 8/Ed 8th Edition, David Halliday, Robert ResnickJearlWalker, Wiley India Pvt Ltd, 2008.
3.	Lawrence H.Vanvlack, "Elements of materials Science Engineering, 6th Edition, Pearson Publication.
4.	S.O.Pillai, "Solid State Physics", New Age International Publishers
5.	Dr.V.Rajendran, "Engineering Physics", Tata McGraw Hill Education Private Limited, New Delhi

E-Resources

1.	www.e-booksdirectory.com
2.	Home.iitk.ac.in
3.	physics.cu.ac.bd/

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Programme	**B.E.**	Programme Code		**102**	Regulation		**2023**	
Department	**ELECTRICAL AND ELECTRONICS ENGINEERING**				Semester		**II**	
Course Code	Course Name	Periods Per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23EE202	**Electric Circuit Theory**	3	0	0	3	40	60	100

Course Objectives	The students should made to • understand the basics of circuit components, their characteristics and responses • Develop the ability to apply circuit analysis to DC and AC circuits • Gain knowledge on solving circuit equations using various network theorems • Learn the operation of resonance and coupled circuits. • Learn the three phase system and two port networks

Course Outcome	At the end of the course, the student should be able to,	**Knowledge Level**
	CO1: Understand the basic circuit concepts, mesh current, nodal voltage methods for problem solving.	K2
	CO2: Understand the different network theorems used for solving networks For both DC and AC inputs.	K2
	CO3: Understand the concepts of resonance and coupled circuits	K2
	CO4: Understand the analysis of three phase circuits with star and delta connected loads and the concept of power and power factor measurement	K3
	CO5: Understand the concepts of two-port networks	K2
Pre-requisites	Fundamentals of Electrical and magnetic fields	

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

CourseAssessmentMethods

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	**BASIC CIRCUIT ANALYSIS**	**Periods**	**9**
Basic Circuit terminologies and parameters,- Ohms law–Kirchoff"s law-Mesh, Node and Loop analysis-verification using PSpice-Concept of DC circuits – Voltage source–Current source transformations- Star-Delta transformations. Concept of AC Circuits-RMS value, Average value, Form and Peak factors –Real and reactive power.			
Unit-II	**NETWORK THEOREMS**	**Periods**	**9**
Networktheorems-SuperpositionTheorem–Thevenin'sandNorton'sTheorem Maximum Power Transfer Theorem–Reciprocity Theorem- Applications to DC and AC circuits			
Unit – III	**RESONANCE AND COUPLED CIRCUIT**	**Periods**	**9**
Resonance in series and parallel circuits-Coupled circuits- Self and Mutual induction- Coefficient of coupling–Dot convention			
Unit-IV	**THREE PHASE CIRCUITS**	**Periods**	**9**
Analysis of Three phase star and delta circuits with balanced and unbalanced loads– Symmetrical components-Measurement of Power and Power factor in three phase systems			
Unit– V	**TWO PORT NETWORKS**	**Periods**	**9**
Two Port Networks-Relationship of two port variables- Impedance parameters-Admittance Parameters-Transmission parameters and hybrid parameters-Interconnections of two port networks.			
		TotalPeriods	**45**

Text Books	
1.	S.Salivahanan, "Circuit theory Analysis and synthesis", Second Edition, Pearson, 2023.
2.	W.H.Hayt and J.E.Kemmerly, "Engineering Circuit Analysis" ,Eighth Edition, McGrawHill,2013.
References	
1.	Robins&Miller,"CircuitAnalysisTheoryandPractice",Delmar Publishers,5thEdition,2012.
2.	MahmoodNahviandJosephEdminister,"Electriccircuits",McGrawHill,5thEdition.2010
3.	M. E. Van Valkenburg, "Network Analysis", third edition Prentice Hall, 2010.
4.	S. N. Sivanandam," Electric Circuit Analysis" Second Edition, Vikas Publishing House, November2009
E-Resources	
1.	https://archive.nptel.ac.in/courses/108/104/108104139/
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/

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Elayampalayam,Tiruchengode –637205

Programme	B.E	Programme code	102	Regulation	2023
Department	**ELECTRICAL AND ELECTRONICS ENGINEERING**			Semester	II

Course code	Course name	Periods per week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23TA202	**தமிழரும் தொழில்நுட்பமும்** Tamils and Technology*	1	0	0	1	40	60	100

Content of the syllabus

அலகு 1	**நெசவு மற்றும் பானைத்தொழில்நுட்பம்**	**Periods**	3

சங்ககாலத்தில் நெசவுத்தொழில் – பானைத்தொழில்நுட்பம் - கருப்புசிவப்புபாண்டங்கள் – பாண்டங்களில்கீறல்குறியீடுகள்.

அலகு 2	**வடிவமைப்பு மற்றும் கட்டிடத்தொழில்நுட்பம்**	**Periods**	3

சங்ககாலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்ககாலத்தில் வீட்டுப்பொருட்களில் வடிவமைப்பு- சங்ககாலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் – சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள்– மாமல்லபுரச்சிற்பங்களும் , கோவில்களும் – சோழர்காலத்துப்பெருங்கோயில்கள் மற்றும் பிறவழி பாட்டுத்தலங்கள் –நாயக்கர் காலக்கோயில்கள்-மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால்–செட்டிநாட்டு வீடுகள்– பிரிட்டிஷ்காலத்தில் சென்னையில் இந்தோ-சாரோசெனிக்கட்டிடக்கலை.

அலகு 3	**உற்பத்தித்தொழில்நுட்பம்**	**Periods**	3

கப்பல் கட்டும்கலை – உலோகவியல் – இரும்புத்தொழிற்சாலை – இரும்பை உருக்குதல் ,எஃகு – வரலாற்றுச்சான்றுகளாக-செம்பு மற்றும் தங்க நாணயங்கள் – நாணயங்கள் அச்சடித்தல் – மணி உருவாக்கும் தொழிற்சாலைகள் – கல்மணிகள், கண்ணாடி மணிகள் – சுடுமண் மணிகள் – சங்கு மணிகள் – எலும்புத்துண்டுகள் – தொல்லியல்சான்றுகள் – சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.

அலகு 4	**வேளாண்மைமற்றும்நீர்ப்பாசனத்தொழில்நுட்பம்**	**Periods**	3

அணை, ஏரி, குளங்கள் ,மதகு – சோழர்காலக்குமுழித்தூம்பின் முக்கியத்துவம் – கால்நடை பராமரிப்பு – கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் – வேளாண்மை மற்றும் வேளாண்மைச்சார்ந்த செயல்பாடுகள் – கடல்சார் அறிவு – மீன்வளம் – முத்து மற்றும் முத்துக்குளித்தல் – பெருங்கடல் குறித்த பண்டைய அறிவு – அறிவுசார் சமூகம்.

அலகு 5	**அறிவியல் தமிழ் மற்றும் கணினித்தமிழ்**	**Periods**	3

அறிவியல் தமிழின் வளர்ச்சி – கணினித்தமிழ் வளர்ச்சி – தமிழ் நூல்களை மின்பதிப்பு செய்தல் – தமிழ் மின் பொருட்கள் உருவாக்கம் – தமிழ் இணையக்கல்விக்கழகம் – தமிழ் மின்நூலகம் – இணையத்தில் தமிழ் அகராதிகள் – சொற்க்குவைத்திட்டம்.

	Total Periods	15

Programme	B.E/B.Tech.	Programme code	102	Regulation	2023
Department	**ELECTRICAL AND ELECTRONICS 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 TECHNOLOG**	**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**

TEXT-CUM-REFERENCE BOOKS

1	தமிழக வரலாறும் – மக்களும் பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாட நூல்மற்றும்கல்வியியல்பணிகள்கழகம்).
2	கணினித்தமிழ் – முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3	கீழடி – வைகை நதிக்கரையில் சங்க நக ரநாகரிகம் (தொல்லியல்துறை வெளியீடு)
4	பொருநை – ஆற்றங்கரை நாகரிகம். (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 C ivilization 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 Bookand Educational Services Corporation, Tamil Nadu)
12	Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

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

Programme	**B.E. / BT.ech.**	Programme Code		Regulation	**2023**
Department	**EEE, ECE, BT, BME**			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													**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**	**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

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

Indirect

1. 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.			
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**
1. Write a program to demonstrate different number data types in Python.	CO1
2. Write a program to perform different Arithmetic Operations on numbers in Python.	CO1
3. Write a program to create, append and remove lists and demonstrate the tuples in python.	CO2
4. Write a program to demonstrate working with dictionaries in python.	CO2
5. Write a program to create, concatenate and print a string and accessing sub-string from a given string.	CO3
6. Write a Python function to calculate the factorial of a number (a non-negative integer). The function accepts the number as an argument.	CO3
7. Write a program to compute the number of characters, words and lines in a file.	CO4
8. To write a Python program to find the most frequent words in a text read from a file.	CO4
9. Find mean, median, mode for the given set of numbers in a list.	CO5
10. Draw a horizontal bar chart with Matplotlib	CO5
Lecture 45: Practical 30;Total: 75	

Text Books

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

References

1.	Allen B. Downey, "Think Python: How to Think Like a Computer Scientist'', 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016.
2.	John V Guttag, ―Introduction to Computation and Programming Using Python'', Revised and expanded Edition, MIT Press , 2021
3.	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

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
(Autonomous Institution, Affiliated to AnnaUniversity, Chennai)
Elayampalayam, Tiruchengode –637205

Programme	B.E	Programme code		102	Regulation		2023	
Department	**ELECTRICAL AND ELECTRONICS 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

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

Outcomes

The students who complete this course successfully are expected 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**	**PSO1**	**PSO 2**	**PSO 3**	**PSO 4**
CO 1						2			3	3		3		2		
CO 2						2			3	3		3		2		
CO 3						2			3	3		3		2		
CO 4						2			3	3		3		2		
CO 5						2			3	3		3		2		

	Course Assessment Methods **Direct** 1. Continuous Assessment Test I & II 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 forIndustrial 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.	Sumant.S,Pereira Joyce, English for Communication, Vijay Nicole Imprints Pvt.Ltd., 2014.
2.	Sokkaalingam, S.RM., The Art Of Speaking EnglishVersatile Publishing House,2018.
Reference books	
1.	Norman Whitby - Business Benchmark Pre-Intermediate to Intermediate, Students Book,

	Cambridge University Press, 2008. , 1997.
2.	Dutt, Rajeevan, Prakash .A Course in Communication Skills (Anna University, Coimbatore edition) :. Cambridge University Press India Pvt.Ltd, 2007.
3.	Meenakshi Raman and Sangeeta Sharma-'Technical Communication English Skills for Engineers'; Oxford University Press, 2008.
4.	S.P. Dhanavel, English and Communication Skills for Students of Science and Engineering, Orient Blackswan Pvt, Ltd, 2009.
5.	Technical English – I & II, Sona versity, 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

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN

(Autonomous Institution, Affiliated to Anna University, Chennai)

Elayampalayam, Tiruchengode – 637 205

Programme	B.E.	Programme code	102	Regulation	2023
Department	Electrical and Electronics Engineering			Semester	II

Course Code	Course Name	Periods PerWeek			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
U23PH202	**PHYSICS LABORATORY**	0	0	2	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: Understand the importance of laser beam compared to ordinary light	K2

CO / PO Mapping

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

CO/PSO Mapping

COs	Programme Outcomes (POs)												PSOs			
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
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			

Course Assessment Methods

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

Content of the syllabus

PHYSICS

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 Wave length and particle size using Laser	**CO5**
	Total Periods	**30**

Lab Manual

1.	R.Jayaraman, Engineering Physics Laboratory Manual ,PearsonPub, Edition-2021.
2.	A.K. Katiyar & C.K. Pandey Engineering Physics: Theory and Practical, Wiley Pub,2 nd Edition.

	VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN (Autonomous Institution, Affiliated to Anna University ,Chennai) Elayampalayam, Tiruchengode – 637 205								
Programme	**B.E**	Programme Code	**102**		Regulation	**2023**			
Department	**Electrical & Electronics 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 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	

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

Course Assessment Method

Direct

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

Indirect

1.Course –End survey

Content of the Syllabus

GROUP A
(CIVIL & MECHANICAL ENGINEERING)

(CIVIL ENGINEERING PRACTICE)

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 Work: a) To make a rectangular tray from the given sheet metal. b) To make a basket from the given sheet metal.	CO1
6.Special Laboratory a) Study of 3D Printing machine and its applications. b) Study of CO_2 Laser engraving & cutting machine and its applications. c) 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
6. Measurement of illumination in different lamps	CO3
7. Study of batteries.	CO3
ELECTRONICS ENGINEERING PRACTICE	
1. Study of Electronic components and equipments –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 :

R1	Dr.P.Kannan, Mr.T.Satheeskumar & Mr.K.Rajasekar, “Engineering Practices Laboratory” Manual. First Edition, 2017.
R2	Mr.T.Jeyapoovan, Mr.M.Saravana Pandian, “Engineering Practices Lab” Manual, Vikas Publishing House Pvt Ltd, 2017.

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
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Elayampalayam, Tiruchengode – 637 205

Programme	B.E	Programme code	102	Regulation	2023
Department	**Electrical and Electronics 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

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.

Outcomes

The students who complete this course successfully are expected 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**

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

Course Assessment Methods

Direct

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

Indirect

Course - end survey

	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 and Biodiversity- Ecosystem-Structure, Characteristics and functions of ecosystem - Biodiversity – Definition – Conservation of Biodiversity (in-situ and Ex-situ)-Values and Threats of Biodiversity 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-EIA, 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, Geographical Information System (GIA), 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

Reference books

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-Resourses

1	https://libraries.ou.edu/
2	https://libguides.reading.ac.uk/
3	https://www.loc.gov/, https://rdl.lib.uconn.edu/