GOVERNMENT COLLEGE OF ENGINEERING,

(An Autonomous Institution, Affiliated to Anna University, Chennai)

BARGUR – 635 104

Regulation 2022

FULL TIME B.E. DEGREE PROGRAM

CHOICE BASED CREDIT SYSTEM

Curriculum for
SEMESTER I & SEMESTER II
(For the students admitted in the AY 2022-23 onwards)

OFFICE OF CONTROLLER OF EXAMINATIONS

GOVERNMENT COLLEGE OF ENGINEERING, BARGUR – 635 104

Website: www.gcebargur.ac.in

GOVERNMENT COLLEGE OF ENGINEERING,

(An Autonomous Institution, Affiliated to Anna University, Chennai)

BARGUR – 635 104

Regulation 2022

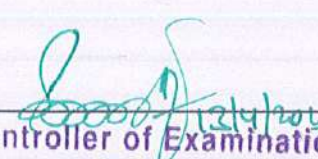### B.E. COMPUTER SCIENCE AND ENGINEERING
(Full Time)

CHOICE BASED CREDIT SYSTEM

Curriculum for
SEMESTER I & SEMESTER II
(For the students admitted in the AY 2022-23 onwards)

OFFICE OF CONTROLLER OF EXAMINATIONS

GOVERNMENT COLLEGE OF ENGINEERING, BARGUR – 635 104

Website: www.gcebargur.ac.in

Controller of Examinations
Government College of Engineering
Bargur-635 104

PRINCIPAL
Government College of Engg.,
BARGUR-635 104

copy to :

HOD /ECE : *श्री ...*
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HOD/ CSE : *[signature]*
13/4/23

HOD/MECH : *[signature]* 13/4/2023

PROGRAM SPECIFIC OUTCOMES (PSOs):

1	**PSO1: Professional Skills:** The ability to understand, analyze and develop computer programs in the areas related to algorithms, data structures ,databases, software engineering and networking for efficient design of computer-based systems of varying complexity.
2	**PSO2: Problem-Solving Skills:** The ability to apply standard practices andstrategies in software project development using open-ended programmingenvironments to deliver a quality product for business success.
3	**PSO3: Successful Career and Entrepreneurship:** The ability to employ moderncomputer languages, environments, and platforms in creating innovative careerpaths to be an entrepreneur, and a zest for higher studies.

PROGRAM OUTCOMES (POs)

1	**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	**ProblemAnalysis:**Identify, formulate,research literature, andanalyzecomplex engineering problemsreachingsubstantiatedconclusions using firstprinciplesofmathematics, natural sciences, and engineering sciences.
3	**Design/development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4	**Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, andsynthesis of the information to provide valid conclusions.
5	**Modern Tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complexengineering activities with an understanding of the limitations.
6	**The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilitiesrelevant to the professional engineering practice.
7	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities andnorms of the engineering practice.
8	**Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, andneed for sustainable development.
9	**Individual and Team Work:** Function effectively as an individual, and as a member orleader in diverse teams, and in multidisciplinary settings.
10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and giveandreceive clear instructions.
11	**Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a memberand leader in a team, to manage projects and in multidisciplinary environments.
12	**Life-long Learning:** Recognize the need for, and have the preparation and ability to engagein independent and life-long learning in the broadest context of technological change.

Mandatory Course: Induction Program
(Common to all branches)

Induction	3 Weeks Duration
Induction program for students to beOffered right at the start of the first year.	• Physical activity • Creative Arts • Universal Human Values • Literary • Proficiency Modules • Lectures by Eminent People • Visits to local Areas • Familiarization to Dept./Branch &Innovations

GOVERNMENT COLLEGE OF ENGINEERING (AUTONOMOUS), BARGUR
REGULATIONS2022
CHOISE BASED CREDIT SYSTEM
FULL TIME -B.E. COMPUTER SCIENCE ANDENGINEERING
I & II SEMESTERSCURRICULUM FOR SYLLABI

SEMESTER I

Sl. No	COURSECODE	COURSE TITLE	CAT	CONTACT HOURS	L	T	P	C
		THEORY COURSES						
1.	22ZHS101	English for Engineers-1	HSMC	3	3	0	0	3
2.	22ZBS102	Matrices and Calculus	BSC	4	3	1	0	4
3.	22ZBS103	Engineering Physics	BSC	3	3	0	0	3
4.	22ZBS104	Engineering Chemistry	BSC	3	3	0	0	3
5.	22ZES105	Problem Solving and Python Programming	ESC	3	3	0	0	3
6.	22ZMC106	தமிழர்மரபு /Heritage of Tamils	MC	1	1	0	0	0
		LABORATORY COURSES						
7.	22ZES107	Problem Solving and Python Programming Laboratory	ESC	3	0	0	3	1.5
8.	22ZBS108	Chemistry Laboratory	BSC	3	0	0	3	1.5
9.	22ZBS109	Physics Laboratory	BSC	3	0	0	3	1.5
			TOTAL	26	16	1	9	20.5

SEMESTER II

Sl. No	COURSE CODE	COURSE TITLE	CAT	CONTACT HOURS	L	T	P	C
		THEORY COURSES						
1.	22ZHS201	English for Engineers-II	HSMC	3	3	0	0	3
2.	22SBS202	Transforms and Partial Differential Equations	BSC	4	3	1	0	4
3.	22ZBS203	Physics of Semiconductor Devices	BSC	3	3	0	0	3
4.	22ZES204	Engineering Graphics	ESC	5	1	0	4	3
5.	22ZES205	Programming in C	ESC	3	3	0	0	3
6.	22ZMC207	தமிழரும்தொழில்நுட்பமும்/ Tamils and Technology	MC	1	1	0	0	0
		LABORATORY COURSES						
7.	22ZES209	Programming in C Laboratory	ESC	3	0	0	3	1.5
8.	22ZHS210	Communication English Laboratory	HSMC	2	0	0	2	1
9.	22ZES211	Engineering Practices Laboratory	ESC	3	0	0	3	1.5
			TOTAL	27	14	1	12	20.0

GOVERNMENT COLLEGE OF ENGINEERING,

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BARGUR – 635 104

Regulation 2022

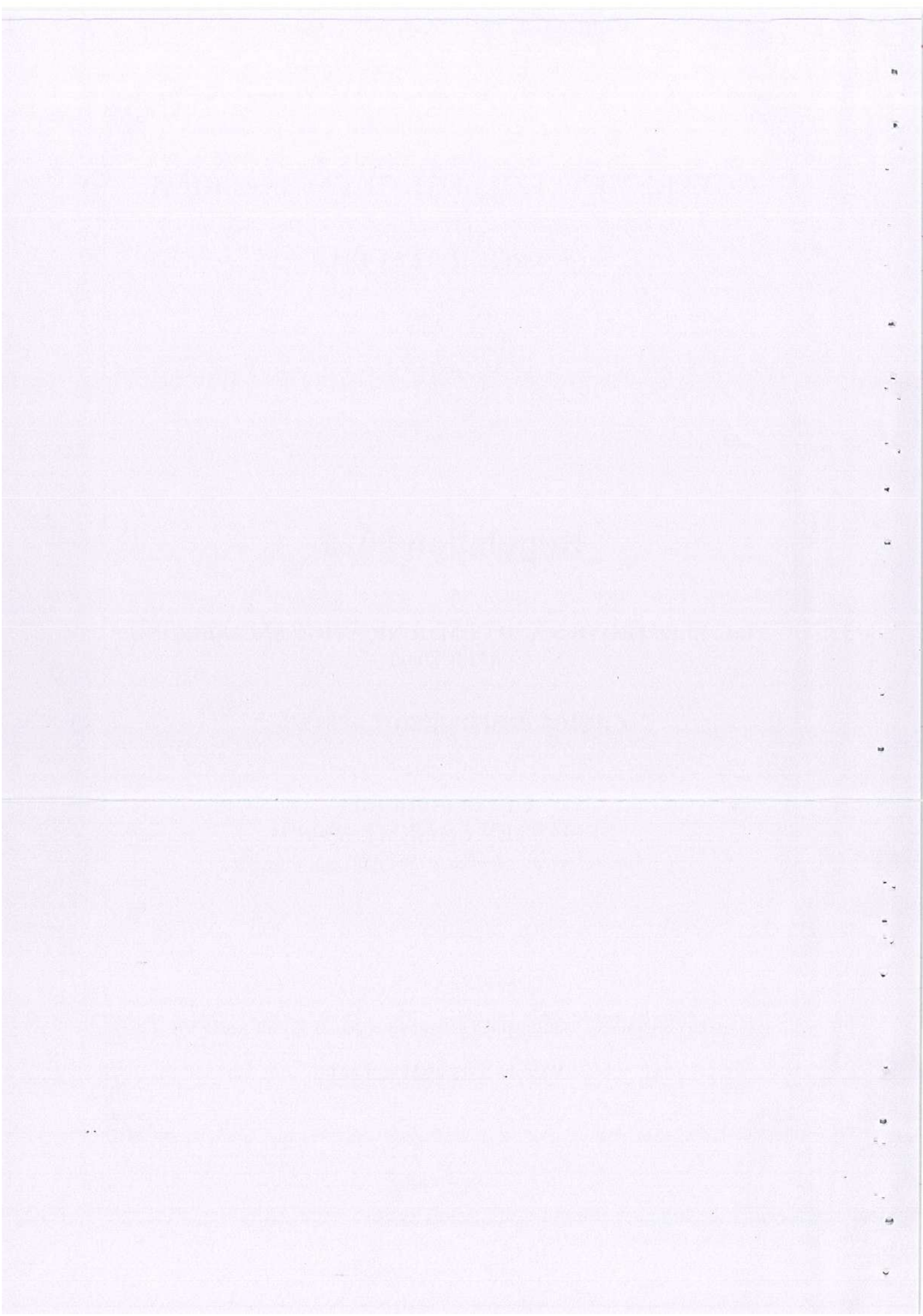## B.E. ELECTRONICS AND COMMUNICATION ENGINEERING
(Full Time)

CHOICE BASED CREDIT SYSTEM

Curriculum for
SEMESTER I & SEMESTER II
(For the students admitted in the AY 2022-23 onwards)

OFFICE OF CONTROLLER OF EXAMINATIONS

GOVERNMENT COLLEGE OF ENGINEERING, BARGUR – 635 104

Website: www.gcebargur.ac.in

	PROGRAM SPECIFIC OUTCOMES (PSOs):	
1	Graduates will be able to understand and apply the concepts of Electronics and Communication Engineering in the field of Communication, Microelectronics, Signal Processing, Networking, Embedded and VLSI Systems.
2	Graduates will be able to design and utilize advanced Hardware and Software tools to analyze and implement subsystems for real time applications.
3	Graduates will be able to apply domain knowledge to enhance research in the field of Communication Engineering, Embedded Systems and VLSI Systems.

	PROGRAM OUTCOMES (POs)	
1	**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	**Problem Analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3	**Design/development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4	**Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5	**Modern Tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6	**The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
8	**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.
9	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
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12	**Life-long Learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Mandatory Course: Induction Program
(Common to all branches)

Induction	3 Weeks Duration
Induction program for students to be Offered right at the start of the first year.	• Physical activity • Creative Arts • Universal Human Values • Literary • Proficiency Modules • Lectures by Eminent People • Visits to local Areas • Familiarization to Dept./Branch & Innovations

GOVERNMENT COLLEGE OF ENGINEERING (AUTONOMOUS), BARGUR
REGULATIONS 2022
CHOISE BASED CREDIT SYSTEM
FULL TIME B.E. ELECTRONICS AND COMMUNICATION ENGINEERING
CURRICULUM FOR SEMESTER I & SEMESTER II

SEMESTER I

Sl. No	COURSE CODE	COURSE TITLE	CAT	CONTACT HOURS	L	T	P	C
		THEORY COURSES						
1.	22ZHS101	English for Engineers - I	HSMC	3	3	0	0	3
2.	22ZBS102	Matrices and Calculus	BSC	4	3	1	0	4
3.	22ZBS103	Engineering Physics	BSC	3	3	0	0	3
4.	22ZBS104	Engineering Chemistry	BSC	3	3	0	0	3
5.	22ZES105	Problem Solving and Python Programming	ESC	3	3	0	0	3
6.	22ZMC106	தமிழர் மரபு /Heritage of Tamils	MC	1	1	0	0	0
		LABORATORY COURSES						
7.	22ZES107	Problem Solving and Python Programming Laboratory	ESC	3	0	0	3	1.5
8.	22ZBS108	Chemistry Laboratory	BSC	3	0	0	3	1.5
9.	22ZBS109	Physics Laboratory	BSC	3	0	0	3	1.5
10.	22ZHS110	Communication English Laboratory	HSMC	2	0	0	2	1
			TOTAL	28	16	1	11	21.5

SEMESTER II

Sl. No	COURSE CODE	COURSE TITLE	CAT	CONTACT HOURS	L	T	P	C
		THEORY COURSES						
1.	22ZHS201	English for Engineers - II	HSMC	3	3	0	0	3
2.	22ZBS202	Ordinary Differential Equation and Analytical Functions	BSC	4	3	1	0	4
3.	22ZBS203	Physics of Semiconductor Devices	BSC	3	3	0	0	3
4.	22LPC204	Circuit Theory	PCC	3	3	0	0	3
5.	22ZES205	Programming in C	ESC	3	3	0	0	3
6.	22LES206	Electrical and Instrumentation Engineering	ESC	3	3	0	0	3
7.	22ZMC207	தமிழரும் தொழில்நுட்பமும்/ Tamils and Technology	MC	1	1	0	0	0
		LABORATORY COURSES						
8.	22ZES209	Programming in C Laboratory	ESC	3	0	0	3	1.5
9.	22LPC210	Circuits and Devices Laboratory	PCC	3	0	0	3	1.5
10.	22ZES211	Engineering Practices Laboratory	ESC	3	0	0	3	1.5
			TOTAL	29	19	1	9	23.5

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B.E. ELECTRICAL AND ELECTRONICS ENGINEERING
(Full Time)

CHOICE BASED CREDIT SYSTEM

Curriculum for
SEMESTER I & SEMESTER II
(For the students admitted in the AY 2022-23 onwards)

OFFICE OF CONTROLLER OF EXAMINATIONS

GOVERNMENT COLLEGE OF ENGINEERING, BARGUR – 635 104

Website: www.gcebargur.ac.in

PROGRAM SPECIFIC OUTCOMES (PSOs):

1	Apply the fundamentals of mathematics, science and engineering knowledge to identify, formulate, design and investigate complex engineering problems of electric circuits, analog and digital electronic circuits, electrical machines and power systems.
2	Apply appropriate techniques and modern Engineering hardware and software tools in power systems to engage in life- long learning and to successfully adapt in multi-disciplinary environments.
3	Ability to understand the recent technological developments in Electrical & Electronics Engineering and develop products to cater the societal & Industrial needs.

PROGRAM OUTCOMES (POs)

1	**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	**Problem Analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3	**Design/development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4	**Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5	**Modern Tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6	**The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
8	**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.
9	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11	**Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12	**Life-long Learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

Mandatory Course: Induction Program
(Common to all branches)

Induction	3 Weeks Duration
Induction program for students to be Offered right at the start of the first year.	- Physical activity - Creative Arts - Universal Human Values - Literary - Proficiency Modules - Lectures by Eminent People - Visits to local Areas - Familiarization to Dept./Branch & Innovations

GOVERNMENT COLLEGE OF ENGINEERING (AUTONOMOUS), BARGUR
REGULATIONS 2022
CHOISE BASED CREDIT SYSTEM
FULL TIME B.E. ELECTRICAL AND ELECTRONICS ENGINEERING

CURRICULUM FOR SEMESTER I & SEMESTER II

SEMESTER I

SI No	Course Code	Course Name	Course Category	Contact Hours	L	T	P	C
Induction Programme (Non Credit Mandatory Course)								0
THEORY COURSES								
1	22ZHS101	English for Engineers-1	HSMC	3	3	0	0	3
2	22ZBS102	Matrices and Calculus	BSC	4	3	1	0	4
3	22ZBS103	Engineering Physics	BSC	3	3	0	0	3
4	22ZBS104	Engineering Chemistry	BSC	3	3	0	0	3
5	22ZES105	Problem Solving and Python Programming	ESC	3	3	0	0	3
6	22ZMC106	தமிழர் மரபு /Heritage of Tamils	MC	1	1	0	0	0
LABORATORY COURSES								
7	22ZES107	Problem Solving and Python Programming Laboratory	ESC	3	0	0	3	1.5
8	22ZBS108	Chemistry Laboratory	BSC	3	0	0	3	1.5
9	22ZHS110	Communication English Laboratory	HSMC	2	0	0	2	1
			TOTAL	25	16	1	8	20.0

SEMESTER II

SI No	Course Code	Course Name	Course Category	Contact Hours	L	T	P	C
THEORY COURSES								
1	22ZHS201	English for Engineers-II	HSMC	3	3	0	0	3
2	22ZBS202	Ordinary Differential Equation and Analytical Functions	BSC	4	3	1	0	4
3	22ZBS203	Physics of Semiconductor Devices	BSC	3	3	0	0	3
4	22ZES204	Engineering Graphics	ESC	5	1	0	4	3
5	22EES205	Basic Civil and Mechanical Engineering	ESC	3	3	0	0	3
6	22EES206	Electric Circuit Analysis	ESC	3	3	0	0	3
7	22ZMC207	தமிழரும் தொழில்நுட்பமும்/ Tamils and Technology	MC	1	1	0	0	0
LABORATORY COURSES								
8.	22ZBS209	Physics Laboratory	BSC	3	0	0	3	1.5
9.	22EES210	Electrical Circuits Laboratory	ESC	3	0	0	3	1.5
10.	22ZES211	Engineering Practices Laboratory	ESC	3	0	0	3	1.5
			TOTAL	31	17	1	13	23.5

GOVERNMENT COLLEGE OF ENGINEERING,

(An Autonomous Institution, Affiliated to Anna University, Chennai)

BARGUR – 635 104

Regulation 2022

B.E. MECHANICAL ENGINEERING
(Full Time)

CHOICE BASED CREDIT SYSTEM

Curriculum for
SEMESTER I & SEMESTER II
(For the students admitted in the AY 2022-23 onwards)

OFFICE OF CONTROLLER OF EXAMINATIONS

GOVERNMENT COLLEGE OF ENGINEERING, BARGUR – 635 104

Website: www.gcebargur.ac.in

	PROGRAM SPECIFIC OUTCOMES (PSOs):
1	Acquire basic knowledge and expertise necessary for professional practice in Mechanical Engineering for higher studies and research.
2	Attain and practice technical skills to identify, analyze, innovate and interact with industry to solve complex problems related to Mechanical Engineering.
3	Possess a professional attitude as an individual or a team member with consideration for society, professional ethics, environmental factors and motivation for lifelong learning.

	PROGRAM OUTCOMES (POs)
1	**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	**Problem Analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3	**Design/development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4	**Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5	**Modern Tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6	**The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
8	**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.
9	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11	**Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12	**Life-long Learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

Mandatory Course: Induction Program
(Common to all branches)

Induction	3 Weeks Duration
Induction program for students to be Offered right at the start of the first year.	• Physical activity • Creative Arts • Universal Human Values • Literary • Proficiency Modules • Lectures by Eminent People • Visits to local Areas • Familiarization to Dept./Branch & Innovations

GOVERNMENT COLLEGE OF ENGINEERING (AUTONOMOUS), BARGUR
REGULATIONS 2022
CHOISE BASED CREDIT SYSTEM
FULL TIME B.E. MECHANICAL ENGINEERING
CURRICULUM FOR SEMESTER I & SEMESTER II

SEMESTER I

s.no.	Course Code	Course Title	CAT	CONTACT PERIODS	L	T	P	C
		THEORY COURSES						
1	22ZHS101	English for Engineers-1	HSMC	3	3	0	0	3
2	22ZBS102	Matrices and Calculus	BSC	4	3	1	0	4
3	22ZBS103	Engineering Physics	BSC	3	3	0	0	3
4	22MBS104	Applied Chemistry	BSC	3	3	0	0	3
5	22ZES105	Problem Solving and Python Programming	ESC	3	3	0	0	3
6	22ZMC106	தமிழர் மரபு /Heritage of Tamils	MC	1	1	0	0	0
		LABORATORY COURSES						
7	22ZES107	Problem Solving and Python Programming Laboratory	ESC	3	0	0	3	1.5
8	22ZBS108	Chemistry Laboratory	BSC	3	0	0	3	1.5
9	22MES111	Engineering Practices Laboratory	ESC	3	0	0	3	1.5
			TOTAL	26	16	1	9	20.5

SEMESTER II

Sl. No	Course Code	Course Title	CAT	CONTACT PERIODS	L	T	P	C
		THEORY COURSES						
1	22ZHS201	English for Engineering – II	HSMC	3	3	0	0	3
2	22MBS202	Probability and Analytic Functions	BSC	4	3	1	0	4
3	22MBS203	Material Science	BSC	3	3	0	0	3
4	22ZES204	Engineering Graphics	ESC	5	1	0	4	3
5	22MES205	Basic Electrical and Electronics Engineering	ESC	3	3	0	0	3
6	22ZMC207	தமிழரும் தொழில்நுட்பமும் /Tamils and Technology	MC	1	1	0	0	0
		LABORATORY COURSES						
7	22ZBS209	Physics Laboratory	BSC	3	0	0	3	1.5
8	22ZHS210	Communication English Laboratory	HSMC	2	0	0	2	1
9	22MES211	Basic Electrical and Electronics Engineering Laboratory	ESC	3	0	0	3	1.5
			TOTAL	27	14	1	12	20.0

REGULATION 2022

SEMESTER I

SYLLABI

(W.e.f. the AY 2022-2023 onwards)

R-2022	ENGLISH FOR ENGINEERS - I	L	T	P	C
	Common for all Branches				
	22ZHS101	3	0	0	3

OBJECTIVES:

- Improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writing skills.
- To be aware of concepts in terms of situational and verbal context.
- To acquire vocabulary by following the techniques of reading and listening comprehension.
- Able to follow and glean the important information by listening and professional talk and classroom lectures.
- Write coherently by following the principles of reading and listening comprehension.

UNIT I	VOCABULARY DEVELOPMENT	

Technical Vocabulary – Formal and Informal Vocabulary - Silent Letters – Avoidance of Jargon – Collocations – Verbal Analogies - Archaisms and Contemporary Synonyms - One Word Substitution - Word Order – Effective Use of Words – Trim Padding Words – Use Concrete and Specific Words – Prepositions – Using Determiners – Linking Words – Fixed and Semi-Fixed Expressions.

UNIT II	LANGUAGE DEVELOPMENT	

Numerical Adjectives - Embedded Sentences - Subject-Verb Agreement - If Conditionals - Active Voice and Passive Voice – Reporting and Reported Speech – Summarising - Elaboration- Paraphrasing – Phrasal Verbs – Redundancy – Misplaced Modifiers - Dangling Constructions – Avoidance of Cliché.

UNIT III	LISTENING AND SPEAKING	

Listening to Talks mostly of a Scientific Nature - Listening to Longer Technical Talks – Listening to Classroom Lectures - Listening to TED Talks - Formal and Informal Conversation - Greeting People - Asking for and Giving directions - Asking for and Offering Help – Seeking Clarification – Speaking about a Process.

UNIT IV	READING	

Skimming and Scanning – Accent Variations - Pronunciation - Reading Short Technical Texts - Reading Longer Texts: General and Technical - Reading for Detailed Comprehension - Reading and Understanding Technical Articles - Reading Advertisements.

UNIT V	WRITING	

Checklists ,Writing Instructions, Recommendations and Warnings - Interpreting Charts and Graphs - Describing a Process - Extended Definitions - Report Writing - Accident Report – Survey Report - Minutes of Meeting – Discourse markers, Jumbled Sentences – Paragraph Writing – Drafting E-Mails.

TOTAL HOURS		Hrs

1

OUTCOMES: At the end of the course , the students will be able to :

- Acquire proficiency in English including reading and listening comprehension, writing and speaking skills.
- Participate effectively in formal and informal conversations; introduce themselves and express their opinions in English.
- Present extempore speech on any technical related talks.
- Draft reports, minutes of meeting and interpretation of charts and graphs effectively.
- Utilise right word in right context and also to frame right grammatical sentences of their own.

TEXT BOOKS:

1.	A Course in Technical English, D Praveen Sam KN Shoba Cambridge University Press, 2020.

REFERENCES:

1.	Markel, Mike. Technical Communication. New York. Bedford.2007.
2.	Communication Skills in English. Edited by The department Of English, Osmania University, Hyderabad. Oxford University Press.1998.
3.	Laplante, A. Phlip. Technical Writing: A Practical guide for Engineers, Scientists and Nano Technical Professionals. CRC Press.2019.
4.	Gerson, Sharon & steven Gerson. Technical Communication: Process and Product. Pearson. 2019.

20ZBS102   **MATRICES AND CALCULUS**   L T P C

(Common to all branches)   3 1 0 4

COURSE OBJECTIVES:

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

UNIT I   MATRICES   9 + 3

Eigenvalues and Eigenvectors of a real matrix – Characteristic equation – Properties of Eigenvalues and Eigenvectors – Cayley - Hamilton theorem – Diagonalization of matrices by orthogonal transformation – Reduction of a quadratic form to canonical form by orthogonal transformation – Nature of quadratic forms – Applications: Stretching of an elastic membrane.

UNIT II   DIFFERENTIAL CALCULUS   9 + 3

Representation of functions - Limit of a function - Continuity - Derivatives - Differentiation rules (sum, product, quotient, chain rules) - Implicit differentiation - Logarithmic differentiation - Applications: Maxima and Minima of functions of one variable.

UNIT III   FUNCTIONS OF SEVERAL VARIABLES   9 + 3

Partial differentiation – Homogeneous functions and Euler's theorem – Total derivative – Changeof variables – Jacobians – Partial differentiation of implicit functions – Taylor's series for functions of two variables – Applications: Maxima and minima of functions of two variables and Lagrange'smethod of undetermined multipliers.

UNIT IV   INTEGRAL CALCULUS   9 + 3

Definite and Indefinite integrals - Substitution rule - Techniques of Integration: Integration by parts, Trigonometric integrals, Trigonometric substitutions, Integration of rational functions by partial fraction, Integration of irrational functions - Improper integrals - Applications: Hydrostatic forceand pressure, moments and centres of mass.

UNIT V   MULTIPLE INTEGRALS   9 + 3

Double integrals – Change of order of integration – Double integrals in polar coordinates – Area enclosed by plane curves – Triple integrals – Volume of solids – Change of variables in double andtriple integrals – Applications: Moments and centres of mass, moment of inertia.

TOTAL: 60 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

- Use the matrix algebra methods for solving practical problems.
- Apply differential calculus tools in solving various application problems.
- Able to use differential calculus ideas on several variable functions.
- Apply different methods of integration in solving practical problems.
- Apply multiple integral ideas in solving areas, volumes and other practical problems.

TEXT BOOKS:

1. Kreyszig.E, "Advanced Engineering Mathematics" John Wiley and Sons, 10th Edition, New Delhi, 2016.
2. Grewal.B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition , 2018.
3. James Stewart, " Calculus: Early Transcendentals", Cengage Learning, 8th Edition, New Delhi, 2015. [For Units II & IV - Sections 1.1, 2.2, 2.3, 2.5, 2.7 (Tangents problems only), 2.8, 3.1 to 3.6, 3.11, 4.1, 4.3, 5.1 (Area problems only), 5.2, 5.3, 5.4 (excluding net change theorem), 5.5, 7.1 - 7.4 and 7.8].

REFERENCES:

1. Anton. H, Bivens. I and Davis. S, "Calculus", Wiley, 10th Edition, 2016.
2. Bali. N., Goyal. M. and Watkins. C., "Advanced Engineering Mathematics", FirewallMedia (An imprint of Lakshmi Publications Pvt., Ltd.,), New Delhi, 7th Edition, 2009.
3. Jain. R.K.and Iyengar. S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi, 5th Edition, 2016.
4. Narayanan. S. and Manicavachagom Pillai. T. K., "Calculus" Volume I and II,
5. S. Viswanathan Publishers Pvt. Ltd., Chennai, 2009.
6. Ramana. B.V., "Higher Engineering Mathematics", McGraw Hill Education Pvt. Ltd,New Delhi, 2016.
7. Srimantha Pal and Bhunia. S.C, "Engineering Mathematics" Oxford University Press,2015.
8. Thomas. G. B., Hass. J, and Weir. M.D, "Thomas Calculus", 14th Edition, Pearson India,2018.

M. Mag
27|12|22
Dr. M. MAGESWARI

22ZBS103	ENGINEERING PHYSICS	L	T	P	C
	Common for all branches	3	0	0	3

OBJECTIVES:

- To develop knowledge on basics of mechanics and properties of solids
- To understand the thermal properties of materials and their relevant applications.
- To apply principles of quantum physics in the engineering field
- To know about the fundamentals of LASER and optical fiber
- To understand physics of magnetic and dielectric materials.

UNIT I	MECHANICS AND PROPERTIES OF MATTER	9

Mechanics: Center of mass- rotation of rigid bodies (qualitative) - moment of Inertia of circular disc - torsion pendulum (Theory and Experiment).

Properties of matter: Elasticity – Hooke's law – Young's Modulus – rigidity Modulus – bulk Modulus – Poisson's ratio, bending moment of a beam - depression of cantilever (Theory and Experiment), determination of Young's modulus: uniform bending (Theory and Experiment) - non-uniform bending (qualitative).

UNIT II	THERMAL PHYSICS	9

Review of thermal properties: specific heat capacity- thermal capacity, modes of heat transfer- thermal expansion of solids – bimetallic strip, determination of thermal conductivity - Lee's disc method: theory and experiment, conduction through compound media (series and parallel), thermostat.

UNIT III	QUANTUM PHYSICS	9

Blackbody radiation – Planck's theory of radiation - Wien's displacement law – Rayleigh-Jean's law, matter waves – de-Broglie's hypothesis – wave-particle duality – wavefunction and its physical significance – Schrodinger wave equation – time-dependent and time-independent – application of Schrodinger wave equation: particle in a 1 D box.

UNIT IV	LASERS AND FIBRE OPTICS	9

LASER: characteristics of LASER – Einstein's A and B coefficient (derivation) - population inversion – pumping actions, Nd-YAG LASER: construction and working, industrial and medical applications of LASER.

FIBRE OPTICS: total internal reflection – critical angle – principle and propagation of light in optical fibers –numerical aperture and acceptance angle, types of optical fibers (material, refractive index and mode), applications: Sonogram.

UNIT V	PHYSICS OF MATERIALS	9

Magnetic dipole moment - Bohr magneton - magnetic permeability and susceptibility – classification of magnetic materials - domain theory of ferromagnetism - soft and hard magnet, dielectric materials – dipole moment – permittivity –polarization and its types– Langevin- Debye equation – temperature and frequency dependent polarization-dielectric loss mechanism.

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student will be able

•	To explain about center of mass of a system, able to calculate moment of inertia of a circular disc and to calculate Young's modulus for different materials.
•	To apply concepts of thermal properties on fabrication of thermal insulators, thermostat and thermistors, able to calculate thermal conductivity.
•	To understand the quantum behavior of materials and apply fundamental principles of quantum physics to the tunneling microscope.
•	To understand the working principles of LASER and its applications. Able to understand principles and applications of optic fibers.
•	To understand the physics behind magnetic and dielectric properties of materials.

TEXTBOOKS:

1.	R.K. Gaur & S.L. Gupta. "Engineering physics". Dhanpat Rai Publishers, 2012.
2.	D.K. Bhattacharya & T. Poonam. "Engineering Physics". Oxford University Press,2015.
3.	S.O. Pillai, Solid State Physics, New age international publishers, 9th edition, 2020
4.	D.S. Mathur, Mechanics, S Chand & Co Ltd 2020
5.	R. Murugesan & Kiruthiga Sivaprasath, "Modern Physics", CHAND publication, 18th edition, 2016

REFERENCES:

1.	D. Halliday, R. Resnick and J. Walker. "Fundamentals of Physics". Wiley, 2015
2.	M. N. Avadhanulu and P. G. Kshirsagar, "A textbook of engineering physics", S. Chand and Company Ltd, New Delhi, 2005.
3.	A.B. Gupta, Mechanics and Properties of matter, Books & Allied (P) Ltd, 2021
4.	R.A. Serway & J.W. Jewett. "Physics for Scientist and Engineers". Cengage Learning, 2010.
5.	M. Arumugam, "Engineering physics", Anuradha publishers
6	John M. Senior, "Optical fiber communication principles and practice", Pearson publication, 3rd edition, 2010
7	N. Subramaniam Brijlal, P. S. Hemne, Heat Thermodynamics and Statistical Physics 1st Edition, 2008.

8/12/22

R-2022 22ZBS104	ENGINEERING CHEMISTRY	L	T	P	C
		3	0	0	3

(Common for ECE / EEE / CSE)

OBJECTIVES:

- To make students conversant with water parameters, boilers, need for water treatment and its merits and demerits.
- Students ought to be aware of fundamental principles behind different electrochemical reactions, corrosion of materials and methods to prevent corrosion.
- To learn the chemistry behind polymers, synthesis, merits, demerits and its applications in various field.
- To acquire basic knowledge in renewable, non renewable and alternate energy resources and the chemical reactions involved in cell, batteries and its applications.
- To learn the working principle of various spectroscopy and its applications. To acquire basic knowledge in Nano materials, synthesis, properties and uses.

UNIT I	WATER TECHNOLOGY	9

Characteristics – alkalinity and its significance – hardness (problems) - types and estimation by EDTA method – specifications of drinking water (BIS and WHO standards) – potable water treatment – boiler feed water - requirements – disadvantages of using hard water in boilers (Scales & Sludge, Boiler corrosion, Priming & Foaming, Caustic embrittlement) – water treatment – Internal treatment – external treatment – zeolite method - Demineralization process – desalination – reverse osmosis.

UNIT II	ELECTROCHEMISTRY AND CORROSION	9

Electrochemistry: Electrochemical cells – reversible and irreversible cells – EMF – measurement of EMF – single electrode potential – Nernst equation (Problems) – reference electrode – standard hydrogen electrode and calomel electrode – ion selective electrode – glass electrode and measurement of pH – electrochemical series and its applications.

Corrosion: Corrosion – Pilling Bedworth rule - dry corrosion and its mechanism - electrochemical corrosion and its mechanism – types (galvanic, pitting, differential aeration) – factors influencing corrosion – corrosion control methods – sacrificial anode method – impressed current method – corrosion inhibitors – protective coatings – paints – constituents – functions – metallic coatings – electroplating (Cu) and electro less plating (Ni).

UNIT III	POLYMERS AND COMPOSITES	9

Polymers: Definition – classification – functionality – polymerization – degree of polymerization – types (addition, condensation, copolymerization) – mechanism (free radical) – plastics – thermoplastics and thermosetting plastics – preparation, properties and uses of individual polymers (PVC, TEFLON, Nylon-6,6, Nylon-6, PET, epoxy resin) – rubber - vulcanization of rubber – applications – Biopolymers – Properties and its applications (Polylactic acid) – Conducting polymers - Properties and its applications (Polyacetylene)

Composites: definition – types polymer matrix composites – Fibre Reinforced Polymers – applications – advanced composite materials – physical and chemical properties – applications.

UNIT IV	NON-CONVENTIONAL ENERGY SOURCES AND STORAGE DEVICES	9

Nuclear energy – fission fusion reactions – light water nuclear reactor for power generation – breeder reactor – solar energy conversion – solar cells – wind energy – batteries: alkaline batteries – lead –acid, Ni-Cd, and Li-ion batteries – fuel cells – principles and applications – advantages and disadvantages.

UNIT V	ANALYTICAL TECHNIQUES AND NANOMATERIALS	9

Spectroscopy: Electromagnetic spectrum - Fundamentals of spectroscopy – Instrumentation, working principle and applications of UV-Visible spectrophotometer, Atomic Absorbance Spectrophotometer, Flame photometer.

Nanomaterials: Introduction to nanotechnology in electronics - nanomaterials – fullerernes carbon nanotubes – nanowires – Electronics and mechanical properties - synthesis of nanomaterials – topdown and bottomup approach – applications of nanomaterials in electronic devices (Semiconductors, LED & OLED) – electronics and telecommunication – medicines.

TOTAL : 45 PERIODS

COURSE OUTCOMES

On completion of the course the student will be able to,

Apply the knowledge of basic science in identifying, to formulate and to solve the engineering problems.

Analyze water borne problems faced in boilers, need for water treatment and various methods and techniques for treating hard water.

Understand polymerization reactions and electrochemical reactions and its applications.

Acquire Knowledge about energy conversion and chemical reaction taking place in nuclear, solar, wind energy, Batteries, fuel cells and its applications..

Obtain in-depth knowledge on various nanomaterials and its applications in electronic devices. Students get basic knowledge on advanced analytical techniques.

COURSE ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2		2		1			1			1	1			
CO2	2		3		1			1			2	1			
CO3	2		1		1			1			2	1	2		1
CO4	2		3		2			1	1		2	1	1		1
CO5	2		1		2			1	1		2	1	1		1

TEXT BOOKS:

1	Jain and Jain , 16th edition, "Engineering Chemistry" Dhanpat Rqai Publishing Co.
2	Sivasankar B., "Engineering Chemistry", Tata McGraw-Hill Publishing Company Ltd, New Delhi, 2008.
3	S.S.Dara, "A Text book of Engineering Chemistry", S.Chand Publishing, 12th Edition, 2018.

REFERENCES:

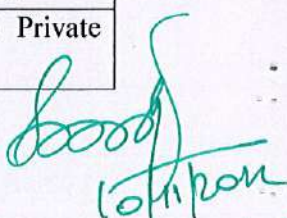| 1.	Pahari A and Chauhan B., "Engineering Chemistry"., Firewall Media., New Delhi., 2010.
2.	ShikhaAgarwal, "Engineering Chemistry-Fundamentals and Applications", Cambridge University Press, Delhi, Second Edition, 2019.
3.	B.S.Murty, P.Shankar, Baldev Raj, B.B.Rath and James Murday, "Text book of nanoscience and nanotechnology", Universities Press-IIM Series in Metallurgy and Materials Science, 2018.
4.	O.V. Roussak and H.D. Gesser, Applied Chemistry-A Text Book for Engineers and Technologists, Springer Science Business Media, New York, 2nd Edition, 2013.
5.	O.G. Palanna, "Engineering Chemistry" McGraw Hill Education (India) Private Limited, 2nd Edition, 2017.

(HOD/Chemistry)

22MBS104	APPLIED CHEMISTRY	L	T	P	C
	Mechanical Engineering	3	0	0	3

OBJECTIVES:
- To make students conversant with water parameters, boilers, need for water treatment and acquire basic knowledge in spectroscopy and its applications.
- Students ought to be aware of fundamental principles behind different electrochemical reactions, corrosion of materials, methods to prevent corrosion and industrial importance of alloys.
- To learn the chemistry behind polymers, synthesis, merits, demerits and its applications in various field.
- To acquire basic knowledge in non-conventional energy resources and the chemical reactions involved in cell, batteries and function of lubricants.
- To learn the chemistry behind fuels and combustion.

UNIT I	WATER TECHNOLOGY AND ANALYTICAL TECHNIQUES	9

Water Technology: Characteristics – alkalinity and its significance – hardness (problems) - types and estimation by EDTA method – potable water treatment – boiler feed water - requirements – disadvantages of using hard water in boilers (Scales & Sludge, Boiler corrosion, Priming & Foaming, Caustic embrittlement) – water treatment – Internal treatment – external treatment – Demineralization process – desalination – reverse osmosis.
Analytical Techniques: Electromagnetic spectrum – Beer-Lambert's law - Fundamentals of spectroscopy – (Instrumentation) of UV-Visible, AAS, Flame photometry.

UNIT II	ELECTROCHEMISTRY, CORROSION AND ALLOYS	9

Electrochemistry: Electrochemical cells – reversible and irreversible cells – EMF – measurement of EMF – single electrode potential – Nernst equation (Problems) – reference electrode – standard hydrogen electrode and calomel electrode – electrochemical series and its applications.
Corrosion: Corrosion – Pilling Bedworth rule - dry corrosion - electrochemical corrosion – types (galvanic, pitting, differential aeration) – factors influencing corrosion – corrosion control methods – sacrificial anode method – impressed current cathodic method – protective coatings – paints – constituents – functions – metallic coatings – electroplating (Cu) and electro less plating (Ni).

UNIT III	POLYMERS AND COMPOSITES	9

Polymers: Definition – classification – functionality – polymerization – degree of polymerization – types (addition, condensation, copolymerization) – mechanism (free radical) – plastics – thermoplastics and thermosetting plastics – preparation, properties and uses of individual polymers (PVC, TEFLON, Nylon-6,6, Nylon-6, PET, epoxy resin) – rubber - vulcanization of rubber – applications- Biopolymers – Properties and its applications (Polylactic acid) – Conducting polymers - Properties and its applications (Polyacetylene)
Composites: definition – types - polymer matrix composites – Fibre Reinforced Polymers – applications – advanced composite materials – physical and chemical properties – applications.

UNIT IV	NON-CONVENTIONAL ENERGY SOURCES AND STORAGE DEVICES - LUBRICANTS	9

Nuclear energy – fission fusion reactions – light water nuclear reactor for power generation – breeder reactor – solar energy conversion – solar cells – wind energy – batteries: alkaline batteries – lead–acid accumulator, Ni-Cd ,and Li-ion batteries – fuel cells – H_2-O_2 fuel cell - principles and applications – advantages and disadvantages.
Lubricants: Lubricants - mechanism of lubrication, classification and properties of lubricants (viscosity index, flash and fire points, cloud and pour points, oilyness), Additives for lubricants, synthetic lubricants, Greases – Preparation & properties (consistency, drop point) and uses.

UNIT V	FUELS AND COMBUSTION	9

Classification - Calorific value – coal – analysis of coal (Proximate and Ultimate) – metallurgical coke – manufacture by Otto-Hoffmann method – petroleum – manufacture of synthetic petrol (Bergius method) – Knocking –octane number – diesel oil – cetane number – Power alcohol - natural gas - compressed natural gas (CNG) – Liquefied petroleum gas (LPG) – Producer gas – water gas.

Combustion of fuels: theoretical calculation of calorific value – calculation of stoichiometry of fuel and air ratio – ignition temperature - explosive range – flue gas analysis (ORSAT apparatus)

TOTAL: 45 PERIODS

COURSE OUTCOMES

On completion of the course the student will be able to,

- apply the knowledge of basic science in identifying, to formulate and to solve the engineering problems.
- analyze water borne problems faced in boilers, water treatment methods and analytical techniques and its applications.
- understand polymerization reactions and electrochemical reactions and its applications.
- Obtain knowledge in various renewable energy resources, Batteries, fuel cells, lubricants and its applications.
- acquire in-depth knowledge in fuels and combustion.

COURSE ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2		2		1			1			1	1			
CO2	2	1	3		1			1	1		2	1			
CO3	2		1		1			1	1		2	1	2		1
CO4	2		3		2			1	1		2	1	1		1
CO5	2		1		2			1	1		2	1	1		1

TEXT BOOKS:

1. Jain and Jain , 16th edition, "Engineering Chemistry" Dhanpat Rqai Publishing Co.
2. Sivasankar B., "Engineering Chemistry", Tata McGraw-Hill Publishing Company Ltd, New Delhi, 2008.
3. S.S.Dara, "A Text book of Engineering Chemistry", S.Chand Publishing, 12th Edition, 2018.

REFERENCES:

6. Pahari A and Chauhan B., "Engineering Chemistry"., Firewall Media., New Delhi., 2010.
7. ShikhaAgarwal, "Engineering Chemistry-Fundamentals and Applications", Cambridge University Press, Delhi, Second Edition, 2019.
8. B.S.Murty, P.Shankar, Baldev Raj, B.B.Rath and James Murday, "Text book of nanoscience and nanotechnology", Universities Press-IIM Series in Metallurgy and Materials Science, 2018.
9. O.V. Roussak and H.D. Gesser, Applied Chemistry-A Text Book for Engineers and Technologists, Springer Science Business Media, New York, 2nd Edition, 2013.
10. O.G. Palanna, "Engineering Chemistry" McGraw Hill Education (India) Private Limited, 2nd Edition, 2017.

(HOD/Chemistry)

22ZES105	PROBLEM SOLVING AND PYTHON PROGRAMMING	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To know the basics of algorithmic problem solving and to read and write simple python programs.
- To develop python programs with conditionals and loops and to define python functions and call them.
- To use python data structures-lists-tuples-dictionaries and to do input/output with files in python.

UNIT I	PROBLEM SOLVING				9

Algorithms, building blocks of algorithms (statements, state, control flow, functions), notations (pseudo code, flowchart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion). Illustrative Problems – Computing Factorial, Generating Fibonacci Series, Checking Prime Number, Armstrong Number, Perfect Number, Strong Number, Find minimum in a list, Insert a card in a list of sorted cards, and guess an integer number in a range, Towers of Hanoi.

UNIT II	DATA, EXPRESSIONS, STATEMENTS				9

Introduction - Features of Python - Writing and Executing first Python - Literal Constants - Variables and Identifiers - Data Types - Input Operation - Comments - Reserved Words - Indentation - Operators and Expressions - Operations on Strings - Type Conversion.
Decision Control Statements - Introduction - Selection/Conditional Branching - Basic Loop Structures - The Break Statement - The Continue Statement - The Pass Statement. Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

UNIT III	LISTS, TUPLES, DICTIONARIES				9

Sequence – Lists - Functional Programming – Tuple, Creating Tuple, Accessing Values in a Tuple, Deleting Elements in Tuple, Updating Tuple - Sets – Dictionaries, Creating a Dictionary, Accessing Values, Deleting Items, Sorting Items. Illustrative programs: selection sort, insertion sort, mergesort, histogram.

UNIT IV	CONTROL FLOW, FUNCTIONS				9

Introduction - Function Definition - Function Call - Variable Scope and Lifetime - The Return Statement - More on Defining Functions - Lambda Functions or Anonymous Functions - Recursive Functions.
Modules - Packages in Python - Standard Library Modules - Globals(), Locals(), and Reload() - Function Redefinition. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.

UNIT V	FILES, MODULES, PACKAGES				9

Files and exception: text files, reading and writing files, format operator; command line arguments, Errors and exceptions, handling exceptions, Built-in and User-Defined Exceptions - The finally Block. modules, packages; Illustrative programs: word count, Copy file.

	TOTAL : 45 PERIODS

OUTCOMES:	On completion of this course, students will be able to
1.	Develop algorithmic solutions to simple computational problems
2.	Read, write, execute by hand simple Python programs.
3.	Represent compound data using Python lists, tuples, dictionaries
4.	Decompose a Python program into functions
5.	Read and write data from/to files in python programs

COURSE ARTICULATION MATRIX:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	1		1	1	1							
CO2	3	3	2	2	1	1	1	1			2				
CO3	3	3	2	2	1	1	1	1			1				
CO4	3	3	2	2		1	1	1			1				
CO5	3	3	2	2	1	1	1	1			2				

(1-Low, 2- Moderate, 3-High)

*PSO Mapping may be done accordingly.

TEXT BOOKS:

1.	Reema Thareja, "Problem Solving and Programming with Python", Oxford University Press 2018.
2.	Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016.

REFERENCES:

1.	Robert Sedgewick, Kevin Wayne, Robert Dondero, "Introduction to Programming in Python", An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd., 2016.
2.	Timothy A. Budd, "Exploring Python", Mc-Graw Hill Education (India) Private Ltd.,, 2015.
3.	John V Guttag, "Introduction to Computation and Programming Using Python", Revised and expanded Edition, MIT Press , 2013
4.	Charles Dierbach, "Introduction to Computer Science using Python: A Computational Problem-Solving Focus", Wiley India Edition, 2013.
5.	Paul Gries, Jennifer Campbell and Jason Montojo, "Practical Programming: An Introduction to Computer Science using Python 3", Second edition, Pragmatic Programmers, LLC,2013.
6.	Kenneth A. Lambert, "Fundamentals of Python: First Programs", CENGAGE Learning, 2012.

Files and exception: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file, Voter's age validation, Marks range validation (0-100).

TOTAL : 45 PERIODS

COURSE OUTCOMES:

Upon completion of the course, students will be able to

CO1: Develop algorithmic solutions to simple computational problems.

CO2: Develop and execute simple Python programs.

CO3: Write simple Python programs using conditionals and looping for solving problems.

CO4: Decompose a Python program into functions.

CO5: Represent compound data using Python lists, tuples, dictionaries etc.

CO6: Read and write data from/to files in Python programs.

TEXT BOOKS:

1. Allen B. Downey, "Think Python: How to Think like a Computer Scientist", 2nd Edition, O'Reilly Publishers, 2016.
2. Karl Beecher, "Computational Thinking: A Beginner's Guide to Problem Solving and programming", 1st Edition, BCS Learning & Development Limited, 2017.

REFERENCES:

1. Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, 1st Edition, 2021.
2. G Venkatesh and Madhavan Mukund, "Computational Thinking: A Primer for Programmers and Data Scientists", 1st Edition, Notion Press, 2021.
3. John V Guttag, "Introduction to Computation and Programming Using Python: With Applications to Computational Modeling and Understanding Data", Third Edition, MIT Press 2021
4. Eric Matthes, "Python Crash Course, A Hands - on Project Based Introduction to Programming", 2nd Edition, No Starch Press, 2019.
5. https://www.python.org/
6. Martin C. Brown, "Python: The Complete Reference", 4th Edition, Mc-Graw Hill, 2018.

~~GE3152~~ 22ZMC106   தமிழர் மரபு   L T P C
                                                                                                          1 0 0 1

அலகு I   மொழி மற்றும் இலக்கியம்:   3
இந்திய மொழிக் குடும்பங்கள் – திராவிட மொழிகள் – தமிழ் ஒரு செம்மொழி – தமிழ் செவ்விலக்கியங்கள் - சங்க இலக்கியத்தின் சமயச் சார்பற்ற தன்மை – 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 II **மரபு – பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை – சிற்பக் கலை:** 3

நடுகல் முதல் நவீன சிற்பங்கள் 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 சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு.

அலகு III **நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள்:** 3
தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஒயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.

அலகு IV **தமிழர்களின் திணைக் கோட்பாடுகள்:** 3
தமிழகத்தின் தாவரங்களும், விலங்குகளும் – தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் – தமிழர்கள் போற்றிய அறக்கோட்பாடு – சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும் – சங்ககால நகரங்களும் துறை முகங்களும் – சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி – கடல்கடந்த நாடுகளில் சோழர்களின் வெற்றி.

அலகு V **இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு:** 3
இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு – இந்தியாவின் பிறபகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் – சுயமரியாதை இயக்கம் – இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு – கல்வெட்டுகள், கையெழுத்துப்படிகள் - தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS

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

22ZES107	PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY	L	T	P	C
		0	0	3	1.5

OBJECTIVES:

•	To write, test and debug simple python programs
•	Use functions for structuring Python programs.
•	Represent compound data using Python lists, tuples and dictionaries.
•	To implement python programs with conditionals and loops.
•	Read and write data from/to files in Python.

LIST OF EXPERIMENTS:

1. Compute the GCD of two numbers.
2. Find the square root of a number (Newton 's method).
3. Exponentiation (power of a number).
4. Find the maximum of a list of numbers.
5. Linear search and Binary search.
6. Selection sort, Insertion sort.
7. Merge sort.
8. First n prime numbers.
9. Multiply matrices.
10. Programs that take command line arguments (word count).
11. Find the most frequent words in a text read from a file.
12. Simulate elliptical orbits in Pygame.
13. Simulate bouncing ball using Pygame.

TOTAL : 45 PERIODS

OUTCOMES:	On completion of this course, students will be able to
1.	Write, test, and debug simple Python programs.
2.	Implement Python programs with conditionals and loops.
3.	Develop Python programs step-wise by defining functions and calling them.
4.	Use Python lists, tuples, dictionaries for representing compound data.
5.	Read and write data from/to files in Python.

COURSE ARTICULATION MATRIX:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	2	1	2				1						
CO2	3	2	3	1	2				1						
CO3	3	3	2	2	2				1						
CO4	3	3	3	3	2				1						
CO5	3	3	3	3	3				1						

(1-Low, 2- Moderate, 3-High)

*PSO Mapping may be done accordingly.

REFERENCES:

1. Stephen Brown, ZvonkoVranesic,"Fundamentals of Digital Logic Design With VHDL", Third Edition, McGrawHill India, 2012.

R-2022	CHEMISTRY LABORATORY	L	T	P	C
22ZBS108	Common to ECE / EEE / CSE / MECH	0	0	3	1.5

OBJECTIVES:

- To make students conversant with hands on water parameter analysis.
- To acquaint the students with the determination of molecular weight of a polymer by Ostwald viscometer.
- To make the student acquire practical skills in analytical instruments.

1. Determination of total hardness of given water sample by EDTA method.

2. Determination of alkalinity in given water sample.

3. Determination of molecular weight of polyvinylalcohol using Ostwald viscometer.

4. Conductometric titration: Mixture of acids (HCl & CH_3COOH) vs Strong base (NaOH).

5. Conductometric titration: Strong acid (HCl) vs Strong base (NaOH).

6. Conductometric titration: $BaCl_2$ vs Na_2SO_4 (Precipitation Titration).

7. Determination of strength of in given hydrochloric acid using pH meter.

8. Estimation of iron content of the given solution using potentiometer meter.

9. Determination of EMF of an unknown cell by Poggendorff's compensation method.

10. Estimation of sodium present in water using flame photometer.

11. Estimation of iron content of the given sample using Spectro photometer (thiocyanate method).

COURSE OUTCOMES

On completion of the course the student will be able to,

a.	The students will be outfitted with hands-on knowledge in the qualitative and quantitative chemical analysis of water quality related parameters, molecular weight of polymer.

COURSE ARTICULATION MATRIX

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO	1	2	1		1			2	1		1	1	1	1	1

REFERENCES:

1.	J. Mendham, R. C. Denney, J.D. Barnes, M. Thomas and B. Sivasankar, Vogel's Textbook of Quantitative Chemical Analysis (2009).
2.	A Textbook on Experiments and Calculations in Engineering Chemistry by S.S.Dara; 9th Edition, ISBN-13, 978-8121908641; published by S.Chand & Co, 2015.
3.	Daniel R. Palleros, "Experimental organic chemistry" John Wiley & Sons, Inc., New York 2001.
4.	D.P.Shoemaker, C.W.Garland and Joseph W.Nibler, Experiments in Physical Chemistry, 5th Edition, McGraw Hill, London.

(Note: A minimum of SEVEN experiments shall be offered)
List of equipments for a batch of 30 students

1. Flame photometer - 2 nos
2. Weighing balance - 2 nos
3. Conductivity meter ; Potentiometer; pH meter- 9 nos each.
4. Ostwald viscometer - 30 nos
5. Potentiometric bridge setup - 2 nos.

Common apparatus: Pipette, Burette, Burette stand, Standard volumetric flask, funnel, Conical flask, porcelain tiles, dropper, reagent bottles, glass rod, beaker, wash bottle, test tube (30 nos each).

(HOD/chemistry)

22ZBS109	PHYSICS LABORATORY	L	T	P	C
	Common to ECE and CSE	0	0	3	1.5

OBJECTIVES:

•	To introduce different experiments to understand basic physics by doing experiments

LIST OF EXPERIMENTS: PHYSICS LABORATORY (ANY 5 EXPERIMENTS)	
1	Determination of moment of inertia of a disc and rigidity modulus of the given wire – torsion pendulum
2	Determination of Young's modulus of a beam using pin and microscope – uniform bending
3	Study of I-V Characteristics of PN junction diode
4	Determination of thermal conductivity of poor conductor – Lee's disc method
5	(a) Determination of wavelength of LASER using grating, (b) Determination of numerical aperture and acceptance angle in an optical fibre
6	Determination of band gap of the given semiconductor
7	Determination of dielectric constant of the given material using LCR meter
8	Study of I-V Characteristics of Zener diode

Course outcomes:

After the course, the student will be able to apply principles of experimental physics in engineering applications.

Text Book:

1. A text book of practical physics by M.N. Srinivasan, S. Balasubramanian and R. Ranganathan, Sultan Chand and sons' publication, 2019.

2. A text book of engineering physics practicals by A. Ruby Dass, C.S. Robinson, Rajesh Kumar and Prasanth kumar sahu, Laxmi publications pvt ltd., 2016.

Reference:

R. Bakkiyaraj, A. Anandakumar and S. Santhosh, Physics Laboratory Manual, 2022.

R-2022 22ZHS110	COMMUNICATION ENGLISH LABORATORY	L	T	P	C
ECE & EEE SEM / I 22ZHS110		0	0	2	1

OBJECTIVES:

- To develop their communicative competency in English with specific reference to their speaking and listening.
- To enhance their ability to communicate effectively in interviews.
- To strengthen their prospects of success in competitive examinations.
- To Strengthen a good command over of the language proficiency.
- To comprehend a different types of accent and use them in their communication

UNIT I	PHONETICS & LISTENING COMPREHENSION	6

Verbal Ability, Articulation of sounds- Intonation-Stress and Rhythm-Conversation practice-listening Various lectures

UNIT II	COMMUNICATION AT WORKPLACE	6

Writing job applications - cover letter- resume- e-mails- memos- reports - interpreting visual texts – Summarising the text.

UNIT III	ENGLISH FOR NATIONAL AND INTERNATIONAL EXAMINATIONS AND PLACEMENTS	6

International English Language Testing System (IELTS)- Test of English as a Foreign Language (TOEFL)- Civil Service(Language related part) –English for competitive examinations – Practice for On-line examination.

UNIT IV	INTERVIEW SKILLS	6

Different types of Interview format- answering questions- offering information- mock interviews- Body languages – Role Plays – Telephone Conversation.

UNIT V	SOFT SKILLS	6

Motivation- emotional intelligence-Multiple intelligences- managing changes- time management- leadership straits- team work- career planning- creative and critical thinking

TOTAL HOURS	30 Hrs

OUTCOMES: At the end of the course, the students will be able to

•	Face interviews, group discussions and other language parameters in the job market
•	Write any competitive examinations which cover language part in it.
•	Take part in any English conversations of any kind in English. Flawlessly without fear and shyness.
•	Write articles for newspapers and magazines or any write-up in English without grammar mistakes.
•	Come out with leadership qualities, team work and career planning and will also possess critical and creative thinking.

TEXT BOOKS:

1.	Communication Skills for Engineers and Scientists, PHI Learning PVT.LTD, Delhi, 2014.
2.	Communication Skills and Soft Skills An Integrated Approach, Dorling Kindersley (INDIA) PVT.LTD, New Delhi, 2012.
3.	Soft Skills, MJP Publishers, Chennai, 2010.

REFERENCES:

5.	Craven, Miles. Listening Extra-A resource book of multi-level skills activities. Cambridge University Press, 2004.
6.	Seely, John. The Oxford guide to writing & Speaking. New Delhi: Oxford University Press.20
7.	Comfort, Jeremy, et al. Speaking Effectively: Developing speaking skills for Business English. Cambridge University Press, Cambridge: Reprint 2011.
8.	Dutt P. Kiranmai and RajeevanGeetha. Basic Communication Skills, Foundation Books:2013

22MES111 / 22ZES211	ENGINEERING PRACTICES LAB	L	T	P	C
	(Common to All Branches)	0	0	4	1.5

COURSE OBJECTIVES:

- To make various basic prototypes in the carpentry trade such as Lap joint, Lap Tee joint, Dove tail joint and various welding joints such as lap joint, butt joint and T-joint.
- To know about the simple house wiring, Demonstration of mobile and laptop and troubleshooting of personal computer.

LIST OF EXPERIMENTS:

1. Introduction to use of tools and equipment in Carpentry, Welding, Foundry and Sheet metal
2. Safety aspects in Welding and Carpentry
3. Half lap Joint and Dovetail Joint in Carpentry
4. Welding of Lap joint, Butt joint and T-joint
5. Fabrication of parts like tray, frustum of cone and square box in sheet metal
6. Plumbing
7. Electrical wiring for domestic equipment, MCB 2/3/4 pole, Light and Fan connections and Circuit breakers.
8. Dismantling and assembly of Computer/Laptops, Changing HDD, RAM and Mother Board etc.
9. Basic IOT experiments, controlling devices with mobile applications using Arduino and Raspberry pi.

Lecture: 0 Periods   Tutorial: 0 Periods   Practical: 60 Periods   Total: 60 Periods

COURSE OUTCOMES:	on completion of this course, students will be able to
1	Use of tools and equipment for Carpentry, Welding and Sheet metal.
2.	Make half lap joint, dovetail joint in carpentry and welded lap joint, butt joint and T-joint
3	Fabricate parts like tray, frustum of cone and square box in sheet metal.
4	Carry out minor works/repair related to electrical wiring and plumbing.
5	Demonstration on mobile or laptop and troubleshooting of personal computer.

REGULATION 2022

SEMESTER II

SYLLABI

(W.e.f. the AY 2022-2023 onwards)

R-2022 22ZHS201	ENGLISH FOR ENGINEERS - II Common for all Branches	L	T	P	C
		3	0	0	3

OBJECTIVES:

•	Learn to use right engineering Terminologies and impersonal way of communication in Technical writing.
•	Able to draft any Technical Varied documents, following the techniques of effective writing.
•	Able to write introduction and conclusion of any given document.
•	Aware of accent change according to function and meaning of the word.
•	Able to develop different types of presentations, role-play and taking part in virtual interview.

UNIT I	Infinitives – Split Infinitive – Plain Infinitive – Participles – Gerund – Tenses – Portmanteau Words or Blends – Barrowed words – Difference in British and American English – Engineering Terminology – Impersonal Passive Voice – Prepositional Phrases – Idioms and Phrases	9
UNIT II	Errors Analysis - Announcements – Airline/Train Announcement – Weather Forecast Report – Product Description – Advertisement Preparation – Posture Making – Slogan Making- Writing Responses to Complaints – Enquiring about a course over phone.	9
UNIT III	Technical Essay writing – Features of an Essay – Thesis Statement – Organisation of the Material – Writing Introduction and Conclusion – Historical and Technical Background – Letter Writing (Formal and Informal) – Job / Internship Application - Resume Writing	9
UNIT IV	Writing Vision and Mission Statement, Short Report on An Event (Field Trip, Internship Report etc.) – Writing Articles in Technical Blogs – News Paper Articles – Letter to Editor –Writing Proposal – Case Studies – Film Review – Note Making.	9

UNIT V	Making Effective Speech – Accent Change according to Meaning – Intonation – Oral Presentation – Difference between Lecture and Public Speech and Presentation- Participating in a Role Play (Interview/ Telephone Interview/ Virtual Interview) – Making Presentations with Visual Aids	9

TOTAL HOURS		45 Hrs

OUTCOMES: At the end of the course , the students will be able to :

•	Apply conventional patterns of organising technical texts.
•	Gain knowledge to rectify common errors and incorrect usages of words in a meaningful context.
•	Develop competence in writing descriptive essays or articles in technical blogs.
•	Acquire the skill of making announcements, writing film reviews, case studies and proposal writing.
•	Demonstrate the skill of oral presentation on technical and general context.

TEXT BOOKS:

1.	English Language Skills for Engineers, Aruna Koneru, McGraw Hill Education (India) Private Ltd 2020.

REFERENCES:

13.	Bailey, Stephen. Academic Writing: A Practical guide for students .New York: Rutledge, 2018.
14.	Sudarshana, N.P. and Savitha, C. (2018). English for Engineers. Cambridge University Press.
15.	Zinsser, William. (2001). On Writing Well. Harper Resource Book.
16.	Hamp-Lyons, L. (2006). Study writing. Cambridge University Press.

D.J சுந்தர்
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GOVERNMENT COLLEGE OF ENGINEERING (AUTONOMOUS), BARGUR

Regulations – 2022

Curriculum for B.E.(FT) COMPUTER SCIENCE AND ENGINEERING

(From the Academic Year 2022-23 AND ONWARDS)

SL.No	SEMESTER	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	C
1.	I	22ZBS102	MATRICES AND CALCULUS	BS	3	1	0	4
2.	II	22SBS202	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	BS	3	1	0	4
3.	III	22SBS301	PROBABILITY AND QUEUEING THEORY	BS	3	1	0	4
4.	IV	22SBS401	APPLIED STATISTICS AND NUMERICAL METHODS	BS	3	1	0	4
5.	V	22SBS501	DISCRETE MATHEMATICS	BS	3	1	0	4

M. Mag
1/2/23

GOVERNMENT COLLEGE OF ENGINEERING (AUTONOMOUS), BARGUR

Regulations – 2022

Curriculum for M.E.(FT) COMPUTER SCIENCE AND ENGINEERING

(From the Academic Year 2022-23 AND ONWARDS)

SL.No	SEMESTER	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	C
1.	I	22CSFC01	MATHEMATICAL FOUNDATIONS FOR COMPUTER SCIENCE	BS	4	0	0	4

M. Mag
1/2/23

Sonbuano
1/2/23

22 SBS 202:

22ZBS301 TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS

L T P C

(III Semester MECH)

3 1 0 4

COURSE OBJECTIVES:
- To introduce Fourier series analysis which is central to many applications in engineering apart from its use in solving boundary value problems.
- To acquaint the student with Fourier transform techniques used in wide variety of situations.
- To introduce the effective mathematical tools for the solutions of partial differential equations that model several physical processes and to develop Z transform techniques for discrete time systems.

UNIT I PARTIAL DIFFERENTIAL EQUATIONS   9+3
Formation of partial differential equations – Singular integrals -- Solutions of standard types of first order partial differential equations - Lagrange"s linear equation -- Linear partial differential equations of second and higher order with constant coefficients of both homogeneous and non-homogeneous types.

UNIT II FOURIER SERIES   9+3
Dirichlet"s conditions – General Fourier series – Odd and even functions – Half range sine series – Half range cosine series – Complex form of Fourier series – Parseval's identity – Harmonic analysis.

UNIT III APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS   9+3
Classification of PDE – Method of separation of variables - Solutions of one dimensional wave equation – One dimensional equation of heat conduction – Steady state solution of two dimensional equation of heat conduction (excluding insulated edges).

UNIT IV FOURIER TRANSFORMS   9+3
Statement of Fourier integral theorem – Fourier transform pair – Fourier sine and cosine transforms – Properties – Transforms of simple functions – Convolution theorem – Parseval's identity.

UNIT V Z - TRANSFORM AND DIFFERENCE EQUATIONS   9+3
Z- transform - Elementary properties – Inverse Z - transform (using partial fraction and residues) – Convolution theorem - Formation of difference equations – Solution of difference equations using Z - transform.

COURSE OUTCOMES:

After completing the course the students will be able to

- solve higher order partial differential equations
- apply Fourier series in Engineering problems
- apply partial differential equations in solving wave and heat equations
- apply Fourier transform to solve partial differential equations.
- apply Z-Transform to solve Difference Equations

TEXT BOOKS:

1. Veerarajan. T, "Transforms and Partial Differential Equations", Second reprint, Tata Mc Graw Hill Education Pvt. Ltd, New Delhi, 2012.
2. Grewal.B.S, "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, Delhi, 2012.
3. Narayanan.S,Manicavachagom.P.T.K and Ramanaiah.G, "Advanced Mathematics for

Engineering Students" ,Vol. II & III, S.Viswanathan Publishers Pvt Ltd,1998.

REFERENCES:

1. Bali.N.P and M. Goyal, "A Textbook of Engineering Mathematics", 7th Edition, Laxmi Publications Pvt Ltd , 2007.
2. Ramana.B.V, "Higher Engineering Mathematics", Tata Mc-Graw Hill Publishing Company Limited, New Delhi, 2008.
3. G. James, "Advanced Modern Engineering Mathematics", 3rd Edition, Pearson Education, 2007.
4. E. Kreyszig, "Advanced Engineering Mathematics", 8th Edition, Wiley India, 2007. Ray W.C and Barrett.L.C, "Advanced Engineering Mathematics" ,Sixth Edition, Tata Mc Graw Hill Education Pvt Ltd, New Delhi, 2012.
5. Datta.K.B, "Mathematical Methods of Science and Engineering", Cengage Learning India Pvt Ltd, Delhi, 2013.

GOVERNMENT COLLEGE OF ENGINEERING (AUTONOMOUS), BARGUR

Regulations – 2022

Curriculum for B.E.(FT) ELECTRONICS AND COMMUNICATION ENGINEERING

(From the Academic Year 2022-23 AND ONWARDS)

SL.No	SEMESTER	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	C
1.	I	22ZBS102	MATRICES AND CALCULUS	BS	3	1	0	4
2.	II	22ZBS202	ORDINARY DIFFERENTIAL EQUATIONS AND ANALYTIC FUNCTIONS	BS	3	1	0	4
3.	III	22ZBS301	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	BS	3	1	0	4
4.	IV	22LBS401	STATISTICS AND RANDOM PROCESSES	BS	3	1	0	4

M. Mag
1/2/23
M. ᴄᴏᴛ
1/2/23

GOVERNMENT COLLEGE OF ENGINEERING (AUTONOMOUS), BARGUR

Regulations – 2022

Curriculum for M.E.(FT) APPLIED ELECTRONICS

(From the Academic Year 2022-23 AND ONWARDS)

SL.No	SEMESTER	COURSE CODE	COURSE TITLE	CATEGORY	L	T	P	C
1.	I	22AEFC01	MATHEMATICAL FOUNDATIONS FOR ELECTRONICS ENGINEERS	BS	4	0	0	4

M. Mag
1/2/23

M. ᴄᴏᴛ
1/2/23
for

22ZBS202   ORDINARY DIFFERENTIAL EQUATIONS AND ANALYTIC FUNCTIONS

II Semester ECE

(Common to ECE/ EEE)

L T P C
3 1 0 4

COURSE OBJECTIVES:

To equip students with the knowledge of

- vector calculus and their uses in various field theoretic subjects.
- higher order and special type of linear differential equations and methods to find solutions.
- Laplace transforms and properties and their applications in engineering.
- construction of analytic functions and concepts of conformal mapping
- complex integration and series solutions.

UNIT- I VECTOR CALCULUS   9+3

Gradient, divergence and curl – Directional derivative – Irrotational and solenoidal vector fields – Vector integration – Green's theorem in a plane, Gauss divergence theorem and Stokes' theorem (excluding proofs) – Simple applications involving cubes and rectangular parallelopipeds.

UNIT- II ORDINARY DIFFERENTIAL EQUATIONS   9+3

Higher order linear differential equations with constant coefficients – Method of variation of parameters – Cauchy's and Legendre's linear equations – Simultaneous first order linear equations with constant coefficients.

UNIT- III LAPLACE TRANSFORMS   9+3

Laplace transform – Sufficient condition for existence – Transform of elementary functions – Basic properties – Transforms of derivatives and integrals of functions - Derivatives and integrals of transforms - Transforms of unit step function and impulse functions – Transform of periodic functions. Inverse Laplace transform -Statement of Convolution theorem – Initial and final value theorems – Solution of linear ODE of second order with constant coefficients using Laplace transformation techniques.

UNIT- IV ANALYTIC FUNCTIONS   9+3

Functions of a complex variable – Analytic functions: Necessary conditions – Cauchy-Riemann equations and sufficient conditions (excluding proofs) – Harmonic and orthogonal properties of analytic function – Harmonic conjugate – Construction of analytic functions – Conformal mapping: $w = z+k$, kz, $1/z$, z^2 and bilinear transformation.

UNIT- V COMPLEX INTEGRATION   9+3

Complex integration – Statement and applications of Cauchy's integral theorem and Cauchy's integral formula – Taylor's and Laurent's series expansions – Singular points – Residues – Cauchy's residue theorem – Evaluation of real definite integrals as contour integrals around unit circle and semi-circle (excluding poles on the real axis).

TOTAL (L : 45 + T : 15): 60 PERIODS

COURSE OUTCOMES:

After completing the course the students will be able to

- solve problems on vector calculus and to apply them in any other field theory related subjects.
- solve differential equations and will be exposed to their applications in various fields of engineering.
- solve problems on Laplace transforms and will be able to use Laplace transform in finding solutions of differential and integral equations and other engineering applications.
- Apply analytic functions and conformal mapping in engineering problems.
- Evaluate integrations involving functions of complex variables.

TEXTBOOKS:

1. Bali. N.P and Manish Goyal, "A Textbook of Engineering Mathematics", Laxmi Publications Pvt Ltd, 9th Edition 2016.

2. Grewal.B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition , 2018.

REFERENCE BOOKS:

1. Dass, H.K., and Er. Rajnish Verma, "Higher Engineering Mathematics", S. Chand Private Ltd., 2014.

2. Glyn James, "Advanced Modern Engineering Mathematics", 5th Edition, Pearson Education, 2018.

3. Peter V. O'Neil, "Advanced Engineering Mathematics", 7th Edition, Cengage learning, 2012.

4. Ramana. B.V., "Higher Engineering Mathematics", McGraw Hill Education Pvt. Ltd,New Delhi, 2017.

5. Sivarama Krishna Das P. and Rukmangadachari E., "Engineering Mathematics", Volume II, Second Edition, PEARSON Publishing, 2018.

22MBS202 PROBABILITY AND ANALYTIC FUNCTIONS   L T P C
(II Semester MECH)   3 1 0 4

COURSE OBJECTIVES:
- To make the student acquire sound knowledge of techniques in solving ordinary differential Equations that model engineering problems.
- To develop an understanding of the standard techniques of complex variable theory so as to enable the student to apply them with confidence, in application areas such as heat conduction, elasticity, fluid dynamics and flow the of electric current
- To provide necessary basic concepts in probability

UNIT I   ORDINARY DIFFERENTIAL EQUATIONS

Higher order linear differential equations with constant coefficients – Method of variation of parameters – Cauchy's and Legendre's linear equations – Simultaneous first order linear equations with constant coefficients.

UNIT II   ANALYTIC FUNCTIONS

Functions of a complex variable – Analytic functions: Necessary conditions – Cauchy-Riemann equations and sufficient conditions (excluding proofs) – Harmonic and orthogonal properties of analytic function – Harmonic conjugate – Construction of analytic functions – Conformal mapping: $w = z+k$, kz, $1/z$, z^2 and bilinear transformation.

UNIT III COMPLEX INTEGRATION

Complex integration – Statement and applications of Cauchy's integral theorem and Cauchy's integral formula – Taylor's and Laurent's series expansions – Singular points – Residues – Cauchy's residue theorem – Evaluation of real definite integrals as contour integrals around unit circle and semi-circle (excluding poles on the real axis).

UNIT IV PROBABILITY AND RANDOM VARIABLES   9+3

Basic concepts of Probability - Discrete and Continuous random variables – Moments – Moment generating functions – Binomial, Poisson and Normal distributions (Problems only).

UNIT V   TESTING OF HYPOTHESIS

Sampling distributions – Type I and Type II errors – Small and large samples – Tests based on Normal, t, Chi square and F distributions for testing of mean, variance and proportions – Tests for independence of attributes and goodness of fit.

TOTAL (L:45+T:15): 60 PERIODS

COURSE OUTCOMES:
After completing the course the students will be able to
- solve differential equations and will be exposed to their applications in various fields of engineering.
- Apply analytic functions and conformal mapping in engineering problems.
- Evaluate integrations involving functions of complex variables.
- Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
- Apply knowledge of testing of hypothesis in engineering problems

TEXT BOOKS:

1. Bali N. P and Manish Goyal, "A Text book of Engineering Mathematics", Eighth Edition, Laxmi Publications Pvt Ltd.,2011.
2. Grewal. B.S, "Higher Engineering Mathematics", 41 st Edition, Khanna Publications, Delhi, 2011.
3. Gupta S.C. and Kapoor V. K., "Fundamentals of Mathematical Statistics", Sultan Chand & Sons,New Delhi, 12th Edition, 2020.

REFERENCES:

1. Dass, H.K., and Er. Rajnish Verma," Higher Engineering Mathematics", S. Chand Private Ltd., 2011
2. Glyn James, "Advanced Modern Engineering Mathematics", 3rd Edition, Pearson Education, 2012.
3. Peter V. O'Neil," Advanced Engineering Mathematics", 7th Edition, Cengage learning, 2012.
4. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, 2008.
5. Sivarama Krishna Das P. and Rukmangadachari E., "Engineering Mathematics" Volume II, Second Edition, PEARSON Publishing, 2011.
6. Walpole. R.E., Myers. R.H., Myers. S.L., and Ye. K., "Probability and Statistics for Engineers and Scientists", 8 th Edition, Pearson Education, Asia, 2007.
7. Spiegel. M.R., Schiller. J., and Srinivasan. R.A., "Schaum's Outlines on Probability and Statistics", Tata McGraw Hill Edition, 2004.
8. Johnson. R.A., and Gupta. C.B., "Miller and Freund's Probability and Statistics for Engineers", 11th Edition, Pearson Education, , Asia, 2011.

22ZBS203	PHYSICS OF SEMICONDUCTOR DEVICES	L	T	P	C
	Common to ECE, EEE and CSE Branches	3	0	0	3

OBJECTIVES:

- To learn about the fundamentals of electronic materials and their properties
- To understand how to calculate charge carriers in semiconducting materials
- To know characteristics of p-n junction and its applications
- To understand about principle and working of semiconducting devices
- To familiarize about the working applications of special semiconductor devices

UNIT I	ELECTRONIC MATERIALS	9

Classical free electron theory: expression for electrical conductivity-thermal conductivity-Wiedemann – Franz law - Lorenz number- success and failures, quantum free electron theory: Fermi-Dirac statistics- Fermi energy, density of energy states (derivation), energy bands in solids.

UNIT II	CARRIER CONCENTRATION IN SEMICONDUCTOR	9

Types of semiconductors-energy band diagram – direct and indirect band gap- Intrinsic semiconductor - intrinsic carrier concentration (electrons and holes) - electrical conductivity of intrinsic semiconductor - extrinsic semiconductor – types- carrier concentration of n and p type semiconductor, variation of Fermi level with temperature, determination of band gap.

UNIT III	THE P-N JUNCTION DIODE	9

Basic structure of p-n junction, depletion region – barrier potential – drift and diffusion current density-forward and reverse bias characteristics of p-n junction - Zener breakdown – avalanche breakdown, Zener diode: working, characteristics, Zener diode as a voltage regulator.

UNIT IV	TRANSISTORS	9

BJT: NPN and PNP transistors- current equation- principle of operation - input and output characteristics of CE, CB and CC configuration of NPN transistors, JFET: types- construction- drain and transfer characteristics, MOSFET: Construction and working of e-MOSFET and d-MOSFET.

UNIT V	SPECIAL SEMICONDUCTOR DEVICES	9

Principle, construction, working and applications of: Schottky diode, light emitting diodes, solar Cells, photoconductive cell and tunnel diode.

TOTAL:45 PERIODS

OUTCOMES:

•	Students will understand the electronic properties of materials
•	Students will be able to realize the semiconducting materials and its carrier concentration
•	Students will understand different types of diodes and its applications
•	Students will also get an exposure to the function of various transistors in engineering aspects
•	Students will able to recognize the usage of special semiconductor devices

TEXTBOOKS:

1	V.K. Mehta and Rohit Mehta, Principles of electronics, S. Chand publication,2020
2	Thomas L. Floyd, Electronic devices, Pearson publication, 9th edition 2015.
3	Uma Mukherji, Engineering Physics, Alpha Science International Ltd., Oxford, U.K.
4	K. Rajagopal, "Engineering Physics", PHI, New Delhi, 2011.
5	Kanaan Kano, Semiconductor devices, PHI publication, 2010.

REFERENCES:

1	Concepts of Modern Physics. Arthur Beiser, Tata McGraw-Hill, New Delhi (2010)
2	Sima Dimitrijev, Principles of semiconductor devices, Oxford university press, 2nd edition, 2011
3	Fundamentals of Physics II, R. Shankar, Yale University Press, New Haven and London (2016).
4	Fundamentals of Physics, 6th Edition, D. Halliday, R. Resnick and J. Walker, John Wiley and Sons, New York (2001).
5	Callister's materials Science and Engineering, R. Balasubramaniam, Wiley India Pvt. Ltd., 2014
6	Semiconductor physics and devices, Donald A Neaman, Dhrubes Biswas, McGraw Hill Education India, 4th edition.

22MBS203	MATERIALS SCIENCE	L	T	P	C
	Mechanical Engineering	3	0	0	3

OBJECTIVES:

- To become proficient in basics of crystals, their structures and defects in crystals
- To understand electrical properties of materials
- To learn the fundamentals about semiconducting properties and its device applications
- To understand the importance, properties and fabrication techniques of low-dimension materials
- To understand the basics of advanced materials and its applications

UNIT I	CRYSTALLOGRAPHY	9

Crystal structures: BCC, FCC and HCP – directions and planes in a crystal, Miller indices – inter-planar distances, crystal imperfections: edge and screw dislocations – grain and twin boundaries - Burger vectors, plastic deformation of materials, nucleation and growth (qualitative), Bragg's law of X-ray diffraction – powder crystal method.

UNIT II	ELECTRICAL PROPERTIES OF MATERIALS	9

Classical free electron theory: expression for electrical conductivity-thermal conductivity-Wiedemann – Franz law- Lorenz number-success and failures, quantum free electron theory: Fermi-Dirac statistics- density of energy states, zone theory- electron in periodic potential-energy bands in solids.

UNIT III	PHYSICS OF SEMICONDUCTOR DEVICES	9

P type and N type semiconductors – diode characteristics, LED, Solar cells, Hall effect, BJT: Structure and types – principle and working of NPN transistors – three configurations (qualitative) – BJT as an amplifier in CE configuration, IC-Op-amp- IC 741 pin configuration-Characteristics of op-amp – applications: inverting and non-inverting amplifier

UNIT IV	NANOMATERIALS AND APPLICATIONS	9

Nanomaterials: Types- 2D, 1D, 0D materials- quantum confinement – quantum structures: well, wire, dots- properties and applications of nanomaterial, synthesis: top down approach: ball milling, bottom up approach- Pulsed laser deposition method, structure, properties and applications of carbon nanotubes

UNIT V	ADVANCED MATERIALS	9

Shape memory alloys (SMA): one way and two way memory effect-pseudoeleasticity-Ni-Ti alloy-properties and applications, Metallic glasses: preparation-properties-medical applications, spintronics-active and passive optoelectronic devices, giant magnetoresistance (GMR) devices, smart glasses.

TOTAL:45 PERIODS

OUTCOMES:

•	Students will understand the basics of crystals, their structures and defects in crystals
•	Students will be able to experience the electrical properties of materials
•	Students will also acquire knowledge in semiconducting properties and device applications
•	Students will understand the fundamentals of nanomaterials synthesis, properties and its applications
•	Students will also get an exposure towards the uses of advanced materials.

TEXTBOOKS:

1.	V.K. Mehta and Rohit Mehta, Principles of electronics, S. Chand publication, 2020
2.	S. Mani Naidu, "Applied Physics", Pearson Publisher, India, 2010.
3.	Uma Mukherji, "Engineering Physics", Alpha Science International Ltd., Oxford, U.K.
4.	T. Pradeep, "NANO: The Essentials", Tata Mc Graw-Hill Pvt. Ltd., New Delhi, 2007
5.	P. Mani, "Engineering physics", Dhanam Publications, 2017

REFERENCES:

1.	Concepts of Modern Physics. Arthur Beiser, Tata McGraw-Hill, New Delhi (2010)
2.	Introduction to Nanotechnology, C.P. Poole and F.J. Owens, Wiley, New Delhi (2007).
3.	Fundamentals of Physics II, R. Shankar, Yale University Press, New Haven and London (2016).
4.	Fundamentals of Physics, 6th Edition, D. Halliday, R. Resnick and J. Walker, John Wiley and Sons, New York (2001).
5.	Callister's materials Science and Engineering, R. Balasubramaniam, Wiley India Pvt. Ltd., 2014

26/6/2022

(Dr. R. BACKIYARAJ)

AP/PHY

22ZES204	ENGINEERING GRAPHICS	L	T	P	C
	(Common to MECH, EEE & CSE)	2	0	4	4

COURSE OBJECTIVES:

•	This course aims to introduce the concept of graphic communication, develop the drawing skills for communicating concepts, ideas and designs of engineering products and to expose them to existing national standards related to technical drawings
•	To draw the projection of simple solids like prisms, pyramids, cylinder etc.
•	To draw the development of surfaces to estimate the sheet metal requirement and to prepare sectional views of solids.
•	To develop skills in three-dimensional visualization of engineering components and to draw isometric views of simple solids.

CONCEPTS AND CONVENTIONS (Not for Examination)

Importance of graphics in engineering applications – use of drafting instruments – BIS / ISO conventions and specifications – size, layout and folding of drawing sheets – lettering and dimensioning.

UNIT I	PLANE CURVES AND FREE-HAND SKETCHING	6+9

Basic geometrical constructions, curves used in engineering. Conics – construction of ellipse, parabola and hyperbola by eccentricity method – drawing of tangents and normal to the above curves. Visualization concepts and free hand sketching: visualization principles –representation of three dimensional objects – layout of views- freehand sketching of multiple views from pictorial views of objects.

UNIT II	PROJECTION OF POINTS, LINES AND PLANE SURFACES	6+9

Orthographic projection – Principles-principal planes - First angle projection - Projection of points - Projection of straight lines inclined to both the principal planes - determination of true lengths and true inclinations by rotating line method - traces. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT III	PROJECTION OF SOLIDS	6+9

Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids, when the axis is inclined to both the principal planes by rotating object method.

UNIT IV	PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES	6+9

Sectioning of prisms, pyramids, cylinders and cones in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids – prisms, pyramids cylinders and cones.

UNIT V	ISOMETRIC PROJECTION AND OVERVIEW OF COMPUTER GRAPHICS	6+9

Principles of isometric projection – isometric scale –isometric projections of simple solids and truncated solids - prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions – Introduction to CAD - The Menu System, Toolbars (Standard, Object Properties,

Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD- (CAD – evaluation during CA only)

Lecture: 30 Periods   Tutorial: 0 Periods   Practical: 60 Periods   Total: 90 Periods

OUTCOMES:	On completion of this course, students will be able to
1	Familiarize with the fundamentals, standards of Engineering graphics and Perform freehand sketching of multiple views of basic geometrical constructions.
2	Draw orthographic projections of points, lines and plane surfaces.
3	Draw projections of simple solids.
4	Visualize and draw sectioned solids and development of surfaces.
5	Visualize and draw isometric views of simple solids and appreciate the use of computers in drawing and modelling of simple objects.

TEXT BOOKS:

1	Natrajan K. V., "**A text book of Engineering Graphics**", Dhanalakshmi Publishers, Chennai, 2016.
2	Venugopal K. and Prabhu Raja V., "**Engineering Graphics**", New Age International (P) Limited, 2016.
3	Shah, M. B. and Rana B. C. "**Engineering Drawing and Computer Graphics**", Pearson Education, 2010

REFERENCES:

1	*N S Parthasarathy and Vela Murali, "**Engineering Graphics**", Oxford University, Press, New Delhi, 2015.*
2	*Gopalakrishna K.R., "**Engineering Drawing**" (**Vol. I&II combined**), Subhas publications, Bangalore, 2014.*
3	*Basant Agrawal and Agrawal C.M., "**Engineering Drawing**", Tata McGraw Hill Publishing Company Limited, New Delhi, 2013.*
4	*Luzzader, Warren J. and Duff John M., "**Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production**", Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005*
5	*Bhatt N. D. and Panchal V. M., "**Engineering Drawing**", Charotar Publishing House, 53rd Edition, 2014.*

22ZES205	PROGRAMMING IN C	L	T	P	C
	(Common to CSE & ECE)	3	0	0	3

OBJECTIVES:

- Learn the organization of a digital computer and get exposed to the number systems
- Learn to think logically and write pseudo code or draw flow charts for problems and get exposed to the syntax of C
- Learn to use arrays, strings, functions, pointers, structures, unions and file management in C

UNIT I	INTRODUCTION	8

Generation and Classification of Computers- Basic Organization of a Computer –Number System – Binary – Decimal – Conversion – Problems. Need for logical analysis and thinking – Algorithm –Pseudo code – Flow Chart - Problem formulation – Problem Solving.

UNIT II	C PROGRAMMING BASICS	10

Introduction to C Programming - Basic Structure of C Programs - Compilation and Linking processes - C Tokens – Constants - Variables - Data Types - Expressions using operators in 'C' – Managing Input and Output operations – Decision Making and Branching – Looping statements – solving simple scientific and statistical problems.

UNIT III	ARRAYS AND STRINGS	9

Arrays – Initialization – Declaration – One dimensional and Two dimensional arrays. - Multi-Dimensional Arrays - Dynamic Arrays. Strings –String Operations – String Arrays. Simple programs- Sorting- Searching – Matrix operations.

UNIT IV	FUNCTIONS, STRUCTURES AND UNION	9

Functions - Elements of User-Defined Functions - Function Calls - Category of Functions – Recursion - The Scope, Visibility, and Lifetime of Variables.

Introduction –Defining Structures – Accessing Structure Members - Arrays of Structures. Unions - Storage classes – Preprocessor Directives.

UNIT V	POINTERS AND FILE MANAGEMENT	9

Pointers – Accessing the address of a variable – Declaring and Initialization of Pointer Variable– Accessing a variable through its pointers.

File Management – Opening and Closing a File – Input/Output Operations of Files.

TOTAL : 45 PERIODS

OUTCOMES:	On completion of this course, students will be able to
1.	Know the various number systems and their conversion.
2.	Understand the fundamentals of C Programming.
3.	Design programs based on arrays and Strings.
4.	Construct programs using Functions, Structures and Union concepts
5.	Formulate simple Pointers and Files program.

COURSE ARTICULATION MATRIX:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	3	1								3	2	1
CO2	3	2	3	3	1								3	2	1
CO3	3	2	3	3	1								3	2	1
CO4	3	2	3	3	1						1		3	1	
CO5	3	2	3	3	1						1		3	1	

(1-Low, 2- Moderate, 3-High)

TEXT BOOKS:

1.	Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", Dorling Kindersley (India) Pvt. Ltd., Pearson Education in South Asia, 2011.
2.	E.Balagurusamy, "Programming in ANSI C", 8th Edition, McGraw Hill Publishing company, 2019.

REFERENCES:

1.	Pradip Dey, Manas Ghosh, "Fundamentals of Computing and Programming in C", First Edition, Oxford University Press, 2009.
2.	Byron S Gottfried, "Programming with C", Schaum's Outlines, Second Edition, Tata McGraw-Hill, 2006.
3.	Dromey R.G., "How to Solve it by Computer", Pearson Education, Fourth Reprint, 2007.
4.	Kernighan,B.W and Ritchie,D.M, "The C Programming language", Second Edition, Pearson Education, 2006.
5.	Yashavant P. Kanetkar. "Let Us C", BPB Publications, 2011.
6.	Herbert Schildt, "C The Complete Reference", Tata McGraw Hill Publishing Company, New Delhi, 2010.

22LPC204	CIRCUIT THEORY	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To introduce the basic concepts of DC/ AC circuits and analyze them using network Theorems &Topology.
- To study the transient response of the circuits and the concepts of resonance and coupled circuits.
- To learn about the two port networks and characterize them using parameters

UNIT I	DC CIRCUIT ANALYSIS	9

Basic Components of electric Circuits, Charge, current, Voltage and Power, Voltage and Current Sources, Ohms Law, Kirchoff's Current Law, Kirchoff's voltage law, The single Node – Pair Circuit, series and Parallel Connected Independent Sources, Resistors in Series and Parallel, voltage and current division, Nodal analysis, Mesh analysis, Duality and dual networks.

UNIT II	NETWORK THEOREMS	9

Network theorems -Superposition theorem, Thevenin's theorem, Norton's theorem, Reciprocity theorem, Millman's theorem, and Maximum power transfer theorem, application of Network theorems- Network reduction: voltage and current division, source transformation – star delta conversion.

UNIT III	RESONANCE AND COUPLED CIRCUITS	9

Resonance - Series resonance - Parallel resonance - Variation of impedance with frequency -Variation in current through and voltage across L and C with frequency – Bandwidth - Q factor -Selectivity. Self-inductance - Mutual inductance - Dot rule - Coefficient of coupling - Analysis of coupled circuits - Series, Parallel connection of coupled inductors.

UNIT IV	TRANSIENT ANALYSIS	9

Natural response-Forced response - Transient response of RC, RL and RLC circuits to excitation by Step Signal, Impulse Signal and exponential sources - Complete response of RC, RL and RLC Circuits to sinusoidal excitation.

UNIT V	TWO PORT NETWORKS	9

Introduction to two port networks, Introduction to two port network parameters – Z, Y, Transmission (ABCD) and Hybrid (H) Parameters, Analysis of two port network using Z and Y parameters, Interconnection of two port networks, Symmetrical properties of T and π networks.

	TOTAL:45 PERIODS

COURSE OUTCOMES	Upon the completion of the course students will have the

1.	Ability to analyse the DC/AC circuits using network topology.
2.	Ability to analyse the DC/AC circuits using network theorems.
3.	an understanding of the concepts of resonance and coupled circuits.
4.	exposure to transient and steady state response of electric circuits.
5.	knowledge on two port networks and their parameter characterization.

TEXT BOOKS:

1.	William H. Hayt, Jr. Jack E. Kemmerly and Steven M. Durbin, —"Engineering Circuit Analysis" , McGraw Hill Science Engineering, Eighth Edition, 11th Reprint 2016.
2.	Joseph Edminister and Mahmood Nahvi, —"Electric Circuits", Schaum's Outline Series, Tata McGraw Hill Publishing Company, New Delhi, Fifth Edition Reprint 2016.
3.	Sudhakar A and Shyam Mohan SP, "Circuits and Network Analysis and Synthesis",Tata McGraw Hill, 2007.

REFERENCES:

1.	Charles K. Alexander, Mathew N.O. Sadiku, —Fundamentals of Electric Circuits\, Fifth Edition,McGraw Hill, 9th Reprint 2015
2.	A.Bruce Carlson, —Cicuits: Engineering Concepts and Analysis of Linear Electric Circuits",Cengage Learning, India Edition 2nd Indian Reprint 2009
3.	Allan H.Robbins, Wilhelm C.Miller, —Circuit Analysis Theory and Practice\, Cengage Learning,Fifth Edition, 1st Indian Reprint 2013.
4.	Chakrabati A, "Circuits Theory (Analysis and synthesis), Dhanpath Rai & Sons, New Delhi, 1999.

COURSE ARTICULATION MATRIX:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	1	-	-	-	-	-	-	-	-	3	2	-
CO2	2	3	3	1	-	-	-	-	-	-	-	-	3	2	-
CO3	2	3	3	1	-	-	-	-	-	-	-	-	3	2	-
CO4	2	3	3	1	-	-	-	-	-	-	-	-	3	2	-
CO5	2	3	3	1	-	-	-	-	-	-	-	-	3	2	-
	2	3	3	1	-	-	-	-	-	-	-	-	3	2	-

22EES205	BASIC CIVIL AND MECHANICAL ENGINEERING	L	T	P	C
	(Only for EEE)	2	1	0	3

UNIT I	BUILDINGS AND THEIR COMPONENTS	9

Buildings-Definition-Classification according to NBC, construction materials-stone, brick, cement, cement-mortar, concrete, steel. Buildings- Various Components and their functions. Soils and their classification Foundations-Functions and types of foundations, Masonry, Floors-functions and types of floors, Roofs and types of roofs.

UNIT II	BASIC INFRASTRUCTURE	9

Surveying-classification, general principles of surveying – Basic terms and definitions of chain, compass and leveling surveying, uses of surveying, contours, their characteristics and uses. Roads-types, Water bound macadam road, cement concrete road, bituminous road. Bridges-components and types of bridges. Dams-Purpose, selection of site, types of dams and components. Water supply-sources and quality requirements. Rainwater harvesting.

UNIT III	INTERNAL AND EXTERNAL COMBUSTION SYSTEMS	9

Working principles of IC engines – Classification – Diesel and petrol engines: two stroke and four stroke engines. Steam generators (Boilers) – Classification – Constructional features (of only low pressure boilers). Conventional Power Generation Systems Hydraulic, steam and gas turbines power plants – Schemes and layouts – Selection criteria of above power plants.

UNIT IV	NON-CONVENTIONAL ENERGY SYSTEMS (DESCRIPTION ONLY)	9

Solar thermal systems – Solar photovoltaic – Solar pond – wind, wave, tidal, geothermal and ocean thermal energy conversion systems.

UNIT V	METAL JOINING	9

Elements of arc and gas welding, brazing and soldering – Bolted joint types – Adhesive Bonding; classification of adhesives – applications. Sheet Metal Processing Punching, blanking, shearing, bending, and deep drawing processes; descriptions and applications

TOTAL : 45 PERIODS

TEXT BOOKS:

1.	G Shanmugam, M S Palanichamy, Basic Civil and Mechanical Engineering, McGraw Hill Education; First edition, 2018
2.	Natarajan, K V, Basic Civil Engineering, 11th Edition, Dhanalakshmi Publications Chennai, 2001.
3.	Palanikumar, K. Basic Mechanical Engineering, ARS Publications, 2018.
4.	Ramamrutham S., "Basic Civil Engineering", Dhanpat Rai Publishing Co.(P) Ltd, 2013
5.	Nagpal, Power Plant Engineering, Khanna Publishers, Delhi, 1998

REFERENCES:

6.	Seetharaman S., "Basic Civil Engineering", Anuradha Agencies, 2005.

7.	Shantha Kumar SRJ., "Basic Mechanical Engineering", Hi-tech Publications, Mayiladuthurai,2000.
8.	Punmia, B.C., et. al., Surveying , Vol-I, Laxmi Publishers, New Delhi, 2002
9.	Punmia, B.C., et.al Building Construction, Laxmi Publishers, New Delhi ,2002
10.	Hajra Choudhry, et. al., Workshop Technology Vol I and II, Media Promoters Publishers Pvt. Ltd., Bombay, 2004.

22MES205	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	L	T	P	C
	(For Mechanical Engineering Only)	3	0	0	3

OBJECTIVES:

- To introduce the basics of electric circuits and analysis
- To impart knowledge in the basics of working principles and application of electrical machines
- To introduce analog devices and their characteristics
- To educate on the fundamental concepts of digital electronics
- To introduce the functional elements and working of measuring instruments

UNIT I	ELECTRICAL CIRCUITS	9

DC Circuits: Circuit Components: Conductor, Resistor, Inductor, Capacitor – Ohm's Law - Kirchhoff's Laws –Independent and Dependent Sources – Simple problems- Nodal Analysis, Mesh analysis with Independent sources only (Steady state) Introduction to AC Circuits and Parameters: Waveforms, Average value, RMS Value, Instantaneous power, real power, reactive power and apparent power, power factor – Steady state analysis of RLC circuits (Simple problems only)

UNIT II	ELECTRICAL MACHINES	9

Construction and Working principle- DC Separately and Self excited Generators, EMF equation, Types and Applications. Working Principle of DC motors, Torque Equation, Types and Applications. Construction, Working principle and Applications of Transformer, Three phase Alternator, Synchronous motor and Three Phase Induction Motor

UNIT III	ANALOG ELECTRONICS	9

Resistor, Inductor and Capacitor in Electronic Circuits- Semiconductor Materials: Silicon & Germanium – PN Junction Diodes, Zener Diode –Characteristics Applications – Bipolar Junction Transistor-Biasing, JFET, SCR, MOSFET, IGBT – Types, I-V Characteristics and Applications, Rectifier and Inverters

UNIT IV	DIGITAL ELECTRONICS	9

Review of number systems, binary codes, error detection and correction codes, Combinational logic - representation of logic functions-SOP and POS forms, K-map representations - minimization using K maps (Simple Problems only)

UNIT V	MEASUREMENTS AND INSTRUMENTATION	9

Functional elements of an instrument, Standards and calibration, Operating Principle, types -Moving Coil and Moving Iron meters, Measurement of three phase power, Energy Meter, Instrument Transformers-CT and PT, DSO- Block diagram- Data acquisition.

TOTAL : 45 PERIODS

OUTCOMES:	At the end of this course, students will able to
1.	Compute the electric circuit parameters for simple problems.
2	Explain the working principle and applications of electrical machines
3	Analyze the characteristics of analog electronic devices
4	Explain the basic concepts of digital electronics
5	Explain the operating principles of measuring instruments

TEXT BOOKS:

1	Kothari DP and I.J Nagrath, "Basic Electrical and Electronics Engineering", Second Edition, McGraw Hill Education, 2020.
2	James A .Svoboda, Richard C. Dorf, "Dorf's Introduction to Electric Circuits", Wiley, 2018.
3	S.K.Bhattacharya "Basic Electrical and Electronics Engineering", Pearson Education, Second Edition, 2017.
4	Sedha R.S., "A textbook book of Applied Electronics", S. Chand & Co., 2008
5	A.K. Sawhney, Puneet Sawhney 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, 2015

REFERENCES:

1	Kothari DP and I.J Nagrath, "Basic Electrical Engineering", Fourth Edition, McGraw Hill Education, 2019.
2	Thomas L. Floyd, 'Digital Fundamentals', 11th Edition, Pearson Education, 2017.
3	Albert Malvino, David Bates, 'Electronic Principles, McGraw Hill Education; 7th edition, 2017
4	Mahmood Nahvi and Joseph A. Edminister, "Electric Circuits", Schaum' Outline Series, McGraw Hill, 2002
5	H.S. Kalsi, 'Electronic Instrumentation', Tata McGraw-Hill, New Delhi, 2010

MAPPING OF COs, POs AND PSOs:

	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	2		3					3			3	2	1
CO2	3	2	2		3					3			3	2	1
CO3	3	2	2		3					3			3	2	1
CO3	3	2	2		3					3			3	2	1
CO3	3	2	2		3					3			3	2	1
Average	3	2	2		3					3			3	2	1
Round off	3	2	2		3					3			3	2	1

3- Strong Correlation; 2 - Medium Correlation; 1 – Low Correlation

22LES206	BASIC ELECTRICAL AND INSTRUMENTATION ENGINEERING	L	T	P	C
		3	0	0	3

OBJECTIVES

- To introduce DC Machines
- To study the Basics of Transformer
- To introduce Induction Machines
- To understand the concepts of Alternators and Special machines
- To introduce different Electrical Measuring Instruments.

UNIT I	DC MACHINES	9

Introduction –DC generators- Constructional Features–Principle of operation- EMF Equation – Types and Characteristics of DC generators –DC motors - Principle of Operation–Types and Characteristics of DC motors –Starting and Speed Control – Losses and Efficiency – Applications.

UNIT II	TRANSFORMERS	9

Introduction - Single phase transformer construction and principle of operation –Types–EMF equation–No load and Load characteristics – Equivalent Circuit –Voltage Regulation – Losses-Efficiency –OC and SC tests –Autotransformers –Three Phase Transformers – Applications.

UNIT III	INDUCTION MACHINES	9

Principle of operation of three-phase induction motors – Construction –Types – Torque Slip Characteristics –Equivalent circuit– Starting and Speed Control–Single phase Induction motors: Construction– Double revolving field theory –Types– Applications.

UNIT IV	SYNCHRONOUS AND SPECIAL MACHINES	9

Alternator-Constructional details–working principle–EMF Equation – Voltage regulation by EMF and MMF methods. Synchronous motor: Working principle - Starting methods – Torque equation – Characteristics. Special Machines: Stepper Motor – Brushless DC Motor - Reluctance Motor – Universal Motor.

UNIT V	ELECTRICAL INSTRUMENTS AND MEASUREMENTS	9

Absolute and Secondary Instruments-Electrical Principle of operation-Standards and errors-Essentials of indicating instruments- Moving Coil and Moving Iron Ammeters and Voltmeters– Wattmeter and Energy meter–Measurement of R, L and C parameters: Wheatstone, Anderson, Schering and Wien bridges –Transducers – Classification of Transducers: Resistive, Inductive, Capacitive, piezoelectric, photoelectric and Hall effect.

TOTAL: 45 PERIODS

COURSE OUTCOMES	At the end of the course, students able to
1.	Choose the appropriate DC motor and generator based on their performance characteristics.
2.	Understand the functions and operations of transformer
3.	Choose an appropriate induction motor based on their performance characteristics.
4.	Select appropriately a special machine for an Industrial application.
5.	Choose an appropriate measuring instruments for a given application to measure the unknown parameter.

TEXT BOOKS:

1.	D.P. Kothari and I.J.Nagarath, —"Basic Electrical and Electronics Engineering", McGraw HillEducation (India) Private Limited, Third Reprint, 2016.
2.	B.L.Theraja and A.K.Theraja,"A Text Book of Electrical Technology", Vol-I and II, S. Chand &Co. 2014.
3.	Toro,"Electrical Engineering Fundamental", Pearson Education, New Delhi, 2015.

REFERENCES:

1.	*Rajendra Prasad ,"Fundamentals of Electrical engineering", Prentice Hall of India,2006*
2.	*S.K.Bhattacharya —"Basic Electrical and Electronics Engineering", Pearson India, 2011.*
3.	*E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.*
4.	*A.K. Sawhney, "A Course in Electrical & Electronic Measurements & Instrumentation", Dhanpat Rai and Co, 2010.*

22EES206	ELECTRIC CIRCUIT ANALYSIS	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To study D.C electric circuits and its analysis
- To impart knowledge on solving circuits using network theorems
- To introduce the phenomenon of Resonance and analysis of single &three phase circuits
- To educate on obtaining the electric circuit using Laplace transforms
- To study various network parameters in two port network

UNIT I	DC CIRCUIT ANALYSIS	9

DC circuits and its solution using Kirchhoff's laws –Network reduction using series and parallel connection- Network voltage and current division Rule, Source transformation – Star delta conversion- Mesh and Nodal analysis.

UNIT II	DC NETWORK THEOREMS	9

Network theorems -Superposition theorem, Thevenin's and Norton's theorem, Reciprocity theorem, Millman's theorem, and Maximum power transfer theorem, Application of Network theorems for DC circuits.

UNIT III	AC CIRCUITS	9

Fundamental parameters of AC circuits-solutions of simple circuits -Series resonance and Parallel Resonance-frequency response – Quality factor and Bandwidth. Introduction to three phase system-Analysis of three phase 3-wire and 4-wire circuits with star and delta connection-power and power factor measurements using Two wattmeter method.

UNIT IV	ELECTRICAL CIRCUIT ANALYSIS USING LAPLACE TRANSFORMS	9

Review of Laplace Transform and inverse Laplace- Analysis of electrical circuits using Laplace Transform for using RL,RC,RLC-transformed network with initial conditions

UNIT V	TWO PORT NETWORK	9

One port and Two Port Networks, terminal pairs-Impedance parameters-Admittance parameters-Transmission parameters -Hybrid parameters, Interconnections of two port networks. Relationship of two port variables

TOTAL : 45- PERIODS

OUTCOMES:	At the end of this course, students will able to
1.	Explain circuit's behavior using circuit laws. Apply mesh analysis. nodal analysis of the given DC circuit
2.	Apply network theorems for the analysis of electrical circuits.
3.	Analyze the single-phase and three-phase ac circuits.
4.	Obtain the solution of electric circuit using Laplace transform.
5.	Analyze the two port networks and network functions to get network parameters solutions.

TEXT BOOKS:

1.	M. E. Van Valkenburg, –Network Analysisl, Prentice Hall, 2006.

2.	D. Roy Choudhury, –Networks and Systems‖,New AgeInternational Publications, 1998.
3.	Sudhakar and Shyam Mohan.Sp,–Circuits and Networks Analysis and Synthesis‖, Tata Mc Graw hill, 2015.
4.	Chakrabarti A, "Circuits Theory (Analysis and synthesis), Dhanpat Rai& Sons, New Delhi, 2020

REFERENCES:

1.	W. H. Hayt and J. E. Kemmerly, "Engineering Circuit Analysis", McGraw Hill Education, 2013.
2.	C. K. Alexander and M. N. O. Sadiku, "Electric Circuits", McGraw Hill Education, 2004.
3.	K. V. V. Murthy and M. S. Kamath, "Basic Circuit Analysis", Jaico Publishers, 1999.

COURSEARTICULATIONMATRIX

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2		2		2		3		3	3	3	3	3
CO2	3	2	2		1		2		3		2	3	3	2	3
CO3	3	2	2		2		2		3		1	3	3	3	3
CO4	3	2	2		2		2		3		2	3	3	2	3
CO5	3	2	2		3		2		3		1	2	3	3	3

1-Low,2-Moderate(Medium), 3-High

13/4/23
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Special points applicable to University Examinations on Engineering Graphics:
1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solution within A3 size.
4. The examination will be conducted in appropriate sessions on the same day

22ZMC207.

GE3252   தமிழரும் தொழில்நுட்பமும்   **L T P C**
                                                                          1 0 0 1

அலகு I   நெசவு மற்றும் பானைத் தொழில்நுட்பம்:   3

சங்க காலத்தில் நெசவுத் தொழில் – பானைத் தொழில்நுட்பம் - கருப்பு சிவப்பு பாண்டங்கள் – பாண்டங்களில் கீறல் குறியீடுகள்.

அலகு II   வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்:   3

சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு- சங்க காலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் – சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் - மாமல்லபுரச் சிற்பங்களும், கோவில்களும் – சோழர் காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் – நாயக்கர் காலக் கோயில்கள் - மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் – செட்டிநாட்டு வீடுகள் – பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ-சாரோசெனிக் கட்டிடக் கலை.

அலகு III   உற்பத்தித் தொழில் நுட்பம்:   3

கப்பல் கட்டும் கலை – உலோகவியல் – இரும்புத் தொழிற்சாலை – இரும்பை உருக்குதல், எஃகு – வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் – நாணயங்கள் அச்சடித்தல் – மணி உருவாக்கும் தொழிற்சாலைகள் – கல்மணிகள், கண்ணாடி மணிகள் – சுடுமண் மணிகள் – சங்கு மணிகள் – எழும்புத்துண்டுகள் – தொல்லியல் சான்றுகள் – சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.

அலகு IV   வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நுட்பம்:   3

அணை, ஏரி, குளங்கள், மதகு – சோழர்காலக் குமுழித் தூம்பின் முக்கியத்துவம் – கால்நடை பராமரிப்பு – கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் – வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள் – கடல்சார் அறிவு – மீன்வளம் – முத்து மற்றும் முத்துக்குளித்தல் – பெருங்கடல் குறித்த பண்டைய அறிவு – அறிவுசார் சமூகம்.

அலகு V   **அறிவியல் தமிழ் மற்றும் கணித்தமிழ்:**   3

அறிவியல் தமிழின் வளர்ச்சி –கணித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின்பதிப்பு
செய்தல் – தமிழ் மென்பொருட்கள் உருவாக்கம் – தமிழ் இணையக் கல்விக்கழகம் –
தமிழ் மின் நூலகம் – இணையத்தில் தமிழ் அகராதிகள் – சொற்குவைத் திட்டம்.

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS

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

GE3252   **TAMILS AND TECHNOLOGY**   L T P C
                                                                                 1 0 0 1

UNIT I   WEAVING AND CERAMIC TECHNOLOGY   3
Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW)
– Graffiti on Potteries.

UNIT II   DESIGN AND CONSTRUCTION TECHNOLOGY   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.

22EES210

ELECTRIC CIRCUITS LABORATORY	L	T	P	C
	0	0	3	1.5

OBJECTIVES:

- To solve DC electric circuits using mesh analysis, nodal analysis, and network theorems.
- To conduct experiment on electric circuits to know the time and frequency response
- To simulate various electric circuits using Pspice/ Matlab/e-Sim / Scilab

LIST OF EXPERIMENTS

1. Experimental verification of Kirchhoff's voltage and current laws

2. Experimental verification of Thevenin's and Norton's Theorem.

3. Experimental verification of Superposition and Maximum Power Transfer Theorem.

4. Experimental determination of frequency response of RLC circuits.

5. Design and Simulation of series resonance circuit.

6. Design and Simulation of parallel resonant circuits.

7. Simulation of three phase balanced star and delta connected circuits.

8. Simulation of three phase unbalanced star and delta connected circuits.

9. Experimental determination of power in three phase circuits by two-wattmeter method.

10. Design and Simulation of ABCD parameters.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

SI No	Description	Quantity
1.	Regulated Power Supply: 0–15VD.C	10 Nos/Distributed Power Source.
2.	FunctionGenerator(1MHz)	10Nos.
3.	Oscilloscope(20MHz)	10Nos.
4.	Digital StorageOscilloscope(20MHz)	1 No.
5.	Circuit Simulation Software (Pspice/Matlab/other Equivalent software Package) with PC	5 Nos
6.	Printer	1 No
7.	AC/DC- Voltmeters, Ammeters and Multi-meters	Each 10 Nos
8.	Single Phase Wattmeter	3 Nos
9.	Double-element wattmeter	2 Nos
10.	Decade Resistance Box, Decade Inductance Box, Decade Capacitance Box	Each 6 Nos

| 11. | Circuit Connection Boards | 10 Nos |
| 12. | P-Spice or its equivalent software | 10 users |

		TOTAL:45 PERIODS

OUTCOMES:	After successful completion of the course students able to	
1.	Understand the solution of DC electric circuits using mesh analysis, nodal analysis, and network theorems.
2.	Analyze the time and frequency response electric circuits.
3.	Design and simulate resonance circuits and three phase circuits
4.	Fabricate electrical and electronics circuits.
5.	Design and simulate the two-port network circuits.

COURSEARTICULATIONMATRIX

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2		2						3	3	3	3	3
CO2	3	2	2		1						2	3	3	2	3
CO3	3	2	2		2						1	3	3	3	3
CO4	3	2	2		2						2	3	3	2	3
CO5	3	2	2		3						1	2	1	2	3

1-Low,2-Moderate(Medium),3-High

13/4/23

HOD/EEE

22ZES209	PROGRAMMING IN C LABORATORY	L	T	P	C
	(Common to CSE & ECE)	0	0	3	1.5

OBJECTIVES:

- Be familiar with the use of Office software and presentation and visualizationtools.
- Be familiar with programming in C and basics of Decision making, Loopingconstructs.
- Learn to use Arrays, strings, functions and implement the concepts ofstructure, Union and file organization.

LIST OF EXPERIMENTS:

1. The price of one kg of rice is Rs.44.75 and one kg of sugar is Rs.35. Write a program to get these values from the user and display the prices as follows:

   *** List of Items ***

Item	Price
Rice	44.75
Sugar	35

2. Display the size of various data types in C.
3. Check whether the given number is ODD or EVEN.
4. Find the largest among the given three numbers.
5. Generate the Armstrong numbers within the given range.
6. Arrange the given numbers in an ascending and descending order.
7. Perform Matrix addition using 2D array.
8. Check the given String is Palindrome or not.
9. Swapping the number using Call by Value and Call by References.
10. Evaluate the factorial for given number using recursion.
11. Calculate the subject wise and student-wise totals and store them as a part of the structure.
12. Illustrate the use of indirection operator '*' to access the value of a variable using pointer.
13. Perform Character oriented read/write operations on a file.

TOTAL : 45 PERIODS

OUTCOMES:	On completion of this course, students will be able to
1.	Apply good programming design methods for program development.
2.	Design and implement C programs for simple applications.
3.	Write C programs, which involve decision making and arrays and strings.
4.	Develop programs using functions and pointers.
5.	Develop programs using structures and unions.

COURSE ARTICULATION MATRIX:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1							1		3	3	
CO2	3	2	2	1							1		3	3	
CO3	3	2	2	1							2		2	1	
CO4	3	2	2	2							2		2	1	
CO5	3	2	2	2							2		3	1	

(L- Low, M- Moderate, H-High)

REFERENCES:	
1.	Herbert Schildt, "C - The Complete Reference", Tata McGraw Hill Publishing Company, New Delhi, 2010.

R-2022	COMMUNICATION ENGLISH LABORATORY	L	T	P	C
CSE& MECH – SEM / II ~~22ZHS200~~		0	0	2	1

OBJECTIVES:

- To develop their communicative competency in English with specific reference to their speaking and listening.
- To enhance their ability to communicate effectively in interviews.
- To strengthen their prospects of success in competitive examinations.
- To Strengthen a good command over of the language proficiency.
- To comprehend a different types of accent and use them in their communication

UNIT I	PHONETICS & LISTENING COMPREHENSION	6

Verbal Ability, Articulation of sounds- Intonation-Stress and Rhythm-Conversation practice-listening
Various lectures

UNIT II	COMMUNICATION AT WORKPLACE	6

Writing job applications - cover letter- resume- e-mails- memos- reports- interpreting visual texts – Summarizing the text.

UNIT III	ENGLISH FOR NATIONAL AND INTERNATIONAL EXAMINATIONS AND PLACEMENTS	6

International English Language Testing System (IELTS) - Test of English as a Foreign Language (TOEFL)- Civil Service(Language related part) –English for competitive examinations – Practice for On-line examination.

UNIT IV	INTERVIEW SKILLS	6

Different types of Interview format- answering questions- offering information- mock interviews- Body languages – Role Plays – Telephone Conversation.

UNIT V	SOFT SKILLS	6

Motivation- emotional intelligence-Multiple intelligences- managing changes- time management-leadership straits- team work- career planning- creative and critical thinking

	TOTAL HOURS	30

OUTCOMES: At the end of the course, the students will be able to

•	Face interviews, group discussions and other language parameters in the job market
•	Write any competitive examinations which cover language part in it.
•	Take part in any English conversations of any kind in English. Flawlessly without fear and shyness.
•	Write articles for newspapers and magazines or any write-up in English without grammar mistakes.
•	Come out with leadership qualities, team work and career planning and will also possess critical and creative thinking.

TEXT BOOKS:

1.	Communication Skills for Engineers and Scientists, PHI Learning PVT.LTD, Delhi, 2014.
2.	Communication Skills and Soft Skills An Integrated Approach, Dorling Kindersley (INDIA) PVT.LTD, New Delhi, 2012.
3.	Soft Skills, MJP Publishers, Chennai, 2010.

REFERENCES:

1.	*Craven, Miles. Listening Extra-A resource book of multi-level skills activities. Cambridge University Press, 2004.*
2.	*Seely, John. The Oxford guide to writing & Speaking. New Delhi: Oxford University Press, 20*
3.	*Comfort, Jeremy, et al. Speaking Effectively: Developing speaking skills for Business English. Cambridge University Press, Cambridge: Reprint 2011.*
4.	*Dutt P. Kiranmai and RajeevanGeetha. Basic Communication Skills, Foundation Books:2013*

22LPC210	CIRCUITS AND DEVICES LABORATORY	L	T	P	C
		0	0	2	1

OBJECTIVES:

- To analyze experimentally the characteristics of diodes, BJT 's and FET 's.
- To verify practically the response of various special purpose electron devices.
- To construct and simulate various electronic circuits using PSPICE/MULTISIM.

LIST OF EXPERIMENTS

Design, Simulation & implementation of the below using discrete components

1. Characteristics of PN Junction Diode.
2. Characteristics of Zener diode & its application as regulator.
3. Input-output Characteristics of common emitter configuration.
4. Input-output Characteristics of common base configuration.
5. FET Characteristics.
6. Verification of Thevenin 's & Norton 's theorem.
7. Verification of KVL &KCL.
8. Verification of Super Position Theorem.
9. Verification of Maximum Power Transfer & Reciprocity theorem.
10. Determination of Resonance Frequency of Series & Parallel RLC Circuits.

TOTAL: 30 PERIODS

COURSE OUTCOMES		Upon completion of the course, the students will have the ability to
1.	Analyze the characteristics of various diodes.	
2.	Analyze the characteristics of BJT and FET transistors.	
3.	Verify Thevenin, Norton, KVL, KCL, Maximum Power Transfer and Super Position Theorems.	
4.	Determine and verify resonant frequency of tuning circuits.	
5.	Analyze various electronic circuits usingPSPICE/multisim simulator.	

COURSE ARTICULATION MATRIX:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	3	-	-	–	2	–	–	2	3	2	1
CO2	2	2	2	1	3	-	-	–	2	–	–	2	2	3	2
CO3	2	2	1	1	3	–	–	–	2	–	–	2	3	2	2
CO4	3	2	2	1	3	-	-	-	2	–	–	2	2	3	1
CO5	3	2	2	1	3	-	-	-	2	–	–	2	2	3	1
	3	2	2	1	3	–	–	–	2	–	–	2	2	3	1

1-LOW   2-MODERATE (MEDIUM)   3-HIGH

22MES241 ~~22MES208~~	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY	L	T	P	C
	(For Mechanical Engineering Only)	0	0	3	1.5

OBJECTIVES:

- To train the students in conducting load tests on electrical machines.
- To gain practical experience in characterizing electronic devices.
- To train the students to use DSO for measurements.

LIST OF EXPERIMENTS :

1	Verification of ohms and Kirchhoff's Laws.
2	Load test on DC Shunt Motor.
3	Load test on Self Excited DC Generator
4	Load test on Single phase Transformer
5	Load Test on Induction Motor
6	Characteristics of PN and Zener Diodes
7	Characteristics of BJT, SCR and MOSFET
8	Half wave and Full Wave rectifiers
9	Study of Logic Gates
10	Implementation of Binary Adder and Subtractor.
11	Study of DSO.

TOTAL PERIODS	45

OUTCOMES:	After the course, the student will be able to
1.	Use experimental methods to verify the Ohm's and Kirchhoff's Laws.
2.	Analyze experimentally the load characteristics of electrical machines
3.	Analyze the characteristics of basic electronic devices
4.	Understand the design of Digital logic circuits.
5.	Use DSO to measure the various parameters

MAPPING OF COs, POs AND PSOs:

	POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	2		3					3			3	2	1
CO2	3	2	2		3					3			3	2	1
CO3	3	2	2		3					3			3	2	1
CO4	3	2	2		3					3			3	2	1
CO5	3	2	2		3					3			3	2	1
Average	3	2	2		3					3			3	2	1
Round off	3	2	2		3					3			3	2	1

3- Strong Correlation; 2 - Medium Correlation; 1 – Low Correlation