Syed Ammal Engineering College, Ramanathapuram

An Autonomous Institution

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.

Regulation 2024

Choice Based Credit System

B.E. Mechanical Engineering

CURRICULUM & SYLLABI FOR SEMESTERS I TO VIII

Vision	Mission
To be an eminent center of excellence to produce engineers who could evolve as technocrats to serve the society	• Accomplish the welfare of society through excellence in teaching. • Research and skills that exploit the rapidly changing technical diversity of mechanical engineering with a collaborative environment that stimulates staff and students. • Reach their highest potential through life-long learning.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

Graduates of the programme B.E. Mechanical Engineering will

PE01. Successful careers as Mechanical Engineers with fundamental and advanced knowledge in Mechanical and allied engineering.

PE02. Professional in engineering practice to comprehend, analyzes, design and create unique solutions for real life and societal problems.

PE03. Have ethical behavior, communication skills and multi-disciplinary team work to pursue innovative research by engaging in lifelong learning.

PROGRAMME OUTCOMES (POs)
Mechanical Engineering Graduates will be able to

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

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

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

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

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

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

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

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

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

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

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs)

On successful completion of the Mechanical Engineering Degree programme, the Graduates shall exhibit the following:

PSO1. Study the various characteristics of thermal systems using different Alternative energy resources.

PSO2. Design, Manufacture and analysis of various Mechanical components and composite Materials.

HSMC	–	Humanities and Social Sciences including Management Courses
BSC	–	Basic Science Courses (Maths, Physics, Chemistry and EVS)
ESC	–	Engineering Science Courses (Basic Engineering)
PCC	–	Professional Core Courses (Branch Compulsory Courses)
PEC	–	Professional Elective Courses (Branch Elective Course)
OE	–	Open Elective Courses (Elective Courses offered by other branches)
EEC	–	Employability Enhancement Course (Communication lab, Project, Internship, Seminar, Case studies, Industrial training, Professional Practices) & Audit Course – Non-credit courses

SEMESTER – I

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	**T**	**P**		
1.	24IP101T	Induction Programme	-	-	-	-	-	0
THEORY								
2.	24EN101T	Professional English-I	HSMC	3	0	0	3	3
3.	24MA101T	Matrices and Calculus	BSC	3	1	0	4	4
4.	24PH101T	Engineering Physics	BSC	3	0	0	3	3
5.	24CH101T	Engineering Chemistry	BSC	3	0	0	3	3
6.	24GE101T	Problem Solving using C Programming	ESC	3	0	0	3	3
7.	24TA101T	தமிழர் மரபு /Heritage of Tamils	HSMC	1	0	0	1	1
PRACTICALS								
8.	24GE101P	Problem Solving using C Programming Laboratory	ESC	0	0	4	4	2
9.	24BS101P	Physics and Chemistry Laboratory	BSC	0	0	4	4	2
10.	24GE102P	English Laboratory	EEC	0	0	2	2	1
			TOTAL	**16**	**1**	**10**	**27**	**22**

SEMESTER – II

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	24EN201T	Professional English- II	HSMC	2	0	0	2	2
2.	24MA201T	Statistics and Numerical Methods	BSC	3	1	0	4	4
3.	24PH204T	Engineering Materials and Metallurgy	BSC	3	0	0	3	3
4.	24BE201T	Basic Electrical and Electronics Engineering	ESC	3	0	0	3	3
5.	24GE201T	Engineering Graphics	ESC	2	0	4	6	4
6.	24TA201T	தமிழரும் தொழில்நுட்பமும்/ Tamils and Technology	HSMC	1	0	0	1	1
PRACTICALS								
7.	24GE201P	EngineeringPracticesLaboratory	ESC	0	0	4	4	2
8.	24BE201P	Basic Electrical and Electronics Engineering Laboratory	ESC	0	0	4	4	2
9.	24GE202P	Communication Skills Laboratory	EEC	0	0	4	4	2
			TOTAL	**14**	**1**	**16**	**31**	**23**

SEMESTER – III

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.		Transforms &Partial differential equations	BSC	3	1	0	4	4
2.		Engineering Mechanics	ESC	4	0	0	4	4
3.		Engineering Thermodynamics	PCC	4	0	0	4	4
4.		Basic Manufacturing Process	PCC	3	0	0	3	3
5.		Fluid Mechanics and Machinery	ESC	3	0	2	5	4
6.		Electrical Drives and Controls	ESC	2	0	2	4	3
PRACTICALS								
7.		Computer Aided Machine Drawing	ESC	0	0	4	4	2
8.		Interpersonal Skills Laboratory - Listening & Speaking	EEC	0	0	2	2	1
			TOTAL	**19**	**1**	**10**	**30**	**25**

SEMESTER – IV

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.		Kinematics of Machinery	PCC	3	0	0	3	3
2.		Hydraulics and Pneumatics	PCC	3	0	0	3	3
3.		Strength of Materials	PCC	3	0	2	5	4
4.		Thermal Engineering	PCC	3	0	2	5	4
5.		Manufacturing Technology	PCC	3	0	2	5	4
6.		Environmental Sciencesand Sustainability	BSC	2	0	0	2	2
PRACTICALS								
7.		Applied DesignThinking	EEC	0	0	4	4	2
			TOTAL	**17**	**0**	**10**	**27**	**22**

SEMESTER – V

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.		Design of Machine Elements	PCC	4	0	0	4	4
2.		Dynamics of Machines	PCC	3	0	2	5	4
3.		Metrology and Measurements	PCC	3	0	2	5	4
4.		Professional Elective I	PEC	-	-	-	-	3
5.		Professional Elective II	PEC	-	-	-	-	3
6.		Professional Elective III	PEC	-	-	-	-	3
7.		Mandatory course – I#	MC	3	0	0	3	Non Credit Course
PRACTICALS								
8.		Summer Internship	EEC	0	0	0	0	1
			TOTAL	**-**	**-**	**-**	**-**	**22**

Mandatory Course-I is a Non-credit Course (Student shall select one course from the list given under MC-I)

SEMESTER – VI

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.		Computer Aided Design and Manufacturing	PCC	3	0	0	3	3
2.		Heat and Mass Transfer	PCC	3	0	2	5	4
3.		Principles of Management	HSMC	-	-	-	-	3
4.		Professional Elective IV	PEC	-	-	-	-	3
5.		Professional Elective V	PEC	-	-	-	-	3
6.		Open Elective – I*	OEC	2	0	2	4	3
7.		Mandatory Course-II#	MC	3	0	0	3	Non Credit Course
PRACTICALS								
8.		CAD/CAM Laboratory	PCC	0	0	4	4	2
			TOTAL	-	-	-	-	**21**

Mandatory Course-II is a Non-credit Course (Student shall select one course from the list given under MC-II)
*Open Elective – I shall be chosen from the emerging technologies.

SEMESTER – VII

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.		Computer Integrated Manufacturing	PCC	3	0	0	3	3
2.		Mechatronics and IoT	PCC	3	0	2	5	4
3.		Finite Element Analysis	PCC	3	0	2	5	4
4.		Human Values and Ethics	HSMC	2	0	0	2	2
5.		Professional Elective VI	PEC	-	-	-	-	3
6.		Open Elective –II#	OEC	3	0	0	3	3
PRACTICALS								
7.		Summer Internship	EEC	0	0	0	0	1
8.		Intellectual Property Rights	EEC	0	0	4	4	2
			TOTAL	17	0	8	25	22

 # Open Elective II (Shall be chosen from the list of open electives offered by other Programmes.

SEMESTER – VIII

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
PRACTICALS								
1.	24CE801P	Project Work/Internship	EEC	0	0	20	20	10
			TOTAL	0	0	20	20	10

SUMMARY

S.NO.	SUBJECT AREA	CREDITSPERSEMESTER								CREDITS TOTAL
		I	II	III	IV	V	VI	VII	VIII	
1.	HSMC	4	3					2		9
2.	BSC	12	7	4	2		3			28
3.	ESC	5	11	13						29
4.	PCC				7	18	12	9	11	57
5.	PEC					9	6	3		18
6.	OEC						3	3		6
7.	EEC	1	2	1	2	1		3	10	20
8.	#Mandatory Course (Non-credit)					✔	✔			
	Total	22	23	25	22	22	21	22	10	167

24IP101T	INDUCTION PROGRAMME	L	T	P	C
		0	0	0	0

This is a mandatory 2-weekprogramme to be conducted as soon as the students enter the institution. Normal classes start only after the induction program is over.

The induction programme has been introduced by AICTE with the following objective:

"Engineering colleges were established to train graduates well in the branch/department of admission, have a holistic outlook, and have a desire to work for national needs and beyond. The graduating student must have knowledge and skills in the area of his/her study. However, he/she must also have a broad understanding of society and relationships. Character needs to be nurtured as an essential quality by which he/she would understand and fulfill his/her responsibility as an engineer, a citizen and a human being. Besides the above, several meta-skills and underlying values are needed."

"One will have to work closely with the newly joined students in making them feel comfortable, allow them to explore their academic interests and activities, reduce competition and make them work for excellence, promote bonding within them, build relations between teachers and students, give a broader view of life, and build character."

Hence, the purpose of this programme is to make the students feel comfortable in their new environment, open them up, set a healthy daily routine, create bonding in the batch as well as between faculty and students, develop awareness, sensitivity and understanding of the self, people around them, society at large, and nature.

The following are the activities under the induction program in which the student would be fully engaged throughout the day for the entire duration of the program.

(i) Physical Activity

This would involve a daily routine of physical activity with games and sports, yoga, gardening, etc.

(ii) Creative Arts

Every student would choose one skill related to the arts whether visual arts or performing arts. Examples are painting, sculpture, pottery, music, dance etc. The student would pursue it everyday for the duration of the program. These would allow for creative expression. It would develop a sense of aesthetics and also enhance creativity which would, hopefully, grow into engineering design later.

(iii) Universal Human Values

This is the anchoring activity of the Induction Programme. It gets the student to explore oneself and allows one to experience the joy of learning, stand up to peer pressure, make decisions with courage, be aware of relationships with colleagues and supporting stay in the hostel and department, be sensitive to others, etc. A module in Universal Human Values provides the base. Methodology of teaching this content is extremely important. It must not be through do's and don'ts, but get students to explore and think by engaging them in a dialogue. It is best taught through group discussions and real-life activities rather than lecturing.

Discussions would be conducted in small groups of about 20 students with a faculty mentor each. It would be effective that the faculty mentor assigned is also the faculty advisor for the student for the full duration of the UG programme.

(iv) Literary Activity

Literary activity would encompass reading, writing and possibly, debating, enacting a play etc.

(v) Proficiency Modules

This would address some lacunas that students might have, for example, English, computer familiarity etc.

(vi) Lectures by Eminent People

Motivational lectures by eminent people from all walks of life should be arranged to give the students exposure to people who are socially active or in public life.

(vii) Visits to Local Area

A couple of visits to the landmarks of the city, or a hospital or orphanage could be organized. This would familiarize them with the area as well as expose them to the underprivileged.

(viii) Familiarization to Dept./Branch & Innovations

They should be told about what getting into a branch or department means what role it plays in society, through its technology. They should also be shown the laboratories, workshops & other facilities.

(ix) Department Specific Activities

About a week can be spent in introducing activities (games, quizzes, social interactions, small experiments, design thinking etc.) that are relevant to the particular branch of Engineering / Technology / Architecture that can serve as a motivation and kindle interest in building things (become a maker) in that particular field. This can be conducted in the form of a workshop. For example, CSE and IT students may be introduced to activities that kindle computational

thinking, and get them to build simple games. ECE students may be introduced to building simple circuits as an extension of their knowledge in science, and so on. Students may be asked to build stuff using their knowledge of science.

Induction Programme is totally an activity-basedprogramme and therefore there shall be no tests / assessments during this programme.

References:
Guide to Induction program from AICTE

24EN101T	PROFESSIONAL ENGLISH I	L	T	P	C
	(COMMON TO ALL BRANCHES)	3	0	0	3

COURSE OBJECTIVES:

Upon completing this course, the students will be able
- To improve the communicative competence of learners
- To learn to use basic grammatical structures in suitable contexts
- To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text
- To help learners use language effectively in professional contexts
- To develop learners' ability to read and write complex texts, summaries, articles, blogs, definitions, essays and user manuals.

UNIT–I   INTRODUCTION TO FUNDAMENTALS OF COMMUNICATION   9

Reading - Reading brochures (technical context), social media messages relevant to technical contexts and emails. Writing - Writing emails / letters introducing oneself. Grammar –Parts of Speech; Kinds of Sentences; Present Tense and its forms; Question types: Wh / Yes or No/ and Tags. Vocabulary - One word substitution; Abbreviations & Acronyms (as used in technical contexts).

UNIT II   NARRATION AND SUMMATION   9

Reading-Reading news paper reports, Excerpts from literature, and travel & technical blogs. Writing - Guided writing-- Paragraph writing, Short Report on an event (field tripetc.) Grammar –Past tense and its forms; Subject-Verb Agreement. Vocabulary – Word forms (prefixes& suffixes); Synonyms and Antonyms. Phrasal verbs.

UNIT III   DESCRIPTION OF A PROCESS / PRODUCT   9

Reading — Reading advertisements, gadget reviews; user manuals. Writing - Writing definitions; instructions; and Product /Process description. Grammar - Imperatives; Adjectives; Degrees of comparison; Future and its forms. Vocabulary - Compound Nouns, Homonyms; and Homophones, discourse markers (connectives & sequence words).

UNIT IV   CLASSIFICATION AND RECOMMENDATIONS   9

Reading–News paper articles; Journal reports–and Non Verbal Communication (tables, pie charts etc,).Writing–Note-making/Note-taking; Writing recommendations; Transferring information from non verbal (chart, Graphtec, to verbal mode) Grammar–Articles; Pronouns-Possessive&Relativepronouns.Vocabulary-Collocations; Fixed /Semi fixed expressions.

UNIT V EXPRESSION 9

Reading – Reading editorials; Writing – Essay Writing (Descriptive or narrative).Grammar-Punctuation; Negation (Statements & Questions); and Simple, Compound & Complex Sentences. Vocabulary - Cause & Effect Expressions – Content vs. Function words.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

CO 1: To use appropriate words in a professional context

CO 2: To gain understanding of basic grammatical structures and use the min right context.

CO 3: To read and infer the denotative and connotative meanings of technical texts

CO 4: To read and interpret information presented in tables ,charts and other graphic forms

CO 5: To write definitions ,descriptions ,narrations and essays on various topics

TEXTBOOKS:

1. English for Engineers &Technologists Orient Black swan Private Ltd. Department of English, Anna University,(2020 edition)
2. English for Science & Technology Cambridge University Press, 2021.
3. Authored by Dr.Veena Selvam , Dr.Sujatha Priya darshini, Dr. Deepa Mary Francis, Dr.KN.Shoba, and Dr.Lourdes Joevani, Department of English, Anna University.

REFERENCES:

1. Technical Communication Principles And Practices By Meenakshi Raman & Sangeeta Sharma, Oxford Univ.Press,2016, New Delhi.
2. A Course Book On Technical English By Lakshmi narayanan , Scitec Publications(India)Pvt. Ltd.
3. English For Technical Communication (With CD) By Aysha Viswamohan, Mcgraw Hill Education, ISBN: 0070264244.
4. Effective Communication Skill, Kulbhusan Kumar ,RS Salaria, Khanna Publishing House.
5. Learning to Communicate–Dr.V.Chellammal, Allied Publishing House, New Delhi,2003.

WEB SOURCES:

1. https://www.talkenglish.com/grammar/grammar.aspx
2. https://basicenglishspeaking.com/basic-english-grammar-rules/
3. https://www.englishbook.in/beginner-english-grammar/#google_vignette
4. https://english-at-home.com/grammar/
5. https://www.englishclub.com/grammar/

COs - POs & PSOs: MAPPING

CO	PO												PSO	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**
1	-	-	-	-	-	1	-	1	2	3	-	3	-	-
2	-	-	-	-	-	1	-	1	2	3	-	3	-	-
3	-	-	-	-	-	1	-	1	2	3	-	3	-	-
4	-	-	-	-	-	1	-	1	2	3	-	3	-	-
5	-	-	-	-	-	1	-	1	2	3	-	3	-	-
Avg.	-	-	-	-	-	1	-	1	2	3	-	3	-	-

1-Low, 2-Medium, 3-High, '-' - No correlation

24MA101T	MATRICES AND CALCULUS	L	T	P	C
		3	1	0	4

COURSE OBJECTIVES:

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

UNIT–I   MATRICES   9+3

Eigen values and Eigenvectors of a real matrix – Characteristic equation – Properties of Eigen values 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 – Change of 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's method 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 force and pressure, moments and centre 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 and triple integrals – Applications: Moments and centre of mass, moment of inertia.

                                                               TOTAL: 60 PERIODS

COURSE OUTCOMES:

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

CO 1:   Use the matrix algebra methods for solving practical problems

CO 2:   Apply differential calculus tools in solving various application problems.

CO 3:   Use differential calculus ideas on several variable functions.

CO 4:   Apply different methods of integration in solving practical problems.

CO 5:   Apply multiple integral ideas in solving areas, volumes and other practical problems.

TEXTBOOKS :

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", Firewall Media (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,
S. Viswanathan Publishers Pvt. Ltd., Chennai, 2009.

5. Ramana. B.V., "Higher Engineering Mathematics", McGraw Hill Education Pvt. Ltd, New Delhi, 2016.

6. Srimantha Pal and Bhunia. S.C, "Engineering Mathematics " Oxford University Press, 2015.

7. Thomas. G. B., Hass. J, and Weir. M.D, "Thomas Calculus", 14th Edition, Pearson India, 2018.

COs - POs & PSOs: MAPPING

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	3	1	1	-	-	-	-	2	-	2	3	-	-
2	3	3	1	1	-	-	-	-	2	-	2	3	-	-
3	3	3	1	1	-	-	-	-	2	-	2	3	-	-
4	3	3	1	1	-	-	-	-	2	-	2	3	-	-
5	3	3	1	1	-	-	-	-	2	-	2	3	-	-
Avg.	3	3	1	1	-	-	-	-	2	-	2	3	-	-

1-Low, 2-Medium, 3-High, '-' - No correlation

24PH101T	ENGINEERING PHYSICS	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

Upon completing this course, the students will be able
- To make the students effectively achieve an understanding of mechanics.
- To enable the students to gain knowledge of electromagnetic waves and its applications.
- To introduce the basics of oscillations, optics and lasers.
- Equipping the students to successfully understand the importance of quantum physics.
- To motivate the students towards the applications of quantum mechanics.

UNIT–I   MECHANICS   9

Multi-particle dynamics: Center of mass (CM) – CM of continuous bodies – motion of the CM –. Rotation of rigid bodies: Rotational kinematics – rotationalkineticenergyandmomentofinertia-theoremsofM.I–momentofinertiaofsolid sphere and solid cylinder– M.I of a diatomic molecule - torque – rotational dynamics of rigid bodies – conservation of angular momentum–rotational energy state of a rigid diatomic molecule-gyroscope-torsional pendulum.

UNIT–II   ELECTRO MAGNETIC WAVES   9

The Maxwell's equations - wave equation; Plane electromagnetic waves in vacuum, Conditions on the wave field - properties of electromagnetic waves: speed, amplitude, phase, orientation and waves in matter - polarization - Energy and momentum in EM waves: Intensity, waves from localized sources, momentum and radiation pressure-Cell-phone reception. RADAR and its application.

UNIT–III   OSCILLATIONS, OPTICS AND LASERS   9

Simple harmonic motion-resonance- waves on a string - standing waves - traveling waves – sound waves-Doppler effect. Reflection and refraction of light waves-total internal reflection–

Fiber optics-application-interference –Theory of air wedge and experiment.   Theory of laser - characteristics-Spontaneous   and   stimulated   emission-Einstein's   coefficients-population inversion- Nd-YAG laser, CO_2 laser, semiconductor laser–Basic applications of lasers in industry.

UNIT–IV   BASIC QUANTUM MECHANICS   9

Photons and light waves - Electrons and matter waves - The Schrodinger equation (Time dependent and time independent forms) - meaning of wave function - Normalization –Free particle-particle in a infinite potential well:1D,2D and 3D Boxes-Normalization, probabilities.

UNIT–V   APPLIED QUANTUM MECHANICS   9

Barrier penetration and quantum tunneling(qualitative)-Tunneling microscope - Resonant diode - Finite potential wells (qualitative)- Bloch's theorem for particles in a periodic potential –origin of energy bands.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After completion of this course, the students should be able to

CO 1: Understand the importance of mechanics.

CO 2: Express their knowledge in electromagnetic waves.

CO 3: Demonstrate a strong foundational knowledge in oscillations, optics and lasers.

CO 4: Understand the importance of quantum physics.

CO 5: Comprehend and apply quantum mechanical principles towards the formation of energy bands.

TEXTBOOKS:

1. D.Kleppner and R.Kolenkow. "An Introduction t o Mechanics". McGraw Hill Education (Indian Edition),2017.
2. E.M. Purcell and D.J.Morin, "Electricity and Magnetism" ,Cambridge Univ.Press, 2013.
3. Arthur Beiser, Shobhit Mahajan, S.Rai Choudhury,"Concepts of Modern Physics", McGraw-Hill(Indian Edition),2017.

REFERENCES:

1. R.Wolfson ."Essential University Physics". Volume 1&2.Pearson Education (Indian Edition), 2009.
2. Paul A. Tipler ,"Physic"–Volume 1& 2,CBS,(Indian Edition),2004.
3. K.Thyagarajan and A.Ghatak."Lasers :Fundamentals and Applications", Laxmi Publications, (Indian Edition),2019.
4. D.Halliday,R.Resnick and J.Walker. "Principles of Physics" ,Wiley(Indian Edition),2015.
5. N.Garcia,A. DamaskandS. Schwarz. "Physics for Computer Science Students". Springer-Verlag, 2012.

COs - POs & PSOs: MAPPING

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	3	2	1	1	1	-	-	-	-	-	1	-	-
2	3	3	2	1	2	1	-	-	-	-	-	1	-	-
3	3	3	2	2	2	1	-	-	-	-	-	1	-	-
4	3	3	1	1	2	1	-	-	-	-	-	1	-	-
5	3	3	1	1	2	1	-	-	-	-	-	1	-	-
Avg.	3	3	1.6	1.2	1.8	1	-	-	-	-	-	1	-	-

1-Low, 2-Medium, 3-High, '-' - No correlation

24CY101T	ENGINEERING CHEMISTRY	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

Upon completing this course, the students will be able

- To make the students, familiar with boiler feed water requirements, related problems and water treatment techniques.

- To learn the basic concept and principle of electrochemical cell.

- To learn the device corrosion, types of corrosion and its protection method.
- To be familiar with different types of fuel and combustion.
- To understand the various types of batteries and renewable resources.

UNIT–I WATER AND ITS TREATMENT   9

Water: Sources and impurities-. Municipal water treatment: primary treatment and disinfection (UV, Ozonation, break-point chlorination). **Desalination of brackish water**: Reverse Osmosis. **Boiler troubles**: Scale and sludge, Boiler corrosion, Caustic embrittlement, Priming &foaming. Treatment of boiler feed water: Internal treatment (phosphate, colloidal, sodium aluminate and calgon conditioning) and External treatment – Ion exchange demineralisation and zeolite process.

UNIT–II ELECTRO CHEMISTRY   9

Electrochemistry: Basic concepts of electrochemistry; Conductance: Specific, equivalent and molar conductance and effect of dilution on conductance (Electrochemical cells: Galvanic cell (Daniel cell); Electrode potential; Electrochemical series and its applications; Nernst equation; Reference electrodes: Standard Hydrogen Electrode (SHE), Standard Calomel Electrode (SCE) Ion-Selective Electrode(ISE) .

UNIT–III DEVICE CORROSION   9

Introduction – chemistry of IC and PCB- causes of corrosion on IC, PC - miniaturization, complex material utilisation, production and service factors, Electrical Contact Degradation – environmental contamination (airborne contaminants) - Forms of corrosion – anodic & cathodic corrosion – Electrolytic metal migration – Corrosion in Service and Production — pore & creep corrosion in electrical contacts and metallic joints – Fretting corrosion in microelectronic and the wear patterns – corrosion costs – corrosion protection of computer hardware – self-assembled

UNIT–III FUELS AND COMBUSTION   9

Fuels: Introduction: Classification of fuels; Coal and coke: Analysis of coal (proximate and ultimate), Carbonization, Manufacture of metallurgical coke (Otto Hoffmann method). Petroleum and Diesel: Manufacture of synthetic petrol (Bergius process), Knocking - octane number, diesel oil - cetane number; Power alcohol and biodiesel.

Combustion of fuels: Introduction: Calorific value - higher and lower calorific values, Theoretical calculation of calorific value; Ignition temperature: spontaneous ignition temperature, Explosive range; Flue gas analysis - ORSAT Method. CO_2 emission and carbon foot print.

UNIT–V   ENERGY RESOURCES   9

Nuclear energy – Nuclear fission – Nuclear Fusion: light water nuclear power plant, breeder reactor. **Solar energy conversion**: Principle, working and applications of solar cells; Recent developments in solar cell materials. **Wind energy; Geothermal energy**; **Biomass energy Batteries:** Types of batteries, Primary battery - dry cell, Secondary battery - lead acid battery and lithium-ion-battery; **Electric vehicles**-working principles; **Fuel cells**: H_2-O_2 fuel cell, microbial fuel cell; **Super capacitors.**

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

CO 1:   Infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.

CO 2:   Understand the basic concept of electrochemistry and various types of electrodes and its applications.

CO 3:   Understand the various types of corrosion and its prevention technique.

CO 4:   Recommend suitable fuels for engineering processes and applications.

CO 5:   Recognize different forms of energy resources and apply them for suitable applications in energy sectors.

TEXT BOOKS:

1. P. C. Jain and Monica Jain, "Engineering Chemistry", 17th Edition, Dhanpat Rai Publishing Company (P) Ltd, New Delhi, 2018.
2. Siva sankar 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. O.G. Palanna, "Engineering Chemistry" McGraw Hill Education (India) Private Limited, 2nd Edition, 2017.
2. Friedrich Emich, "Engineering Chemistry", Scientific International PVT, LTD, New Delhi, 2014.

3. Shikha Agarwal, "Engineering Chemistry-Fundamentals and Applications", Cambridge University Press, Delhi, Second Edition, 2019.

COs - POs & PSOs: MAPPING

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	1	-	-	-	1	1	1	1	1	-	2	-	-
2	3	1	-	-	-	1	1	1	1	1	-	1	-	-
3	3	1	-	-	-	1	1	1	1	1	-	2	-	-
4	3	1	-	-	-	1	1	1	1	1	-	2	-	-
5	3	1	-	-	-	1	1	1	1	1	-	2	-	-
Avg.	3	1	-	-	-	1	1	1	1	1	-	2	-	-

1-Low, 2-Medium, 3-High, '-' - No correlation

24GE101T	PROBLEM SOLVING USING C PROGRAMMING	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

Upon completing this course, the students will be able
- To gain knowledge on problem solving techniques.
- To learn how to write simple and modular C programs.
- To understand the usage of arrays and strings.
- To learn the usage of pointers in accessing and manipulating memory.
- To exploit the notion of derived data types and files.

UNIT–I   COMPUTATIONAL THINKING AND PROBLEM SOLVING   9

Basic Organization of a Computer - Introduction to Number System (Decimal, Binary, Octal, Hexadecimal). Problem Solving Techniques: Fundamentals of Computing – Identification of Computational Problems -Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language).

UNIT–II   BASIC CONSTRUCTS IN C   9

Structure of C program - C programming: Data Types – Storage classes – Constants, Enumeration Constants - Keywords – Operators: Precedence and Associativity - Expressions - Input/Output statements, Assignment statements – Decision making statements – Switch

statement - Looping statements – Pre-processor directives. Example Programs: Simple Calculator using switch case, Fibonacci series, Palindrome, Armstrong number.

UNIT–III ARRAYS AND STRINGS IN C **9**

Introduction to Arrays: Declaration, Initialization – One dimensional array – Example Program**:** Computing Mean, Median and Mode - Two dimensional arrays – Example Program: Matrix Operations (Addition and Multiplication) - String operations: length, compare, concatenate, copy – Bubble Sort, linear and binary search**.**

UNIT–IV FUNCTIONS AND POINTERS IN C **9**

Introduction to functions: Function prototype, function definition, function call, Built-in functions (string functions) – Recursion – Example Program: Factorial, Fibonacci series using recursive functions.

Pointers – Pointer operators – Pointer arithmetic – Arrays and pointers – Array of pointers – Example Program: Sorting of names – Parameter passing: Pass by value, Pass by reference – Example Program: Swapping of two numbers using pass by reference.

UNIT–V STRUCTURES AND FILE HANDLING IN C **9**

Structure - Pointer and Structures – Array of structures – Example Program: Student Mark Details using array of structure. – Self-referential structures – Dynamic memory allocation, Union. Files – Types of file processing: Sequential access, Random access – Sequential access file - Example Program: Finding average of numbers stored in sequential access file - Random access file - Example Program: Transaction processing using random access files – Command line arguments**.**

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

CO 1: Apply computational thinking to solve real time problems.

CO 2: Write simple C programs with decision making and looping statements.

CO 3: Store and manipulate homogeneous data using arrays and strings.

CO 4: Develop programs using functions and pointers.

CO 5: Store and manipulate heterogeneous data using structures and files.

TEXT BOOK:
1. Karl Beecher, "Computational Thinking: A Beginner's Guide to Problem Solving and Programming", 1st Edition, BCS Learning & Development Limited, 2017
2. Reema Thareja, "Programming in C", Oxford University Press, Second Edition, 2016.

3. Behrouz A. Forouzan, Richard F.Gilberg, P.GoldaJeyasheeli, G.Priyanka,S.T.Veena "Problem solving Using C A Structured Programming Approach" Volume I &II.First Edition, Cengage Publication, 2022.

REFERENCE BOOK:

1. Yashavant P. Kanetkar, "Let Us C : Authentic guide to C programming language", Eighteenth Edition, BPB Publications, 2021.
2. Paul Deitel, Harvey Deitel, "C How to Program", Ninth Edition, Pearson, 2021.
3. Brian.W.Kernighan and Dennis.M.Ritchie, "C Programming language", Second Edition, Independently Published, 2021
4. Byron S Gottfried, "Programming with C", Fourth Edition, Schaum's Outlines, McGraw Hill Education, 2018 5. Ashok N. Kamthane, Amit A.Kamthane, "Programming in C", Third Edition, Pearson Education, 2015.

COs - POs & PSOs: MAPPING

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	3	3	3	2	-	-	-	-	-	-	2	-	-
2	3	3	3	2	2	-	-	-	-	-	-	2	-	-
3	3	3	3	3	2	-	-	-	-	-	-	2	-	-
4	3	3	3	3	2	-	-	-	-	-	-	2	-	-
5	3	3	3	3	2	-	-	-	-	-	-	2	-	-
Avg.	3	3	3	3	2	-	-	-	-	-	-	2	-	-

1-Low, 2-Medium, 3-High, '-' - No correlation

24TA101T	தமிழர் மரபு	L	T	P	C
		1	0	0	1

UNIT 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.

UNIT 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.

UNIT III   நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள்:   **3**

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

UNIT 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.

UNIT V   இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு:   **3**

இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு – இந்தியாவின் பிறப்பகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் – சுயமரியாதை இயக்கம் – இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு – கல்வெட்டுகள், கையெழுத்துப்படிகள் – தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.

Text Books & 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 Book and Educational Services Corporation, Tamil Nadu)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

TOTAL: 15 PERIODS

24TA101T	HERITAGE OF TAMILS	L	T	P	C
		1	0	0	1

3

UNIT I LANGUAGE AND LITERATURE

Language Families in India - Dravidian Languages – Tamil as aClassical Language - Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature - Management Principles in Thirukural - Tamil Epics and Impact of Buddhism & Jainism in Tamil Land - Bakthi Literature Azhwars and Nayanmars - Forms of minor Poetry - Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan.

UNIT II HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE
3

Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.

UNIT III FOLK AND MARTIAL ARTS
3

Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leatherpuppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.

UNIT IV THINAI CONCEPT OF TAMILS
3

Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.

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

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

TOTAL: 15 PERIODS

Text Books & 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 Book and Educational Services Corporation, Tamil Nadu)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

24GE101P	PROBLEM SOLVING USING C PROGRAMMING LABORATORY	L	T	P	C
		0	0	4	2

COURSE OBJECTIVES:

- To familiarize with C programming constructs.
- To develop programs in C using basic constructs.
- To develop programs in C using arrays.
- To develop applications in C using strings, pointers, functions.
- To develop applications in C using structures.
- To develop applications in C using file processing

LIST OF EXPERIMENTS

Note: The lab instructor is expected to design problems based on the topics listed. The Examination shall not be restricted to the sample experiments designed.

LIST OF EXPERIMENTS:

Note: The lab instructor is expected to design problems based on the topics listed. The Examination shall not be restricted to the sample experiments designed.

1. Identification and solving of simple real life or scientific or technical problems, and developing flow charts for the same

2. I/O statements, operators, expressions

3. Decision-making constructs: if-else, goto, switch-case, break-continue

4. Loops: for, while, do-while

5. Arrays: 1D and 2D, Multi-dimensional arrays, traversal

6. Strings: operations

7. Functions: call, return, passing parameters by (value, reference), passing arrays to function.

8. Recursion

9. Pointers: Pointers to functions, Arrays, Strings, Pointers to Pointers, Array of Pointers

10. Structures: Pointers to Structures, Arrays of Structures and Unions.

11. Files: reading and writing, File pointers, file operations, random access, processor directives.

TOTAL: 60 PERIODS

COURSE OUTCOMES:

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

CO 1:   Demonstrate knowledge on C programming constructs.

CO 2:   Develop programs in C using basic constructs.

CO 3:   Develop programs in C using arrays.

CO 4:   Develop applications in C using strings, pointers, functions.

CO 5:   Develop applications in C using structures.

CO 6:   Develop applications in C using file processing.

TEXT BOOKS:

1. Karl Beecher, "Computational Thinking: A Beginner's Guide to Problem Solving and Programming", 1st Edition, BCS Learning & Development Limited, 2017.
2. Reema Thareja, "Programming in C", Oxford University Press, Second Edition, 2016.

3. Behrouz A. Forouzan, Richard F.Gilberg, P.Golda Jeyasheeli, G.Priyanka,S.T.Veena "Problem solving Using C A Structured Programming Approach" Volume I &II. First Edition, Cengage Publication, 2022.

REFERENCES:

1. Paul Deitel and Harvey Deitel, "C How to Program with an Introduction to C++", Eighth edition, Pearson Education, 2018.
2. Yashwant Kanetkar, Let us C, 17th Edition, BPB Publications, 2020.
3. Byron S. Gottfried, "Schaum's Outline of Theory and Problems of Programming with C", McGraw-Hill Education, 1996.
4. Pradip Dey, Manas Ghosh, "Computer Fundamentals and Programming in C", Second Edition, Oxford University Press, 2013.
5. Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", 1st Edition, Pearson Education, 2013.

24BS101P	PHYSICS AND CHEMISTRY LABORATORY	L	T	P	C
		0	0	4	2

PHYSICS LABORATORY: (Any Seven Experiments)

COURSE OBJECTIVES:

- To learn the proper use of various kinds of physics laboratory equipment.
- To learn how data can be collected, presented and interpreted in a clear and concise manner.
- To learn problem solving skills related to physics principles and interpretation of experimental data.
- To determine error in experimental measurements and techniques used to minimize such error.
- To make the student as an active participant in each part of all lab exercises.

LIST OF EXPERIMENTS:

1. Torsional pendulum - Determination of rigidity modulus of wire and moment of inertia of regular and irregular objects.

2. Simple harmonic oscillations of cantilever.

3. Non-uniform bending- Determination of Young's modulus

4. Uniform bending–Determination of Young's modulus

5. Laser-Determination of the wave length of the laser using grating

6. Air wedge- Determination of thickness of a thin sheet/wire

7. a)Optical fibre-Determination of Numerical Aperture and acceptance angle

8. b) Compact disc-Determination of width of the groove using laser.

9. Acoustic grating-Determination of velocity of ultrasonic waves in liquids.

10. Ultrasonicinterferometer–determinationofthevelocityofsoundandcompressibilityofliquids

11. Post office box-Determination of Band gap of a semiconductor.

12. Photo electric effect

13. Michelson Interferometer.

14. Melde's string experiment

15. Experiment with lattice dynamics kit.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

CO 1:   Understand the function of various physics laboratory equipment.

CO 2:   Use graphical models to analyze laboratory data.

CO 3:   Use mathematical models as a medium for quantitative reasoning and describing physical reality.

CO 4:   Access, process and analyze scientific information.

CO 5:   Solve problems individually and collaboratively

TEXT BOOK
1. John Wiley & Sons - Wiley indiapvt ,Ltd, new edition.

CHEMISTRY LABORATORY: (Any Seven Experiments)
COURSE OBJECTIVES:
- To inculcate experimental skills to test basic understanding of water quality parameters, such as, acidity, alkalinity, hardness, DO, chloride and copper.
- To induce the students to familiarize with electro analytical techniques such as, pH metry, potentiometry and conductometry in the determination of impurities in aqueous solutions.
- To demonstrate the analysis of metals and alloys.
- To demonstrate the synthesis of nanoparticles.

LIST OF EXPERIMENTS:

1. Preparation of Na_2CO_3 as a primary standard and estimation of acidity of a water sample using the primary standard.

2. Determination of types and amount of alkalinity in water sample.

3. Determination of total, temporary & permanent hardness of water by EDTA method.

4. Determination of DO content of water sample by Winkler's method.

5. Determination of chloride content of water sample by Argentometric method.

6. Estimation of copper content of the given solution by Iodometry.

7. Estimation of TDS of a water sample by gravimetry.

8. Determination of strength of given hydrochloric acid using pH meter.

9. Determination of strength of acids in a mixture of acids using conductivity meter.

10. Conductometric titration of barium chloride against sodium sulphate (precipitation titration)

11. Estimation of iron content of the given solution using potentiometer.

12. Estimation of sodium /potassium present in water using flame photometer.

13. Preparation of nanoparticles (TiO2/ZnO/CuO) by Sol-Gel method.

14. Estimation of Nickel in steel.

15. Proximate analysis of Coal.

TOTAL: 30 PERIODS

COURSE OUTCOMES

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

CO 1:   Analyze the quality of water samples with respect to their acidity, alkalinity, hardness and DO.

CO 2:   Determine the amount of metal ions through volumetric and spectroscopic techniques.

CO 3:   Analyze and determine the composition of alloys.

CO 4:   Learn simple method of synthesis of nano particles.

CO 5:   Quantitatively analyze the impurities in solution by electro analytical techniques

TEXT BOOK

1. J. Mendham, R. C. Denney, J.D. Barnes, M. Thomas and B. Sivasankar, Vogel's Textbook of Quantitative Chemical Analysis (2009).

24GE102P   ENGLISH LABORATORY   **L   T   P   C**
                                                           0   0   2   1

COURSE OBJECTIVES:

- To improve the communicative competence of learners
- To help learners use language effectively in academic/work contexts
- To develop various listening strategies to comprehend various types of audio materials like lectures, discussions, videos etc.
- To build on students' English language skills by engaging them in listening, speaking and grammar learning activities that are relevant to authentic contexts.
- To use language efficiently in expressing their opinions via various media.

UNIT I   INTRODUCTION TO FUNDAMENTALS OF COMMUNICATION   6

Listening - conversation: Introduction to classmates – Telephone conversation; Speaking-making telephone calls-Self Introduction; Introducing a friend; -understanding basic instructions (filling out a bank application for example).

UNIT II   NARRATION AND SUMMATION   6

Listening- Listeningtopodcasts,anecdotes/stories/eventnarration;documentariesandinterviewswith celebrities. Speaking - Narrating personal experiences / events- -engaging in small talk-describing requirements and abilities.

UNIT III   DESCRIPTION OF A PROCESS PRODUCT   6

Listening - Listen to product and process descriptions; a classroom lecture; and advertisements about products. Speaking— Picture description—Giving instruction to use the product- Presenting a product- describing shapes and sizes and weights

UNIT IV   CLASSIFICATIONAND RECOMMENDATIONS   6

Listening – Listening to TED Talks; Listening to lectures - and educational videos. Speaking – Small Talk; discussing and making plans-talking about tasks-talking about progress—talking about travel preparations-talking about transportation

UNITV   EXPRESSION   6

Listening — Listening to debates/ discussions; different viewpoints on an issue; and panel discussions. Speaking–making predictions-talking about a given topic - giving opinions-understanding a website-describing processes

                                        TOTAL:30 PERIODS

COURSE OUTCOMES:

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

CO 1: Listen to and comprehend general as well as complex academic information

CO 2: Listen to and understand different points of view in a discussion

CO 3: Speak fluently and accurately in formal and informal communicative contexts

CO 4: Describe products and processes and explain their uses and purposes clearly and accurately.

CO 5: Solve problems individually and collaboratively

24EN201T	PROFESSIONAL ENGLISH II	L	T	P	C
	(COMMON TO ALL BRANCHES)	2	0	0	2

COURSE OBJECTIVES:

Upon completing this course, the students will be able

- To engage learners in meaningful language activities to improve their reading and writing skills
- To learn various reading strategies and apply in comprehending documents in professional context.
- To help learners understand the purpose, audience, contexts of different types of writing
- To develop analytical thinking skills for problem solving in communicative contexts
- To demonstrate an understanding of job applications and interviews for internship and placements

UNIT I   MAKING COMPARISONS   6

Reading - Reading advertisements, user manuals, brochures; Writing – Professional emails, Email etiquette - Compare and Contrast Essay; Grammar – Mixed Tenses, Prepositional phrases

UNIT II   EXPRESSING CAUSAL RELATIONS IN SPEAKING AND WRITING   6

Reading - Reading longer technical texts– Cause and Effect Essays, and Letters / emails of complaint, Writing - Writing responses to complaints. Grammar - Active Passive Voice transformations, Infinitive and Gerunds

UNIT III   PROBLEM SOLVING   6

Reading - Case Studies, excerpts from literary texts, news reports etc. Writing – Letter to the Editor, Checklists, Problem solution essay / Argumentative Essay. Grammar – Error correction; If Conditional Sentences.

UNIT IV   REPORTING OF EVENTS AND RESEARCH   6

Reading –Newspaper articles; Writing – Recommendations, Transcoding, Accident Report, Survey Report Grammar – Reported Speech, Modals Vocabulary – Conjunctions- use of prepositions.

UNIT V   THE ABILITY TO PUT IDEAS OR INFORMATION COGENTLY   6

Reading – Company profiles, Statement of Purpose, (SOP), an excerpt of interview with professionals; Writing – Job / Internship application – Cover letter & Resume; Grammar – Numerical adjectives, Relative Clauses.

TOTAL : 30 PERIODS

COURSE OUTCOMES:

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

CO 1: Compare and contrast products and ideas in technical texts.

CO 2: Identify and report cause and effects in events, industrial processes through technical texts

CO 3: Analyse problems in order to arrive at feasible solutions and communicate them in the written format.

CO 4: Present their ideas and opinions in a planned and logical manner

CO 5: Draft effective resumes in the context of job search

TEXT BOOKS :

1. "English for Engineers & Technologists" (2020 edition) Orient Blackswan Private Ltd. Department of English, Anna University.
2. "English for Science & Technology" Cambridge University Press 2021.,Dr. Veena Selvam, Dr. Sujatha Priyadarshini, Dr. Deepa Mary Francis, Dr. KN.Shoba, and Dr. Lourdes Joevani, Department of English, Anna University.

REFERENCES:

1. Raman. Meenakshi, Sharma. Sangeeta (2019)." Professional English". Oxford university press.New Delhi.
2. "Improve Your Writing" ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, 2001, New Delhi.
3. "Learning to Communicate" – Dr. V. Chellammal. Allied Publishers, New Delhi, 2003
4. "Business Correspondence and Report Writing" by Prof. R.C. Sharma & Krishna Mohan, Tata McGraw Hill & Co. Ltd., 2001, New Delhi.
5. "Developing Communication Skills " by Krishna Mohan, Meera Bannerji- Macmillan India Ltd.1990, Delhi.

WEB SOURCES:

1. https://www.talkenglish.com/grammar/grammar.aspx
2. https://basicenglishspeaking.com/basic-english-grammar-rules/
3. https://www.englishbook.in/beginner-english-grammar/#google_vignette
4. https://english-at-home.com/grammar/
5. https://www.englishclub.com/grammar/

COs - POs & PSOs: MAPPING

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	-	-	-	-	-	1	-	1	2	3	-	3	-	-
2	-	-	-	-	-	1	-	1	2	3	-	3	-	-
3	-	-	-	-	-	1	-	1	2	3	-	3	-	-
4	-	-	-	-	-	1	-	1	2	3	-	3	-	-
5	-	-	-	-	-	1	-	1	2	3	-	3	-	-
Avg.	-	-	-	-	-	1	-	1	2	3	-	3	-	-

1-Low, 2-Medium, 3-High, '-' - No correlation

24MA201T	STATISTICS AND NUMERICAL METHODS	L	T	P	C
		3	1	0	4

COURSE OBJECTIVES:

Upon completing this course, students will be able

- To provide the necessary basic concepts of a few statistical and numerical methods and give procedures for solving numerically different kinds of problems occurring in engineering and technology.
- To acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life problems.
- To introduce the basic concepts of solving algebraic and transcendental equations.
- To introduce the numerical techniques of interpolation in various intervals and numerical techniques of differentiation and integration which plays an important role in engineering and technology disciplines.
- To acquaint the knowledge of various techniques and methods of solving ordinary differential equations.

UNIT I   TESTING OF HYPOTHESIS   **9 + 3**

Sampling distributions - Tests for single mean, proportion and difference of means (Large and small samples) – Tests for single variance and equality of variances – Chi square test for goodness of fit – Independence of attributes.

UNIT II   DESIGN OF EXPERIMENTS   **9 + 3**

One way and two way classifications - Completely randomized design – Randomized block design – Latin square design - 2^2 factorial design.

UNIT III   SOLUTION OF EQUATIONS AND EIGEN VALUE PROBLEMS   9 + 3

Solution of algebraic and transcendental equations - Fixed point iteration method – Newton Raphson method- Solution of linear system of equations - Gauss elimination method – Pivoting - Gauss Jordan method – Iterative methods of Gauss Jacobi and Gauss Seidel - Eigenvalues of a matrix by Power method and Jacobi's method for symmetric matrices.

**UNIT IV   INTERPOLATION,   NUMERICAL   DIFFERENTIATION   AND   9+3
           NUMERICAL INTEGRATION**

Lagrange's and Newton's divided difference interpolations – Newton's forward and backward difference interpolation – Approximation of derivatives using interpolation polynomials – Numerical single and double integrations using Trapezoidal and Simpson's 1/3 rules.

**UNIT V   NUMERICAL   SOLUTION   OF   ORDINARY   DIFFERENTIAL   9+3
          EQUATIONS**

Single step methods: Taylor's series method - Euler's method - Modified Euler's method - Fourth order Runge-Kutta method for solving first order differential equations - Multi step methods: Milne's and Adams - Bash forth predictor corrector methods for solving first order differential equations.

TOTAL: 60 PERIODS

COURSE OUTCOMES:

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

CO 1:   Apply the concept of testing of hypothesis for small and large samples in real life problems.

CO 2:   Apply the basic concepts of classifications of design of experiments in the field of agriculture.

CO 3:   Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.

CO 4:   Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.

CO 5:   Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

TEXT BOOKS:

1. Johnson, R.A., Miller, I and Freund J., "Miller and Freund's Probability and Statistics for Engineers", Pearson Education, Asia, 8th Edition, 2015.
2. Grewal, B.S., and Grewal, J.S., "Numerical Methods in Engineering and Science", Khanna Publishers, 10th Edition, New Delhi, 2015.

REFERENCES:
1. Burden,R.Land Faires, J.D,"Numerical Analysis",9th Edition, Cengage Learning, 2016.
2. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning, New Delhi, 8th Edition, 2014.
3. Gerald. C.F. and Wheatley. P.O. "Applied Numerical Analysis" Pearson Education, Asia, New Delhi, 7th Edition, 2007.
4. Gupta S.C. and Kapoor V. K., "Fundamentals of Mathematical Statistics", Sultan Chand & Sons, New Delhi, 12th Edition, 2020.
5. Spiegel. M.R., Schiller. J. and Srinivasan. R.A., "Schaum's Outlines on Probability and Statistics ", Tata McGraw Hill Edition, 4th Edition, 2012.
6. Walpole. R.E., Myers. R.H., Myers. S.L. and Ye. K., "Probability and Statistics for Engineers and Scientists", 9th Edition, Pearson Education, Asia, 2010.

COs - POs & PSOs: MAPPING

CO	PO												PSO	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**
1	3	3	1	1	1	-	-	-	2	-	2	3	-	-
2	3	3	1	1	1	-	-	-	2	-	2	3	-	-
3	3	3	1	1	1	-	-	-	2	-	2	3	-	-
4	3	3	1	1	1	-	-	-	2	-	2	3	-	-
5	3	3	1	1	1	-	-	-	2	-	2	3	-	-
Avg.	3	3	1	1	1	-	-	-	2	-	2	3	-	-

1-Low, 2-Medium, 3-High, '-' - No correlation

24PH204T   ENGINEERING MATERIALS AND METALLURGY   L T P C
3 0 0 3

COURSE OBJECTIVES:
Upon completing this course, the students will be able
- To understand crystallography and its significance in the study of materials.
- To analyze selection criteria, material imperfections, and strengthening mechanisms.
- To identify and characterize the mechanical properties of materials.
- To gain knowledge of ferrous metals, alloy steels, and tool steel phase diagrams.
- To develop a basic understanding of heat treatment and surface treatment processes.

**UNIT–I   STRUCTURE, PROPERTIES AND SELECTION OF   9
             ENGINEERING MATERIALS**

Introduction to crystals, Unit cells, Metallic crystal structures, Classification and properties of Materials, Metals and Alloys, Polymers, Ceramics, Composites Biomaterials and Semiconductors, Selection of Engineering Materials: Material selection approach, selection process.

**UNIT–II   IMPERFECTION IN SOLIDS AND STRENGTHENING   9
         MECHANISM**

Point, Line, Surface and Volume detects. Dislocations and plastic deformation, slip systems, slip in single crystals, Deformation by twinning, Mechanisms of strengthening: solid solution strengthening, strengthening by Grain Size Reduction, Recovery, Recrystallization, and Grain Growth, Strain Hardening and Precipitation Hardening.

UNIT-III MECHANICAL PROPERTY CHARACTERIZATION   9

Tensile,Compression and Torsion tests, young's modulus, Shear modulus. True Stress and strain, Engineering stress and strain, Stress-strain curves, Generalized Hooke's law, Yielding and yield strength, Ductility, Resilience, Toughness and Elastic recovery, Hardness: Rockwell, Brinell and Vickers and their relation to strength.

UNIT-IV   PHASE DIAGRAMS AND ALLOY MATERIALS   9

Alloys, Substitutional and Interstitial solid solutions, Phase diagram fundamentals, Eutectic, Peritectic, Peritectoid and Monotectic reactions, Iron-carbide phase diagram and Microstructural aspects of Ledeburite. Austenite, Ferrite and Cementite.
Alloy Steels: Purpose of alloying, Effect of alloying elements. Tool Steels: Classification and selections of tool steels. Properties and applications of Copper alloys: Brass, Bronze. Aluminum alloys, Al-Cu, Nickel and Titanium alloys.

UNIT-V   HEAT TREATMENT AND SURFACE TREATMENT OF STEEL   9

Annealing. Stress relieving, Process annealing, Spheroidising. Full annealing, Normalising, Hardening, Tempering, TTT diagram, Continuous cooling curves, Austenitizing temperature. Martempering. Austempering and Ausforming, Mechanism of heat removal during Quenching, Quenching medium, Surface Hardening of steel: Carburising. Nitriding, Cyaniding. Carbonitriding. Flame hardening, Induction hardening.

                                                          TOTAL: 45 PERIODS

COURSE OUTCOMES :

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

CO 1: Identify suitable materials for specific engineering applications based on their structure and properties

CO 2: Identify the best strengthening mechanism and its effects for crystalline materials

CO 3: Analyze the stress , strain , hardness , percentage elongation , reduction in area, and tensile strength of materials.

CO 4: Analyze phase diagrams to illustrate phases, phase percentages, invariant reactions, and microstructures of ferrous systems.

CO 5: Identify the appropriate heat treatment and surface hardening process for steel and select the appropriate material for machine tool fabrication and cutting.

TEXT BOOKS:

1. Callister W.D,"Materials Science and Engineering", John Wiley &Sons, 9th Edition, 2014.
2. V.Raghavan. "Materials Science and Engineering: A First Course" , Prentice Hall India Learning Private Limited, 2015.
3. A text book of "Material science and engineering" by O.P.Khanna, Dhanpat Rai Publication 2021.

REFERENCES:

1. William F Smith, Javad Hashemi, Ravi Prakash,"Materials Science and Engineering",Tata McGraw Hill Private Limited, 5th Edition, 2013.
2. George Dieter,"Mechanical Metallurgy",Tata McGraw Hill,3rd Edition,New Delhi,2013.
3. Van Vlack L.H.,"Elements of Materials Science and Engineering", 6th Edition, Pearson India, 2002.
4. Rajan.T.V.,Sharma C.P., Ashok Sharma., "Heat Treatment Principles and Techniques", Prentice Hall of India Pvt. Ltd., New Delhi,2002.
5. Sidney H.Avner, "Introduction to Physical Metallurgy",Tata McGraw Hill, NewDelhi, 2nd Edition, 5th reprint, 2009.

COs - POs & PSOs: MAPPING

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	2	1	-	-	-	-	-	-	-	-	-	1	-	-
2	3	2	1	-	-	-	-	-	-	-	-	1	-	-
3	3	2	1	-	-	-	-	-	-	-	-	1	-	-
4	3	2	1	-	-	-	-	-	-	-	-	1	-	-
5	3	2	1	-	-	-	-	-	-	-	-	1	-	-
Avg.	3	2	1	-	-	-	-	-	-	-	-	1	-	-

1-Low, 2-Medium, 3-High, '-' - No correlation

24BE201T   **BASIC ELECTRICAL AND ELECTRONICS**   **L T P C**
                                      ENGINEERING   **3 0 0 3**

COURSE OBJECTIVES:

Upon completing this course, the students will be able
- 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 the basics of Analog Electronics.
- To introduce the basics of Digital Electronics.
- To introduce the functional elements, working of measuring instruments and sensors.

UNIT I   ELECTRIC CIRCUITS   9

DC Circuits: Circuit Components: Conductor, Resistor, Inductor and Capacitor–Energy Sources – Ohms law – Kirchhoff's laws – Series and Parallel connection of circuit elements– Node voltage analysis –Mesh current analysis.

AC Circuits: Alternating voltages and currents, Power, Power Factor – Single Phase Series RL, RC, RLC Circuits.

UNIT II   ELECTRICAL MACHINES   9

Construction, Working Principle and applications of DC Generators – DC Motors – Single phase Transformers – Three phase and Single-phase induction motors – Three Phase Alternator.

UNIT III   ANALOG ELECTRONICS   9

Semiconductor Materials: Silicon & Germanium – PN Junction diode –Zener Diode – Bipolar Junction transistors, JFET, MOSFET – Characteristics. Half wave and Full wave rectifier – Voltage regulators – Inverters.

UNIT IV   DIGITAL ELECTRONICS   9

Review of number systems – Binary codes –Error detection and correction codes – Representation of logic functions, SOP and POS forms – K-map representations, minimization using K maps – Combinational Circuits: Half and Full Adder - Half and Full Subtractors.

UNIT V   MEASUREMENTS, SENSORS AND INSTRUMENTATION   9

Functional elements of an instrument - Operating Principle – Moving coil and Moving Iron meters –Measurement of three phase power - Energy meters – Instrument Transformers: CT and PT –Sensors: Strain gauge, LVDT, Proximity sensors, Piezoelectric, Halleffect, Photo sensors - DSO – Data Acquisition Systems.

                                                       TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

CO 1: Compute the electric circuit parameters for simple problems

CO 2: Explain the working principle and applications of electrical machines.

CO 3: Analyze the characteristics of analog electronic devices

CO 4: Explain the basic concepts of digital electronics.

CO 5: Explain the operating principles of measuring instruments and sensors.

TEXT BOOKS:

1. D P Kothari and I.J Nagarath, "Basic Electrical and Electronics Engineering", McGraw Hill Education (India) Private Limited, Second Edition, 2020.
2. S.K. Bhattacharya, "Basic Electrical Engineering", Pearson Education, 2019.
3. James A Svoboda, Richard C. Dorf, "Dorf's Introduction to Electric Circuits", Wiley,2018.
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. John Bird, "Electrical Circuit theory and technology", Routledge; 2017.
2. Thomas L. Floyd, 'Electronic Devices', 10th Edition, Pearson Education, 2018.
3. Albert Malvino, David Bates, 'Electronic Principles, McGraw Hill Education; 7th edition, 2017.
4. Muhammad H.Rashid, "Spice for Circuits and electronics", 4th Edition., Cengage India,2019.
5. H.S. Kalsi, 'Electronic Instrumentation', Tata McGraw-Hill, New Delhi, 2010.

COs - POs & PSOs: MAPPING

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	2	2	1	-	-	-	-	1	-	-	-	2	-	-
2	2	2	1	-	-	-	-	1	-	-	-	1	-	-
3	2	1	1	-	-	-	-	1	-	-	-	2	-	-
4	2	2	1	-	-	-	-	1	-	-	-	2	-	-
5	2	2	1	-	-	-	-	1	-	-	-	2	-	-
Avg.	2	1.8	1	-	-	-	-	1	-	-	-	1.8	-	-

1-Low, 2-Medium, 3-High, '-' - No correlation

24GE201T	ENGINEERING GRAPHICS	L T P C
	(COMMON TO ALL BRANCHES)	2 0 4 4

COURSE OBJECTIVES:

The main learning objective of this course is to prepare the students for:

- Drawing engineering curves and Free hand sketch.
- Drawing orthographic projection of points,straight lines ,plane surfaces.
- Drawing orthographic projection of simple solids.
- Drawing section of solids and development of surfaces.
- Drawing isometric and perspective projections of simple solids.

CONCEPTS AND CONVENTIONS (Not for Examination)

Importance of graphics in engineering applications - Use of drafting instruments – BIS conventions and specifications- Size, layout and folding of drawing sheets - Lettering and dimensioning.

UNIT I   PLANE CURVES AND FREEHAND SKETCHING   6+12

Basic Geometrical Constructions, Curves used in engineering practices: Conics – Construction of ellipse, parabola and hyperbola by eccentricity method – Construction of cycloid – Construction of involutes of square and circle – Drawing of tangents and normal to the above curves.

Orthographic projection - Principles – Principal planes - Representation of Three-Dimensional objects - Layout of views - Sketching of multiple views (Front, Top and Side views) from pictorial views of simple objects and Engineering Components.

UNIT II   PROJECTION OF POINTS, LINES AND PLANE SURFACES   6+12

Projection of points in four quadrants. Projection of straight lines (only First angle projection) inclined to both the principal planes – Determination of true lengths and true inclinations by rotating line method and traces.

Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by change of position method.

UNIT III PROJECTION OF SOLIDS   6+12

Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one of the principal planes by change of position method.

**UNIT IV   SECTION OF SOLIDS AND DEVELOPMENT OF LATERAL SURFACES
                OF SOLIDS   6+12**

Sectioning of solids in simple vertical position when the cutting plane is inclined to one of the principal planes and perpendicular to the other – Obtaining true shape of the section.

Development of lateral surfaces of simple solids – Prisms, pyramids, cylinder and cone. Development of lateral surfaces of sectioned solids

UNIT V   ISOMETRIC AND PERSPECTIVE PROJECTIONS   6+12

Principles of isometric projection – Isometric View – Isometric projections of simple solids and cut solids – Prisms, pyramids, cylinder, cone – Combination of two solid objects in simple vertical positions. Perspective projection of simple solids – Prisms, pyramids and cylinder by visual ray method.

TOTAL: (L=30; P=60) 90 PERIODS

COURSE OUTCOMES:

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

CO 1:   Draw engineering curves and free hand sketches of solids.

CO 2:   Draw orthographic projections of points, lines and planes.

CO 3:   Draw orthographic projections of simple solids

CO 4:   Draw sectional views of the objects and development of surfaces.

CO 5:   Draw isometric and perspective views of simple solids.

TEXT BOOK:

1. Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, 54th Edition ,2023.
2. Natrajan K.V., "A Text Book of Engineering Graphi cs", Dhanalakshmi Publishers, Chennai, 2018.
3. Parthasarathy, N. S. and Vela Murali, "Engineering Drawing", Oxford University Press, 2015.

REFERENCES:

1. Basant Agarwal and Agarwal C.M., "Engineering Drawing", McGraw Hill, 2nd Edition, 2019.
2. Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Publications, Bangalore,27th Edition, 2017.
3. 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.
4. Shah M.B., and Rana B.C., "Engineering Drawing", Pearson Education India, 2nd Edition, 2009.
5. Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 15th Edition 2018.

Publication of Bureau of Indian Standards:

1. IS 10711 - 2001: Technical products Documentation - Size and lay out of drawing sheets.
2. IS 9609 (Parts 0 & 1) - 2001: Technical products Documentation - Lettering.
3. IS 10714 (Part 20) - 2001 & SP 46-2003: Lines for technical drawings.
4. IS 11669 -1986 & SP 46 -2003: Dimensioning of Technical Drawings.
5. IS 15021 (Parts 1 to 4) - 2001: Technical drawings -Projection Methods.

Special points applicable to End Semester Examinations in 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.
4. The students will be permitted to use appropriate scale to fit solution within A3 size.
5. The examination will be conducted in appropriate sessions on the same day.

COs - POs & PSOs: MAPPING

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	3	1	1	-	-	-	-	1	1	3	-	1	-	-
2	3	2	2	-	-	-	-	1	1	3	-	1	-	-
3	3	2	2	-	3	-	-	1	1	3	-	1	-	-
4	3	2	2	-	3	-	-	1	1	3	-	1	-	-
5	3	2	2	-	3	-	-	1	1	3	-	1	-	-
Avg.	3	2	2	-	3	-	-	1	1	3	-	1	-	-

1-Low, 2-Medium, 3-High, '-' - No correlation

24TA201T	தமிழரும் தொழில்நுட்பமும்	L T P C
		1 0 0 1

பாடத்திட்டநோக்கங்கள் :

* சங்ககாலத்தில் நெசவு மற்றும் பானை தொழில்நுட்பத்தினை அறியமுற்படுத்துதல்
* சங்க கால கட்டிட வடிவமைப்பு பற்றி இலக்கியத்தின் வாயிலாக அறிந்து கொள்ள முயற்சித்தல்
* சங்ககால தொழில்நுட்ப சிறப்பினை அறிய தூண்டல்
* வேளாண்மை மற்றும் அதற்கு பயன்படுத்தப்பட்ட நீர் பாசனங்களின் முக்கியத்துவத்தை பற்றியும் ஆராய அறியமுற்படுத்தல்
* தமிழ் மூலம் அறிவியலையும் கணினி மூலம் தமிழில் சிறப்பையும் ஆராய முற்படுத்துதல்

அலகு I   நெசவு மற்றும் பானைத் தொழில் நுட்பம்

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

அலகு II   வடிவமைப்பு மற்றும் கட்டிடத் தொழில் நுட்பம்   3
சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு - சங்க காலத்தில் கட்டுமானப் 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 - செட்டி நாட்டு வீடுகள் - பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ சாரோ செனிக் கட்டிடக் கலை.

அலகு III   உற்பத்தித் தொழில்நுட்பம்   3
கப்பல் கட்டும் கலை - உலோகவியல் - இரும்புத் தொழிற் சாலை - இரும்பை உருக்குதல், எஃகு - வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் - நாணயங்கள் அச்சடித்தல் - மணி உருவாக்கும் தொழிற்சாலை - கல் மணிகள், கண்ணாடி மணிகள் - சுடுமண் மணிகள் - சங்கு மணிகள் - எலும்புத் துண்டுகள் - தொல்லியல் சான்றுகள் - சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.

அலகு IV   வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில்நுட்பம்   3
அணை, ஏரி, குளங்கள், மதகு - சோழர் காலக் குமுழித் தூம்பின் முக்கியத்துவம் - கால்நடை பராமரிப்பு - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள் - கடல் சார்அறிவு - மீன் வளம் - முத்து மற்றும் முத்துக் குளித்தல் - பெருங்கடல் குறித்த பண்டைய அறிவு - அறிவு சார் சமூகம்.

அலகு V   அறிவியல் தமிழ் மற்றும் கணினி தமிழ்   3
அறிவியல் தமிழின் வளர்ச்சி - கணினி தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின் பதிப்பு செய்தல் - தமிழ் மென் பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக் கழகம் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ் அகராதிகள் - சொற்குவைத் திட்டம்.

TOTAL : 15 PERIODS

COURSE OUTCOMES:

இறுதியாக இப்பாடத்தை படிப்பதன் மூலம் மாணவர்கள் கீழ்கண்ட பயன்களை அடைய முடியும்:

CO 1: சங்க கால தமிழர்களின் நெசவு மற்றும் பானை தொழில்நுட்பத்தின் தொன்மையை அறிந்து கொள்ளல்

CO 2: சங்ககால மக்களின் கட்டிட வடிவமைப்பு திறனை உணர செய்தல்

CO 3: தமிழர்களின் உற்பத்தி தொழில்நுட்பத்தினை சங்க இலக்கியத்திலிருந்து கற்றல்

CO 4: சங்க இலக்கியத்தின் வாயிலாக வேளாண்மை சார்ந்த செய்திகளை அறிதல்

CO 5: அறிவியல் தமிழ் மற்றும் கணினி தமிழ் பற்றிய சிறப்பினை கற்றுணர்தல்

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 C ivilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Textbook 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 Textbook and Educational Services Corporation, Tamil Nadu).

12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

COs - POs & PSOs: MAPPING

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	-	-	-	-	-	1	1	1	1	1	-	-	-	-
2	-	-	-	-	-	1	1	1	1	1	-	-	-	-
3	-	-	-	-	-	1	1	1	1	1	-	-	-	-
4	-	-	-	-	-	1	1	1	1	1	-	-	-	-
5	-	-	-	-	-	1	1	1	1	1	-	-	-	-
Avg.	-	-	-	-	-	1	1	1	1	1	-	-	-	-

1-Low, 2-Medium, 3-High, '-' - No correlation

24TA201T	TAMILS AND TECHNOLOGY	L T P C
	(COMMON TO ALL BRANCHES)	**1 0 0 1**

COURSE OBJECTIVES:

Upon completing this course, the students will be able
- To learn about weaving and pottery technique of the sangam period through literature
- To learn about the sangam architectural design through literature
- To know about the technical excellence introduced in sangam period.
- To study the scenario of agriculture and irrigation systems used in sangam period
- To explore science through tamil and excellence of tamil through computers.

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.

UNIT III   MANUFACTURING TECHNOLOGY   3

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

UNIT IV   **AGRICULTURE AND IRRIGATION TECHNOLOGY**   **3**

Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society.

UNIT V   **SCIENTIFIC TAMIL & TAMIL COMPUTING**   **3**

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

TOTAL : 15 PERIODS

COURSE OUTCOMES:

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

CO 1:   Know the history of weaving and pottery technology of Sangam period Tamils.
CO 2:   Realize the architectural design potential of the Sangam people.
CO 3:   Learn the production technology of Tamils from Sangam Literature.
CO 4:   Know the knowledge of agricultural news through association literature
CO 5:   Learn about science Tamil and Computer Tamil speciality.

TEXT-CUM REFERENCE BOOKS:

1. தமிழக வரலாறு - மக்களும்பண்பாடும் - கே. கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித்தமிழ் - முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி - வைகை நதிக்கரையில் சங்க கால 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 C ivilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Textbook 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 Textbook and Educational Services Corporation, Tamil Nadu).
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

COs - POs & PSOs: MAPPING

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	-	-	-	-	-	1	1	1	1	1	-	-	-	-
2	-	-	-	-	-	1	1	1	1	1	-	-	-	-
3	-	-	-	-	-	1	1	1	1	1	-	-	-	-
4	-	-	-	-	-	1	1	1	1	1	-	-	-	-
5	-	-	-	-	-	1	1	1	1	1	-	-	-	-
Avg.	-	-	-	-	-	1	1	1	1	1	-	-	-	-

1-Low, 2-Medium, 3-High, '-' - No correlation

24GE201P	ENGINEERING PRACTICES LABORATORY	L T P C
	(COMMON TO ALL BRANCHES)	0 0 4 2

COURSE OBJECTIVES:

The main learning objective of this course is to provide hands on training to the students in:

- Welding process, sheet metal working, foundry work and basic machining operations.
- Laying and connecting various pipe fittings and making joints in wood materials.
- Wiring various electrical joints in common household electrical wire work.
- Soldering and testing simple electronic circuits.

GROUP – A (MECHANICAL & CIVIL)
PART I   MECHANICAL ENGINEERING PRACTICES   15
WELDING WORK:

a) Welding of Butt Joint , Lap Joint and T joint using arc welding.
b) Practicing gas welding.

SHEET METAL WORK:
a) Making of a square tray

FOUNDRY WORK:
a) Demonstrating basic foundry operations

BASIC MACHINING WORK:
a) Facing and Turning

b) Step turning

c) Drilling

PART II   CIVIL ENGINEERING PRACTICES   15

PLUMBING WORK:

a) Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, elbows and other components which are commonly used in-house hold.

b) Preparing plumbing line sketches.

c) Laying pipe connection to the suction side of a pump

d) Laying pipe connection to the delivery side of a pump.

e) Connecting pipes of different materials: Metal, plastic and flexible pipes used in-house Hold appliances.

WOOD WORK:

a) Sawing

b) Planing

c) Making joints - lap joint and T-Joint.

GROUP – B (ELECTRICAL & ELECTRONICS)

PART III   ELECTRICAL ENGINEERING PRACTICES   15

1. Introduction to switches, fuses, Miniature Circuit Breakers, indicators and lamps – Basic switch board wiring with lamp, fan and three pin sockets.

2. Staircase wiring.

3. Fluorescent Lamp wiring with introduction to CFL and LED types.

4. Energy meter wiring and related calculations/ calibration.

5. Study of Iron Box wiring and assembly /Water heater.

6. Study of Electronic type Fan Regulator using Diac/Triac

7. Study of emergency lamp wiring.

PART IV   ELECTRONIC ENGINEERING PRACTICES   15

SOLDERING WORK

a) Soldering simple electronic circuits and checking continuity.

ELECTRONIC ASSEMBLY AND TESTING WORK:

 a) Assembling and testing electronic components on a small PCB.

ELECTRONIC EQUIPMENT STUDY:

a) Study of elements of smart phone.

b) Study of elements of LED TV.

c) Assembly and dismantle of computer/laptop.

<div align="right">TOTAL: 60 PERIODS</div>

COURSE OUTCOMES:

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

CO 1: Perform arc welding joints ,making sheet metal object ,prepare sand mould and machining simpleoperations.

CO 2: Connect various pipe fittings and making joints in wood materials.

CO 3: Wiring various electrical joints in common household electrical wire work.

CO 4: Perform soldering and testing simple electronic circuits.

COs - POs & PSOs : MAPPING

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	2	2	2	-	-	-	-	-	-	2	-	-	-	-
2	2	2	2	-	-	-	-	-	-	2	-	-	-	-
3	2	2	2	-	3	-	-	-	-	2	-	-	-	-
4	2	2	2	-	3	-	-	-	-	2	-	-	-	-
Avg.	2	2	2	-	3	-	-	-	-	2	-	-	-	-

<div align="center">1-Low, 2-Medium, 3-High, '-' - No correlation</div>

24BE201P BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY   L T P C

      0 0 4 2

COURSE OBJECTIVES:

Upon completing this course, the students will be able

- 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.

<div align="center"><u>LIST OF EXPERIMENTS</u></div>

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 and MOSFET.

8. Half wave and Full Wave rectifiers.

9. Study of Logic Gates.

10. Study of DSO

11. Measurement of displacement using LVDT

TOTAL: 60 PERIODS

COURSE OUTCOMES:

At the end of the course, Students will be able to

CO1: Use experimental methods to verify the Ohm's and Kirchhoff's Laws

CO2: Analyze experimentally the load characteristics of electrical machines.

CO3: Analyze the characteristics of basic electronic devices

CO4: Use DSO to measure the various parameter

COs - POs & PSOs: MAPPING:

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	2	3	1	2	-	-	-	1	2	-	-	-	-	-
2	2	3	1	2	-	-	-	1	2	-	-	-	-	-
3	2	3	1	2	-	-	-	1	2	-	-	-	-	-
4	2	3	1	2	-	-	-	1	2	-	-	-	-	-
Avg.	2	3	1	2	-	-	-	1	2	-	-	-	-	-

1-Low, 2-Medium, 3-High, '-' - No correlation

24GE202P   **COMMUNICATION SKILLS LABORATORY**   **L T P C**
                 (COMMON TO ALL BRANCHES)

                                                          0   0 4 2

COURSE OBJECTIVES:
Upon completing this course, the students will be able

- To identify varied group discussion skills and apply them to take part in effective discussions in a professional context.
- To analyse concepts and problems and make effective presentations explaining them clearly and precisely.
- To be able to communicate effectively through formal and informal writing.
- To be able to use appropriate language structures to write emails, reports and essays
- To give instructions and recommendations that are clear and relevant to the context.

UNIT I   **12**
Speaking-Role Play Exercises Based on Workplace Contexts, discussing progress toward goals-talking about experiences- talking about events in life- discussing past events-Writing: writing emails (formal & semi-formal).

UNIT II   **12**
Speaking: discussing news stories- -talking about travel problems- discussing travel procedures-making arrangements-describing arrangements- discussing plans and decisions- discussing purposes and reasons- -Writing: - writing different types of emails.

UNIT III   **12**
Speaking: discussing predictions-describing the climate-discussing forecasts and scenarios-talking about purchasing-discussing advantages and disadvantages- discussing likes and dislikes-Writing: short essays and reports-formal/semi-formal letters.

UNIT IV   **12**
Speaking: discussing the natural environment-describing systems-describing position and movement- explaining rules-(example- discussing rental arrangements)- understanding technical instructions-Writing: writing instructions-writing a short article.

UNIT V   **12**
Speaking: describing things relatively-describing clothing-discussing safety issues (making recommendations) talking about electrical devices-describing controlling actions- Writing: job application (Cover letter + Curriculum vitae)-writing recommendations.

                                                          TOTAL: 60 PERIODS

COURSE OUTCOMES:

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

CO 1: Speak effectively in group discussions held in a formal/semi formal contexts.

CO 2: Discuss, analyse and present concepts and problems from various perspectives to arrive at suitable solutions.

CO 3: Write emails, letters and effective job applications.

CO 4: Write critical reports to convey data and information with clarity and precision

CO 5: Give appropriate instructions and recommendations for safe execution of tasks.

COs - POs & PSOs: MAPPING:

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1	-	-	-	-	-	1	-	1	2	3	-	3	-	-
2	-	-	-	-	-	1	-	1	2	3	-	3	-	-
3	-	-	-	-	-	1	-	1	2	3	-	3	-	-
4	-	-	-	-	-	1	-	1	2	3	-	3	-	-
5	-	-	-	-	-	1	-	1	2	3	-	3	-	-
Avg.	-	-	-	-	-	1	-	1	2	3	-	3	-	-

1-Low, 2-Medium, 3-High, '-' - No correlation