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.Tech. Information Technology

CURRICULUM AND SYLLABI FOR SEMESTER I TO VIII

Vision	Mission
• To cultivate versatile professionals who can effectively tackle present and future challenges in the ever-evolving field of information technology	• To promote inclusivity and empower individuals through equitable access to technology, bridging digital divides, and cultivating diversity within the IT workforce. • To equip individuals with the essential skills, knowledge, and entrepreneurial mindset required for success in both conventional employment and entrepreneurial pursuits within the IT industry. • To foster the creation of IT solutions that tackle pressing societal issues, advance sustainability goals, and drive meaningful social impact.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)
Graduates of the programme B.Tech Information Technology will be able to
PEO 1: Have strong analytical and problem-solving skills, enabling them to identify, analyze, and solve complex technical challenges using IT tools and methodologies.
PEO 2: Excel in identifying opportunities, leveraging technology creatively, contributing to startups, and advancing in IT careers.
PEO 3: Collaborate effectively in multidisciplinary teams, demonstrating leadership and interpersonal skills to achieve common goals in IT project.
PROGRAMME OUTCOMES (POs)
Information Technology Graduates will be able to
PO 1: **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering

problems.

PO 2: **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of Mathematics, natural sciences, and engineering sciences.

PO 3: **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4: **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 5: **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6: **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO 7: **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8: **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 9: **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10: **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11: **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: **Life-long Learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

On successful completion of IT Degree Programme, the graduates shall exhibit the following

PSO 1: Adopt and apply emerging technologies, such as artificial intelligence (AI), machine learning (ML) and Internet of Things (IoT) to solve complex problems in IT.

PSO 2: Apply software development principles, practices, and technologies to design, create, and implement software solutions for IT, entrepreneurial ventures, and enhanced employability.

SEMESTER I

S.NO	COURSE CODE	TITLE	CATEGORY	L	T	P	TOTAL CONTACT PERIODS	CREDIT
1	24IP101T	Induction Programme	-	0	0	0	0	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	24BE201T	Basic Electrical and Electronics Engineering	ESC	3	0	0	3	3
8	24TA101T	தமிழர்மரபு /Heritage of Tamils	HSMC	1	0	0	1	1
PRACTICAL								
9	24GE101P	Problem Solving using C Programming Laboratory	ESC	0	0	4	4	2
10	24BS101P	Physics and Chemistry Laboratory	BSC	0	0	4	4	2
11	24GE102P	English Laboratory	EEC	0	0	2	2	1
			TOTAL	**19**	**1**	**10**	**30**	**25**

SEMESTER II

S.NO	COURSE CODE	TITLE	CATEGORY	L	T	P	TOTAL CONTACT PERIODS	CREDIT
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	24CS201T	Programming in Python	PCC	3	0	0	3	3
4	24EC202I	Digital Principles And System Design	ESC	3	0	2	5	4
5	24GE201T	Engineering Graphics	ESC	2	0	4	6	4
6	24TA201T	தமிழரும்தொழில்நுட்பமும் / Tamils and Technology	HSMC	1	0	0	1	1
PRACTICAL								
7	24CS201P	Programming in Python Laboratory	PCC	0	0	3	3	1.5
8	24GE201P	Engineering Practices Laboratory	ESC	0	0	4	4	2
9	24GE202P	Communication Skills Laboratory	EEC	0	0	4	4	2
			TOTAL	**16**	**1**	**17**	**34**	**23.5**

SEMESTER III

S.NO	COURSE CODE	TITLE	CATEGORY	L	T	P	TOTAL CONTACT PERIODS	CREDIT
THEORY								
1		Discrete Mathematics	BSC	3	1	0	4	4
2		Database Management System	PCC	3	0	0	3	3
3		Computer Organization and Architecture	PCC	3	0	0	3	3
4		Data Structures	PCC	3	0	0	3	3
THEORY CUM LABORATORY								
5		Artificial Intelligence	PCC	3	0	2	5	4
6		Operating System	PCC	2	0	2	4	4
PRACTICAL								
7		Database Management System Laboratory	PCC	0	0	3	3	1.5
8		Data Structures Laboratory	PCC	0	0	4	4	2
			TOTAL	**17**	**1**	**11**	**29**	**23.5**

SEMESTER IV

S.NO	COURSE CODE	TITLE	CATEGORY	L	T	P	TOTAL CONTACT PERIODS	CREDIT
THEORY								
1		Web Essentials	PCC	3	0	0	3	4
2		Java Programming	PCC	3	0	0	3	3
3		Foundation of Data Science	PCC	3	0	0	3	3
4		Environmental Science and Sustainability	BSC	2	0	0	2	2
THEORY CUM LABORATORY								
5		Algorithms	PCC	3	0	2	5	4
6		Computer Networks	PCC	2	0	2	4	4
PRACTICAL								
7		Data Science Laboratory	PCC	0	0	3	3	1.5
8		Java Programming Laboratory	PCC	0	0	3	3	1.5
			TOTAL	**16**	**0**	**10**	**26**	**22**

SEMESTER V

S.NO	COURSE CODE	TITLE	CATEGORY	L	T	P	TOTAL CONTACT PERIODS	CREDIT
THEORY								
1		Cryptography and Cyber Security	PCC	3	0	0	3	3
2		Distributed Computing	PCC	3	0	0	3	3
3		Machine Learning	PCC	2	0	2	4	4
4		Mobile Application Development	PCC	2	0	2	4	4
5		Professional Elective I	PEC	-	-	-	-	3
6		Professional Elective II	PEC	-	-	-	-	3
7		Mandatory Course I[#]	MC	3	0	0	3	0
PRACTICAL								
8		Communication Laboratory I	EEC	0	0	4	4	2
9		Summer Internship I	EEC	0	0	4	4	2
			TOTAL	-	-	-	-	**22**

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

SEMESTER VI

S.NO	COURSE CODE	TITLE	CATEGORY	L	T	P	TOTAL CONTACT PERIODS	CREDIT
THEORY								
1		Full Stack Development	PCC	3	0	2	5	4
2		Object Oriented Software Engineering	PCC	3	0	2	5	4
3		Embedded System and IoT	PCC	2	0	2	4	4
4		Professional Elective III	PEC	-	-	-	-	3
5		Professional Elective IV	PEC	-	-	-	-	3
6		Professional Elective V	PEC	-	-	-	-	3
7		Mandatory Course II[#]	MC	3	0	0	3	3
PRACTICAL								
8		Communication Laboratory II	EEC	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 Mandatory Course-II)

SEMESTER VII

S.NO	COURSE CODE	TITLE	CATEGORY	L	T	P	TOTAL CONTACT PERIODS	CREDIT
THEORY								
1		Human Value Ethics	HSMC	2	0	0	2	2
2		Management Elective[$]	HSMC	-	-	-	-	3
3		Open Elective I**	OEC	-	-	-	-	3
4		Open Elective II**	OEC	-	-	-	-	3
5		Open Elective III**	OEC	-	-	-	-	3
PRACTICAL								
6		Mini Project	EEC	0	0	4	4	2
			TOTAL	**-**	**-**	**-**	**-**	**16**

**** Open Elective I -III (Shall be chosen from the list of open electives offered by other Programmes).**
$ Management – Elective shall be chosen from the Management Elective courses.

SEMESTER VIII

S.NO	COURSE CODE	TITLE	CATEGORY	L	T	P	TOTAL CONTACT PERIODS	CREDIT
PRACTICAL								
1		Project	EEC	0	0	20	20	10
			TOTAL	**0**	**0**	**20**	**20**	**10**

S.No	Subject Area	Credits per Semester								Total Credits
		I	II	III	IV	V	VI	VII	VIII	
1	**HSMC**	4	3					5		12
2	**BSC**	12	4	4	6					26
3	**ESC**	8	10							18
4	**PCC**		4.5	19.5	16	12	10			65
5	**PEC**					6	9			15
6	**OEC**							9		9
7	**EEC**	1	2			4	2	2	10	21
8	**Non-Credit /(Mandatory)**					√	√			
	Total Credits	**25**	**23.5**	**23.5**	**22**	**22**	**21**	**16**	**10**	**163**

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

24IP101T **INDUCTION PROGRAMME**

This is a mandatory 2-week programme 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-based programme 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
		3	0	0	3

Course Objectives:

1. To improve the communicative competence of learners
2. To learn to use basic grammatical structures in suitable contexts
3. To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text
4. To help learners to use language effectively in professional contexts
5. 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 newspaper reports, Excerpts from literature, and travel & technical blogs. Writing - Guided writing-- Paragraph writing, Short Report on an event (field trip etc.) 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 – Newspaper articles; Journal reports –and Non Verbal Communication (tables, piechartsetc,) . Writing – Note-making / Note-taking; Writing recommendations; Transferring information from nonverbal (chart, graph etc, to verbal mode) Grammar – Articles; Pronouns - Possessive & Relative pronouns. 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

CO1: To use appropriate words in a professional context

CO2: To gain understanding of basic grammatical structures and use them in right context.

CO3: To read and infer the denotative and connotative meanings of technical texts

CO4: To read and interpret information presented in tables, charts and other graphic forms

CO5: To write definitions, descriptions, narrations and essays on various topics

CO's-PO's & PSO's MAPPING

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

Text Books

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

Reference Books

1. Technical Communication – Principles And Practices By Meenakshi Raman &SangeetaSharma, Oxford Univ. Press, 2016, New Delhi.
2. A Course Book On Technical English By Lakshminarayanan, Scitech Publications(India) Pvt.Ltd.
3. English For Technical Communication (With CD) By Aysha Viswamohan, McgrawHill 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 Links

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/

24MA101T **MATRICES AND CALCULUS** **L T P C**

3 1 0 4

Course Objectives:

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

UNIT I MATRICES 9 + 3

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

UNIT II DIFFERENTIAL CALCULUS 9 + 3

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

UNIT III FUNCTIONS OF SEVERAL VARIABLES 9 + 3

Partial differentiation – Homogeneous functions and Euler's theorem – Total derivative – 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 centres of mass.

UNIT V MULTIPLE INTEGRALS 9 + 3

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

TOTAL: 60 PERIODS

Course Outcomes: At the end of the course the students will be able to

CO1: Use the matrix algebra methods for solving practical problems.

CO2: Apply differential calculus tools in solving various application problems.

CO3: Able to use differential calculus ideas on several variable functions.

CO4: Apply different methods of integration in solving practical problems.

CO5: Apply multiple integral ideas in solving areas, volumes and other practical problems.

CO's-PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	3	1	1	0	0	0	0	2	0	2	3	-	-
2	3	3	1	1	0	0	0	0	2	0	2	3	-	-
3	3	3	1	1	0	0	0	0	2	0	2	3	-	-
4	3	3	1	1	0	0	0	0	2	0	2	3	-	-
5	3	3	1	1	0	0	0	0	2	0	2	3	-	-
Avg	**3**	**3**	**1**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**3**	-	-

1 - Low, 2 - Medium, 3 - high, '-' - No Correlation

Text Books

1. Kreyszig.E, "Advanced Engineering Mathematics", John Wiley and Sons, 10th Edition, New Delhi, 2016.
2. Grewal.B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition, 2018.
3. James Stewart, "Calculus : Early Transcendentals", Cengage Learning, 8th Edition, New Delhi, 2015. [For Units II & IV - Sections 1.1, 2.2, 2.3, 2.5, 2.7 (Tangents problems only), 2.8, 3.1

Reference Books

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"VolumeI and II,
5. S. Viswanathan Publishers Pvt. Ltd., Chennai, 2009.
6. Ramana. B.V., "Higher Engineering Mathematics", McGraw Hill Education Pvt. Ltd, New Delhi, 2016.
7. Srimantha Pal and Bhunia. S.C, "Engineering Mathematics " Oxford University Press, 2015.

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

Course Objectives:

1. To make the students effectively achieve an understanding of mechanics.
2. To enable the students to gain knowledge of electromagnetic waves and its applications.
3. To introduce the basics of oscillations, optics and lasers.
4. Equipping the students to successfully understand the importance of quantum physics.
5. 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 – rotational kinetic energy and moment of inertia- theorems of M.I– moment of inertia of solid 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– Introduction to non linear oscillations..

UNIT II ELECTROMAGNETIC 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– Fibre optics-application-interference – Theory of air wedge and experiment.Theory of laser -characteristics-Spontaneous and stimulated emission- Einstein's coefficients-populationinversion- Nd-YA Glaser, CO_2laser, 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 3DBoxes-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

CO1: Understand the importance of mechanics.

CO2: Express their knowledge in electromagnetic waves.

CO3: Demonstrate a strong foundational knowledge in oscillations, optics and lasers.

CO4: Understand the importance of quantum physics.

CO5: Comprehend and apply quantum mechanical principles towards the formation of energy bands.

CO's-PO's & PSO's MAPPING

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

Text Books

1. D .K leppner and R.Kolenkow. An Introduction to Mechanics. McGraw Hill Education (Indian Edition), 2017.
2. E.M.Purcelland D.J.Morin, Electricity and Magnetism, Cambridge Univ .Press, 2013.
3. Arthur Beiser,Shobhit Mahajan,S.RaiChoudhury,Concepts of Modern Physics, McGraw-Hill (Indian Edition),2017

Reference Books

1. R.Wolfson.Essential University Physics.Volume1&2.Pearson Education (Indian Edition), 2009.
2. Paul A.Tipler, Physic–Volume 1&2, CBS,(Indian Edition),2004.
3. K.Thyagarajanand 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.Damaskand S.Schwarz. Physics for Computer Science Students. Springer-Verlag, 2012.

24CH101T **ENGINEERING CHEMISTRY** **L T P C**

3 0 0 3

Course Objectives:

1. To make the students, familiar with boiler feed water requirements, related problems and water treatment techniques.
2. To learn the basic concept and principle of electrochemical cell.
3. To learn the device corrosion, types of corrosion and its protection method.
4. To be familiar with different types of fuel and combustion.
5. 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 ELECTROCHEMISTRY 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 IV 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**: H2-O2 fuel cell, microbial fuel cell; **Super capacitors.**

TOTAL: 45 PERIODS

Course Outcomes: At the end of the course, the students will be able

CO1: To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.

CO2: To understand the basic concept of electrochemistry and various types of electrodes and its applications.

CO3: To understand the various types of corrosion and its prevention technique.

CO4: To recommend suitable fuels for engineering processes and applications.

CO5: To recognize different forms of energy resources and apply them for suitable applications in energy sectors.

CO's-PO's & PSO's MAPPING

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

Text Books

1. P. C. Jain and Monica Jain, "Engineering Chemistry", 17th Edition, DhanpatRai Publishing Company (P) Ltd, New Delhi, 2018.
2. Sivasankar B., "Engineering Chemistry", Tata McGraw-Hill Publishing Company Ltd, New Delhi, 2008.
3. S.S. Dara, "A text book of Engineering Chemistry", S. Chand Publishing, 12th Edition, 2018.

Reference Books

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

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

Course Objectives:

1. To gain knowledge on problem solving techniques.
2. To learn how to write simple and modular C programs.
3. To understand the usage of arrays and strings.
4. To learn the usage of pointers in accessing and manipulating memory.
5. 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: MatrixOperations (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

CO1: Apply computational thinking to solve real time problems.

CO2: Write simple C programs with decision making and looping statements.

CO3: Store and manipulate homogeneous data using arrays and strings.

CO4: Develop programs using functions and pointers.

CO5: Store and manipulate heterogeneous data using structures and files.

CO's-PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	3	3	3	2	-	-	-	-	-	-	2	3	3
2	3	3	3	2	2	-	-	-	-	-	-	2	3	3
3	3	3	3	3	2	-	-	-	-	-	-	2	3	3
4	3	3	3	3	2	-	-	-	-	-	-	2	3	3
5	3	3	3	3	2	-	-	-	-	-	-	2	3	3
Avg	**3**	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**3**	**3**

1 - Low, 2 - Medium, 3 - high, '-' - No Correlation

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

Reference Books

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.

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

Course Objectives:

1. To introduce the basics of electric circuits and analysis.
2. To impart knowledge in the basics of working principles and application of electrical machines.
3. To introduce the basics of Analog Electronics.
4. To introduce the basics of Digital Electronics.
5. 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 MACHINES 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, Hall effect, Photo sensors - DSO – Data Acquisition Systems.

TOTAL: 45 PERIODS

Course Outcomes: After completing this course, the students will be able to

CO1: Compute the electric circuit parameters for simple problems

CO2: Explain the working principle and applications of electrical machines.

CO3: Explain the characteristics of analog electronic devices

CO4: Explain the basic concepts of digital electronics.

CO5: Explain the operating principles of measuring instruments and sensors.

CO's-PO's & PSO's MAPPING

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

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.

Reference Books

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

24TA101T	தமிழர் மரபு	L T P C 1 0 0 1

அலகு I **மமொழி மற்றும் இலக்கியம்** **3**

இந்திய தமொழிக் குடும்பங்கள் – திரொவிட தமொழிகள் – தமிழ் ஒரு தெம்தமொழி –தமிழ் தெவ்விலக்கியங்கள் - ெங்க இலக்கியத்தின் ெமெய் ெொர்பற்ற தன்மம – ெங்கஇலக்கியத்தில் பகிர்தல் அறம் – திருக்குறளில் மமலொன்மமக் கருத்Fக்கள் –தமிழ்க் கொப்பியங்கள், தமிழகத்தில் ெமண தபௌத்த ெமயங்களின் தொக்கம் – பக்திஇலக்கியம், ஆழ்வொர்கள் மற்றும் நொயன்மொர்கள் – சிற்றிலக்கியங்கள் – தமிழில்நவீன இலக்கியத்தின் வளர்ெ்சி – தமிழ் இலக்கிய வளர்ெ்சியில் பொரதியொர் மற்றும் பொரதிதொென் ஆகிமயொரின் பங்களிப்பு.

அலகு II **மரபு – பொறற ஒவியங்கள் முதல் நவீன ஒவியங்கள் வறர –சிற்பக் கறல** **3**

நடுகல் முதல் நவீன சிற்பங்கள் வமர – ஐம்தபொன் சிமலகள் – பழங்குடியினர்மற்றும் அவர்கள் தயொரிக்கும்மகவிமன தபொருட்கள், தபொம்மமகள் – மதர்தெய்யும்கமல – சுடுமண் சிற்பங்கள் – நொட்டுப்புறததய்வங்கள் –குமரிமுமனயில் திருவள்ளுவர் சிமல – இமெக் கருவிகள் – மிருதங்கம், பமற, வீமண, யொழ், நொதஸ்வரம் – தமிழர்களின் ெமூக தபொருளொதொரவொழ்வில்மகொவில்களின் பங்கு.

அலகு III **நொட்டுப்புறக் கறலகள் மற்றும் வீர விறளயொட்டுகள்** **3**

ததருக்கூத்F, கரகொட்டம், வில்லுப்பொட்டு, கணியொன் கூத்F, ஒயிலொட்டம், மதொல்பொமவக் கூத்F, சிலம்பொட்டம், வளரி, புலியொட்டம், தமிழர்களின்விமளயொட்டுகள்.

அலகு IV **தமிழர்களின் திறைக் ககொட்பொடுகள்** **3**

தமிழகத்தின் தொவரங்களும், விலங்குகளும் – ததொல்கொப்பியம் மற்றும் ெங்கஇலக்கியத்தில் அகம் மற்றும் புறக் மகொட்பொடுகள் – தமிழர்கள் மபொற்றியஅறக்மகொட்பொடு – ெங்ககொலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும் –ெங்ககொல நகரங்களும் Fமற முகங்களும் – ெங்ககொலத்தில் ஏற்றுமதி மற்றும்இறக்குமதி – கடல்கடந்த நொடுகளில் மொழர்களின் தவற்றி.

அலகு V **இந்திய கதசிய இயக்கம் மற்றும் இந்திய பைபொட்டிற்குத் தமிழர்களின் பங்களிப்பு** **3**

இந்திய விடுதமலப்மபொரில் தமிழர்களின் பங்கு – இந்தியொவின் பிறப்பகுதிகளில்தமிழ்ப் பண்பொட்டின் தொக்கம் – சுயமரியொமத இயக்கம் – இந்திய மருத்Fவத்தில், சித்த மருத்Fவத்தின் பங்கு – கல்தவட்டுகள், மகதயழுத்Fப்படிகள் – தமிழ்ப்புத்தகங்களின் ெசு வரலொறு.

TOTAL: 15 PERIODS

Text-Cum Reference Books

1. தமிழக வரலொறு – மக்களும் பண்பொடும் – மக.மக. பிள்மள (தவளியீடு: தமிழ்நொடு பொடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் – முமனவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி – மவமக நதிக்கமரயில் ெங்ககொல நகர நொகரிகம் (ததொல்லியல் Fமறதவளியீடு)
4. தபொருமந – ஆற்றங்கமர நொகரிகம்(ததொல்லியல் Fமறதவளியீடு)
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

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

UNIT I LANGUAGE AND LITERATURE 3

Language Families in India - Dravidian Languages – Tamil as a Classical Language – Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature - Management Principles in Thirukural - Tamil Epics and Impact of Buddhism & Jainism in Tamil 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, Leather puppetry, 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 AND INDIAN CULTURE 3

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

TOTAL: 15 PERIODS

Text-Cum Reference Books

1. தமிழக வரலொறு – மக்களும் பண்பொடும் – மக.மக. பிள்மள (தவளியீடு: தமிழ்நொடு பொடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் – முமனவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி – மவமக நதிக்கமரயில் ெங்ககொல நகர நொகரிகம் (ததொல்லியல் Fமறதவளியீடு)
4. தபொருமந – ஆற்றங்கமர நொகரிகம்(ததொல்லியல் Fமறதவளியீடு)
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.

24GE101P PROBLEM SOLVING USING C PROGRAMMING LABORATORY L T P C

0 0 4 2

Course Objectives:

1. To familiarize with C programming constructs.
2. To develop programs in C using basic constructs.
3. To develop programs in C using arrays.
4. To develop applications in C using strings, pointers, functions.
5. To develop applications in C using structures.
6. 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.

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: Upon completion of the course, the students will be able to

CO1: Demonstrate knowledge on C programming constructs.

CO2: Develop programs in C using basic constructs.

CO3: Develop programs in C using arrays.

CO4: Develop applications in C using strings, pointers, functions.

CO5: Develop applications in C using structures and files

CO's-PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	3	3	3	2	-	-	-	2	-	-	2	3	3
2	3	3	3	2	2	-	-	-	2	-	-	2	3	3
3	3	3	3	3	2	-	-	-	2	-	-	2	3	3
4	3	3	3	3	2	-	-	-	2	-	-	2	3	3
5	3	3	3	3	2	-	-	-	2	-	-	2	3	3
Avg	**3**	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**2**	**-**	**-**	**2**	**3**	**3**

1 - Low, 2 - Medium, 3 - high, '-' - No Correlation

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.

Reference Books

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
PHYSICS LABORATORY : (Any Seven Experiments)		**0**	**0**	**4**	**2**

Course Objectives:

1. To learn the proper use of various kinds of physics laboratory equipment.
2. To learn how data can be collected, presented and interpreted in a clear and concise manner
3. To learn problem solving skills related to physics principles and interpretation of experimental data
4. To determine error in experimental measurements and techniques used to minimize such error.
5. 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

   b) Compact disc-Determination of width of the groove using laser.
8. Acoustic grating-Determination of velocity of ultrasonic waves in liquids
9. Ultrasonic interferometer–determination of the velocity of sound and compressibility of liquids
10. Post office box-Determination of Band gap of a semiconductor.
11. Photo electric effect
12. Michelson Interferometer.
13. Melde's string experiment
14. Experiment with lattice dynamic skit

TOTAL:30 PERIODS

Course Outcomes: Upon completion of the course, the students should be able to

CO1: Understand the functioning of various physics laboratory equipment.

CO2: Use graphical models to analyze laboratory data.

CO3: Use mathematical models as a medium for quantitative reasoning and describing physical reality.

CO4: Access, process and analyze scientific information.

CO5: Solve problems individually and collaboratively

CO's-PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	3	1	1	-	-	-	-	-	-	1	-	-
2	3	3	2	1	1	-	-	-	-	-	-	1	-	-
3	3	2	3	1	1	-	-	-	-	-	-	1	-	-
4	3	3	2	1	1	-	-	-	-	-	-	1	-	-
5	3	2	3	1	1	-	-	-	-	-	-	1	-	-
Avg	**3**	**2.4**	**2.6**	**1**	**1**	-	-	-	-	-	-	**1**	-	-

1 - Low, 2 - Medium, 3 - high, '-' - No Correlation

Text Books

1. John Wiley & Sons - Wiley india pvt ,Ltd, new edition

CHEMISTRYLABORATORY: (AnySevenExperiments)

Course Objectives:

1. To inculcate experimental skills to test basic understanding of water quality parameters, such as, acidity, alkalinity, hardness, DO, chloride and copper.
2. 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.
3. To demonstrate the analysis of metals and alloys.
4. To demonstrate the synthesis of nano particles
5. To inculcate experimental skills to test basic understanding of water quality parameters, such as, acidity, alkalinity, hardness, DO, chloride and copper.

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 nano particles (TiO2/ZnO/CuO) by Sol-Gel method.
14. Estimation of Nickel in steel.
15. Proximate analysis of Coal

TOTAL: 30 PERIODS

Course Outcomes: Upon completion of the course, the students should be able

CO1: To analyse the quality of water samples with respect to their acidity, alkalinity, hardness and do.

CO2: To determine the amount of metal ions through volumetric and spectroscopic techniques.

CO3: To analyse and determine the composition of alloys.

CO4: To learn simple method of synthesis of nanoparticles.

CO5: To quantitatively analyse the impurities in solution by electroanalytical techniques

CO's-PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	-	1	-	-	2	2	-	-	-	-	2	-	-
2	3	1	2	-	-	1	2	-	-	-	-	1	-	-
3	3	2	1	1	-	-	1	-	-	-	-	-	-	-
4	2	1	2	-	-	2	2	-	-	-	-	-	-	-
5	2	1	2	-	1	2	2	-	-	-	-	1	-	-
Avg	**2.6**	**1.3**	**1.6**	**1**	**1**	**1.4**	**1.8**	**-**	**-**	**-**	**-**	**1.3**	**-**	**-**

1 - Low, 2 - Medium, 3 - high, '-' - No Correlation

Text Books

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:

1. To improve the communicative competence of learners
2. To help learners use language effectively in academic /work contexts
3. To develop various listening strategies to comprehend various types of audiomaterials like lectures, discussions, videos etc.
4. To build on students' English language skills by engaging them in listening, speaking and grammar learning activities that are relevant to authentic contexts.
5. 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 - Listening to podcasts, anecdotes / stories / event narration; documentaries and interviews with 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 CLASSIFICATION AND 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.

UNIT V EXPRESSION 6

Listening – Listening to debates/ discussions; different viewpoints on an issue; andpanel 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, learners will be able

CO1: To listen to and comprehend general as well as complex academic information.

CO2: To listen to and understand different points of view in a discussion.

CO3: To speak fluently and accurately in formal and informal communicative contexts.

CO4: To describe products and processes and explain their uses and purposes clearly and accurately.

CO5: To express their opinions effectively in both formal and informal discussions.

CO's-PO's & PSO's MAPPING

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

Text Books

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

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Reference Books

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, Scitech Publications (India) Pvt.Ltd.
3. English For Technical Communication (WithCD) By Aysha Viswamohan, Mcgraw Hill Education, ISBN:0070264244.
4. Effective Communication Skill, Kulbhusan Kumar, RSSalaria, Khanna Publishing House.
5. Learning to Communicate–Dr.V.Chellammal, Allied Publishing House, New Delhi,2003.

24EN201T	PROFESSIONAL ENGLISH II	L	T	P	C
		2	0	0	2

COURSE OBJECTIVES:

- 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, Emailetiquette - 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, the students will be able

CO 1: To compare and contrast products and ideas in technical texts.

CO 2: To identify and report cause and effects in events, industrial processes through technical texts.

CO 3: To analyse problems in order to arrive at feasible solutions and communicate them in the writtenformat.

CO 4: To present their ideas and opinions in a planned and logical manner.

CO 5: To draft effective resumes in the context of job search.

TEXT BOOKS:

1. "English for Engineers & Technologists" (2020 edition) Orient Blackswan Private Ltd. Departmentof 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.

CO's – PO's & PSO's 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:

- This course aims at providing 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 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 EIGENVALUE 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 NUMERICAL INTEGRATION 9+3

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 EQUATIONS 9+3

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:

Upon successful completion 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.L and 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.

CO's – PO's & PSO's 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

24CS201T	PYTHON PROGRAMMING	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

- To understand the basics of Python programming such as operators and control structures.
- To learn different functions and modules with various data structures.
- To study Object-Oriented programming and exception handling with Python.
- To work on advanced OOP concepts.
- To perform file handling and work with packages.

UNIT I INTRODUCTION TO PYTHON 9

Introduction: Importance – limitations - Python impressions - Internal working – comments. Basics: Identifiers - reserved keywords – literals - fundamental data types - base conversion - type casting -escape characters - eval(), input(), and print() functions - command line arguments - delete statement. Operators - operator precedence – conditional, iterative and transfer statements - loops with else block. Strings: multiline string literal – accessing characters of string - operators for string - string operations – formatting.

UNIT II DATA STRUCTURES, FUNCTIONS AND MODULES 9

Data structures: list, tuple, set, dictionary - Types of Functions - Return Statement - arguments in a function – scope of variables - global keyword - recursive, Lambda - filter(), map(), and reduce() function - function aliasing - nested, decorator, and generator functions. Modules: Module Aliasing - Member Aliasing - Reloading a Module - Dir() Function - Math Module - Random Module – Packages.

UNIT III OBJECT ORIENTED PROGRAMMING AND EXCEPTION HANDLING 9

Class – object – self variable – constructor – types of variables and methods – setter and getter methods – passing members of one class to another class. Types of Error – Exception - Default Exception Handling – Customized Exception Handling: Using Try- Except - Multiple Except Blocks – finally block - Nested Try- Except- Finally Block - Types of Exception - Raise User-Defined Exception – Assertion.

UNIT IV ADVANCED OOPS CONCEPTS 9

Inner class - Garbage collection – destructor - Finding the number of references of an object – Encapsulation – Inheritance – Aggregation vs Composition – Inheritance types – method resolution order – super() method – polymorphism – abstract class and method – interface - __str__() method.

UNIT V FILE HANDLING AND PACKAGES 9

Introduction to file – With statement – seek() and tell() methods – Testing the existence of a file – Handling binary data and CSV files – Zipping and unzipping files – Directory – Get information about a file – Pickling and unpickling of objects, using Packages: Math – Numpy – Matplotlib.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

Upon successful completion of the course,the students will be able to:

CO 1: Explore the basics of Python programming such as operators and control structures.

CO 2: Construct functions and modules with various data structures.

CO 3: Create Classes and Objects using Python and handle exceptions.

CO 4: Explore advanced OOP concepts in python.

CO 5: Work on files and packages.

TEXT BOOKS:

1. Vijay Kumar Sharma, Vimal Kumar, Swati Sharma, Shashwat Pathak, "Python Programming – A Practical Approach", CRC Press, First Edition, 2022.

2. D.S.Mathur. "Elements of Properties of Matter". S Chand & Company, 2010.

REFERENCES:

1. Urban, Michael. Murach, Joel. "Murach's Python Programming", United States: Mike Murach & Associates, Incorporated, Second Edition, 2021.

2. Alex Martelli, Anna Ravenscroft, and Steve Holden, "Python in a nutshell", O'REILLY Publisher, Third Edition, 2022.

CO's – PO's & PSO's MAPPING

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

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

24EC201I	DIGITAL PRINCIPLES AND SYSTEM DESIGN	L	T	P	C
		3	0	2	4

COURSE OBJECTIVES:

- To design digital circuits using simplified Boolean functions.
- To analyze and design combinational circuits.
- To analyze and design synchronous sequential circuits.
- To analyze and design asynchronous sequential circuits.
- To understand Programmable Logic Devices.

UNIT I BOOLEAN ALGEBRA AND LOGIC GATES 9

Boolean Algebra and Logic Gates- Theorems and Properties of Boolean Algebra - Boolean Functions - Canonical and Standard Forms - Simplification of Boolean Functions using Karnaugh Map.

UNIT II COMBINATIONAL LOGIC 9

Combinational Circuits – Analysis and Design Procedures - Binary Adder- Subtractor - Decimal Adder - Magnitude Comparator - Decoders – Encoders –Multiplexers –De Multiplexers.

UNIT III SYNCHRONOUS SEQUENTIAL LOGIC 9

Sequential Circuits - Storage Elements: Latches, Flip-Flops - Analysis of Clocked Sequential Circuits - State Reduction and Assignment - Design Procedure - Registers: Shift Registers- Universal Shift Register - Counters- Mod Counters – Up/Down Counter –Ring Counter.

UNIT IV ASYNCHRONOUS SEQUENTIAL LOGIC 9

Analysis and Design of Asynchronous Sequential Circuits – Reduction of State and Flow Tables – Race-free State Assignment – Hazards.

UNIT V MEMORY AND PROGRAMMABLE LOGIC 9

RAM – Memory Decoding – Error Detection and Correction - ROM - Programmable Logic Array – Programmable Array Logic – Implementation of combinational logic circuits using ROM, PLA, PAL. Introduction to IoT- Home automation.

TOTAL : 45 PERIODS

PRACTICAL EXERCISES:

1. Verification of Boolean theorems using logic gates.
2. Design and implementation of Adder /Subtractor using Logic Gates.
3. Design and Implementation of code converters.
4. Design and Implementation of BCD adder
5. Design and Implementation of Multiplexers/ Demultiplexer
6. Design of Adder/Subtractor using Verilog HDL.

COURSE OUTCOMES:

After completing this course, the students will be able to

CO 1: Simplify Boolean functions using K Map.

CO 2: Design and Analyze Combinational Circuits.

CO 3: Design and Analyze Synchronous Sequential Circuits.

CO 4: Design and Analyze Asynchronous Sequential Circuits.

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

TEXT BOOKS:

1. M. Morris R. Mano, Michael D. Ciletti, "Digital Design: With an Introduction to theVerilog HDL, VHDL, and SystemVerilog", 6th Edition, Pearson Education, 2017.
2. S.Salivahanan and S. Arivazhagan, "Digital Circuits and Design", Fifth Edition, Oxford University Press, 2018.

REFERENCES:

1. John F.Wakerly, "Digital Design Principles and Practices", Pearson Education, Fifth Edition, 2018.
2. Donald D.Givone, "Digital Principles and Design", McGraw Hill Education, 2017.
3. Charles H.Roth, Jr. "Fundamentals of Logic Design", Cengage Learning, Seventh edition, 2013.

CO's – PO's & PSO's MAPPING

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

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

24GE201T	ENGINEERING GRAPHICS	L	T	P	C
		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 and solids.
- Drawing 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, cylinders and cones 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:

On successful completion of this course, the student 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 BOOKS:

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 1071 - 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.

CO's – PO's & PSO's 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

COURSE OBJECTIVES:

- சங்ககாலத்தில் நெசவு மற்றும் பானை தொழில்நுட்பத்தினை அறிய முற்படுத்துதல்
- இலக்கியத்தின் வாயிலாக சங்க கால கட்டிட வடிவமைப்பு பற்றி அறிந்து கொள்ள முயற்சித்தல்
- சங்ககால தொழில்நுட்ப சிறப்பினை அறிய முற்படுதல்
- வேளாண்மை மற்றும் நீர் பாசனங்களின் முக்கியத்துவத்தை ஆராய முற்படுதல்
- அறிவியல் தமிழையும் மற்றும் கணினி தமிழின் சிறப்பையும் ஆராய முற்படுதல்

அலகு I நெசவு மற்றும் பானைத் தொழில்நுட்பம் 3

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

அலகு II வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம் 3

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

அலகு III உற்பத்தித் தொழில் நுட்பம் 3

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

அலகு IV வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நுட்பம் 3

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

அலகு V அறிவியல் தமிழ் மற்றும் கணித்தமிழ் 3

அறிவியல் தமிழின் வளர்ச்சி – கணினிதமிழ் வளர்ச்சி - தமிழ் நூல்களை மின்பதிப்பு செய்தல் – தமிழ் மென்பொருட்கள் உருவாக்கம் – தமிழ் இணையக் கல்விக்கழகம் – 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 அறிய செய்தல்.

CO 3: சங்க இலக்கியத்திலிருந்து தமிழர்களின் உற்பத்தி தொழில்நுட்பத்தினை 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 Civilization 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.

CO's – PO's & PSO's 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
		1	0	0	1

COURSE OBJECTIVES:

- 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. □□□□□ □□□□□□ – □□□□□□□□ □□□□□□□□□ – **கே. கே. பிள்ளை (**□□□□□□□□: □□□□□□□□□ □□□□□□□ □□□□□□□ □□□□□□□□□□ □□□□□□ □□□□□).
2. □□□□□□□ □□□□□ – □□□□□□□ **இல. சுந்தரம். (விகடன் பிரசுரம்).**
3. □□□□□ – □□□□ □□□□□□□□□□□□ □□□□□□□ □□□ □□□□□□□□ (□□□□□□□□□ □□□□ □□□□□□□□).
4. □□□□□□ – **ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை** □□□□□□□□).
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 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.

CO's – PO's & PSO's MAPPING

CO	PO											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
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

24CS201P	PYTHON PROGRAMMING LABORATORY	L	T	P	C
		0	0	3	1.5

COURSE OBJECTIVES:

- To practice conditional and loop statements using python
- To learn about functions and modules with various data structures
- To work with Object-Oriented programming principles and error handling using Python
- To practice with operator overloading, inner class and garbage collector
- To know about persistent storage and the use of packages

LIST OF EXPERIMENTS:

1. Python programs using conditional statements.
2. Python programs using Loops.
3. Python program using List, tuple, and dictionary..
4. Python programs using String and String handling functions..
5. Python programs using functions, modules.
6. Python programs using Classes, object, member data and method, initialize and handling errors.
7. Inheritance and polymorphism using Python.
8. Operator overloading using python.
9. Inner class and garbage collection, and finding the number of references of an object using Python.
10. Method Resolution Order (MRO) tracing using python.
11. Python program using File I/O, random access file handling methods and Zipping and Unzipping of files.
12. Python programs using packages.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

CO 1: Write Python programs with conditionals and loops.

CO 2: Construct functions and modules with various data structures.

CO 3: Apply Object-Oriented programming principles to solve real world problem and handle errors.

CO 4: Develop application using operator overloading method for user defined types, inner class and garbage collector.

CO 5: Exploit file handling and use the packages.

REFERENCES:

1. Vijay Kumar Sharma, Vimal Kumar, Swati Sharma, Shashwat Pathak, “Python Programming – A Practical Approach”, CRC Press, First Edition, 2022.
2. Urban, Michael., Murach, Joel. “Murach's Python Programming”, United States: Mike Murach & Associates, Incorporated, Second Edition, 2021.

3. Alex Martelli, Anna Ravenscro, and Steve Holden, “Python in a nutshell”, O’REILLY Publisher, Third edition, 2022.

CO’s – PO’s & PSO’s MAPPING

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

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

24GE201P	ENGINEERING PRACTICES LABORATORY	L	T	P	C
		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.

TOTAL: 60 PERIODS

COURSE OUTCOMES:

Upon completion of this course, the students will be able to:

CO 1: Perform arc welding joints, making sheet metal object, prepare sand mould and Machining simple operations.

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.

CO's – PO's & PSO's 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	-	-	-	-

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

24GE202P	COMMUNICATION SKILLS LABORATORY	L	T	P	C
		0	0	4	2

COURSE OBJECTIVES:

- 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 clearlyand 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

TEXT BOOKS:

1. "English for Engineers & Technologists", Orient Blackswan Private Ltd. Department of English,Anna University, (2020 edition)
2. "English for Science & Technology", Cambridge University Press 2021. Authored by 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, TataMcGraw Hill & Co. Ltd., 2001, New Delhi.
5. "Developing Communication Skills" by Krishna Mohan, Meera Bannerji- Macmillan India Ltd.1990, Delhi.

CO's – PO's & PSO's MAPPING

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