FIRST YEAR CURRICULUM AND SYLLABUS (REGULATIONS 2023)

FOR

UNDER GRADUATE PROGRAMMES
CHOICE BASED CREDIT SYSTEM
(Applicable to the students admitted from the Academic Year 2024-25 onwards)

B.E. – Computer Science and Engineering
(Artificial Intelligence and Machine Learning)

AUTONOMOUS

EASWARI ENGINEERING COLLEGE
(AUTONOMOUS INSTITUTION)
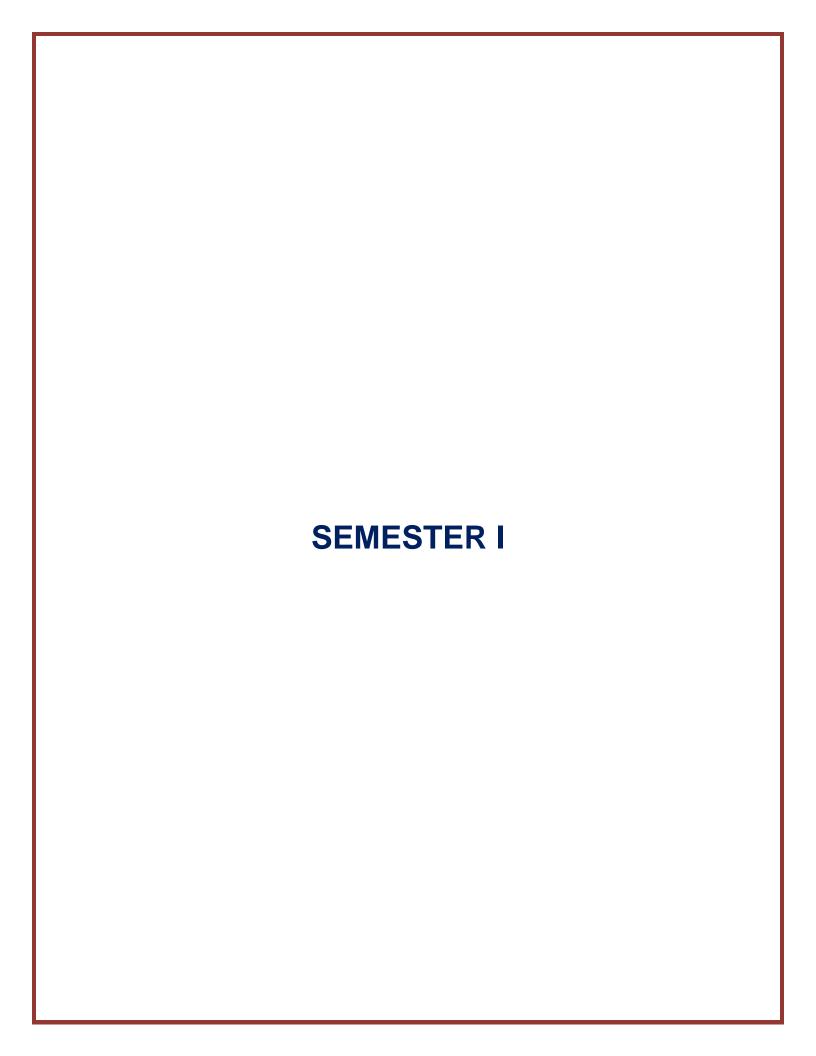### Bharathi Salai, Ramapuram, Chennai – 600 089

(Version 1)

I Year – Computer Science and Engineering (AIML)

S.No	Course Code	Course Title	Category	L	T	P	R	CREDITS	Internal / External %
				SEMESTER I					
						Hours / Week			
THEORY									
1	231LEH101T	Technical English	HS	3	-	-	-	3	40 / 60
2	231MAB101T	Matrices and Calculus	BS	3	1	-	-	4	40 / 60
3	231PYB101T	Engineering Physics	BS	3	-	-	-	3	40 / 60
4	231CYB101T	Engineering Chemistry	BS	3	-	-	-	3	40 / 60
5	231GES104T	Problem Solving through Python Programming	ES	2	-	-	-	2	40 / 60
6	231GEH101T	Heritage of Tamils / தமிழர்மரபு	HS	1	-	-	-	1	40 / 60
LABORATORY									
7	231PYB011L	Physics Laboratory	BS	-	-	2	-	1	60 / 40
8	231GES012L	Visualization of Design and Drawing	ES	-	-	3	1	2	60 / 40
9	231GES114L	Python Programming Laboratory	ES	-	-	3	1	2	60 / 40
10	231GEH111L	Induction Training&	MC	-	-	2	-	0	-
		TOTAL CREDITS						**21**	**-**

& - Mandatory to complete the course

S.No	Course Code	Course Title	Category	L	T	P	R	CREDITS	Internal / External %
				SEMESTER II					
						Hours / Week			
THEORY									
1	231LEH201T	Professional Communication	HS	3	-	-	-	3	40 / 60
2	231MAB201T	Advanced Calculus and Complex Analysis	BS	3	1	-	-	4	40 / 60
3	231PYS202T	Physics for Information Science	ES	3	-	-	-	3	40 / 60
4	231GEB201T	Environmental Science for Computing Sciences	BS	2	-	-	-	2	40 / 60
5	231CSC201T	Programming in C	PC	3	-	-	-	3	40 / 60
6	231GEH201T	தமிழரும் தொழில்நுட்பமும் /Tamils and Technology	HS	1	-	-	-	1	40 / 60
LABORATORY									
7	231CYB011L	Chemistry Laboratory	BS	-	-	2	-	1	60 / 40
8	231GES011L	Basic Workshop Practice	ES	-	-	2	-	1	60 / 40
9	231GES013L	Basic Electrical and Electronics Engineering Laboratory	ES	-	-	4	-	2	60 / 40
10	231CSC211L	C Programming Laboratory	PC	-	-	3	1	2	60 / 40
		TOTAL CREDITS						**22**	**-**

SEMESTER I

231LEH101T	TECHNICAL ENGLISH	Periods per week				Credits
	(Common to all branches of Engineering and Technology)	L	T	P	R	
Regulation - R23		3	0	0	0	3

SCHEME OF EXAMINATION						
Duration of End Semester Examination in Hours	Maximum Marks - 100		Minimum Marks for Pass - 50			
	Weightage		Weightage			
	Continuous assessment Examination	End Semester Examination	Continuous assessment Examination	End Semester Examination	Overall	
3	40 %	60 %	-	45%	50%	

PREREQUISITES:

Nil

COURSE OBJECTIVES:

1.	To improve the communicative competence of learners
2.	To help learners use language effectively in academic /work contexts
3.	To build on students' English language skills by engaging them in listening, speaking and grammar learning activities that are relevant to authentic contexts
4.	To develop learners' ability to read and write complex texts, summaries, articles, blogs, definitions, essays and user manuals.
5.	To use language efficiently in expressing their opinions via various media.

COURSE OUTCOMES (COs):

Upon completion of this course, student will be able to:	Bloom's level
CO1: Listen and comprehend lectures and talks in their area of specialization successfully.	K2
CO2: Speak appropriately and effectively in varied formal and informal contexts.	K4
CO3: Read technical texts.	K5
CO4: Write Letters , Paragraphs, Descriptions.	K6
CO5: Speak convincingly and express opinions on technical topics.	K6
CO6: Communicate effectively through emails and analyze issues , technical articles and involve in speed writing.	K4

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	1	1	-	-
CO2	-	-	-	-	-	-	-	-	1	2	-	-
CO3	-	-	-	-	-	-	-	-	-	2	-	-
CO4	-	-	-	-	-	-	-	-	-	2	-	-
CO5	-	-	-	-	-	-	-	-	-	1	-	1
CO6	-	-	-	-	-	-	-	-	1	-	-	-

3 – High : 2 - Medium : 1 – Low   : '-' - No correlation

UNIT	TITLE	PERIODS
I		**9**

Listening : Active listening -Types – Barriers **Speaking**:   Self – introduction and introducing others / short conversation in formal and informal contexts- **Reading** : skimming and scanning – Intensive and extensive reading -**Writing**-Developing an outline– Developing hints **Vocabulary development and Grammar**: Parts of speech – Word formation – One word substitution – Phrasal verbs.

UNIT	TITLE	PERIODS
II		**9**

Listening: Listening to Telephonic conversation – Etiquettes- Do's and Don'ts - **Speaking**:– Making technical and presentation- Presentation Do's and Don'ts - **Reading**:- Interpretative and critical levels of reading – **Writing** – Technical writing – letter (request/ permission/ complaint)- **Vocabulary and Grammar** –Tenses – Subject verb agreement –Pronoun (Possessive and Relative Pronoun)

UNIT	TITLE	PERIODS
III		**9**

Listening: Listening to longer technical talks - **Speaking**: Expressing opinions – one to one debate – **Reading**: Comprehension- Pre- reading- post- reading - **Writing**- Email writing – Etiquette- Instructions and Recommendations - **Vocabulary and Grammar**: Adverbs – prepositions - Degrees of comparison (Comparative Degree)

UNIT	TITLE	PERIODS
IV		**9**

Listening: Listening to speeches of formal and informal conversation and answer comprehension - **Speaking**: Sharing information of a personal kind – greeting- taking leave – routine action - Reading: Note making and summarizing – Paraphrasing -**Writing**-Writing a Paragraph – Paragraph Types **Vocabulary and Grammar**: If clause –– Articles – Sequence words – collocation– Conjunction.

UNIT	TITLE	PERIODS
V		**9**

Listening: TED /INK talks – Note taking **Speaking**: Participating in group discussion – Do's and Don'ts **Reading:** Reading reviews, advertisement – Newspaper/ magazines / Short stories - **Writing:** Process and Product description **Vocabulary and Grammar:**– Figures of Speech– Embedded sentences – WH Questions / Yes/No questions / Question tag

TOTAL PERIODS:		**45**

TEXT BOOKS:

1.	V. Chellamal, Deepa Mary Francis, K.N Shoba, P.R Sujatha Priyadharsini, Veena Selvam English for science and Technology, Cambridge University Press and Assessment 2023

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 (With CD) By Aysha Viswamohan, Mcgraw Hill Education,ISBN::0070264244.
4.	Effective Communication Skill, Kulbhusan Kumar, R S Salaria, Khanna Publishing House.
5.	Learning to Communicate – Dr. V. Chellammal, Allied Publishing House, New Delhi, 2003.

WEBSITES:

1.	https://www.usingenglish.com
2.	http://grammarbook.com

JOURNALS:

1.	National Council for Teachers of English
2.	https://www2.ncte.org/resources/journals/college-english/

EXTENSIVE READER:

1.	Spencer Johnson, Who Moved My Cheese, Putnam Adult, 1998

COURSE DESIGNERS

1.	Dr.Samuel Dawson	HoD	Department of English
2.	Dr.Usha Menon	Professor	Department of English
3.	Ms.Jean Ida	Assistant Professor	Department of English
4.	Ms.Moby	Assistant Professor	Department of English
5.	Ms.Surya S	Assistant Professor	Department of English
6.	Dr.Rudhra T S	Assistant Professor	Department of English

Recommended by Board of Studies	Date: 12.10.2023	Syllabus version	1
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

231MAB101T	MATRICES AND CALCULUS	Periods per week				Credits
	(Common to all branches of Engineering and Technology)	L	T	P	R	
Regulation - R23		3	2	0	0	4

SCHEME OF EXAMINATION						
Duration of End Semester Examination in Hours	Maximum Marks - 100		Minimum Marks for Pass - 50			
	Weightage		Weightage			
	Continuous assessment Examination	End Semester Examination	Continuous assessment Examination	End Semester Examination	Overall	
3	40 %	60 %	-	45%	50%	

PREREQUISITES:

Basic Knowledge of Matrices and Determinants, Differentiation

COURSE OBJECTIVES:

1.	To reduce quadratic form to canonical form of a matrix and identify its nature
2.	To analyze the convergence of infinite series
3.	To study the concept of evolutes and envelopes
4.	To find the extreme values for a function of two variables
5.	To solve Differential Equations using different techniques

COURSE OUTCOMES (COs):

Upon completion of this course, student will be able to:		Bloom"s level
CO1:	Reduce quadratic form to canonical form by orthogonal transformation and identify the nature of the quadratic form	K4
CO2:	Analyze the convergence of a given infinite series	K5
CO3:	Find evolute of a given curve and envelope of family of curves	K5
CO4:	Find the extreme of a linear function with two variables	K4
CO5:	Solve Ordinary differential equations with constant coefficients and variable coefficients	K6

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	-	-	-	-	-	-	-	-	1
CO2	2	2	1	-	-	-	-	-	-	-	-	1
CO3	2	1	1	-	-	-	-	-	-	-	-	1
CO4	2	2	1	-	-	-	-	-	-	-	-	1

CO5	2	1	1	-	-	-	-	-	-	-	-	1

3 – High : 2 - Medium : 1 – Low   : „-„ - No correlation

UNIT	TITLE	PERIODS
I	**MATRICES**	9+3

Characteristic equation – Eigen values and Eigenvectors of a real matrix – Properties of Eigen- values and Eigen-vectors, Cayley-Hamilton Theorem – statement and applications, Diagonalization of matrices by orthogonal transformation - Quadratic form – Reduction of a quadratic form to canonical form by Orthogonal transformation – Nature of quadratic forms

UNIT	TITLE	PERIODS
II	**SEQUENCES AND SERIES**	9+3

Sequences – Definition and examples, Series – Types of Convergence, Series of positive terms, Tests of convergence – Comparison test, Integral test and D'Alembert"s ratio test, Alternating series – Leibnitz's test.

UNIT	TITLE	PERIODS
III	**APPLICATIONS OF DIFFERENTIAL CALCULUS**	9+3

Curvature, radius of curvature – Cartesian and parametric co-ordinates – Centre of curvature – Circle of curvature in Cartesian form, Evolutes, Envelopes, Evolute as envelope of normals.

UNIT	TITLE	PERIODS
IV	**FUNCTIONS OF SEVERAL VARIABLES**	9+3

Partial derivatives – Total derivative – Differentiation of implicit functions – Jacobian and its properties – Taylor's series for functions of two variables – Maxima and minima of functions of two variables –Lagrange's method of undetermined multipliers.

UNIT	TITLE	PERIODS
V	**ORDINARY DIFFERENTIAL EQUATIONS**	9+3

Solution of second and higher order linear differential equation with constants coefficients (Particular integrals involving $f(x) = e^{mx}$, sin mx, cos mx,x^m , $e^{mx} f(x)$). Euler's and Legendr's methods of solving Linear differential equations with variable coefficients, Method of variation of parameters.

TOTAL PERIODS:	60

TEXT BOOKS:

1.	Joel Hass, Christopher Heil and Maurice D. Weir "Thomas" Calculus", 14th Edition, Pearson.
2.	Grewal.B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition, 2018
3.	Work-Book on"" Matrices and Calculus", Chess Educational Publishers, prepared by Department of Mathematics

REFERENCE BOOKS:	
1.	Bali N P, Manish Goyal, "A Textbook of Engineering Mathematics", Ninth Edition, Laxmi Publications Pvt Ltd, 2016.
2.	James Stewart, "Calculus: Early Transcendentals", Cengage Learning, 8th Edition, New Delhi, 2015
3.	Kreyszig.E, "Advanced Engineering Mathematics", John Wiley and Sons, 10th Edition, New Delhi, 2016.
4.	Anton. H, Bivens. I and Davis. S, "Calculus", Wiley, 10th Edition, 2016

WEBSITES:	
1.	www.pearsoned.co.in/georgebthomasjr
2.	www.cengage.com/international
3.	https://onlinecourses.nptel.ac.in/noc21_ma58/unit?unit=1&lesson=2

COURSE DESIGNERS			
1.	Dr.S.Muthukumar	Professor	Department of Mathematics
2.	Dr.S.R.Ananthalakshmi	Associate Professor & HOD	Department of Mathematics
3.	Dr.K.S.Vidhyaa	Asst.Professor(Sr.G)	Department of Mathematics

Recommended by Board of Studies	Date: 12-10-2023	Syllabus version	1
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

231PYB101T	ENGINEERING PHYSICS	Periods per week				Credits
	(Common to all branches of Engineering and Technology)	L	T	P	R	
Regulations - R23		3	0	0	0	3

SCHEME OF EXAMINATION

Duration of End Semester Examination in Hours	Maximum Marks - 100		Minimum Marks for Pass - 50		
	Weightage		Weightage		Overall
	Continuous assessment Examination	End Semester Examination	Continuous assessment Examination	End Semester Examination	
3	40 %	60 %	-	45%	50%

PREREQUISITES: NIL

COURSE OBJECTIVES:

1.	To impart knowledge on the basic principle of mechanics.
2.	To enable the students to gain knowledge on thermal physics.
3.	To explain the application of ultrasonics devices in engineering and medicine.
4.	To teach the description of various crystal structures and crystal defects for industrial applications.
5.	To learn the importance of laser and optical fibers for industry, telecommunication and medical applications.

COURSE OUTCOMES (COs):

Upon completion of this course, student will be able to:	Bloom's level
CO1: Apply the basic principle of dynamics in torsional pendulum.	K3
CO2: Evaluate the heat energy flow in thermal devices	K5
CO3: Design ultrasonic devices for engineering and medical disciplines	K6
CO4: Analyze the crystal structures and crystal defects for industrial applications.	K4
CO5: Select the appropriate laser and optical fibers for industry, telecommunication and medical applications.	K4

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)

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

3 – High : 2 - Medium : 1 – Low   : '-' - No correlation

UNIT I	MECHANICS	9
Multiparticle dynamics: Center of mass (CM) – CM of continuous bodies – motion of the CM – kinetic energy of system of particles. Rotation of rigid bodies: Rotational kinematics – rotational kinetic energy and moment of inertia - theorems of M.I – moment of inertia of uniform rod, circular disc, solid cylinder – M.I of a diatomic molecule - torque – rotational dynamics of rigid bodies – conservation of angular momentum – gyroscope – Torsional pendulum.		

UNIT II	THERMAL PHYSICS	9
Fundamentals of thermal energy - Expansion joints - Bimetallic strips - Thermal conductivity, conductions in solids, Determination of thermal conductivity- Forbe's and Lee's disc method - Conduction through compound media – Thermal insulation – thermal shock resistance - Applications: Solar water heater- tempered glass- cryogenic materials.		

UNIT III	SOUND WAVES AND VIBRATIONS	9
Propagation, Intensity, Loudness of sound waves – Determination of absorption coefficient, Reverberation, Sabine's formula for reverberation time - Factors affecting acoustics of buildings and their remedies - Ultrasonic waves and properties, Methods of Ultrasonic production, Applications of Ultrasonic in engineering and medicine.		

UNIT IV	CRYSTAL PHYSICS	9
Single crystalline, polycrystalline and amorphous materials – single crystals: unit cell, crystal systems, Bravais lattices, directions and planes in a crystal, Miller indices – inter-planar distances - coordination number and packing factor for SC, BCC, FCC, HCP and diamond structures - crystal imperfections: point defects, line defects – Burger vectors, stacking faults.		

UNIT V	APPLIED OPTICS	9
Theory of laser - characteristics - Spontaneous and stimulated emission - Einstein's coefficients - population inversion – He-Ne laser, CO_2 laser, Semiconductor laser – Basic applications of lasers in industry. Principle and propagation of light in optical fibre, Derivation for Numerical aperture and Acceptance angle - Types and losses of optical fibre - Fibre Optical Communication (Block diagram) – Fibre Optic Endoscope.		

TOTAL PERIODS:	45

TEXT BOOKS:	
1.	R. K. Gaur and S. L. Gupta, Engineering Physics, Dhanpat Rai Pub., 2018.
2.	Arthur Beiser, Shobhit Mahajan, S. Rai Choudhury, Concepts of Modern Physics, McGraw-Hill (Indian Edition), 2017.
3.	D.Kleppner and R.Kolenkow, An Introduction to Mechanics. McGraw Hill Education (Indian Edition), 2017.

REFERENCE BOOKS:	

1.	Jeff Sanny, Samuel J. Ling, and William Moebs, University Physics, Volume 1- 3, OpenStax, ISBN-13: 978-1-947172-15-9, 2023.
2.	D.Halliday, R.Resnick and J.Walker. Principles of Physics, Wiley (Indian Edition), 2015.
3.	Paul A. Tipler, Physic – Volume 1 & 2, CBS, (Indian Edition), 2004.
4.	D.K.Bhattacharya & T.Poonam, Engineering Physics, Oxford University Press, 2015.
5.	V. Rajendran, Engineering Physics, McGraw Hill Publication, 2017.

WEBSITES:

1.	https://www.britannica.com/technology/laser/Laser-applications
2.	https://en.wikipedia.org/wiki/Crystal_structure

COURSE DESIGNERS

1.	Dr. S. Nirmala	Assoc Professor & Head	Department of Physics
2.	Dr. G. Rajkumar	Professor	Department of Physics
3.	Dr. R. Sivakumar	Asst Professor	Department of Physics
4.	Dr. K. Raju	Asst Professor	Department of Physics

Recommended by Board of Studies	Date: 12-10-2023	Syllabus version	1
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

231CYB101T	**ENGINEERING CHEMISTRY** (Common to all branches of Engineering and Technology)	Periods per week				Credits
		L	T	P	R	
Regulation - R23		3	0	0	0	3

SCHEME OF EXAMINATION						
Duration of End Semester Examination in Hours	Maximum Marks - 100			Minimum Marks for Pass - 50		
	Weightage			Weightage		
	Continuous assessment Examination	End Semester Examination		Continuous assessment Examination	End Semester Examination	Overall
3	40 %	60 %		-	45%	50%

PREREQUISITES:
Nil

COURSE OBJECTIVES:	
1.	To explain water quality parameters and water treatment techniques
2.	To know about the polymers and polymer reinforced composites
3.	To gain knowledge about the types and applications of fuels
4.	To learn about various energy resources and storage devices
5.	To impart knowledge about the nanomaterials synthesis, properties and applications

COURSE OUTCOMES (COs):		
Upon completion of this course, student will be able to:		Bloom's level
CO1:	Identify an appropriate water treatment technique for the given water sample	K4, Analyze
CO2:	Choose an appropriate method for polymer synthesis and for fabrication of plastics.	K3, Apply
CO3:	Select a suitable fuel for given application, based on the combustion characteristics of fuel.	K3, Apply
CO4:	Construct the device for electricity generation from available energy.	K3, Apply
CO5:	Synthesize the nanomaterials for a given application	K3, Apply

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)

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

3 – High : 2 - Medium : 1 – Low : '-' - No correlation

UNIT	TITLE	PERIODS
I	**WATER AND ITS TREATMENT**	9

Introduction - types of impurities in water - water quality parameters: definition and significance of colour, odour, turbidity, pH, hardness, alkalinity, dissolved oxygen, chloride and fluoride - alkalinity - types and determination - hardness - types only - boiler feed water- requirements-boiler troubles - scale & sludge – disadvantages (wastage of fuels, decrease in efficiency, boiler explosion) - softening of hard water - external treatment process - demineralization and zeolite, internal treatment - boiler compounds (phosphate, calgon, carbonate and colloidal conditioning methods) – desalination of brackish water - reverse osmosis.

UNIT	TITLE	PERIODS
II	**POLYMERS AND FRP COMPOSITES**	9

Introduction- classification of polymers - natural and synthetic - thermoplastic and thermosetting, functionality – degree of polymerization,types - addition and condensation polymerization - free radical polymerization mechanism - preparation, properties and uses of PVC, Nylon 6,6, Teflon and Epoxy resin. Plastics - Compounding of plastics - moulding methods -injection, extrusion and compression – composites - definition, FRP composites

UNIT	TITLE	PERIODS
III	**FUELS AND COMBUSTION**	9

Classification - coal - proximate and ultimate analysis – carbonization - metallurgical coke - manufacture by Otto Hoffmann method - petroleum - refining - cracking -synthetic petrol by Bergius process – knocking in petrol and diesel engines- octane and cetane rating of fuels - synthesis - advantages and commercial application of alternate fuels (power alcohol, biodiesel and cryogenic fuel) - gaseous fuels - liquefied petroleum gases (LPG)- compressed natural gas (CNG) - Combustion of fuels: introduction - calorific value - higher & lower- theoretical calculation – flue gas analysis by Orsat method.

UNIT	TITLE	PERIODS
IV	**ENERGY SOURCES AND STORAGE DEVICES**	9

Energy - types - non-renewable energy - nuclear energy - fission and fusion reactions - differences between nuclear fission and fusion - nuclear chain reactions - light water nuclear reactor for power generation - breeder reactor - renewable energy - solar energy conversion - principle, working and applications of solar cells; recent developments in solar cell materials

Batteries - types of batteries - characteristics - construction and working of primary battery (dry cell) - secondary battery (lead acid battery and lithium-ion-battery), electric vehicles - working principles - fuel

cells (H2-O2)

UNIT	TITLE	PERIODS
V	**NANO CHEMISTRY AND GREEN NANOTECHNOLOGY**	**9**

Introduction of Nano materials - distinction between nanoparticles, molecules and bulk materials – properties of nanomaterials - size dependent properties - synthesis – bottom up methods - precipitation, thermolysis (hydrothermal & solvothermal) - top down methods - electro-deposition, chemical vapour deposition, laser ablation – types of nanoparticles: nano cluster, nano-rod, nano-wire and nano-tube - carbon nano tube (synthesis and properties) - applications of nanoparticles.

Green nanotechnology - nanotechnology products as potential substitutes for harmful chemicals, environmental concerns with nanotechnology

TOTAL PERIODS:	45

TEXT BOOKS:

1.	Kannan P and Ravikrishnan A, - Engineering Chemistry, Sri Krishna, Hitech publishing Company Pvt. Ltd, 2023.
2.	Jain P.C. and Monika Jain, - Engineering Chemistry, Dhanpat Rai, Publishing Company (P) Ltd.,New Delhi, 2018.
3.	Sivasankar B., "Engineering Chemistry", Tata McGraw-Hill Publishing Company Ltd, New Delhi, 2008.

REFERENCE BOOKS:

1.	Dara S.S & S.S Umare, - A Text book of Engineering Chemistry‖, S.Chand & Company Ltd., New Delhi, 2018.
2.	Palanna O.G, —Engineering Chemistry‖, McGraw Hill Education (India)Pvt. Ltd, 2nd Edition, 2017.
3.	ShikhaAgarwal, "Engineering Chemistry-Fundamentals and Applications", Cambridge University Press, Delhi, 2nd Edition, 2019.

WEBSITES:

1.	https://www.brainkart.com/subject/Engineering-Chemistry_264/
2.	https://www.poriyaan.in/paper/engineering-chemistry-4

JOURNALS:

1.	Journal of water technology and treatment methods
2.	Journal of polymers and composites
3.	Fuel and combustion scientific and research journal
4.	Journal of renewable and sustainable energy
5.	Journal of nanomaterials

EXTENSIVE READER:

1.	B. S. Murty, P. Shankar, Baldev Raj, B. B. Rath and James Murday, "Text book of nanoscience and nanotechnology", Universities Press-IIM Series in Metallurgy and Materials Science, 2018.
2.	Friedrich Emich, "Engineering Chemistry", Scientific International PVT, LTD, New Delhi, 2014.
3.	O.V. Roussak and H.D. Gesser, Applied Chemistry-A Text Book for Engineers and Technologists, Springer Science Business Media, New York, 2nd Edition, 2013.

COURSE DESIGNERS

1.	Dr. C. Ravichandran	Professor	Chemistry
2.	Dr. V. Vanitha	Assistant Professor	Chemistry
3.	Dr. K. Saravanan	Associate Professor	Chemistry

Recommended by Board of Studies	Date: 12-10-2023	Syllabus version	1
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

231GES104T	PROBLEM SOLVING THROUGH PYTHON PROGRAMMING (Common to CSE, CSE (CS), CSE (AIML), AI-DS, IT)	Periods per week				Credits
		L	T	P	R	
Regulation - R23		2	0	0	0	2

SCHEME OF EXAMINATION					
Duration of End Semester Examination in Hours	Maximum Marks - 100		Minimum Marks for Pass - 50		
	Weightage		Weightage		
	Continuous assessment Examination	End Semester Examination	Continuous assessment Examination	End Semester Examination	Overall
3	40 %	60 %	-	45%	50%

PREREQUISITES:

Nil

COURSE OBJECTIVES:

1.	To introduce the basics of algorithmic problem solving
2.	To solve problems using Python conditionals and loops.
3.	To use Python function calls to solve problems.
4.	To impart Python data structures - lists, tuples, dictionaries to represent complex data
5.	To implement file operations using Python.

COURSE OUTCOMES (COs):

Upon completion of this course, student will be able to:	Bloom"s level
CO1: Solve problems using algorithms, flowchart and pseudocode.	Analyze
CO2: Use python conditional and iteration statements for problem solving.	Apply
CO3: Apply strings and user defined functions in python programming.	Apply
CO4: Choose appropriate python data structures for real time applications.	Analyze
CO5: Develop Python code to manipulate data using file and exception-handling.	Create

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	2	1	0	0	0	0	0	2	1	1
CO2	1	2	1	1	0	0	0	0	0	1	0	1
CO3	2	2	1	1	0	0	0	0	0	1	0	1
CO4	2	2	1	1	0	0	0	0	0	1	0	1
CO5	1	3	2	2	0	2	1	0	0	1	1	1
3 — High : 2 - Medium : 1 — Low : „-„ - No correlation												

UNIT	TITLE	PERIODS
I	**ALGORITHMIC PROBLEM SOLVING**	5

Fundamentals of Computing -Algorithms, building blocks of algorithms (statements, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion).

UNIT	TITLE	PERIODS
II	**CONTROL FLOW STATEMENTS**	7

Python interpreter, interactive mode and script mode; variables, expressions, statements; values and data types; Operators and Precedence of operators; Conditionals: conditional, alternative, chained conditional, nested conditional; Iterations: while, for, break, continue.

UNIT	TITLE	PERIODS
III	**FUNCTIONS AND STRINGS**	6

Function definition and flow of execution, parameters and arguments; Fruitful functions, composition, recursion; Strings: string slices, immutability, Looping and counting, String methods.

UNIT	TITLE	PERIODS
IV	**LIST, TUPLE AND DICTIONARIES**	8

Lists: list operations: list slices, , traversing, mutability, aliasing, list methods, list arguments, list comprehension; Tuples: Operations, tuple assignment; Dictionaries: Operations, functions and Looping.

UNIT	TITLE	PERIODS
V	**FILES, EXCEPTIONS**	4

Files: Text files, reading and writing files,; Exceptions: handling exceptions, multiple exception blocks, finally block.

TOTAL PERIODS:	30

TEXT BOOKS:

1.	ReemaThareja —Python Programming using Problem solving Approach‖, Oxford University Press.

REFERENCE BOOKS:

1.	Robert Sedgewick, Kevin Wayne, Robert Dondero, Introduction to Programming in Python: An Inter- disciplinary Approach, Pearson India Education Services Pvt. Ltd., 2016.
2.	Paul Gries, Jennifer Campbell and Jason Montojo, Practical Programming: An Introduction to Computer Science using Python 3‖, Second edition, Pragmatic Programmers, LLC, 2013.
3.	Allen B. Downey, "Think Python: How to Think Like a Computer Scientist, Version 2.0.17 edition, Updated for Python 3,Shroff/O_ReillyPublishers, (http://greenteapress.com/wp/thinkpython/)

WEBSITES:	
1.	https://www.python.org
2.	https://www.learnpython.org
3.	https://www.w3schools.com/python/

JOURNALS:	
1.	Nil

EXTENSIVE READER:	
1.	Nil

COURSE DESIGNERS			
1.	Dr.N.Ananthi	Professor & Head	Information Technology
2.	Dr.G.S.Anandha Mala	Professor & Head	Computer Science and Engineering
3.	Mrs.B.Chandra	Assistant Professor	Information Technology
4.	Dr.J.Deepa	Associate professor	Computer Science and Engineering
5	A.Jeba Sheela	Assistant Professor	Computer Science and Engineering

Recommended by Board of Studies	Date: 20-10-2023	Syllabus version	1
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

231GEH101T	HERITAGE OF TAMILS / தமிழர்மரபு (Common to all branches of Engineering and Technology)	Periods per week				Credits
		L	T	P	R	
Regulation - R23		1	0	0	0	1

SCHEME OF EXAMINATION						
Duration of End Semester Examination in Hours	Maximum Marks - 100			Minimum Marks for Pass - 50		
	Weightage			Weightage		
	Continuous assessment Examination	End Semester Examination		Continuous assessment Examination	End Semester Examination	Overall
3	40 %	60 %		-	45%	50%

PREREQUISITES:

Nil

COURSE OBJECTIVES:

1.	சங்க இலக்கியங்கள் முதல் நவீன இலக்கியங்கள் வரையிலான வளர்ச்சியைப் பற்றி அறிய வைத்தல் To know about the development from Sangam literature to modern literature
2.	பாறை ஓவியங்கள் முதல் நவீன சிற்பங்கள் வரையிலான தமிழர் கலைகள் பற்றி அறிந்துகொள்ள வைத்தல் Learn about Tamil art from rock paintings to modern sculptures
3.	தமிழர்களின் நாட்டுப்புற கலைகள் மற்றும் வீர விளையாட்டுகள் பற்றி தெரிந்துகொள்ள வைத்தல் To know about folk arts and heroic games of Tamils
4.	தமிழர்கள் போற்றிய அகம் மற்றும் புறக் கோட்பாடுகள் பற்றி தெரிந்து கொள்ள வைத்தல் To know about internal and external principles cherised by Tamils.
5.	இந்தியப் பண்பாட்டில் தமிழர்களின் பங்களிப்பு பற்றி அறிந்து கொள்ள வைத்தல் To know about the contribution of Tamils in Indian culture

COURSE OUTCOMES (COs):

Upon completion of this course, student will be able to: இந்தப் பாடத்தினை கற்று முடிக்கும்போது, மாணவர்கள் கீழ்க்கண்டவற்றை பற்றி அறிந்திருப்பார்கள்:		Bloom's level
CO1:	சங்க இலக்கியங்கள் முதல் நவீன இலக்கியங்கள் வரையிலான வளர்ச்சியைப் பற்றி. On the Development from Sangam Literature to Modern Literature	K2
CO2:	பாறை ஓவியங்கள் முதல் நவீன சிற்பங்கள் வரையிலான தமிழர் கலைகள் பற்றி. About Tamil arts from rock paintings to modern sculptures.	K2
CO3:	தமிழர்களின் நாட்டுப்புற கலைகள் மற்றும் வீர விளையாட்டுகள் பற்றி.	K2

	About folk arts and heroic games of Tamils	
CO4:	தமிழர்கள் போற்றிய அகம் மற்றும் புறக் கோட்பாடுகள் பற்றி. About internal and external principles cherished by Tamils.	K2
CO5:	இந்தியப் பண்பாட்டில் தமிழர்களின் பங்களிப்பு பற்றி. About the contribution of Tamils in Indian culture.	K2

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

3 – High : 2 - Medium : 1 – Low : '-' - No correlation

UNIT	TITLE	PERIODS
I	**LANGUAGE AND LITERATURE/மொழி மற்றும் இலக்கியம்**	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 Bharathidasan.

இந்திய மொழிக்குடும்பங்கள் – திராவிட மொழிகள் – தமிழ் ஒரு செம்மொழி – தமிழ் செவ்விலக்கியங்கள் –சங்க இலக்கியத்தின் சமயச்சார்பற்றதன்மை- சங்கஇலக்கியத்தில் பகிர்தல் அறம் – திருக்குறளில் மேலாண்மைக்கருத்துக்கள்- தமிழ்க்காப்பியங்கள், தமிழகத்தில் சமணபௌத்த சமயங்களின் தாக்கம்பக்திஇலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலக்கியங்கள் - தமிழில்நவீனஇலக்கியத்தின்வளர்ச்சி – தமிழ் இலக்கியவளர்ச்சியில் பாரதியார்மற்றும் பாரதிதாசன்ஆகியோரின் பங்களிப்பு.

UNIT	TITLE	PERIODS
II	**HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE/ மரபு – பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள்வரை- சிற்பக்கலை**	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.

நடுகல் முதல் நவீன சிற்பங்கள்வரை – ஐம்பொன் சிலைகள்- பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் – தேர்செய்யும் கலை – சுடுமண் சிற்பங்கள் நாட்டுப்புறத் தெய்வங்கள் குமரிமுனையில் திருவள்ளுவர் சிலை - இசைக்கருவிகள் - மிருதங்கம், பறை, வீணை, யாழ். நாதஸ்வரம் – தமிழர்களின் சமூக பொருளாதாரவாழ்வில் கோவில்களின் பங்கு.

UNIT	TITLE	PERIODS
III	**FOLK AND MARTIAL ARTS / நாட்டுப்புறக்கலைகள் மற்றும் வீரவிளையாட்டுகள்**	3

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

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

UNIT	TITLE	PERIODS
IV	**THINAI CONCEPT OF TAMILS /தமிழர்களின் திணைக்கோட்பாடுகள்**	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.

தமிழகத்தின் தாவரங்களும், விலங்குகளும் தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் பறக்கோட்பாடுகள் தமிழர்கள் போற்றிய அறக்கோட்பாடு – சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும் – சங்ககாலநகரங்களும் துறைமுகங்களும் – சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி கடல் கடந்தநாடுகளில் சோழர்களின் வெற்றி.

UNIT	TITLE	PERIODS
V	**CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE /இந்திய தேசியஇயக்கம்மற்றும்இந்தியபண்பாட்டிற்குத்தமிழர்களின்பங்களிப்பு**	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.

இந்திய விடுதலைப் போரில் தமிழர்களின் பங்கு இந்தியாவின் பிறப்பகுதிகளில் தமிழ்ப்பண்பாட்டின் தாக்கம் – சுயமரியாதை இயக்கம் – இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு-கல்வெட்டுகள், கையெழுத்துப்படிகள் – தமிழ்ப்புத்தகங்களின் அச்சு வரலாறு.

TOTAL PERIODS:	15

TEXT BOOKS CUM REFERENCE BOOKS:	
1.	தமிழக வாலாறு மக்களும் பண்பாடும் கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள்கழகம்).
2.	கணினித்தமிழ் - முனைவர்இல. சுந்தரம். (விகடன்பிரசுரம்).
3.	வைகை நதிக்கரையில் சங்ககால நகரநாகரிகம் (தொல்லியல்துறை வெளியீடு)
4.	பொருறை - ஆற்றங்கரைநாகரிகம், தொல்லியல்துறைவெளியீடு)
5.	Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6.	Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.

7.	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
8.	The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
9.	Keeladi - 'Sangam City C ivilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10.	Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
11.	Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
12.	Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

COURSE DESIGNERS	
1.	Anna University, Chennai

Recommended by Board of Studies	Date:	Syllabus version	-
Approved by the Academic Council	Date:	Meeting No.	6

231PYB011L	PHYSICS LABORATORY	Periods per week				Credits
	(Common to all branches of Engineering and Technology)	L	T	P	R	
Regulation - R23		0	0	2	0	1

SCHEME OF EXAMINATION

Duration of End Semester Examination in Hours	Maximum Marks - 100		Minimum Marks for Pass - 50		
	Weightage		Weightage		
	Continuous assessment Examination	End Semester Examination	Continuous assessment Examination	End Semester Examination	Overall
3	60 %	40 %	-	45%	50%

PREREQUISITES:
Nil

COURSE OBJECTIVES:	
1.	To impart knowledge on experimental skills to determine elastic, optical and thermal properties of materials.
2.	To demonstrate the experimental determination of compressibility of liquid and band gap of a semiconductor.

COURSE OUTCOMES (COs):	

Upon completion of this course, student will be able to:	Bloom's level
CO1: determine the elastic properties of materials using torsional pendulum and non uniform bending.	K3
CO2: determine the optical properties of light waves using optical fibre, laser and spectrometer.	K3
CO3: determine the physical properties of materials using Lee's disc apparatus and air wedge.	K3
CO4: calculate the compressibility of liquid using ultrasonic interferometer.	K3
CO5: calculate the band gap of a semiconductor using band gap apparatus.	K3

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)												
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	-	-	-	-	-	-	-	-	1
CO2	3	2	1	-	-	-	-	-	-	-	-	1
CO3	3	2	1	-	-	-	-	-	-	-	-	1
CO4	3	2	1	-	-	-	-	-	-	-	-	1
CO5	3	2	1	-	-	-	-	-	-	-	-	1

3 – High   : 2 - Medium   :   1 – Low   : '-' - No correlation

S. No	ANY FIVE EXPERIMENTS
	NAME OF THE EXPERIMENT
1	Torsion Pendulum – Rigidity modulus of wire and moment of inertia of disc
2	Non Uniform Bending – Determination of Young's modulus
3	Semiconductor Laser –Wavelength of laser light and Size of particle
4	Optical Fiber – Numerical Aperture and Acceptance Angle
5	Lee's Disc method - Determination of thermal conductivity of a bad conductor
6	Spectrometer – Dispersive power of the prism
7	Air Wedge – Measurement of thickness of thin wire
	EXPERIMENTS BEYOND THE SYLLABUS
	ANY ONE EXPERIMENT
1	Ultrasonic Interferometer - Velocity of sound and Compressibility of liquid
2	Determination of the Band gap of a semiconductor

TOTAL PERIODS:	15

REFERENCE BOOKS:	
1	Physics Laboratory Manual, Department of Physics, Easwari Engineering College.
2	R.K.Shukla and Anchal Srivastava, Practical Physics, 1st Edition, New Age International (P) Ltd, New Delhi, 2006.
3	G.L.Souires, Practical Physics, 4th Edition, Cambridge University, UK, 2001.
4	D.Chattopadhyay, P.C. Rakshit and B.Saha, An Advanced Course in Practical Physics, 2nd ed., Books & Allied Ltd., Calcutta, 1990.

COURSE DESIGNERS

1.	Dr. S. Nirmala	Assoc Professor & Head	Department of Physics
2.	Dr. G. Rajkumar	Professor	Department of Physics
3.	Dr. R. Sivakumar	Asst Professor	Department of Physics
4.	Dr. K. Raju	Asst Professor	Department of Physics

Recommended by Board of Studies	Date: 12-10-2023	Syllabus version	1
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

231GES012L	VISUALISATION OF DESIGN AND DRAWING	Periods per week				Credits
	(Common to AI&DS, CSE, CSE (AIML), CSE (CS), CSBS, CSD, ECE, EEE, IT	L	T	P	R	
Regulation - R23		0	0	3	1	2

SCHEME OF EXAMINATION

Duration of End Semester Examination in Hours	Maximum Marks - 100		Minimum Marks for Pass - 50		
	Weightage		Weightage		Overall
	Continuous assessment Examination	End Semester Examination	Continuous assessment Examination	End Semester Examination	
3	60 %	40 %	-	45%	50%

PREREQUISITES:
Nil

COURSE OBJECTIVES:	
1.	To develop students, graphic skills for communication of concepts, ideas and design of engineering products
2.	To expose them to existing National standards related to technical drawings.
3.	To familiarize with basic geometrical constructions and orthographic projections using drafting software.
4.	To make the students to draw the different projections of the solids.
5.	To get an idea about 3D views through isometric projections.

COURSE OUTCOMES (COs):

Upon completion of this course, student will be able to:		Bloom's level
CO1:	Apply BIS and ISO standards in Engineering drawing.	Apply
CO2:	Use the CAD software for drawing the plane surfaces by rotating plane method.	Apply
CO3:	Apply the Projection concepts and drafting tools to the projection of simple solids.	Apply
CO4:	Construct orthographic projections from pictorial views of simple machine elements.	Apply
CO5:	Draw the pictorial views of prism, pyramid, cylinder, cone and combination of solids.	Apply

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	2	-	3	1	-	1	2	2	-	1
CO2	3	3	2	-	3	1	-	1	2	2	-	1
CO3	3	3	2	-	3	1	-	1	2	2	-	1
CO4	3	3	2	-	3	1	-	1	2	2	-	1

CO5	3	3	2	-	3	1	-	1	2	2	-	1

3 – High : 2 - Medium : 1 – Low : '-' - No correlation

UNIT	TITLE	PERIODS
I	**BASIC CONVENTIONS USED IN ENGINEERING DRAWING AND INTRODUCTION TO COMPUTER GRAPHICS**	12

Principles of Engineering graphics and their significance - Use of drawing Instruments-BIS conventions and Specifications-Size, Layout and folding of drawing Sheets-Lettering and Dimensioning.

The Concepts of Computer Aided Drafting for Engineering drawing, Computer graphics & Geometrical modeling (2D Orthographic Views) and 3D drafting (Isometric Views) using AutoCAD.

List of Experiments:

1. Drawing of a title block with necessary text, projection symbol and lettering using CAD software.
2. Drawing of line, Planes (Polygonal and Circular surfaces).

UNIT	TITLE	PERIODS
II	**PROJECTION OF PLANES**	12

Projection of planes (polygonal and circular surfaces) inclined to one of the principal planes by rotating object method.

List of Experiments:

1. Drawing of plane Surface inclined to HP.
2. Drawing of plane Surface inclined to VP.

UNIT	TITLE	PERIODS
III	**PROJECTION OF SOLIDS**	12

Projection of simple solids like Prisms, Pyramids, Cylinder and Cone when the axis is inclined to one of the principal planes by rotating object method.

List of Experiments:

1. Drawing of simple solids like prism and pyramids when the axis is inclined to HP or VP.
2. Drawing of simple solids like cylinder and cone when the axis is inclined to HP or VP.

UNIT	TITLE	PERIODS
IV	**ORTHOGRAPIC PROJECTION**	12

Visualization concepts and Orthographic Projection - Layout of views – Orthographic Projection-Conversion of pictorial diagram into orthographic views

List of Experiments:

1. Drawing orthographic view of simple solids like Prism, Pyramids, Cylinder, Cone, etc, and dimensioning.
2. Drawing of orthographic views from the given pictorial diagram.

UNIT	TITLE	PERIODS
V	**ISOMETRIC DRAWING**	12

Principles of isometric view – Isometric view of simple solids – Prism, Pyramid, Cylinder, Cone, and combination of solids.

List of Experiments:
1. Drawing isometric projection of simple solids.
2. Modeling of 2D to 3D objects using drafting software

TOTAL PERIODS:	**60**

TEXT BOOKS:	
1.	Natarajan K.V., "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2009
2.	Jayapoovan T, "Engineering Graphics using AUTOCAD", Vikas Publishing ,7 th Edition.
3.	Venugopal K. and Prabhu Raja V., "Engineering Drawing with AUTOCAD and building drawing", New Age International (P) Limited, 2018, 5th edition.

REFERENCE BOOKS:	
1.	Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill Publishing Company Limited, New Delhi, 2008.
2.	Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, 50th Edition, 2010.
3.	Dinesh Kumar S, K.Sivakumar and R.Ramadoss, " Engineering Graphics", Maruthi Publishers, Chennai,2019.
4.	Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Stores, Bangalore, 2007.
5.	Parthasarathy N S and Vela Murali, "Engineering Graphics", Oxford University, Press, New Delhi, 2015.
6.	Shah M.B., and Rana B.C., "Engineering Drawing", Pearson, 2nd Edition, 2009.
7.	CAD software Theory and User Manuals.

WEBSITES:	
1.	https://ieeexplore.ieee.org/abstract/document/6132125
2.	https://www.indianjournals.com/ijor.aspx?target=ijor:ajmr&volume=10&issue=1&article=039

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

COURSE DESIGNERS			
1.	Dr. R. Ramadoss	Professor	Mechanical Engineering
2.	Mr. R. Jeremiah	Assistant Professor	Mechanical Engineering
3.	Mr. M. Raju	Assistant Professor	Mechanical Engineering

Recommended by Board of Studies	Date: 16-11-2023	Syllabus version	1
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

231GES114L	PYTHON PROGRAMMING LABORATORY	Periods per week				Credits
	(Common to CSE, CSE (CS), CSE (AIML), AI-DS, IT)	L	T	P	R	
Regulation - R23		0	0	3	1	2

SCHEME OF EXAMINATION

Duration of End Semester Examination in Hours	Maximum Marks - 100		Minimum Marks for Pass - 50		
	Weightage		Weightage		Overall
	Continuous Assessment Examination	End Semester Examination	Continuous Assessment Examination	End Semester Examination	
3	60 %	40 %	-	45%	50%

COURSE OBJECTIVES:

1.	To impart knowledge on problem solving approaches.
2.	To experiment with programming constructs in Python
3.	To practice various computing strategies for Python-based solutions to real world problems
4.	To use Python data structures - lists, tuples, dictionaries.
5.	To train inbuilding simple project using python.

COURSE OUTCOMES:	Bloom"s level
Upon completion of this course, student will be able to:	Analyze
CO1: Develop algorithmic solutions to simple computational problems	Apply
CO2: Implement programs in Python using conditionals and loops for solving problems	Apply
CO3: Deploy functions to decompose a Python program	Apply
CO4: Process compound data using Python data structures.	Apply
CO5: Design python programs for file handling and exception handling.	Apply
CO6: Create GUI application for user defined requirement.	Create

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	2	1	1	-	-	-	-	2	1	2
CO2	1	2	1	1	1	-	-	-	1	2	1	2
CO3	2	2	1	1	1	-	-	-	1	2	1	2
CO4	2	2	1	1	1	-	-	-	1	2	1	2
CO5	1	3	2	2	1	-	-	-	1	2	1	2
CO6	2	2	2	2	2	-	1	2	3	3	2	3
3 — High : 2 - Medium : 1 — Low : „-„ - No correlation												

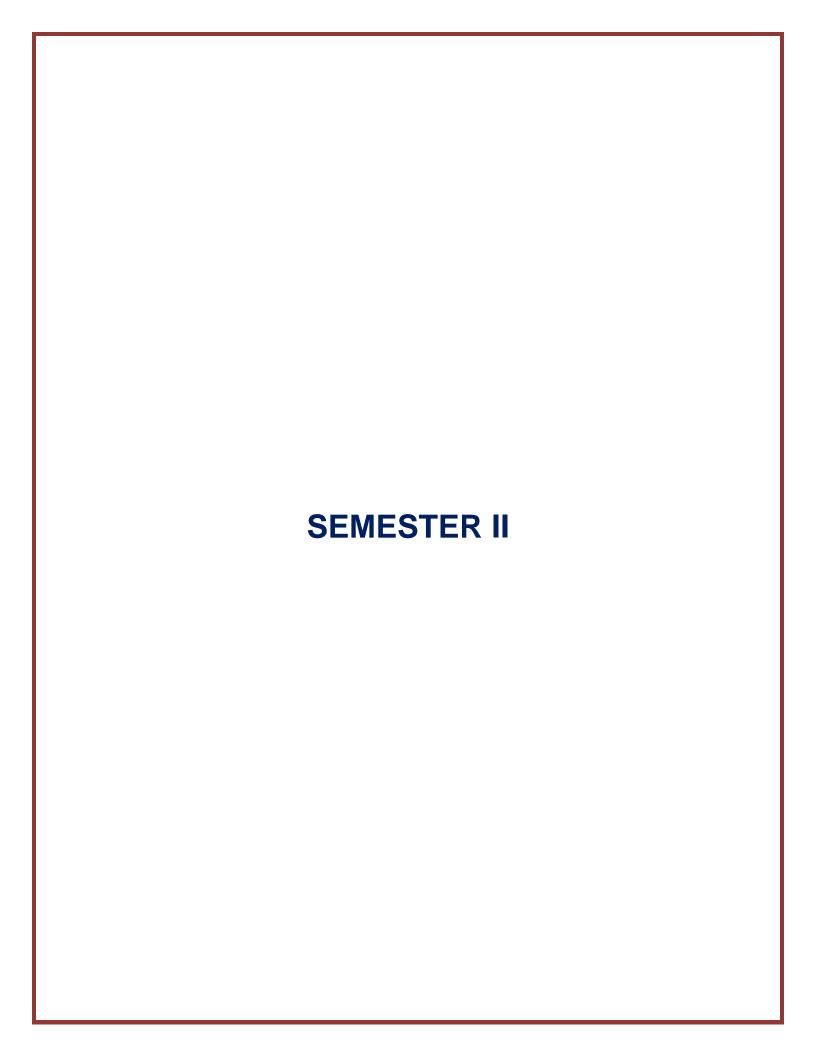|	LIST OF EXPERIMENTS
1.	Identification and solving of simple real life or scientific or technical problems, and developing flow charts, algorithms and pseudocode for the same. (Electricity Billing / Retail shop billing/ Sin series/ weight of a motorbike/ Weight of a steel bar/ compute Electrical Current in Three Phase AC Circuit, etc.)
2.	Python programming using simple statements and expressions (exchange the values of two variables/ circulate the values of n variables/ distance between two points).
3.	Scientific problems using Conditionals and Iterative loops. (Number series/ Number Patterns/ pyramid pattern)
4.	Implementing real-time/technical applications using Lists, Tuples. (Items present in a library/Components of a car/ Materials required for construction of a building –operations of list & tuples)
5.	Implementing real-time/technical applications using Sets, Dictionaries. (Language/ components of an automobile / Elements of a civil structure etc.- operations of Sets & Dictionaries)
6.	Implementing programs using Functions. (Factorial / largest number in a list/ area of shape)
7.	Implementing programs using Strings. (reverse / palindrome / character count / replacing characters)
8.	Implementing real-time/technical applications using File handling. (copy from one file to another, word count, longest word)
9.	Implementing real-time/technical applications using Exception handling. (divide by zero error / voter"s age validity / student mark range validation)
10.	Exploring Pygame tool to Develop a game activity like bouncing ball, car race etc.
11.	Mini Project (any ONE): Design GUI for • Airline reservation system • Feedback system • Employee management system • Student management system • Banking system
TOTAL PERIODS:	**60**

	EXPERIMENTS BEYOND THE SYLLABUS (Any one)
1.	Implementing programs using written modules and Python Standard Libraries - pandas, numpy.
2.	Implementing programs using written modules and Python Standard Libraries - Matplotlib, spicy

COURSE DESIGNERS

1.	Dr.N.Ananthi	Professor & Head	Information Technology
2.	Dr.G.S.Anandha Mala	Professor & Head	Computer Science and Engineering
3.	Mrs.B.Chandra	Assistant Professor	Information Technology
4.	Dr.J.Deepa	Associate professor	Computer Science and Engineering
5.	A.Jeba Sheela	Assistant Professor	Computer Science and Engineering

Recommended by Board of Studies	Date: 20-10-2023	Syllabus Version	1
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

SEMESTER II

231LEH201T	PROFESSIONAL COMMUNICATION	Periods per week				Credits
	(Common to all branches of Engineering and Technology)	L	T	P	R	
Regulation - R23		3	0	0	0	3

SCHEME OF EXAMINATION

Duration of End Semester Examination in Hours	Maximum Marks - 100		Minimum Marks for Pass - 50		
	Weightage		Weightage		Overall
	Continuous Assessment Examination	End Semester Examination	Continuous Assessment Examination	End Semester Examination	
3	40 %	60 %	-	45%	50%

PREREQUISITES:
Nil

COURSE OBJECTIVES:	
1.	To develop the basic writing skills of the First year Engineering students.
2.	To help learners develop their listening skills, which will, enable them to listen to lectures and enhance their ability to comprehend by asking questions and seeking clarification.
3.	To help learners develop their speaking skills and help them to speak fluently.
4.	To inculcate reading habit and to develop effective reading skills.
5.	To help students improve their active and passive vocabulary.

COURSE OUTCOMES (COs):		
Upon completion of this course, student will be able to:		Bloom's level
CO1:	Listen, Understand and Respond to others in different situations	K2
CO2:	Speak correctly and fluently in different situations using appropriate communication strategies.	K4
CO3:	Read and Comprehend a range of texts adopting different reading skills.	K3
CO4:	Write with clarity in simple, apt and flawless language with coherence and cohesion.	K6
CO5:	Use their communicative competency with purpose and clarity in the context of Science and Technology	K6

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	1	1	-	-
CO2	-	-	-	-	-	-	-	-	1	2	-	-
CO3	-	-	-	-	-	-	-	-	-	2	-	-
CO4	-	-	-	-	-	-	-	-	-	2	-	-
CO5	-	-	-	-	-	-	-	-	-	1	-	1
CO6	-	-	-	-	-	-	-	-	1	-	-	-

3 – High : 2 - Medium : 1 – Low : '-' - No correlation

UNIT	TITLE	PERIODS
I	Listening: Listening to talks and complete information gap exercises. (Comprehension).Speaking: Introduction to speaking mechanics. Reading: Prescribed non-detail text .Writing: Communication- Process/ forms /barriers. Vocabulary and Grammar: Purpose and function- Active/Passive voice/Impersonal passive voice - Numerical adjectives - Words used as different parts of speech – Contextual meaning of words	9

UNIT	TITLE	PERIODS
II	Listening: Listening to documentaries and interpret Speaking: Speaking an advertisements/ gadget reviews user manuals Reading: Prescribed non-detail text - Reading longer technical texts Writing: Interpreting Chart/ graphs – letter writing (placing order/ escalation/ complaint) Vocabulary and Grammar: Transformation of sentences –Simple, Complex, and Compound sentences-Modal verb –Infinity and Gerund – Error correction.	9

UNIT	TITLE	PERIODS
III	Listening: Listening to technical talk and making notes. Speaking: Describing a process. Reading: Prescribed non-detail text- reading editorials and opinion blogs. Writing: Essay writing (descriptive/ argumentative/ analytical/ narrative).Vocabulary and Grammar: Words often misspelt –Synonyms and antonyms – Modifiers – Direct / Indirect.	9

UNIT	TITLE	PERIODS
IV	Listening: Listening to Online interviews and discussion. Speaking: Small Talk (any random topics Reading: Prescribed non-detail text .Writing: Report Writing (accident/ industrial / Feasibility/ project) Vocabulary and Grammar: Extended definition – cause and effect expressions –Verbal analogies- Compound nouns.	9

UNIT	TITLE	PERIODS
V	Listening: Listening for taking notes and seeking clarifications. Speaking: Group Discussion- Etiquette/ Do's and Dont's. Reading:Prescribed non-detail text .Writing: Cover letter and Resume writing – Minutes of Meeting Vocabulary and Grammar: Collective noun - Relative clause – Redundancies.	9

TOTAL PERIODS:	45

TEXT BOOKS:

1.	V. Chellamal, Deepa Mary Francis, K.N Shoba, P.R Sujatha Priyadharsini, Veena Selvam English for science and Technology, Cambridge University Press and Assessment 2023

REFERENCE BOOKS:

1.	Dutt P. Kiranmai and RajeevanGeeta. Basic Communication Skills, Foundation Books: 2013
2.	Bailey, Stephen. Academic Writing: A practical guide for students. New York: Rutledge,2011.
3.	Means,L. Thomas and Elaine Langlois. English & Communication for Colleges. Cengage Learning ,USA: 2007.

WEBSITES:

1.	https://www.usingenglish.com
2.	http://grammarbook.com

JOURNALS:

1.	National Council for Teachers of English
2.	https://www2.ncte.org/resources/journals/college-english/

EXTENSIVE READER:

1.	Spencer Johnson, Who Moved My Cheese, Putnam Adult, 1998

COURSE DESIGNERS

1.	Dr Usha Menon	Professor	Department of English
2.	Dr Sam Dawson	Professor and Head	Department of English
3.	Ms Jean Ida	Assistant Professor	Department of English
4.	Ms Moby	Assistant Professor	Department of English
5	Ms Surya S	Assistant Professor	Department of English
6	Dr Rudhra T S	Assistant Professor	Department of English

Recommended by Board of Studies	Date: 12-10-2023	Syllabus version	1
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

231MAB201T	ADVANCED CALCULUS AND COMPLEX ANALYSIS	Periods per week				Credits
	(Common to all branches of Engineering and Technology)	L	T	P	R	
Regulation - R23		3	2	0	0	4

SCHEME OF EXAMINATION

Duration of End Semester Examination in Hours	Maximum Marks - 100		Minimum Marks for Pass - 50		Overall
	Weightage		Weightage		
	Continuous Assessment Examination	End Semester Examination	Continuous Assessment Examination	End Semester Examination	
3	40 %	60 %	-	45%	50%

PREREQUISITES:

Basic Knowledge of Complex Variables, Vector Algebra and Integration

COURSE OBJECTIVES:

1.	To compute area of closed surface and volume of solids using multiple integrals
2.	To evaluate Line, Surface and Volume integrals
3.	To find the Laplace Transforms and inverse transforms for standard functions
4.	To apply C-R equations in the construction of Analytic Functions
5.	To study the methods of Complex Integration, finding Taylor's and Laurent's Series expansions

COURSE OUTCOMES (COs):

Upon completion of this course, student will be able to:		Bloom's level
CO1:	Find the area enclosed by simple closed curve using double integral and volume of solid using triple integral	K6
CO2:	Verify Green's, Stoke's and Gauss divergence theorems	K6
CO3:	Obtain Laplace Transforms and inverse transforms of standard functions.	K5
CO4:	Solve problems in Analytic functions and construct analytic functions by using C-R equations	K5
CO5:	Identify a suitable method of complex integration for evaluating certain indefinite integrals	K4

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	-	-	-	-	-	-	-	-	1
CO2	2	1	2	-	-	-	-	-	-	-	-	1
CO3	2	2	1	-	-	-	-	-	-	-	-	1
CO4	2	1	2	-	-	-	-	-	-	-	-	1
CO5	2	2	1	-	-	-	-	-	-	-	-	1

3 – High : 2 - Medium : 1 – Low   : '-' - No correlation

UNIT	TITLE	PERIODS
I	**MULTIPLE INTEGRALS**	9+3

Double integrals in Cartesian and polar coordinates – Change of order of integration, Area enclosed by plane curves – Change of variables in double integrals, Triple integrals

UNIT	TITLE	PERIODS
II	**VECTOR CALCULUS**	9+3

Gradient and directional derivative – Divergence and curl – Irrotational and Solenoidal vector fields, Line integral over a plane curve, Surface integral – Area of a curved surface, Volume integral, Green's, Gauss divergence and Stoke's theorems – Verification and application in evaluating line, surface and volume integrals (Cubes and Cuboids only)

UNIT	TITLE	PERIODS
III	**LAPLACE TRANSFORM**	9+3

Definition, properties, existence conditions – Transforms of elementary functions – Transform of unit step function and unit impulse function, shifting theorems, transforms of derivatives and integrals, Initial and final value theorems, Periodic functions, Inverse transforms – Convolution theorem-, Solving linear second order ordinary differential equations with constant coefficients using Laplace transforms

UNIT	TITLE	PERIODS
IV	**ANALYTIC FUNCTIONS**	9+3

Analytic functions – necessary and sufficient conditions, Cauchy-Riemann equations in Cartesian and polar form – Properties – harmonic functions, Construction of analytic function by Milne Thomson method, conformal mapping – some standard transformations $w = z + c$, cz, $1/z$, bilinear transformation.

UNIT	TITLE	PERIODS
V	**COMPLEX INTEGRATION**	9+3

Line integral – Cauchy's integral theorem – Cauchy's integral formula, Taylor's and Laurent's series, Singularities – Residues – Residue theorem – Application of residue theorem for evaluation of real integrals – Use of circular contour and semicircular contour (except the poles on the real axis). line, surface and volume integrals.

TOTAL PERIODS:		60

TEXT BOOKS:

1.	Joel Hass, Christopher Heil and Maurice D. Weir "Thomas' Calculus", 14th Edition, Pearson.
2.	Grewal.B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition, 2018
3.	Workbook on"Advanced calculus and Complex Analysis",Chess Publications,Prepared by Department of Mathematics

REFERENCE BOOKS:

1.	Bali N P, Manish Goyal, "A Textbook of Engineering Mathematics", Ninth Edition, Laxmi Publications Pvt Ltd, 2016.
2.	James Stewart, "Calculus: Early Transcendentals", Cengage Learning, 8th Edition, New Delhi, 2015
3.	Kreyszig.E, "Advanced Engineering Mathematics", John Wiley and Sons, 10th Edition, New Delhi, 2016.
4.	T Veerarajan," Engineering Mathematics II", McGraw Hill (India) Private Limited, Chennai

WEBSITES:

1.	www.pearsoned.co.in/georgebthomasjr
2.	www.webassign.net
3.	https://onlinecourses.nptel.ac.in/noc22_ma08/course

COURSE DESIGNERS

1.	Dr.S.Muthukumar	Professor	Department of Mathematics
2.	Dr.S.R.Ananthalakshmi	HOD / Associate Professor	Department of Mathematics
3.	Dr.K.S.Vidhyaa	Assistant Professor (Sr.G)	Department of Mathematics

Recommended by Board of Studies	Date:12.10.2023	Syllabus version	V.1
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

231PYS202T	PHYSICS FOR INFORMATION SCIENCE (Common to CSE, IT, CS, AIML and AI & DS)	Periods per week				Credits
		L	T	P	R	
Regulations - R23		3	0	0	0	3

SCHEME OF EXAMINATION

Duration of End Semester Examination in Hours	Maximum Marks - 100		Minimum Marks for Pass - 50		Overall
	Weightage		Weightage		
	Continuous Assessment Examination	End Semester Examination	Continuous Assessment Examination	End Semester Examination	
3	40 %	60 %	-	45%	50%

PREREQUISITES:
Nil

COURSE OBJECTIVES:	
1.	To teach the principles of quantum mechanics and transport phenomena for semiconducting materials.
2.	To explain the functioning of optical materials for optoelectronics.
3.	To introduce the basic principles of quantum mechanics to one dimensional motion of particles.
4.	To enable the students to gain knowledge on applied quantum mechanics to form energy bands.
5.	To teach the basics of quantum structures and their applications and quantum computing.

COURSE OUTCOMES (COs):		
Upon completion of this course, student will be able to:		Bloom's level
CO1:	Apply the principles of quantum mechanics and transport phenomena for semiconducting materials.	K3
CO2:	Design the optical materials and devices for optoelectronics	K6
CO3:	Apply the principles of quantum mechanics to one dimensional motion of particles.	K3
CO4:	Analyze the quantum mechanical principles towards the formation of energy bands.	K4
CO5:	Recommend the nano devices and nano materials for quantum computing	K5

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)

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

3 – High : 2 - Medium : 1 – Low : '-' - No correlation

UNIT	TITLE	PERIODS
I	**SEMICONDUCTOR PHYSICS**	9

Intrinsic Semiconductors – Energy band diagram – direct and indirect band gap semiconductors – Carrier concentration in intrinsic semiconductors – extrinsic semiconductors - Carrier concentration in N-type & P-type semiconductors (Qualitative study) – Variation of carrier concentration with temperature – variation of Fermi level with temperature and impurity concentration – Carrier transport in Semiconductor: random motion, drift, mobility and diffusion – Hall effect and devices – Ohmic contacts – Schottky diode.

UNIT	TITLE	PERIODS
II	**LIGHT - SEMICONDUCTOR INTERACTION**	9

Classification of optical materials – carrier generation and recombination processes - Absorption emission and scattering of light in metals, insulators and semiconductors (concepts only) - photo current in a PIN diode – solar cell - LED – Organic LED – Laser diodes – Optical data storage techniques.

UNIT	TITLE	PERIODS
III	**BASIC QUANTUM MECHANICS**	9

Inadequacies of Classical Mechanics – Black body radiation - Planck's theory of radiation - Dual nature of electromagnetic radiation – De Broglie hypothesis for matter waves – Heisenberg's uncertainty principle – Schrodinger's time dependent and independent wave equation, significance of wave function - Born interpretation - Particle confinement in 1D box.

UNIT	TITLE	PERIODS
IV	**APPLIED QUANTUM MECHANICS**	9

The harmonic oscillator - Barrier penetration and quantum tunneling – Scanning Tunneling Microscope (STM) - Resonant diode - Finite potential wells - Bloch's theorem for particles in a periodic potential – Basics of Kronig - Penney model and origin of energy bands.

UNIT	TITLE	PERIODS
V	**NANODEVICES AND QUANTUM COMPUTING**	9

Introduction - quantum confinement – quantum structures: quantum wells, wires and dots – band gap of nanomaterials. Tunneling – Single electron phenomena: Coulomb blockade – resonant tunneling diode – single electron transistor – quantum system for information processing - quantum states – classical bits – quantum bits or qubits – CNOT gate - multiple qubits – Bloch sphere – quantum gates – advantage of quantum computing over classical computing.

TOTAL PERIODS:	45

TEXT BOOKS:

1.	Jasprit Singh, "Semiconductor Devices: Basic Principles", Wiley (Indian Edition), 2007.
2.	S.O. Kasap. Principles of Electronic Materials and Devices, McGraw-Hill Education (Indian Edition), 2020.
3.	Parag K. Lala, Quantum Computing: A Beginner's Introduction, McGraw-Hill Education (Indian Edition), 2020.

REFERENCE BOOKS:

1.	Charles Kittel, Introduction to Solid State Physics, Wiley India Edition, 2019.
2.	Y. B. Band and Y. Avishai, Quantum Mechanics with Applications to Nanotechnology and Information Science, Academic Press, 2013.
3.	B. Rogers, J.Adams and S.Pennathur, Nanotechnology: Understanding Small Systems, CRC Press, 2014.
4.	Nouredine Zettili, Quantum Mechanics Concepts and Applications, 2nd Edition, Wiley, 2009.
5.	V.Rajendran, Materials Science, McGraw Hill Education (India) Private Ltd., 2017.
6.	G. Aruldhas, Quantum Mechanics, PHI Learning, 2008.

WEBSITES:

1.	https://nptel.ac.in/courses/115102025

COURSE DESIGNERS

1.	Dr. S. Nirmala	Associate Professor & Head	Department of Physics
2.	Dr. G. Rajkumar	Professor	Department of Physics
3.	Dr. R. Sivakumar	Assistant Professor	Department of Physics
4.	Dr. K. Raju	Assistant Professor	Department of Physics

Recommended by Board of Studies	Date: 12-10-2023	Syllabus version	1
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

231GEB201T	ENVIRONMENTAL SCIENCE FOR COMPUTING SCIENCES (Common to CSE, IT, CS, AIML and AI & DS)	Periods per week				Credits
		L	**T**	**P**	**R**	
Regulation - R23		2	0	0	0	**2**

SCHEME OF EXAMINATION						
Duration of End Semester Examination in Hours	Maximum Marks - 100			Minimum Marks for Pass - 50		
	Weightage			Weightage		Overall
	Continuous Assessment Examination	End Semester Examination		Continuous Assessment Examination	End Semester Examination	
3	40 %	60 %		-	45%	50%

PREREQUISITES: NIL

COURSE OBJECTIVES:

1.	To provide a basic understanding about the Ecology and Environmental agreements.
2.	To explain various natural resources and its conservation.
3.	To apply engineering knowledge to solve environmental pollution and its global issues.
4.	To analyze the concepts of various geospatial technology.
5.	To apply the geospatial technology in environmental aspects.

COURSE OUTCOMES (COs):

Upon completion of this course, student will be able to:		Bloom's level
CO1:	Analyze various threats to biodiversity, its conservation and environmental agreements.	K4, Analyze
CO2:	Select a suitable method to conserve natural resources for sustainable development.	K4, Analyze
CO3:	Apply necessary steps for pollution prevention, global issues and disaster management.	K3, Apply
CO4:	Analyze the various tools used in the geospatial technology	K4, Analyze
CO5:	Apply the geospatial technology in environmental studies	K3, Apply

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)

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

3 – High : 2 - Medium : 1– Low : '-' - No correlation

UNIT	TITLE	PERIODS
I	**Ecological biodiversity and its agreement**	6

Definition and scope of an environment – ecosystem (biotic and abiotic components) – ecological succession – food chain, food web – values of biodiversity – threats to biodiversity – conservation of biodiversity: In-situ and Ex-situ.

Environmental Conventions and Agreements: Stockholm Conference on Human Environment 1972, Montreal Protocol, 1987, Conference of Parties (COPs, Kyoto Protocol, 1997, Clean Development Mechanism (CDM)

UNIT	TITLE	PERIODS
II	**Natural resources and its conservation**	6

Natural resources – types - Forest resources - Uses and over exploitation - Water Resources – Uses and over utilization - Water conservation- Rain Water Harvesting- Watershed Management – Mineral resources –Uses and Exploitation (Al, Cu, Fe), Food resources- World food problems - Effects of modern agriculture - Role of an individual in conservation of natural resources.

UNIT	TITLE	PERIODS
III	**Environmental Pollution and Global Issues**	6

Environmental pollution- types, causes, effects and controls; Air, water, soil - classification of pollutants based on solubility - hydrophilic, hydrophobicand lipophilic pollutants; Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.

Pollution Tragedies: Love canal, Bhopal Gas, Minamata and Flint water and chernobyl – Disaster management: cyclone and earthquake.

UNIT	TITLE	PERIODS
IV	**GEOSPATIAL TECHNOLOGY**	6

Remote Sensing: Introduction, definition, fundamentals, Sensors, Active and passive remote sensing; data products, remote sensing satellites, Indian remote sensing satellite system (IRS).
GIS: Introduction, components, functions, types of GIS, Data structures in GIS-Raster and Vector data analysis-advantages and disadvantages.

GPS: Introduction, functions and segments of GPS, factors affecting GPS data.

UNIT	TITLE	PERIODS
V	**GEOSPATIAL TECHNOLOGY IN ENVIRONMENTAL STUDIES**	6

Application of Geospatial Technology: Watershed studies, Flood studies, Health Issues, Utility studies, Security and Defense studies, Urban and infrastructure development studies, Disaster management.

TOTAL PERIODS:	30

TEXT BOOKS:

1.	Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, 2006.
2.	Ravikrishnan. A, Environmental Science & Engineering, Sri Krishna Publications, (New Edition).
3.	Joseph G. Fundamentals of remote sensing. Universities Press, Hyderabad.2003.

REFERENCE BOOKS:

1.	Elliott, D. 1997. Sustainable Technology. Energy, Society and Environment (Chapter 3). New York, Routledge Press.
2.	R.K. Trivedi, 'Handbook of Environmental Laws, Rules, Guidelines,Compliances and Standards', Vol. I and II, Enviro Media.
3.	Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press 2005.
4.	Lillisand, T. M. and Keifer, R. W. (2007). Remote sensing and image interpretation. John Willey and Sons, USA.
5.	Barrett, E. C. and Curtis, L. F. (1999). Introduction to environmental remote sensing. Chapman and Hall Publishers, USA.

WEBSITES:

1.	https://www.sciencedirect.com/journal/journal-of-environmental-management
2.	https://journals.e-palli.com/home/index.php/ajgt

JOURNALS:

1.	Journal of Environmental Management
2.	Environmental Science & Policy.
3.	American Journal of Geospatial Technology

COURSE DESIGNERS

1.	Dr. C. Ravichandran	Professor and Head	Chemistry
2.	Dr. R. Anitha devi	Assistant Professor	Chemistry
3.	Dr. D. Sivasankaran	Assistant Professor	Chemistry
4.	Dr. K. Saravanan	Associate Professor	Chemistry

Recommended by Board of Studies	Date: 12.10.2023	Syllabus version	1.0
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

231CSC201T	PROGRAMMING IN C	Periods per week				Credits
	(Common to B.E Computer Science Engineering, B.Tech Information Technology and B.Tech Artificial Intelligence and Data Science)	L	T	P	R	
Regulation - R23		3	0	0	0	3

SCHEME OF EXAMINATION						
Duration of End Semester Examination in Hours	Maximum Marks - 100			Minimum Marks for Pass - 50		
	Weightage			Weightage		
	Continuous Assessment Examination	End Semester Examination		Continuous Assessment Examination	End Semester Examination	Overall
3	40 %	60 %		-	45%	50%

PREREQUISITES:
Nil

COURSE OBJECTIVES:

1.	Learn to think logically and write pseudo code or draw flow charts for problems.
2.	Be exposed to the syntax of C.
3.	To develop C Programs using basic programming constructs.
4.	Learn to use arrays and strings in C.
5.	To develop applications in C using functions , pointers and structures
6	To do input/output and file handling in C

COURSE OUTCOMES (COs):

Upon completion of this course, student will be able to:	Bloom's level
CO1: Execute simple programs using basic C programming concepts.	K3
CO2: Apply arrays and strings for simple application development.	K3
CO3: Solve complex problems using functions and pointers.	K3
CO4: Organize heterogeneous data with structures and unions.	K4
CO5: Select suitable file access techniques for data processing.	K5

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)

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

3 – High   :   2 - Medium   :   1 – Low   :   '-' - No correlation

UNIT	TITLE	PERIODS
I	**C PROGRAMMING BASICS**	9

Introduction- Algorithm – Flow Charts – Pseudo Code - Structure of a C program – compiling and linking processes – Character set - Constants, Variables – Data Types – Expressions using operators in C – Managing Input and Output operations – Decision Making and Branching – Looping statements.

UNIT	TITLE	PERIODS
II	**ARRAYS AND STRINGS**	9

Arrays: Initialization – Declaration – Accessing the array elements – Operations on arrays- One dimensional array - two dimensional arrays – Strings: String operations – String Arrays - Simple programs: sorting- searching – matrix operations.

UNIT	TITLE	PERIODS
III	**FUNCTIONS AND POINTERS**	9

Functions: Introduction - Function prototype - function definition - function call and return statements – Recursive functions. Parameter passing: Pass by value - Pass by reference. Pointers: Pointer operators – Declaring the pointer variable - Pointer arithmetic Null pointer- Arrays and pointers – Array of pointers.

UNIT	TITLE	PERIODS
IV	**STRUCTURES AND UNIONS**	9

Structures: Introduction - Need for structures –definition and declaration – Structure within structure – Structures and functions – Union: Definition and Declaration – Accessing the members of union - Programs using Structures and Unions – Scope of variables - Storage classes - Preprocessor directives.

UNIT	TITLE	PERIODS
V	**FILE HANDLING**	9

Introduction – Using files in C - File operation: Read data from files, writing data to files, detecting the end of file, Functions for selecting a record randomly – File pointer – Error handling - Types of file processing: Sequential access, Random access- Dynamic memory allocation.

	TOTAL PERIODS:	45

TEXT BOOKS:	
1.	Balagurusamy E — Programming in ANSI C, McGraw Hill Publication, Eighth Edition, 2019.

2.	Herbert Schildt — The Complete Reference C, McGraw Hill Education, Fourth Edition , 2017
3.	Reema Thareja, —Programming in C, Oxford University Press, Second Edition, 2016.

REFERENCE BOOKS:

1.	Byron S. Gottfried, "Schaum's Outline of Theory and Problems of Programming with C", McGraw-Hill Education, 1996.
2.	Pradip Dey, Manas Ghosh, —Fundamentals of Computing and Programming in C, First Edition, Oxford University Press, 2009.
3.	Paul Deitel and Harvey Deitel, —C How to Program, Seventh edition, Pearson Publication
4.	Juneja, B. L and Anita Seth, —Programming in C, CENGAGE Learning India pvt. Ltd., 2011.
5.	Kernighan, B.W and Ritchie, D.M, —The C Programming language, Second Edition, Pearson Education, 2006.

WEBSITES:

1.	www.w3schools.com/c
2.	https://www.programiz.com/c-programming

JOURNALS:

1.	Nil

EXTENSIVE READER:

1.	Nil

COURSE DESIGNERS

1.	Dr G S Anandha Mala	Professor	Computer Science and Engineering
2.	Dr S Ahamed Ali	Assistant Professor	Computer Science and Engineering
3.	Dr A Arockia Abins	Assistant Professor	Computer Science and Engineering
4.	Dr J Deepa	Associate Professor	Computer Science and Engineering
5	Dr V Balaji	Associate Professor	CSE (Cyber Security)

Recommended by Board of Studies	Date: 20-10-2023	Syllabus version	1
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

231GEH201T	Tamils and Technology /தமிழரும் தொழில்நுட்பமும் (Common to all branches of Engineering and Technology)	Periods per week				Credits
		L	T	P	R	
Regulation - R23		1	0	0	0	1

SCHEME OF EXAMINATION						
Duration of End Semester Examination in Hours	Maximum Marks - 100			Minimum Marks for Pass - 50		
	Weightage			Weightage		
	Continuous Assessment Examination	End Semester Examination		Continuous Assessment Examination	End Semester Examination	Overall
3	40 %	60 %		-	45%	50%

PREREQUISITES:

Nil

COURSE OBJECTIVES:

1.	தமிழர்கள் நெசவு மற்றும் பானைத் தொழிற்நுட்பங்களில் சிறந்து விளங்கியிருப்பதை அறிய வைத்தல்/ To know that Tamils have excelled in weaving and pottery techniques.
2.	கட்டிட வடிவமைப்பு மற்றும் கட்டிடத் தொழிற்நுட்பங்களில் தமிழர்கள் சிறந்து விளங்கியதை எடுத்துக்காட்டுகளுடன் அறிய வைத்தல்./ To Exemplify Tamil excellence in architectural design and construction techniques.
3.	கப்பல் கட்டுதல், இரும்புத் தொழில், நாணயம் அச்சிடுதல், மணி தயாரித்தல் போன்ற உற்பத்தித் தொழிற்நுட்பங்களில் தமிழர்கள் திறனுற்று விளங்கியதை அறிய வைத்தல்/ To show that Tamils were skilled in manufacturing techniques such as ship building, iron industry, coin minting, bell making etc.
4.	அணை, ஏரி, குளம், கிணறு போன்றவற்றை வடிவமைத்தல் மூலமாகவும் பராமரித்தல் மூலமாகவும் தமிழர்கள் வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழிற்நுட்பத்தில் சிறந்து விளங்கியதை அறிய வைத்தல்/ To promote Tamil excellence in agriculture and irrigation technology through design and maintenance of dams, streams, ponds, wells etc.
5.	அறிவியல் தமிழ் மற்றும் கணித் தமிழ் வளர்ச்சியையும் தமிழ் மென்பொருள் உருவாக்கம் பற்றியும் அறிய வைத்தல்/ To know about Scientific Tamil and Digital Tamil development and Tamil software development.

COURSE OUTCOMES (COs):

	இந்தப் பாடத்தினை கற்று முடிக்கும்போது, மாணவர்கள் கீழ்க்கண்டவற்றை பற்றி அறிந்திருப்பார்கள்:. Upon completion of this course, students will be aware of the following:	Bloom's level
CO1:	தமிழர்கள் நெசவு மற்றும் பானைத் தொழிற்நுட்பங்களில் சிறந்து விளங்கியிருப்பதைப் பற்றி./ About Tamils excelling in weaving and pottery techniques.	K2
CO2:	கட்டிட வடிவமைப்பு மற்றும் கட்டிடத் தொழிற்நுட்பங்களில் தமிழர்கள் சிறந்து விளங்கியது பற்றி./ About the excellence of Tamils in architectural design and construction techniques.	K2
CO3:	கப்பல் கட்டுதல், இரும்புத் தொழில், நாணயம் அச்சிடுதல், மணி தயாரித்தல் போன்ற உற்பத்தித் தொழிற்நுட்பங்களில் தமிழர்கள் திறனுற்று விளங்கியதைப் பற்றி./ About Tamils becoming proficient in manufacturing techniques like ship building, iron industry, coinage, bell making etc.	K2
CO4:	அணை, எரி, குளம், கிணறு போன்றவற்றை வடிவமைத்தல் மூலமாகவும் பராமரித்தல் மூலமாகவும் தமிழர்கள் வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழிற்நுட்பத்தில் சிறந்து விளங்கியதைப் பற்றி./ About how Tamils excelled in agriculture and irrigation technology by designing and maintaining dams, streams, ponds, wells etc.	K2
CO5:	அறிவியல் தமிழ் மற்றும் கணித தமிழ் வளர்ச்சி பற்றியும் தமிழ் மென்பொருள் உருவாக்கம் பற்றியும் / About Development of Scientific Tamil and Digital Tamil and Tamil Software Development	K2

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

3 – High : 2 - Medium : 1 – Low   : '-' - No correlation

UNIT	TITLE	PERIODS
I	**WEAVING AND CERAMIC TECHNOLOGY / நெசவு மற்றும் பானைத் தொழில்நுட்பம்**	3
	Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries	
	சங்க காலத்தில் நெசவுத் தொழில் - பானைத் தொழில்நுட்பம் - கருப்பு சிவப்பு பாண்டங்கள் - பாண்டங்களில் கீறல் குறியீடுகள்.	
UNIT	TITLE	PERIODS
II	**DESIGN AND CONSTRUCTION TECHNOLOGY / வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்**	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.	

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

UNIT	TITLE	PERIODS
III	**MANUFACTURING TECHNOLOGY / உற்பத்தித் தொழில் நுட்பம்**	3

Art of Ship Building - Metallurgical studies - Iron industry - Iron smelting, steel -Copper and goldCoins 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.

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

UNIT	TITLE	PERIODS
IV	**AGRICULTURE AND IRRIGATION TECHNOLOGY / வேளாண்மை மற்றும் தீர்ப்பாசனத் தொழில் நுட்பம்**	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.

அணை, எரி, குளங்கள், மதகு - சோழர்காலக் குமுத் நூம்பின் முக்கியத்துவம் - கால்நடை பராமரிப்பு - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள் - கடல்சார் அறிவு - மீன்வளம் - முத்து மற்றும் முத்துக்குளித்தல் - பெருங்கடல் குறித்த பண்டைய அறிவு - அறிவுசார் சமூகம்.

UNIT	TITLE	PERIODS
V	**SCIENTIFIC TAMIL & TAMIL COMPUTING / அறிவியல் தமிழ் மற்றும் கணித்தமிழ்**	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.

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

TOTAL PERIODS:	15

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

	COURSE DESIGNERS
1.	Anna University, Chennai

Recommended by Board of Studies	Date:	Syllabus version	-
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

231CYB011L	CHEMISTRY LABORATORY	Periods per week				Credits
	(Common to all branches of Engineering and Technology)	L	T	P	R	
Regulation - R23		0	0	2	0	1

SCHEME OF EXAMINATION

Duration of End Semester Examination in Hours	Maximum Marks - 100		Minimum Marks for Pass - 50		
	Weightage		Weightage		Overall
	Continuous assessment Examination	End Semester Examination	Continuous assessment Examination	End Semester Examination	
3	60 %	40 %	-	45%	50%

PREREQUISITES:
Nil

COURSE OBJECTIVES:	
1.	To acquire practical skills in the determination of water quality parameters.
2.	To impart the students with the determination of the molecular weight of the polymer by using a viscometer.

COURSE OUTCOMES (COs):	
Upon completion of this course, student will be able to:	Bloom's level
CO1: Determine the water quality parameters like hardness and DO content.	K3, Apply
CO2: Calculate the molecular weight and classify the polymers.	K3, Apply
CO3: Estimate the strength of acids using instrumental techniques.	K3, Apply
CO4: Analyze the alkalinity parameters of water.	K4, Analyze

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)												
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	-	1	-	-	-	-	1
CO2	3	2	-	-	-	-	1	-	-	-	-	1
CO3	3	2	-	-	-	-	1	-	-	-	-	1
CO4	3	2	-	-	-	-	1	-	-	-	-	1
3 – High : 2 - Medium : 1 – Low : '-' - No correlation												

List of experiments: (Any Five Experiments)

1. Determination of alkalinity in the given water sample
2. Estimation of total, temporary & permanent hardness of water by EDTA method
3. Determination of chloride content of water sample by Argentometric method
4. Find the molecular weight of PVA using Ostwald viscometer
5. Determine the strength of given strong acid using pH meter
6. Evaluate the strength of acids in a mixture by conductometric titration
7. Estimation of Fe^{2+} by Potentiometric titration
8. Determination of BOD and COD in water sample

Content beyond the syllabus: (Any one)

9. Demonstrate the of DO Content of water sample by Wrinkler method
10. Estimation of Iron content of water sample using spectrophotometer (1,10 – Phenanthroline/ thiocyanate method)

TOTAL PERIODS:	30

TEXT BOOKS:

1.	Dr. C. Ravichandran, "Engineering Chemistry Laboratory" Global publications, India, (2020)
2.	Furniss B.S. Hannaford A.J, Smith P.W.G and Tatchel A.R., "Vogel's Textbook of practical organic chemistry, LBS Singapore (1994)

COURSE DESIGNERS

1.	Dr. C. Ravichandran	Professor	Chemistry
2.	Dr. R. Anithadevi	Assistant Professor	Chemistry
3.	Dr. V.Vanitha	Assistant Professor	Chemistry

Recommended by Board of Studies	Date: 12.10.2023	Syllabus version	1.0
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

231GES011L	**BASIC WORKSHOP PRACTICE**	Periods per week				Credits
	(Common to all branches of Engineering and Technology)	L	T	P	R	
Regulation - R23		0	0	2	0	1

SCHEME OF EXAMINATION

Duration of End Semester Examination in Hours	Maximum Marks - 100		Minimum Marks for Pass - 50		
	Weightage		Weightage		Overall
	Continuous Assessment Examination	End Semester Examination	Continuous Assessment Examination	End Semester Examination	
3	60 %	40 %	-	45%	50%

PREREQUISITES:
Nil

COURSE OBJECTIVES:	
1.	To provide exposure to the students with the concepts involved in product realization by carrying out basic workshop exercises.
2.	Hands-on practice with exercises and assembly leading to realization of a new product in a group

COURSE OUTCOMES (COs):		
Upon completion of this course, student will be able to:		Bloom's level
CO1:	Prepare the pipe connections using pipes and joints	Apply
CO2:	Prepare welding joints using arc welding.	Apply
CO3:	Make carpentry joints.	Apply
CO4:	Prepare objects using sheet metal.	Apply

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)												
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	1	-	1	3	1	2	2	-	1	3
CO2	3	-	1	-	1	3	1	2	2	-	1	3
CO3	3	-	1	-	1	3	1	2	2	-	1	3
CO4	3	-	1	-	1	3	1	2	2	-	1	3
3 – High : 2 - Medium : 1 – Low : '-' - No correlation												

LIST OF EXPERIMENTS

PART A - CIVIL ENGINEERING PRACTICE

Plumbing Works:

1. Study of pipeline joints, its location and functions: Valves, Taps, Couplings, Unions, Reducers, Elbows in house hold fittings.
2. Connection of PVC pipes
3. Basic pipe connections involving the fitting like Valves, Taps and Bends

Carpentry works:

4. Study of the joints in Roofs, Doors, Windows and Furniture.
5. Cross Lap joint
6. Dove Tail Joint

PART B - MECHANICAL ENGINEERING PRACTICE

Welding:

7. Introduction to Welding
8. Arc welding of Butt joints, Tap joints and Tee joints.
9. Gas welding practice

Sheet metal work:

10. Introduction to sheet metal
11. Rectangular tray making
12. Funnel making

Group Task: Model house creation using plumbing and carpentry tools.

TOTAL PERIODS:	30

TEXT BOOKS:	
1.	Hajara Choudhary, Bose S K, Elements of Workshop Technology Vol I and II, Asia Publishing House.

REFERENCE BOOKS:	
1.	Rao P N, Manufacturing Technology and Foundry, Forming and Welding, Tata McGrawHill publishing Company
2.	Parmar R S, Welding Process and Technology, Khanna Publisher.
3.	Jain R K, Production Technology, Khanna Publisher

WEBSITES:	
1.	https://pdf.usaid.gov/pdf_docs/PNAAM100.pdf
2.	https://content.kopykitab.com/ebooks/2016/06/7478/sample/sample_7478.pdf

JOURNALS:	
1.	https://www.irjet.net/archives/V6/i4/IRJET-V6I4824.pdf
2.	https://www.sciencedirect.com/science/article/pii/S2352710223012688

COURSE DESIGNERS			
1.	Dr. M. Vetrivel Sezhian	Professor	Mechanical Engineering
2.	Dr. A. Praveen Kumar	Assistant Professor	Mechanical Engineering

Recommended by Board of Studies	Date: 16-11-2023	Syllabus version	
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

231GES013L	**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY** (Common to AI&DS, Automobile, BioTech, Civil, CSBS, CSD, CSE (AIML), CSE (CS), Mechanical, IT)	Periods per week				Credits
		L	T	P	R	
Regulation - R23		0	0	4	0	2

SCHEME OF EXAMINATION

Duration of End Semester Examination in Hours	Maximum Marks - 100			Minimum Marks for Pass - 50		
	Weightage			Weightage		
	Continuous assessment Examination	End Semester Examination		Continuous assessment Examination	End Semester Examination	Overall
3	60 %	40 %		-	45%	50%

PREREQUISITES: NIL

COURSE OBJECTIVES:	
1.	To train the students in residential wiring.
2.	To gain practical knowledge in performance characteristics of analog devices
3.	To acquire exposure in combinational circuits

COURSE OUTCOMES (COs):

Upon completion of this course, student will be able to:		Bloom's level
CO1:	Carry out the simple electrical wiring of a residential building.	Apply
CO2:	Measure the electrical quantities using Energy meter and Megger	Apply
CO3:	Calculate the voltage and current parameters of given circuits using Kirchhoff's Laws.	Apply
CO4:	Analyze the characteristics of analog devices.	Analyze
CO5:	Construct combinational circuits with logic gates.	Apply

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	-	-	-	-	-	1	-	-	1
CO2	3	2	2	-	-	-	-	-	1	-	-	1
CO3	3	2	2	-	-	-	-	-	1	-	-	1
CO4	3	2	2	-	-	-	-	-	1	-	-	1
CO5	3	2	2	-	-	-	-	-	1	-	-	1
3 – High : 2 - Medium : 1 – Low : '-' - No correlation												

	LIST OF EXPERIMENTS
1.	Fluorescent Lamp wiring.
2.	Staircase wiring.
3.	Fabricate and test a PCB layout for a given circuit.
4.	Study of Single-Phase Energy meter.
5.	Study of earth resistance measurement using Megger.
6.	Verification of Kirchhoff's Laws.
7.	Characteristics of PN and Zener Diodes.
8.	Characteristics of BJT.
9.	Half wave and Full Wave rectifiers.
10.	Study of Logic Gates.
11.	Implementation of Binary Adder and Subtractor.
12.	Characteristics of the LVDT.

TOTAL PERIODS:	**60**

REFERENCE BOOKS:	
1.	Mittle V.N, Arvind Mittal, "Basic Electrical Engineering", Tata Mc Graw Hill (India), Second Edition, 2013.
2.	Sedha R.S., "A Text Book of Applied Electronics", S. Chand & Co., 2014

COURSE DESIGNERS

1.	Dr. M. Sujatha	Assistant Professor	EEE
2.	Mrs. D. Chandrakala	Assistant Professor	EEE
3.	Mrs. K. A. Indu Sailaja	Assistant Professor	EEE

Recommended by Board of Studies	Date: 30.10.2023	Syllabus version	1
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6

231CSC211L	**C PROGRAMMING LABORATORY** (Common to CSE, IT, CSE (AIML), CSE (CS) and AI-DS)	Periods per week				Credits
		L	T	P	R	
Regulation - R23		0	0	4	0	2

SCHEME OF EXAMINATION					
Duration of End Semester Examination in Hours	Maximum Marks - 100		Minimum Marks for Pass - 50		
	Weightage		Weightage		Overall
	Continuous Assessment Examination	End Semester Examination	Continuous Assessment Examination	End Semester Examination	
3	60 %	40 %	-	45%	50%

PREREQUISITES:

Nil

COURSE OBJECTIVES:

1.	To develop programs in C using basic constructs.
2.	To develop applications in C using strings and pointers.
3.	To develop applications in C using functions and structures.
4.	To develop applications in C using file processing.
5.	To develop simple project using C

COURSE OUTCOMES:	Bloom's level
Upon completion of this course, student will be able to:	
CO1: Develop simple programs using basic constructs in C programming.	K5
CO2: Develop C programs for simple applications making use of arrays and strings.	K5
CO3: Implement modular programming with functions.	K3
CO4: Build programs with storage classes and pointers for memory management.	K6
CO5: Construct programs with user defined data types.	K6
CO6: Design applications using file processing techniques.	K5

MAPPING OF COURSE OUTCOMES (CO) WITH PROGRAMME OUTCOME (PO)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	3	1	1	1	2	2	3	2
CO2	3	3	3	3	3	2	2	2	2	2	3	2
CO3	3	3	3	3	3	2	2	2	3	3	3	2
CO4	3	3	3	3	3	2	2	2	3	3	3	2
CO5	3	3	3	2	3	1	1	2	2	3	3	2
CO6	3	3	3	2	3	1	1	2	2	3	3	2

3 – High : 2 - Medium : 1 – Low : '-' - No correlation

LIST OF EXPERIMENTS

1.	Programs using only I/O functions.
2.	Programs to study operators and data types.
3.	Programs based on control structures (IF, SWITCH CASE).
4.	Programs using FOR and WHILE loops.
5.	Programs using single dimensional arrays.
6.	Programs using multi dimensional arrays.
7.	Programs on Sorting and Searching using arrays.
8.	Programs based on String manipulations.
9.	Programs based on User Defined Functions.
10.	Programs using Functions with Parameters.
11.	Programs using Storage Classes.
12.	Programs to introduce Pointers.
13.	Programs using Structures and Union.
14.	Programs using Array of Structures.
15.	Programs based on Files.
16.	Mini Project
TOTAL PERIODS:	**60**

CONTENT BEYOND SYLLABUS

1.	Programs using basic graphic functions
2.	Programs using Conditional Compilation directives

LIST OF EQUIPMENTS:		
1.	**HARDWARE**:	
	• Standalone desktops. 30nos.	
2.	**SOFTWARE**	
	• GCC Compiler , Turbo C or equivalent	

COURSE DESIGNERS

1.	Dr G S Anandha Mala	Professor	Computer Science and Engineering
2.	Dr S Ahamed Ali	Assistant Professor	Computer Science and Engineering
3.	Dr A Arockia Abins	Assistant Professor	Computer Science and Engineering
4	Dr J Deepa	Associate Professor	Computer Science and Engineering
5.	Dr V Balaji	Associate Professor	CSE (Cyber Security)

Recommended by Board of Studies	Date: 20-10-2023	Syllabus version	1
Approved by the Academic Council	Date: 24-01-2024	Meeting No.	6