



SRI VENKATESWARA COLLEGE OF ENGINEERING

(An Autonomous Institution, Affiliated to Anna University, Chennai – 600025)

B.E. Civil Engineering

CURRICULUM AND SYLLABUS REGULATION – 2022 CHOICE BASED CREDIT SYSTEM

Curriculum Revision No:	00	Board of Studies recommendation date :	03.10.2022	Academic Council Approved date:	08.10.2022
Salient Points of the revision	01.				
	02.				
	03.				
	04.				
	05.				

SRI VENKATESWARA COLLEGE OF ENGINEERING

(An Autonomous Institution, Affiliated to Anna University, Chennai – 600025)

REGULATIONS 2022

B. E. CIVIL ENGINEERING

CHOICE BASED CREDIT SYSTEM

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

Civil Engineering graduates during the first few years of graduation will:

- I. Practice civil engineering in construction industry, public sector undertaking or as an entrepreneur by applying ethical principles and following norms of civil engineering practice. (Technical Competence)
- II. Pursue higher education for professional development. (Life-long Learning)
- III. Exhibit leadership and team working skills in their profession and other activities with demonstrable attributes to contribute to the societal needs and to adapt to the changing global scenario. (Professionalism)

PROGRAM OUTCOMES (POs)

PO GRADUATE ATTRIBUTES

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals and concepts of Civil Engineering to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions for complex problems.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional

- engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
 9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
 10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
 11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
 12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

Students in the Civil Engineering program should, at the time of their graduation, be able to

1. Provide solutions for real life problems related to core areas of civil engineering by applying knowledge of mathematics, Basic and Engineering Sciences and by using appropriate engineering tools.
2. Plan, analyse, design, execute and manage infrastructure projects considering safety, societal and environmental factors.

PEOs – POs & PSOs MAPPING:

POs/PSOs	PEOs		
	I	II	III
PO 1	3	2	
PO 2	3	2	
PO 3	3	2	
PO 4	3		
PO 5	3		
PO 6	2		
PO 7	2		
PO 8	3		
PO 9	3		3
PO 10	2	2	
PO 11	3		3
PO 12	1	3	
PSO 1	3	2	2
PSO 2	3		3

SRI VENKATESWARA COLLEGE OF ENGINEERING,
(An Autonomous Institution, Affiliated to Anna University, Chennai – 600025)

REGULATIONS 2022
CHOICE BASED CREDIT SYSTEM

B. E. CIVIL ENGINEERING

**CURRICULUM FOR SEMESTERS I TO II AND SYLLABI FOR
SEMESTERS I AND II**

SEMESTER I

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK				TOTAL Hours	Prerequisite	Position
				L	T	P	C			
1.	IP22151	Induction Programme (Common to all Branches)		-	-	-	-	-	-	-
Theory Subjects										
2.	HS22151	Tamil language and Heritage of Ancient Tamil Society (Common to all branches)	HS	1	0	0	1	15	NIL	F
3.	HS22152	Communicative English (Common to all Branches)	HS	3	0	0	3	45	NIL	F
4.	MA22151	Applied Mathematics I (Common to all Branches except MR)	BS	3	1	0	4	60	NIL	F
5.	PH22152	Engineering Physics (Common to AE, CE, ME, MN, MR)	BS	3	0	0	3	45	NIL	F
6.	CY22153	Technical Chemistry (Common to BT, CH, CE)	BS	3	0	0	3	45	NIL	F
7.	CE22101	Engineering Geology and Construction Materials	PC	3	0	0	3	45	NIL	F
8.	CE22102	Engineering Drawing for Civil Engineers	ES	1	0	4	3	75	NIL	F
Practical Subjects										
9.	PH22161	Physics Laboratory (Common to all Branches except BT)	BS	0	0	2	1	30	NIL	F
10.	CY22161	Chemistry Laboratory (Common to all	BS	0	0	2	1	30	NIL	F

		Branches except AD, CS, IT)								
11.	ME22161	Basic Civil and Mechanical Engineering Laboratory (Common to CE, EE, EC)	ES	0	0	2	1	30	NIL	F
Total				17	1	10	23	420		

SEMESTER II

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK				TOTAL Hours	Prerequisite	Position
				L	T	P	C			
Theory Subjects										
1.	HS22251	Science and Technology in Ancient Tamil Society (Common to all Branches)	HS	2	0	0	2	30	NIL	F
2.	HS22252	Technical English (Common to all Branches)	HS	3	0	0	3	45	NIL	F
3.	MA22251	Applied Mathematics II (Common to all Branches except MR)	BS	3	1	0	4	60	NIL	F
4.	IT22251	Computer Programming and Practice (Common to AE, BT, CE, CH)	ES	2	0	2	3	60	NIL	F
5.	EE22151	Basic Electrical and Electronics Engineering (Common to all Branches except CH, EE, EC)	ES	3	0	0	3	45	NIL	F
6.	CE22201	Building Planning and Drawing	PC	2	0	2	3	60	NIL	F
7.	CE22202	Engineering Mechanics for Civil Engineers	ES	3	1	0	4	60	NIL	F
Practical Subjects										
8.	EE22111	Basic Electrical and Electronics Engineering Laboratory (Common to all Branches except EC)	ES	0	0	2	1	30	NIL	F
9.	CE22211	Construction Materials Laboratory	PC	0	0	2	1	30	NIL	F
Total				18	2	8	24	420		

HS22151

தமிழ் மொழியும் தமிழர் மரபும்
TAMIL LANGUAGE AND HERITAGE OF ANCIENT
TAMIL SOCIETY
(Common to all branches)

L	T	P	C
1	0	0	1

OBJECTIVES:

பாடத்தின் நோக்கங்கள்:

1. They will learn about the origin of the Tamil language and the ways of life through five types of lands.
2. They will also learn about the contribution of Tamils in the Indian National Freedom Movement and the management methods of Tamils.
1. தமிழ் மொழியின் தோற்றம் பற்றியும், திணை கருத்துக்கள் வாயிலாக வாழ்வியல் முறைகளை பற்றியும் கற்றுக் கொள்வார்கள்.
2. இந்திய தேசிய சுதந்திர இயக்கத்தில் தமிழர்களின் பங்களிப்பு மற்றும் தமிழர்களின் மேலாண்மை முறைகளை பற்றியும் கற்றுக் கொள்வார்கள்.

UNIT I LANGUAGE AND HERITAGE

அலகு 1 தமிழுக்கும் தொழில்நுட்பக் கல்விக்கும் உள்ள தொடர்பு 3

Language families in India – Dravidan Languages – Tamil as a Classical language – Classical Literature in Tamil – Contribution of U. Ve. Saminathaiyar. Arumuka Navalar – Importance of Tamil language in technical education.

மொழி மற்றும் பாரம்பரியம்: இந்தியாவில் உள்ள மொழிக் குடும்பங்கள் – திராவிட மொழிகள் – தமிழ் ஒரு செம்மொழி – தமிழில் செம்மொழி இலக்கியம் - உ.வே.. சாமிநாதய்யர். ஆறுமுகநாவலர் ஆகியோரின் பங்களிப்பு – தொழில் நுட்பக் கல்வியில் தமிழ் மொழியின் முக்கியத்துவம்.

UNIT II THINAI CONCEPTS

அலகு 2 திணை கருத்துக்கள் 9

Five types of lands, animals, Gods, occupation, life styles, music, dance , food style, Floara and Fauna of Tamils - Agam and puram concept from Tholkappiyam and Sangam Literature – Aram concept of Tamil – Education and Literacy during Sangam Age – Ancient cities and Ports of Sangam Age – Export and Import during Sangam Age - Overseas Conquest of Cholas

திணை கருத்துக்கள்: -ஐந்து வகை நிலங்கள், விலங்குகள், கடவுள்கள், தொழில், வாழ்க்கை முறைகள், இசை, நடனம், உணவு முறை, தமிழர்களின் தாவரங்கள் மற்றும் விலங்கினங்கள் – தொல்காப்பியம் மற்றும் சங்க இலக்கியங்களில் இருந்து அகம் மற்றும் புரம் கருத்து – தமிழ் பற்றிய அறம் கருத்து – கல்வி மற்றும் எழுத்தறிவு சங்க காலம் – சங்ககாலத்தின் பண்டைய நகரங்கள் மற்றும் துறைமுகங்கள் – சங்க காலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி – சோழர்களின் வெளிநாட்டு வெற்றி.

UNIT III HERITAGE OF TAMILS

3

அலகு 3 தமிழரின் மரபு

Contribution of Tamils to Indian National Freedom Movement and Indian Culture : Contributions of Subramanya Bharathi, Vanchinathan, Subramaniya Siva, Veerapandiya Kattabomman, V O Chidambaram Pillai, Dheeran Chinnamalai, The Maruthu Pandiyar, Puli Thevar, Tiruppur Kumaran, Veera Mangai Velunachiyar

இந்திய தேசிய சுதந்திர இயக்கம் மற்றும் இந்திய கலாச்சாரத்திற்கு தமிழர்களின் பங்களிப்பு:- சுப்ரமணிய பாரதி, வாஞ்சிநாதன், சுப்பிரமணிய சிவா, வீரபாண்டிய கட்ட பொம்மன், வா.ஊ சிதம்பரம் பிள்ளை, தீரன் சின்னமலை, மருது பாண்டிய சகோதரர்கள், பூலி தேவர், திருப்பூர் குமரன், வீரமங்கை வேலு நாச்சியார் - ,தமிழர் இலக்கியங்களில் மேலாண்மை கருத்துக்கள் (கி. மு. 500 முதல் கி. பி 200 வரை) – அகநானூறு, புறநானூறு, திருக்குறள் ஆகியவற்றில் மேலாண்மைக் கருத்துகள்.

TOTAL : 15 PERIODS

OUTCOMES :

பாடநெறி முடிவுகள் :

CO	CO statements	RBT level
CO1	Upon successful completion of the course, the students should be able to படிப்பை வெற்றிகரமாக முடித்தவுடன், மாணவர்கள் பின்வருவனவற்றைச் செய்ய முடியும்.	
CO1	Students will learn about the origin of the Tamil language மாணவர்கள் தமிழ் மொழித் தோற்றம் பற்றித் தெரிந்து கொள்வார்கள்.	1
CO2	They will know the ways of life of Tamils. தமிழர்களின் வாழ்வியல் முறைகளைத் தெரிந்து கொள்வார்கள்.	2
CO3	They will know about the freedom fighters of Tamils and the management of Tamils தமிழர்களின் சுதந்திர போராட்ட வீரர்களை பற்றியும், மேலாண்மைகளை பற்றியும் தெரிந்து கொள்வார்கள்.	2

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

TEXT BOOKS:

பாடநூல்கள்:

1. பொன். முத்துகுமாரன் (2002), "தமிழ் மரபு", காந்தளகம், 68, அண்ணா சாலை, சென்னை 600 002
2. பி. டிபுளினிவாச ஜயங்கார் (தமிழ்க்கமும் திறனாய்வும்) புலவர் கா. கோவிந்தன் (1988), "தமிழர் வரலாறு (முதல் பகுதி)", திருநெல்வேலி தென்னிந்திய சைவ சித்தாந்த நூற்பதிப்பு கழகம் ,154, TTK சாலை, சென்னை 18.
3. டாக்டர். கே. கே. பிள்ளை (2009), "தமிழக வரலாறு மக்களும் பண்பாடும்", உலக தமிழாராய்ச்சி நிறுவனம், தரமணி , சென்னை 600113
4. முனைவர். ச. இராஜேந்திரன் (2004), "தமிழில் சொல்லாக்கம்", தஞ்சாவூர் தமிழ் பல்கலைக் கழகம் வெளியீடு

L	T	P	C
3	0	0	3

OBJECTIVES:

1. Enable learners to interact fluently on everyday social contexts.
2. Train learners to engage in conversations in an academic/scholarly setting.
3. Instil confidence in learners to overcome public speaking barriers.
4. Develop learners' ability to take notes and in the process, improve their listening Skills
5. Enhance learners' reading skill through reading text passages for comprehension and contemplation.
6. Improve learners' skills to write on topics of general interest and drafting correspondences for general purposes.

UNIT I**9**

Listening - short video clips - conversational scenes from movies, celebrities' speeches /interviews. Speaking - several ways of introducing oneself at several situations, introducing others at several situations, inviting people for several occasions, describing people and their places. Reading - short comprehension passages - making inferences, critical analysis. Writing - completing the incomplete sentences - developing hints from the given information. Grammar - Wh-Questions and Yes or No questions - Parts of speech. Vocabulary development - prefixes - suffixes - articles - countable / uncountable nouns.

UNIT II**9**

Listening - customer care voice files, short narratives - identifying problems and developing telephone etiquettes. Speaking - speaking over skype/ whatsapp, making business calls, making self-recorded informative videos, inquiring about a concept/activity, describing a concept/activity. Reading - reading the headlines on news magazines - slogans and taglines from advertisements. Writing - free writing - writing - headlines, slogans and taglines individual inspirations. Grammar- conjunctions, idioms, phrases, quotes. Vocabulary development - guessing the meanings of words in different contexts.

UNIT III**9**

Listening - courtroom scenes from movies, debates and talks from news channels, notes taking. Speaking - language and tone for arguments, discussion, deliberation, contemplation, expressing opinions, reacting to different situations in an alien country. Reading - language used in instruction manuals of household appliances, cookery and other basic instructions. Writing- understanding the structure of texts - use of reference words, discourse markers- coherence, rearranging the jumbled sentences. Grammar - adjectives - degrees of comparison, framing direct and indirect questions. Vocabulary development - concise approach, single word substitution.

UNIT IV**9**

Listening - Sports commentaries, advertisements with users' criticisms; Speaking - for social causes, for promoting a concept, negotiating and bargaining; Reading - review of a product, movie, movement or a system; Writing - writing for advertisements, selling a product; Grammar – Tenses - Simple Past, Present and Future, Continuous - Past, Present and Future; Vocabulary Development - synonyms, antonyms and phrasal verbs.

UNIT V

9

Listening - video lectures, video demonstration of a concept; Speaking – presenting papers/concepts, delivering short speeches, discourses on health, suggesting natural home remedies, cleanliness, civic sense and responsibilities; Reading - columns and articles on home science; Writing - correspondences of requests, basic enquiry/observation and basic complaints; Grammar - modal verbs, perfect tenses - Vocabulary development - collocations.

TOTAL: 45 PERIODS

OUTCOMES :

CO	CO statements	RBT level
	Upon successful completion of the course, the students should be able to	
CO1	Acquire adequate vocabulary for effective communication	3
CO2	Listen to formal and informal communication and read articles and infer meanings from specific contexts from magazines and news papers.	3
CO3	Participate effectively in informal/casual conversations; introduce themselves and their friends and express opinions in English.	4
CO4	Comprehend conversations and short talks delivered in English.	6
CO5	Write short write-ups and personal letters and emails in English	6

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

REFERENCES:

1. Department of English, Anna University, Mindsapes : English for Technologists and Engineers. Orient Black Swan, Chennai, 2017.
2. Downes and Colm, "Cambridge English for Job-hunting";, Cambridge University Press, New Delhi, 2008.
3. Murphy and Raymond, "Intermediate English Grammar with Answers Cambridge University Press, 2000.
4. Thomson, A.J., "Practical English Grammar 1 & 2";, Oxford, 1986.

WEBSITES:

1. <http://www.usingenglish.com>
2. <http://www.uefap.com3>
3. <https://owl.english.purdue.edu/owl/>
4. www.learnenglishfeelgood.com/esl-printables-worksheets.html

SOFTWARES:

1. Face 2 Face Advance – Cambridge University Press, 2014.
2. English Advance Vocabulary- Cambridge University Press.
3. IELTS test preparation – Cambridge University Press 2017.
4. Official Guide to the TOEFL Test With CD-ROM, 4th Edition.
5. Cambridge Preparation for the TOEFL TEST- Cambridge University Press, 2017.

COURSE ARTICULATION MATRIX :

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	3	-	-	-	-

3-High, 2-Medium, 1-Low

3 means 'a strong correlation' as the students will use all the four skills (Listening, Speaking, Reading and Writing) with appropriate body language in formal and informal environment.

OUTCOMES :

CO	CO statements	RBT level
	Upon successful completion of the course, the students should be able to	
CO1	Solve the Eigen value problems in matrices.	3
CO2	Apply the basic notion of calculus in Engineering problems and to tackle for different geometries.	3
CO3	Perform calculus for more than one variable and its applications in Engineering problems.	3
CO4	Apply definite integrals for design of three dimensional components.	3
CO5	Evaluate multiple integral in Cartesian and polar coordinates.	3

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

TEXT BOOKS:

1. Erwin Kreyszing, Herbert Kreyszing, Edward Norminton, "Advanced Engineering Mathematics", 10th Edition, John Wiley, (2015)
2. Grewal B.S, Grewal J.S, "Higher Engineering Mathematics", 43rd Edition, Khanna Publications, Delhi, (2015).

REFERENCES:

1. Bali N.P and Manish Goyal, "A Text book of Engineering Mathematics", Ninth Edition, Laxmi Publications Pvt. Ltd., (2014).
2. Glyn James, "Advanced Modern Engineering Mathematics", 4th Edition, Pearson Education, (2016).
3. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, (2013).

WEB LINKS:

1. <https://home.iitk.ac.in/~peeyush/102A/Lecture-notes.pdf>
2. <https://www.sydney.edu.au/content/dam/students/documents/mathematics-learning-entre/integration-definite-integral.pdf>

COURSE ARTICULATION MATRIX :

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	3	3	-	-	-	-	-	-	-	3	-	-
CO2	3	3	-	-	-	-	-	-	-	-	-	3	-	-
CO3	3	3	3	3	-	-	-	-	-	-	-	3	-	-
CO4	3	3	-	-	-	-	-	-	-	-	-	3	-	-
CO5	3	3	2	2	-	-	-	-	-	-	-	3	-	-

3-High, 2-Medium, 1-Low

L	T	P	C
3	0	0	3

OBJECTIVES:

To enhance the fundamental knowledge in Physics and its applications relevant to various Streams of Engineering.

UNIT I MECHANICS 9

Moment of inertia (M.I) - Radius of gyration - Theorems of M. I - M.I of circular disc, solid cylinder, hollow cylinder, solid sphere and hollow sphere - K.E of a rotating body – M.I of a diatomic molecule – Rotational energy state of a rigid diatomic molecule - centre of mass – conservation of linear momentum – Relation between Torque and angular momentum - Torsional pendulum.

UNIT II PROPERTIES OF MATTER AND THERMAL PHYSICS 9

Fluid – definition, distinction between solid and fluid - Units and dimensions - Properties of fluids - density, specific weight, specific volume, specific gravity, viscosity, compressibility, vapour pressure, capillarity and surface tension - Fluid statics: concept of fluid static pressure, absolute and gauge pressures - pressure measurements by manometers-forces on planes – centre of pressure – buoyancy and floatation.

Modes of heat transfer- thermal conductivity- Newton’s law of cooling - Linear heat flow – Lee’s disc method – Radial heat flow – Rubber tube method – conduction through compound media (series and parallel)

UNIT III ACOUSTICS AND ULTRASONICS 9

Classification of Sound- decibel- Weber–Fechner law – Sabine’s formula- derivation using growth and decay method – Absorption Coefficient and its determination –factors affecting Acoustics of buildings and their remedies. Production of Ultrasonics by Magnetostriction and Piezoelectric methods – Acoustic grating -Non-Destructive Testing – pulse echo system through transmission and reflection modes - A, B and C – scan displays, medical applications – Sonogram.

UNIT IV PHOTONICS AND FIBER OPTICS 9

Photonics: population of energy levels, Einstein’s A and B coefficients derivation – resonant cavity, optical amplification (qualitative) – Nd-YAG laser – CO₂ Laser – Applications. **Fiber optics:** principle, numerical aperture and acceptance angle - types of optical fibres (material, refractive index, and mode) – losses associated with optical fibers–Fiber optic communication-fibre optic sensors: pressure and displacement- Endoscope.

UNIT V 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 – interplanar distances- coordination number and packing factor for SC, BCC, FCC, HCP and diamond structure (qualitative) - crystal imperfections: point defects, line defects – Burger vectors, stacking faults

TOTAL : 45 PERIODS

OUTCOMES :

CO	CO statements	RBT level
CO1	Upon successful completion of the course, the students should be able to Gain knowledge in Mechanics	2
CO2	Evaluate the concepts of properties of matter and thermal physics	3
CO3	Learn to solve the issues related to defects in the buildings due to acoustic design and the significance of ultrasonic waves	3
CO4	Develop an understanding about photonics and Fiber Optic communication system	2
CO5	Classify and demonstrate the fundamentals of crystals and their defects.	3

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

TEXT BOOKS:

1. Gaur R.K. and Gupta S.L, "Engineering Physics", Dhanput Publications, 2015.
2. Shatendra Sharma and Jyotsna Sharma, "Engineering Physics", Pearson, 2006.
3. Rajendran V, "Engineering Physics", Tata McGraw Hill, 2009.
4. Arumugam M, "Materials Science", Anuradha Publications, 2015.

REFERENCES:

1. David Halliday, Robert Resnick, Jearl Walker, "Principles of Physics", 10th Edition, Wiley, 2015.
2. Peter Atkins and Julio De Paula, "Physical Chemistry", 10th Edition, Oxford University Press, 2014.
3. Arthur Beiser, Shobhit Mahajan, Rai Choudhury S, "Concepts of Modern Physics", 7th Edition, McGraw Hill Education, 2017.
4. Raghavan V, "Materials Science and Engineering", PHI Learning Pvt. Ltd., 2010

COURSE ARTICULATION MATRIX :

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	2	-	2	-	-	-	-	-	1	-	-	-	-
CO2	3	2	-	2	-	-	-	-	-	1	-	2	-	-
CO3	3	-	2	-	3	2	1	-	-	1	-	-	-	-
CO4	3	-	2	-	3	2	1	-	-	1	-	2	-	-
CO5	3	2	2	-	-	-	-	-	-	1	-	-	-	-

3-High, 2-Medium, 1-Low

L	T	P	C
3	0	0	3

OBJECTIVES:

make the student conversant with the

- Electrodes, Corrosion and Protective coatings
- Photochemical process
- Synthesis and applications of nanoparticles
- Characteristics and analysis of water
- Materials like polymers, composites and binding materials

UNIT I ELECTROCHEMISTRY 9

Electrodes and electrochemical cells – electrode potential, standard electrode potential, single electrode potential and its determination, types of electrodes – calomel, quinhydrone and glass electrode. Nernst equation – determination of pH of a solution by using quinhydrone and glass electrode. Electrochemical series and its applications. Batteries – Primary (dry cell) and secondary batteries (Lead – acid storage battery and Lithium ion battery) and next generation batteries.

UNIT II PHOTOCHEMISTRY 9

Laws of photochemistry – Grotthuss-Draper law, Stark-Einstein law and Lambert Beer Law – determination iron by spectrophotometer. Quantum efficiency – Photo physical processes - internal conversion, inter-system crossing, fluorescence, phosphorescence and photosensitization-Quenching of fluorescence and its kinetics, Stern-Volmer relationship. Applications of photochemistry.

UNIT III NANOCHEMISTRY 9

Basics and scale of nanotechnology, different classes of nanomaterials, Distinction between molecules, nanoparticles and bulk materials; size-dependent properties. Synthesis of nanomaterials, fabrication (lithography) and its applications – Basics of nanophotonics and quantum confined materials (surface plasmon resonance).

UNIT IV WATER TECHNOLOGY 9

Sources, impurities in water and their effects. WHO guideline and BIS guideline for drinking water. Water characteristics – Hardness – Types of hardness – Disadvantages of hard water. Boiler troubles: Scale, Sludge, Priming and Foaming, Caustic embrittlement and Boiler corrosion. Water softening methods - Internal treatment of water: Carbonate conditioning, Phosphate conditioning and Calgon conditioning - External treatment of water: Ion exchange process. Domestic water treatment. Water analysis: Hardness – determination by EDTA method, Alkalinity – determination by double indicator method, Determination of dissolved oxygen by Winkler's method and Determination of chloride by Mohr's method.

UNIT V MATERIALS CHEMISTRY**9**

Polymers: Introduction – Monomers, functionality and its significance, Free radical polymerization mechanism. Conducting polymers – mechanism of conduction in polyacetylene and applications.

Composites: Definition, need for composites. Constitution – Matrix materials (Polymer matrix, metal matrix and ceramic matrix) and Reinforcement (fiber, particulates, flakes and whiskers). Properties and applications of composites materials. Hybrid composites, Binding materials and its applications

TOTAL (L: 45): 45 PERIODS**OUTCOMES :**

CO	CO statements	RBT level
CO1	Upon successful completion of the course, the students should be able to Identify electrochemical cells, corrosion and fundamental aspects of batteries	2
CO2	Interpret the photochemical reactions and make use of spectroscopic techniques	2
CO3	Realize the structures, properties and applications of nanoparticles.	2
CO4	Describe the hardness of water, the problems caused by the hard water and their removals methods.	3
CO5	Illustrate the significance of various materials like polymer, composites their composition, properties and applications.	2

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

TEXT BOOKS:

1. P.C.Jain and Monica Jain, “Engineering Chemistry”, Dhanpet Rai & Sons, New Delhi, 17th Edition, 2018.
2. Dara, “A Text Book of Engineering Chemistry”, S.Chand & Co. Ltd., New Delhi, 12th Edition, 2016.

REFERENCES:

- 1 B.R. Puri, L.R. Sharma, M.S. Pathania., “Principles of Physical Chemistry” Vishal Publishing Company, 2008.
- 2 Sivasankar B., “Engineering Chemistry”, Tata McGraw-Hill Publishing Company, Ltd., New Delhi, 2008.

COURSE ARTICULATION MATRIX :

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	3	2	-		-	-	-	-	-	3	-	-
CO2	3	3	-	-	-	3	3	-	-	-	-	3	-	-
CO3	3	3	3	-	-	3	3	3	-	-	-	3	-	-
CO4	3	3	-	2	-	3	3	3	-	-	-	3	-	-
CO5	3	3	3	-	-	3	3	3	-	-	-	3	-	-

3-High, 2-Medium, 1-Low



CE22101

**ENGINEERING GEOLOGY AND CONSTRUCTION
MATERIALS**

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

1. This course will give insights on the basics of geology and significance of rocks and minerals.
2. This course will introduce students to various materials commonly used in civil engineering construction and their properties.

UNIT I MINERALS AND ROCKS

9

Relevance and importance of Engineering Geology of Civil Engineers, Minerals, their physical properties, composition and their use in the manufacture of construction materials– rock forming minerals, physical and engineering properties of igneous, metamorphic and sedimentary rocks

UNIT II LIME, STONE, BRICK AND MASONRY

9

Lime mortar, Stone as building material – Criteria for selection – Tests on stones – Bricks – Classification, Manufacturing of clay bricks – Tests on bricks – Compressive Strength – Water Absorption, Efflorescence – Brick and Stone Masonry – Concrete hollow blocks –Paver Blocks.

UNIT III CEMENT, MORTAR, AGGREGATES

9

Cement – Ingredients – Manufacturing process – Types and Grades – Properties of cement and Cement mortar – Hydration – Compressive strength – Tensile strength – Fineness– Soundness and consistency – Setting time – Aggregates – Natural stone aggregates – Crushing strength – Impact strength – Flakiness Index – Elongation Index – Abrasion Resistance – Sand - Grading – Sand Bulking

UNIT IV CONCRETE

9

Concrete – Ingredients, Manufacturing Process, Properties of fresh concrete – Slump, Flow and compaction Factor, Properties of hardened concrete –Compressive strength, tensile strength, flexural strength, modulus of elasticity, Mix specification and proportioning, Mix design using BIS.

UNIT V MODERN MATERIALS

9

Timber – types and applications, Metals used in construction industry – steel, aluminium – Characteristics, forms available and applications, Bitumen, Fibre Reinforced Polymer, Glass, geotextiles, High Density Polyethylene, self healing materials.

TOTAL: 45 PERIODS

OUTCOMES:

CO	CO statements	RBT level
	Upon successful completion of the course, the students should be able to	
CO1	Explain about minerals and rock formation.	2
CO2	Summarise the significance of lime, stone, brick and masonry in construction.	2
CO3	Describe the properties of cement, mortar and aggregates.	2
CO4	Explain about concrete, its ingredients, properties and tests.	2
CO5	Ennumerate on the modern construction materials.	2

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

TEXT BOOKS:

1. Varghese, P.C., Engineering Geology for Civil Engineering Prentice Hall of India Learning Private Limited, New Delhi, 2012.
2. Varghese.P.C, "Building Materials", PHI Learning Pvt. Ltd, New Delhi, 2015.

REFERENCES:

1. Parbin Singh. A "Text book of Engineering and General Geology", Katson publishing house, Ludhiana 2009
2. Chenna Kesavulu N. "Textbook of Engineering Geology", Macmillan India Ltd., 2009.
3. Blyth F.G.H. and de Freitas M.H., Geology for Engineers, Edward Arnold, London, 2010.
4. Bell .F.G.. "Fundamentals of Engineering Geology", B.S. Publications. Hyderabad 2011.
5. Rajput. R.K., "Engineering Materials", S. Chand and Company Ltd., 2008.
6. Shetty.M.S., "Concrete Technology (Theory and Practice)", S. Chand and Company Ltd.,2008
7. Gambhir.M.L., "Concrete Technology", 3rd Edition, Tata McGraw Hill Education, 2004
8. Jagadish.K.S, "Alternative Building Materials Technology", New Age International, 2007.
9. Gambhir. M.L., &Neha Jamwal., "Building Materials, products, properties and systems", Tata McGraw Hill Educations Pvt. Ltd, New Delhi, 2012.
10. IS 456 - 2000: Indian Standard specification for plain and reinforced concrete, 2011
11. IS 4926 - 2003: Indian Standard specification for ready-mixed concrete, 2012
12. IS 383 - 2016: Indian Standard specification for coarse and fine aggregate from natural Sources for concrete.
13. IS 1542-1992: Indian standard specification for sand for plaster, 2009
14. IS 10262-2019: Indian Standard Concrete Mix Proportioning –Guidelines.

COURSE ARTICULATION MATRIX

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	2	-	-	-	-	-	-	-	-	-	-	3	2
CO2	3	2	-	-	-	-	-	-	-	-	-	-	3	2
CO3	3	2	-	-	-	-	-	-	-	-	-	-	3	2
CO4	3	2	-	-	-	-	-	-	-	-	-	-	3	2
CO5	3	2	-	-	-	-	-	-	-	-	-	-	3	2

3-High, 2-Medium, 1-Low



L	T	P	C
1	0	4	3

COURSE OBJECTIVES:

- This course will introduce students to Engineering Drawing and build their ability to read drawings and interpret the position and form of simple geometry, culminating into understanding of simple technical assemblies.

UNIT I FUNDAMENTALS OF DRAWING AND CONIC SECTIONS 12

Drawing standards: BIS, Lettering, Dimensioning, Type of lines, BIS Conventions, size, layout and folding of drawing sheets, use of drafting tools, Basic geometrical constructions.

Projection: Principal Planes, Projection of Points using Four Angles of Projection, Projection of Straight Lines - Lines parallel or inclined to one plane.

Conic Sections - Ellipse, Parabola, Hyperbola using Eccentricity method

UNIT II PROJECTION OF PLANES AND SOLIDS 15

Projection of Plane Figures - Inclined to any one Principal Plane

Projection of Solids - Simple Solids (Prisms, Pyramids, Cone and Cylinder) axis inclined to any one Principal Plane.

UNIT III SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES 15

Section of Solids - Sectional views of simple vertical solids cut by section plane inclined to any one Principal Plane.

Development of Surfaces - Development of lateral surfaces of truncated and frustum of simple solids.

UNIT IV ORTHOGRAPHIC AND ISOMETRIC PROJECTION 15

Isometric Projection - Principle, Isometric Planes, Isometric Scales, Isometric Projection of simple solids and their combination.

Orthographic Projection - Orthographic views of simple blocks from their Isometric view, Isometric view of simple blocks from their Orthographic views.

UNIT V COMPUTER AIDED DRAWING 18

Basics of Computer Tools – basic drawing and modifying commands, hatching, plotting drawings. Drawing simple solids, orthographic and simple 3D models.

Civil Drawing Conventions, Building Plan standards, layer creation, Drawing plan of a single room building using software.

.TOTAL: 75 PERIODS

OUTCOMES:

CO	CO statements	RBT level
	Upon successful completion of the course, the students should be able to	
CO1	Apply the basic engineering drawing principles to construct conic sections and sketch the orthographic views of lines as per drawing standards	3
CO2	Draw projections of plane surfaces and simple solids in various positions.	3
CO3	Draw projections of sectioned solids and develop the lateral surfaces of simple solids.	3
CO4	Draw orthographic and isometric projections of simple solids and their combinations	3
CO5	Apply the engineering drawing fundamentals to draw solids and building plan using software application	3

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

TEXT BOOKS:

1. Bhatt N.D, Panchal Pramod V.M and Ingle R, "Engineering Drawing", Charotar Publishing House, 2019.
2. Gupta B.V.R and Raja Roy.M, "Engineering Drawing with AutoCAD", Dream Tech Press and Wiley Publications, third edition, 2021

REFERENCES:

1. Venugopal K and Prabhu Raja V, "Engineering Graphics", New Age International (P) Limited, 2014.
2. Shah M.B and Rana B.C, "Engineering Drawing", Pearson Education, 2009.
3. Gopalakrishna K.R, "Engineering Drawing" (Vol. I & II), Subhas Publications, 2010.
4. Natrajan K.V, "A Textbook of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2006.
5. Gowri S and Jeyapoovan T, "Engineering Graphics", Vikas Publishing House Pvt. Ltd., 2012.

COURSE ARTICULATION MATRIX

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	2	-	-	-	-	-	-	-	-	-	-	3	3
CO2	3	2	-	-	-	-	-	-	-	-	-	-	3	3
CO3	3	2	-	-	-	-	-	-	-	-	-	-	3	3
CO4	3	2	-	-	-	-	-	-	-	-	-	-	3	3
CO5	3	2	-	-	3	-	-	-	-	-	-	-	3	3

3-High, 2-Medium, 1-Low

PH22161

PHYSICS LABORATORY
(Common to all Branches except BT)

L	T	P	C
0	0	2	1

COURSE OBJECTIVES:

- To introduce different experiments to test basic understanding of physics concepts applied in optics, thermal physics and properties of matter.

LIST OF EXPERIMENTS (Any eight Experiments)

- a) Determination of Wavelength, and particle size using Laser.
b) Determination of acceptance angle in an optical fiber.
- Determination of velocity of sound and compressibility of liquid – Ultrasonic Interferometer.
- Determination of wavelength of mercury spectrum – spectrometer grating.
- Determination of thermal conductivity of a bad conductor – Lee’s Disc method.
- Determination of Young’s modulus by Non uniform bending method.
- Determination of specific resistance of a given coil of wire – Carey Foster’s Bridge.
- Determination of Rigidity modulus of a given wire -Torsional Pendulum
- 8. Energy band gap of a Semiconductor**
- Determine the Hysteresis loss of a given Specimen
- 10. Calibration of Voltmeter & Ammeter using potentiometer.**

TOTAL: 30 Periods

OUTCOMES :

CO	CO statements	RBT level
CO1	Upon successful completion of the course, the students should be able to Analyze the physical principle involved in the various instruments; also relate the principle to new application.	4
CO2	Comprehend the Experiments in the areas of optics, mechanics and thermal physics to nurture the concepts in all branches of Engineering.	3
CO3	Apply the basic concepts of Physical Science to think innovatively and also improve the creative skills that are essential for engineering.	3
CO4	Evaluate the process and outcomes of an experiment quantitatively and qualitatively	3
CO5	Extend the scope of an investigation whether or not results come out as expected	3

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

REFERENCES:

- "Physics Laboratory practical manual", 1st Revised Edition by Faculty members, 2018.

COURSE ARTICULATION MATRIX :

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	2	3	2	-	-	-	3	1	-	2	-	-
CO2	3	3	-	3	-	2	-	-	3	1	-	2	-	-
CO3	3	3	2	3	2	2	-	-	3	1	-	2	-	-
CO4	3	3	-	3	-	-	-	-	3	1	-	2	-	-
CO5	3	3	-	3	2	-	-	-	3	1	-	2	-	-

3-High, 2-Medium, 1-Low



CY22161

Chemistry Laboratory
(Common to all Branches except AD, CS, IT)

L	T	P	C
0	0	2	1

OBJECTIVES

The objective of the Chemistry Laboratory is to acquaint the students with the basic phenomenon/concepts of chemistry, the student face during course of their study in the industry and Engineering field.

1. To appreciate the need and importance of water quality parameters for industrial and domestic use.
2. To gain the knowledge on electrochemical instrumentation techniques like potential and current measuring used in electrochemistry applications
3. To impart knowledge on separation of components using paper chromatography.
4. To enhance the thinking capability about polymer and properties like molecular weight.

LIST OF EXPERIMENTS (Minimum 8 Experiments)

1. Determination of DO content of water sample by Winkler's method.
2. Determination of strength of given hydrochloric acid using pH meter
3. Determination of strength of acids in a mixture using conductivity meter
4. Estimation of iron content of the water sample using spectrophotometer (phenanthroline / thiocyanate method)
5. Determination of total, temporary & permanent hardness of water by EDTA Method.
6. Estimation of iron content of the given solution using potentiometer.
7. Determination of alkalinity in water sample.
8. Determination of Single electrode potential.
9. Separation of components from a mixture of red and blue inks using Paper chromatography.
10. Determination of molecular weight of polymer by using Ostwald's/Ubbelohde viscometer.

TOTAL: 15 Periods

OUTCOMES:

CO	CO statements	RBT level
CO1	Upon successful completion of the course, the students should be able to Distinguish hard and soft water, solve the related numerical problems on water, purification and its significance in industry and daily life.	3
CO2	Interpret the knowledge of instruments to measure potential and current related parameters.	2
CO3	Demonstrate the basic principle for separation of components using paper chromatography.	3
CO4	Evaluate the molecular weight of polymer using Ostwald's/Ubbelohde viscometer.	3

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

REFERENCES:

1. Daniel R. Palleros, "Experimental organic chemistry" John Wiley & Sons, Inc., New York 2001.
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.
3. Jeffery G.H., Bassett J., Mendham J.and Denny vogel"s R.C, "Text book of quantitative analysis chemical analysis", ELBS 5th Edn. Longman, Singapore publishers, Singapore, 1996.
4. Kolthoff I.M., Sandell E.B. et al. "Quantitative chemical analysis", Mcmillan, Madras 1980

COURSE ARTICULATION MATRIX :

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	2	-	-	-	3	3	3	1	-	1	2	-	-
CO2	3	2	1	-	-	3	3	3	-	-	-	-	-	-
CO3	3	-	-	-	-	3	3	-	-	-	-	2	-	-
CO4	3	-	-	1	-	3	3	3	-	-	-	-	-	-

3-High, 2-Medium, 1-Low

ME22161

**BASIC CIVIL AND MECHANICAL ENGINEERING
LABORATORY**
(Common to CE, EE, EC)

L	T	P	C
0	0	2	1

OBJECTIVES:

To provide an exposure and hands on experience to the students on various civil and mechanical engineering processes.

LIST OF EXPERIMENTS

- 1- Carpentry – Preparation of Cross half lap joint and Tee joint using power tools.
- 2- Plumbing – Basic pipe line connection used in houses with PVC pipes, valves, taps, couplings, unions, reducers, elbows.
- 3- Welding - Butt joint and lap joint using Electric Arc welding.
- 4- Machining – Turning and facing using Centre Lathe.
- 5- Sheet metal work – Making of a cylinder using GI sheet and finishing using rivets.
- 6- Fitting – Preparation of metal pieces by grinding and filing to maintain flat sides at right angles
- 7- Drilling and Tapping – Drilling of holes precisely and making internal threads by Tapping for various sizes.
- 8- Casting – Mould preparation using simple solid pattern and casting.
- 9- Automation – Basic pneumatic circuit using single and double acting cylinder.
- 10- 3D printing – Demonstration of printing of simple solids using Additive Manufacturing/3D printing.

TOTAL: 30 PERIODS

OUTCOMES :

CO	CO statements	RBT level
CO1	Upon successful completion of the course, the students should be able to Prepare various joints used for assembling wooden parts.	3
CO2	Make required pipeline connection by selecting the suitable components	3
CO3	Fabricate components by various manufacturing processes.	3
CO4	Understand the principles of low-cost automation using pneumatic circuits.	2
CO5	Understand the principle of additive manufacturing/3D printing	2

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

TEXT BOOKS:

1. Jeyachandran K., Natarajan S. & Balasubramanian S., "A Primer on Engineering Practices Laboratory", Anuradha Publications, 2007.

2. Jeyapoovan T., Saravanapandian M. & Pranitha S., "Engineering Practices Lab Manual", Vikas Publishing House Pvt.Ltd, 2006.
3. Bawa H.S., "Workshop Practice", Tata McGraw Hill Publishing Company Limited, 2007.
4. Ian Gibson, David W Rosen, Brent Stucker., "Additive Manufacturing Technologies: Rapid Prototyping to Direct Digital Manufacturing", Springer, 2010.
5. Anthony Esposito, Fluid Power with Applications, Pearson Education, 7th edition, 2009.
6. Civil & Mechanical engineering practices lab manual, SVCE, 2022.

COURSE ARTICULATION MATRIX :

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	1	-	-	-	2	-	-	-	-	-	-	-	-	-
CO5	1	-	-	-	2	-	-	-	-	-	-	-	-	-

3-High, 2-Medium, 1-Low

HS22251

**அறிவியல் மற்றும் தொழில்நுட்பத்தில் தமிழ்
SCIENCE AND TECHNOLOGY IN ANCIENT TAMIL
SOCIETY**

(Common to all Branches)

L	T	P	C
2	0	0	2

OBJECTIVES:

பாடத்தின் நோக்கங்கள்:

1. They will know about the use of Tamil in science.
2. Learn about the impact of Tamil heritage on technology.
1. அறிவியலில் தமிழின் பயன்பாடு பற்றி தெரிந்து கொள்வார்கள்.
2. தொழில்நுட்பத்தில் தமிழ் பாரம்பரியத்தின் தாக்கம் பற்றி அறிந்து கொள்வார்கள்

UNIT I SCIENTIFIC TAMIL

அலகு 1 அறிவியல் தமிழ்

6

Tool Development - Research Development - Educational Development - Scientific Tamil words Creation

கருவி உருவாக்கம் - ஆராய்ச்சி மேம்பாடு - கல்வி வளர்ச்சி - அறிவியல் தமிழ் சொற்கள் உருவாக்கம்

UNIT II TAMIL IN TECHNOLOGY

அலகு 2 தொழில்நுட்பத்தில் தமிழ்

24

Design and Construction Technology : Building materials in Sangam age – Great temples of Cholas and other workshop places – Sculptures and Temples of Pallavas (Mamallapuram) – Temples of Nayakas period (Madurai Meenakshi amman temple), Thirumalai Nayakar Mahal, Chetti Nadu Houses.

Manufacturing Technology : Art of Ship building, Metallurgical studies, Knowledge about Gold, Copper, Iron – Archeological evidences – Terracotta beads, Shell beads, Bone beads.

Agriculture and Irrigation Technology: Dams, Tank, ponds, sluice, Significance of Kumuzhi Thoompu of Cholas period- Animal Husbandry, Wells designed for cattle use. Agriculture and Agro processing, - Knowledge about Sea – Fisheries, Pearl, Conche diving.

Tamil Computing : Development of Scientific Tamil – Tamil Computing, Digitization of Tamil books, Tamil Digital Library, Development of Tamil Softwares – Tamil virtual Academy – Sorkuvai project. Future of Tamil and Information Technology- Globalization and Information Technology-Teaching Tamil for Computer-Resources in Tamil Language Technology.

வடிவமைப்பு மற்றும் கட்டுமான தொழில்நுட்பம் : சங்க காலத்தில் கட்டுமானப் பொருட்கள் – சோழர்களின் பெரியகோவில்கள் மற்றும் பிற வழிபாட்டுதலங்கள் – பல்லவர்களின் சிற்பங்கள் மற்றும் கோவில்கள் (மாமல்லபுரம்) - நாயக்கன் கால

கோவில்கள் (மதுரை மீனாட்சி அம்மன் கோவில்), திருமலை நாயக்கர் மஹால், செட்டிநாட்டு வீடுகள்.

உற்பத்தி தொழில் நுட்பம் : கப்பல் கட்டும் கலை, உலோகவியல் ஆய்வுகள், தங்கம், தாமிரம், இரும்பு பற்றிய அறிவு – தொல்பொருள் சான்றுகள் – சுட்டக் களிமண் மணிகள், சங்கு மணிகள், எலும்பு மணிகள்.

விவசாயம் மற்றும் நீர்ப்பாசன தொழில்நுட்பம் : அணைகள், ஏரிகள், குளங்கள், மதகுகள், சோழர் கால குழுழி தூம்பு ஆகியவற்றின் முக்கியத்துவம் – கால்நடை பராமரிப்பு, கால்நடைகளின் பயன்பாட்டிற்காக வடிவமைக்கப்பட்ட கிணறுகள். விவசாயம் மற்றும் வேளாண் செயலாக்கம் – கடல் பற்றிய அறிவு – மீன் பிடித்தல், முத்து குளித்தல், சங்கு சேகரித்தல்.

தமிழ் கணினி: அறிவியல் தமிழ் வளர்ச்சி – தமிழ் கணினி, தமிழ் புத்தகங்களின் டிஜிட்டல்மயமாக்கல், தமிழ் டிஜிட்டல் நூலகம், தமிழ் மென்பொருள் உருவாக்கம் – தமிழ் மெய் நிகர் அகாடமி – சொற்குவை திட்டம்.

தமிழின் எதிர்காலமும் தகவல் தொழில்நுட்பமும்- உலகமயமாக்கலும் தகவல் தொழில்நுட்பமும் – கணினிக்கு தமிழ் கற்று கொடுத்தல் – தமிழ்மொழித் தொழில்நுட்பத்தில் வளங்கள்.

TOTAL : 30 PERIODS

OUTCOMES :

பாடநெறி முடிவுகள் :

CO	CO statements	RBT level
CO1	Upon successful completion of the course, the students should be able to படிப்பை வெற்றிகரமாக முடித்தவுடன், மாணவர்கள் பின்வருவனவற்றைச் செய்ய முடியும்.	
CO1	They will know about the use of Tamil language in science அறிவியலில் தமிழ் மொழியின் பயன்பாடு பற்றி தெரிந்து கொள்வார்கள்.	2
CO2	They will learn about the influence of Tamil language in various technologies. பல்வேறு தொழில்நுட்பத்தில் தமிழ்மொழியின் தாக்கம் பற்றி அறிந்து கொள்வார்கள்	3

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

TEXT BOOKS:

பாடநூல்கள்:

1. டாக்டர், வா.செ .குழந்தைசாமி (1985), "அறிவியல் தமிழ்" , பாரதி பதிப்பகம், 126/108, உஸ்மான் சாலை, தியாகராய நகர் , சென்னை 600017
2. சுப. திண்ணப்பன், (1995), "கணினியும் தமிழ் கற்பித்தலும்", புலமை வெளியீடு, 38-B மண்ணத்தோட்டத் தெரு, ஆழ்வார்பேட்டை, சென்னை 600018

3. மு. பொன்னவைக்கோ, (2003), "வளர்தமிழில் அறிவியல் – இணையத் தமிழ்", அனைத்திந்திய அறிவியல் தமிழ்க் கழகம், தஞ்சாவூர் 615 005.
4. துரை. மணிகண்டன், (2008), "இணையமும் தமிழும்", நல்நிலம் பதிப்பகம், 7-3, சிமேட்லி சாலை, தியாகராய நகர், சென்னை 600 017.



HS22252

TECHNICAL ENGLISH
(Common to all Branches)

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

1. Enable learners to define and understand technical communication and scientific writing
2. Expose learners to the technicalities of seminar presentation, group discussion, and public speaking
3. Develop learners' writing skills for scientific and documenting purposes
4. Improve learners' ability to draft correspondences for business purposes
5. Cultivate learners' ability to holistically understand the nuances of job interviews and recruiting process.

UNIT I

9

Listening - AV files pertaining to manufacturing processes of products, scientific documentaries; Speaking - syllable division and word stress, intonation, sharing opinions; Reading - news articles related to science and technology; Writing - definitions, instruction, recommendation, data interpretation, resume; Grammar -tenses and their aspects, sentence connectors – discourse markers, sequential words, active and passive voice, subject-verb agreement.

UNIT II

9

Listening - AV pertaining to marketing strategies, peer reading and pronunciation; Speaking- turn taking, sharing opinions; conducting and attending a meeting, understanding the nuances of spoken communication among internal audience and external audience; Reading - analytical documents, descriptive documents; Writing - fliers, brochures, resume - letter of application, checklists; Grammar - modal verbs, clauses - types and uses, conditional clauses, articles.

UNIT III

9

Listening - AV related to how to use components, scientific description, Speaking - speaking for motivation and initiation, speaking at a seminar presentation; Reading - scientific journals, papers; Writing - Technical descriptions - process description, purpose and function, PowerPoint, Google forms, user manuals; Grammar - phrasal verbs, prepositions, technical and scientific affixes.

UNIT IV

9

Listening - scientific debates, crisis management; Speaking - handling conflicts, speaking about the loss of benefits, progress or decline of business, identifying the connotative meanings, Reading- documented evidences of uses and functions of a product, review of a product, Writing - memos, follow-up letters, reports - proposal, project, progress reports, sales reports, reports on industrial visits, executive summary. Grammar - reported speech and tag questions, sentence structure - comparative, imperative, cause and effect, infinitive of result.

UNIT V

9

Listening - AV of Group discussions, panel discussions, face to face interviews for

recruitment purposes; Speaking- speaking at group discussions, interviewing a personality, answering at the interviews; Reading - WebPages of top notch engineering companies, Writing - blogging, e-mails, letter of complaint, minutes of the meeting; Grammar - one word substitution, collocations, better word/sentence substitution (rephrasing the content/improvising ideas).

TOTAL: 45 PERIODS

OUTCOMES:

CO	CO statements	RBT level
	Upon successful completion of the course, the students should be able to	
CO1	Understand the nuances of technical communication and scientific writing	3
CO2	Present papers and give seminars	6
CO3	Discuss in groups and brainstorm	6
CO4	Draft business correspondences and write for documenting purposes	6
CO5	Face job interviews with confidence	6

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

REFERENCES:

1. Department of English, Anna University. Mindscapes: English for Technologists and Engineers. Orient Blackswan, Chennai. 2012.
2. Downes, Colm, Cambridge English for Job-hunting, Cambridge University Press, New Delhi. 2008
3. Murphy, Raymond, Intermediate English Grammar with Answers, Cambridge University Press 2000.
4. Thomson, A.J., Practical English Grammar 1 & 2, Oxford, 1986.
5. Herbert A J, The Structure of Technical English, Longman, 1965.

Websites

1. <http://www.usingenglish.com>
2. <http://www.uefap.com3>
3. <https://owl.english.purdue.edu/owl/>
4. www.learnenglishfeelgood.com/esl-printables-worksheets.html

Software

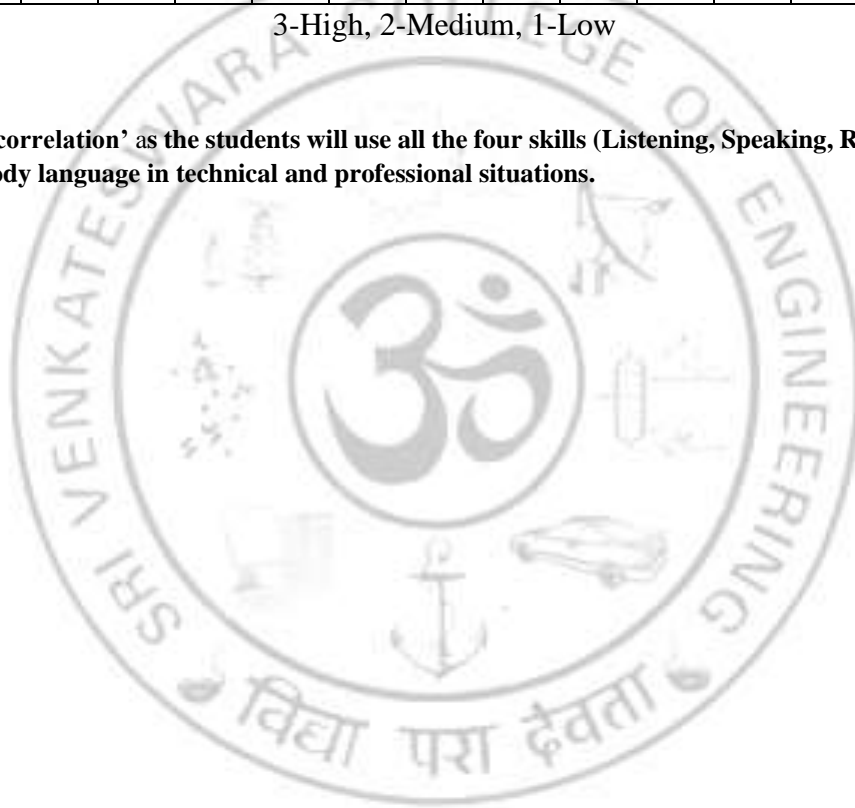
1. Face 2 Face Advance – Cambridge University Press, 2014.
2. English Advance
Vocabulary- Cambridge University Press.
3. IELTS test preparation – Cambridge University Press 2017.
4. Official Guide to the TOEFL Test With CD-ROM, 4th Edition.
5. Cambridge Preparation for the TOEFL TEST- Cambridge University Press, 2017.

COURSE ARTICULATION MATRIX :

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	3	-	-	-	-

3-High, 2-Medium, 1-Low

3 denotes 'a strong correlation' as the students will use all the four skills (Listening, Speaking, Reading and Writing) with appropriate body language in technical and professional situations.



OBJECTIVES:

The students should be made to

- Acquire the concepts of vector calculus needed for problems in all engineering disciplines and compute different types of integrals using Green's, Stokes' and Divergence theorems.
- Skilled at the techniques of solving ordinary differential equations that model engineering problems.
- Extend their ability of using Laplace transforms to create a new domain in which it is easier to handle the problem that is being investigated.
- Explain geometry of a complex plane and state properties of analytic functions.
- Understand the standard techniques of complex variable theory so as to apply them with confidence in application areas such as heat conduction, elasticity, fluid dynamics and flow of electric current.

UNIT I VECTOR CALCULUS

(9+3)

Gradient, divergence and curl - Directional derivative - Vector identities – Irrotational and solenoidal vector fields - Line integral over a plane curve – Surface integral - Area of a curved surface - Volume integral - Green's theorem in a plane, Gauss divergence theorem and Stokes' theorem (excluding proofs) – Verification and application in evaluating line, surface and volume integrals.

UNIT II ORDINARY DIFFERENTIAL EQUATIONS AND ITS APPLICATIONS

(9+3)

Differential equations of first order – Equations of the first order and first degree – Linear equations – Higher order linear differential equations with constant coefficients - Method of variation of parameters - Cauchy's and Legendre's linear equations - Simultaneous first order linear equations with constant coefficients – Applications of Linear differential equations – Oscillatory electrical circuit – Deflection of beams.

UNIT III LAPLACE TRANSFORM

(9+3)

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

UNIT IV ANALYTIC FUNCTIONS

(9+3)

Analytic functions - Necessary and sufficient conditions (Cauchy-Riemann equations) -

Properties of analytic function - Harmonic conjugates - Construction of analytic functions - Conformal mapping – Mapping by functions $W = Z + C$, CZ , $1/Z$, Z^2 – Joukowski's transformation- Bilinear transformation.

UNIT V COMPLEX INTEGRATION (9+3)

Cauchy's integral theorem - Cauchy's integral formula - Taylor's and Laurent's series expansions - Singular points - Residues - Cauchy's Residue theorem – Application of residue theorem for evaluation of real integrals – Use of circular contour and semi-circular contour.

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

OUTCOMES:

CO	CO statements	RBT level
	Upon successful completion of the course, the students should be able to	
CO1	Interpret the fundamentals of vector calculus and execute evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems.	3
CO2	Solve first order linear, homogeneous differential equations and use series solution method to solve second order differential equations.	3
CO3	Determine the methods to solve differential equations using Laplace transforms and Inverse Laplace transforms.	3
CO4	Explain Analytic functions and Categorize transformations.	3
CO5	Perform Complex integration to evaluate real definite integrals using Cauchy integral theorem and Cauchy's residue theorem.	3

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

TEXT BOOKS:

1. Erwin Kreyszing, Herbert Kreyszing, Edward Norminton, “Advanced Engineering Mathematics”, 10th Edition, John Wiley, (2015).
2. Grewal .B.S, Grewal .J.S “Higher Engineering Mathematics”, 43rd Edition, Khanna Publications, Delhi, (2015).

REFERENCES:

1. Dass, H.K., and Rajnish Verma, “Higher Engineering Mathematics”, S.Chand Private Ltd., 2011.
2. Ramana B.V, “Higher Engineering Mathematics”, Tata McGraw Hill Publishing Company, New Delhi, (2013).
3. Bali N. P and Manish Goyal, “A Text book of Engineering Mathematics”, 9th edition, Laxmi Publications(p) Ltd., 2014.

WEB LINK:

1. <https://nptel.ac.in/courses/111/105/111105134/>
2. <https://nptel.ac.in/courses/111/105/111105121/>

COURSE ARTICULATION MATRIX :

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	2	2	-	-	-	-	-	-	-	3	-	-
CO2	3	3	3	3	-	-	-	-	-	-	-	3	-	-
CO3	3	3	3	3	-	-	-	-	-	-	-	3	-	-
CO4	3	3	-	-	-	-	-	-	-	-	-	3	-	-
CO5	3	3	-	-	-	-	-	-	-	-	-	3	-	-

3-High, 2-Medium, 1-Low



IT22251

**Computer Programming and Practice
(Common to AE, BT, CE, CH)**

L	T	P	C
2	0	2	3

OBJECTIVES:

To know the basics of algorithmic problem solving

To learn programming using a structured programming language.

To implement programs with basic features of C.

Unit 1 Fundamentals of Computing 6+3

Computing Devices – Identification of Computational Problems – Algorithms – Building Blocks of Algorithms - Pseudocodes and Flowcharts- Notion of memory, addresses, variables, instructions, execution of instructions- Operating system commands, file editing, compiling, linking, executing a program. Introduction to different programming languages.

Suggested Activities:

Practical - Use of operating system commands and file editing operations

Unit 2 Basics of C 6+9

Data types - constants, variables - operators - expressions - basic input/output. Statements and blocks - Selection - if-else construct - iteration - while - for constructs.

Suggested Activities

Practical

Demonstration of programs using data types, operators and basic input/output.

Demonstration of programs using if else, else-if, switch.

Demonstration of programs using while, for do-while, break, continue

Unit 3 Arrays and Strings 6+6

Array, declaration, initialization. Multi dimensional arrays. Strings and character arrays, string

operations on arrays

Suggested Activities

Practical

Demonstration of programs using arrays and operations on arrays

Demonstration of programs implementing string operations on arrays

Unit 4 Functions and Structures 6+6

Functions, definition, call, arguments, call by value. Call by reference. Recursion, Introduction to structures and unions.

Suggested Activities

Practical

Demonstration of programs using functions.

Demonstration of programs using recursion

Demonstration of programs using Structures and Unions

Unit 5 Pointers and File handling in c 6+6

Introduction to Pointers- pointers to basic variables, pointers and arrays. Pointers to strings
Dynamic Memory Allocation, Files - binary, text - open, read, write, random access, close.
Preprocessor directives

Suggested Activities

Practical

Demonstration of programs using pointers

Demonstration of programs using files

Total (L:30+P:30)

OUTCOMES:

CO	CO statements	RBT level
	Upon successful completion of the course, the students should be able to	
CO1	Apply appropriate programming constructs to solve problems	3
CO2	Design, implement, test and debug programs that use the basic features of C.	3
CO3	Design modularized applications in C to solve real world problems.	3
CO4	Use C pointers and dynamically allocated memory to solve complex problems	3
CO5	Apply file operations to develop solutions for real-world problems	3

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

TEXT BOOKS:

1. Pradip Dey, Manas Ghosh, “ Programming in C ”, First Edition, Oxford University Press, 2018.
2. R G Dromey, “How to Solve it using Computer”, Pearson,2006.

REFERENCES:

1. Kernighan,B.W and Ritchie,D.M, “The C Programming language”, Second Edition, Pearson Education, 2015.
2. Yashavant P. Kanetkar. “Let Us C”, BPB Publications, 2011.
3. Byron S Gottfried, “Programming with C”, Schaum’s Outlines, Third Edition, Tata McGrawHill, 2010
4. Reema Thareja, “Programming in C”, 2nd ed., Oxford University Press, 2016

Evaluation Method

60% theory+40% practical

COURSE ARTICULATION MATRIX

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	1	3	-	-	-	-	-	2	3	-	-	2	-	-
CO2	1	3	-	-	-	-	-	2	3	-	-	2	-	-
CO3	1	-	3	2	1	-	-	2	3	-	-	2	-	-
CO4	1	-	3	2	1	-	-	2	3	-	-	2	-	-
CO5	1	-	3	2	1	-	-	2	3	-	-	2	-	-

3-High, 2-Medium, 1-Low



EE22151

**BASIC ELECTRICAL AND ELECTRONICS
ENGINEERING**

(Common to all Branches except CH, EE, EC)

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

1. To understand the basic theorems used in Electrical circuits.
2. To educate on the different concepts and functions of electrical machines.
3. To introduce electron devices and its applications.
4. To explain the principles of digital electronics.
5. To impart knowledge on the principles of measuring instruments.

UNIT I ELECTRICAL CIRCUITS 9

Ohm's Law – Kirchhoff's Laws - Steady State Solution of DC Circuits using Mesh and Nodal Analysis -Introduction to AC Circuits - Waveforms and RMS Value - Power and Power factor - Single Phase and Three Phase AC Balanced Circuits.

UNIT II ELECTRICAL MACHINES 9

Construction, Principle of Operation, Basic Equations and Applications of DC Generators, DC Motors, Single phase induction Motor, Single Phase Transformer.

UNIT III SEMICONDUCTOR DEVICES AND APPLICATIONS 9

Characteristics of PN Junction Diode - Zener Effect - Zener Diode - LED, Photo diode and its Characteristics-Half Wave and Full Wave Rectifiers-Voltage Regulation. Bipolar Junction Transistor-Common Emitter Configuration, Characteristics and CE as an Amplifier - Photo transistors.

UNIT IV DIGITAL ELECTRONICS 9

Number System Conversion Methods–Simplification of Boolean Expression using K-Map – Half and Full Adders – Flip-Flops – Shift Registers - SISO, SIPO, PISO, PIPO and 4-bit Synchronous and Asynchronous UP Counters.

UNIT V MEASURING INSTRUMENTS 9

Types of Signals: Analog and Digital Signals- Construction and working Principle of Moving Moving Iron Instruments (Ammeters and Voltmeters), Dynamometer type Watt meters and meters. Instrumentation Amplifier, – R-2R ladder Type D/A Converter - Flash Type and Successive Approximation Type A/D Converter.

TOTAL: 45 PERIODS

OUTCOMES :

CO	CO statements	RBT level
	Upon successful completion of the course, the students should be able to	
CO1	Compute the electric circuit parameters for simple problems	4
CO2	Understand the construction and characteristics of different electrical machines.	4
CO3	Describe the fundamental behavior of different semiconductor devices and circuits.	4
CO4	Design basic digital circuits using Logic Gates and Flip-Flops.	4
CO5	Analyze the operating principle and working of measuring instruments.	4

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

TEXT BOOKS:

1. Kothari DP and I.J Nagrath, "Basic Electrical and Electronics Engineering", Second Edition, McGraw Hill Education, 2020.
2. Sedha. R.S., "A Text Book of Applied Electronics", S.Chand & Co., 2014.

REFERENCES:

1. Muthusubramanian R, Salivahanan S and Muraleedharan K A, "Basic Electrical, Electronics Engineering", Tata McGraw Hill, 2013.
2. Mehta VK, "Principles of Electronics", S. Chand & Company Ltd, 2010.
3. M. Morris Mano, "Digital Logic & Computer Engineering", Prentice Hall of India, 2004.
4. Mahmood Nahvi and Joseph A.Edminister, "Electric Circuits", Schaum' Outline Series, McGraw Hill, Fourth Edition, 2007.

COURSE ARTICULATION MATRIX :

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	3	3	-	-	2	-	-	-	-	2	-	-
CO2	3	3	3	3	-	-	2	-	-	-	-	2	-	-
CO3	3	3	3	3	-	-	2	-	-	-	-	2	-	-
CO4	3	3	3	3	-	-	2	-	-	-	-	2	-	-
CO5	3	3	3	3	-	-	2	-	-	-	-	2	-	-

3-High, 2-Medium, 1-Low

L	T	P	C
2	0	2	3

COURSE OBJECTIVES:

- The objective of this course is to inculcate in the student the ability to plan any building with appropriate dimensions.

UNIT I FUNDAMENTALS OF BUILDINGS AND ITS ELEMENTS 12

Buildings – Classifications based on nature of occupancy, based on their fire resistance, built in environment, load transfer- components of a building (Dimensions of building) –Foundation and super-structure– Doors – Windows – Lintels and arches – Stairs – Roof – Flooring – Plastering. Practical : cross-section of a load bearing wall and RCC column along with foundation details and specifications, drawing of a dog-legged stair case.

UNIT II PRINCIPLES OF PLANNING OF BUILDINGS & ORIENTATION OF BUILDINGS 12

Aspect – Prospect – Privacy –furniture requirement – roominess – grouping – circulation – lighting –ventilation– economy – Practical considerations – Orientation of building – Factors affecting orientation – Vaastu considerations.

Practical : Furnishing details of a residential building; line sketch of a 1BHK room considering the principles of orientation.

UNIT III PLANNING OF RESIDENTIAL BUILDINGS 12

Single storey Residential buildings – Rooms meant for various activities – Drawing or living room, dining room, kitchen, bedroom, bath and water-closets, veranda, store room, Prayer room, study room, guest room, office room, stairs, garage – minimum dimensions – doors, windows and ventilators

Practical : plan, elevation and sectional elevation of a residential building with furniture and specifications.

UNIT IV PLANNING OF PUBLIC BUILDINGS 12

Public buildings - Schools, Library, Hospital, Theatre, Auditorium,– site selection, components, Principles of planning

Practical : Plan of a library and hospital building.

UNIT V ANTHROPOMETRIC STUDIES AND BUILDING BYE-LAWS 12

Engineering anthropometry – application of anthropometric data in design of residential building components. Building bye-laws as per National Building Code – Minimum plot sizes and building frontage – Floor Area Ratio- Open spaces – Minimum standard dimensions of building elements – provisions for lighting and ventilation, safety from fire and explosions, means of access, drainage and sanitation, safety against hazards or accidents, off street parking – sizes for structural elements

Practical : Plan layout of a residential complex

TOTAL: 60 PERIODS

OUTCOMES:

CO	CO statements	RBT level
	Upon successful completion of the course, the students should be able to	
CO1	Explain the fundamentals of buildings and components of a building.	3
CO2	Apply the basic principles of building planning and orientation.	3
CO3	Plan residential buildings	3
CO4	Summarise the important aspects of planning public buildings.	3
CO5	Implement anthropometric studies and bye laws while planning a building.	3

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

TEXT BOOKS:

1. Dr. N. Kumara Swamy, A. KameswaraRao, “Building planning and drawing”, Charotar Publishing house Pvt. Ltd , 7th edition, 2014
2. National Building Code of India, Part V, "Building Materials", 2016.

REFERENCES:

1. SS Bhavikatti& M V Chitawadagi , “Building planning and drawing”, I.K. International Publishing house Pvt. Ltd. , 2014.
2. Shah.M.G., Kale. C.M. and Patki. S.Y., "Building Drawing with an Integrated Approach to Built Environment", Tata McGraw Hill Publishers Limited, 2004.
3. Verma.B.P., "Civil Engineering Drawing and House Planning", Khanna Publishers, 2010. 4. National Building Code of India, BIS.

COURSE ARTICULATION MATRIX

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	-	-	-	-	3	-	-	-	-	-	1	3	3
CO2	2	-	-	-	-	3	-	-	-	-	-	1	3	3
CO3	2	-	-	-	-	3	-	-	-	-	-	1	3	3
CO4	2	-	-	-	-	3	-	-	-	-	-	1	3	3
CO5	2	-	-	-	-	3	-	3	-	-	-	1	3	3

3-High, 2-Medium, 1-Low



L	T	P	C
3	1	0	4

COURSE OBJECTIVES:

- To introduce the various systems of forces and resolution of forces
- To illustrate the concepts of equilibrium of particles and rigid bodies in two and three dimensions
- To make the students to determine the centroid and moment of inertia of composite plane areas and to analyse trusses
- To impart knowledge on determination of shear force and bending moment in determinate beams

STATICS OF PARTICLES**12****UNIT I**

Introduction – Units and Dimensions – Laws of Mechanics – Lami's theorem, Parallelogram and triangular Law of forces – Vectorial representation of forces – Coplanar Forces – rectangular components – Equilibrium of a particle – Forces in space – Equilibrium of a particle in space – Equivalent systems of forces – Principle of transmissibility.

UNIT II EQUILIBRIUM OF RIGID BODIES**12**

Free body diagram – Types of supports – Action and reaction forces – stable equilibrium – Moments and Couples – Moment of a force about a point and about an axis – Vectorial representation of moments and couples – Varignon's theorem – Single equivalent force – Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three dimensions.

UNIT III CENTROID AND MOMENT OF INERTIA**12**

Centroids – Centroids of lines and areas - Rectangular, circular, triangular areas by integration – Parallel axis theorem and perpendicular axis theorem- Centroids of T section, I section, - Angle section, Hollow section by using standard formula – Area moments of inertia of plane areas – Rectangular, circular, triangular areas by integration – T section, I section, Angle section, Hollow section by using standard formula – Product of Inertia – Principal axes and Principal moments of inertia of plane area.

UNIT IV ANALYSIS OF TRUSSES**12**

Analysis of pin jointed plane determinate trusses by method of joints, method of sections and method of tension coefficient

UNIT V ANALYSIS OF DETERMINATE BEAMS**12**

Types of beams and their supports — Determinate and Indeterminate Beams - Types of loadings

– Shear force and bending moment – Shear force Diagram and Bending Moment Diagram for Simply supported, Cantilever and over-hanging beams - Theory of simple bending – Bending stress distribution.

TOTAL: 60 PERIODS

OUTCOMES:

CO	CO statements	RBT level
	Upon successful completion of the course, the students should be able to	
CO1	Apply the concepts of mechanics to solve problems on statics of particles in two and three dimensions	3
CO2	Solve problems on equilibrium of rigid bodies in two and three dimensions	3
CO3	Evaluate centroid and moment of inertias of simple plane figures and composite plane areas	3
CO4	Determine member forces in truss using different methods of analysis	3
CO5	Draw the Shear force and Bending moment diagrams for determinate beams	3

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

TEXT BOOKS:

1. David Mazurek, E. Russell Johnston, Ferdinand Beer, “Vector Mechanics for Engineers: Statics”, McGraw-Hill Education (India) Pvt. Ltd. 12th Edition, 2019.
2. Rajput.R.K. “Essentials of Strength of Material”s, S.Chand & Company Ltd., New Delhi Reprint 2017.

REFERENCES:

1. Bhavikatti, S.S and Rajashekarappa, K.G., “Engineering Mechanics”, New Age International (P) Limited Publishers,1998.
2. Hibbeler, R.C and Ashok Gupta, “Engineering Mechanics: Statics and Dynamics”, 11th Edition, Pearson Education2010.
3. Punmia.B.C., Ashok Kumar Jain and Arun Kumar Jain, SMTS –I Strength of materials, Laxmi publications. New Delhi, 2015
4. Bansal. R.K. “Strength of Materials”, Laxmi Publications Pvt. Ltd., New Delhi, 2010
5. Timoshenko.S.B. and Gere.J.M, “Mechanics of Materials”, Van NosReinhold, New Delhi 1999.

COURSE ARTICULATION MATRIX

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	2	2	-	-	-	-	-	-	-	-	3	3
CO2	3	3	2	2	-	-	-	-	-	-	-	-	3	3
CO3	3	3	2	2	-	-	-	-	-	-	-	-	3	3
CO4	3	3	2	2	-	-	-	-	-	-	-	-	3	3
CO5	3	3	2	2	-	-	-	-	-	-	-	-	3	3

3-High, 2-Medium, 1-Low



**EE22111 BASIC ELECTRICAL AND ELECTRONICS
ENGINEERING LABORATORY
(Common to all Branches except EC)**

L	T	P	C
0	0	2	1

COURSE OBJECTIVES:

- To provide exposure to the students with hands on experience in basic of Electrical and Electronics wiring connection and measurements.
- To introduce the students to Electrical Machines and basic laws of Electrical Circuits.

LIST OF EXPERIMENTS

1. Wiring – Residential house wiring and Stair case wiring.
2. (a) AC Analysis- Measurement of electrical quantities–voltage, current, power, and power factor using RLC.
(b) Study of three phase system.
3. Energy conservation - Measurement and comparison of energy for incandescent lamp and LED lamp.
4. (a) Identification of circuit components (Resistor, Capacitor, Diode and BJT) and soldering practice.
(b) Signal Measurement- Measurement of peak to peak, RMS, average, period, frequency of signals using CRO.
5. (a) VI Characteristics of Solar photovoltaic panel.
(b) Design of Solar PV Array and Battery sizing for Residential solar PV system.
6. Design a 5V/12V Regulated Power Supply using FWR and IC7805/IC7812.
7. DC Analysis- Verification of Ohm’s Law and Kirchhoff’s Laws.
8. Study of Transformer and motor characteristics.

TOTAL: 30 PERIODS

OUTCOMES :

CO	CO statements	RBT level
	Upon successful completion of the course, the students should be able to	
CO1	Verify the basic laws of Electric circuits and select various Electrical Machines.	4
CO2	Listen to formal and informal communication and read articles and infer meanings from specific contexts from magazines and news papers.	4
CO3	Construct electronic circuits and design solar photovoltaic system.	4
CO4	Apply the concept of three-phase system.	4
CO5	Construct a fixed voltage regulated power supply.	4

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

REFERENCES:

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 ARTICULATION MATRIX :

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	3	3	3	-	-	-	-	2	-	-	2	-	-
CO2	3	3	3	3	-	-	-	-	2	-	-	2	-	-
CO3	3	3	3	3	-	-	-	-	2	-	-	2	-	-
CO4	3	3	3	3	-	-	-	-	2	-	-	2	-	-
CO5	3	3	3	3	-	-	-	-	2	-	-	2	-	-

3-High, 2-Medium, 1-Low



L	T	P	C
0	0	2	1

COURSE OBJECTIVES:

To develop skills to test various construction materials

LIST OF EXPERIMENTS

1. Tests on Cement
 - a. Determination of fineness of cement
 - b. Determination of consistency of cement
 - c. Determination of specific gravity of cement
 - d. Determination of initial and final setting time of cement
 - e. Soundness test
2. Tests on Fine Aggregates
 - a. Determination of specific gravity of fine aggregates
 - b. Determination of Grading of fine aggregates
 - c. Determination of water absorption of fine aggregates
3. Tests on Coarse Aggregates
 - a. Determination of compacted and loose bulk density of coarse aggregate
 - b. Determination of specific gravity and water absorption of coarse aggregate
4. Tests on Bricks
 - a. Determination of compressive strength of bricks
 - b. Determination of water absorption of bricks
 - c. Determination of efflorescence of bricks
5. Tests on Concrete
 - a. Determination of workability
 - i. Slump cone test
 - ii. Compaction factor test
 - iii. Flow table test
 - iv. Vee bee test
 - b. Determination of compressive strength - Cubes
 - c. Determination of split tensile strength - Cylinders
 - d. Determination of Flexural strength - prisms
6. Exercise for demonstration only
 - i. Determination of workability by Flow table test
 - ii. Determination of workability by Vee bee test

TOTAL: 30 PERIODS

OUTCOMES :

CO	CO statements	RBT level
	Upon successful completion of the course, the students should be able to	
CO1	Determinate the physical and mechanical properties of cement and aggregates.	3
CO2	Determine the characteristics of bricks	3
CO3	Investigate the properties of fresh and hardened concrete.	3

1- Remember, 2- Understand, 3- Apply, 4- Analyse, 5- Evaluate, 6- Create

TEXT BOOKS:

1. M. S. Shetty & A K Jain, Concrete Technology: Theory and Practice, S. Chand Publishing, 2019.

REFERENCES:

1. S.D Hasan, Civil Engineering Materials and Their Testing, Narosa Publication, reprinted in 2020.
2. IS 383– 2016 Indian Standard specification for coarse and fine aggregates from natural sources for concrete .
3. IS 516 -1959 – Indian Standard methods of tests for strength of concrete.
4. IS10262 -2019 – Indian standard Concrete Mix Proportioning — Guidelines.
5. IS 2386 – 1978, Methods of test for aggregates, Bureau of Indian Standards.

COURSE ARTICULATION MATRIX

COs	POs												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	1	1	1	-	-	-	-	3	1	-	-	3	3
CO2	3	1	1	1	-	-	-	-	3	1	-	-	3	3
CO3	3	1	1	1	-	-	-	-	3	1	-	-	3	3

3-High, 2-Medium, 1-Low