



KSR College of
Engineering

AN AUTONOMOUS INSTITUTION

25
Years
KSRCE
2001 - 2026
Celebrating
Academic Excellence

NAAC
ACCREDITED **A++**

NBA
ACCREDITED
PROGRAMMES



B.E. - CIVIL ENGINEERING

REGULATIONS 2024

(Academic Year 2025-26 Onwards)

**Curriculum & Syllabus
Semester I and II**





K.S.R. COLLEGE OF ENGINEERING: TIRUCHENGODE - 637 215

(Autonomous)

DEPARTMENT OF CIVIL ENGINEERING

B.E. – Civil Engineering

(REGULATIONS 2024)

Vision of the Institution

IV	To become a globally renowned institution in Engineering and Management, committed to providing holistic education that fosters research, innovation and sustainable development.
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Mission of the Institution

IM1	Deliver value-based quality education through modern pedagogy and experiential learning.
IM2	Enrich Engineering and Managerial Skills through cutting-edge laboratories to meet evolving global demands.
IM3	Empower research and innovation by integrating collaboration, social responsibility and commitment to sustainable development.

Vision of the Department / Programme: (Civil Engineering)

DV	To develop premier Civil Engineers through education, fostering innovation and research to create a sustainable environment.
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Mission of the Department / Programme: (Civil Engineering)

DM1	Provide value-based education using advanced teaching methods and experiential learning.
DM2	Prepare engineers for global challenges through state-of-the-art labs and advanced skills.
DM3	Promote research, foster innovation, and strengthen industry collaboration, addressing infrastructure challenges through sustainable solutions.

Programme Educational Objectives (PEOs): (Civil Engineering)

The graduates of the programme will be able to	
PEO 1	Core Competency: Apply comprehensive civil engineering knowledge to analyze, design, and solve real-world problems.
PEO 2	Professionalism: Apply ethical principles, communicate effectively, and collaborate in multidisciplinary teams.
PEO 3	Career Development: Attain professional success, embrace lifelong learning, and develop leadership skills to make a positive impact in their fields.

(Signature)
Chairman (BoS)

KSR College of Engineering



Programme Outcomes (POs) of B.E. - Civil Engineering

Program Outcomes (POs)	
PO1	Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop the solution of complex engineering problems.
PO2	Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)
PO3	Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)
PO4	Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).
PO5	Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6).
PO6	The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).
PO7	Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)
PO8	Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.
PO9	Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences.
PO10	Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
PO11	Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)
Program Specific Outcomes (PSOs)	
PSO1	Structural Analysis and Design: Plan and design structural systems that ensure safety, sustainability, and compliance with relevant codes and standards.
PSO2	Construction Planning and Management: Develop sustainable construction materials from waste, ensuring environmentally responsible waste management and complying with relevant regulations and standards.

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		K.S.R. COLLEGE OF ENGINEERING (Autonomous) (Approved by AICTE & Affiliated to Anna University) K.S.R. Kalvi Nagar, Tiruchengode - 637 215								CURRICULUM UG R - 2024		
Department		Department of Civil Engineering										
Programme		B.E. Civil Engineering										
SEMESTER I												
S.No	Course Code	Course Title	Category	Periods per semester					Credit C = T/30	Max. Marks		
				L	T	P	SL	Tot		CA	ES	Tot
Induction Programme			MC	-	-	-		-	-	-	-	-
THEORY COURSES												
1	24ENT19	Professional Communication	HSMC	45	0	0	45	90	3	40	60	100
2	24CET11	Civil Engineers and society	PCC	45	0	0	45	90	3	40	60	100
3	24GET19	□□□□□□□□ / Heritage of Tamils	HSMC	15	0	0	15	30	1	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT												
4	24MAI19	Matrices and Calculus	BSC	45	0	30	45	120	4	50	50	100
5	24PHI06	Applied Physics	BSC	45	0	30	45	120	4	50	50	100
6	24CEI12	Engineering Graphics	ESC	30	0	30	60	120	4	50	50	100
LABORATORY COURSES												
7	24GEP17	Manufacturing Practices Laboratory	ESC	0	0	30	0	30	1	60	40	100
8	24CEP11	Computer aided Building Drawing	PCC	0	0	30	0	30	1	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE												
9	24SDP19	Soft Skills Development- I	EEC	0	0	30	0	30	1	60	40	100
TOTAL				225	0	180	255	660	22	900		


Chairman (BoS)



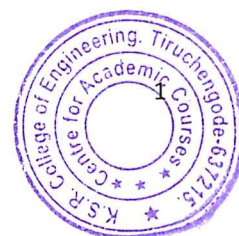
SEMESTER II												
S.No	Course Code	Course Title	Category	Periods per semester					Credit C = T/30	Max. Marks		
				L	T	P	SL	Tot		CA	ES	Tot
THEORY COURSES												
1	24CET21	Design Thinking	PCC	30	0	0	30	60	2	40	60	100
2	24CET22	Construction Materials, Techniques and Practices	PCC	45	0	0	45	90	3	40	60	100
3	24GET29	தமிழரும் தொழில்நுட்பமும் /Tamil and Technology	HSMC	15	0	0	15	30	1	40	60	100
THEORY COURSES WITH LABORATORY COMPONENT												
4	24MAI29	Probability and Statistics	BSC	45	0	30	45	120	4	50	50	100
5	24CHI07	Applied Chemistry	BSC	45	0	30	45	120	4	50	50	100
6	24CSI29	Python Programming	ESC	15	0	90	15	120	4	50	50	100
LABORATORY COURSES												
7	24ENP29	Professional Communication Laboratory	HSMC	0	0	30	0	30	1	60	40	100
8	24CEP21	Construction Materials Laboratory	PCC	0	0	30	0	30	1	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE												
9	24SDP29	Soft Skills Development- II	EEC	0	0	30	0	30	1	60	40	100
MANDATORY COURSES												
10		Mandatory Course - I	MC	0	0	30	0	30	0	-	-	-
TOTAL				195	0	270	195	660	21	1000		


Chairman (BoS)



24ENT19	PROFESSIONAL COMMUNICATION	Category	L	T	P	SL	C
		HSMC	45	0	0	45	3
(Common to All Branches)							
PRE-REQUISITE: A comprehensive understanding of basic English grammar, vocabulary, and sentence structure with familiarity in Communication and Technical Writing are considered as pre-requisite for the course.							
OBJECTIVE: To equip learners with essential verbal and written communication skills, including technical writing, necessary for academic, professional, and workplace success.							
UNIT - I	UNDERSTANDING COMPARISONS AND CONTRASTS						(9)
Reading: Technical brochures, telephone messages, social media messages. Writing: Emails/letters introducing oneself, Compare and Contrast Essay. Grammar: Present Tenses, Framing WH and Yes-No questions. Vocabulary: Portmanteau words, One-word substitutions.							
UNIT - II	WRITING REPORTS AND PARAGRAPHS						(9)
Reading: Technical texts, biographies, travelogues, travel & technical blogs. Writing: Paragraph writing, Short Report on an event/industrial visit. Grammar: Past Tenses, Active & Passive Voice transformations, Prepositions. Vocabulary: Word formations using Prefixes & Suffixes.							
UNIT - III	DESCRIBING THE PROCESS/PRODUCT						(9)
Reading: Advertisements, gadget reviews, user manuals, news reports. Writing: Definitions, Instructions, Product/Process description, Checklists. Grammar: Future Tenses, If clauses, Concord. Vocabulary: Nominal Compounds, Discourse Markers (connectives & sequence words).							
UNIT - IV	TRANSCODING AND RECOMMENDATIONS						(9)
Reading: Newspaper articles, Journal reports. Writing: Recommendations, Transcoding.(Conversion of non-verbal to verbal information) Grammar: Articles, Relative pronouns, Modals. Vocabulary: Collocations, Homonyms.							
UNIT - V	SUMMATION AND DESCRIPTION						(9)
Reading: Editorials and Opinion blogs, Company profiles. Writing: Descriptive/Narrative Essays, Job/Internship Application with Resume. Grammar: Numerical adjectives, Relative Clauses. Vocabulary: Cause & Effect Expressions, Homophones.							
TOTAL (T:45 , SL:45) = 90 PERIODS							

Signature
Chairman (Bos)



COURSE OUTCOMES:

At the end of the course, the learners will be able to:

COs	Course Outcome	Cognitive Level
CO1	Recognize the structure of comparison texts using correct tenses and appropriate vocabulary.	Understand
CO2	Construct short paragraphs and reports using past tense and clear expressions.	Understand
CO3	Comprehend processes and products using future forms and appropriate vocabulary.	Understand
CO4	Interpret visuals like charts or graphs to produce well-structured written content.	Understand
CO5	Draft essays and job applications clearly, using proper grammar and structure.	Understand

TEXT BOOKS:

1. English for Engineers & Technologists, Orient Blackswan Private Ltd. Department of English, Anna University, 2023.
2. Nitin Bhatnagar, Communicative English for Engineers and Professionals, Pearson, 2024.

REFERENCES:

1. Dr. K.N. Shoba, and Dr. Lourdes Jovani, English for Science & Technology-II Cambridge University Press. Francis, Department of English, Anna University, 2023.
2. Lakshminarayanan, A Course Book on Technical English, Scitech Publications (India) Pvt. Ltd.2022.
3. Kulbhusan Kumar, RS Salaria, Effective Communication Skill, Khanna Publishing House, 2023.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	-	-	-	-	-	-	-	2	3	-	3	-	-
CO2	-	-	-	-	-	-	-	2	3	-	3	-	-
CO3	-	-	-	-	-	-	-	2	3	-	3	-	-
CO4	-	-	-	-	-	-	-	2	3	-	3	-	-
CO5	-	-	-	-	-	-	-	2	3	-	3	-	-

1-Low, 2-Medium, 3-High


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24CET11	CIVIL ENGINEERS AND SOCIETY	Category	L	T	P	SL	C
		PCC	45	0	0	45	3
PREREQUISITE: A basic understanding of engineering principles, as well as familiarity with core Civil engineering ideas. Students should also be aware of environmental challenges and sustainability, as well as the ethical aspects involved in engineering methods.							
OBJECTIVES: This course explores the impact of engineering on society and technology, covering key concepts in building construction and infrastructure. It emphasizes the societal role of infrastructure and the ethical responsibilities of engineers. The course also highlights the importance of reliability and safety in engineering practices.							
UNIT – I	INTRODUCTION OF CIVIL ENGINEERING					(9)	
Engineering – Definition – Engineering Education – Graduate Attributes – Engineering functions – Role and Responsibilities of Engineers – Early construction and development over time.							
UNIT – II	FUNDAMENTALS OF CIVIL ENGINEERING					(9)	
Introduction to Civil Engineering –Branches in Civil Engineering – Elements of Building Construction - General Requirement of Building, Elementary principles and basic requirements of a building Planning, Importance of Planning – Possible scopes for a career.							
UNIT – III	NATIONAL PLANNING FOR CONSTRUCTION AND INFRASTRUCTURE DEVELOPMENT					(9)	
Types of Infrastructures - Impact of infrastructural development on economy and environment of country – Position of Construction Industry - Five year plan outlays for construction – Current budget for infrastructure works - Role of Civil Engineer in Society.							
UNIT – IV	ENGINEERING AS SOCIAL EXPERIMENTATION					(9)	
The concept of profession – Importance of ethics in engineering – Role of codes of ethics – Professional responsibilities of engineers – Overview of ethical theories and applications - Engineering as Experimentation – Engineers as responsible Experimenters.							
UNIT – V	SUSTAINABILITY					(9)	
Reliability, risk and safety – Risk management – Engineering and the environment – Ethics and the environment – Sustainable Engineering – Sustainable Development Goal and Civil Engineering.							
L=45,SL= 45,Total = 90 PERIODS							



COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Describe the role and responsibilities of engineers and the evolution of civil engineering.	Understand
CO2	Explain basic building construction elements and the importance of planning.	Understand
CO3	Describe infrastructure types and their impact on economy and environment.	Understand
CO4	Interpret engineering ethics and the concept of engineers as responsible experimenters.	Understand
CO5	Summarize key aspects of sustainable engineering, including reliability, safety, and sustainability goals	Understand

TEXT BOOKS:

1. Dr. Shakuntala Acharya, "Civil Engineering Societal and Global Impact" All India Council for Technical Education (AICTE), New Delhi. November, 2023.
2. S S Bhavikati, "Basic Civil Engineering", New Age International (P) Limited Publishers, New Delhi, 2018.

REFERENCES:

1. Rebecca Mirsky and John Schaufelberger, "Professional Ethics for the Construction Industry" RICS, USA, 2014.
2. Kim Strom Gottfried, "Straight Talk about Professional Ethics", Lyceum Books, 2nd Edition, 2014.
3. Kenneth K. Humphreys, "What Every Engineer Should Know about Ethics", CRC Press, 1999.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	–	–	–	–	–	–	1	–	–	2	2
CO2	3	2	–	–	–	–	–	–	1	–	–	2	2
CO3	3	2	–	–	–	–	–	–	1	–	–	2	2
CO4	3	2	–	–	–	–	–	–	1	–	–	2	2
CO5	3	2	–	–	–	–	–	–	1	–	–	2	2

1-low, 2-medium, 3-high


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24GET19	தமிழர்மரபு	CATEGORY	L	T	P	SL	C
		HSMC	15	0	0	15	1
(அனைத்து துறைகளுக்கும் பொதுவானது)							
முன்கூட்டிய துறைசார் அறிவு : தேவை இல்லை							
அலகு - I	மொழி மற்றும் இலக்கியம்						[03]
இந்திய மொழிக் குடும்பங்கள் - திராவிட மொழிகள் - தமிழ் ஒரு செம்மொழி - தமிழ் செவ்விலயக்கியங்கள் - சங்க இலக்கியத்தின் சமயச்சார்பற்ற தன்மை - சங்க இலக்கியத்தில் பகிர்தல் அறம் - திருக்குறளில் மேலாண்மைக் கருத்துக்கள் - தமிழ் காப்பியங்கள், தமிழகத்தில் சமணபௌத்த சமயங்களின் தாக்கம் - பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலகியங்கள் தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி - தமிழ் இலக்கியவளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.							
அலகு - II	மரபு - பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை - சிற்பக் கலை						[03]
நடுகல் முதல் நவீன சிற்பங்கள் வரை - ஐம்பொன் சிலைகள் - பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் - தேர் செய்யும் கலை - சுடுமண் சிற்பங்கள் - நாட்டுப்புறத் தெய்வங்கள் - குமரிமுனியில் திருவள்ளுவர் சிலை - இசை கருவிகள் - மிருதங்கம், பறை. வீணை. யாழ். நாதஸ்வரம் - தமிழர்களின் சமூகபொருளாதார வாழ்வில் கோவில்களின் பங்கு.							
அலகு - III	நாட்டுப் புறக் கலைகள் மற்றும் வீர விளையாட்டுக்கள்						[03]
தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஓயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.							
அலகு - IV	தமிழர்களின் திணைக் கோட்பாடுகள்						[03]
தமிழகத்தின் தாவரங்களும், விலங்குகளும் - தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் - தமிழர்கள் போற்றிய அறக்கோட்பாடு - சங்கக்காலத்தில் தமிழகத்தில் எழுத்தறிவும் கல்வியும் - சங்ககால நகரங்களும் துறை முகங்களும் - சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி - கடல் கடந்த நாடுகளில் சோழர்களின் வெற்றி.							
அலகு - V	இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு						[03]
இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு - இந்தியாவின் பிறபகுதிகளில் தமிழ் பண்பாட்டின் தாக்கம் - சுயமரியாதை இயக்கம் - இந்திய மருத்துவத்தில் சித்தமருத்துவத்தின் பங்கு கல்வெட்டுகள் கையெழுத்துப்படிகள் - தமிழ்ப் புத்தகங்கள்களின் அச்ச வரலாறு.							
Total (L= 15, SL=15) =30 Periods							


Chairman (BoS)



பாடம் கற்றத்தின் விளைவுகள்: பாடத்தை வெற்றிகரமாக கற்று முடித்த பின்பு, மாணவர்களால் முடியும் விளைவுகள்		அறிவாற்றல் நிலை
CO1:	தமிழ்மொழியின் செந்ததன்மை மற்றும் இலக்கியம் குறித்த தெரிதல்	புரிதல்
CO2:	தமிழர்களின் சிற்பக்கலை, ஓவியக்கலை மற்றும் இசைக் கருவிகள் குறித்த தெளிவு.	புரிதல்
CO3:	தமிழர்களின் நாட்டுப் புரைக் கலைகள் மற்றும் வீரவிளையாட்டுகள் குறித்த தெளிவு	புரிதல்
CO4:	தமிழர்களின் திணைக் கோட்பாடுகள், சங்ககாலவணிகம் மற்றும் சோழர்களின் வெற்றிகள் குறித்த தகவல்கள்.	புரிதல்
CO5:	இந்திய தேசிய இயக்கம், சுயமரியாதை இயக்கம் மற்றும் சித்த மருத்தவம் பற்றிய புரிதல்.	புரிதல்

Text Books:

1	தமிழகவரலாறு-மக்களும்பண்பாடும்-கேகேபிள்ளை (வெளியீடு தமிழ்நாடு பாடநூல் மற்றும் கல்வியில் பணிகள் கழகம்), உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை, 2002
2	கணினித்தமிழ்முனைவர் இல. சுந்தரம், விகடன் பிரசுரம், 2016

Reference Books :

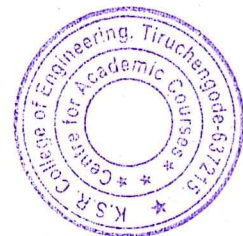
1	கீழடி-வைகை நதிக்கரையில் சங்ககால நகரநாகரிகம்.(தொல்லியல்துறைவெளியீடு)
2	பொருளை - ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு)
3	Social Life of Tamils (Dr.K.K.Pillay) A joint Publication of TNTB & ESC and RMRL – (in print)
4	Social Life of the Tamils – The Classical Period (Dr.S.Sigaravelu) (Published by: International Institute of Tamil Studies).

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	-	-	-	-	-	3	3	-	2	-	3	-	-
CO2	-	-	-	-	-	3	3	-	2	-	3	-	-
CO3	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	-	-	-	-	-	3	3	-	2	-	3	-	-
CO5	-	-	-	-	-	3	3	-	2	-	3	-	-
Avg.	-	-	-	-	-	3	3	-	2	-	3	-	-

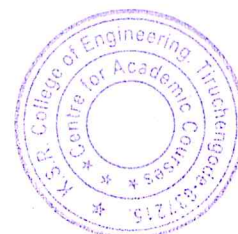
1. சிறிது (குறைந்த) 2. மிதமான (நடுத்தர) 3. கணிசமான (உயர்)

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24GET19	HERITAGE OF TAMILS	CATEGORY	L	T	P	SL	C
		HSMC	15	0	0	15	1
(Common to all branches)							
Prerequisite(s): No prerequisites are needed for enrolling into the course							
UNIT - I	LANGUAGE AND LITERATURE						[03]
Language Families in India - Dravidian Languages – Tamil as a Classical Language - Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature - Management Principles in Thirukural - Tamil Epics and Impact of Buddhism & Jainism in Tamil Land - Bakthi Literature Azhwars and Nayanmars - Forms of minor Poetry - Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan.							
UNIT - II	HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE						[03]
Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.							
UNIT - III	FOLK AND MARTIAL ARTS						[03]
Therukoothu, Karagattam, VilluPattu, KaniyanKoothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.							
UNIT - IV	THINAI CONCEPT OF TAMILS						[03]
Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.							
UNIT - V	CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE						[03]
Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts – Print History of Tamil Books.							
Total (L= 15, SL=15) =30 Periods							
Course Outcomes:							Cognitive Level
At the end of the course, the student will be able to							
CO1:	Recognize the extensive literature of Tamil and its classical nature.						Understand
CO2:	Apprehend the heritage of sculpture, painting and musical instruments of ancient people.						Understand
CO3:	Review on folk and martial arts of Tamil people.						Understand
CO4:	Insight thinai concepts, trade and victory of Chozha dynasty.						Understand
CO5:	Realize the contribution of Tamil in Indian freedom struggle, self-esteem movement and siddha medicine.						Understand

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Text Books:	
1	Social Life of Tamils (Dr.K.K.Pillay) A joint Publication of TNTB & ESC and RMRL – (in print)
2	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukarasu) (Published by : International Institute of Tamil Studies)
Reference Books:	
1	Social Life of the Tamils – The. Classical Period (Dr.S.Sigaravelu) (Published by: International Institute of Tamil Studies).
2	The Contribution of the Tamil to Indian Culture (Dr.M.Valarmathi) (Published by International Institute of Tamil Studies).
3	Keeladi – ‘Sangam City Civilization on the banks of river Vaigai; (Jointly Published by: Department of Archaeology & Tamilnadu Text Book and Educational Services Corporation, Tamilnadu)
4	Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay) (Published by: The Author)

Mapping of COs with POs and PSOs													
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	-	-	-	-	-	3	3	-	2	-	3	-	-
CO2	-	-	-	-	-	3	3	-	2	-	3	-	-
CO3	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	-	-	-	-	-	3	3	-	2	-	3	-	-
CO5	-	-	-	-	-	3	3	-	2	-	3	-	-
Avg.	-	-	-	-	-	3	3	-	2	-	3	-	-
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)													

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24MAI19	MATRICES AND CALCULUS	Category	L	T	P	SL	C
		BSC	45	0	30*	45	4
SEMESTER I - B.E / B.TECH (Common to All Branches)							
PREREQUISITE: The Students should have a basic understanding of calculus, matrices, and differential equations to effectively follow the concepts in this course.							
OBJECTIVES: Build a strong foundation in eigen values, eigen vectors, quadratic forms, and higher-order linear differential equations. Develop skills in differential and vector calculus to analyze curves, optimize multivariable functions, and interpret vector fields.							
UNIT - I	LINEAR ALGEBRA					(9)	
Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values and Eigen vectors (Excluding proof) – Cayley Hamilton theorem (excluding proof) – Quadratic forms – Reduction of quadratic form to canonical form by orthogonal transformation.							
UNIT - II	ORDINARY DIFFERENTIAL EQUATIONS					(9)	
Linear differential equations of second and higher order with constant coefficients – Differential equations with variable coefficients – Legendre’s linear differential equations – Method of variation of parameters.							
UNIT - III	DIFFERENTIAL CALCULUS					(9)	
Curvature - Radius of curvature (Cartesian co-ordinates only) – Centre of curvature and Circle of curvature – Involute and Evolute (Parabola, Ellipse, Hyperbola and Rectangular hyperbola).							
UNIT - IV	FUNCTIONS OF SEVERAL VARIABLES					(9)	
Partial derivatives – Taylor’s series expansion – Jacobians - Maxima and Minima for functions of two variables – Method of Lagrangian multipliers.							
UNIT - V	VECTOR CALCULUS					(9)	
Gradient, Divergence and Curl – Directional derivative – Irrotational and solenoid vector fields – Green’s theorem in plane, Gauss divergence theorem and Stoke’s theorem (Cube, Cuboid and Rectangular Paralleopiped only).							
List of Experiments(R Software): 1. Calculate the characteristic equation and eigen values. 2. Find the eigenvector and diagonalization of a given matrix. 3. Solving ODE with constant coefficients. 4. Detect the solution of ODE with variable coefficients. 5. Identify the radius of curvature. 6. Reckon the Taylor’s series for functions of two variables. 7. Estimate the divergence and curl.							
* Alternative weeks : Tutorial and Laboratory							
L = 45 , * P = 15 & *T = 15, SL = 45, TOTAL: 120 PERIODS							

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COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Apply eigen values, eigen vectors, and the Cayley-Hamilton theorem to solve matrix problems and diagonalize quadratic forms into canonical form.	Apply
CO2	Apply methods to solve second and higher-order linear differential equations with constant and variable coefficients.	Apply
CO3	Apply concepts of differential calculus to find curvature, center of curvature, and evolutes of standard Cartesian conic sections.	Apply
CO4	Apply partial derivatives, Jacobians, and lagrangian multipliers to determine local extremum of multivariable functions.	Apply
CO5	Apply vector differential operators to the vector fields and verify Green's, Gauss divergence, and Stokes' theorems for geometries.	Apply

TEXT BOOKS:

1. Ravish R Singh and Mukul Bhatt, "Engineering Mathematics – I", Mc-Graw Hill Publications, New Delhi, 2nd Edition, 2020.
2. B. S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 40th Edition, 2020.

REFERENCES:

1. Bali N. P and Manish Goyal, "Engineering Mathematics", Laxmi Publications Pvt Ltd., 7th Edition, 2020.
2. Dass H.K, "Advance Engineering Mathematics", S. Chand and company, 11th Edition, 2014.
3. Jain R.K. and Iyengar S.R.K, "Advanced Engineering Mathematics", Narosa Publications, 8th Edition, 2012.
4. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley India, New Delhi, 10th Edition 2016.
5. <https://archive.nptel.ac.in/courses/111/108/111108157/>

Mapping of COs with POs and PSOs

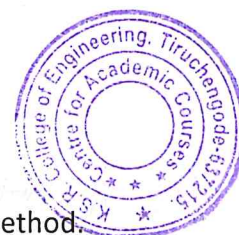
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	3	3	2	-	-	1	-	-	2	-	-
CO2	3	3	3	3	2	-	-	1	-	-	2	-	-
CO3	3	3	3	3	2	-	-	1	-	-	2	-	-
CO4	3	3	3	3	2	-	-	1	-	-	2	-	-
CO5	3	3	3	3	2	-	-	1	-	-	2	-	-

1-low, 2-medium, 3-high

LIST OF EQUIPMENTS (For a Batch of 30 Students)

S.No.	Name of the Equipments	Quantity
1.	A computer with Intel (R) Core (TM) i3 – 2130 CPU @ 3.40GHZ processor and 4 GB RAM – DDR3.	30 Nos.
2.	R software (Open source)	30 Nos.

24PHI06	APPLIED PHYSICS	Category	L	T	P	SL	C
		BSc	45	-	30	45	4
(Common to CE, ME & SFE)							
PREREQUISITE: The students must have knowledge about basic concepts of sound, light, arrangement of atoms in crystalline solids, modern engineering materials, magnetic and super conducting materials and their applications.							
OBJECTIVES: To provide a comprehensive understanding of the principles, properties and applications of acoustics, ultrasonics, lasers, crystalline structures, new engineering materials, magnetic materials and superconductors in modern Science and technology.							
UNIT – I	ACOUSTICS AND ULTRASONICS						(9)
Acoustics–Introduction – classification of sound – characteristics of musical sound – loudness – Weber – Fechner law – decibel – absorption co-efficient – reverberation – reverberation time – Sabine’s formula: growth and decay (derivation) – factors affecting acoustics of buildings and their remedies. Ultrasonics – production – Piezoelectric method – properties – velocity measurement: acoustical grating – applications – SONAR, NDT – ultrasonic flaw detection technique.							
UNIT – II	LASER TECHNOLOGY						(9)
Introduction – principle of spontaneous emission and stimulated emission – Einstein’s co-efficient A & B(derivation) – population inversion, pumping – types of laser – CO ₂ laser and semiconductor diode laser– homo – junction and hetero – junction (qualitative analysis only) – industrial applications: lasers in welding, heat treatment and cutting – holography (construction and reconstruction of images).							
UNIT – III	CRYSTAL PHYSICS						(9)
Introduction to crystalline and amorphous solids – lattice and unit cell – seven crystal systems and Bravais lattices – atomic radius – co-ordination number – packing factor of SC, BCC, FCC and HCP structures–Miller indices(hkl) – d-spacing in cubic lattice – crystal imperfections – point, line and surface defects.							
UNIT – IV	MODERN ENGINEERING MATERIALS						(9)
New engineering materials: Metallic glasses – preparation, properties and applications – shape memory alloys (SMA) – characteristics, properties of Ni-Ti alloy – applications. Smart materials – smart fluids –Electrorheological fluids (ERF)–Magnetorheological fluids (MRF) – effect of temperature in fluids and its applications.							
UNIT - V	MAGNETIC AND SUPERCONDUCTING MATERIALS						(9)
Magnetic Materials: Introduction – origin of magnetic moment – dia, para and ferromagnetic materials – domain theory of ferro-magnetism – Hysteresis – soft and hard magnetic materials. Superconducting Materials: Introduction to superconductivity – properties and types of superconductor – application of superconductors: magnetic levitation–SQUIDS – cryotron.							
List of exercises/experiments:							
1. Calculate the velocity of ultrasonic waves and compressibility of the given liquid using ultrasonic interferometer.							
2. Determine the thickness of the given thin paper using Air wedge method.							
3. Compute the width of the CD groove with a help of semiconductor laser.							
4. Find the band gap of a Germanium/ Silicon crystal.							
5. Evaluate the wavelength of an InP / GaAs crystal laser.							
6. Measure the Young’s modulus of a given beam using non – uniform bending method.							
7. Enumerate the viscosity of a given liquid by Poiseuille’s method.							
8. Assess the Hysteresis loss of magnetic materials using B-H curve.							
Lecture: 45, Laboratory: 30, SL:45 TOTAL: 120 PERIODS							



Dr. R.V.M. RANGARAJAN

CHAIRMAN

Course outcomes:**At the end of the course, the students will be able to:**

COs	Course Outcome	Cognitive level
CO1	Apply acoustics and ultrasonics principles to determine sound quality in building and implement ultrasonic methods in practical applications.	Apply
CO2	Interpret the laser principles, types and explain specific application based on their desirable requisite.	Understand
CO3	Compute seven crystal systems, interplanar spacing in simple cubic lattice, atomic packing factor for SC, BCC, FCC & HCP and crystal imperfections.	Apply
CO4	Discuss the properties and applications of metallic glasses, SMAs, smart fluids and recognize the behavior of ERF and MRF under temperature effects.	Understand
CO5	Illustrate the principles governing magnetic materials, superconductors, including their classification, properties and applications.	Understand

Text Books :

1. M.N. Avadhanulu and P.G. Kshirsagar, "A text book of Engineering Physics", S. Chand and Company, New Delhi, 11th Edition, 2018.
2. R.K. Gaur & S.L. Gupta, "Engineering Physics", Dhanpat Rai Publication, New Delhi, 7th Edition, 2014.

Reference Books :

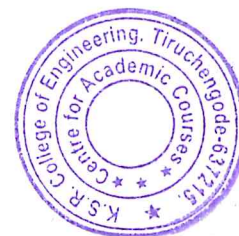
1. R. Murugesan and Kiruthiga Sivaprasath, "Modern Physics", S. Chand & Company, New Delhi, 17th Edition, 2014.
2. V. Rajendran, "Engineering Physics", Tata McGraw-Hill, New Delhi, 1st Edition, 2011.
3. S.O. Pillai, "Solid State Physics", New Age Publication, Chennai, 10th Edition, 2023.
4. Arthur Beiser, Shobhit Mahajan, S. Rai Choudhury, "Concepts of Modern Physics", McGraw-Hill, New Delhi, 7th Edition, 2015.

Mapping of COs with POs and PSOs

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO 1	PSO 2
CO1	3	3	2	-	-	-	1	2	2	-	2	-	-
CO2	3	2	-	-	-	-	1	2	2	-	2	-	-
CO3	3	3	2	-	-	-	1	2	2	-	2	-	-
CO4	3	2	-	-	-	-	1	2	2	-	2	-	-
CO5	3	2	-	-	-	-	1	2	2	-	2	-	-
Avg.	3	2	-	-	-	-	1	2	2	-	2	-	-

1-low, 2-medium, 3-high


BoS chairman
Chairman (BoS)



24PHI06 - APPLIED PHYSICS
I Year B.E (CE, ME & SFE)
Requirements for a batch of 30 students
Regulation (2024)

S.No.	Description of Equipment	Quantity required
1.	Ultrasonic interferometer. (with accessories)	5 Nos
2.	Air wedge apparatus. (with traveling microscope and accessories)	5 Nos
3.	Width of the groove of CD using laser. (with accessories)	5 Nos
4.	Band gap apparatus. (with accessories)	5 Nos
5.	Wavelength of semiconductor laser beam. (with accessories)	5 Nos
6.	Non- uniform Bending apparatus. (with accessories)	5 Nos
7.	Poiseuille's method apparatus. (with accessories)	5 Nos
8.	B-H curve apparatus. (with accessories)	5 Nos

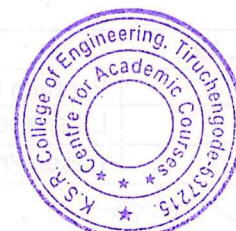

BoS chairman

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24CEI12	ENGINEERING GRAPHICS	Category	L	T	P	SL	C
		ESC	30	0	30	60	4
PREREQUISITE: Student must have the basic knowledge of geometry, trigonometry and algebra, along with an introduction to fundamental engineering concepts. Students should also possess basic computer literacy and knowledge on traditional drafting tools such as scales, compasses, and protractors. The ability to visualize and interpret three-dimensional objects from two-dimensional drawings.							
OBJECTIVES: Apply BIS conventions to ensure standardized and accurate technical drawings. Master true lengths and inclinations to create precise projections of lines and solids. Develop skills in projecting and unfolding 3D solids, including their isometric and perspective views.							
UNIT – I	PLANE CURVES AND ORTHOGRAPHIC PROJECTION						(9)
Introduction on drafting instruments, BIS conventions and specifications, Lettering and Dimensions Conics - Construction of ellipse, Parabola and hyperbola by eccentricity method - Construction of cycloid construction of involutes- Drawing of tangents and normal to the above curves. Representation of Three Dimensional objects - General principles of orthographic projection - First angle projection.							
UNIT - II	PROJECTION OF POINTS, LINES AND PLANE SURFACES						(9)
Projection of points and straight lines located in the first quadrant - Determination of true lengths and true inclinations Projection of polygonal surface and circular lamina inclined to any one reference plane.							
UNIT - III	PROJECTION OF SOLIDS						(9)
Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method.							
UNIT - IV	SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES						(9)
Sectioning of above solids in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other Obtaining true shape of section. Development of lateral surfaces of simple and truncated solids - Prisms, pyramids, cylinders and cones.							
UNIT - V	ISOMETRIC AND PERSPECTIVE PROJECTIONS						(9)
Principles of isometric projection - isometric scale - isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones. Perspective projection of prisms, pyramids and cylinders by visual ray method.							
L=30, P= 30,SL=60, TOTAL= 120 PERIODS							


Chairman (BoS)

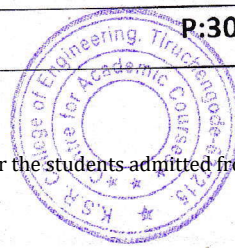


COURSE OUTCOMES:													
At the end of the course, the students will be able to:													
COs	Course Outcome											Cognitive Level	
CO1	Classify types of plane curves and understand their geometric properties and equations.											Understand	
CO2	Explain the orientation of points with respect to the frontal, horizontal, and profile planes.											Understand	
CO3	Construct projections of various solid shapes.											Apply	
CO4	Identify the true shape and size of surfaces using accurate projection methods.											Apply	
CO5	Interpret isometric views of simple 3D objects to understand their projection on a 2D surface.											Understand	
List of Exercise/Experiments:													
1. Study of basic tools, commands and coordinate system (absolute, relative, polar, etc.) used in 2D Software.													
2. Draw the conic curves and special curves by using AutoCAD.													
3. Draw the front view, top view, side view of objects from the given pictorial view.													
4. Draw the projections of straight lines.													
5. Draw the projections of polygonal surface.													
6. Draw the projections of simple solid objects.													
7. Draw the sectional view and the true shape of the given section.													
8. Draw the development of surfaces like prism, pyramids, cylinders and cone													
9. Draw the isometric projections of simple solids, truncated prism and pyramids.													
10. Draw the isometric projections of cylinder and cone.													
TEXT BOOKS:													
1.M.S. Kumar, Engineering Graphics, D.D. Publications, Assam 2018.													
2.K. V. Natarajan, A text book of Engineering Graphics, Dhanalakshmi Publishers, Chennai (2017).													
REFERENCES:													
1. Venugopal & V. Prabhu Raja, Engineering Graphics, New Age International (P) Limited, New Delhi, 15 th Edition, 2018.													
2. K. R. Gopalakrishna, Engineering Drawing (Vol.I&II), Subhas Publications, Bengaluru, 1 st Edition 2017.													
3. B. Shah and B.C. Rana, Engineering Drawing, Pearson Education London, 2 nd Edition, 2009.													
4. N.D. Bhatt, Engineering Drawing, Charotar Publishing House, Gujarat, 46 th Edition, 2003.													
Mapping of COs with POs and PSOs													
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	-	-	1	-	-	2	1	-	2	3	-
CO2	3	2	-	-	1	-	-	2	1	-	2	3	-
CO3	3	3	2	-	1	-	-	2	1	-	2	3	-
CO4	3	2	2	-	1	-	-	2	1	-	2	3	-
CO5	3	2	-	-	1	-	-	2	1	-	2	3	-
1-low, 2-medium, 3-high													

Laboratory Equipment Details
(Requirement for batch of 30 students)

S. No.	Description of Equipment	Quantity required
1.	Pentium IV Computer with AutoCAD	30 Nos.
2.	Licensed Software for Drafting and Modeling	30 licenses
3.	Laser Printer or Plotter to print / plot drawings	2 Nos.

24GEP17	MANUFACTURING PRACTICES LABORATORY	Category	L	T	P	SL	C
		ESC	0	0	30	0	1
(Common to AE, CE, MECH & SFE)							
PREREQUISITE: Students must have a basic knowledge on the topics from Civil works and Mechanical Engineering such as Plumbing, Carpentry, Welding, and Machining and Electrical & Electronics basic components.							
OBJECTIVES: Develop basic practical skills in plumbing, carpentry, welding, machining, sheet metal, and electrical work. Students gain hands-on experience with tools, materials, and techniques used in civil, mechanical, and electrical fields.							
List of Exercise/Experiments:							
GROUP A (CIVIL)				(12)			
PLUMBING WORK							
1. Preparing plumbing line sketches							
2. Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, Elbows and other components which are commonly used in household.							
CARPENTRY WORK							
3. Sawing and planning work							
4. Making joints like T-Joint, Mortise joint and Tenon joint and Dovetail joint.							
GROUP B (MECHANICAL)				(14)			
WELDING WORK							
5. Welding of Butt Joints, Lap Joints, and Tee Joints using arc welding.							
BASIC MACHINING WORK							
6. Simple Facing and Turning operation using centre lathe.							
7. Drilling and Tapping using drilling machine							
SHEET METAL WORK							
8. Making of a square tray.							
GROUP C (ELECTRICAL & ELECTRONICS)				(04)			
9. Study of Ceiling Fan and Iron Box							
10. Study of logic gates AND, OR, EX-OR and NOT.							
LIST OF EQUIPMENT (for a batch of 30 Students)							
S.No.	Name of the Equipment					Quantity	
1	Carpentry tools and its accessories					15 sets	
2	Plumbing tools and its accessories					15sets	
3	Arc Welding equipment and its accessories					5 sets	
4	Centre Lathe with its accessories					2 No's	
5	Pillar type drilling machine					1 No	
6.	Foundry tools and its accessories					5 set	
 P:30 TOTAL: 30 PERIODS							



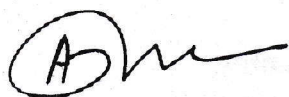
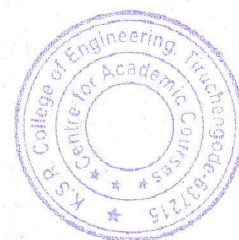
COURSE OUTCOMES: At the end of the course, the students will be able to:			
COs	Course Outcome	Exp. No.	Cognitive Level
CO1	Develop pipe line plan, lay and connect various pipe fittings used in common house hold plumbing work.	1 & 2	Apply
CO2	Develop joints in wood materials used in common household wood work	3 & 4	Apply
CO3	Construct various joints in steel plates using arc welding work	5	Apply
CO4	Apply lathe and drilling machine for turning, drilling, tapping and sheet metal work.	6, 7 & 8	Apply
CO5	Illustrate the key components and basic functions of a ceiling fan, iron box and logic gates.	9 & 10	Understand

REFERENCES:

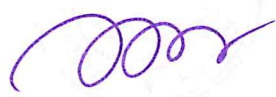
1. Dr. V. Ramesh Babu. Engineering Practices Laboratory Manual, VRB Publishers, Revised Edition 2019-2020.
2. S Gowri & T Jeyapoovan Engineering Practices Lab Manual, Vikas Publishing, 5th Edition.

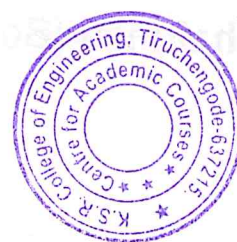
Mapping of COs with POs and PSOs													
COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2	-	-	-	-	1	-	-	-	1	1
CO2	3	3	2	-	-	-	-	1	-	-	-	1	1
CO3	3	3	2	-	-	-	-	1	-	-	-	1	1
CO4	3	3	2	-	-	-	-	1	-	-	-	1	1
CO5	3	2	-	-	-	-	-	1	-	-	-	1	1

1-low, 2-medium, 3-high


Chairman (BoS)

24CEP11	COMPUTER AIDED BUILDING DRAWING	Category	L	T	P	SL	C
		PCC	0	0	30	0	1
PREREQUISITE: Students should have a basic understanding of building design principles and technical drawings. Furthermore, a basic understanding of geometry and mathematics is essential to effectively develop and interpret architectural plans. Students should also have basic computer literacy.							
OBJECTIVES: To equip learners with the skills to prepare 2D and 3D drawings using AutoCAD and interpret building layouts, elevations, and sections. Through hands-on experiments, students will gain practical knowledge of RCC, masonry structures, and factory building design.							
List of Exercise/Experiments: 1. Study of Conventions & Symbols 2. Commands for AutoCAD 3. Cross section of RCC Isolated footing 4. Drawing of Building Components like Doors, Windows and Lintel 5. Reading room with R.C.C flat roof 6. Residential building with flat roof 7. Fully tiled gabled house 8. RCC framed building with partly flat and partly sloped roof 9. Elevation of steel roof truss 10. Workshop building 11. Perspective view of the building 12. C/S & plan of a RCC Dog legged stair case.							
P= 30, TOTAL= 30 PERIODS							


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

COs	Course Outcome	Ex.No	Cognitive Level
CO1	Discuss the principles of planning and bye-laws used in building planning.	1,2	Understand
CO2	Draw layout, plan, elevation & sectional elevation of different types of building.	3,4,5	Apply
CO3	Draw plan, elevation and section of RCC framed structures.	6,7,8	Apply
CO4	Draw plan, elevation and section of factory buildings.	9,10	Apply
CO5	Prepare 2D and 3D model of building	11,12	Apply

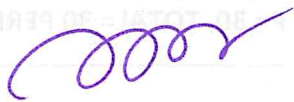
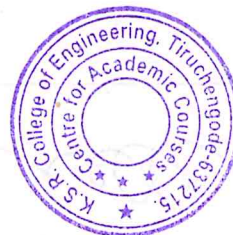
Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PSO1	PSO 2
CO1	3	2	-	-	-	-	-	1	1	-	1	3	3
CO2	3	3	2	-	-	-	-	1	1	-	1	3	3
CO3	3	3	2	-	-	-	-	1	1	-	1	3	3
CO4	3	3	2	-	-	-	-	1	1	-	1	3	3
CO5	3	3	2	-	-	-	-	1	1	-	1	3	3

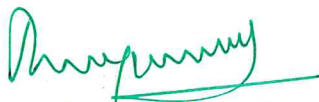
1-low, 2-medium, 3-high

List of Software
(Requirement for batch of 30 students)

S.No.	Description of Software	Quantity required
1.	Auto CAD	30 Nos.
2.	Licensed Software for Drafting and Modelling	30 licenses
3.	Laser Printer or Plotter to print / plot drawings	2 No.


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24SDP19	SOFT SKILLS DEVELOPMENT – I	Category	L	T	P	SL	C
		EEC	0	0	30	0	1
(Common to All Branches)							
OBJECTIVES: To introduce students to the fundamental concepts of aptitude, emphasizing its relevance in academic pursuits and career advancement. It also focuses on developing proficiency in verbal reasoning, which enhances the students' problem-solving abilities and critical thinking skills.							
UNIT - I	NUMBER SYSTEM					(6)	
Introduction to Number System and its Classification – Divisibility Rules and Problems – Remainder Theorem – HCF & LCM and its properties.							
UNIT - II	NUMBERS					(6)	
Introduction to Digits, Place value, Face value and Fractions – BODMAS Rule and Simplifications – Unit Digit, Squares and Cubes.							
UNIT - III	AVERAGES					(6)	
Introduction to Averages, Sum of Observations and Number of Observation – Average of Consecutive Numbers – Weighted Average – Change in Average – Averages in Real-life Scenarios.							
UNIT - IV	LOGICAL REASONING					(6)	
Analogies – Alphabet Series and Number Series – Directions and Distance.							
UNIT - V	VERBAL ABILITY					(6)	
Reading Comprehension – Synonyms and Antonyms – Sentence Formation – Paragraph Formation.							
TOTAL: 30 PERIODS							
COURSE OUTCOMES: At the end of the course, the students will be able to:							
COs	Course Outcome					Cognitive Level	
CO1	Explain the classification of number systems, apply divisibility rules to identify number properties, and understand the concepts of HCF and LCM.					Understand	
CO2	Solve problems using face and place value, fractions, BODMAS and number properties.					Apply	
CO3	Apply concepts of averages, to analyse and solve real-life and quantitative aptitude problems effectively.					Apply	
CO4	Resolve problems with series & direction based logical reasoning.					Apply	
CO5	Interpret passages to demonstrate reading comprehension, and explain the structure of correct sentence and paragraph formation.					Understand	


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TEXT BOOKS:

1. R S Aggarwal, "Quantitative Aptitude for Competitive Examinations".
2. Abhijit Guha, "Quantitative Aptitude for Competitive Examinations".
3. Nishit K. Sinha, "Logical Reasoning and Data Interpretation for CAT".
4. R.S. Agarwal, "A Modern Approach to Verbal & Non-Verbal Reasoning".
5. Edgar Thorpe & Showick Thorpe, "English for Competitive Examinations".

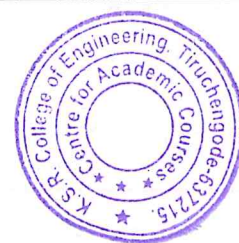
REFERENCES:

1. Arun Sharma, Quantitative Aptitude for CAT, 11e, 2025.
2. Arun Sharma, Logical Reasoning for CAT, 7e, 2025.
3. Wren & Martin, High School English Grammar & Composition.
4. <https://prepinsta.com/>.
5. <https://www.geeksforgeeks.org/quantitative-aptitude/?ref=shm>.
6. <https://www.youtube.com/@FeelFreetoLearn/playlists>.

Mapping of COs with POs and PSOs

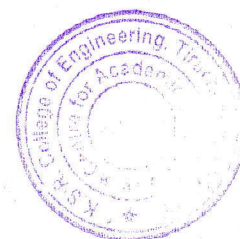
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	-	-	2	-	-	2	-	-	3	-	-
CO2	3	3	2	-	2	-	-	2	-	-	3	-	-
CO3	3	3	2	-	2	-	-	2	-	-	3	-	-
CO4	3	3	2	-	2	-	-	2	-	-	3	-	-
CO5	3	2	-	-	2	-	-	3	3	-	3	-	-
Avg.	3	3	2	-	2	-	-	2	3	-	3	-	-


Chairman (BoS)



24CET21	DESIGN THINKING	Category	L	T	P	SL	C
		PCC	30	0	0	30	2
PREREQUISITE: Students are expected to have an empathetic mindset to help them understand users, a curious mindset to explore and questions assumptions, a collaborative mindset for interdisciplinary teamwork, an iterative approach for refining ideas and creativity to generate innovative solutions							
OBJECTIVES: To provide foundational and advanced knowledge in surveying, including plane and theodolite surveying, trigonometric levelling, curve setting, error adjustments, and modern techniques like total station and remote sensing.							
UNIT - I	FUNDAMENTALS OF DESIGN THINKING	(6)					
What is Design Thinking? - When to use Design Thinking? - How to do it? - Who are involved in this? – Design The Thinking™ – Personal Visualization, The Wheel of Life & Balancing Priorities – Appreciating ‘Design’ – The 3 Laws of Design Thinking.							
UNIT - II	STEP 1: THE ‘FEEL’ STAGE	(6)					
What is this stage about? – What role does a Design Thinker play in this stage? Tools – What is the purpose in this stage? – Persona – Journey Mapping – Stakeholder Mapping & CATWOE Analysis - Cartographic Perspective (LO) – Empathy Map – Case Study: Understanding the Stakeholders.							
UNIT - III	2 STEP: THE ‘DEFINE’ STAGE	(6)					
What is this stage about? – What role does a Design Thinker play in this stage? – What is the most important aspect of this stage? – Tools – What is the purpose in this stage? – Five-Whys – Anti-Pattern – Paraphrasing the Problem – Challenge Mapping – LORD: Definitive skill set for a Design Thinker – Case Study: Relooking at the Problem.							
UNIT - IV	STEP 3: THE ‘DIVERGENCE’ & ‘CONVERGENCE’ STAGE	(6)					
What is this stage about? – What role does a Design Thinker play in this stage? – What is the most important aspect of this stage? – Tools – What is the purpose in this stage? – Brainstorming – Metaphor – Random Association Technique – End-State Visualization - 10gm-100gm-1000gm – Prototyping – Wire framing for digital products – Case Study: Prototyping and Communicating for Effective Outcome.							
UNIT - V	STEP 5: THE ‘COMMUNICATION’ STAGE	(6)					
What is this stage about? – What role does a Design Thinker play in this stage? – What is the most important aspect of this stage? – Tools – What is the purpose in this stage? – The 4Cs Framework – Naming – Packaging – Story boarding – Presentation – Distribution.							
L=30,SL= 30,Total = 30 PERIODS							


Chairman (BoS)



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

COs	Course Outcome	Cognitive Level
CO1	Demonstrate an understanding of Design Thinking concepts and principles by explaining their relevance in real-world contexts.	Understand
CO2	Articulate the significance of a Design Mind set and its impact on creative problem-solving.	Understand
CO3	Apply Design Thinking methods effectively at each stage of the problem-solving process.	Apply
CO4	Implement the phases of Design Thinking to address complex challenges systematically.	Apply
CO5	Use a variety of Design Thinking tools to develop innovative solutions and refine ideas through iteration.	Apply

TEXT BOOKS:

1. UnMukt – The Science & Art of Design Thinking, Arun Jain
2. Don Norman, The Design of Everyday Things, MIT Press, 2013
3. Tim Brown, Change by Design: How Design Thinking Transforms Organizations and inspires innovation, Harper Collins Publishers Ltd, New York, First Edition, 2009.

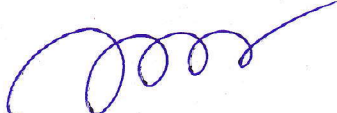
REFERENCES:

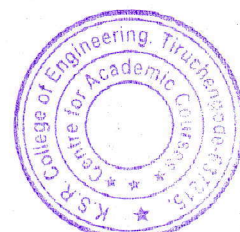
1. Chrisitan Mueller-Roterberg, Handbook of Design Thinking – Tips & Tools for how to design thinking, kindle Direct Publishing, First Edition, 2018.
2. Johnny Schneider, Understanding Design Thinking, Lean and Agile, O'Reilly Media, California, First Edition, 2017
3. Roger Martin, The Design of Business, Why Design Thinking is the next competitive advantage, Harvard Business Press, United States, First Edition, 2009.
4. Idris Mootee, Design Thinking for Strategic Innovation, John Wiley & Sons Inc, New Jersey, First Edition, 2013.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	-	-	-	-	-	2	1	-	1	-	-
CO2	3	2	-	-	-	-	-	2	1	-	1	-	-
CO3	3	3	2	-	-	-	-	2	1	-	1	-	-
CO4	3	3	2	-	-	-	-	2	1	-	1	-	-
CO5	3	3	2	-	-	-	-	2	1	-	1	-	-

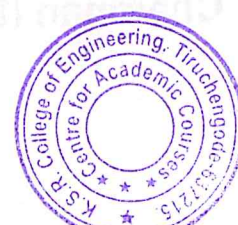
1-low, 2-medium, 3-high



Chairman (BoS)


24CET22	CONSTRUCTION MATERIALS, TECHNIQUES AND PRACTICES	Category	L	T	P	SL	C
		PCC	45	0	0	45	3
PREREQUISITE: The students must have a basic knowledge of physics and mathematics, particularly in mechanics and material properties, along with an understanding of fundamental engineering concepts like statics and structures.							
OBJECTIVES: To choose construction materials and execute techniques for substructure and superstructure works. It also trains them to plan construction stages and determine suitable supporting structures based on site conditions.							
UNIT - I	STONES – BRICKS – CONCRETE BLOCKS	(9)					
Stone as Building Material – Criteria for Selection – Tests on Stones – Deterioration and Preservation of Stone Work – Bricks – Classification – Manufacturing of Clay and Fly Ash Bricks – Tests on Bricks – Compressive Strength – Water Absorption – Efflorescence – Bricks for Special Use – Refractory Bricks – Cement, Concrete Blocks – Lightweight Concrete Blocks.							
UNIT - II	PLANNING FOR CONSTRUCTION & SUPPORTING STRUCTURES	(9)					
Various Stages in the Construction of the Project – Construction Coordination - Job Planning – Technical Planning – Scheduling - Site Clearance - Marking – Setting out foundations, Earthwork job Layout – Temporary Sheds – Setting Out Works – Centering & Shuttering - Slip Forms - Scaffolding – Shoring – De-shuttering Forms.							
UNIT - III	CONSTRUCTION PRACTICES	(9)					
Masonry – Stone Masonry – Bond in Masonry - Concrete Hollow Block Masonry – Flooring – Damp Proof Courses – Construction Joints – Movement and Expansion Joints– Pre Cast Pavements – Building Foundations – Basements – Fabrication and Erection of Steel Trusses – Frames – Braced Domes – Laying Brick - Arrangement of bonds in brick masonry— Weather and Water Proof – Roof Finishes –Acoustic and Fire Protection.							
UNIT - IV	SUB STRUCTURE CONSTRUCTION	(9)					
Techniques of Box Jacking – Pipe Jacking -Under Water Construction of Diaphragm Walls and Basement – Tunneling Techniques – Piling Techniques - Well and Caisson - Sinking Cofferdam – Cable Anchoring and Grouting-Driving Diaphragm Walls, Sheet Piles - Shoring for Deep Cutting – Well Points -Dewatering and Stand by Plant Equipment for Underground Open Excavation.							
UNIT - V	SUPER STRUCTURE CONSTRUCTION	(9)					
Launching Girders, Bridge Decks, Off Shore Platforms – Special Forms for Shells - Techniques for Heavy Decks – In-Situ Pre-Stressing in High Rise Structures, Material Handling - Erecting Light Weight Components On Tall Structures - Support Structure for Heavy Equipment and Conveyors – Erection of Articulated Structures, Braced Domes and Space Decks.							
L=45,SL= 45,Total= 90 PERIODS							


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COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Interpret basic information about construction materials.	Understand
CO2	Summarize the purpose and functionality of different construction stages and supporting structures.	Understand
CO3	Implement appropriate construction techniques based on specific project requirements.	Apply
CO4	Apply appropriate techniques used for sub structure construction.	Apply
CO5	Apply suitable techniques for superstructure construction based on functional and structural requirements.	Apply

TEXT BOOKS:

1. Varghese, P.C., Building Materials, Prentice Hall India Learning Private Limited, Delhi, 2nd Edition, 2015
2. Purushothama Raj, P., Construction Techniques, Equipment's and Practices, Sri Krishna Hitech Publishing Company Pvt. Ltd, Chennai, 5th Edition, 2015.

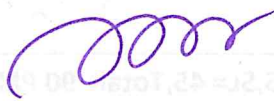
REFERENCES:

1. Jagadish.K.S., Venktarama Reddy., B.V. and Nanjunda Rao, K.S., "Alternative Building Materials Technology", New Age International Private Limited, Bengaluru, 2nd Edition, 2017
2. Sharma, S.C., "Construction Equipment and Management", Khanna Publishers, New Delhi, 1st Edition, 2016.
3. Arora, S.P. and Bindra, S.P., "Building Construction, Planning Techniques and Method of Construction", Dhanpat Rai and Sons, New Delhi, Reprint, 2010.
4. Deodhar, S.V., "Construction Equipment and Job Planning", Khanna Publishers, New Delhi, 4th edition, 2012.

Mapping of COs with POs and PSOs

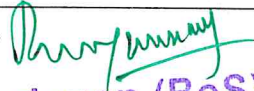
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO 1	PSO2
CO1	3	2	-	-	-	-	-	2	1	-	1	3	3
CO2	3	2	-	-	-	-	-	2	1	-	1	3	3
CO3	3	3	2	-	-	-	-	2	1	-	1	3	3
CO4	3	3	2	-	-	-	-	2	1	-	1	3	3
CO5	3	3	2	-	-	-	-	2	1	-	1	3	3

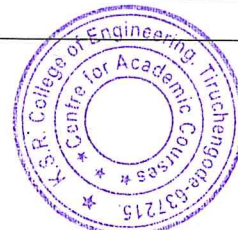
1-low, 2-medium, 3-high


Chairman (BoS)


24GET29	தமிழரும் தொழில் நுட்பமும்	CATEGORY	L	T	P	SL	C
		HSMC	15	0	0	15	1
(அனைத்து துறைகளுக்கும் பொதுவானது)							
முன் கூட்டிய துறைசார் அறிவு : தேவை இல்லை							
அலகு - I	நெசவு மற்றும் பாணைத் தொழில்நுட்பம்						[03]
சங்ககாலத்தில் நெசவுத் தொழில் - பாணைத் தொழில்நுட்பம் கருப்பு சிவப்பு பாண்டங்கள்-பாண்டகளில் கீறல் குறியீடுகள்							
அலகு - II	வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்						[03]
சங்ககாலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு - சங்க காலத்தில் கட்டுமானப் பொருட்களும் நடுகல்லும்-சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள்-மாமல்லபுரச் சிற்பங்களும், கோவில்களும்-சோழர்காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள்-நாயக்கர் காலக்கோயில்கள்-மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன்ஆலயம் மற்றும் திருமலைநாயக்கர்மஹால் - செட்டிநாட்டுவீடுகள்-பிரிட்டிஷ்காலத்தில் சென்னை இந்தோ-சாரோசெனிக் கட்டிடக் கலை.							
அலகு - III	உற்பத்தித் தொழில்நுட்பம்						[03]
கப்பல் கட்டும் கலை-உலோகவியல்-இரும்புத்தொழிற்சாலை-இரும்பை உருக்குதல், எஃகு-வரலாற்றுச்சான்றுகளாக செம்பு மற்றும் தங்கநாணயங்கள்-நாணயங்கள் அச்சடித்தல்-மணி உருவாக்கும் தொழிற்சாலைகள்-கல் மணிகள்-கண்ணாடி மணிகள்-சுடு மண்மணிகள்-சங்குமணிகள்-எலும்புத்துண்டுகள்-தொல்லியல் சான்றுகள்-சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.							
அலகு - IV	வேளாண்மை மற்றும் நீர்ப் பாசனத் தொழில்நுட்பம்						[03]
அணை, ஏரி, குளங்கள், மதகு-சோழர்காலகுமிழித்தூம்பின் முக்கியத்துவம்-கால்நடை பராமரிப்பு-கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள்-வேளாண்மை மற்றும் வேளாண்மை சார்ந்த செயல்பாடுகள்-கடல்சார் அறிவு - மீன் வளம்-முத்து மற்றும் முத்துக் குளித்தல்-பெருங்கடல் குறித்த பண்டைய அறிவு-அறிவுசார் சமூகம்.							
அலகு - V	அறிவியல் தமிழ் மற்றும் கணினித்தமிழ்						[03]
அறிவியல் தமிழின் வளர்ச்சி- கணினித்தமிழ் வளர்ச்சி-தமிழ் நூல்களை மின்பதிப்பு செய்தல்-தமிழ் மென் பொருட்கள் உருவாக்கம்-தமிழ் இணையக்கல்விக் கழகம்-தமிழ் மின்நூலகம்-இணையத்தில் தமிழ் அகராதிகள் சொற்குவைத் திட்டம்.							
Total (L= 15, SL=15) =30 Periods							

பாடம் கற்றத்தின் விளைவுகள் : பாடத்தை வெற்றிகரமாக கற்று முடித்த பின்பு, மாணவர்களால் முடியும் விளைவுகள்		அறிவாற்றல் நிலை
CO1	சங்ககாலத் தமிழிர்களின் நெசவு மற்றும் பாணைவனைதல் தொழில் நுட்பம் குறித்து கற்றுணர்ந்தல்.	புரிதல்
CO2	சங்ககாலத் தமிழிர்களின் கட்டிட தொழில் நுட்பம் கட்டுமான பொருட்கள் மற்றும் அவற்றை விளக்கும் தளங்கள் குறித்து அறிவு.	புரிதல்
CO3	சங்ககாலத் தமிழிர்களின் உலோகத் தொழில், நாணயங்கள் மற்றும் மணிகள் சார்ந்த தொல்லியல் சான்றுகள் பற்றிய அறிவு.	புரிதல்
CO4	சங்ககாலத் தமிழிர்களின் வேளாண்மை, நீர்ப்பாசன முறைகள் மற்றும் முத்து குளித்தல் குறித்த தெளிவு.	புரிதல்
CO5	நவீன அறிவியல் தமிழ் மற்றும் கணினி தமிழ் குறித்த புரிந்துகொள்ளலும் மற்றும் பயன்படுத்தலும்.	பகுப்பாய்வு


Chairman (BoS)

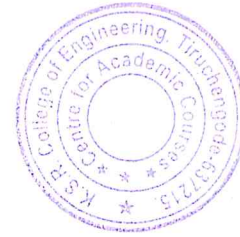


Text Books :	
1	தமிழகவரலாறு- மக்களும் பண்பாடும்- கேகேபிள்ளை (வெளியீடு தமிழ்நாடு பாடநூல் மற்றும் கல்வியில் பணிகள் கழகம்)
2	கணினித்தமிழ் - முனைவர் இல. சுந்தரம் (விகடன் பிரசுரம்)
Reference Books :	
1	கீழடி- வைகை நதிக்கரையில் சங்ககால நகரநாகரிகம்.(தொல்லியல் துறை வெளியீடு)
2	பொருறை - ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு)
3	Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay) (Published by : The Author)
4	Porunai Civilization (Jointly Published by: Department of Archaeology &Tamilnadu Textbook and Educational Services Corporation, Tamilnadu)

Mapping of COs with POs and PSOs													
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	-	-	-	-	-	3	3	-	2	-	3	-	-
CO2	-	-	-	-	-	3	3	-	2	-	3	-	-
CO3	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	-	-	-	-	-	3	3	-	2	-	3	-	-
CO5	-	-	-	-	-	3	3	-	2	-	3	-	-
Avg.	-	-	-	-	-	3	3	-	2	-	3	-	-
1. சிறிது (குறைந்த) 2. மிதமான (நடுத்தர) 3. கணிசமான (உயர்)													

Arumugam

Chairman (BoS)



24GET29	TAMILS AND TECHNOLOGY	CATEGORY	L	T	P	SL	C
		HSMC	15	0	0	15	1
(Common to All Branches)							
Prerequisite(s): No prerequisites are needed for enrolling into the course							
UNIT - I	WEAVING AND CERAMIC TECHNOLOGY					[03]	
Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries.							
UNIT - II	DESIGN AND CONSTRUCTION TECHNOLOGY					[03]	
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) – ThirumalaiNayakar Mahal –Chetti Nādu Houses, Indo –Saracenic architecture at Madras during British Period.							
UNIT - III	MANUFACTURING TECHNOLOGY					[03]	
Art of Ship Building – Metallurgical studies – Iron industry – Iron smelting, steel – Copper and gold – Coins as source of history – Minting of Coins – Beads making – industries Stone beads – Glass beads –Terracotta beads –Shell beads/ bone beats – Archeological evidences – Gem stone types described in Silappathikaram.							
UNIT - IV	AGRICULTURE AND IRRIGATION TECHNOLOGY					[03]	
Dam, Tank, ponds, Sluice, Significance of KumizhiThoompu of Chola Period, Animal Husbandry – Wells designed for cattle use – Agriculture and Agro Processing – Knowledge of Sea – Fisheries – Pearl – Conche diving – Ancient Knowledge of Ocean – Knowledge Specific Society.							
UNIT - V	SCIENTIFIC TAMIL & TAMIL COMPUTING					[03]	
Development of Scientific Tamil – Tamil computing – Digitalization of Tamil Books – Development of Tamil Software – Tamil Virtual Academy – Tamil Digital Library – Online Tamil Dictionaries – Sorkuvai Project.							
Total (L= 15, SL=15) =30 Periods							
Course Outcomes:						Cognitive Level	
At the end of the course, the student will be able to							
CO1	Understand the weaving and ceramic technology of ancient Tamil People nature.					Understand	
CO2	Comprehend the construction technology, building materials in sangam Period and case studies.					Understand	
CO3	Infer the metal process, coin and beads manufacturing with relevant archeological evidence					Understand	
CO4	Realize the agriculture methods, irrigation technology and pearl diving.					Understand	
CO5	Apply the knowledge of scientific Tamil and Tamil computing.					Apply	

Chairman (BoS)

Text Books:	
1	Social Life of Tamils (Dr.K.K.Pillay) A joint Publication of TNTB & ESC and RMRL – (in print)
2	Social Life of the Tamils – The Classical Period (Dr.S.Sigaravelu) (Published by: International Institute of Tamil Studies).
Reference Books:	
1	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukarasu) (Published by : International Institute of Tamil Studies)
2	The Contribution of the Tamils to Indian Culture (Dr.M.Valarmathi)(Puplished by International Institute of Tamil Studies).
3	Keeladi – ‘Sangam City Civilization on the banks of river Vaigai; (Jointly Published by: Department of Archaeology &Tamilnadu Text Book and Educational Services Corporation, Tamilnadu)
4	Studies in the History of India with Special Reference to Tamilnadu (dr.K.K.Pillay) (Published by.: The Author)

Mapping of COs with POs and PSOs													
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	-	-	-	-	-	3	3	-	2	-	3	-	-
CO2	-	-	-	-	-	3	3	-	2	-	3	-	-
CO3	-	-	-	-	-	3	3	-	2	-	3	-	-
CO4	-	-	-	-	-	3	3	-	2	-	3	-	-
CO5	-	-	-	-	-	3	3	-	2	-	3	-	-
Avg.	-	-	-	-	-	3	3	-	2	-	3	-	-
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)													


Chairman (BoS)



24MAI29	PROBABILITY AND STATISTICS	Category	L	T	P	SL	C
		BSC	45	0	30*	45	4
SEMESTER II - B.E / B.TECH (Common to All Branches)							
PREREQUISITE: A basic understanding of algebra, calculus, and introductory statistics is required to grasp the concepts of probability, hypothesis testing, and statistical methods used in engineering and quality control.							
OBJECTIVES: To build a foundational understanding of probability and random variables, enable the application of two-dimensional random variables in engineering contexts, develop the ability to perform hypothesis testing for both small and large samples, introduce the principles of experimental design in agricultural studies, and provide knowledge of statistical quality control techniques.							
UNIT - I	ONE DIMENSIONAL RANDOM VARIABLES					(9)	
One dimensional Random Variable - Discrete and continuous random Variables -Expectations - Moment generating functions and their properties - Binomial, Poisson, Uniform and Normal distributions.							
UNIT - II	TWO - DIMENSIONAL RANDOM VARIABLES					(9)	
Joint distributions – Marginal and conditional distributions – Covariance – Karl Pearson's Coefficient of Correlation - Spearman's Rank Correlation - Regression Analysis.							
UNIT - III	TESTING OF HYPOTHESIS					(9)	
One sample and two sample test for means of large samples (Z- test), One sample and two sample test for means of small samples (t-test), Chi-square - Independent of Attributes - F test for equality of variances.							
UNIT - IV	DESIGN OF EXPERIMENTS					(9)	
Analysis of variance - One way and two way classifications - Completely Randomized Design - Randomized Block Design - Latin Square Design.							
UNIT - V	STATISTICAL QUALITY CONTROL					(9)	
Control charts for measurements $\bar{X}$ and R charts – Control charts for C and P charts.							
List of Experiments (R Software): 1. Determine the probability by using binomial distribution. 2. Find the probability with the help of normal distribution. 3. Determine the correlation co-efficient between X and Y. 4. Examine the small samples using F distribution. 5. Inspect the data using Latin Square Design (LSD). 6. Find the $\bar{X}$ Charts. 7. Compute the R Charts.							
* Alternative weeks : Tutorial and Laboratory							
L = 45 , * P = 15 & *T = 15, SL = 45, TOTAL: 120 PERIODS							



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

COs	Course Outcome	Cognitive Level
CO1	Apply the concepts of one dimensional random variables to compute expectations and analyze the standard distributions.	Apply
CO2	Apply statistical methods to compute marginal and conditional distributions, and perform correlation and regression analysis.	Apply
CO3	Apply Z-test, t-test, Chi-square test, and F-test to analyze sample data and draw inferences on independence of attributes.	Apply
CO4	Apply analysis of variance techniques for one-way and two-way classifications, and implement experimental designs using CRD, RBD and LSD.	Apply
CO5	Construct control charts for measurements Mean and Range charts and attributes charts to assess process control and product quality.	Apply

TEXT BOOKS:

1. S.P. Gupta, "Statistical Methods", Sulthan Chand & Sons, 46th Edition, 2021.
2. Milton. J. S. and Arnold. J.C., "Introduction to Probability and Statistics", Tata McGraw Hill, 4th edition, 2007.

REFERENCES:

1. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning, New Delhi, 8th Edition, 2014.
2. Spiegel. M.R., Schiller. J. and Srinivasan, R.A., "Schaum's Outline of Theory and Problems of Probability and Statistics", Tata McGraw Hill Edition, 2004.
3. Walpole. R.E., Myers. R.H., Myers. S.L. and Ye. K., "Probability and Statistics for Engineers and Scientists", Pearson Education, Asia, 9th Edition, 2010.
4. R.C.Gupta, "Statistical Quality Controls", Khanna Publishers, Delhi, 8th Edition, 2008.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO 5	PO 6	PO7	PO8	P O 9	PO10	PO11	PSO1	PSO2
CO1	3	3	3	3	2	-	-	1	-	-	2	-	-
CO2	3	3	3	3	2	-	-	1	-	-	2	-	-
CO3	3	3	3	3	2	-	-	1	-	-	2	-	-
CO4	3	3	3	3	2	-	-	1	-	-	2	-	-
CO5	3	3	3	3	2	-	-	1	-	-	2	-	-
Avg.	3	3	3	3	2	-	-	1	-	-	2	-	-

1-low, 2-medium, 3-high

LIST OF EQUIPMENTS (For a Batch of 30 Students)

S.No.	Name of the Equipments	Quantity
1.	A computer with Intel (R) Core (TM) i3 – 2130 CPU @ 3.40GHZ processor and 4 GB RAM – DDR3.	30 Nos.
	R software (Open source)	30 Nos.



24CHI07	APPLIED CHEMISTRY	Category	L	T	P	SL	C
		BSC	45	0	30	45	4
(Common to AE, CE, MECH and SFE)							
PREREQUISITE The students must have knowledge about the basic concepts of water parameters, electro chemistry, organic reactions and their applications.							
OBJECTIVES: To equip the leaners to apply the chemical principles and their applications in the engineering fields.							
UNIT - I	WATER TREATMENT						(9)
Hardness – types, units – estimation of hardness by EDTA method; Boiler feed water – requirements, disadvantages of using hard water in boilers – scale and sludge – priming and foaming – caustic embrittlement – boiler corrosion. Softening methods – internal conditioning – calgon, phosphate – external conditioning – zeolite process and ion exchange process; Desalination – reverse osmosis. Domestic water treatment (Sterilisation process Only).							
UNIT - II	ELECTROCHEMISTRY AND CORROSION						(9)
Introduction – electrode potential – Nernst equation – EMF series and its significance; E – Vehicles - Need - Types – Advantages and Disadvantages; Corrosion – causes, consequences – classification – chemical corrosion – electro chemical corrosion – mechanism; Galvanic & differential aeration corrosion – factors influencing corrosion – corrosion control (Sacrificial anode and Impressed Current Cathodic protection method).							
UNIT - III	ENERGY STORAGE DEVICES						(9)
Batteries – primary battery – Dry cell, secondary batteries – lead-acid and lithium-ion batteries. Fuel cells – H ₂ -O ₂ fuel cell, solar cells – principle, applications and advantages; Nuclear energy: Light water Nuclear power plant - breeder reactor.							
UNIT - IV	PHASE RULE & LUBRICANTS						(9)
Phase rule: Introduction, definition of terms with examples. One component system – water system; Reduced phase rule; Two component system: lead-silver system. Lubricants – definition – function – characteristics – properties – viscosity index, flash and fire points, cloud and pour points, oiliness; Solid lubricants – graphite and MoS ₂ .							
UNIT - V	ADVANCED ENGINEERING MATERIALS						(9)
Abrasives – Moh's scale of hardness – types – natural [Diamond] – synthetic [SiC]; Refractories – characteristics – classifications [Acidic, basic and neutral refractories] – properties – refractoriness – RUL – porosity – thermal spalling; Nano materials – CNT– synthesis [CVD, laser evaporation, pyrolysis] – applications of nano materials.							
List of Exercise/Experiments: 1. Estimation of total, permanent and temporary hardness of water sample By EDTA method 2. Estimation of chloride content in water by Argentometric method [Mohr's Method] 3. Conductometric titration of strong acid with strong base (HCl Vs NaOH) 4. Estimation of dissolved oxygen in water (Winkler's Method) 5. Conductometric titration of mixture of acids (HCl & CH ₃ COOH) with strong base 6. Estimation of Fe ²⁺ ion by potentiometric titration 7. Estimation of HCl by p ^H - Metry 8. Conductometric precipitation titration using BaCl ₂ -Na ₂ SO ₄							
L = 45, P = 30, SL = 45, TOTAL = 120 PERIODS							

COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Interpret the treatment solutions for drinking water, boiler feed water, and wastewater reuse.	Understand
CO2	Describe different types of electrochemical cells, including galvanic and electrolytic cells.	Understand
CO3	Categorize different energy storage methods, such as batteries, fuel cell and solar cell for the production of electricity.	Understand
CO4	Choose the Engineering materials through the concept of phase rule and lubricants.	Understand
CO5	Classify the manufacturing processes of advanced engineering materials and its uses.	Understand

TEXT BOOKS:

1. S. S. Dara and S. S. Umare, "A Text book of Engineering Chemistry", S.Chand & Co.Ltd., 12th Edition, 2015.
2. P.C. Jain and Monica Jain, "Engineering Chemistry", Dhanpat Rai Pub. Co., 16th Edition, 2013.
3. Wiley, "Engineering Chemistry", Wiley India Pvt. Ltd., 2nd Edition, 2013.

REFERENCES:

1. Dr. A. Ravikrishnan, "Engineering Chemistry", Srikrishna Hi-tech Publishing Company Pvt. Ltd., 21st Edition, 2022.
2. J. Mendham, R. C. Denney, J. D. Barnes, M. J. K. Thomas and B. Sivasankar, "Vogel's Text book of Quantitative Chemical Analysis", Pearson Education Pvt., Ltd., 6th Edition, 2019.
3. Shashi Chala, "A Text book of Engineering Chemistry", Dhanpat Rai Pub. Co., 2015.
4. S. K. Bhasin and Sudha Rani, "Laboratory Manual of Engineering Chemistry", Dhanpat Rai Publishing Company Private Limited, 3rd Edition, 2012.

Mapping of COs with POs and PSOs

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

1-low, 2-medium, 3-high

Laboratory Equipment Details
(Requirements for a batch of 30 students)

S.No.	Description of Equipment	Quantity required
1.	Electronic balance	1 No.
2.	pH meter	6 Nos.
3.	Conductivity meter	6 Nos.
4.	Potentiometer	6 Nos.

[Signature]
Chairman (BoS)



24CSI29	PYTHON PROGRAMMING	Category	L	T	P	SL	C
		ESC	15	0	90	15	4
(Common to All Branches)							
PREREQUISITE: A basic understanding of programming principles such as variables and loops, paired with good problem- solving abilities, is required. Logical thinking and analytical skills are critical for effective programming.							
OBJECTIVES: To equip learners with essential Python skills in programming logic, data handling, object-oriented design, file operations, database management, web development with Django, and GUI creation using Tkinter.							
UNIT – I	FUNDAMENTALS OF PYTHON						(3+18)
Introduction to Python – Variables and Data types – I/O function – Operators – Control structures – Functions – Types of arguments – Anonymous functions: Lambda.							
List of Experiments: 1. Write a program to calculate the total of all even numbers between 1 and 150 and print the sum of all even numbers. 2. Build a leaderboard for a coding competition platform. To highlight consistent performers, find the second highest unique score from the submitted scores. Write a Python program to accept a list of scores and display the second largest unique score. 3. Create a puzzle game where levels unlock with special Armstrong numbers to check if the player's input is an Armstrong number and display an appropriate message based on the result. 4. Write a Python program to generate patterns like pyramids or triangles based on user input and display the pattern clearly according to the number of rows entered. 5. Create a function in python that accepts any number of integers and returns their sum using variable length arguments. 6. Write a recursive program to find the GCD of two given numbers. The program should return the greatest number that divides both without leaving a remainder. 7. Write a program to find the factorial of a given number using a function. The function should return the product of all positive integers up to that number. 8. Write a Python program to generate the Fibonacci series up to n terms using a function. and display the complete series for the given number of terms. 9. Implement a Python program to accept two dates in DD-MM-YYYY format as input. Manually calculate and display the difference in years, months and days between the two dates without using built in modules. 10. Create a program to accept two integers as the start and end of a range from the user, find and print all prime numbers within this range and print the total count of prime numbers found. 11. Write a program to find the sum of digits of a given number using a while loop. The program should repeatedly extract and add each digit until the number becomes zero. 12. Implement a function that accepts employee information and prints the details in the specific format.							



UNIT – II	HANDLING STRINGS AND EXCEPTIONS	(3+18)
Strings – List – Tuples – Dictionaries – Sets – Exception Handling – Modules and Packages. List of Experiments: 1. Write a program to find the length of a given string without using any built-in functions. Use a loop to count each character until the end of the string. 2. Write a program to check if two input strings are anagram or not. 3. Develop a Python program to sort integers in a list and display the sorted list in ascending and descending order. 4. Write a program to reverse a list without using the built-in reverse() method. Use a loop or slicing to rearrange the elements in reverse order. 5. Create a program to find Maximum, Minimum, and Sum of Elements in a List without using built in functions. 6. Create a python program to find the most frequent element in a list and print the count. 7. Write a Python program that stores student information using a dictionary and perform Add, Modify and Remove student details. 8. Write a program to sort a list of strings in ascending order based on their vowel count. 9. Implement a Python program to perform basic set operations: union, intersection, difference and symmetric difference and print the result. 10. Create a dictionary with course names as keys and the student names as values the student's names should be stored in a set. Write a Python program to identify student names who are enrolled in more than one course, display the list of such students. 11. Write a Python program to simulate basic banking operations such as deposit and withdrawal for a customer account. Implement balance checks during withdrawal and define a user defined exception called InsufficientFundsError that is raised when a withdrawal amount exceeds the saving account balance. 12. Create a Python package structure to manage car brand information using modules and sub-packages		
UNIT – III	OBJECT ORIENTED PROGRAMMING CONCEPTS	(3+18)
Object Oriented Programming basics – Inheritance – Polymorphism – Operator Overloading – Method Overriding – Name Mangling – Duck Typing. List of Experiments: 1. Implement a class known as BankAccount with methods called deposit() and withdraw() create a sub class called SavingsAccount and CurrentAccount that overrides the withdraw() method to prevent withdrawals with AccountBalance falls below one hundred. 2. Create a Python class named Complex to represent complex numbers with real and imaginary parts as attributes. Overload the + operator to add two complex number objects and display the result in the form a + bi using a custom __str__() method. 3. Create a class Employee with attributes like emp_id, name, basic_pay, hra, and da. Write a method to calculate gross salary and display employee details. Create objects for multiple employees and generate their payroll.		



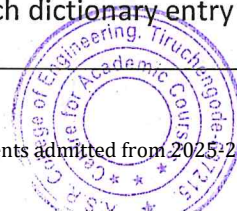
4. Implement a class Time with attributes hour, minute, and second. Overload the + operator to add two Time objects with proper carry-over of seconds and minutes. Display the resulting time in hh:mm:ss format.
5. Create a class Vehicle with attributes brand and model. Derive a class Car that includes fuel_type. Display full details using an object of Car.
6. Create a class Calculator with multiple add() methods one for adding two integers, one for adding three integers and one for adding two floats. Demonstrate polymorphism by calling different versions of the add() method.
7. Create a base class Device, with Phone and Camera inheriting from Device and Smartphone inheriting from both Phone and Camera.
8. Create a Vehicle class with a constructor for make, model, and year and an abstract method displayDetails(). Derive Car and Truck classes, each with overloaded constructors and overridden displayDetails() methods. Demonstrate polymorphism by storing Car and Truck objects in a Vehicle list and calling displayDetails() polymorphically. Use super() to resolve method calls and print the method resolution order (MRO) for Smartphone.
9. Design a Python program using hierarchical inheritance with a base class Account containing account number, holder name and balance. Create SavingsAccount and CurrentAccount. Override withdraw() in both classes and demonstrate account-specific operations.
10. Design a Python class Employee with private fields __salary and __bonus. Add a method to calculate and return total earnings. Access and print the private variables using name mangling.
11. Create two classes Drone and Bird, each having a method fly(). Write a function start_journey(obj) that takes any object and calls its fly() method. Demonstrate duck typing by calling this function with both Drone and Bird objects.
12. Create a classes Mobile and SmartWatch, both with a notify() method. Write a send_alert(device) function that uses duck typing to call notify(). Demonstrate by calling the function with both class objects.

UNIT- IV**FILES AND DATABASES****(3+18)**

File I/O operations – Directory Operations – Reading and Writing in Structured Files – CSV and JSON – Data manipulation using SQLite.

List of Experiments:

1. Write a Python program to read a text file and count the number of lines, words, and characters and display the counts after reading the file.
2. Write a program to rename and delete files in a specific directory using Python. Use built-in file handling functions for the operations.
3. Read a CSV file and display its contents in a tabular format using Python. Use proper formatting to enhance readability.
4. Create a CSV file with product details (ID, name, price). Write a program to append new product entries to it and update its contents.
5. Write a program to sort data from a CSV file based on a specified column (e.g., marks or salary). Read, sort, and display the updated data.
6. Read a JSON file containing employee data. Display names of employees with salary greater than 50,000.
7. Load collections of dictionaries from a JSON file using Python. Print each dictionary entry one by one.



8. Convert a JSON file to a CSV file using Python. Ensure each JSON object becomes a row in the CSV.
9. Create a SQLite table "Students" with fields: ID, Name, Marks. Insert and retrieve sample student records using Python.
10. Create a SQLite table "Books" with fields: BookID, Title, Author, Price and Year. Insert data, accept author name from user, and display matching books.
11. Write a Python program to perform aggregate functions like MAX, MIN, and SUM on marks or salary. Use SQLite queries to get the results and display them.
12. Export data from a SQLite table to a CSV file using Python. Read table contents and write them to a new CSV file.

UNIT – V	WEBPROGRAMINGAND GUI USING PYTHON	(3+18)
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Frameworks: Introduction to Django – Django CRUD – UI design: Tkinter – Events – CGI: Introduction to CGI Programming, GET and POST Methods.

List of Experiments:

1. Implement a basic Django project and run the development server.
2. Create a Django app with a model Book and implement Create, Read, Update and Delete operations using generic views.
3. Design a GUI login form using Tkinter with fields for username and password. Add a login button that verifies if both fields are filled. Display a success or error message based on the input validation.
4. Implement a calculator using Tkinter with buttons for digits and operations.
5. Create a GUI application using Tkinter to design a simple color picker.
6. Create a calendar of a month in a year using Tkinter module.
7. Implement a basic text editor using Tkinter with Open, Save, and Clear functions.
8. Implement a mouse click events to select and apply a color to the window background. Display the selected color name or code on the screen.
9. Implement a CGI program that accepts user input using HTML form and displays it using POST method.
10. Develop a Python CGI script that takes a user's input for email and phone number, validates the input, and displays an error message if the email or phone number is invalid.
11. Implement a Python CGI script to handle user sessions. The script should track a user's login status and display different content based on whether the user is logged in or not.
12. Create a feedback form using CGI where submitted data is stored and displayed on another page.

L:15, T:0, P:90, SL:15, TOTAL: 120 PERIODS

COURSE OUTCOMES:

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

COs	Course Outcome	Cognitive Level
CO1	Apply Python syntax to write code, using data types, operators, loops and conditionals.	Apply
CO2	Implement string manipulation, data structures, and exception handling to build robust applications.	Apply
CO3	Construct object-oriented programs by applying inheritance, polymorphism, and encapsulation to develop modular and reusable code.	Apply
CO4	Demonstrate the use of file I/O operations and database management techniques to effectively manage and manipulate data in Python.	Apply
CO5	Develop web applications and graphical user interfaces using Python frameworks and libraries	Apply

TEXT BOOKS:

1. Yashwant Kanetkar, Aditya Kanetkar, "Let Us Python", BPB Publications, 5th Edition ,2023
2. Wesley J.Chun, "Core Python Programming", Pearson Education, 2nd Edition, 2017

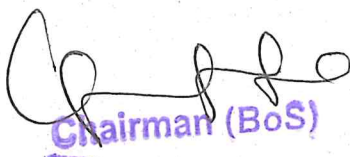
REFERENCES:

1. Robert Oliver, "Python Quick Start Guide: The Simplified Beginner's Guide to Python Programming Using Hands-On Projects and Real-World Applications", Clyde Bank Media LLC,1st Edition, 2023
2. Allen B. Downey, "Think Python", O'Reilly Media, 2nd Edition, 2016.
3. David Beazley, Brian K. Jones, "Python Cookbook", O'Reilly Media, 3rd Edition, 2013
4. Mark Lutz, "Python Pocket Reference", O'Reilly Media,5th Edition, 2014
5. www.python.org
6. https://onlinecourses.swayam2.ac.in/cec22_cs20/preview

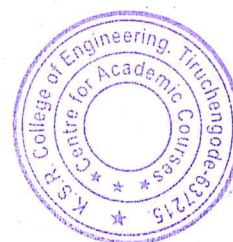
Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PSO 1	PSO 2
CO1	3	3	2	-	-	-	1	-	1	-	3	-	-
CO2	3	3	2	-	-	-	1	-	1	-	3	-	-
CO3	3	3	2	-	-	-	1	-	1	-	3	-	-
CO4	3	3	2	-	-	-	1	-	1	-	2	-	-
CO5	3	3	2	-	-	-	1	-	1	-	2	-	-

1-low, 2-medium, 3-high

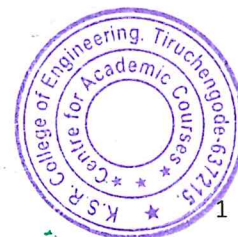


Chairman (BoS)



24ENP29	PROFESSIONAL COMMUNICATION LABORATORY	Category	L	T	P	SL	C
		HSMC	0	0	30	0	1
(Common to All Branches)							
OBJECTIVE: To enhance learners' proficiency in listening, speaking, reading, and writing through structured activities and professional communication practices relevant to academic and workplace settings.							
UNIT - I	VERBAL AND CRITICAL REASONING						(6)
Syllogism – Drawing conclusions from given logical statements, Assertion and Reason – Judging the link between a claim and its reason, Verbal Analogies – Completing word pairs based on relationships, Statement and Assumption – Identifying hidden assumptions in statements, Statement and Conclusion – Choosing valid conclusions from given data, Critical Reasoning – Evaluating arguments for logic and consistency.							
UNIT - II	LISTENING						(6)
Listening to Announcement – Understanding key details and context from public messages, Short Conversation – Extracting specific information from brief dialogues, Motivational Speech – Grasping main ideas, tone, and speaker's intent, Telephone Conversation – Comprehending spoken exchanges over the phone.							
UNIT - III	SPEAKING						(6)
Talking about Oneself – Sharing personal details clearly and confidently, Oral-presentation on a General Topic – Presenting ideas briefly with clarity and structure, Group Discussion on Current Affairs – Expressing and support opinions in group settings, Role Play – Performing situational conversations using appropriate language, Mock & HR Interview – Answering common interview questions with clarity and confidence.							
UNIT - IV	READING						(6)
Reading Short Texts – Understanding the main message and key ideas, Reading for General and Specific Information – Locating relevant details in various texts, Case Studies on Problem Solving – Analyzing real-life scenarios to identify issues and solutions.							
UNIT - V	WRITING						(6)
Written communication: Letters (Apology & Complaint) – Writing formal letters using appropriate tone and structure, E-mails (Appreciation & Permission) – Composing clear and courteous emails, Technical Report – Using standard format for preparing structured technical report, Agenda / Minutes – Preparing format for meeting agendas and recording minutes.							
TOTAL (P:30) = 30 PERIODS							

Shreyas
 Chairman (BoS)



List of Experiments:

1. Syllogism, Assertion & Reason and Verbal Analogies
2. Statement & Assumption, Statement & Conclusion and Critical Reasoning
3. Listening: Announcement and Short Conversation
4. Listening: Motivational Speech and Telephone Conversation
5. Speaking: Taking about oneself, Mock & HR Interview and Mini-presentation
6. Speaking: Group Discussion and Role Play
7. Reading: Multiple Choice & Fill in the Blanks
8. Reading: Analyzing Case Studies on Problem Solving
9. Writing: Complaint/Apology Letter and Appreciation/Permission Email
10. Writing: Format of Technical Report and Format of Agenda/Minutes

COURSE OUTCOMES:

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

COs	Description	Ex. No.	Cognitive Level
CO1	Comprehend assumptions and draw conclusions from verbal reasoning tasks.	1 & 2	Understand
CO2	Understand spoken texts to identify key points and the speaker's intent.	3 & 4	Understand
CO3	Use appropriate language and tone in personal, group, and interview conversations.	5 & 6	Understand
CO4	Recognize main ideas and supporting points in short texts and case studies.	7 & 8	Understand
CO5	Draft formal letters, emails, reports, and meeting notes in the correct format.	9 & 10	Understand

TEXT BOOKS:

1. Bhatnagar Nitin, Communicative English for Engineers and Professionals, Pearson India, 2010.
2. Kulbhusan Kumar, RS Salaria, Effective Communication Skill, Khanna Publishing House, 2018.

REFERENCES:

1. Jack C Richards, Interchange, Cambridge University Press, 2022.
2. RS Aggarwal, A Modern Approach to Verbal & Non-Verbal Reasoning, S Chand, 2024.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	-	-	-	-	-	-	2	3	-	-	-	-
CO2	2	-	-	-	-	-	-	2	3	-	-	-	-
CO3	2	-	-	-	-	-	1	2	3	-	-	-	-
CO4	2	-	-	-	-	-	1	-	3	-	-	-	-
CO5	2	-	-	-	-	-	1	-	3	-	-	-	-

1-Low, 2-Medium, 3-High

Manoj Kumar
Chairman (BoS)



Lab Requirement for a batch of 30 Students

Sl. No.	Description of Equipment / Software	Quantity required
1.	Server	1
	Intel core i3 - 2120	
	4 GB RAM / 240 GB SSD	
	OS: Windows 2011	
	Headphones with mike	
2.	Client Systems	30
	Intel core i3 - 2120	
	4 GB RAM / 240 GB SSD	
	OS: Windows 2011	
	Headphones with mike	
3.	Software	1
	a) Interactive Teacher control software	
	b) English Language Lab Software	
	c) Career Lab Software	

Murugan
Chairman (BoS)



24CEP21	CONSTRUCTION MATERIALS LABORATORY	Category	L	T	P	SL	C
		PCC	0	0	30	0	1
PREREQUISITE: Basic understanding of geometry, trigonometry, and physics, along with familiarity in handling measurement instruments and interpreting technical drawings.							
OBJECTIVES: A basic understanding of material science and engineering principles, knowledge of construction materials and their properties and familiarity with laboratory equipment and testing procedures are all required.							
List of Exercise/Experiments: 1. Compressive Strength Test on Clay and Fly ash Bricks 2. Water Absorption Test on clay and Fly ash Bricks 3. Efflorescence Test on Clay and Fly ash Bricks 4. Specific Gravity of Cement 5. Consistency of Cement 6. Initial and Final Setting time of Cement 7. Soundness of Cement 8. Compressive Strength of Cement 9. Specific Gravity test on Fine and Coarse Aggregate 10. Water Absorption Test on Fine and Coarse Aggregate 11. Bulking of Sand 12. Compressive Strength Tests on Paver Blocks							
P= 30, TOTAL= 30 PERIODS							


Chairman (BoS)

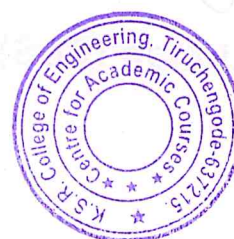


COURSE OUTCOMES: At the end of the course, the students will be able to:													
COs	Course Outcome									Ex.No	Cognitive Level		
CO1	Determine the compressive strength of clay bricks, fly ash bricks, and paver blocks through standard testing procedures.									1,12	Apply		
CO2	Perform water absorption and efflorescence tests on bricks to evaluate their durability and quality.									2,3	Apply		
CO3	Determine consistency, setting time, and soundness of cement to assess its suitability for construction.									5,6,7	Apply		
CO4	Conduct the specific gravity and compressive strength tests on cement and analyze strength development as per standards.									4,8	Apply		
CO5	Determine the specific gravity, water absorption, and bulking of aggregates to apply in mix proportioning and construction practices.									9,10,11	Apply		
Mapping of COs with POs and PSOs													
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2	-	-	-	-	1	1	-	2	3	3
CO2	3	3	2	-	-	-	-	1	1	-	2	3	3
CO3	3	3	2	-	-	-	-	1	1	-	2	3	3
CO4	3	3	2	-	-	-	-	1	1	-	2	3	3
CO5	3	3	2	-	-	-	-	1	1	-	2	3	3
1-low, 2-medium, 3-high													

Laboratory Equipment Details
(Requirement for batch of 30 students)

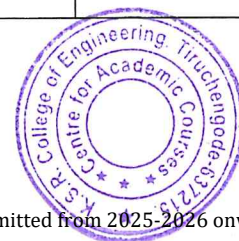
S.No.	Description of Equipment	Quantity required
1.	CTM – 3000 KN capacity	1
2.	Vicat apparatus	1
3.	Le Chatlier Flask	1
4.	Le Chatelier Mould	1
5.	Pyconometer	1


Chairman (BoS)



24SDP29	SOFT SKILLS DEVELOPMENT – II	Category	L	T	P	SL	C
		EEC	0	0	30	0	1
(Common to All Branches)							
OBJECTIVES: To introduce students to the basics of aptitude, helping them understand its core concepts and real-world applications. A key focus is placed on developing proficiency in verbal reasoning, which supports improved problem-solving and analytical thinking. Additionally, the course works toward building a strong foundation in English grammar to enhance language accuracy and communication skills.							
UNIT - I	PERCENTAGE	(6)					
Concept of Percentage – Successive Percentage – Increasing and Decreasing Percentage – Population – Depreciation.							
UNIT - II	PROFIT AND LOSS	(6)					
Concepts of Cost Price, Selling Price, Profit and Loss – Profit Percentage – Loss Percentage – Problems on Dishonest Seller.							
UNIT - III	RATIO PROPORTIONS AND PARTNERSHIP	(6)					
Introduction and Ratio Calculation – Mean Proportion – Share Calculation Based on Ratio – Ages – Partnership.							
UNIT - IV	LOGICAL REASONING	(6)					
Coding and Decoding – Blood Relations – Ranking and Ordering.							
UNIT - V	VERBAL ABILITY	(6)					
Sentence Improvement – Ordering of Sentence – Cloze Test – Spellings.							
TOTAL: 30 PERIODS							
COURSE OUTCOMES: At the end of the course, the students will be able to:							
COs	Course Outcome	Cognitive Level					
CO1	Apply percentage concepts to solve problems on growth, depreciation, and population change effectively.	Apply					
CO2	Apply concepts of profit, loss, and pricing to analyse transactions, including cases of dishonest selling.	Apply					
CO3	Demonstrate proficiency in applying ratio, proportion, and partnership principles	Apply					
CO4	Solve the problems on coding-decoding, blood relations, and ranking using logical reasoning techniques	Apply					
CO5	Improve the sentence structure, logical sequencing, contextual understanding, and spelling accuracy for effective communication.	Understand					


Chairman (BoS)



TEXT BOOKS:

1. R S Aggarwal, "Quantitative Aptitude for Competitive Examinations".
2. Abhijit Guha, "Quantitative Aptitude for Competitive Examinations".
3. Nishit K. Sinha, "Logical Reasoning and Data Interpretation for CAT".
4. R.S. Agarwal, "A Modern Approach to Verbal & Non-Verbal Reasoning".
5. Edgar Thorpe & Showick Thorpe, "English for Competitive Examinations".

REFERENCES:

1. Arun Sharma, Quantitative Aptitude for CAT, 11e, 2025.
2. Arun Sharma, Logical Reasoning for CAT, 7e, 2025.
3. Wren & Martin, High School English Grammar & Composition.
4. <https://prepinsta.com/>.
5. <https://www.geeksforgeeks.org/quantitative-aptitude/?ref=shm>.
6. <https://www.youtube.com/@FeelFreetoLearn/playlists>.

Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2	-	2	-	-	2	-	-	3	-	-
CO2	3	3	2	-	2	-	-	2	-	-	3	-	-
CO3	3	2	2	-	2	-	-	2	-	-	3	-	-
CO4	3	3	2	-	2	-	-	2	-	-	3	-	-
CO5	3	2	-	-	2	-	-	3	3	-	3	-	-
Avg.	3	3	2	-	2	-	-	2	3	-	3	-	-


Chairman (BoS)

