

Dr. MAHALINGAM
COLLEGE OF ENGINEERING AND TECHNOLOGY

Udumalai Road, Pollachi, Coimbatore District - 642003

Established in 1998 • Approved by AICTE • Affiliated to Anna University

(A DIVISION OF NIA EDUCATIONAL INSTITUTIONS)



NAAC A++ GRADE
Cycle 3 (2023-2030)
The Highest Grade

Curriculum and Syllabi

Semesters I & II

Regulations 2023

Programme:
Curriculum and Syllabi: Semester I & II
Recommended by Board of Studies on:
Approved by Academic Council on:

Action	Responsibility	Signature of Authorized Signatory
Designed and Developed By		
Compiled By	Office of Controller of Examination	
Approved By	Principal	

Dr. Mahalingam College of Engineering and Technology, Pollachi 642003.
(An autonomous institution approved by AICTE and affiliated to Anna University)

Department of Civil Engineering

Vision

To develop Competent Civil Engineers to meet the infrastructure challenges of India and the world.

Mission:

- To become one of the reputed departments offering Civil Engineering Program in the country.
- To produce excellent engineers to cope up with the changes through dynamic, innovative, and flexible curriculum.
- To provide a conducive environment for teaching & learning and to develop leaders with effective communication skills.
- To conduct quality research driven by industry & societal needs and provide affordable engineering solutions in an ethical way.

Programme Educational Objectives (PEOs) - Regulations 2023

B.E Civil Engineering graduates will:

- PEO.1** Graduates who effectively demonstrate engineering knowledge, problem solving skill, design capabilities and entrepreneurial skills by providing practical solutions.
- PEO.2** Graduates who effectively demonstrate professionalism in multi-disciplinary engineering environment, leadership quality, teamwork and engage in life-long learning.
- PEO.3** Graduates who demonstrate an ethical commitment to the community and the profession through involvement with professional societies.
- PEO.4** Graduates who make contributions to knowledge and establish best engineering practice through research and development.

Programme Outcomes (POs) - Regulations 2023

On successful completion of B.E. Civil Engineering programme, graduating students /graduates will be able to:

- PO1. Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialisation to the solution of complex engineering problems.
- PO2. Problem Analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

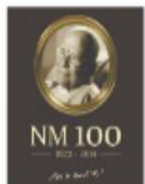
- PO4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
- PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12. Life-long learning:** Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes (PSOs)

On successful completion of B.E. Civil Engineering programme, graduating students /graduates will be able to:

- PSO.1 Problem Analysis:** Able to arrive solutions to real time problems related to various domains of civil engineering through problem solving skills

- PSO.2 Design and Management:** Able to design systems, components and processes considering safety, quality and cost consideration and able to prepare project documents, engineering drawings and construction schedules.



Dr. MAHALINGAM

COLLEGE OF ENGINEERING AND TECHNOLOGY

Udumalai Road, Pollachi, Coimbatore District - 642003

Established in 1998 • Approved by AICTE • Affiliated to Anna University

(A DIVISION OF NIA EDUCATIONAL INSTITUTIONS)



NAAC A++ GRADE
Cycle 3 (2023-2030)
The Highest Grade

Programme: B.E. - CIVIL ENGINEERING

2023 Regulations

Curriculum for semester I & II

Type of Course	Course Code	Course Title	Duration	Credits	Marks
VAC	23VAL101	Induction Program	3 Weeks	-	100

SEMESTER I

Type of Course	Course Code	Course Title	Hours/Week			Credits	Marks	Common to Programmes
			L	T	P			
AEC	23ENI101	Communication Skills I	2	0	2	3	100	All
Minor	23MAI101	Linear Algebra and Calculus	3	0	2	4	100	-
Minor	23PHT101	Physics for Civil Engineering	3	0	0	3	100	-
Minor	23CET101	Civil Engineers and Society	3	0	0	3	100	-
Minor	23PHL101	Physics for Civil Engineering Laboratory	0	0	3	1.5	100	-
Minor	23CEL101	Engineering Drawing for Civil Engineering	1	0	3	2.5	100	-
VAC	23VAL102	Wellness for Students	0	0	2	1	100	All
VAC	23VAT101	தமிழர்மரபு / Heritage of Tamils	1	0	0	1	100	All
AEC	23SAL101	Studio Activities	0	0	2	-	-	All
Total			13	0	14	19	800	

SEMESTER II

Type of Course	Course Code	Course Title	Hours/Week			Credits	Marks	Common to Programmes
			L	T	P			
AEC	23ENI201/ 23FLT201/ 23FLT202	Communication Skills II/ Foreign Language-Japanese/ Foreign Language-German	2	0	2	3	100	All
Minor	23MAI201	Ordinary Differential Equations and Complex Variables	3	0	2	4	100	-
Minor	23CHI201	Chemistry for Civil Engineering	3	0	2	4	100	-
Minor	23CET201	Engineering Mechanics	3	0	0	3	100	-
Multi-disciplinary	23ADT001	C Programming	3	0	0	3	100	CE, EA, EC, EV
SEC	23ADL001	C Programming Laboratory	0	0	3	1.5	100	CE, EA, EC, EV
SEC	23MEL202	Engineering Practices Laboratory	0	0	3	1.5	100	AU, CE, ME
SEC	23ESL201	Professional Skills 1: Aptitude	0	0	2	1	100	All
VAC	23VAT201	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	1	0	0	1	100	All
Multi-disciplinary	23CHT202	Environmental Sciences	1	0	0	-	100	All
AEC	23SAL201	Studio Activities	0	0	2	-	-	All
Total			16	0	16	22	1000	

TENTATIVE CURRICULUM for Semester III to VIII

SEMESTER III

Course Type	Course Code	Course Title	Hours/Week			Credits	Marks	Common to Programmes
			L	T	P			
Minor	23MAI301	Transforms and Partial Differential Equations	3	1	0	4	100	-
Major	23CET301	Strength of Materials	3	0	0	3	100	-
Major	23CET302	Fluid Mechanics	3	0	0	3	100	-
Major	23CET303	Construction Materials and Practices	3	0	0	3	100	-
Major	23CEL301	Strength of Materials and Fluid Mechanics Laboratory	0	0	3	1.5	100	-
Major	23CEL302	Building Drawing Laboratory	0	0	3	1.5	100	-
SEC	23ESL301	Professional Skills 2: Problem Solving Skills & Logical Thinking 2	0	0	2	1	100	-
VAC	23VAL003	Universal Human Values 2 :Understanding Harmony	2	1	0	3	100	-
AEC	23SAL301	Studio Activities	0	0	2	-	-	All
Total			14	2	10	20	800	

SEMESTER IV

Course Type	Course Code	Course Title	Hours/Week			Credits	Marks	Common to Programmes
			L	T	P			
Major	23CET401	Structural Analysis I	3	1	0	4	100	-
Major	23CET402	Transportation Engineering	3	0	0	3	100	-
Major	23CEI401	Concrete Technology	2	0	2	3	100	-
Major	23CEI402	Surveying	2	0	2	3	100	-
Major	23CEI403	Soil Mechanics	2	0	2	3	100	-
Major	23CEI404	Applied Hydraulic Engineering Laboratory	2	0	2	3	100	-
Major	23CEL401	Material Testing Laboratory	0	0	3	1.5	100	-
SEC	23ESL401	Professional Skills 3	0	0	2	1	100	-
Major	23XXXXXX	Survey Camp	2 weeks			1	100	-
AEC	23SAL401	Studio Activities	0	0	2	-	-	All
Total			14	1	15	23.5	1000	

Course Code	Course Title	Duration	Credits	Marks
23CES001	Internship-I/ Research Internship/ Skill Development	2 Weeks	2	100

SEMESTER V

Type of Course	Course Code	Course Title	Hours/Week			Credits	Marks	Common to Programmes
			L	T	P			
Major	23XXXXXX	Structural Analysis II	3	0	0	3	100	-
Major	23XXXXXX	Design of Reinforced Concrete Elements	3	0	0	3	100	-
Major	23XXXXXX	Water Supply Engineering	2	0	2	3	100	-
Major	23XXXXXX	Foundation Engineering	3	0	0	3	100	-
Minor	23XXXXXX	Cyber Security	3	0	0	3		All
Major	23XXXXXX	Professional Elective-I	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective-I	3	0	0	3	100	-
SEC	XXXXXXX	Professional Skills 4	0	0	2	1	100	All
VAC	XXXXXXX	Reverse Engineering Project	0	0	6	3	100	-
AEC	23SAL501	Studio Activities	0	0	2	-	-	All
Total			20	0	12	25	800	

SEMESTER VI

Type of Course	Course Code	Course Title	Hours/Week			Credits	Marks	Common to Programmes
			L	T	P			
Major	23XXXXXX	Design of Steel Structures	3	0	0	3	100	-
Major	23XXXXXX	Waste Water Engineering	2	0	2	3	100	-
Major	23XXXXXX	Irrigation Engineering	3	0	0	3	100	-
Major	23XXXXXX	Computer Aided Design and Drafting Laboratory	0	0	3	1.5	100	-
Major	23XXXXXX	Professional Elective-III	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective-IV	3	0	0	3	100	-
Major	23XXXXXX	Open Elective-I	3	0	0	3	100	-
SEC	XXXXXXX	Professional Skills 5	0	0	2	1	100	All
AEC	23SAL601	Studio Activities	0	0	2	-	-	All
Total			17	0	9	22.5	900	

Course Code	Course Title	Duration	Credits	Marks
23CES002	Internship-II/ Research Internship/ Skill Development	4 Weeks	2	100

SEMESTER VII

Type of course	Course Code	Course Title	Hours/Week			Credits	Marks	Common to Programmes
			L	T	P			
Major	23XXXXXX	Prestressed Concrete Structures	3	0	0	3	100	-
Major	23XXXXXX	Estimation and Quantity Surveying	3	0	0	3	100	--
Major	23XXXXXX	Construction Project Management	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective-V	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective- VI	3	0	0	3	100	-
Minor	23XXXXXX	Open Elective-II	3	0	0	3	100	-
Major	XXXXXXX	Project Phase-I	0	0	8	4	100	-
Total			18	0	8	22	700	

SEMESTER VIII

Type of Course	Course Code	Course Title	Hours/Week			Credits	Marks	Common to Programmes
			L	T	P			
Major	23XXXXXX	Professional Elective-VII	3	0	0	3	100	
Major	23XXXXXX	Professional Elective- VIII	3	0	0	3	100	
Major	23XXXXXX	Project Phase-II	0	0	12	6	200	
Total			6	0	12	16	500	

Course Code	Course Title	Duration	Credits	Marks
23CES003	Internship-III/ Research Internship/ Skill Development	8 Weeks	4	100

Total Credits: 170

SEMESTER I

Course Code:23VAL101		Course Title: INDUCTION PROGRAM (Common to all B.E/B.Tech Programmes)
Course Category: VAC		Course Level: Introductory
Duration: 3 weeks	Mandatory Non-Credit Course	Max Marks:100

Course Objectives

The course is intended to:

1. Explain various sources available to meet the needs of self, such as personal items and learning resources
2. Explain various career opportunities, opportunity for growth of self and avenues available in the campus
3. Explain the opportunity available for professional development
4. Build universal human values and bonding amongst all the inmates of the campus and the society.

List of Activities:

1. History of Institution and Management: Overview on NIA Educational Institutions — Growth of MCET – Examination Process –OBE Practices –Code of Conduct – Centre of Excellence.
2. Lectures, interaction sessions and Motivational Talks by Eminent people, Alumni, Employer and Industry Experts.
3. Familiarization of Department / Branch: HoD's & Senior Interaction- Department Association.
4. Universal Human Value Modules: Aspirations and concerns, Self-Management, Relations Social and Natural Environment.
5. Orientation on Professional Skills Courses.
6. Proficiency Modules: Mathematics, English, Physics and Chemistry.
7. Introduction to various Chapters, Cells, Clubs and its events.
8. Creative Arts: Painting, Music and Dance.
9. Physical Activity: Games, Sports and Yoga.
10. Group Visits: Visit to local area and Campus Tour.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1 : Explain various sources available to meet the needs of self, such as personal items and learning resources through visit to local areas and campus	Understand
CO2: Explain various career opportunities and avenues available in the campus through orientation sessions	Understand
CO3: Explain the opportunity available for professional development through professional skills, curricular, co-curricular and extracurricular activities	Understand
CO4: Build universal human values and bonding amongst all the inmates of the campus and society for having a better life	Apply

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	PO1	PO1	PSO1	PSO2
CO1	1	-	-	-	-	-	-	2	1	2	-	-	-	-
CO2	1	-	-	-	-	-	-	2	1	2	-	-	-	-
CO3	1	-	-	-	-	-	-	2	1	2	-	-	-	-
CO4	2	-	-	-	-	-	-	2	1	2	-	-	-	-

High: 3, Medium: 2, Low: 1

Text Book(s):

T1. Reading material, Workbook prepared by PS team of the college

Reference Book(s):

- R1. Sean Covey, "Seven habits of highly effective teenagers", Simon & Schuster Uk, 2004.
R2. Vethathiri Maharishi Institute for Spiritual and Intuition Education, aliyar, "value education harmonious life (Manavalakalai Yoga)", Vethathri Publications, Erode, 2010.
R3. Dr. R.Nagarathna, Dr.H.R. Nagendra, "Integrated approach of yoga therapy for positive Swami Vivekananda Yoga Prakashana Bangalore, 2008 Ed.

Web References:

1. https://youtube.com/playlist?list=PLYwzG2fd7hzc4HerTNkc3pS_lvcCfKznV.
2. <https://www.youtube.com/watch?v=P4vjfEVk&list=PLWDeKF97v9SO0frdgmphagDMjkom1>.
3. <https://fdp-si.aicte-india.org/download/AboutSIP/About%20SIP.pdf>.

Course Code: 23EN101	Course Title: COMMUNICATION SKILLS I (Common to all B.E/B.Tech Programmes)		
Course Category: AEC		Course Level: Introductory	
L:T:P(Hours/Week) 2:0:2	Credits: 3	Total Contact Hours:60	Max Marks:100

Course Objectives

The course is intended to impart formal and informal language effectively and accurately in various real-life contexts on par with B1 level of CEFR Scale.

Module I

20 Hours

Grammar: Synonyms & Antonyms -Tense forms - Modals - Passives – Reported Speech – Comparatives and Descriptive adjectives.

Listening: Listening for gist and specific information - Listening to past events, experiences and job preferences - Listening to descriptions of monuments - Listening for excuses - Listening to description: transportation systems and public places.

Speaking: Introducing oneself - Exchanging personal information — Effective Conversations: Role Play Situations (Describing personality traits - Describing landmarks, monuments and festivals - Making polite requests and excuses - Discussing facts - Asking for and giving information — Expressing wishes - Talking about lifestyle changes - Talking about transportation and its problems - Describing positive and negative features of things and places - Making comparisons)

Reading: Skimming and Scanning - Reading Comprehension - Reading and comprehending online posts and emails — Case Studies

Writing: Letter writing (Permission letters - Online cover letter for job applications) - Instructions - Recommendations - Write a blog (General) - Report Writing (Industrial Visit Report and Event Reports) - formal and informal emails.

Module II

20 Hours

Grammar: Sequence adverbs - Phrasal verbs - Relative clauses – Imperatives - Infinitives - Conditionals.

Listening: Listening to review of food items - Listening to results of surveys- Listening to motivational talks & podcasts

Speaking: Expressing likes and dislikes - Describing a favourite snack - Giving advices and suggestions - Speculating about past and future Events — Group Discussion

Reading: Reading different expository texts - Reading to factual texts - Print and online media- Reading Comprehension

Writing: Process Descriptions – Email Writing (Requesting for information) - Reviewing Movie – Social media feeds/posts (Any Social Media)

List of Experiments:

20 Hours

1. Mini Presentation and Picture Prompt Discussion
2. Debate Tournament
3. Listening, Mind Mapping & Summarization
4. Listening to Stories and Providing the Innovative Climax
5. Reading Comprehension
6. Writing - Interpretation of Visuals.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO 1: Utilize the basic English grammar and vocabulary to acquire professional communication skills.	Apply
CO 2 : Develop listening and speaking skills through classroom activities based on listening comprehension, recapitulation, interpretation and debate on the same	Apply
CO 3 : Read and write social media posts and comments	Apply
CO 4 : Perform as a member of a team and engage in individual presentation	Apply

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO4	-	-	-	-	-	-	-	-	2	3	-	-	-	-

High-3; Medium-2; Low-1

Textbooks:

T1. Jack C. Richards, Jonathan Hull, and Susan Proctor, “Interchange - Student’s book 2”, 5th Edition, Cambridge University Press, South Asia Edition, 2022.

T2. Jack C. Richards, Jonathan Hull, and Susan Proctor, “Interchange - Student’s Book 1”, 5th Edition, Cambridge University Press, South Asia Edition, 2022.

Reference Book(s):

R1. David Bohlke, Jack C. Richards, "Four Corners", 2nd Edition, Cambridge University Press, 2018.

R2. Adrian Doff, Craig Thaine, Herbert Puchta, Jeff Stranks, Peter Lewis-Jones, Graham Burton, Empower B1 – Student's Book, Cambridge University Press, 2020.

R3. Raymond Murphy, "Intermediate English Grammar" 30th Edition, Cambridge University Press, 2022.

Web References:

1. <https://speakandimprove.com/>

2. <https://writeandimprove.com/>

3. <https://www.cambridgeenglish.org/exams-and-tests/linguaskill/>.

Course Code: 23MAI101		Course Title: LINEAR ALGEBRA AND CALCULUS	
Course Category: Minor		Course Level: Introductory	
L:T:P(Hours/Week) 3:0:2	Credits: 4	Total Contact Hours:75	Max Marks:100

Course Objectives:

The course is intended to impart knowledge to formulate and solve matrix based operations, sequences, series and gain proficiency in calculus computations through mathematical software tools.

Module I

23 Hours

Matrices

Eigen values and Eigen vectors-symmetric, skew symmetric and orthogonal matrices- Diagonalization of matrix through orthogonal transformation- Cayley-Hamilton theorem (without proof) - Reduction of quadratic forms to canonical form-rank, index, signature and nature of quadratic forms.

Sequences and Series

Sequences-definitions and examples- Series-Tests for convergence-comparison test, integral test, Alembert's ratio test- Alternating series –Leibnitz's test.

Differential Calculus I

Curvature-Cartesian and Polar coordinates- radius of curvature-center of curvature-

Module II

22Hours

Differential Calculus II

Circle of curvature.-Evolute and Involute of standard curves.

Multivariable Differentiation

Partial derivatives - Total derivatives- Differentiation of implicit functions- Taylor's series and Maclaurin's series – Jacobian – Maxima, Minima and saddle points - Method of Lagrange's multipliers.

Multiple Integral

Multiple Integration: Double integrals - Change of order of integration in double integrals - Change of variables (Cartesian to polar) - Triple integrals - Applications: Finding areas and volumes.

List of Experiments:**30 Hours**

1. Introduction to MATLAB.
2. Rank of matrix and solution of system of linear algebraic equations.
3. Characteristic equation of a matrix and Verification of Cayley Hamilton theorem.
4. Finding Eigen values and Eigen vectors of a matrix.
5. Curve fitting and Interpolation.
6. Determining maxima and minima of a function of two variables.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1: Use orthogonal transformation to transform quadratic form to canonical form.	Apply
CO2: Apply different testing methods to check the nature of infinite series.	Apply
CO3: Calculate the Evolute and envelope of curves.	Apply
CO4: Apply partial derivatives to find extreme values of multivariate functions.	Apply
CO5: Determine the area between plane curves and volume of solids using multiple integrals.	Apply
CO6: Demonstrate the understanding of linear algebra and calculus concepts through modern tool.	Apply

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	3	-	-	-	-	-	-	-	-	-

High-3; Medium-2;Low-1

Text Book(s):

- T1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th edition, John Wiley & sons, 2010.
 T2.T.Veerarajan.,Engineering Mathematics for first year, 3rd edition, Tata McGraw-Hill,2019.NewDelhi, 2008.

Reference Book(s):

R1.G.B.Thomas and R.L Finney, Calculus and Analytic Geometry, 9th edition, Pearson, Reprint, 2002.

R2.B.S.Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.

R3. P. Sivaramakrishna Das , C. Vijayakumari , "Engineering Mathematics "2017, PearsonIndia.

Web References:

1.<https://nptel.ac.in/courses/111107112>

2.<https://nptel.ac.in/courses/111104031>

Course Code: 23PHT101		Course Title: PHYSICS FOR CIVIL ENGINEERING	
Course Category: Minor		Course Level: Introductory	
L:T:P(Hours/Week) 3: 0: 0	Credits: 3	Total Contact Hours: 45	Max Marks: 100

Course Objectives:

The course is intended to impart knowledge of the basic properties of Matter, Acoustics, Nano concepts and NDT.

Module I

22 Hours

Elasticity: Introduction – Concept of Load, Stress and Strain – Hooke’s law – Stress-Strain Diagram – Elastic and Plastic Materials – Factors affecting Elastic Properties – Three Moduli of Elasticity – Relation between Young’s, Rigidity and Bulk moduli (Qualitative – No derivation) – Bending Moment of a Beam – Determination of Young’s modulus using a Cantilever – I-Shaped Girders – Twisting Couple of a wire – Determination of Rigidity Modulus of a thin wire using Torsional Pendulum.

Viscosity: Coefficient of Viscosity – Experimental determination of coefficient of viscosity: Poiseuille’s method and Stoke’s method.

Thermal Physics: Introduction – Modes of Heat Transfer – Thermal Conductivity – Newton’s law of cooling – Specific Heat Capacity determination – Advantages and disadvantages of Newton’s law of cooling method – Verification of Newton’s law of cooling – Lee’s disc method for the determination of thermal conductivity of a bad conductor – Conduction of Heat through a compound media: Bodies in both series and Parallel.

Nanotechnology: Introduction – Importance of Nanotechnology – Nanomaterials – Nanoparticles – Synthesis of Nanoparticles: High-energy ball milling (top-down approach) – Sol-gel process (bottom-up approach) – Application of Nanomaterials.

Module II**23 Hours**

Nanomaterials: Carbon Nanomaterials – Fullerenes: Properties, synthesis and Applications – Carbon Nanotubes – Types – Synthesis of Carbon Nanotubes: Arc-Evaporation method – Properties of Carbon Nanotubes – Application of Carbon Nanotubes.

Architectural Acoustics: Introduction – Classification of Sound – Characteristics of musical sound (Intensity, Frequency and Quality) – Weber – Fechner law – Sound Intensity level – Decibel – Human Audiogram – Phon – Sound reflection – Reverberation Time – Sound Absorption – Sabine’s formula for reverberation time (Growth and Decay of Sound Energy in a hall) – Absorption coefficient and its determination – Factors affecting acoustics of a building and their remedies – Acoustic design of a hall.

Non-Destructive Testing (NDT): Introduction – Advantages of NDT over conventional testing techniques – Methods of NDT. Liquid Penetrant Testing (LPT): Steps of LPT – Materials used in LPT – Advantages and Limitations of LPT. Ultrasonic Inspection: Pulse Echo method and through transmission method. Data presentation: A-Scan, B-Scan and C-Scan displays.

Sensors: Sensors for Structural Health Monitoring – Accelerometer – Vibrating wire sensors – Strain Gauges – Inclinometer – Acoustic emission sensor – Temperature sensors.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1: Apply the basic concepts of elasticity, heat and nanotechnology to solve the different physical parameters.	Apply
CO2: Perform as a member of team in analysing the concepts of elasticity, heat and nanotechnology involved in real-life applications related to civil engineering and make a presentation.	Apply
CO3: Interpret the concepts of nanomaterials, acoustics and non-destructive techniques and apply it for different engineering applications.	Apply
CO4: Perform as a member of team in articulating the modern technologies behind nanotechnology, architectural acoustics and testing of materials.	Apply

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	1	3	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	3	-	-	-	-	-	-	-	1	3	-	-	-	-

High-3; Medium-2; Low-1

Text Book(s):

- T1. M.N.Avadhanulu, P.G.Kshirsagar, "A Textbook of Engineering Physics", S.Chand & Co. New Delhi, Revised 8th Edition, 2014.
- T2. A. Marikani, "Engineering Physics", PHI Learning Private Limited, New Delhi, 2nd Edition, 2014.

Reference Book(s):

- R1. J. Walker, D.Halliday, R.Resnick,"Principles of Physics", Wiley Student Edition, New Delhi, 10th Edition, 2015.
- R2. D.S.Mathur, "Properties of Matter", S. Chand & Co., New Delhi, 4th Edition, 2012.
- R3. Balasubramaniam "Callister's Material Science and Engineering", John Wiley and Sons Inc., 2nd Edition, 2015.

Web References:

- 1. <https://www.fprimec.com/sensors-for-structural-health-monitoring/>
- 2. <http://www.physicsclassroom.com/>
- 3. <http://nptel.ac.in/course.php?disciplineId=115>

Course Code: 23CET101		Course Title: CIVIL ENGINEERS AND SOCIETY	
Course Category: Minor		Course Level: Introductory	
L:T:P(Hours/Week) 3: 0: 0	Credits:3	Total Contact Hours:45	Max Marks:100

Course Objectives:

The course is intended to provide an overview of the profession of Civil Engineering and professional ethics.

Module I

22 Hours

Introduction

Engineering – Definition – Engineering Education – Graduate Attributes – Engineering functions – Role and Responsibilities of Engineers – Early construction and development over time.

Fundamentals of Civil Engineering

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.

Overview of National Planning for Construction and Infrastructure development

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.

Module II

23 Hours

Engineering as Social Experimentation

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.

Sustainability

Reliability, risk and safety – Risk management – Engineering and the environment – Ethics and the environment – Sustainable Engineering – Sustainable Development Goal and Civil Engineering.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO.1 Identify and analyze the graduate attributes in their course of study.	Apply
CO.2 Identify and apply the elements of building and importance of Civil Engineering towards nation's economy.	Apply
CO.3 Identify and apply the ethical interest of stake in real world situation or practice.	Apply
CO.4 Engage in independent study as a member of a team and make an effective oral presentation on the application of graduate attributes and ethical values.	Apply

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	3	-	-	-	-	-	-
CO4	-	-	-	-	-	3	3	3	3	3	-	3	3	-

High-3; Medium-2;Low-1

Text Book(s):

- T1. Kim Strom Gottfried, "Straight Talk about Professional Ethics", Lyceum Books, 2nd edition, 2014.
- T2. S S Bhavikati, "Basic Civil Engineering", New Age International (P) Limited Publishers, New Delhi, 2018.

Reference Book(s):

- R1. Rebecca Mirsky and John Schaufelberger, "Professional Ethics for the Construction Industry" RICS, USA, 2014.
- R2. Ramesh Chandra Das, "Social, Health, and Environmental Infrastructures for Economic Growth", IGI Global Disseminator of Knowledge, 2017.
- R3. Kenneth K. Humphreys, "What Every Engineer Should Know about Ethics", CRC Press, 1999.

Web References:

1. <https://archive.nptel.ac.in/courses/105/106/105106201/>
2. Richard Ashley, "The role of the civil engineer in society: engineering ethics and major projects", <https://doi.org/10.1680/cien.2012.165.3.99>, May 25, 2015.

Course Code: 23PHL101	Course Title: PHYSICS FOR CIVIL ENGINEERING LABORATORY		
Course Category: Minor		Course Level: Introductory	
L:T:P (Hours/Week) 0:0:3	Credits:1.5	Total Contact Hours: 45	Max Marks: 100

Course Objectives

The course is intended to expose the students to various experimental skills which are very essential for an Engineering student.

List of Experiments (Any ten):

1. Determination of Young's Modulus of the material – Cantilever bending method.
2. Determination of Young's Modulus of the material – Uniform bending method.
3. Determination of Young's Modulus of the material – Non-Uniform bending method.
4. Determination of Rigidity modulus of the metallic wire – Torsion Pendulum method.
5. Determination of Viscosity of low viscous liquid – Poiseuille's method.
6. Determination of Viscosity of high viscous liquid –Stoke's method.
7. Lee's Disc method - Determination of thermal conductivity of the bad conductor.
8. Determination of specific heat capacity of given liquid – Newton's law of cooling method.
9. Ultrasonic interferometer – Determination of velocity of ultrasonics and compressibility of given liquid.
10. Measurement of sound intensity using sound level meter.
11. Measurement of strain using strain gauge.
12. Determination of Wavelength of laser using plane transmission grating and hence estimate particle size of lycopodium powder.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1: Elucidate the basic principles involved in the given experiments	Understand
CO2: Conduct, analyze and interpret the data and results from physics experiment	Evaluate

Course Articulation Matrix

CO Vs PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	3	-	3	-	-	-	-	-	-	-	-	-	-

High-3; Medium-2; Low-1

Reference Book(s):

- R1. Physics Laboratory Manual Prepared by Faculty of Physics, Dr. Mahalingam College of Engineering and Technology
- R2. Engineering Physics Laboratory Manual, Dr. R. Jayaraman, V. Umadevi, S. Maruthamuthu, B. Saravanakumar, Pearson India Education Services Pvt. Ltd, 2022.
- R3. B.Sc., Practical Physics, C.L. Arora, S. Chand and Co, 2012.

Web References:

1. <https://vlab.amrita.edu/index.php?sub=1&brch=280>
2. <https://vlab.amrita.edu/index.php?sub=1&brch=189>
3. <https://vlab.amrita.edu/index.php?sub=1&brch=194>

Course Code: 23CEL101	Course Title: ENGINEERING DRAWING FOR CIVIL ENGINEERING		
Course Category: Minor		Course Level: Introductory	
L:T:P(Hours/Week) 1: 0 : 3	Credits: 2.5	Total Contact Hours:60	Max Marks: 100

Course Objectives:

The course is intended to understand and develop the skill of drawing projection of points and lines, orthographic projection, isometric views of simple objects and buildings, perspective view of simple building. Also, to know the basic commands and applications of AutoCAD.

Module I

8 Hours

Importance of drawing in engineering applications - BIS conventions and specifications - Size, layout and folding of drawing sheets - Lettering and dimensioning - First angle projection - projection of points and lines - Determination of true lengths and true inclinations - Representation of Three-Dimensional objects - General principles of orthographic projection - Need for importance of multiple views and their placement - layout of views - Orthographic projection - Conversion of pictorial view to orthographic views - Projection of simple solids - Prism, pyramid, cylinder and cone - Isometric projection of simple solids- Prism, pyramid, cylinder & cone - Projection of simple residential building.

Module II

7 Hours

Perspective projection of simple solids like prism, pyramid, cylinder and cone by Visual Ray Method - Perspective projection of building by vanishing point method- AutoCAD- Applications, Advantages, System requirement, Elements of drawing window, Units, Limits, Drawing Tools - Draw, modify, annotation, layers and properties - Function keys - 3D tools - Orthographic projection of simple solids.

List of Experiments:

45 Hours

1. Lettering & Dimensioning
2. Projection of points and lines
3. Orthographic projection of pictures
4. Orthographic projection of simple solids
5. Isometric projection of simple solids
6. Isometric projection of building
7. Perspective projection of simple solids
8. Perspective projection of building.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO 1: Apply the knowledge of lettering and dimensioning as per the standards in projection of points, lines and simple solids.	Apply
CO 2: Apply the principles to draw the isometric and perspective projections of simple solids and buildings.	Apply
CO 3: Illustrate the projection of solids by applying the drawing tools available in CAD software.	Apply

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	3	-	-	-	-	-	-	2	-	-

High-3; Medium-2;Low-1

Text Book(s):

- T1. K. V. Natrajan, A Text Book of Engineering Graphics, 48th Edition, Dhanalakshmi Publishers, Chennai, 2018.
- T2. Rangawala, "A text book of Civil Engineering Drawing", Charotar publishers, 3rd edition, 2017.

Reference Book(s):

- R1. K.L. Narayana and P. Kannaiah, "Engineering Drawing", Scitech Publications (India) Pvt. Ltd., 3rd Edition, 2021.
- R2. Anurag A. Kandya, "Elements of Civil Engineering" Charotar publishers, 3rd edition, 2017 (Reprint).
- R3. B.P. Verma, "Civil Engineering Drawing & House Planning", Khanna publishers, 12th edition, 2006.

Publications of Bureau of Indian Standards:

1. IS 10711 - 2001: Technical Product Documentation - Sizes and layout of drawing sheets.
2. IS 9609 (Part- 0 & 1) - 2001: Technical Product Documentation - Lettering.
3. IS 10714 (Part 20) - 2001: Technical Drawings- General Principles of Presentation- Basic Conventions for Lines.
4. IS 11669 - 1986: General Principles of Dimensioning on Technical Drawings.
5. IS 15021 (Part- 1 to 4) - 2001: Technical Drawings - Projection Methods.
6. SP 46 - 2003: Engineering Drawing Practice for Schools & Colleges.

Course Code: 23VAL102		Course Title: WELLNESS FOR STUDENTS (Common to all B.E/B.Tech Programmes)	
Course Category: VAC		Course Level: Introductory	
L:T:P(Hours/Week) 0: 0 :2	Credits:1	Total Contact Hours:30	Max Marks:100

Course Objectives:

The course is intended to impart knowledge on setting SMART goals for academic, career and life, applying time management techniques, articulating the importance of wellness for success in life and understanding the dimensions of wellbeing and relevant practices.

Module I

15 Hours

GOAL SETTING Understanding Vision and mission statements - Writing personal mission statements – ‘Focus’ as a way of life of most successful people. Clarifying personal values, interests and orientations – Awareness of opportunities ahead – Personal SWOT analysis - Principles driving goal setting: Principle of response and stimuli, Circle of influence and circle of concern, What you see depends on the role you assume. Potential obstacles to setting and reaching your goals - Five steps to goals setting: SMART goals, Inclusive goals, Positive stretch, Pain vs gain, Gun-point commitment.

TIME MANAGEMENT - TOOLS AND TECHNIQUES Importance of planning and working to time. Pareto 80-20 principle of prioritization – Time quadrants as a way to prioritize weekly tasks – The glass jar principle - Handling time wasters – Assertiveness, the art of saying ‘NO’ – Managing procrastination.

CONCEPT OF WELLNESS – impact of absence of wellness - Wellness as important component to achieve success. Wellbeing as per WHO - Dimensions of Wellbeing: Physical, Mental, Social, Spiritual – indicators and assessment methods

Module II

15 Hours

Simplified Physical Exercises. Fitness as a subset of Wellness – health related physical fitness - skill related physical fitness. Joint movements, Warm up exercises, simple asanas, WCSC simplified exercises.

PRACTICES FOR MENTAL WELLNESS

Meditation: Mind and its functions - mind wave frequency – Simple basic meditation – WCSC Meditation and introspection tables. Greatness of friendship and social welfare – individual, Family and world peace – blessings and benefits.

Food & sleep for wellness: balanced diet - good food habits for better health (anatomic therapy) – hazards of junk food - food and the gunas.

PUTTING INTO PRACTICE

Practicals: Using the weekly journal – Executing and achieving short term goals – Periodic reviews.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO 1: Set well-articulated goals for academics, career, and personal aspirations.	Apply
CO 2: Apply time management techniques to complete planned tasks on time.	Apply
CO 3: Explain the concept of wellness and its importance to be successful in career and life.	Apply
CO 4: Explain the dimensions of wellness and practices that can promote wellness.	Apply
CO 5: Demonstrate the practices that can promote wellness.	Valuing

Course Articulation Matrix

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

High-3; Medium-2;Low-1

Text Book(s):

T1. Reading material, workbook and journal prepared by PS team of the college.

Reference Book(s):

- R1. Stephen R Covey, "First things first", Simon & Schuster UK, Aug 1997
- R2. Sean Covey, "Seven habits of highly effective teenagers", Simon & Schuster UK, 2004.
- R3. Vethathiri Maharishi Institute for Spiritual and Intuition Education, Aliyar, "Value education for harmonious life (Manavalakalai Yoga)", Vethathiri Publications, Erode, I Ed. (2010).
- R4. Dr. R. Nagarathna, Dr. H.R. Nagendra, "Integrated approach of yoga therapy for Positive health", Swami Vivekananda Yoga Prakashana, Bangalore, 2008 Ed.
- R5. Tony Buzan, Harper Collins, "The Power of Physical Intelligence English"

Course Code: 23VAT101		Course Title: HERITAGE OF TAMILS (Common to all B.E/B.Tech Programmes)	
Course Category: VAC		Course Level: Introductory	
L:T:P (Hours/Week) 1: 0 :0	Credit: 1	Total Contact Hours: 15	Max Marks:100

Pre-requisites

➤ NIL

Course Objectives

மாணவர்கள் இப்பாடத்தை கற்றலின் மூலம்

CO.1 மொழி மற்றும் இலக்கியம், பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை - சிற்பக் கலை , நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள் , திணைக் கோட்பாடுகள் மூலம் தமிழர் மரபை அறிந்து கொள்ள இயலும்.

CO.2 இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பை அறிந்து கொள்ள இயலும்.

தமிழர் மரபு

அலகு 1 - மொழி மற்றும் இலக்கியம்

3

இந்திய மொழிக் குடும்பங்கள் - திராவிட மொழிகள் - தமிழ் ஒரு செம்மொழி - தமிழ் செவ்விலக்கியங்கள் - சங்க இலக்கியத்தின் சமயச் சார்பற்ற தன்மை - சங்க இலக்கியத்தில் பகிர்தல் அறம் - திருக்குறளில் மேலாண்மைக் கருத்துக்கள் - தமிழ்க் காப்பியங்கள், தமிழகத்தில் சமண பௌத்த சமயங்களின் தாக்கம் - பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலக்கியங்கள் - தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி - தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

அலகு 2 - மரபு - பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை - சிற்பக் கலை

3

நடுகல் முதல் நவீன சிற்பங்கள் வரை - ஐம்பொன் சிலைகள் - பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் - தேர் செய்யும் கலை - சுடுமண் சிற்பங்கள் - நாட்டுப்புறத் தெய்வங்கள் - குமரிமுனையில் திருவள்ளூர் சிலை - இசைக் கருவிகள் - மிருதங்கம், பறை, வீணை, யாழ், நாத்தஸ்வரம் - தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு.

அலகு 3 - நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள்

3

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

அலகு 4 - தமிழர்களின் திணைக் கோட்பாடுகள்**3**

தமிழகத்தின் தாவரங்களும், விலங்குகளும் - தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் - தமிழர்கள் போற்றிய அறக் கோட்பாடு - சங்க காலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும் - சங்ககால நகரங்களும் துறைமுகங்களும் - சங்க காலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி - கடல் கடந்த நாடுகளில் சோழர்களின் வெற்றி.

அலகு 5 - இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு**3**

இந்திய விடுதலைப் போரில் தமிழர்களின் பங்கு - இந்தியாவின் பிற்பகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் - சுய மரியாதை இயக்கம் - இந்திய மருத்துவத்தில் சித்த மருத்துவத்தின் பங்கு - கல்வெட்டுகள், கையெழுத்துப் படிக்கல்- தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.

TOTAL : 15 PERIODS

Course Outcomes		Cognitive Level
மாணவர்கள் இப்பாடத்தை கற்றபின்		
CO.1	மொழி மற்றும் இலக்கியம், பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை - சிற்பக் கலை , நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள் , திணைக் கோட்பாடுகள் மூலம் தமிழர் மரபை அறிந்து கொள்வார்கள்.	அறிதல் (Understand)
CO.2	இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பை அறிந்து கொள்வார்கள்.	அறிதல் (Understand)

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	1	-	-

High-3; Medium-2; Low-1

TEXT - CUM REFERENCE BOOKS

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

Course Code: 23VAT101	Course Title: HERITAGE OF TAMILS (Common to all B.E/B.Tech Programmes)		
Course Category: VAC		Course Level: Introductory	
L:T:P (Hours/Week) 1: 0 :0	Credit: 1	Total Contact Hours: 15	Max Marks:100

Pre-requisites

➤ NIL

Course Objectives

The course is intended to:

1. Understand the Heritage of Tamils in terms of Language and Literature, Rock Art Paintings to Modern Art – Sculpture, Folk and Martial Arts, Thinaï Concept.
2. Understand the Contribution of Tamils to Indian National Movement and Indian Culture.

HERITAGE OF TAMILS

UNIT I LANGUAGE AND LITERATURE

3

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

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

3

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

UNIT III FOLK AND MARTIAL ARTS**3**

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

UNIT IV THINAI CONCEPT OF TAMILS**3**

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

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

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

TOTAL : 15 PERIODS

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO.1 Understand the Heritage of Tamils in terms of Language and Literature, Rock Art Paintings to Modern Art – Sculpture, Folk and Martial Arts, Thinai Concept.	Understand
CO.2 Understand the Contribution of Tamils to Indian National Movement and Indian Culture.	Understand

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	1	-	-

High-3; Medium-2; Low-1

TEXT - CUM REFERENCE BOOKS

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

SEMESTER II

Course Code: 23ENI201		Course Title: COMMUNICATION SKILLS II (Common to all B.E/B.Tech Programmes)	
Course Category: AEC		Course Level: Introductory	
L:T:P(Hours/Week) 2:0:2	Credits: 3	L:T:P(Hours/Week) 2:0:2	Credits: 3

Course Objectives

The course is intended to impart effective and accurate language in business correspondence on par with B2 level of CEFR Scale.

Module I

20 Hours

Grammar: Linking Words - Collocations –Sentence Completion - Articles –Adverbs– Indefinite Pronoun

Listening: Listening to short conversations - Listening for gist and summarizing - Listening for detail - Responding to straightforward questions.

Speaking: Making statements of facts - Agreeing and disagreeing to opinions - Respond to queries - Group Discussion.

Reading: Read and select (phrasal verbs & relative clause)- Cloze Test-Gapped sentences - Multiple- choice gap-fill.

Writing: Paragraph Writing: Descriptive, narrative, persuasive and argumentative - Emails: Giving information - Making enquiries - Responding to enquiries - Power Point Presentation.

Module II

20 Hours

Grammar: Expressions of cause and result – Concord - Error Spotting (Parts of Speech & Indian English) – Prepositions.

Listening: Listening for identifying main points - Responding to a range of questions about different topics - Listening to identify relevant information.

Speaking: Empathetic Enunciation – Situation handling – Visual Interpretation - - Short presentations.

Reading: Intensive Reading: Comprehending business articles, reports and proposals and company websites-- Open gap-fill - Extended reading.

Writing: – Report Writing - Memo – Complaint letter - Business Letters (Seeking permission & Providing Information).

List of Experiments:**20 Hours**

1. Listening to Monologue and Extended Listening Activity I.
2. Listening to Monologue and Extended Listening Activity II.
3. Expressing Opinions and Situational based speaking.
4. Mini Presentation and Visual Interpretation.
5. Reading Comprehension.
6. Writing letter, email and report.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1: Identify the common errors in written and spoken correspondence.	Apply
CO2: Develop listening, reading and speaking skills through task based activities in listening, reading comprehension, recapitulation, interpretation and discussion.	Apply
CO3: Read business correspondences like memo, Email, letter, proposals and write reports and website entries and product launches.	Apply
CO4: Perform as an individual and member of a team and engage effectively in group discussion and individual presentation.	Apply

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO4	-	-	-	-	-	-	-	-	2	3	-	-	-	-

High-3; Medium-2; Low-1

Textbooks:

- T1. Guy Brook- Hart, "Business Benchmark Upper Intermediate", 2nd Edition, South Asian, Cambridge University Press, 2020.
- T2. Norman Whitby, "Business Benchmark pre-intermediate to Intermediate", 2nd Edition, South Asian, Cambridge University Press, 2014.

Reference Book(s):

- R1. Hewings Martin - Advanced Grammar in use Upper-intermediate Proficiency, CUP, 3rd Edition, 2013.
- R2. Clark David – Essential BULATS (Business Language Testing Service), CUP, 2006.
- R3. Adrian Doff, Craig Thaine, Herbert Puchta, Jeff Stranks, Peter Lewis-Jones, Rachel Godfrey, Gareth Davies, Empower B1+ – Student's Book, Cambridge University Press, 2015.

Web References:

1. <https://speakandimprove.com/>
2. <https://writeandimprove.com/>
3. <https://www.cambridgeenglish.org/exams-and-tests/linguaskill/>

Course Code:23FLT201	Course Title: FOREIGN LANGUAGE - JAPANESE (Common to all B.E/B.Tech Programmes)		
Course Category: AES		Course Level: Introductory	
L:T:P (Hours/Week) 3: 0: 0	Credits:3	Total Contact Hours:45	Max. Marks:100

Course Objectives:

The course objectives intended to:

1. Express a basic exposure on Japanese language and culture
2. Express thoughts and communicate in the beginner level of Japanese with native Japanese speaker
3. Identify the kanji etymology as well as use it in basic vocabulary required for the JLPT/NAT 5 examination level
4. Read and write 100 kanji of the official JLPT N5
5. Choose the appropriate verb forms for learning and practicing the Japanese language

UNIT I Introduction to Japan and greetings 9 Hours

Japan : Land and culture - Introduction to Japanese language — Greetings — Seasons - Days of the week - Months of the year – Dates of the month - Self introduction – Numbers (Upto 99,999) – Expressing time – Conversation audio and video.

Listening: Listening to Greetings - Listening for Specific Information: Numbers, Time. Speaking: Self-Introduction

UNIT II Building vocabulary 9 Hours

Family relationships - Colours - Parts of body - Profession - Directions - Time expressions (today, tomorrow, yesterday, day before, day after) - Japanese housing and living style - Food and transport (vocabulary) - Stationery, fruits and vegetables

Listening: Listening for Specific Information: Directions, Family Members, Parts of body Speaking: Introducing one's family.

UNIT III Writing systems 9 Hours

Hiragana Chart 1 - vowels and consonants and related vocabulary – Hiragana Charts 2&3, double consonants, vowel elongation and related vocabulary – Introduction to Kanji – Basic Vocabulary – Basic Conversational Phrases.

Listening: Listening to Japanese Alphabet Pronunciation, Simple Conversation. Speaking: Pair Activity (Day to day situational conversation)

UNIT IV Kanji and preposition 9 Hours

Katakana script and related vocabulary — Basic kanjis: naka, ue, shita, kawa , yama , numbers (1- 10, 100, 1000, 10,000 and yen) , person, man, woman, child, tree , book , hidari, migi, kuchi , 4 directions - Usage of particles wa, no, mo and ka and exercises - Usage of kore, sore, are, kono, sono, ano, arimasu and imasu - Particles — ni (location) and ga , donata and dare - Particles ni (time), kara, made , ne , koko, soko, asoko and doko - Directions : kochira, sochira, achira and dochira , associated vocabulary (mae, ushiro, ue, shita, tonari, soba, etc.)

Listening: Listening to conversation with related particles

UNIT V

Verb forms

9 Hours

Introduction to Verbs - Verbs –Past tense, negative - i-ending and na-ending adjectives introduction - ~masen ka, mashou - Usage of particles de, e , o, to, ga(but) and exercises - Adjectives (present/past — affirmative and negative) — Counters - ~te form

Listening: Listening to different counters, simple conversations with verbs and adjectives.

Speaking: Pair Activity (Explaining one's daily routine by using appropriate particles and verbs).

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1: Recognize and write Japanese alphabet.	Understand
CO2: Comprehend the conversation and give correct meaning.	Understand
CO3: Apply appropriate vocabulary needed for simple conversation in Japanese language.	Apply
CO4: Apply appropriate grammar to write and speak in Japanese Language.	Apply
CO5: Speak using words of the Japanese language.	Apply

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	3	-	1	-	-
CO4	-	-	-	-	-	-	-	-	-	3	-	1	-	-
CO5	-	-	-	-	-	-	-	-	2	3	-	1	--	-

High-3; Medium-2; Low-1

Text Book:

T1.Genki 1 Textbook: An Integrated Course in Elementary Japanese by Eri Banno, Yoko Ikeda, Yutaka Ohno, Yoko Sakane, Chikako Shinagawa, Kyoko Tokashiki published by The Japan Times

T2.Genki 1 Workbook: An Integrated Course in Elementary Japanese by Eri Banno published by The Japan Times

Reference:

1. *Japanese for Everyone: Elementary Main Textbook1-1*, Goyal Publishers and Distributors Pvt. Ltd., Delhi, 2007
2. *Japanese for Everyone: Elementary Main Textbook1-2*, Goyal Publishers and Distributors Pvt. Ltd., Delhi, 2007
3. www.japaneselifestyle.com
4. www.learn-japanese.info/
5. www.learn.hiragana-katakana.com/typing-hiragana-characters/
6. www.kanjisite.com/

Course Code:23FLT202	Course Title: FOREIGN LANGUAGE - GERMAN (Common to all B.E/B.Tech Programmes)		
Course Category: AEC		Course Level: Introductory	
L:T:P (Hours/Week) 3: 0: 0	Credits:3	Total Contact Hours:45	Max. Marks:100

Course Objectives:

The course is intended to:

1. Listen and understand numbers, names and dialogues of a native speaker on par with A1 level.
2. Speak and introduce self in simple sentences to convey their opinion and ideas on par with A1 level.
3. Read simple passages and given text on par with A1 level.
4. Write letter and simple sentences on par with A1 level.

UNIT I BASIC INTRODUCTION TO GERMAN SCRIPTS 9 Hours

Theme and Text (Introduction to German - German script, Deutsche Namen, Daily Greetings and Expressions) — Grammar ('wh' questions, das Alphabet)– Speak Action (Buchstabieren, sich und andere vorstellen nach Namen und Herkunft fragen, internationale Wörter auf Deutsch verstehen, jemanden begrüßen)– pronunciation (Buchstabieren J,V,W,Y, - Long vowels A,E,I,O,U - Pronunciation of Ä,Ü,Ö) — To learn (internationale Wörter in Texten finden, Wörter sortieren)

Theme and Text (Gespräche im café, Getränkekarte, Telefon-buch, Namen, Rechnungen) — Grammar (Frägesätze mit wie, woher, wo, was Verben in präsens Singular und Plural, das Verb Sein, Personalpronomen und Verben)– Speak Action (eine Gespräch beginnen sich und andere vorstellen zählen, etwas bestellen und bezahlen Telefonnummern und verstehen)– pronunciation (Wortakzent in Verben und in Zahlen) –

To learn (Grammatiktablelle ergänzen, mit einem Redemittelkasten arbeiten)

UNIT II NUMBERS AND NOMINATIVE CASE 9 Hours

Theme and Text (Numbers – 1 to 12 (Eins bis Zwölf) – 20, 30, 40, 90 (zwanzig-Neunzig) – All Numbers (1-10000) – German Currency (Euro) – Basic Mathematics (plus, Minus, Malen, Geteilt durch)) – Grammar (Introduction of verbs –Have Verb – To Come, To Speak, To Read, To Drive, To Fly, To write, To Eat, To sleep, To take etc.,)

Theme and Text (Communication in course) — Grammar (Singular and Plural, Artikel: der,das,die/ ein,eine, verneinung: kein, keine, Komposita: das Kursbuch) – Speak Action (Gegenständen fragen/ Gegenstände benennen im kurs:) – pronunciation (word accent Marking, Umlaute ö ä ü hören und sprechen) — To learn (Lernkarten schreiben, Memotipps, eine Regel selbst finden) Theme and Text (City, Town, Language: Nachbar, Sprachen, Sehenswürdigkeiten in Europa) – Grammar (Past tense for Sein, W-Frage, Aussagesatz und Satzfrage) – Speak Action (about city and siteseeing) — pronunciation (Satzakzent in Frage- und Aussagesätzen) — To learn (eine Regel ergänzen, eine Grammatiktablelle erarbeiten, Notizen machen).

UNIT III AKKUSATIVE CASE AND PREPOSITIONS**9 Hours**

Theme and Text (Menschen und Hauser, Furniture catalogue, E-Mail, House information) – Grammar (possesivartikel im Nominativ, Artikel im Akkusativ, Adjektive im satz, Graduierung mit zu)– Speak Action (Whonung beschreiben about perons and things)– pronunciation (consonant - ch) — To learn (wortschatz systematisch)

Theme and Text (Termine - Appointment and punctuality in Germany) — Grammar (questions with wann?, Preposition (am, um, von... bis), verneinung mit nicht, trennbare verben, präteritum von haben) — Speak Action (Daily plan making, time commitment, excuse for late coming) — pronunciation (consonants- p,b,t,d / k,g) — To learn (Rollenkarten arbeiten)

Theme and Text (orientation in working area, go for work, floor plan city plan, office and computer) — Grammar (preposition: in,neben, unter, auf, vor, hinter, an, zwischen, bei und mit + Datic)– Speak Action (work place, work, giving appointments)– pronunciation (consonants: f,w und v) – To learn (Making notice in calender)

UNIT IV DATIV CASE AND PREPOSITIONS**9 Hours**

Theme and Text (Holiday and Party, holiday plan, party plan in Germany) – Grammar (regular and iregular verbs) – Speak Action (holiday speak, accident, Ich-Text schreiben) – pronunciation (lange und kurze vokale markieren) – To learn (Text Order)

Theme and Text (organising an Excursion to Berlin through city orientation, Bus plan, City plan, post card, Excursion programme) — Grammar (preposition: in, durch, über + Akkusativ: zu, an... vorbei + Dativ, Modalverb wollen) – Speak Action (Tourism, culture, postcard preparation, travel description) — pronunciation (r and l)– To learn (plaket making)Theme and Text (Beruf und all Tag, Visiten karten, wörterbuch) – Grammar – Speak Action (profession, statistic speaking) – pronunciation (n,ng and nk)– To learn (wörterbuch , text information in tabel)

UNIT V ADJECTIVES AND PRONUNCIATION**9 Hours**

Theme and Text (Haushaltstipp, kochrezept, maße und gewichte, Mahlzeiten und Gerichte) – Grammar (jeden Tag, manchmal, nie, Question - welche, Comparison – viel, gut, gern) — Speak Action (about eat, drink question and answers) — pronunciation (e,en,el,er) – To learn (Text auswerten und zusammenfassen)

Theme and Text (Clothing , colour, weather) — Grammar (Adjecktive im Akkusativ, unbestimmer Artikel) — Speak Action (weather, dress and colour understanding) — pronunciation (e-o- ö and ie-u- ü) – To learn (wetter and Farben interkulturelle)

Theme and Text (in super market,purchase, House Maintainence, Emotion, Sports, Body parts) – Grammar (Modal Verb) – Speak Action (Body parts) – To learn (Rollenkarten arbeiten)

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1: Recognize and write German alphabet, numbers.	Understand
CO2: Comprehend the conversation and give correct meaning.	Understand
CO3: Apply appropriate grammar and vocabulary to write and speak.	Apply
CO4: Apply appropriate cases and texts to listen, write and speak.	Apply
CO5: Speak and read using words of the German language	Apply

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	3	-	1	-	-
CO4	-	-	-	-	-	-	-	-	-	3	-	1	-	-
CO5	-	-	-	-	-	-	-	-	2	3	-	1	--	-

High-3; Medium-2;Low-1

TEXT BOOK(s)

T1. Netzwerk, "Deutsch als Fremdsprache" by Stefanie Dengler, Paul Rusch, Helen Schmitz published by Goyal Publishers & Distributors Pvt Ltd;

T2. Funk, Kuhn, Demme, "Studio D A1 Deutsch als Fremdsprache" published by Goyal Publishers & Distributors Pvt Ltd;

REFERENCES(s)

R1. Hueber, "Fit for Goethe- Zertifikat A1 (Start Deutsch 1)" by GOYAL PUBLISHERS AND DISTRIBUTORS; 2016

Course Code: 23MAI201		Course Title: ORDINARY DIFFERENTIAL EQUATION AND COMPLEX VARIABLES	
Course Category: Minor		Course Level: Introductory	
L:T:P(Hours/Week) 3:0 :2	Credits: 4	Total Contact Hours:75	Max Marks:100

Course Objectives:

The objective of this course is to familiarize the graduate engineers with techniques in vector calculus, complex variables and ordinary differential equations.

Module I

23 Hours

Vector Calculus

Gradient – Divergence – Curl – Line integrals – Surface integrals – Volume integrals – Theorems of Green, Gauss and Stokes (without proof) and their applications.

Complex Variables (Differentiation)

Cauchy-Riemann equations – Analytic functions – Properties – Harmonic functions – Finding harmonic conjugate – Conformal mapping ($w=z+a$, $w=az$, $w=1/z$) – Mobius transformation and their properties.

Complex Variables I (Integration)

Cauchy Integral formula– Cauchy Integral theorem – Taylor’s series– Singularities of analytic functions – Laurent’s series.

Module II

22 Hours

Complex Variables II (Integration)

Residues – Cauchy Residue theorem – Contour integrals – Evaluation of real definite integrals around unit circle and semi-circle (Excluding poles on the real axis).

Ordinary Differential Equations of Higher Orders

Second and higher order linear differential equations with constant coefficients – Second order linear differential equations with variable coefficients – Method of variation of parameters – Solution of first order simultaneous linear ordinary differential equations.

Laplace Transform

Laplace Transform – Properties of Laplace Transform – Laplace transform of periodic functions -Inverse Laplace transforms - Convolution theorem – Solution of ordinary differential equations by Laplace Transform.

List of Experiments(Using Python):

30 Hours

1. Find gradient of a given scalar function, divergence and curl of a vector function.
2. Verify Green’s theorem in a plane.
3. Graphically plot time and frequency domain of standard functions and compute Laplace transform of In- built functions.
4. Compute second order ordinary differential equation.
5. Compute Inverse Laplace transform of In- built functions.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1: Apply the concepts of Vector Differentiation and Integration to solve problems in Science and Engineering.	Apply
CO2: Using the concept of complex variables to construct analytical functions.	Apply
CO3: Use the concept of complex integration to evaluate definite integrals.	Apply
CO4: Determine the solution of second and higher order ordinary differential equations.	Apply
CO5: Apply Laplace transform techniques to solve ordinary differential equations.	Apply
CO6: Develop programs using differential equations concepts through modern tool.	Apply

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	3	-	-	-	-	-	-	-	-	-

High-3; Medium-2;Low-1

Text Book(s):

- T1. Erwinkreyzig, Advanced Engineering Mathematics, 9th edition, John Wiley & Sons, 2006.
T2. Veerarajan T., Engineering Mathematics for first year, 3rd edition, Tata McGraw-Hill, New Delhi, 2019.

Reference Book(s):

- R1. G.B.Thomas and R.L Finney, Calculus and Analytic Geometry, 9th edition, Pearson, Reprint, 2002.
R2. B.S.Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
R3. P. Sivaramakrishna Das , C. Vijayakumari , Engineering Mathematics, Pearson India, 2017.

Web References:

- <https://nptel.ac.in/courses/111107112>
- <https://nptel.ac.in/courses/111104031>

Course Code:23CHI201	Course Title: CHEMISTRY FOR CIVIL ENGINEERING		
Course Category: Minor	Course Level: Introductory		
L:T:P (Hours/Week) 3: 0: 2	Credits:4	Total Contact Hours:75	Max Marks:100

Course Objectives

The course is intended to impart the knowledge of chemistry involved in Water technology, Corrosion and its control, Engineering materials, Spectroscopic techniques, and Building Materials.

Module: I

22 Hours

Water Technology: Water quality parameters - Types of water - Hardness of water - Types, expression, units, problems - Determination of hardness by EDTA method - Boiler feed water - Boiler troubles (Scale, Sludge, Priming, Foaming, Caustic embrittlement, Boiler Corrosion) - Water conditioning methods - Internal conditioning - Phosphate, Calgon, and Sodium aluminate conditioning. External conditioning - Demineralization, Desalination of brackish water -Reverse Osmosis process.

Corrosion and its Control: Corrosion – Causes – Consequences - Types- Chemical, electrochemical corrosion (galvanic, differential aeration - Pitting corrosion) - Factors influencing corrosion (Based on Metal and Environment) - Corrosion control - Cathodic protection methods and Metallic coating - Galvanizing and Tinning. Paints - Constituents and their functions.

Polymers, Plastics and Composites: Polymers – definition –Terminologies – Polymerization – Types - Addition and Condensation Polymerization - Classification. Plastics - Classification.

Module: II

23 Hours

Polymers, Plastics and Composites: Engineering Plastics (PVC, Teflon, Polycarbonates, Polyurethanes, PET) - Preparation, Properties and Uses. Compounding of Plastics - Moulding technique - Blow and Extrusion. Polymer composites - FRP and Ceramic matrix composites.

Analytical Techniques: Spectroscopy - Electromagnetic Spectrum, Absorption and Emission Spectroscopy - Beer-Lambert's law (Problems). UV-Visible Spectroscopy – Principle - Instrumentation (block diagram only) - Estimation of Iron by Spectrophotometry. Atomic Absorption Spectroscopy – Principle - Instrumentation (block diagram only) - Estimation of Nickel by AAS. Flame Photometry – Principle - Instrumentation (block diagram only) - Estimation of Sodium by Flame Photometry.

Chemistry of Building Materials: Chemistry of lime and gypsum. Cement - Chemical Composition, Classification, Manufacture by wet and dry process, Setting and Hardening of Cement, Chemical reactions during the Hydration of Cement, Waterproof and White Cement - Properties and Uses. Chemistry and applications of Admixtures.

LIST OF EXPERIMENTS: (Any 6 experiments)**30 Hours**

1. Estimation of hardness of Water by EDTA method.
2. Determination of alkalinity in Water Sample by indicator method.
3. Determination of corrosion rate of mild steel by weight –loss method.
4. Determination of molecular weight of polymer by viscometric method.
5. Estimation of iron by spectrophotometry
6. Determination of percentage of calcium oxide in cement by titrimetric method.
7. Determination of strength of acid by pH metry.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1: Understand and explain the chemistry involved in Water treatment, Corrosion and its control, Engineering materials, Spectroscopic techniques, and Building materials.	Understand
CO2: Apply the acquired knowledge of chemistry to solve the Engineering problems.	Apply
CO3: Analyze Engineering problems through the concept of Water technology Corrosion, Engineering materials, Analytical techniques, and Building materials.	Apply
CO4: Investigate Engineering materials by volumetric and instrumental methods in chemistry and analyze, interpret the data to assess and address the issues of Environmental Problems.	Evaluate

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	3	-	-	-	-	-	-	-	-	-	-

High-3; Medium-2; Low-1

Text Book(s):

- T1.** Jain and Jain, Engineering Chemistry, 17th Edition, Dhanpat Rai Publishing Company, New Delhi, 2018.
- T2.** Wiley Engineering Chemistry, 2nd Edition, Wiley India Pvt Ltd, New Delhi, 2011.

Reference Book(s):

- R1.** Dara S. S and Umare S. S., A textbook of Engineering Chemistry, 12th Edition, S.Chand & Co Ltd, New Delhi , 2014.
- R2.** V. R. Gowariker, N. V. Viswanathan and Jayadev Sreedhar, Polymer Science,4th Edition, New Age International(P) Ltd, Chennai ,2021.
- R3.** Jeffery G. H., Bassett. J., Mendham J and Denny R. C., Vogel's Textbook of Quantitative chemical analysis, 5th Edition, Oxford, ELBS, London ,2012.

Web References:

1. <http://nptel.ac.in/courses/122101001/downloads/lec.23.pdf>
2. <https://nptel.ac.in/courses/104106075/Week1/MODULE%201.pdf2>.

Course Code: 23CET201		Course Title: ENGINEERING MECHANICS	
Course Category: Major		Course Level: Introductory	
L:T:P(Hours/Week) 3: 0: 0	Credits:3	Total Contact Hours:45	Max Marks:100

Course Objectives:

The course is intended to expose the students to the fundamental concepts of mechanics and enhance their problem-solving skills. It introduces students to the influence of applied force system and the geometrical properties of the rigid bodies while in stationary or in motion.

Module I

23 Hours

STATICS OF PARTICLES

Introduction – Units and Dimensions – Laws of Mechanics – Lami’s theorem, Parallelogram and triangular Law of forces — Vectorial representation of forces – Vector operations of forces - additions, subtraction, dot product, cross product – Coplanar Forces and Non-Coplanar Forces– rectangular components – Equilibrium of a particle – Forces in space – Equilibrium of a particle in space – Equivalent systems of forces – Principle of transmissibility .

EQUILIBRIUM OF RIGID BODIES

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

CENTROIDS OF SURFACES AND SOLIDS

Centroids and centre of mass– Centroids of lines and areas - Rectangular, circular, triangular areas by integration – T section, I section, Angle section, Hollow section by using standard formula - Theorems of Pappus.

Module II

22 Hours

PROPERTIES OF SURFACES AND SOLIDS

Area moments of inertia of plane areas – Rectangular, circular, triangular areas by integration – T section, I section, Angle section, Hollow section by using standard formula – Parallel axis theorem and perpendicular axis theorem –Principal moments of inertia of plane areas – Principal axes of inertia-Mass moment of inertia –mass moment of inertia for prismatic, cylindrical and spherical solids from first principle – Relation to area moments of inertia.

FRICTION

The Laws of Dry Friction, Coefficients of Friction, Angles of Friction, Wedge friction, Wheel Friction, Rolling Resistance, Ladder friction.

DYNAMICS OF PARTICLES

Kinematics - Rectilinear Motion and Curvilinear Motion of Particles. Kinetics- Newton’s Second Law of Motion -Equations of Motions, Dynamic Equilibrium, Energy and Momentum Methods - Work of a Force, Kinetic Energy of a Particle, Principle of Work and Energy, Principle of Impulse and Momentum, Impact of bodies.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1: Identify and apply law of mechanics to calculate resultant forces, moments and couples.	Apply
CO2: Analyze and develop free body diagrams for any system of forces in two and three dimensions.	Analyze
CO3: Determine the location of centroid of composite bodies and apply suitable method to calculate moment of inertia.	Apply
CO4: Apply the concept of friction to practical problems.	Apply
CO5: Determine single dynamic variables and solve simple dynamic problems including kinematics, energy and momentum.	Apply
CO6: Engage in independent study as well as a member of team to make an effective presentation on the application of statics and dynamics in solving real time problems.	Analyze

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	-	3	-
CO2	3	3	-	-	-	-	-	-	-	-	-	-	3	-
CO3	3	-	-	-	-	-	-	-	-	-	-	-	3	-
CO4	3	-	-	-	-	-	-	-	-	-	-	-	3	-
CO5	3	-	-	-	-	-	-	-	-	-	-	-	3	-
CO6	3	3	-	-	2	-	-	2	3	3	-	-	3	-

High-3; Medium-2;Low-1

Text Book(s):

- T1. Beer Ferdinand P, Russel Johnston Jr., David F Mazurek, Philip J Cornwell, Sanjeev Sanghi, "Vector Mechanics for Engineers: Statics and Dynamics", McGraw Higher Education, 11th Edition, 2017.
- T2. Vela Murali, "Engineering Mechanics-Statics and Dynamics", Oxford University Press, 2018.

Reference Book(s):

- R1. Boresi P and Schmidt J, Engineering Mechanics: Statics and Dynamics, 1/e, Cengagelearning, 2008.
- R2. Hibbeler, R.C., Engineering Mechanics: Statics, and Engineering Mechanics: Dynamics, 13th edition, Prentice Hall, 2013.
- R3. Meriam J L and Kraige L G, Engineering Mechanics: Statics and Engineering Mechanics: Dynamics, 7th edition, Wiley student edition, 2013.

Web References:

1. <https://archive.nptel.ac.in/courses/112/106/112106286/>
2. <https://www.selfstudys.com/mcq/gate/mechanical-engineering/online-test/chapter-7-engineering-mechanics>

Course Code: 23ADT001		Course Title: C PROGRAMMING (Common to CE,EA,EC,EE& EV)	
Course Category: Multi-disciplinary		Course Level: Introductory	
L:T:P(Hours/Week) 3: 0: 0	Credits:3	Total Contact Hours:45	Max Marks:100

Course Objectives:

The course helps to understand the structured and procedural programming skills. The major objective is to provide students with understanding of code organization and functional hierarchical decomposition using complex data types.

Module I Hours

22

Basics Of Computer Organization: Generation and Classification of Computers – Basic Organization of a Computer – Software development life cycle – Problem Solving Techniques, Algorithm, Pseudo code and Flow Chart.

Introduction To C Programming: Introduction – Structure of a C program – Keywords – Identifiers – Constants – Variables – Data Types – Operators and Expressions – Formatted & Unformatted I/O functions – Decision statements – Loop control statements.

Arrays: Characteristics – Declaration- One-dimensional array, Two-dimensional arrays

Module II Hours

23

Functions: Declaration & Definition of function – Built in function – User defined function -Types of functions – Call by value & reference.

Strings and Pointers: Formatting strings – String handling functions. Pointers: Features and Types of pointers – Arithmetic operations with pointers–Pointers and Arrays- Array of Pointers- Pointers and Strings

Structures and Union: Structures: Features – Operations on Structures – Array of structures – Pointers to Structures -Unions-Union of Structures.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1: Correlate the fundamental concepts of computer organization such as architectures of the processors and project management for real time application	Apply
CO2: Infer the fundamental concepts of programming, such as variables, data types and control structures for real time problems	Analyze
CO3: Apply programs solving skills and knowledge of C programming constructs to solve the given one dimensional and two dimensional datasets	Apply
CO4: Build a modules to solve the given application using functions	Apply
CO5: Develop a program by accessing the address of the variable using pointers and manipulation of characters using string handling functions	Apply
CO6: Test the performance of the students by group assignments and projects on real time problems	Evaluate

Course Articulation Matrix

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

High-3; Medium-2; Low-1

Text Book(s):

- T1. Ashok N.Kamthane, Amit.N.Kamthane, "Programming in C", 3rd Edition, Pearson Education, 2015.
- T2. Deitel H M and Deitel P J, "C How to Program", Prentice Hall, 2013.

Reference Book(s):

- R1. Ajay Mittal, "Programming in C-A Practical Approach", 3rd Edition, Pearson Education, 2010.
- R2. Yashavant P.Kanetkar, "Let Us C", 16th Edition, BPB Publications, 2018.
- R3. Herbert Schildt, "C The Complete Reference", Tata McGraw Hill, 2010.
- R4. S Gottfried Byron, "Programming With C", Tata McGraw Hill, 2011.

Web References:

1. NPTEL course content on Introduction To Programming In https://onlinecourses.nptel.ac.in/noc22_cs40.
2. Complete guide on Learn C programming: <http://www.cprogramming.com/>
3. Complete reference manual on C programming: <http://www.c4learn.com/>

Course Code:23ADL001		Course Title: C PROGRAMMING LABORATORY (Common to CE,EA,EC,EE &EV)	
Course Category: Multi-disciplinary		Course Level: Introductory	
L:T:P(Hours/Week) 0:0:3	Credits:1.5	Total Contact Hours:45	Max Marks:100

Course Objectives

The course introduces students to the practical knowledge of programming using C programming language as an implementation tool. It aims at providing students with understanding of programming essentials used within the framework of imperative and structural programming paradigms.

List of Experiments:

1. Implement basic C programs using data types
2. Implement programs using Operators and Expressions
3. Develop Programs using Branching statements
4. Implement Programs using Control Structures
5. Develop programs using Arrays
6. Implement programs using Functions
7. Implement programs using String Operations
8. Develop programs using Pointers
9. Implement programs using Structures
10. Develop programs using Union

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1: Write programs using appropriate programming constructs.	Apply
CO2: Apply programs solving skills and knowledge of C programming constructs to solve the given one dimensional and two dimensional dataset	Apply
CO3: Develop a program by accessing the address of the variable using pointers and manipulation of characters using string handling functions	Analyze
CO4: Evaluate modular programming techniques to break down complex programs into smaller and manageable modules	Evaluate

Course Articulation Matrix

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

High-3; Medium-2; Low-1

Text Book(s):

- T1. Ashok N.Kamthane, Amit.N.Kamthane, "Programming in C", 3rd Edition, Pearson education, 2015.
- T2. Deitel H M and Deitel P J, "C How to Program", Prentice Hall, 2013.

Reference Book(s):

- R1. Ajay Mittal, "Programming in C-A Practical Approach", 3rd Edition, Pearson Education, 2010.
- R2. Yashavant P.Kanetkar, "Let Us C", 16th Edition, BPB Publications, 2018.
- R3. Herbert Schildt, "C The Complete Reference", Tata McGraw Hill, 2010.

Web References:

1. C programming resources: <https://electronicsforu.com/resources/15-free-c-programming-Ebooks>.
2. C programming tutorials: <https://www.fromdev.com/2013/10/c-programming-tutorials.html>.
3. C Manual: <https://books.goalkicker.com/CBook>.

Course Code: 23MEL202		Course Title: ENGINEERING PRACTICES LABORATORY (Common to AU,CE,ME)	
Course Category: SEC		Course Level: Practice	
L:T:P(Hours/Week) 0: 0: 3	Credits:1.5	Total Contact Hours:45	Max Marks:100

Course Objectives:

The course is intended to impart knowledge on basic electrical, mechanical and civil operations.

List of Experiments

Electrical & Electronics

- 1) Symbols of electrical and electronic components and study of electrical drawing.
- 2) Insulation Testing using Megger.
- 3) Soldering practice of simple circuit and testing.
- 4) Fluorescent tube, staircase and house wiring.
- 5) Verification of Kirchoff's current and voltage law.

Civil & Mechanical

1. Make a wooden Tee joint to the required dimension.
2. Make a "V" filling to the required dimension using fitting tools.
3. Make a tray in sheet metal to the required dimension.
4. Assemble the pipeline connections with different joining components for the given layout.
5. Demonstrate a butt joint using welding process to the required dimension.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1: Apply engineering knowledge to conduct experiments and analyze the electrical and electronic connections as per the given circuit.	Analyze
CO2: Apply to make wooden 'T' joint, and pipeline connection individually using various workshop tools as per the given dimensions.	Apply
CO3: Apply to make metal 'V' joint with various joining components and a permanent joint as per the given dimensions using modern workshop tools and engineering principles.	Apply

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	2	-	2	-	-	-	-	2	-	-	-	-	-
CO2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	2	-	-	-	2	-	-	-	-	-	-	-	-	-

High-3; Medium-2; Low-1

Reference Book(s):

R1. Jeyachandran.K, Natarajan.S & Balasubramanian.S, "A Primer on Engineering Practices Laboratory", Anuradha Publications, Tamilnadu (India), 2016.

R2. 19EPL21 - Engineering practices laboratory Manual.

Web References:

1. <http://nptel.ac.in/courses/112103019/>
2. <https://www.aaaengcoll.ac.in/engineering-practices-lab/>
3. <https://www.coursera.org/courses?query=engineering>

Course Code: 23ESL201		Course Title: PROFESSIONAL SKILLS 1:PROBLEM SOLVING SKILLS & LOGICAL THINKING 1 (Common to all B.E/B.Tech Programmes)			
Course Category: SEC		Course Level: Introductory			
L:T:P(Hours/Week) 0: 0: 2	Credits: 1	Total Contact Hours:30		Max Marks:100	

Course Objectives:

The course is intended to enhance the students' numerical, analytical and logical reasoning ability. Also course focus to make learners prepare for various public and private sector exams and placement drives.

Module I Quantitative Ability

20 Hours

Number System and LCM & HCF- Percentage- Ratio and Proportion - Average- Progressions- Ages- Partnership- Mixture & Allegation - Profit and loss- Interest calculation- Data interpretation.

Module II Reasoning Ability

10 Hours

Seating Arrangement- Linear, circular and Complex – Direction Problems- Blood Relation- Puzzles- Crypt arithmetic- Venn diagrams- Statement and conclusion- Statement and argument- Causes and effects- Self-Learning.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1: Build the competence in numerical, analytical and logical reasoning ability	Apply

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	3	-	-

High-3; Medium-2; Low-1

Textbook(s):

- T1: Dr. R. S. Aggarwal. "Quantitative Aptitude for Competitive Examinations" Sultan Chand & Sons Pvt. Ltd, New Delhi, 2018.
T2: Dr. R. S. Aggarwal. "A Modern Approach to Logical Reasoning", Sultan Chand & Sons Pvt. Ltd, New Delhi, 2018

Reference Book(s):

- R1: R. V. Praveen. "Quantitative Aptitude and Reasoning" 2nd Revised Edition, Prentice-Hall of India Pvt.Ltd, 2013
R2: Arun Sharma. "Quantitative Aptitude for Common Aptitude Test", McGraw Hill Publications, 5th Edition, 2020
R3: Arun Sharma. "Logical Reasoning for Common Aptitude Test", McGraw Hill Publications, 6th Edition, 2021.

Web References:

- 1 <https://www.indiabix.com/aptitude/questions-and-answers/>
- 2 <https://www.geeksforgeeks.org/aptitude-questions-and-answers/>

Course Code: 23VAT201		Course Title: TAMILS AND TECHNOLOGY (Common to all B.E/B.Tech Programmes)	
Course Category: VAC		Course Level: Introductory	
L:T:P (Hours/Week) 1: 0 :0	Credit: 1	Total Contact Hours: 15	Max Marks:100

Pre-requisites

➤ NIL

Course Objectives

மாணவர்கள் இப்பாடத்தை கற்றலின் மூலம்

- CO.1 நெசவு மற்றும் பாணைத் தொழில்நுட்பம், வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம், உற்பத்தித் தொழில்நுட்பம், வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில்நுட்பம் ஆகியன குறித்து அறிந்து கொள்ள இயலும்.
- CO.2 அறிவியல் தமிழ் மற்றும் கணினித் தமிழ் குறித்து அறிந்து கொள்ள இயலும்.

தமிழரும் தொழில்நுட்பமும்

அலகு 1 - நெசவு மற்றும் பாணைத் தொழில்நுட்பம்

3

சங்க காலத்தில் நெசவுத் தொழில் - பாணைத் தொழில்நுட்பம் - கருப்பு சிவப்பு பாண்டங்கள் - பாண்டங்களில் கீறல் குறியீடுகள்

அலகு 2 - வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்

3

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

அலகு 3 - உற்பத்தித் தொழில்நுட்பம்

3

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

அலகு 4 வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில்நுட்பம்**3**

அணை, ஏரி, குளங்கள், மதகு - சோழர்காலக் குழுவித் தூம்பின் முக்கியத்துவம் - கால்நடை பராமரிப்பு - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள் - கடல்சார் அறிவு - மீன் வளம் - முத்து மற்றும் முத்துக் குளித்தல் - பெருங்கடல் குறித்த பண்டைய அறிவு - அறிவுசார் சமூகம்.

அலகு 5 - அறிவியல் தமிழ் மற்றும் கணினித் தமிழ்**3**

அறிவியல் தமிழின் வளர்ச்சி - கணினித் தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின் புதிப்பு செய்தல் - தமிழ் மென் பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக் கழகம் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ் அகராதிகள் - சொற்குவைத் திட்டம்.

TOTAL : 15 PERIODS

Course Outcomes	Cognitive Level
மாணவர்கள் இப்பாடத்தை கற்றபின்	
CO.1 நெசவு மற்றும் பாணைத் தொழில்நுட்பம், வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம், உற்பத்தித் தொழில்நுட்பம், வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில்நுட்பம் ஆகியன குறித்து அறிந்து கொள்வார்கள்.	அறிதல் (Understand)
CO.2 அறிவியல் தமிழ் மற்றும் கணினித் தமிழ் குறித்து அறிந்து கொள்வார்கள்.	அறிதல் (Understand)

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	1	-	-

High-3; Medium-2; Low-1

TEXT - CUM REFERENCE BOOKS

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

Course Code: 23VAT201	Course Title: TAMILS AND TECHNOLOGY (Common to all B.E/B.Tech Programmes)		
Course Category: VAC		Course Level: Introductory	
L:T:P (Hours/Week) 1: 0 :0	Credit: 1	Total Contact Hours: 15	Max Marks:100

Pre-requisites

➤ NIL

Course Objectives

The course is intended to:

1. Understand Weaving and Ceramic Technology, Design and Construction Technology, Manufacturing Technology, Agriculture and Irrigation Technology.
2. Understand the Scientific Tamil & Tamil Computing.

TAMILS AND TECHNOLOGY

UNIT I WEAVING AND CERAMIC TECHNOLOGY 3

Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries.

UNIT II DESIGN AND CONSTRUCTION TECHNOLOGY 3

Designing and Structural construction House & Designs in household materials during Sangam Age - Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study (Madurai Meenakshi Temple)- Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period.

UNIT III MANUFACTURING TECHNOLOGY 3

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

UNIT IV AGRICULTURE AND IRRIGATION TECHNOLOGY**3**

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

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

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

TOTAL : 15 PERIODS

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO.1 Understand Weaving and Ceramic Technology, Design and Construction Technology, Manufacturing Technology, Agriculture and Irrigation Technology.	Understand
CO.2 Understand the Scientific Tamil & Tamil Computing.	Understand

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	1	-	-

High-3; Medium-2; Low-1

TEXT - CUM REFERENCE BOOKS

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

Course Code: 23CHT202		Course Title: Environmental Sciences (Common to all B.E/B.Tech Programmes)	
Course Category: Mandatory Non-Credit Course		Course Level: Introductory	
L:T:P(Hours/Week) 1: 0: 0	Credits: 0	Total Contact Hours: 15	Max Marks:100

Course Objectives:

The course is intended to impart knowledge on sustainable utilization of natural resources, prevention of pollution, disaster management and environmental issues & public awareness on ecosystem.

Module I

8 Hours

Natural Resources

Role of individual in conservation of natural resources; Equitable use of resources for sustainable lifestyles.

Environmental Pollution and Disaster Management

Role of an individual in prevention of pollution; Disaster management : floods, earthquake, cyclone and landslides.

Environmental Ethics and Legislations

Environmental ethics : Environment Protection Act; Air Act; Water Act ; Wildlife Protection Act; Forest Conservation Act; Issues involved in enforcement of environmental legislation.

Module II

7 Hours

Environmental Issues and Public Awareness

Public awareness - Environment and human health.

Environmental Activities

(a) Awareness Activities:

- i. Small group meetings about water management, promotion of recycle use, generation of less waste, avoiding electricity waste.
- ii. Slogan making event.
- iii. Poster making event.

(b) Actual Activities:

- i. Plantation.
- ii. Cleanliness drive.
- iii. Drive for segregation of waste.
- iv. To know about the different varieties of plants.
- v. Shutting down the fans and ACs of the campus for an hour or so.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO 1: Explain the use of natural resources for a sustainable life as an individual in prevention of pollution.	Understand
CO 2: Apply the environmental ethics and legislations for various environmental issues.	Apply
CO 3: Create the public awareness on environment and human health as an individual or team through various activity based learning.	Apply

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	3	3	-	-	-	-
CO3	3	-	-	-	-	3	3	-	3	3	-	-

High-3; Medium-2;Low-1

Text Book(s):

- T1. Benny Joseph, "Environmental Studies", Tata McGraw Hill, New Delhi, 2006.
- T2. Mackenzie Davis and Susan Masten, "Principles of environmental engineering and science", Mc-Graw Hill, 3rd Edition, 2014.

Reference Book(s):

- R1. Trivedi R.K. "Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards", Vol.I and II, Enviro Media.
- R2. Cunningham, W.P.Cooper, T.H. Gorhani, "Environmental Encyclopedia", Jaico Publishing House, Mumbai, 2001.

Web References:

1. https://onlinecourses.nptel.ac.in/noc23_hs155/preview.
2. https://en.wikipedia.org/wiki/Environmental_science.