



SENGUNTHAR ENGINEERING COLLEGE (AUTONOMOUS)

(Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai)
Recognized Under Section 2(f) & 12(B) of the UGC Act, 1956
NAAC Accredited with 'A' Grade

TIRUCHENGODE - 637 205 NAMAKKAL (Dt) TAMILNADU



CURRICULUM & SYLLABI

B.E. CIVIL ENGINEERING

(CHOICE BASED CREDIT SYSTEM)

REGULATIONS-2023

(I - IV SEMESTER)

(For the students admitted from the Academic year 2023-2024 onwards)



Note: The regulations hereunder are subject to amendments as may be decided by the Academic Council of the Sengunthar Engineering College from time to time. Any or all such amendments will be effective from such date and to such batches of candidates including those already undergoing the program under the same Regulation as may be decided by the Academic Council.


Chairman - BoS


DEAN (ACADEMICS)
SENGUNTHAR ENGINEERING COLLEGE
TIRUCHENGODE-637 205


PRINCIPAL
SENGUNTHAR ENGINEERING COLLEGE
(AUTONOMOUS)
TIRUCHENGODE - 637 205





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INDEX			
UNDER GRADUATE (B.E.- CIVIL ENGINEERING) PROGRAMMES			Page No.
I	SCHEME FOR CURRICULUM		
	Curriculum 1-8 Semester	----	06 – 13
	List of Humanities and Social Sciences (HS)	----	14
	List of Basic Sciences (BS)	----	14
	List of Engineering Sciences (ES)	----	15
	List of Professional Core (PC)	----	16
	List of Professional Electives (PE)	----	17 – 19
	List of Open Electives (OE)	----	20 – 22
	General Electives (GE)	----	22
	Elective – Management	----	22
	List of Employability Enhancement Courses (EEC)	----	23
	List of Mandatory Courses (MC)	----	23– 24
	Credit Summary	----	25
II	SCHEME FOR SYLLABI		
	I Semester Syllabi	----	26 – 51
	II Semester Syllabi	----	52 – 84
	III Semester Syllabi	----	85 – 99
	IV Semester Syllabi	----	100 –116





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III	MINOR DEGREE / HONOURS		
	Construction Technology	---	117-126
	Credit Summary	----	127
	Minor Degree - Indian Knowledge System (IKS)	----	128





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REGULATIONS 2023 CHOICE BASED CREDIT SYSTEM B. E. CIVIL ENGINEERING

Vision

- To develop highly skilled and socially responsible civil engineers to address the global infrastructure challenges.

Mission

- To equip students with the expertise, ethical and sustainability to lead in emerging technologies.
- To promote research and innovation in construction, exploring smart materials and methods for resilient infrastructure.
- To foster entrepreneurial skills for solving structural engineering problems.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

Graduates of B.E. – Civil Engineering program will

- ✓ Exhibit the leadership skills, effectively collaborate in multidisciplinary teams, and uphold ethical practices to achieve project and organizational objectives.
- ✓ Engage in higher studies, applying knowledge in construction field to address infrastructure challenges and drive sustainable development.
- ✓ Develop innovative solutions to complex engineering problems, leveraging entrepreneurial skills and critical thinking to create value in professional practice.

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

PO1	Engineering knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	Problem analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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





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		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 modeling 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	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOME (PSOs)

PSO1	Develop the professional skills in the area of Structural Engineering, Water Resources Engineering, Transportation Engineering, Geotechnical Engineering and Construction techniques & Management.
PSO2	Plan, analyze, design, prepare cost estimates and execute all kinds of Civil Engineering Projects.





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MAPPING OF COURSE OUTCOME AND PROGRAM OUTCOME

Year	Sem	Course Name	PO												PSO	
			1	2	3	4	5	6	7	8	9	10	11	12	1	2
I		23HST101- Professional English	1	1	1.5	2	1	-	-	1.8	3	1.5	2	2	-	-
		23MAT101 - Matrices and Calculus	3	3	2	-	-	-	-	-	-	-	-	2	-	-
		23HST102- தமிழ்மரபு/ Heritage of Tamils	-	-	-	-	-	-	-	2	1	2	-	1	-	-
		23PHE101- Engineering Physics	3	3	1	1	-	-	-	-	-	-	-	-	-	-
		23CYE102 - Chemistry for Engineers	2.50	2.17	2.67	2.20	2.00	2.00	2.00	1.83	1.60	1.60	1.33	2.33	-	-
		23GEE101 - Programming in C	2.83	2.83	2.5	1.8	3	-	-	1	1	1.33	1	2	3	2.66
		23EEC101 - Soft Skills & Life Skills	1.25	1.6	1	1	3	1.4	1.4	2	2.6	2.8	2.6	2	-	-
		23MDC101 - Induction Program (2 Weeks)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	II	23MAT202 - Differential Equations and Numerical Methods	3	3	2	1	1	-	-	-	-	-	2	3	-	-
		23PHT201 - Advanced Physics of Materials	2	3	2	1	1.8	1	1	-	-	-	-	-	-	-
		23CYT201 - Environmental Sciences and Sustainability	2	1.4	3	2	2.8	3	3	3	2	2.7	2.4	2.2	-	-
		23CET201-Applied Mechanics	3	3	2	2	-	-	-	-	-	-	-	3	3	3
		23HST202 -தமிழரும் தொழில்நுட்பமும்/ Tamil and Technology	-	-	-	-	-	-	2	1	-	-	1	-	-	-





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MAPPING OF COURSE OUTCOME AND PROGRAM OUTCOME

Year	Sem	Course Name	PO												PSO	
			1	2	3	4	5	6	7	8	9	10	11	12	1	2
I	II	23GET201 - Engineering Graphics	3	3	2	1	1	-	-	-	-	-	2	3	-	-
		23HSE201 - English for Engineers: Theory and Practice	1	2	-	2	1	2	2	1.5	2.33	3	2	1.66	-	-
		23GEL201- Engineering Practices Laboratory	3	2	-	-	1	1	1	-	-	-	-	2	2	1
		23EEC201 -Indian language (Except Mother Tongue)/ Foreign Language														
		Hindi	-	-	-	-	-	1.0	1.0	1.3	1.6	2.8	-	1.6	-	-
		German	-	-	-	-	-	1.0	1.5	1.7	3.0	-	1.6	1.6	-	-
		Japanese	-	-	-	-	1.4	1.6	1.6	1.0	0.2	2.6	-	1.0	-	-
II	III	23MDC201 - Aptitude Skills	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		23CET301 - Construction Materials and Practices	3	-	-	-	-	2	2	-	1	1	1	3	3	-
		23CET302 - Applied Geology	3	-	-	-	-	1	1	-	-	2	1	2	2	-
		23CET303 - Soil Mechanics	3	2	-	2	-	1	1	-	-	-	-	3	3	-
		23CEE301- Surveying and Levelling	3	3	3	3	-	1	1	-	-	1	1	3	3	1
		23CEE302 - Mechanics of Materials	3	3	2	3	-	3	2	-	-	2	1	2	3	3
		23EEC301 - Professional Development	2.3	1.6	2	2	3	-	-	-	-	1.5	2.6	1	2	2





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MAPPING OF COURSE OUTCOME AND PROGRAM OUTCOME

Year	Sem	Course Name	PO												PSO	
			1	2	3	4	5	6	7	8	9	10	11	12	1	2
II	IV	23CET401 - Reinforced Concrete Design	3	3	3	3	-	2	1	1	1.6	1.0	1.6	2.4	3	3
		23CET402 - Structural Analysis	3	3	2	3	-	1	-	-	1	1	1	2.4	3	3
		23CET403- Highway Engineering	3	1.8	1.6	-	-	2.6	1	-	2.2	2.2	1	-	2.2	1.7
		23CEE401 - Foundation Engineering	3	3	3	3	-	1.8	1	1	1	1	1.7	2.2	2.8	3
		23CEE402- Fluid Mechanics and Machinery	3	3	2	2	-	2	2	2	-	2	-	2	3	2
		23GEE301 - Problem Solving and Python Programming	2.8	2.7	2.2	1.5	2.8	-	1	1	1.5	1	2	-	1.0	2.8
		23EEEC401- Online Certification Courses	-	-	-	-	-	-	-	-	-	-	-	-	-	-





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CURRICULUM AND SYLLABI

FOR B.E. / B.Tech. DEGREE PROGRAMMES

(For the Students Admitted in the Academic Year 2023-2024 onwards)

B.E - CIVIL ENGINEERING - FIRST SEMESTER

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		C	CIA	ESE
THEORY									
23HST101	Professional English	HS	3	0	0	3	40	60	100
23MAT101	Matrices and Calculus	BS	3	1	0	4	40	60	100
23HST102	தமிழர்மரபு/Heritage of Tamils	HS	1	0	0	1	40	60	100
EMBEDDED COURSE									
23PHE101	Engineering Physics	BS	3	0	2	4	50	50	100
23CYE102	Chemistry for Engineers	BS	3	0	2	4	50	50	100
23GEE101	Programming in C	ES	3	0	2	4	50	50	100
EMPLOYABILITY ENHANCEMENT COURSE									
23EEC101	Soft Skills & Life Skills	EEC	1	0	0	1	100	-	100
MANDATORY COURSE									
23MDC101	Induction Program (2 Weeks)	MC	-	-	-	-	-	-	-
TOTAL CREDITS IN SEMESTER – I			21						

HS	:	Humanities and Social Sciences
BS	:	Basic Sciences
ES	:	Engineering Sciences
PC	:	Professional Core
PE	:	Professional Elective
GE	:	General Elective
OE	:	Open Elective
EEC	:	Employability Enhancement Courses
MC	:	Mandatory Courses
L	:	Lecture
T	:	Tutorial
P	:	Practical
C	:	Credit Point
CIA	:	Continuous Internal Assessment
ESE	:	End Semester Examination
TOT	:	Total





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B.E - CIVIL ENGINEERING - SECOND SEMESTER

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		C	CIA	ESE
THEORY									
23MAT202	Differential Equations and Numerical Methods	BS	3	1	0	4	40	60	100
23PHT201	Advanced Physics of Materials	BS	3	0	0	3	40	60	100
23CYT201	Environmental Science and Sustainability	HS	3	0	0	3	40	60	100
23CET201	Applied Mechanics	PC	3	1	0	4	40	60	100
23GET201	Engineering Graphics	ES	3	1	0	4	40	60	100
23HST202	தமிழரும் தொழில்நுட்பமும் /Tamil and Technology	HS	1	0	0	1	40	60	100
EMBEDDED COURSE									
23HSE201	English for Engineers: Theory and Practice	HS	3	0	2	4	50	50	100
PRACTICLS									
23GEL201	Engineering Practices Laboratory	BS	0	0	4	2	60	40	100
EMPLOYABILITY ENHANCEMENT COURSE									
23EEC201	Indian Language (Except Mother Tongue) / Foreign Language	EEC	0	0	4	2	100	-	100
MANDATORY COURSE									
23MDC201	Aptitude Skills	MC	3	0	0	0	-	-	-
TOTAL CREDITS IN SEMESTER - II			27						

HS	Humanities and Social Sciences
BS	Basic Sciences
ES	Engineering Sciences
PC	Professional Core
PE	Professional Elective
OE	Open Elective
GE	General Elective
EEC	Employability Enhancement Courses
MC	Mandatory Courses
L	Lecture
T	Tutorial
P	Practical
C	Credit Point
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ESE	End Semester Examination
TOT	Total





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B.E - CIVIL ENGINEERING - THIRD SEMESTER

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		C	CIA	ESE
THEORY									
23MAT304	Transforms and Partial Differential Equations	BS	3	1	0	4	40	60	100
23CET301	Construction Materials and Practices	PC	3	0	0	3	40	60	100
23CET302	Applied Geology	PC	3	0	0	3	40	60	100
23CET303	Soil Mechanics	PC	3	0	0	3	40	60	100
EMBEDDED COURSE									
23CEE301	Surveying and Levelling	PC	3	0	2	4	50	50	100
23CEE302	Mechanics of Materials	PC	3	0	2	4	50	50	100
EMPLOYABILITY ENHANCEMENT COURSE									
23EEC301	Professional Development	EEC	0	0	2	1	100	-	100
TOTAL CREDITS IN SEMESTER – III					22				

HS	:	Humanities and Social Sciences
BS	:	Basic Sciences
ES	:	Engineering Sciences
PC	:	Professional Core
PE	:	Professional Elective
OE	:	Open Elective
GE	:	General Elective
EEC	:	Employability Enhancement Courses
MC	:	Mandatory Courses
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B.E - CIVIL ENGINEERING - FOURTH SEMESTER

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		C	CIA	ESE
THEORY									
23CET401	Reinforced Concrete Design	PC	3	1	0	4	40	60	100
23CET402	Structural Analysis	PC	3	0	0	3	40	60	100
23CET403	Highway Engineering	PC	3	0	0	3	40	60	100
EMBEDDED COURSE									
23CEE401	Foundation Engineering	PC	3	0	2	4	50	50	100
23CEE402	Fluid Mechanics and Machinery	PC	3	0	2	4	50	50	100
23GEE301	Problem Solving and Python Programming	ES	3	0	2	4	50	50	100
EMPLOYABILITY ENHANCEMENT COURSE									
23EEC401	Online Certification Courses	EEC	3	0	0	3	100	-	100
TOTAL CREDITS IN SEMESTER – IV						25			

HS	:	Humanities and Social Sciences
BS	:	Basic Sciences
ES	:	Engineering Sciences
PC	:	Professional Core
PE	:	Professional Elective
OE	:	Open Elective
GE	:	General Elective
EEC	:	Employability Enhancement Courses
MC	:	Mandatory Courses
L	:	Lecture
T	:	Tutorial
P	:	Practical
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B.E - CIVIL ENGINEERING - FIFTH SEMESTER

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		C	CIA	ESE
THEORY									
23CET501	Design of Steel Structures	PC	3	1	0	4	40	60	100
	Professional Elective I	PE	3	0	0	3	40	60	100
	Professional Elective II	PE	3	0	0	3	40	60	100
	Professional Elective III	PE	3	0	0	3	40	60	100
EMBEDDED COURSE									
23CEE501	Concrete Technology	PC	3	0	2	4	50	50	100
23CEE502	Water Supply and Waste Water Engineering	PC	3	0	2	4	50	50	100
EMPLOYABILITY ENHANCEMENT COURSE									
23EEC503	Industrial Training / Survey Camp	EEC	0	0	4	2	100	-	100
MANDATORY COURSE									
	Mandatory Course-I	MC	3	0	0	0	-	-	-
TOTAL CREDITS IN SEMESTER – V			23						

HS	:	Humanities and Social Sciences
BS	:	Basic Sciences
ES	:	Engineering Sciences
PC	:	Professional Core
PE	:	Professional Elective
OE	:	Open Elective
GE	:	General Elective
EEC	:	Employability Enhancement Courses
MC	:	Mandatory Courses
L	:	Lecture
T	:	Tutorial
P	:	Practical
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B.E - CIVIL ENGINEERING - SIXTH SEMESTER

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		C	CIA	ESE
THEORY									
23CET601	Estimation and Quantitative Surveying	PC	3	0	0	3	40	60	100
	Professional Elective IV	PE	3	0	0	3	40	60	100
	Professional Elective V	PE	3	0	0	3	40	60	100
	Professional Elective VI	PE	3	0	0	3	40	60	100
	Open Elective –I/ NCC L1/L3	OE	3	0	0	3	40	60	100
EMBEDDED COURSE									
23CEE601	Building Planning and Drawing	PC	3	0	2	4	50	50	100
EMPLOYABILITY ENHANCEMENT COURSE									
23EEJ601	Project Work - Phase I	EEC	0	0	8	4	60	40	100
MANDATORY COURSE									
	Mandatory Course – II	MC	3	0	0	0	-	-	-
TOTAL CREDITS IN SEMESTER – VI						23			

HS	:	Humanities and Social Sciences
BS	:	Basic Sciences
ES	:	Engineering Sciences
PC	:	Professional Core
PE	:	Professional Elective
OE	:	Open Elective
GE	:	General Elective
EEC	:	Employability Enhancement Courses
MC	:	Mandatory Courses
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B.E - CIVIL ENGINEERING - SEVENTH SEMESTER

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		C	CIA	ESE
THEORY									
23HST701	Human Values and Ethics	HS	3	0	0	3	40	60	100
	Elective-Management	GE	3	0	0	3	40	60	100
	Open Elective-II/ NCC II L2/L4	OE	3	0	0	3	40	60	100
	Open Elective-III	OE	3	0	0	3	40	60	100
EMPLOYABILITY ENHANCEMENT COURSE									
23EEJ701	Project Work - Phase II	EEC	0	0	8	4	60	40	100
TOTAL CREDITS IN SEMESTER – VII			16						

HS	:	Humanities and Social Sciences
BS	:	Basic Sciences
ES	:	Engineering Sciences
PC	:	Professional Core
PE	:	Professional Elective
OE	:	Open Elective
GE	:	General Elective
EEC	:	Employability Enhancement Courses
MC	:	Mandatory Courses
L	:	Lecture
T	:	Tutorial
P	:	Practical
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B.E - CIVIL ENGINEERING - EIGHTH SEMESTER

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		C	CIA	ESE
EMPLOYABILITY ENHANCEMENT COURSE									
23EEJ801	Product Development	EEC	0	0	12	6	60	40	100
23EEC801	Internship	EEC	0	0	4	2	100	-	100
TOTAL CREDITS IN SEMESTER – VIII					08				

HS	:	Humanities and Social Sciences
BS	:	Basic Sciences
ES	:	Engineering Sciences
PC	:	Professional Core
PE	:	Professional Elective
OE	:	Open Elective
GE	:	General Elective
EEC	:	Employability Enhancement Courses
MC	:	Mandatory Courses
L	:	Lecture
T	:	Tutorial
P	:	Practical
C	:	Credit Point
CIA	:	Continuous Internal Assessment
ESE	:	End Semester Examination
TOT	:	Total





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LIST OF HUMANITIES AND SOCIAL SCIENCES

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		CIA	ESE	TOT
23HST101	Professional English	HS	3	0	0	3	40	60	100
23HST102	தமிழர்மரபு/Heritage of Tamils	HS	1	0	0	1	40	60	100
23HSE201	English for Engineers: Theory and Practice	HS	3	0	2	4	50	50	100
23CYT201	Environmental Science and Sustainability	HS	3	0	0	3	40	60	100
23HST202	தமிழரும் தொழில்நுட்பமும் /Tamil and Technology	HS	1	0	0	1	40	60	100
23HST701	Human Values and Ethics	HS	3	0	0	3	40	60	100

LIST OF BASIC SCIENCES

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		CIA	ESE	TOT
23MAT101	Matrices and Calculus	BS	3	1	0	4	40	60	100
23PHE101	Engineering Physics	BS	3	0	2	4	50	50	100
23CYE102	Chemistry for Engineers	BS	3	0	2	4	50	50	100
23MAT202	Differential Equations and Numerical Methods	BS	3	1	0	4	40	60	100
23PHT201	Advanced Physics of Materials	BS	3	0	0	3	40	60	100
23MAT301	Transforms and Partial Differential Equations	BS	3	1	0	4	40	60	100





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LIST OF ENGINEERING SCIENCES

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		CIA	ESE	TOT
23GEE101	Programming in C	ES	3	0	2	4	50	50	100
23GEE201	Engineering Graphics	ES	3	0	2	4	50	50	100
23GEL201	Engineering Practices Laboratory	ES	0	0	4	2	60	40	100
23GEE301	Problem Solving and Python Programming	ES	3	0	2	4	50	50	100





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LIST OF PROFESSIONAL CORE

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		CIA	ESE	TOT
23CET201	Applied Mechanics	PC	3	1	0	4	40	60	100
23CET301	Construction Materials and Practices	PC	3	0	0	3	40	60	100
23CET302	Applied Geology	PC	3	0	0	3	40	60	100
23CET303	Soil Mechanics	PC	3	0	0	3	40	60	100
23CEE301	Surveying and Levelling	PC	3	0	2	4	50	50	100
23CEE302	Mechanics of Materials	PC	3	0	2	4	50	50	100
23CET401	Reinforced Concrete Design	PC	3	1	0	4	40	60	100
23CET402	Structural Analysis	PC	3	0	0	3	40	60	100
23CET403	Highway Engineering	PC	3	0	0	3	40	60	100
23CEE401	Foundation Engineering	PC	3	0	2	4	50	50	100
23CEE402	Fluid Mechanics and Machinery	PC	3	0	2	4	50	50	100
23CET501	Design of Steel Structures	PC	3	1	0	4	40	60	100
23CEE501	Concrete Technology	PC	3	0	2	4	50	50	100
23CEE502	Water Supply and WasteWater Engineering	PC	3	0	2	4	50	50	100
23CET601	Estimation and Quantitative Surveying	PC	3	0	0	3	40	60	100
23CEE601	Building Planning and Drawing	PC	3	0	2	4	50	50	100





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LIST OF PROFESSIONAL ELECTIVE COURSES

Professional Elective - I

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		CIA	ESE	TOT
23CEP501	Total Station and GPS Surveying	PE	3	0	0	3	40	60	100
23CEP502	Remote Sensing Concepts	PE	3	0	0	3	40	60	100
23CEP503	Satellite Image Processing	PE	3	0	0	3	40	60	100
23CEP504	Cartography and GIS	PE	3	0	0	3	40	60	100
23CEP505	Photogrammetry	PE	3	0	0	3	40	60	100
23CEP506	Hydrographic Surveying	PE	3	0	0	3	40	60	100

Professional Elective - II

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		CIA	ESE	TOT
23CEP507	Advanced Structural Analysis	PE	3	0	0	3	40	60	100
23CEP508	Dynamics and Earthquake Resistant Structures	PE	3	0	0	3	40	60	100
23CEP509	Rehabilitation/ Heritage Restoration	PE	3	0	0	3	40	60	100
23CEP510	Prefabricated Structures	PE	3	0	0	3	40	60	100
23CEP511	Prestressed Concrete Structures	PE	3	0	0	3	40	60	100
23CEP512	Introduction to Finite Element Method	PE	3	0	0	3	40	60	100





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Professional Elective - III

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		CIA	ESE	TOT
23CEP513	Formwork Engineering	PE	3	0	0	3	40	60	100
23CEP514	Construction Equipment and Machinery	PE	3	0	0	3	40	60	100
23CEP515	Sustainable Construction and Lean Construction	PE	3	0	0	3	40	60	100
23CEP516	Advanced Construction Techniques	PE	3	0	0	3	40	60	100
23CEP517	Construction Management and Safety	PE	3	0	0	3	40	60	100
23CEP518	Energy Efficient Buildings	PE	3	0	0	3	40	60	100

Professional Elective - IV

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		CIA	ESE	TOT
23CEP601	Urban Planning and Development	PE	3	0	0	3	40	60	100
23CEP602	Smart Cities	PE	3	0	0	3	40	60	100
23CEP603	Intelligent Transport systems	PE	3	0	0	3	40	60	100
23CEP604	Industrial Waste Water Management	PE	3	0	0	3	40	60	100
23CEP605	Pavement Engineering	PE	3	0	0	3	40	60	100
23CEP606	Transportation planning Process	PE	3	0	0	3	40	60	100





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Professional Elective -V

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		CIA	ESE	TOT
23CEP607	Ocean Wave Dynamics	PE	3	0	0	3	40	60	100
23CEP608	Marine Geotechnical Engineering	PE	3	0	0	3	40	60	100
23CEP609	Coastal Engineering	PE	3	0	0	3	40	60	100
23CEP610	Offshore Structures	PE	3	0	0	3	40	60	100
23CEP611	Railway, Airport and Harbour Engineering	PE	3	0	0	3	40	60	100
23CEP612	Coastal Hazards and Mitigation	PE	3	0	0	3	40	60	100

Professional Elective - VI

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		CIA	ESE	TOT
23CEP613	Geo-Environmental Engineering	PE	3	0	0	3	40	60	100
23CEP614	Ground Improvement Techniques	PE	3	0	0	3	40	60	100
23CEP615	Pile Foundation	PE	3	0	0	3	40	60	100
23CEP616	Soil Dynamics and Machine Foundations	PE	3	0	0	3	40	60	100
23CEP617	Rock Mechanics	PE	3	0	0	3	40	60	100
23CEP618	Earth and Earth Retaining Structures	PE	3	0	0	3	40	60	100





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LIST OF OPEN ELECTIVE COURSES

OPEN ELECTIVES - I

Offered by the Departments	Course Code / Course Name	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		CIA	ESE	TOT
CIVIL	23CEO607 / Environmental and Social Impact Assessment	OE	3	0	0	3	40	60	100
CSE	23CSO610 / Introduction to Drone Technologies	OE	3	0	0	3	40	60	100
ECE	23ECO602 / Fundamentals of Electronic Devices and Circuits	OE	3	0	0	3	40	60	100
EEE	23EEO603 / Electric Vehicle Technology	OE	3	0	0	3	40	60	100
	23EEO604 / Renewable Energy Systems	OE	3	0	0	3	40	60	100
MECHANICAL	23MEO601 / Introduction to Industrial Engineering	OE	3	0	0	3	40	60	100
	23MEO605 / CNC Machining Technology	OE	3	0	0	3	40	60	100
MEDICAL ELECTRONICS	23MDO611 / Hospital Management	OE	3	0	0	3	40	60	100
ROBOTICS AND AUTOMATION	23RAO609 / Fundamentals of Robotics	OE	3	0	0	3	40	60	100
CSE(Cyber Security)	23CSO612 / Cyber Forensics and Ethical Hacking	OE	3	0	0	3	40	60	100
PHARMACEUTICAL TECHNOLOGY	23PMO608 / Pharamaceutical Nanotechnology	OE	3	0	0	3	40	60	100
MATHEMATICS	23MAO606 / Graph Theory	OE	3	0	0	3	40	60	100





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OPEN ELECTIVES- II

Offered by the Departments	Course Code / Course Name	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		CIA	ESE	TOT
CIVIL	23CEO704 / Remote Sensing Concepts	OE	3	0	0	3	40	60	100
ECE	23ECO708 / Energy Technology	OE	3	0	0	3	40	60	100
EEE	23EEO709 / Sensors, Actuators and its Application	OE	3	0	0	3	40	60	100
MECHANICAL	23MEO703 / Fundamentals of Mechatronics	OE	3	0	0	3	40	60	100
	23MEO704 / Nano Technology	OE	3	0	0	3	40	60	100
	23MEO712 / Smart Manufacturing	OE	3	0	0	3	40	60	100
MEDICAL ELECTRONICS	23MDO705 / Ultrasound Principles and its Medical Applications	OE	3	0	0	3	40	60	100
ROBOTICS AND AUTOMATION	23RAO707 / Mobile Robots	OE	3	0	0	3	40	60	100
CSE(Cyber Security)	23CSO711 / Introduction to Cyber Security	OE	3	0	0	3	40	60	100
PHARMACEUTICAL TECHNOLOGY	23PMO706 / Intellectual Property Rights for Pharma Industry	OE	3	0	0	3	40	60	100
MATHEMATICS	23MAO710 / Operations Research	OE	3	0	0	3	40	60	100

OPEN ELECTIVES – III

Offered by the Departments	Course Code / Course Name	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		CIA	ESE	TOT
CIVIL	23CEO717 / Geographical Information System	OE	3	0	0	3	40	60	100
CSE	23CSO715 / Fundamentals of Blockchain Technology	OE	3	0	0	3	40	60	100
ECE	23ECO718 / VLSI Design	OE	3	0	0	3	40	60	100
EEE	23EEO716 / Electrical, Electronic and Magnetic Materials	OE	3	0	0	3	40	60	100
MECHANICAL	23MEO720 / Marine Vehicles	OE	3	0	0	3	40	60	100





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MEDICAL ELECTRONICS	23MDO719 / Wearable Technology	OE	3	0	0	3	40	60	100
	23MDO723 / Medical Waste Management								
	23MDO724 / Lifestyle Diseases								
ROBOTICS AND AUTOMATION	23RAO721 / Robotics Process Automation	OE	3	0	0	3	40	60	100
MATHEMATICS	23MAO714 / Advanced Numerical Methods	OE	3	0	0	3	40	60	100
MANAGEMENT	23MGO722 / Cost management of Engineering Projects	OE	3	0	0	3	40	60	100

GENERAL ELECTIVES

Course Code	Name of the Subject	Category	Periods / Week				Credit	Maximum Marks		
			L	T	P	C		CIA	ESE	TOT
23NCCL01	NCC AIRFORCE LEVEL-1	GE	3	0	0	3		40	60	100
23NCCL02	NCC AIRFORCE LEVEL - 2	GE	3	0	0	3		40	60	100
23NCCL03	NCC ARMY LEVEL - 3	GE	3	0	0	3		40	60	100
23NCCL04	NCC ARMY LEVEL - 4	GE	3	0	0	3		40	60	100

ELECTIVE - MANAGEMENT

Course Code	Name of the Subject	Category	Periods / Week				Credit	Maximum Marks		
			L	T	P	C		CIA	ESE	TOT
23MGT701	Principles of Management	GE	3	0	0	3		40	60	100
23MGT702	Total Quality Management	GE	3	0	0	3		40	60	100
23MGT703	Engineering Economics and Financial Accounting	GE	3	0	0	3		40	60	100
23MGT704	Human Resource Management	GE	3	0	0	3		40	60	100
23MGT705	Knowledge Management	GE	3	0	0	3		40	60	100
23MGT706	Industrial Management	GE	3	0	0	3		40	60	100
23MGT707	Supply Chain Management	GE	3	0	0	3		40	60	100
23MGT708	e-Waste Management	GE	3	0	0	3		40	60	100





LIST OF EMPLOYABILITY ENHANCEMENT COURSES

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		CIA	ESE	TOT
23EEC101	Soft Skills & Life Skills	EEC	1	0	0	1	100	-	100
23EEC201	Indian Language (Except Mother Tongue)/ Foreign Language	EEC	0	0	4	2	100	-	100
23EEC304	Professional Development	EEC	0	0	2	1	100	-	100
23EEC401	Online Certification Courses	EEC	3	0	0	3	100	-	100
23EEC503	Industrial Training/Survey Camp	EEC	0	0	4	2	100	-	100
23EEJ601	Project Work - Phase I	EEC	0	0	8	4	60	40	100
23EEJ701	Project Work - Phase II	EEC	0	0	8	4	60	40	100
23EEJ801	Product Development	EEC	0	0	12	6	60	40	100
23EEC801	Internship	EEC	0	0	4	2	100	-	100

LIST OF MANDATORY COURSES

MANDATORY COURSES - I

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		CIA	ESE	TOT
23MDC501	Introduction to Women and Gender Studies	MC	3	0	0	0	-	-	-
23MDC502	Elements of Literature	MC	3	0	0	0	-	-	-
23MDC503	Film Appreciation	MC	3	0	0	0	-	-	-
23MDC504	Disaster Risk Reduction and Management	MC	3	0	0	0	-	-	-
23MDC505	Constitution of India	MC	3	0	0	0	-	-	-





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MANDATORY COURSES - II

Course Code	Name of the Subject	Category	Periods / Week			Credit	Maximum Marks		
			L	T	P		CIA	ESE	TOT
23MDC601	Well Being with Traditional Practices- Yoga, Ayurveda and Siddha	MC	3	0	0	0	-	-	-
23MDC602	History of Science and Technology in India	MC	3	0	0	0	-	-	-
23MDC603	Political and Economical Thought for a Human Society	MC	3	0	0	0	-	-	-
23MDC604	State, Nation Building and Politics in India	MC	3	0	0	0	-	-	-
23MDC605	Industrial Safety	MC	3	0	0	0	-	-	-





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CURRICULUM AND SYLLABI

FOR B.E. / B.Tech. DEGREE PROGRAMMES

(For the Students Admitted in the Academic Year 2023 - 2024 onwards)

CREDIT SUMMARY

B.E. CIVIL ENGINEERING

Category	Credits Per Semester								Credit Total
	I	II	III	IV	V	VI	VII	VIII	
HS	4	8	-	-	-	-	3	-	15
BS	12	7	4	-	-	-	-	-	23
ES	4	6	-	4	-	-	-	-	14
PC	-	4	17	18	12	7	-	-	58
PE	-	-	-	-	9	9	-	-	18
GE	-	-	-	-	-	-	3	-	03
OE	-	-	-	-	-	3	6	-	09
EEC	1	2	1	3	2	4	4	8	25
MC	-	-	-	-	-	-	-	-	00
Total	21	27	22	25	23	23	16	08	165





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SEMESTER I

23HST101

PROFESSIONAL ENGLISH

L T P C

(Common to all B.E. & B.Tech. Branches)

3 0 0 3

OBJECTIVES

- To build vocabulary proficiency and familiarity with varied lexical and contextual usages.
- To strengthen grammatical accuracy for effective sentence construction and language application.
- To develop clarity and coherence in written communication across academic and business contexts.
- To enhance oral fluency, confidence, and interactive communication skills.
- To promote efficient reading strategies for comprehension, analysis, and note-making.

UNIT I VOCABULARY

8

Synonyms and Antonyms - Word Formation - Sentence Types (declarative, imperative, interrogative & exclamatory) - Single Word Substitutes - Use of Abbreviations and Acronyms - Homonyms and Homophones - Collocation - British and American Vocabulary.

UNIT II GRAMMAR

10

Parts of speech - Be, Have and Do verbs - Punctuation - Tenses - Numerical Adjectives - modal verbs - Single line Definition - Direct and Indirect Speech - Gerunds and Infinitives - Same Word Used as Different Parts of Speech.

UNIT III WRITING

9

Letter Writing - Business communications - quotations, placing orders, complaints, replies to queries from business customers - Dialogue Writing - Paragraph Writing (descriptive, narrative, expository & persuasive) - Essay Writing - Writing Instructions.

UNIT IV SPEAKING

9

Self-introduction - Giving personal and factual information - Talking about present circumstances, past experiences and future plans - Expressing opinions and justifying opinions - Agreement / disagreement - Likes and dislikes - Tongue twisters

UNIT V READING SKILLS

9

Reading Comprehension - Reading techniques, pre-reading, post-reading, comprehension questions (multiple choice questions or short questions) - Short Comprehension Passages, practice skimming - Scanning and Predicting - Reading the passage and taking (Note making) Notes - Scan and understand main contents of the passage.

TOTAL: 45 PERIODS





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OUTCOMES

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

- Use a wide range of vocabulary effectively in oral and written communication.
- Frame grammatically and meaningful sentences.
- Write formal and informal letters, develop coherent paragraphs and essays, and engage in meaningful dialogues.
- Apply speaking skills for self-introduction, speeches, and technical presentations.
- Read, comprehend, and take organized notes from passages and technical content.

TEXT BOOKS

1. "Using English A Course book for Undergraduate Engineers and Technologists", Orient Black Swan Limited, Hyderabad, Board of Editors: 2015.
2. Richards, C. Jack, "Interchange Students' Book-2", 2015.

REFERENCES

1. Department of English, Anna University, "Mindscapes: English for Technologists and Engineers", First Edition, Orient Black Swan, 2012.
2. Krishna Mohan, Meera Banerji, "Developing Communication Skills", Paperback, MacMillan, 2019.

E-RESOURCES

1. <http://www.usingenglish.com>
2. <https://www.khanacademy.org/humanities/grammar>

Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	1	-	-	-	1	-	-	2	3	-	2	2	-	-
2	1	-	-	-	1	-	-	2	3	-	2	2	-	-
3	-	1	2	-	1	-	-	2	3	1	2	2	-	-
4	-	-	1	-	-	-	-	2	3	2	2	2	-	-
5	1	1	-	2	1	-	-	1	3	-	2	2	-	-
AVG.	1	1	1.5	2	1	-	-	1.8	3	1.5	2	2	-	-

1 - Low 2 - Medium 3 - High '-' - No Correlation

Chairman - BoS





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23MAT101

MATRICES AND CALCULUS

(Common to all B.E./B.Tech. Branches)

L T P C

3 1 0 4

OBJECTIVES

- To develop the use of matrix algebra and its properties.
- To explore the techniques of differential and integral calculus.
- To categorize methods for functions of several variables.
- To introduce the use of multiple integrals and their applications.
- To provide knowledge of vector calculus.

UNIT I MATRICES

9+3

Eigen values and Eigen vectors – Properties of Eigen values – Cayley-Hamilton theorem – Reduction of quadratic form to canonical form by orthogonal transformation – Nature of quadratic form.

UNIT II DIFFERENTIAL AND INTEGRAL CALCULUS

9+3

Differentiation rules: Derivatives of polynomials and exponential functions – The product and quotient Rules – Derivatives of trigonometric functions – The Chain rule – Implicit differentiation – Applications of differentiation: Maximum and Minimum Values – Techniques of integration: Integration by parts – Trigonometric integrals – Integration of rational functions by partial fractions.

UNIT III FUNCTIONS OF SEVERAL VARIABLES

9+3

Partial derivatives – Homogeneous functions – Euler's theorem – Total derivative – Jacobians – Taylor's theorem for functions of two variables – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers.

UNIT IV MULTIPLE INTEGRALS

9+3

Double integrals – Change of order of integration – Double integrals in polar coordinates – Area enclosed by plane curves – Triple integrals – Volume of solids – Change of variables in double integrals.

UNIT V VECTOR CALCULUS

9+3

Scalar and vector point functions – Gradient – Divergence and curl – Line integral – Surface integral – Green's theorem in a plane – Volume integral – Divergence theorem – Irrotational and Solenoidal fields.





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OUTCOMES

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

- Apply matrix algebra methods to solve practical problems.
- Apply the concepts of differential and integral calculus.
- Analyze the ideas of differential calculus for functions of several variables.
- Apply multiple integral ideas in solving areas and volumes.
- Solve the engineering problems using the concepts of vector calculus.

LIST OF EXPERIMENTS

1. Computation of Eigen values and Eigenvectors.
2. Matrix addition and multiplications.
3. Calculate differentiations of simple functions.
4. Calculate integrations of simple functions.
5. Determining Maxima and minima of functions for one variable.
6. Determining Maxima and minima of functions for two variables.
7. Evaluating double integral with constant limits.
8. Evaluating triple integral with constant limits.
9. Computing Gradient, divergence and curl of point functions.
10. Evaluating line integral in vector calculus.

TOTAL:45+15 PERIODS

TEXT BOOKS

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, Fourty Third Edition, New Delhi, 2014.
2. James Stewart, "Calculus: Early Transcendentals", Cengage Learning, Seventh Edition, New Delhi, 2015.

REFERENCES

1. Bali N.P, Goyal M. and Watkins C., "Advanced Engineering Mathematics", Firewall Media (An imprint of Lakshmi Publications Pvt., Ltd.), New Delhi, Seventh Edition, 2009.
2. Kanti B. Dutta., "Mathematical Methods of Science and Engineering – Aided with MATLAB", Cengage Learning, New Delhi, Second Edition, 2013.

E-RESOURCES

1. <https://nptel.ac.in/courses/111105121> (Differential Calculus and Integral Calculus)
2. <https://nptel.ac.in/courses/111107112> (matrix analysis)





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Mapping of COs-POs & PSOs

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

1-Low 2-Medium 3-High '-' – No Correlation


Chairman - BoS





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23HST102

HERITAGE OF TAMILS

L T P C

(Common to All Branches)

1 0 0 1

OBJECTIVES

- To familiarize the students on extensive literature of classical Tamil.
- To analyze rock art paintings to modern art.
- To acquire knowledge on folk and martial arts.
- To apply the concepts of Thinaï in Tamils.
- To realize the contribution of Tamils in Indian freedom struggle.

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, Yath 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.





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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

OUTCOMES

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

- Analyze the extensive literature Tamil and classical nature.
- Understand the heritage of sculpture, painting and musical instruments.
- Classify the folk and martial arts of Tamil people.
- Examine Thina concepts, trade and victory of Chozha dynasty.
- Interpret the contribution of Tamils in Indian freedom struggle, Self-esteem movement and siddha medicine.

TEXT-CUM-REFERENCE BOOKS

1. தமிழகவரலாறு – மக்களும் புண்பாடும் – கே. கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித்தமிழ் - முனைவர்இல. சுந்தரம். (விகடன்பிரசுரம்).
- 3.கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருறை -ஆற்றங்கரைநாகரீகம். (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.)





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9. Keeladi – 'Sangam City Civilization on the banks of the river Vaigai' (Jointly Published by: Department of Archaeology & Tamilnadu Textbook and Educational Services Corporation, Tamilnadu.)

10. Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay)
(Published by: The Author)

11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamilnadu Textbook and Educational Services Corporation, Tamilnadu.)

12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

Mapping of COs-POs & PSOs

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

1 - Low 2 - Medium 3 - High '-' – No Correlation


Chairman - BoS





23HST102

தமிழர் மரபு

L T P C

(அனைத்து துறைகளுக்கும்
பொதுவானது)

1 0 0 1

நோக்கங்கள்:

மாணவர்கள் கண்டிப்பாக அறிய வேண்டுவன:

- செம்மொழியான தமிழ்மொழியின் விரிவான இலக்கியத்தைப் பற்றி அறிதல்.
- பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை உள்ள கலைகளை பகுப்பாய்வு செய்தல்.
- நாட்டுப்புறக்கலைகள் மற்றும் வீரவிளையாட்டுகளைப்பற்றிந்து கொள்ளுதல்.
- தமிழர்களின் திணைக்கோட்பாடுகளைச் செயல்படுத்துதல்.
- இந்திய விடுதலைப் போராட்டத்திற்கும் பண்பாட்டிற்கும் தமிழர்களின் பங்களிப்பை உணருதல்.

அலகு 1 மொழிமற்றும் இலக்கியம்

3

இந்திய மொழிக்குடும்பங்கள் - திராவிடமொழிகள் - தமிழ் ஒரு செம்மொழி - தமிழ்செவ்விலக்கியங்கள் -சங்க இலக்கியத்தின் சமயச்சார்பற்றதன்மை - சங்கஇலக்கியத்தில் பகிர்தல் அறம்-திருக்குறளில் மேலாண்மைக் கருத்துக்கள்- தமிழக்காப்பியங்கள், தமிழகத்தில் சமண பௌத்த சமயங்களின்தாக்கம்- பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலக்கியங்கள் -தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி - தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

அலகு II மரபு - பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை - சிற்பக்கலை

3

நடுகல் முதல் நவீன சிற்பங்கள் வரை - ஐம்பொன்சிலைகள் - பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப்பொருட்கள், பொம்மைகள் - தேர்செய்யும்கலை - சுடுமண்சிற்பங்கள் -





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நாட்டுப்புறத்தெய்வங்கள் - குமரிமுனையில் திருவள்ளுவர் சிலை -
இசைக்கருவிகள் - மிருதங்கம், பறை, வீணை, யாழ், நாதஸ்வரம் -
தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோவில்களில் பங்கு.

அலகு III நாட்டுப்புறக்கலைகள் மற்றும் வீரவிளையாட்டுகள் 3

தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான்கூத்து, ஓயிலாட்டம்,
தோல்பாவைக்கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம்,
தமிழர்களின் விளையாட்டுகள்.

அலகு IV தமிழர்களின் திணைக்கோட்பாடுகள் 3

தமிழகத்தின் தாவரங்களும், விலங்குகளும் - தொல்காப்பியம் மற்றும்
சங்க இலக்கியத்தில் அகம் மற்றும் புறக்கோட்பாடுகள் - தமிழர்கள்
போற்றிய அறக்கோட்பாடு - சங்ககாலத்தில் தமிழகத்தில்
எழுத்தறிவும், கல்வியும் - சங்ககால நகரங்களும் துறைமுகங்களும் -
சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி - கடல் கடந்த நாடுகளில்
சோழர்களின் வெற்றி.

**அலகு V இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத்
தமிழர்களின் பங்களிப்பு** 3

இந்திய விடுதலைப் போரில் தமிழர்களின் பங்கு - இந்தியாவின்
பிறப்பகுதிகளில் தமிழ்ப்பண்பாட்டின்தாக்கம் - சுயமரியாதை இயக்கம்
- இந்திய மருத்துவத்தில் சித்தமருத்துவத்தின்பங்கு - கல்வெட்டுகள்,
கையெழுத்துப்படிக்கைகள் - தமிழ்ப் புத்தகங்களின் அச்சுவரலாறு.

TOTAL: 15 PERIODS

முடிவுகள்:

பாடத்தின் முடிவில், மாணவர்கள் அறிந்து கொள்வன:

- தமிழ்மொழியின் செம்மொழிதன்மையையும் சங்க இலக்கியத்தின் முக்கியத்துவத்தையும் உணர்வார்கள்.
- தமிழர்களின் சிற்ப, ஓவிய, இசைமரபுகளைப் புரிந்துகொள்வார்கள்.
- நாட்டுப்புறக் கலைகளையும் வீரவிளையாட்டுகளையும் வகைப்படுத்துவார்கள்.





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- தமிழர்களின் திணைக்கோட்பாடுகளும் சங்ககாலவர்த்தகமும் புரிந்து கொள்வார்கள்.
- இந்திய விடுதலைப் போராட்டம், சுயமரியாதை இயக்கம், சித்தமருத்துவம் ஆகியவற்றில் தமிழர்களின் பங்களிப்பை விளக்குவார்கள்.

உரைமற்றும் குறிப்புத்தகங்கள்:

1. தமிழக வரலாறு - மக்களும் பண்பாடும் - கே. கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித்தமிழ் - முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி - வைகை நதிக்கரையில் சங்ககால நகரநாகரிகம் (தொல்லியல்துறை வெளியீடு)
4. பொருநை - ஆற்றங்கரைநாகரீகம். (தொல்லியல்துறை வெளியீடு).
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL - (in print)
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12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) - Reference Book.





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Mapping of COs-POs & PSOs

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

1 - Low 2 - Medium 3 - High '-' - No Correlation


Chairman - BoS





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TIRUCHENGODE - 637 205 NAMAKKAL (Dt) TAMILNADU



23PHE101

ENGINEERING PHYSICS

L T P C

(Common to Civil, Mechanical, R & A and Pharm. Tech)

3 0 2 4

OBJECTIVES

- To impart knowledge of the structure of crystalline materials using crystallographic techniques.
- To enable students to understand the concepts of elasticity, plasticity, stress, and strain and their significance in industrial applications.
- To introduce the fundamentals of ultrasonics and sound waves, along with their practical engineering applications.
- To explain complex physical phenomena through the principles of quantum mechanics and Schrödinger's wave equation.
- To provide an understanding of the modes of heat transmission, thermal conduction in solids, and their engineering applications.
- To determine the optical, mechanical, acoustic, thermal, and electrical properties of materials through laser, interferometric, bending, and thermal methods.

UNIT I CRYSTAL PHYSICS

9

Lattice and Unit cell – Crystal Systems and Bravais lattice – Lattice planes – Miller Indices – d - Spacing in Cubic lattice – Calculation of Number of Atoms per Unit Cell – Atomic radius, Coordination Number, Packing factor for SC, BCC, FCC and HCP structures – Crystal Growth Techniques: Melt Growth Techniques (Bridgman and Czochralski). - Silicon chip Production Process.

UNIT II MECHANICAL PROPERTIES OF SOLIDS & FLUIDS

9

Elasticity – Stress-Strain Diagram and its Uses - Factors Affecting Elastic Modulus – Torsional Stress and Deformations – Twisting Couple - Torsion Pendulum: Theory and Experiment - Bending of beams - Bending Moment – Cantilever: Theory and Experiment – Non-Uniform Bending: Theory and Experiment - I-Shaped Girders.

UNIT III ACOUSTICS & ULTRASONICS

9

ACOUSTICS : Classification of Sound – Decibel - Weber Fechner Law- Reverberation-Sabine's formula (Concept only) - Factors affecting Acoustics of Buildings and their Remedies.

ULTRASONICS: Properties -Production of Ultrasonics - Magnetostriction and Piezoelectric methods - Non Destructive Testing – Pulse echo system, through Transmission and Reflection modes.

UNIT IV QUANTUM PHYSICS

9

Black Body Radiation – Planck's Theory (derivation) – Electron Diffraction – Wave function and its Physical significance – Schrödinger's Wave Equation: Time independent and time dependent equations - Scanning Electron Microscope - Transmission Electron Microscope - Quantum Tunneling & Scanning Tunneling Electron Microscope





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UNIT V THERMAL PHYSICS

9

Transfer of Heat Energy – Thermal expansion of Solids and Liquids – Expansion joints - Bimetallic strips - Thermal Conduction, Convection and Radiation – Heat conduction in Solids – Thermal Conductivity Lee's disc method: Theory and Experiment - Geothermal Energy - Geothermal power - Thermal battery - Thermal Energy Storage.

LIST OF EXPERIMENTS

(Any Eight experiments to be conducted)

1. Determination of wavelength of laser.
2. Determination of particle Size lycopodium powder using laser.
3. Determination of wavelength of mercury spectrum- Spectrometer.
4. Determination of Young's modulus - Uniform bending.
5. Torsional Pendulum: Determination of moment of inertia and rigidity modulus.
6. Determination of velocity of ultrasonic in liquid.
7. Determination of Viscosity of a liquid –Poiseuille's Method.
8. Determination of thermal conductivity of bad conductor using Lee's Disc Apparatus.
9. Determination of Specific resistance of a given wire using Carey's Foster's Bridge (Virtual).
10. Radiation with Temperature Change Using Stefan's Law. (Virtual)

TOTAL:45+15=60 PERIODS

OUTCOMES

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

- Apply crystallographic knowledge to get familiar with the structure of crystalline solids.
- Analyze the mechanical properties of solids and fluids.
- Explain the fundamentals of sound waves and ultrasonic's and their engineering applications.
- Analyze the principles of quantum mechanics and Schrödinger's wave equation to identify complex physical phenomena.
- Analyze the concept of thermal conductivity and its engineering applications.
- Evaluate fundamental properties of materials—such as wavelength, particle size, elastic constants, ultrasonic velocity, viscosity, thermal conductivity and electrical resistance.

TEXT BOOKS

1. P.Mani, "A Text book of Engineering Physics" Dhanam Publications, 2018.
2. Rajendran V. "Engineering Physics". TaTa McGraw Hill Publications, 2016.
3. Arthur Beiser, Shobhit Mahajan, S. Rai Choudhury, "Concepts of Modern Physics", McGraw Hill, 2017.





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REFERENCES

1. Askeland, D. "Materials Science and Engineering". Brooks/Cole, 2010.
2. Wahab, M.A. "Solid State Physics: Structure and Properties of Materials" Narosa Publishing House, 2009
3. K.Thyagarajan and A.Ghatak. "Lasers: Fundamentals and Applications", Laxmi Publications, (Indian Edition), 2019
4. D.Halliday, R.Resnick and J.Walker. "Principles of Physics", Wiley (Indian Edition), 2015

E-RESOURCES

1. <https://archive.nptel.ac.in/courses/122/107/122107035/>
2. <https://archive.nptel.ac.in/courses/115/101/115101107/>

Mapping of COs-POs & PSOs

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1	3	3	1	1	-	-	-	-	-	-	-	-	-	-
2	3	3	1	1	-	-	-	-	-	-	-	-	-	-
3	3	3	1	1	-	-	-	-	-	-	-	-	-	-
4	3	3	1	1	-	-	-	-	-	-	-	-	-	-
5	3	3	1	1	-	-	-	-	-	-	-	-	-	-
6	3	3	1	1	-	-	-	-	-	-	-	-	-	-
AVG	3	3	1	1	-	-	-	-	-	-	-	-	-	-

1 - Low 2 - Medium 3 - High '-' - No Correlation

[Signature]
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23CYE102

CHEMISTRY FOR ENGINEERS
(Common to CIVIL, MECH, R&A)

L T P C
3 0 0 3

OBJECTIVES

- To apply water quality analysis and treatment methods for industrial applications.
- To explain the classification, properties, manufacture, and applications of fuels.
- To utilize spectroscopic and chromatographic techniques for chemical analysis.
- To familiarize students with the principles of energy conversion in nuclear reactors, solar cells, batteries, and fuel cells.
- To apply electrochemical principles to understand corrosion and corrosion control methods.
- To inculcate practical skills in the determination of water quality parameters and instrumental analysis.

UNIT I WATER TECHNOLOGY

9

Introduction - Characteristics - Hardness - Estimation of hardness by EDTA method - Alkalinity and its estimation - Boiler feed water - Requirements - Boiler troubles (Scale and Sludge) - Internal conditioning (phosphate, calgon and carbonate conditioning methods) - External conditioning - Zeolite process, Demineralization process - Desalination of brackish water by reverse osmosis.

UNIT II FUELS AND COMBUSTION

9

Fuels: Introduction - Classification of fuels - Coal - Carbonization - Manufacture of metallurgical coke (Otto Hoffmann method) - Petroleum - Manufacture of synthetic petrol (Bergius process) - Knocking - Octane number - Diesel oil - Cetane number - Natural gas - Compressed Natural Gas (CNG) - Power Alcohol and Biodiesel. Combustion of fuels: Introduction - Calorific value - Higher and lower calorific values - Ignition temperature - Spontaneous ignition temperature - Explosive range - Flue gas analysis (ORSAT Method).

UNIT III ANALYTICAL CHEMISTRY

9

Spectroscopy: Electromagnetic spectrum - Absorption of radiation - Electronic, Vibrational and rotational transitions. UV-Visible and IR Spectroscopy - Principles, instrumentation (Block Diagram Only). - Chromatography - General principles - classification - Gas chromatography - High Pressure Liquid Chromatography - Applications.

UNIT IV ENERGY SOURCES AND STORAGE DEVICES

9

Nuclear Fission - Controlled nuclear fission - Nuclear fusion - Differences between nuclear fission and fusion - Nuclear chain reactions - Nuclear energy - Light water nuclear power plant - Breeder reactor - Solar energy conversion - Solar cells - Wind energy. Batteries - Types of batteries - lead acid battery, lithium-ion-battery Fuel Cells - H₂ - O₂ fuel cell.





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UNIT V ELECTROCHEMISTRY, CORROSION AND ITS CONTROL

9

Introduction- Electrochemical cells, applications of electrochemical series-Reference Electrode-standard calomel electrode, ion selective electrode, glass electrode, Corrosion – Types – Chemical Corrosion – Electrochemical Corrosion (galvanic and differential aeration) – Factors influencing corrosion – Material selection and design aspects-Control methods of corrosion – sacrificial anodic and impressed current cathodic protection.

LIST OF EXPERIMENTS

(Any Eight Experiments to be conducted)

1. Determination of total, temporary & permanent hardness of water by EDTA method.
2. Determination of alkalinity in water sample.
3. Determination of DO content of water sample by Winkler's method.
4. Determination of chloride content of water sample by Argentometric method.
5. Determination of strength of given hydrochloric acid using pH meter.
6. Estimation of sodium and potassium present in water using flame photometer.
7. Conductometric Precipitation Titration using BaCl_2 and Na_2SO_4 .
8. Conductometric titration of strong acid vs strong base.
9. Estimation of Ferrous ions by Potentiometric Titration.
10. Estimation of copper content in the brass by Iodometry.

TOTAL: 45 + 15 PERIODS

OUTCOMES

Upon completion of the course, Students will be able to

- Explain the quality parameters of water and suitable methods for removing impurities in domestic and industrial applications.
- Interpret the characteristics of fuels and their role in efficient and eco-friendly combustion systems.
- Analyze the interaction of light with matter and the use of analytical techniques to characterize molecules.
- Explain the energy resources and their applications in the energy sector.
- Analyze the causes of corrosion and effective methods for its prevention and control.
- Determine the water quality parameters and perform quantitative chemical analysis by pH meter, flame photometry, conductometry and potentiometry.

TEXT BOOKS

1. Jain P.C and Monika Jain, "Engineering Chemistry", Dhanpet Rai Publishing Company (P) Ltd., 2015.
2. R.Gopalan, "Analytical Chemistry" Sultan Chand & Sons, Third Edition, 2017.





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REFERENCES

1. S. S. Dara and S. S. Umare, "A Textbook of Engineering Chemistry", S. Chand & Company Ltd, 2015.
2. Shobha Ramakrishnan, Banani Mukhopadhyay, "Essentials of Analytical Chemistry" Pearson Education India, 2018.

E-RESOURCES

1. <https://nptel.ac.in/courses/104105084> - (Analytical Chemistry)
2. <http://library.iitbbs.ac.in/open-access-e-resources.php>

Mapping of COs-POs & PSOs

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3	3	3	3	3	3	2	2	2	2	2	2	3	-	-
4	2	2	2	3	3	2	2	2	1	1	1	-	-	-
5	3	2	3	2	3	2	2	1	2	1	-	2	-	-
6	3	3	2	1	1	2	2	1	1	2	-	-	-	-
AVG.	2.50	2.17	2.67	2.20	2.00	2.00	2.00	1.83	1.60	1.60	1.33	2.33	-	-

1 - Low 2 - Medium 3 - High '-' - No Correlation


Chairman - BoS





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23GEE101

PROGRAMMING IN C
(Lab Embedded Theory Course)

L T P C
3 0 2 4

OBJECTIVES

- To impart fundamental knowledge of C programming concepts, syntax, data types, operators, control structures, and program development.
- To develop students' understanding of arrays, strings, searching, and sorting techniques for solving computational problems.
- To train students in designing modular programs using functions, recursion, pointers, and parameter passing mechanisms.
- To familiarize students with structures, unions, dynamic memory allocation, and their applications in software development.
- To enable students to perform file handling operations and develop efficient C programs using sequential and random file processing.
- To develop C programs to solve real-world programming problems.

UNIT I BASICS OF C PROGRAMMING

9

Introduction to programming paradigms – Structure of C program – C programming: Data Types– variables–Storage classes – Constants – Enumeration Constants – Keywords – Operators: Precedence and Associativity – Expressions –Input/Output statements, Assignment statements – Decision making statements – Switch statement – Looping statements – Pre-processor directives – Compilation process.

Coding practices:

1. Develop a program to find the largest of three numbers using nested if statements.
2. Develop a program to generate multiplication tables using loops.

Problem - solving assignments:

1. Write a program to calculate the area and perimeter of a rectangle, circle, and triangle.
2. Write a program to calculate simple interest and compound interest.

UNIT II ARRAYS AND STRINGS

9

Introduction to Arrays: Declaration, Initialization – One dimensional array – Example Program: Computing Mean, Median and Mode – Two dimensional arrays – Example Program: Matrix Operations (Addition, Scaling, Determinant and Transpose) – String operations: length, compare, concatenate, copy –Sorting – Selection sort, Insertion sort, Merge sort, quick sort – Searching – linear and binary search.

Coding practices:

1. Develop a program to perform matrix addition and transpose using two-dimensional arrays.
2. Write a program to sort an array using Insertion Sort.





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Problem - solving assignments:

1. Develop a program to perform matrix operations such as addition and transpose using two-dimensional arrays.
2. Write a program to search for an element in an array using Linear Search and Binary Search.

UNIT III FUNCTIONS AND POINTERS

9

Introduction to functions: Function prototype, function call, Built-in functions (string functions, math functions) – Recursion – Example Program: Computation of Sine series, Scientific calculator using built-in functions – Pointers – Pointer operators – Arrays and pointers – Example Program: Sorting of names – Parameter passing: Pass by value, Pass by reference – Example Program: Swapping of two numbers and changing the value of a variable using pass by reference.

Coding practices:

1. Develop a recursive program to generate the Fibonacci series.
2. Develop a program to implement a scientific calculator using built-in mathematical functions.

Problem - solving assignments:

1. Write a program to perform arithmetic operations using user-defined functions.
2. Write a program to swap two numbers using pass-by-value and pass-by-reference.

UNIT IV STRUCTURES AND UNION

9

Structure – Example Programs – Nested structures – Pointer in Structures – Array of structures Example Program using structures and pointers – Self referential structures – Dynamic memory allocation, Union- Storage classes.

Coding practices:

1. Develop a program to generate an employee salary slip using structures and pointers.
2. Develop a program using nested structures to represent student academic details.

Problem - solving assignments:

1. Write a program to store and display employee details using an array of structures.
2. Develop a program to demonstrate dynamic memory allocation using structures.

UNIT V FILE PROCESSING

9

Files – Operations of File – Types of file processing: Sequential access, Random access – Sequential access file – Random access file – Command line arguments.

Coding practices:

1. Write a program to create, write, and read a text file.
2. Develop a program to copy the contents of one file to another.

Problem - solving assignments:

1. Write a program to create, write, and read student records using sequential file processing.
2. Write a program to implement command-line arguments for performing arithmetic operations or file processing.





LIST OF EXPERIMENTS

(Any Eight Experiments to be conducted)

1. Programs using I/O statements, expressions and decision-making constructs.
2. Write a program to find whether the given year is leap year or Not.
3. Design a calculator to perform the operations, namely, addition, subtraction, multiplication, division and square of a number.
4. Check whether a given number is Armstrong number or not?
5. Given a set of numbers like <10, 36, 54, 89, 12, 27>, find sum of weights based on the following conditions.
 - a) 5 if it is a perfect cube.
 - b) 4 if it is a multiple of 4 and divisible by 6.
 - c) 3 if it is a prime number.
6. Populate an array with height of persons and find how many persons are above the average height.
7. From a given paragraph perform the following using built-in functions:(i) Find the total number of words.(ii) Capitalize the first word of each sentence.(iii) Replace a given word with another word.
8. Solve towers of Hanoi using recursion.
9. Locate and Display the Contents of an Array using Pointers.
10. Generate salary slip of employees using structures and pointers.
11. Count the number of account holders whose balance is less than the minimum balance using sequential access file.

TOTAL: 45 +15 = 60 PERIODS

OUTCOMES

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

- Explain the fundamental concepts of C programming and develop programs using data types, operators, expressions, and control structures.
- Develop C programs using arrays, strings, searching, and sorting techniques to solve computational problems.
- Construct modular C programs by applying functions, recursion, pointers, and parameter passing techniques.
- Develop applications using structures, unions, pointers, and dynamic memory allocation for efficient data organization and manipulation.
- Analyze file processing techniques using sequential and random access methods to perform data storage and retrieval operations.
- Develop reliable software solutions using C programming for real-world applications.

TEXT BOOKS

1. E.Balagurusamy, "Programming in ANSI C", Tata McGraw Hill, Eighth Edition, 2019.
2. Kernighan, B.W and Ritchie, D.M, "The C Programming Language", Second Edition, Pearson Education, 2006.





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REFERENCES

1. ReemaThareja, "Programming in C", Oxford University Press, Second Edition, 2016.
2. Juneja, B. L and Anita Seth, "Programming in C", CENGAGE Learning India pvt.Ltd., First Edition, 2011.

E – RESOURCES

1. <https://nptel.ac.in/courses/106/105/106105085/> (Introduction to C Programming)
2. <https://nptel.ac.in/courses/106/106/106106210/> (File operations)

Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	2	-	3	-	-	-	-	-	-	2	3	2
2	3	3	2	1	3	-	-	-	-	-	-	2	3	3
3	3	3	3	2	3	-	-	-	-	-	-	2	3	3
4	3	3	3	2	3	-	-	-	-	1	-	2	3	3
5	2	3	2	2	3	-	-	-	-	1	-	2	3	2
6	3	3	3	2	3	-	-	1	1	2	1	2	3	3
AVG.	2.83	2.83	2.5	1.8	3	-	-	1	1	1.33	1	2	3	2.66

1 - Low 2 - Medium 3 - High '-' – No Correlation


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23EEEC101

SOFTSKILLS & LIFE SKILLS

L T P C

(Common to all First year / First Semester B.E., B.Tech., Branches)

1 0 0 1

OBJECTIVES

- To understand the Universal Human Values
- To have an overview on Life skills required in their profession
- To manage the behavior with emotional intelligent skills
- To learn professional Skills required for 21st century
- To formulate and implement effective leadership strategies.

UNIT I UNIVERSAL HUMAN VALUES

3

Understanding harmony in the human being - understanding harmony in the family and society - understanding harmony in the nature and existence - understanding of harmony on professional ethics

UNIT II LIFE SKILLS

3

Soft Skills – Positive Attitude - Empathy - Effective Communication - Decision-Making Skills - Communication Skills - Problem Solving - Critical Thinking- Analytical thinking

UNIT III EMOTIONAL SKILLS

3

Self-Awareness - Interpersonal Relationship - Stress – Stress management - Focus and Self Control - Positive Thinking – Anger management

UNIT IV PROFESSIONAL SKILLS

3

21st century skills – Hard Skills - General computer skills - Spreadsheet proficiency - Career Skills - developing a long - term career plan – Team Work -- Time management

UNIT V LEADERSHIP SKILLS

3

Leadership, Levels of Leadership, Making of a leader, Types of leadership, describing a leadership style.

TOTAL: 15 PERIODS

OUTCOMES

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

- Treat and respect the human beings with harmony,
- Develop the capabilities needed to utilize their potential wherever required.
- Control their emotional feelings and manage the stress.
- Explore the career & professional skills.
- Become highly confident as a leader and find new ways of influencing the teams they lead.

TEXT BOOKS

1. Life Skills for Engineers, McGraw Hill Education (India) Private Ltd., 2016
2. E. Suresh Kumar et al. Communication for Professional Success. Orient Blackswan: Hyderabad, 2015
3. Sydänmaanlakka Pentti. "Intelligent leadership and leadership competencies". Dissertation Series.





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REFERENCES

1. Barun K. Mitra; (2011), "Personality Development & Soft Skills", First Edition; Oxford Publishers.
2. Kalyana; (2015) "Soft Skill for Managers"; First Edition; Wiley Publishing Ltd.

E-RESOURCES

1. <https://uhv.org.in/>
2. <https://nptel.ac.in>

Mapping of COs-POs & PSOs

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1	1	1	-	-	-	2	2	2	3	2	1	-	-	-
2	1	3	1	1	-	1	1	-	2	3	3	1	-	-
3	-	1	-	-	-	1	1	-	3	3	3	1	-	-
4	2	2	1	1	3	1	1	-	2	3	3	3	-	-
5	1	1	1	-	-	2	2	-	3	3	3	3	-	-
Avg.	1.25	1.6	1	1	3	1.4	1.4	2	2.6	2.8	2.6	2	-	-

1-Low 2-Medium 3-High '-' – No Correlation


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23MDC101

INDUCTION PROGRAMME (2 Weeks)

This is a mandatory 2 week programme to be conducted as soon as the students enter the institution. Normal classes start only after the induction program is over.

The induction programme has been introduced by AICTE with the following objective:

Engineering colleges were established to train graduates well in the branch/department of admission, have a holistic outlook, and have a desire to work for national needs and beyond. The graduating student must have knowledge and skills in the area of his/her study. However, he/she must also have a broad understanding of society and relationships. Character needs to be nurtured as an essential quality by which he/she would understand and fulfill his/her responsibility as an engineer, a citizen and a human being. Besides the above, several meta-skills and underlying values are needed."

"One will have to work closely with the newly joined students in making them feel comfortable, allow them to explore their academic interests and activities, reduce competition and make them work for excellence, promote bonding within them, build relations between teachers and students, give a broader view of life, and build character."

Hence, the purpose of this programme is to make the students feel comfortable in their new environment, open them up, set a healthy daily routine, create bonding in the batch as well as between faculty and students, develop awareness, sensitivity and understanding of the self, people around them, society at large, and nature.

The following are the activities under the induction program in which the student would be fully engaged throughout the day for the entire duration of the program.

Physical Activity

This would involve a daily routine of physical activity with games and sports etc.

Universal Human Values

This is the anchoring activity of the Induction Programme. It gets the student to explore oneself and allows one to experience the joy of learning, stand up to peer pressure, make decisions with courage, be aware of relationships with colleagues and supporting stay in the hostel and department, be sensitive to others, etc. A module in Universal Human Values provides the base. Methodology of teaching this content is extremely important. It must not be through do's and don'ts, but get students to explore and think by engaging them in a dialogue. It is best taught through group discussions and real life activities rather than lecturing.





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Discussions would be conducted in small groups of about 20 students with a faculty mentor each. It would be effective that the faculty mentor assigned is also the faculty advisor for the student for the full duration of the UG programme.

Lectures by Eminent People

Motivational lectures by eminent people from all walks of life should be arranged to give the students exposure to people who are socially active or in public life.

Proficiency Modules

This would address some lacunas that students might have, for example, English, computer familiarity etc.

Visits to Local Area

A couple of visits to the landmarks of the city, or a hospital or orphanage could be organized. This would familiarize them with the area as well as expose them to the underprivileged.

Familiarization to Dept./Branch & Innovations

They should be told about what getting into a branch or department means what role it plays in society, through its technology. They should also be shown the laboratories, workshops & other facilities.

Induction Programme is totally an activity based programme and therefore there shall be no tests / assessments during this programme.

References: Guide to Induction program from AICTE


Chairman - BoS





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SEMESTER II

23MAT202	DIFFERENTIAL EQUATIONS AND NUMERICAL METHODS	L	T	P	C
	[Common to Civil, EEE, ECE and MDE]	3	1	0	4

OBJECTIVES

- To explore techniques for solving ordinary differential equations and recurrence relations.
- To compose the purpose of using Laplace transforms to create a new domain in which problems can be handled more easily.
- To develop the concepts of solving algebraic, transcendental and system of linear equations.
- To introduce the numerical techniques of interpolation and integration.
- To explain various numerical methods of solving ordinary differential equations.

UNIT I ORDINARY DIFFERENTIAL EQUATIONS AND RECURRENCE RELATIONS 9+3

Higher order linear differential equations with constant coefficients – Method of variation of parameters – Legendre's linear equations – Simultaneous linear equations with constant coefficients – Recurrence relations: Solving linear homogeneous recurrence relations with constant coefficients.

UNIT II LAPLACE TRANSFORMS 9+3

Definition – Conditions for existence – Transforms of elementary functions – Properties of Laplace transforms – Transform of Periodic functions – Transforms of derivatives and integrals – Multiplication by 'tⁿ' and division by 't' – Evaluation of integrals by Laplace transforms – Inverse transforms – Convolution theorem – Application to solution of linear second order ordinary differential equations with constant coefficients.

UNIT III SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS 9+3

Solution of algebraic and transcendental equations by Newton Raphson method – Solution of simultaneous algebraic equations by Gauss elimination, Gauss Jordan and Gauss Seidel methods – Matrix Inversion by Gauss Jordan method – Eigen values of a matrix by Power method.

UNIT IV INTERPOLATION AND NUMERICAL INTEGRATION 9+3

Interpolation with equal intervals: Newton's forward interpolation formula – Newton's backward interpolation formula – Interpolation with unequal intervals: Lagrange's interpolation formula – Divided differences – Newton's divided difference formula – Numerical integration: Trapezoidal rule – Simpson's one-third rule – Numerical double integration by Trapezoidal rule.





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UNIT V NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS

9+3

Taylor's series method – Euler's method – Modified Euler's method – Runge-Kutta method – Predictor-corrector methods: Milne's method – Adams-Bashforth method.

OUTCOMES

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

- Apply appropriate techniques to solve ordinary differential equations and recurrence relations.
- Solve engineering problems using the concept of Laplace transforms.
- Compute the numerical solution of algebraic, transcendental and system of linear equations.
- Apply the numerical techniques of interpolation and integration.
- Evaluate the numerical solution of ordinary differential equations.

LIST OF EXPERIMENTS

1. Solving ordinary differential equations.
2. Compute homogeneous recurrence relations.
3. Calculate Laplace Transform of simple functions.
4. Calculate Inverse Laplace transform of a given function.
5. Solution of simultaneous algebraic equations by Gauss Seidel method.
6. Find the Eigen values of a matrix by Power method.
7. Illustrate Lagrange's interpolation formula.
8. Evaluation of line integral by Simpson's one-third rule.
9. Solving ordinary differential equations by Euler's method.
10. Solving ordinary differential equations by Runge-Kutta method.

TOTAL: 45+15 PERIODS

TEXT BOOKS

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, Forty Fourth Edition, 2022.
2. Grewal, B.S., "Numerical Methods in Engineering and Science", Khanna Publishers, Eleventh Edition, 2023.

REFERENCES

1. Kreyszig Erwin, "Advanced Engineering Mathematics", John Wiley and Sons, Tenth Edition, 2016.
2. Burden, R.L and Faires, J.D, "Numerical Analysis", Cengage Learning, Ninth Edition, 2016.





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E-RESOURCES

1. <https://archive.nptel.ac.in/courses/111/105/111105121/> (Ordinary differential equations)
2. <https://nptel.ac.in/courses/111106139> (Laplace transforms)
3. <https://nptel.ac.in/courses/111/107/111107105/> (Numerical Methods)

Mapping of COs-POs & PSOs

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

1-Low 2-Medium 3-High '-' – No Correlation

[Signature]
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23PHT201

ADVANCED PHYSICS OF MATERIALS
(Common to Civil, Mechanical, R & A and Pharm.Tech)

L T P C
3 0 0 3

OBJECTIVES

- To impart fundamental knowledge of cryogenics and superconductivity and their engineering applications.
- To provide understanding of various material characterization techniques and Non-Destructive Testing (NDT) methods.
- To introduce nanoscience concepts, nanomaterials, quantum structures and their synthesis techniques.
- To explain the principles, properties and applications of smart and advanced materials.
- To develop knowledge on composite materials, their constituents, properties and applications.

UNIT I CRYOGENICS

9

Introduction to Cryogenics - Properties of Cryogenic Fluids- Gas-Liquefaction of Gases and Refrigeration Systems – Cryocoolers -Cryogenic Insulations - Superconductivity: Properties (Electrical Resistance, Magnetic Property, Meissner effect, Persistent of Current, Effect of heavy Current, Isotope effect, Thermal properties) – Type I and Type II Superconductors – BCS theory of Superconductivity - High T_c superconductors – Applications of Superconductors: Josephson effect (AC & DC), Magnetic Levitation.

UNIT II MATERIALS CHARACTERIZATION

9

Introduction to materials and Techniques-X-Ray Diffraction (XRD) – Atomic Force Microscopy (AFM)- Fourier Transform Infrared Spectroscopy (FTIR)- UV-Vis Spectroscopy- Non-Destructive Testing (NDT) : Liquid Penetrant Test, Magnetic Detection, Electromagnetic Testing, Ultrasonic Test.

UNIT III NANOMATERIALS & NANODEVICES

9

Emergence of Nano science - Role of Particle Size - Quantum Structures: Quantum Well, Quantum Wire and Quantum Dot- Properties at Nano Scale (Optical, Electronic and Magnetic) - Synthesis of Nanomaterials: Physical Vapour Deposition (PVD) - Pulsed Laser Deposition (PLD) - Carbon Nanotubes: Types, Properties and applications - Micro Electro Mechanical Systems (MEMS).

UNIT IV SMART MATERIALS

9

Smart materials – Functional materials – Polyfunctional Materials – Structural Materials, Electrical Materials, Bio-Compatible Materials - Metallic Glasses: Properties, Types, Glass forming ability of Alloys, Melt spinning process, Applications - Shape Memory Alloys: Phases, Shape Memory Effect, Pseudo elastic effect, NiTi alloy, and applications.





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UNIT V COMPOSITE MATERIALS

9

Definitions, Composites, Reinforcements and Matrices, Types of Reinforcements, Types of Matrices, Types of Composites, Carbon Fibre Composites, Properties of Composites in Comparison with Standard Materials, Applications of Metal, Ceramic and Polymer matrix composites.

TOTAL: 45 PERIODS

OUTCOMES

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

- Explain the principles of cryogenics and superconductivity and describe their properties and applications.
- Describe and interpret results from material characterization techniques and NDT methods.
- Explain nanoscale properties, quantum structures and identify suitable nanomaterial synthesis methods.
- Describe the behavior and applications of smart materials such as metallic glasses and shape memory alloys.
- Classify composite materials and compare their properties with conventional materials for engineering applications.

TEXT BOOKS

1. Mani P, "A Text book of Engineering Physics", Dhanam Publications, 2018.
2. Rajendran V, "Engineering Physics", TaTa McGraw Hill Publications, 2017.
3. Sam Zhang, Lin Ki, Ashok Kumar, "Materials Characterization Techniques", CRC Press, Taylor & Francis Group, 2019.

REFERENCES

1. Askeland D, "Materials Science and Engineering", Brooks/Cole, 2015.
2. Wahab M.A. "Solid State Physics: Structure and Properties of Materials", Narosa Publishing House, 2017.
3. Santhana Ragavan P and Ramasamy P, "Crystal Growth Processes and Methods", KRU Publications, 2017.

E-RESOURCES

1. <https://nptel.ac.in/courses/112108150/>
2. https://swayam.gov.in/nd1_noc19_mm13/preview





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Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	3	2	1	2	1	1	-	-	-	-	-	-	-
2	2	3	2	1	2	1	1	-	-	-	-	-	-	-
3	2	3	2	1	2	1	1	-	-	-	-	-	-	-
4	2	3	2	1	1	1	1	-	-	-	-	-	-	-
5	2	3	2	1	2	1	1	-	-	-	-	-	-	-
AVG.	2	3	2	1	1.8	1	1	-	-	-	-	-	-	-

1 - Low 2 - Medium 3 - High '-' - No Correlation


Chairman - BoS





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23CYT201

ENVIRONMENTAL SCIENCE AND SUSTAINABILITY

(Common to All B.E. /B.Tech. Branches)

L T P C

3 0 0 3

OBJECTIVES

- To familiarize students with the concepts of environment, ecosystems, biodiversity, and their conservation.
- To create awareness about environmental pollution, individual responsibilities in pollution prevention, and basic disaster management.
- To impart knowledge about major social and environmental issues, environmental protection laws, and green chemistry principles.
- To analyze population-related issues, human health, social welfare, and the role of information technology in environmental and human health.
- To develop an understanding of sustainability concepts, climate change issues, and sustainable management practices for addressing environmental challenges.

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY

9

Definition, scope and importance of environment – Need for public awareness - Concept of an ecosystem – Structure and function of an ecosystem – Producers, consumers and decomposers – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (d) aquatic ecosystems (oceans) – Introduction to biodiversity definition: genetic, species and ecosystem diversity –Value of biodiversity – Threats to biodiversity – Endangered and endemic species of India – Conservation of biodiversity: In-Situ and Ex-Situ conservation of biodiversity.

Activity: Biodiversity in and around the campus and report submission.

UNIT II ENVIRONMENTAL POLLUTION

9

Definition – Causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution – Solid waste management: causes, effects and control measures of municipal solid wastes - E-waste – Role of an individual in prevention of pollution - Pollution case studies – Disaster management: floods, earthquake and cyclone.

Activity: Local pollution case study and report submission.

UNIT III SOCIAL ISSUES AND THE ENVIRONMENT

9

Water conservation, rain water harvesting, watershed management – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – Green Chemistry and principles - Environment production act – Air (Prevention and Control of Pollution) act –Water (Prevention and control of Pollution) act

Activity: Creating environmental awareness.





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UNIT IV HUMAN POPULATION AND THE ENVIRONMENT

9

Population growth, variation among nations – Population explosion – Family welfare programme – Environment and human health – Human rights – Value education – HIV / AIDS – Women and child welfare – Role of information technology in environment and human health – Case studies.

Activity: Visit to local primary health center.

UNIT V SUSTAINABLE MANAGEMENT

9

Sustainability-Concept, needs and challenges-economic, social and aspects of sustainability-From unsustainability to sustainability—Sustainable Development Goals-Targets, indicators and intervention areas Climate change- Global, Regional and local environmental issues and possible solutions-Case studies. Zero waste, Material Life cycle assessment, Sustainable habitat: Energy efficiency, Sustainable transports.

Activity: Field trips to local organizations or facilities with sustainable practices in place.

TOTAL: 45 PERIODS

OUTCOMES

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

- Explain the basics of environment, ecosystems, biodiversity, and conservation.
- Identify major sources of pollution and understand individual responsibilities in pollution prevention and disaster management.
- Describe key social and environmental issues, environmental laws, and green chemistry principles.
- Analyse population growth, human health, social welfare, and the role of IT in environmental and health management.
- Apply sustainability concepts, climate change mitigation, and sustainable management practices to environmental challenges.

TEXT BOOKS

- 1 Benny Joseph, "Environmental Science and Engineering", Tata McGraw-Hill, 2019.
- 2 Gilbert M.Masters, "Introduction to Environmental Engineering and Science", Eighth Edition, Pearson Education, 2021.
- 3 Allen, D. T. and Shonnard, D. R., "Sustainability Engineering: Concepts, Design and Case Studies", Third Edition, Prentice Hall, 2018.

REFERENCES

1. Erach Bharucha, "Textbook of Environmental Studies", Universities Press (I) Pvt Ltd, 2016.
2. Dharmendra S. Sengar, "Environmental law", Prentice hall of India Pvt Ltd, 2018.
3. Rajagopalan, R, "Environmental Studies-From Crisis to Cure", Oxford University Press, 2019.





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E-RESOURCES

1. <https://nptel.ac.in/courses/122102006/>
2. https://swayam.gov.in/nd1_noc19_ge22/preview

Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	2	2	3	-	-	3	3	3	-	-	2	1	-	-
2	2	2	3	2	3	3	3	3	-	-	3	3	-	-
3	2	1	3	2	2	3	3	3	-	2	3	3	-	-
4	2	1	3	2	3	3	3	3	2	3	2	2	-	-
5	2	1	3	2	3	3	3	3	2	3	2	2	-	-
Avg.	2	1.4	3	2	2.8	3	3	3	2	2.7	2.4	2.2	-	-

1 - Low 2 - Medium 3 - High '-' - No Correlation


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23CET201

APPLIED MECHANICS

L T P C

3 1 0 4

OBJECTIVES

- To inculcate the particle, body, force and their equilibrium conditions.
- To familiarize the concept of equilibrium of rigid bodies.
- To impart knowledge on the surfaces and solids.
- To develop the basic concepts of friction.
- To acquire the dynamics concepts of force, momentum, work and energy

UNIT I STATICS OF PARTICLES

9+3

Introduction – Laws of Mechanics – Parallelogram and Triangular Law of forces – Principle of Transmissibility – Force system – Resolution of force –Free body diagram–Equilibrium of a particle in plane – Forces in space – Equilibrium of a particle in space.

UNIT II STATICS OF RIGID BODIES

9+3

Moments: Moment of a force about a point and about an axis – Vectorial representation of moments and couples – Scalar component of moments – Varignon's theorem– Equivalent systems of forces – Single equivalent force. Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three dimensions.

UNIT III PROPERTIES OF SURFACES AND SOLIDS

9+3

First moment of area and Centroid of sections – T section- I section- Angle section- Hollow section from primary simpler sections – Second moment of plane areas – Parallel axis theorem and Perpendicular axis theorem – T section – I section- Angle section- Hollow section –Product of Inertia- Principal Moment of Inertia of plane area- Mass moment of inertia.

UNIT IV FRICTION

9+3

Surface Friction – Laws of dry friction – Angle of friction & Angle of repose – Sliding friction – Static and Kinetic friction– Ladder friction – Wedge friction – Belt friction. Rectilinear motion of particles.

UNIT V DYNAMICS OF PARTICLES AND KINEMATICS OF RIGID BODY

9+3

Dynamics of Particles: Newton's law, Work – Energy and Impulse – Momentum equations of particles – Impact of elastic bodies. Kinematics of Rigid body: Translation – Rotation about a fixed axis

TOTAL: 45 +15=60 PERIODS





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OUTCOMES

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

- Analyze the forces in vector components (both 2D and 3D) and apply equilibrium conditions.
- Examine the moment produced by various force systems and conclude the static equilibrium equations for rigid body system.
- Identify the centroid, centre of gravity and moment of inertia of geometrical shapes and solids respectively.
- Examine the effect of dry friction and its applications.
- Apply the different principles to study the motion of a body and their constitutive equations.

TEXT BOOKS

1. Beer F.P and Johnston Jr. E.R, "Vector Mechanics for Engineers (In SI Units): Statics and Dynamics", Tata McGraw Hill Publishing company, Tenth Edition, 2020.
2. Kumar K.L, "Engineering Mechanics", Tata McGraw-Hill Publishing company, Fourth Edition, 2019.
3. Vela Murali, "Engineering Mechanics", Oxford University Press, Second Edition, 2019.

REFERENCES

1. Hibbeler R.C and Ashok Gupta, "Engineering Mechanics: Statics and Dynamics", Pearson Education, Fourteenth Edition, 2021.
2. Meriam J L and Kraige L G, "Engineering Mechanics: Statics and Engineering Mechanics: Dynamics", Wiley student edition, Seventh Edition, 2019.
3. Boresi P and Schmidt J, "Engineering Mechanics: Statics and Dynamics", Cengage learning, First Edition, 2020.

E-RESOURCES

1. <https://nptel.ac.in/courses/122/104/122104015/>(Engineering Mechanics)
2. <https://www.courses.com/indian-institute-of-technology-guwahati/engineering-mechanics> (Engineering Mechanics)

Mapping of COs-POs & PSOs

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

1-Low 2-Medium 3-High '-' – No Correlation


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23GET201

ENGINEERING GRAPHICS

(Common to Mech, Civil and Robotics Department)

L T P C

3 1 0 4

OBJECTIVES

- To introduce the fundamental principles of engineering graphics, drawing instruments, and construction of plane curves.
- To teach methods for projecting points, lines, and plane surfaces, including determination of true lengths and inclinations.
- To explain projection techniques of simple solids and handling axes inclined to reference planes using change of position method.
- To train learners in sectioning of solids and development of lateral surfaces of regular and truncated solids.
- To present conversion between orthographic and isometric projections and their practical applications in engineering drawing.

UNIT I PLANE CURVES

9+3

Principles of Engineering Graphics and their significance, usage of Drawing instruments, Types of Lines, Dimensioning Systems as per BIS conventions. **(Not for Examination)**

Construction of ellipse – Parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the curves.

UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACES

9+3

Projection of points – Projection of straight lines located in the first quadrant – Determination of true lengths and true inclinations – Projection of polygonal surface and circular lamina inclined to one reference planes.

UNIT III PROJECTION OF SOLIDS

9+3

Projections of solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method.

UNIT IV SECTION OF SIMPLE SOLIDS AND DEVELOPMENT OF SURFACES

9+3

Sectioning of simple solids like prisms and cone - Inclined to one reference plane. Development of lateral surfaces of simple and truncated solids: pyramids and cylinders.

UNIT V ORTHOGRAPHIC AND ISOMETRIC PROJECTIONS

9+3

Conversion of isometric projection into orthographic projection, Conversion of orthographic projection into isometric projection.

TOTAL : 45+15=60 PERIODS





OUTCOMES

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

- Construct multiple views of engineering components.
- Construct the pictorial drawings as per the standards.
- Develop the projection of solids.
- Draw the section of solids drawings and development of surfaces of given objects.
- Apply free hand sketching and concept of isometric in engineering practice.

TEXT BOOKS

1. Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, Fourth Edition, 2019.
2. Natarajan K.V., "Engineering Graphics", Dhanalakshmi Publishers, Thirty Second Edition, 2019.

REFERENCES

1. K.R. Gopalakrishna, "Engineering Drawing Volume 1 & 2", Subhas Publications, Thirteenth Edition, 2021.
2. T.Jeyapoovan. "Engineering Graphics using Auto CAD" Vikas publishing house Pvt Ltd, Sixth Edition, 2022

E- RESOURCES

1. <https://nptel.ac.in/courses/112/103/112103019/> - (Geometric Constructions)
2. <https://nptel.ac.in/courses/105/104/105104148/> - (Projections)

Mapping of COs-POs & PSOs

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

1 - Low 2 - Medium 3 - High '-' – No Correlation


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23HST202

TAMILS AND TECHNOLOGY
(Common to All Branches)

L T P C
1 0 0 1

OBJECTIVES

- To gain knowledge about weaving and ceramic Technology
- To create a design and construction Technology
- To analyze manufacturing Technology
- To apply agriculture and irrigation Technology
- To remember scientific and scientific Tamil and Tamil computing

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 KumizhiThoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing Knowledge of Sea - Fisheries– Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society.

UNIT V SCIENTIFIC TAMIL & TAMIL COMPUTING

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





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OUTCOMES

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

- Understand weaving under ceramic Technology.
- Develop new design and construction Technology.
- Identify the manufacturing Technology.
- Understand agriculture and irrigation.
- Knowledge of scientific Tamil and Tamil computing.

TEXT-CUM-REFERENCE BOOKS

1. தமிழக வரலாறு – மக்களும் பண்பாடும் – கே. கே. பிள்ளை– (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித்தமிழ் - முனைவர்இல. சுந்தரம். (விகடன்பிரசுரம்).
- 3.கீழடி – வைகை நதிக்கரையில் சங்ககால நகரநாகரிகம் (தொல்லியல்துறை வெளியீடு)
4. பொருறை –ஆற்றங்கரை நாகரீகம். (தொல்லியல்துறை 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 the river Vaigai' (Jointly Published by: Department of Archaeology & Tamilnadu Textbook and Educational Services Corporation, Tamilnadu.)
10. Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay) (Published by: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamilnadu Textbook and Educational Services Corporation, Tamilnadu.)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.





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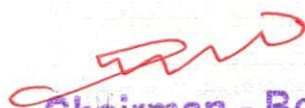
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Mapping of COs-POs & PSOs

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

1 - Low 2 - Medium 3 - High '-' - No Correlation


Chairman - BoS





23HST202

தமிழரும் தொழில்நுட்பமும்
(அனைத்து துறைகளுக்கும் பொதுவானது)

LTPC
1001

நோக்கம்:

மாணவர்கள் கண்டிப்பாக அறிய வேண்டுவன:

- நெசவு மற்றும் பீங்கான் தொழில்நுட்பம் பற்றிய அறிவைப் பெறுதல்.
- வடிவமைப்பு மற்றும் கட்டுமான தொழில்நுட்பத்தை உருவாக்குதல்.
- உற்பத்தி தொழில் நுட்பத்தைப் பகுப்பாய்வு செய்தல்.
- விவசாயம் மற்றும் நீர்ப்பாசனத் தொழில்நுட்பத்தைப் பயன்படுத்துதல்.
- அறிவியல் மற்றும் அறிவியல் தமிழ் மற்றும் தமிழ் கணிப்பொறி தொடர்பான அறிவை நினைவில் கொள்ளுதல்.

அலகு 1 நெசவு மற்றும் பாணைதொழில்நுட்பம்

3

சங்ககாலத்தில் நெசவுத்தொழில் - பாணை தொழில்நுட்பம் - கருப்பு, சிவப்புபாண்டங்கள் - பாண்டுகளில் கீறல்குறியீடுகள்.

அலகு 2 வடிவமைப்பு மற்றும் கட்டிடத்தொழில்நுட்பம்

3

சங்ககாலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்ககாலத்தில் வீட்டுப்பொருட்களில் வடிவமைப்பு சங்ககாலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் - சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் - மாமல்லபுரச்சிற்பங்கள், கோவில்களும் - சோழர் காலத்தாபெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத்தலங்கள் நாயக்கர்காலகோயில்கள் - மாதிரிகட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலைநாயக்கர்மஹால் - செட்டிநாட்டுவீடுகள் - பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ - சாரோசெனிக் கட்டிடக்கலை.

அலகு 3 உற்பத்தித்தொழில்நுட்பம்

3

கப்பல் கட்டும்கலை - உலோகவியல் - இரும்புதொழிற்சாலை - இரும்பை உருக்குதல், எஃகு - வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் - நாணயங்கள் அச்சடிகள் - மணி. உருவாக்கும் தொழிற்சாலைகள் - கல்மணிகள், கண்ணாடிமணிகள் - சுடுமண்மணிகள் - சங்குமணிகள் - எலும்புதுண்டுகள் - தொல்லியல் சான்றுகள் - சிலப்பதிகாரத்தில்மணிகளின்வகைகள்.





அலகு 4 வேளாண்மை மற்றும் நீர்ப்பாசன தொழில்நுட்பம் 3
அணை, குளங்கள், மடகு - சோழர்கால குமுளிதூம்பின் முக்கியத்துவம் - கால்நடை பராமரிப்பு - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மை சார்ந்த செயல்பாடுகள் - கடல்சார் அறிவு - மீன்வளம் - முத்து மற்றும் முத்துகுளித்தல் - பெருங்கடல் குறித்த பண்டைய அறிவு - அறிவுசார்ச்சமுகம்.

அலகு 5 அறிவியல் தமிழ் மற்றும் கணித்தமிழ் 3
அறிவியல் தமிழின் வளர்ச்சி - கணித்தமிழ் வளர்ச்சி - தமிழ்நூல்களை மின்பதிப்பு செய்தல் - தமிழ் மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக்கல்விக்கழகம் - தமிழ்மின்னூலகம் - இணையத்தில் தமிழ் அகராதிகள் - சொற்குவைத்திட்டம்.

TOTAL: 15 PERIODS

முடிவுகள்:

பாடத்தின் முடிவில், மாணவர்கள் அறிந்து கொள்வன:

- பீங்கான் மற்றும் நெசவு தொழில்நுட்பத்தைப் புரிந்து கொள்ளுதல்.
- புதிய வடிவமைப்பு மற்றும் கட்டுமான தொழில்நுட்பத்தை உருவாக்குதல்.
- உற்பத்தித் தொழில்நுட்பத்தை அடையாளம் காணுதல்.
- விவசாயம் மற்றும் நீர்ப்பாசனத்தைப் புரிந்து கொள்ளுதல்.
- அறிவியல் தமிழ் மற்றும் தமிழ்கணிப்பொறி தொடர்பான அறிவை பெறுதல்.

உரை மற்றும் குறிப்பு புத்தகங்கள்:

1. தமிழகவரலாறு - மக்களும்பண்பாடும் - கே. கே. பிள்ளை- (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித்தமிழ் - முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி - வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருளை - ஆற்றங்கரை நாகரீகம். (தொல்லியல் துறை வெளியீடு).
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL - (in print)
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7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
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10. Studies in the History of India with Special Reference to Tamilnadu (Dr.K.K.Pillay)
(Published by: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamilnadu
Textbook and Educational Services Corporation, Tamilnadu.)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference
Book.

Mapping of COs-POs & PSOs

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

1 - Low 2 - Medium 3 - High '-' – No Correlation


Chairman - BoS





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23HSE201

ENGLISH FOR ENGINEERS:THEORY AND PRACTICE

L T P C

(Common to all B.E. & B.Tech. Branches)

3 0 2 4

OBJECTIVES

- To strengthen grammatical accuracy for effective communication.
- To develop listening and reading comprehension skills.
- To improve writing proficiency for academic and formal purposes.
- To train in business and professional correspondence.
- To enhance speaking abilities for social and professional contexts.
- To provide practical exposure through interactive language activities.

UNIT I GRAMMAR

9

Articles - Prepositions - Conditionals - Subject verb agreement- Error Spotting - Active and Passive voice.

UNIT II LISTENING & READING

9

Syllabification -Improving Vocabulary - Reading Newspapers - Listening to Youtube Documentaries- Listening to Podcast- Listening to Motivational Movies.

UNIT III WRITING

9

Checklist - Recommendations - Formal letters – inviting guests – acceptance/declining letters

UNIT IV BUSINESS WRITING

9

E-mail writing - fixing an appointment, cancelling appointment, paper submission for seminars and conferences - Job Application Letter andRésumé.

UNIT V SPEAKING

9

Collaborative task - Turn taking (initiating and responding appropriately) - Negotiating - Exchanging - Suggesting - Comparing and Contrasting - Situational Role-play.

TOTAL: 45 PERIODS





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LIST OF EXERCISES

1. Stage Dynamics (Body Language and Paralanguage - Presentation)
2. Day today real time speaking exposures – Story narration, simple, general topics and incidents.
3. Group Discussion
4. Power Point Presentation (Corporate Skills & Public Speaking)
5. Loud Reading
6. Picture Description
7. Interview Skills (Mock Interview & Interview Etiquette)
8. Case Study Report

TOTAL: 15 PERIODS

OUTCOMES

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

- Use correct grammar in speech and writing.
- Understand and interpret information from various audio and reading sources.
- Write clear, structured, and formal documents.
- Prepare professional emails, résumés, and job-related letters.
- Communicate effectively in group discussions and presentations.
- Apply communication skills confidently in real-time situations.

TEXT BOOKS

1. S. Sumant, "Technical English II", Maven Learning Private Limited, 2012.
2. Joshi, Manmohan, "Soft Skills", First Edition, Bookboon, 2017.

REFERENCES

1. Dr K Elango, Dr. Veena Selvam, Dr. Sujatha Priyadarshini, "Resonance English for Engineers and Technologists", Cambridge University Press, First Edition, 2013.
2. Seely, John. "Oxford Guide to Effective Writing and Speaking", Oxford University Press, UK, 2013.

E-RESOURCES

1. <https://www.fluentu.com/Blog/english/english-small-talk>
2. <https://www.britishcouncil.com>

EXTENSIVE READING

1. Stephen R. Covey, "The 7 Habits of Highly Effective People", Simon & Schuster, 2019.





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Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	1	-	-	-	1	-	-	-	2	3	-	2	-	-
2	1	2	-	2	-	-	-	-	-	3	-	1	-	-
3	1	-	-	-	-	-	-	1	-	3	2	2	-	-
4	-	-	-	-	1	-	-	2	-	3	2	2	-	-
5	-	-	-	-	-	-	-	1	3	3	2	1	-	-
6	-	-	-	-	-	2	2	2	2	3	-	2	-	-
AVG.	1	2	-	2	1	2	2	1.5	2.33	3	2	1.66	-	-

1- Low 2 - Medium 3 - High '-' - No Correlation


Chairman - BoS





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23GEL201

ENGINEERING PRACTICES LABORATORY

L T P C
0 0 4 2

OBJECTIVES

- Drawing pipe line plan; laying and connecting various pipe fittings used in common household plumbing work; Sawing; planing; making joints in wood materials used in common household wood work.
- Wiring various electrical joints in common household electrical wirework.
- Welding various joints in steel plates using arc welding work; Machining various simple processes like turning, drilling, tapping in parts; Assembling simple mechanical assembly of common household equipments; Making a tray out of metal sheet using sheet metal work.
- Soldering and testing simple electronic circuits; Assembling and testing simple electronic components on PCB

GROUP – A (CIVIL & ELECTRICAL)

PART I

CIVIL ENGINEERING PRACTICES

15

PLUMBING WORK:

- a) Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, elbows and other components which are commonly used in household.
- b) Preparing plumbing line sketches.
- c) Laying pipe connection to the suction side of a pump
- d) Laying pipe connection to the delivery side of a pump.
- e) Connecting pipes of different materials: Metal, plastic and flexible pipes used in household appliances.

WOOD WORK:

- a) Sawing,
- b) Planing and,
- c) Making joints like T-Joint, Mortise joint and Tenon joint and Dovetail joint.

Wood Work Study:

- a) Studying joints in door panels and wooden furniture
- b) Studying common industrial trusses using models.





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PART II

ELECTRICAL ENGINEERING PRACTICES

15

- a) Introduction to switches, fuses, indicators and lamps - Basic switch boardwiring with lamp, fan and three pin socket
- b) Staircase wiring
- c) Fluorescent Lamp wiring with introduction to CFL and LED types.
- d) Energy meter wiring and related calculations/ calibration
- e) Study of Iron Box wiring and assembly
- f) Study of Fan Regulator (Resistor type and Electronic type using Diac/Triac/quadrac)
- g) Study of emergency lamp wiring/Water heater

GROUP - B (MECHANICAL AND ELECTRONICS)

PART III

MECHANICAL ENGINEERING PRACTICES

15

WELDING WORK:

- a) Welding of Butt Joints, Lap Joints, and Tee Joints using arc welding.
- b) Practicing gas welding.

BASIC MACHINING WORK:

- a) (simple)Turning
- b) (simple)Drilling
- c) (simple)Tapping

ASSEMBLY WORK:

- a) Assembling a centrifugal pump.
- b) Assembling a household mixer.
- c) Assembling an airconditioner.

SHEET METAL WORK:

- a) Making of a square tray

FOUNDRY WORK:

- a) Demonstrating basic foundry operations.

PART IV

ELECTRONIC ENGINEERING PRACTICES

15

SOLDERING WORK:

- a) Soldering simple electronic circuits and checking continuity.





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ELECTRONIC ASSEMBLY AND TESTING WORK

- Assembling and testing electronic components on a small PCB.

ELECTRONIC EQUIPMENT STUDY:

- Study an elements of smart phone..
- Assembly and dismantle of LED TV.
- Assembly and dismantle of computer/ laptop

TOTAL = 60 PERIODS

OUTCOMES:

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

- Draw pipe line plan; layout and connect various pipe fittings used in common household plumbing work; Sawing; planing; making joints in wood materials used in common household wood work.
- Wire various electrical joints in common household electrical wirework.
- Weld various joints in steel plates using arc welding work; Machining various simple processes like turning, drilling, tapping in parts; Assembling simple mechanical assembly of common household equipments; Making a tray out of metal sheet using sheet metal work.
- Solder and tests simple electronic circuits; Assembling and testing simple electronic components on PCB

Mapping of COs-POs & PSOs

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

1-Low 2-Medium 3-High '-' – No Correlation


Chairman - BoS





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23EEC201

INDIAN LANGUAGE
(EXCEPT MOTHER TONGUE) / FOREIGN LANGUAGE
(Common to all B.E. & B.Tech. Branches)

L T P C
0 0 4 2

OBJECTIVES

- To learn the Hindi alphabet, pronunciation, and basic writing.
- To understand and use basic Hindi grammar correctly.
- To develop basic reading, writing, listening, and speaking skills in Hindi.
- To use Hindi for simple everyday communication.
- To prepare learners to successfully clear the Hindi Examination.

UNIT I वर्णमाला एवं मूलभूत व्याकरण (ALPHABET AND BASIC GRAMMAR)

5

Hindi Vowels (स्वर)- Hindi Consonants (व्यंजन) -Matras (मात्राएँ)- Barakhadi (बारहखड़ी)-Word Formation (शब्दनिर्माण)- Gender (लिंग)- Number (वचन)- Basic Sentence -Formation (सरलवाक्यरचना)

UNIT II शब्दभंडार एवं व्याकरण (VOCABULARY AND GRAMMAR)

7

Nouns (संज्ञा)- Pronouns (सर्वनाम) -Adjectives (विशेषण) -Verbs (क्रिया) -Tenses (काल- Present, Past, Future) - Opposite Words (विलोमशब्द) -Synonyms (पर्यायवाची) -One-word Substitutions (अनेकशब्दोंकेलिएएकशब्द)

UNIT III पठन एवं लेखन कौशल (READING AND WRITING SKILLS)

7

Reading Simple Hindi Passages -Comprehension (गद्यांश) -Paragraph Writing (अनुच्छेदलेखन)- Letter Writing (पत्रलेखन)- Dialogue Writing (संवादलेखन) -Picture Description (चित्रवर्णन) -Dictation Practice (श्रुतिलेख)

UNIT IV दैनिक जीवन में हिंदी (HINDI FOR EVERYDAY COMMUNICATION)

7

Greetings and Introductions -Family Members (परिवार)- Days, Months, Seasons -Numbers (१-१००) -Time and Date - Colours, Fruits, Vegetables - Shopping Conversations - School and Classroom Vocabulary -Common Everyday Conversations

UNIT V साहित्य एवं पुनरावृत्ति (LITERATURE AND REVISION)

4

Simple Poems (कविताएँ)- Short Stories (लघुकथाएँ)- Proverbs and Idioms (मुहावरे एवं लोकोक्तियाँ- basic) -Moral Stories - Translation (English/Tamil to Hindi - Simple Sentences) - Revision of Grammar - Model Question Papers and Practice Tests

TOTAL: 30 PERIODS





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OUTCOMES

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

1. Write basic Hindi words and sentences.
2. Apply fundamental Hindi grammar in simple communication.
3. Develop basic reading, writing, listening, and speaking skills in Hindi.
4. Use Hindi confidently in day-to-day conversations.
5. Develop proficiency required to successfully clear the Hindi Examination.

Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	-	-	-	-	-	-	-	-	-	3	-	1	-	-
2	-	-	-	-	-	-	-	1	1	3	-	1	-	-
3	-	-	-	-	-	-	-	1	2	3	-	2	-	-
4	-	-	-	-	-	1	1	2	2	3	-	1	-	-
5	-	-	-	-	-	-	-	-	-	2	-	3	-	-
AVG.	-	-	-	-	-	1.0	1.0	1.3	1.6	2.8	-	1.6	-	-

1- Low 2 - Medium 3 - High '-' - No Correlation

P. Sankar
Chairman - BoS





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23EEEC201

INDIAN LANGUAGE
(EXCEPT MOTHER TONGUE) / FOREIGN LANGUAGE
(Common to all B.E. & B.Tech. Branches)

L T P C
0 0 4 2

OBJECTIVES

- To learn the German alphabet, pronunciation, and basic communication.
- To understand and use basic German grammar and vocabulary.
- To communicate in German in simple everyday situations.
- To develop basic reading, writing, listening, and speaking skills in German.
- To apply basic German language skills confidently through practice and revision.

UNIT I INTRODUCTION TO GERMAN LANGUAGE

6

German alphabet and pronunciation -Greetings -Self-introduction (Name, age, nationality, profession) - Numbers (0-100) -Days, months, seasons, and dates - Basic classroom expressions - Personal pronouns -Verb **sein** (to be) -Simple sentence formation

UNIT II BASIC GRAMMAR AND VOCABULARY

7

Definite and indefinite articles (der, die, das; ein, eine) - Nouns and gender - Singular and plural forms - Verb conjugation (regular verbs) - Present tense - Question words (Wer, Was, Wo, Wann, Wie, Warum) - Negation (nicht, kein) - Vocabulary: Family, occupations, countries, languages, colors

UNIT III EVERYDAY COMMUNICATION

7

Daily routine - Time and clock reading - Food and beverages - Shopping conversations - Asking for and giving directions -Making simple requests -Modal verbs (möchten, können) - Vocabulary: Home, school, transportation, weather

UNIT IV READING, WRITING, LISTENING, AND SPEAKING SKILLS

5

Reading short dialogues - Listening to simple conversations - Writing short paragraphs- Describing people, places, and objects - Introducing family and friends

UNIT V PRACTICAL APPLICATIONS AND REVISION

5

Travel and tourism vocabulary - At the restaurant - At the railway station and airport -Revision of grammar topics - Translation of simple sentences (English to German and German to English)

TOTAL: 30 PERIODS





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OUTCOMES

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

- Identify the German alphabet and pronounce basic German words correctly.
- Use basic German vocabulary and simple grammar in sentences.
- Practice in simple German for everyday situations.
- Understand basic German texts and conversations.
- Apply basic German language skills confidently in simple real-life situations.

Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	-	-	-	-	-	-	-	-	3	-	1	1	-	-
2	-	-	-	-	-	-	1	1	3	-	1	1	-	-
3	-	-	-	-	-	1	2	2	3	-	2	2	-	-
4	-	-	-	-	-	-	1	2	3	-	2	2	-	-
5	-	-	-	-	-	1	2	2	3	-	2	2	-	-
AVG.	-	-	-	-	-	1.0	1.5	1.7	3.0	-	1.6	1.6	-	-

1- Low 2 - Medium 3 - High '-' - No Correlation

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23EEC201

INDIAN LANGUAGE
(EXCEPT MOTHER TONGUE) / FOREIGN LANGUAGE
(Common to all B.E. & B.Tech. Branches)

L T P C
0 0 4 2

OBJECTIVES

- To learn the Japanese writing system, pronunciation, and basic vocabulary.
- To understand and use basic Japanese grammar and sentence patterns.
- To communicate in Japanese in simple everyday situations.
- To develop basic reading, writing, listening, and speaking skills in Japanese.
- To apply basic Japanese language skills confidently through practice and real-life communication.

UNIT I WRITING SYSTEMS & PRONUNCIATION

5

Hiragana chart reading and writing - Katakana chart reading and writing - Basic pronunciation rules (long vowels, double consonants) - Numbers - Colours, body parts, pets description

UNIT II KANJI & BASIC GRAMMAR

7

First 50 Kanji (Numbers, Time & Days, Basic Directions & People) - Topic marker は (wa) - Identification sentences: Noun + です (desu) - Possession particle の (no) - Inclusion particle も (mo) - Subject marker が (ga) - Direction particles へ (he) and に (ni) - Self-introductions and greetings (Aisatsu) - Numbers, prices, shopping terms - Days, months, relative time - Family members and occupations

UNIT III KANJI & FUNCTIONAL GRAMMAR

8

Next 50 Kanji (Nature, Core Verbs, Adjectives & Nouns) - Verb groups (Group 1, Group 2, Group 3) - Masu forms (Present, Past, Positive & Negative) - Te-form (~て): requests, connecting sentences, continuous actions (~ている) - Adjective conjugation (い & な adjectives) - Desires (~たい) and Invitations (~ましょう)

UNIT IV VOCABULARY & FUNCTIONAL COMMUNICATION

5

Action verbs (daily routine, hobbies) - Adjectives for people, food, and places - Positional words (inside, outside, next to, between) - Transport, travel, and location vocabulary - Simple conversations in everyday situations

UNIT V READING & LISTENING COMPREHENSION

5

Reading short sentences in Hiragana, Katakana, and basic Kanji - Understanding classroom instructions - Listening to slow, clear daily-life conversations - Understanding simple shopping dialogues

TOTAL: 30 PERIODS





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OUTCOMES

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

- Identify the Japanese writing system and pronounce basic Japanese words correctly.
- Use basic Japanese vocabulary and simple grammar in sentences.
- Communicate in simple Japanese for everyday situations.
- Read, write, listen to, and understand basic Japanese texts and conversations.
- Apply basic Japanese language skills confidently in simple real-life situations.

Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	-	-	-	-	1	1	1	-	1	2	-	-	-	-
2	-	-	-	-	1	2	2	-	2	2	-	-	-	-
3	-	-	-	-	2	2	2	1	2	3	-	1	-	-
4	-	-	-	-	2	2	2	1	3	3	-	1	-	-
5	-	-	-	-	1	1	1	1	2	3	-	1	-	-
AVG.	-	-	-	-	1.4	1.6	1.6	1.0	0.2	2.6	-	1.0	-	-

1- Low 2 - Medium 3 - High '-' – No Correlation

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23MDC201

APTITUDE SKILLS
(Common to all Branches)

L T P C
3 0 0 0

OBJECTIVES

- To introduce the basics concepts and techniques of numbers, Highest common factor and Least common multiple.
- To develop the use of decimal fraction and problems on ages.
- To introduce the basic concepts of time, work, distance, calendar and clock.
- To explain the student with the concept of simple and compound interest.
- To provide the knowledge of polynomial and quadratic equations.

UNIT I NUMBERS, HIGHEST COMMON FACTOR AND LEAST COMMON MULTIPLE 9

Numbers and their basic classification – Types of number – Basic operations of numbers – Progression – Tests of divisibility – Highest common factor – Least common multiple

UNIT II DECIMAL FRACTION AND PROBLEMS BASED ON AGES 9

Decimal fraction – Types of fraction – Comparison of fractions – Inserting fractions in between two given fractions – Relation between decimal fraction and normal fraction – Conversion of a decimal fraction into a vulgar fraction – Types of decimals – Conversion of mixed recurring decimal into a vulgar fraction – Standard form of decimal – Problems based on ages.

UNIT III TIME, WORK, DISTANCE, CALENDER AND CLOCK 9

General rule for time and work – General rule for work and wages – Speed – Unit of speed – Average speed – Some useful relations – Problems on Trains – Calendars and clocks – Odd days – Ordinary year – Leap year.

UNIT IV SIMPLE INTEREST, COMPOUND INTEREST AND ELEMENTARY ALGEBRA 9

Simple interest – Compound interest – Some useful relations – Difference between compound interest and simple interest – Short cut methods to solve special types of problems – Elementary Algebra and averages.

UNIT V POLYNOMIAL AND QUADRATIC EQUATIONS 9

Polynomial introduction – Degree of a polynomial – Types of polynomial – Operations on polynomial – Remainder and factor theorem – Quadratic equation – Pure Quadratic equation – Discriminant – Roots of the Quadratic equations – Solution of Quadratic equation – Framing of a Quadratic equation – Special types of roots.

TOTAL: 45 PERIODS





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OUTCOMES

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

- Apply basic concepts and techniques highest common factor and least common multiple on numbers.
- Apply the concept of decimal fraction and problems on ages.
- Apply the concept of time, work, distance, calendar and clock.
- Develop proficiency in simple interest, compound interest and basic algebraic skills.
- Explain the concepts and properties of polynomial and quadratic equations.

TEXT BOOKS

1. Agarwal R.S., "Quantitative Aptitude", S. Chand & Company Ltd, New Delhi, 2012.
2. Dinesh Khattar, "Quantitative Aptitude for competitive examinations ", Pearson India Education Services Pvt. Ltd., New Delhi, 2019.

REFERENCES

1. Praveen R.V., "Quantitative Aptitude and Reasoning", PHI Learning Private Limited, Delhi, 2013.
2. Gupta P, "A unique Approach to Quantitative Aptitude ", Unique Publishers (I) Pvt. Ltd, New Delhi, 2017.

E-RESOURCES

1. <https://youtube.com/playlist?list=RDQM5XI256aOq24>
2. <https://youtu.be/KE7tQf9spPg>


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SEMESTER III

23MAT304	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	L	T	P	C
	[Common to Civil, Mech, R&A and PT]	3	1	0	4

OBJECTIVES

- To introduce the basics of Fourier transforms and their properties.
- To compute the Z-transforms of standard functions and their properties.
- To provide knowledge of Fourier series and half-range series.
- To explore the basic concepts of partial differential equation.
- To explain the classification and applications of partial differential equations.

UNIT I FOURIER TRANSFORMS

9+3

Statement of Fourier integral theorem – Fourier transform – Fourier sine and cosine transforms – Properties of Fourier transform – Convolution theorem for Fourier transform – Parseval's identity for Fourier transform.

UNIT II Z-TRANSFORMS AND DIFFERENCE EQUATIONS

9+3

Z-transforms: Some standard Z-transforms – Elementary properties – Some useful Z-transforms and inverse Z-transforms – Convolution theorem – Evaluation of Inverse Z-transforms by partial fraction method – Application to difference equations.

UNIT III FOURIER SERIES

9+3

Euler's formulae – Conditions for a Fourier expansion – Functions having points of discontinuity – Odd and even function – Half range series – Parseval's formula – Practical Harmonic analysis.

UNIT IV PARTIAL DIFFERENTIAL EQUATIONS

9+3

Formation of partial differential equations – Singular integrals – Solutions of standard types of first order partial differential equations – Lagrange's linear equation – Linear partial differential equations of second and higher order with constant coefficients of homogeneous types.

UNIT V APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS

9+3

Classification of partial differential equations – Method of separation of variables – Fourier series solutions of one dimensional wave equation – One dimensional equation of heat conduction – Steady state solution of two dimensional equation of heat conduction.

TOTAL:45+15 PERIODS





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OUTCOMES

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

- Apply various Fourier transform techniques in physical problems of engineering.
- Solve engineering problems using the concept of Z transforms.
- Analyze Fourier series for periodic functions and functions with discrete data.
- Apply the standard types of partial differential equations.
- Evaluate the Fourier series techniques in application of partial differential equations.

TEXT BOOKS

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, Fourty Fourth Edition, 2022.
2. Narayanan S., Manicavachagom Pillay.T.K and Ramanaiah.G., "Advanced Mathematics for Engineering Students", S.Viswanathan Publishers, Fourth Edition, 1998.

REFERENCES

1. N.P. Bali. and Manish Goyal, "A Textbook of Engineering Mathematics", Laxmi Publications Pvt. Ltd, Nineth Edition, 2014.
2. Kreyszig Erwin, "Advanced Engineering Mathematics ", John Wiley and Sons, Tenth Edition, 2016.

E-RESOURCES

1. <https://archive.nptel.ac.in/courses/111/102/111102129/#> (Transforms)
2. <https://archive.nptel.ac.in/courses/111/103/111103021/> (Partial differential equations)

Mapping of COs-POs & PSOs

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

1-Low 2-Medium 3-High '-' – No Correlation

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23CET301

CONSTRUCTION MATERIALS AND PRACTICES

L T P C

3 0 0 3

OBJECTIVES

- To inculcate the basic of bricks; cement and concrete blocks.
- To explore the characteristics of lime, cement, aggregates and mortar.
- To enhance the fundamentals of timber and building component.
- To instruct the basic concepts of modern materials.
- To familiarize with the importance of good concrete construction.

UNIT I STONES, BRICKS AND CONCRETE BLOCKS

9

Stone as Building Material – Criteria for Selection – Tests on Stones – Deterioration and Preservation of Stone Work – Bricks – Classification – Manufacturing of Clay and Fly Ash Bricks – Tests on Bricks– Compressive Strength – Water Absorption – Efflorescence – Bricks for Special Use – Refractory Bricks – Cement, Concrete Blocks – Light weight Concrete Blocks.

UNIT II LIME, CEMENT, AGGREGATES AND MORTAR

9

Lime: Characteristics, Classification, Manufacturing Process – Cement: Ingredients, Types and Grades, Properties, Manufacturing process, Testing of Cement – Industrial By – products: Fly ash – Aggregates: Natural Stone Aggregates, Classification Characteristics of Aggregates, Testing of Aggregates – Cement Mortar: Functions, Uses of Mortar, Types of Mortar, Ingredients of Mortar, Tests.

UNIT III TIMBER AND OTHER MATERIALS

9

Timber – Market Forms – Industrial Timber– Plywood – Veneer – Thermacole – Panels Laminates–Steel – Aluminum and Other Metallic Materials – Composition–Aluminium composite panel–Uses– Market forms – Mechanical treatment – Paints – Varnishes – Distempers – UPVC in doors, windows, MDF materials – Paneling materials and false ceiling techniques.

UNIT IV MODERN MATERIALS

9

Glass – Ceramics – Sealants for Joints – Fibre Glass Reinforced Plastic – Clay Products – Refractories – Composite Materials – Types – Applications of Laminar Composites – Fibre Textiles – Geo – membranes and Geo – textiles for Earth Reinforcement – Recycled Aggregates.

UNIT V CONSTRUCTION PRACTICES

9

Specifications ,Details and Sequence of activities and Construction Co-ordination– Site Clearance – Marking – Earthwork – Masonry – Stone masonry – Bond in Masonry – Concrete Hollow Block Masonry – Flooring – Damp Proof Courses – Construction Joints – Movement and Expansion Joints – Precast Pavements – Building Foundations – Basements Temporary Shed – Centering and Shuttering – Slip forms – Scaffoldings –De-shuttering Forms – Laying Brick – Weather and Waterproof – Roof Finishes – Acoustic and Fire Protection.

TOTAL: 45 PERIODS





OUTCOMES

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

- Identify the suitable construction materials for building construction.
- Apply the knowledge on lime, cement, aggregates and mortar.
- Construct the basic properties of timber and other materials.
- Analyze the appropriate advanced and modern building materials for various construction applications.
- Examine the site clearance and bond in masonry.

TEXT BOOKS

1. R.K.Gupta, "Civil Engineering Materials and Practices", Jain Brothers, Fifth Edition, 2019.
2. Varghese P.C, "Building Materials", Prentice Hall India, Second Edition, 2020.
3. Rajput R.K, "Engineering Materials", S Chand and Company, Third Edition, 2019.

REFERENCES

1. Taylor G.D, "Materials in Construction: An Introduction", Longman Inc, Third Edition, 2020.
2. Gambhir M.L and Neha Jamwal, "Building Materials, products, properties and systems", Tata McGraw Hill Educations Pvt. Ltd, First Edition, 2020.
3. S.K Khurma, "Building Construction", S.Chand Publishers, Second Edition, 2021.

E-RESOURCES

1. [https://nptel.ac.in/courses/105/102/105102088/\(Building Materials and Construction\)](https://nptel.ac.in/courses/105/102/105102088/(Building%20Materials%20and%20Construction))
2. [https://nptel.ac.in/noc/courses/noc21/SEM1/noc21-ce10/ \(Basic construction materials\)](https://nptel.ac.in/noc/courses/noc21/SEM1/noc21-ce10/(Basic%20construction%20materials))

Mapping of COs-POs & PSOs

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

1-Low 2-Medium 3-High '-' – No Correlation

Chairman - BoS





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23CET302

APPLIED GEOLOGY

L T P C

3 0 0 3

OBJECTIVES

- To inculcate the branches of geology and its importance to civil engineering.
- To acquire the physical properties and formation of minerals.
- To impart knowledge on the classification of rocks and engineering properties of rocks.
- To enhance the geological maps, study of structures, folds, faults, joints and geophysical methods.
- To familiarize the geological investigation for dams, tunnels etc.

UNIT I PHYSICAL GEOLOGY

9

Geology in Civil Engineering – Branches of Geology – Structure of Earth and its composition
Weathering of rocks – Scale of weathering – Soils - Landforms and processes associated with
River, Wind, Groundwater and Sea – Relevance to Civil Engineering. Plate tectonics – Earth
quakes – Seismic zones in India.

UNIT II MINERALOGY

9

Physical properties of minerals – Quartz group, Feldspar group, Pyroxene - Hypersthene and
Augite, Amphibole – Hornblende, Mica – Muscovite and Biotite, Calcite, Gypsum and Clay
minerals.

UNIT III PETROLOGY

9

Classification of rocks, Distinction between Igneous, Sedimentary and Metamorphic rocks.
Engineering properties of rocks. Description, Occurrence, Engineering properties, Distribution
and Uses of Granite, Dolerite, Basalt, Sandstone, Limestone, Laterite, Shale, Quartzite, Marble,
Slate, Gneiss and Schist.

UNIT IV STRUCTURAL GEOLOGY AND GEOPHYSICAL METHODS

9

Geological Maps – Attitude of Beds, Study of Structures – Folds, Faults and Joints – Their
Bearing on Engineering Construction. Geophysical methods – Seismic and Electrical methods
for Subsurface Investigations.

UNIT V APPLICATION OF GEOLOGICAL INVESTIGATIONS

9

Remote Sensing for Civil Engineering applications; Geological conditions necessary for
designing and construction of Dams, Reservoirs, Tunnels and Road cuttings - Hydrogeological
investigations and Mining - Coastal protection structures. Investigation of Landslides, Causes
and mitigation.

TOTAL : 45 PERIODS





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OUTCOMES

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

- Apply geological principles related to the Earth's structure, composition and branches of geology in civil engineering projects.
- Examine the physical properties of minerals.
- Identify the types of rocks, their distribution and uses.
- Analyze the methods of study on geological structure and subsurface investigations.
- Examine the application of geological investigation in projects such as dams, reservoirs, tunnels and road cuttings.

TEXT BOOKS

1. Chenna Kesavulu N, "Textbook of Engineering Geology", Macmillan Publishers India Limited, Third Edition, 2019.
2. Parbin Singh A, "Engineering and General Geology", S.K.Kataria and Sons, Ninth Edition, 2019.
3. Varghese P.C, "Engineering Geology for Civil Engineers", Prentice Hall of India Learning Private Limited, Third Edition, 2020.

REFERENCES

1. S.K.Duggal, " Engineering Geology", McGraw Hill Book company, Forth Edition, 2019.
2. Blyth F.G.H and de Freitas M.H, "Geology for Engineers", Edward Arnold, Fifth Edition, 2020.
3. Krynine and Judd, "Engineering Geology and Geotechniques", McGraw Hill Book Company, Eighth Edition, 2019.

E-RESOURCES

1. [https://nptel.ac.in/courses/105/105/105105106/\(Introduction to Engineering Geology\)](https://nptel.ac.in/courses/105/105/105105106/(Introduction%20to%20Engineering%20Geology))
2. [https://archive.nptel.ac.in/courses/105/105/105105106/\(Geologic Structures\)](https://archive.nptel.ac.in/courses/105/105/105105106/(Geologic%20Structures))

Mapping of COs-POs & PSOs

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

1-Low 2-Medium 3-High '-' – No Correlation

Chairman - B





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23CET303

SOIL MECHANICS

L T P C
3 0 0 3

OBJECTIVES

- To impart knowledge on the basic properties and classification of soil.
- To inculcate the effective stress concepts of soil.
- To familiarize the vertical stress distribution and settlement in soil.
- To explore the behaviour of soil under shear.
- To acquire the stability of slopes.

UNIT I SOIL CLASSIFICATION AND COMPACTION

9

Nature of Soil – Problems with Soil – Phase Relation – Sieve Analysis – Sedimentation Analysis – Atterberg Limits – Classification for Engineering Purposes – BIS Classification System – Soil Compaction – Factors Affecting Compaction – Laboratory Compaction Methods.

UNIT II SOIL WATER AND PERMEABILITY

9

Soil Water – Various Forms – Influence of Clay Minerals – Capillary Rise – Suction – Effective Stress – Concepts in Soil – Total, Neutral and Effective Stress Distribution in Soil – Permeability – Darcy's Law – Permeability Measurement in the Laboratory – Quick Sand Condition – Seepage – Introduction to Flow Nets – Properties and Uses – Application to Simple Problems.

UNIT III STRESS DISTRIBUTION, COMPRESSIBILITY AND SETTLEMENT

9

Stress Distribution – Soil Media – Boussinesq Theory – Use of Newmark's Influence Chart – Components of Settlement – Immediate and Consolidation Settlement – Terzaghi's One Dimensional Consolidation Theory – Computation of Rate of Settlement. – $\sqrt{t}$ and $\log t$ Methods – e - $\log p$ Relationship – Factors Influencing Compression Behaviour of soils.

UNIT IV SHEAR STRENGTH

9

Shear strength of Cohesive and Cohesion less Soils – Mohr – Coulomb Failure Theory – Saturated Soil – Strength Parameters – Measurement of Shear Strength, Direct Shear, Tri-axial Compression, UCC and Vane Shear Tests – Types of Shear Tests Based on Drainage and their Applicability – Drained and Un-drained Behavior of Clay and Sand.

UNIT V SLOPE STABILITY

9

Slope Failure Mechanisms – Modes – Infinite Slopes – Finite Slopes – Total and Effective Stress Analysis – Stability Analysis for Purely Cohesive and $C - \phi$ Soil – Method of Slices – Modified Bishop's Method – Friction Circle Method – Stability Number – Problems – Slope Protection Measures.

TOTAL: 45 PERIODS





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OUTCOMES

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

- Classify the soil and assess the engineering properties, based on index properties.
- Identify the stress concepts in soils.
- Examine the settlement in soils.
- Develop the shear strength of soil.
- Analyze the both finite and infinite slopes.

TEXTBOOKS

1. K. R. Arora, "Soil Mechanics and Foundations", Standard Publishers, Seventh Edition, 2019
2. Gopal Ranjan and Rao A.S.R., "Basic and applied Soil Mechanics", New Age International, Third Edition, 2019.
3. Punmia B.C, Ashok Kumar Jain, Arun Kumar Jain, "Soil Mechanics and Foundations", Laxmi Publications, Sixteenth Edition, 2021.

REFERENCES

1. McCarthy D.F, "Essentials of Soil Mechanics and Foundations: Basic Geotechnics", Prentice Hall of India, Fourth Edition, 2019.
2. Muni Budhu, "Soil Mechanics and Foundations", John Wiley & Sons Inc, Third Edition 2022.
3. Venkatramaiah C, "Geotechnical Engineering", New Age International, Sixth Edition, 2021.

E-RESOURCES

1. [https://nptel.ac.in/courses/105/101/105101084/\(Soil Mechanics\)](https://nptel.ac.in/courses/105/101/105101084/(Soil%20Mechanics))
2. <http://www.nptelvideos.in/2012/11/soil-mechanics.html> (Soil Mechanics)

Mapping of COs-POs & PSOs

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

1-Low 2-Medium 3-High '-' – No Correlation


Chairman - BoS





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23CEE301

SURVEYING AND LEVELLING
(Lab Embedded Theory Course)

L T P C
3 0 2 4

OBJECTIVES

- To explore the principles and concepts of chain and compass surveying.
- To acquire the concept of levelling and contours in field measurement.
- To enhance the elevation of objects by using theodolite survey.
- To develop the concept of tacheometric and triangulation survey.
- To impart the measurements with modern digital instruments.
- To gain knowledge the survey field exercises for land measurement.

UNIT I CHAIN AND COMPASS SURVEYING

9

Definition – Principles – Classification – Plan and map – Scales – Ranging and chaining – Corrections – Types of Compass – Bearing – Types – True and magnetic bearing – Systems and conversions – Dip and declination – Local attraction – Adjustment of errors.

UNIT II LEVELLING AND CONTOURING

9

Level line – Horizontal line – Spirit level – Mean sea level – Sensitiveness – Bench marks – Levelling instruments – Types of Levelling – Booking and reduction of levels – Curvature and refraction – Calculation of areas and volumes – Contouring – Characteristics and uses.

UNIT III THEODOLITE SURVEY AND CURVE SETTING

9

Theodolite survey – Omitted measurements – Curves – types – components and elements of simple curve – Setting out a simple curve by Rankine's method and two theodolite method – Transition curves – Functions and requirements.

UNIT IV TACHEOMETRIC AND TRIANGULATION SURVEY

9

Tacheometric systems – Tangential and stadia methods – Stadia systems – Determination of stadia constants – Anallactic Lens – Triangulation – Corrections – Satellite station – Reduction to centre – Trigonometric Levelling – Single and reciprocal observations.

UNIT V DIGITAL SURVEY

9

Introduction, Aerial Photogrammetry, Terrestrial Photogrammetry, Stereoscopy, Types of EDM Instruments - Total station – Principles of Remote Sensing and its Applications - Basics of GIS & GPS.

LIST OF EXPERIMENTS

1. Chain Surveying: Determination of given area using chain and cross staff survey.
2. Compass Surveying: Determination of bearings and calculation of included angles using compass.
3. Levelling: Determination of elevation of given points by fly leveling.
4. Levelling: Determination of height difference between the points by conducting differential and reciprocal levelling.
5. Theodolite Surveying: Determination of elevation between two points condition by base is accessible and Inaccessible
6. Tachometric Surveying :Determination of Stadia Constant





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7. Tachometric Surveying: Determination of distance and elevation by stadia method
8. Tachometric Surveying: Determination of distance and elevation by tangential method.
9. Total Station: Measurement of distance, elevation and area.
10. Total Station: Setting out works – foundation, column marking

TOTAL: 45+15=60 PERIODS

OUTCOMES

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

- Apply the chain and compass surveying.
- Analyze the levels and to calculate the area and volume.
- Construct the adjustments of closed traverse for errors and setting out the simple curves.
- Examine the tacheometric and triangulation surveying.
- Identify the principles, concepts and applications of digital surveying
- Construct the practical knowledge on handling basic survey instruments including theodolite, tacheometry and total station.

TEXT BOOKS

1. Punmia B.C, "Surveying, Vol. I and II", Laxmi Publications, Seventeenth Edition, 2019.
2. Basak N.N, "Surveying and Levelling", Tata McGraw Hill Publishing Company Ltd., Second Edition 2019.
3. Kanetkarand T P, Kulkarni S.V, "Surveying and Levelling", Parts 1 & 2, Pune Vidyarthi Griha Prakashan, Fifth Edition, 2020.

REFERENCES

1. Kanetkar T. P, "Surveying and Levelling Vols. I & II", United Book Corporation, Third Edition, 2020.
2. Roy S K, "Fundamentals of Surveying", Prentice Hall of India, Fifth Edition, 2019.
3. Subramanian R, "Surveying and Levelling", Oxford University Press, Second Edition 2021.

E-RESOURCES

1. [https://nptel.ac.in/courses/105/107/105107122/\(Surveying\)](https://nptel.ac.in/courses/105/107/105107122/(Surveying))
2. [https://nptel.ac.in/courses/105/104/105104101/\(Surveying\)](https://nptel.ac.in/courses/105/104/105104101/(Surveying))

Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	3	3	3	-	1	1	-	-	1	1	3	3	1
2	3	3	3	3	-	1	1	-	-	1	1	3	3	1
3	3	3	3	3	-	1	1	-	-	1	1	3	3	1
4	3	3	3	3	-	1	1	-	-	1	1	3	3	1
5	3	3	3	3	-	1	1	-	-	1	1	3	3	1
6	3	3	3	3	-	1	1	-	-	1	1	3	3	1
AVG.	3	3	3	3	-	1	1	-	-	1	1	3	3	1

1-Low 2-Medium 3-High '-' – No Correlation

Chairman - BBS





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23CEE302

MECHANICS OF MATERIALS

L T P C

(Lab Embedded Theory Course)

3 0 2 4

OBJECTIVES

- To instruct the fundamental concepts of Stress, Strain and deformation of solids.
- To impart knowledge the shear force and bending moment.
- To enhance the bending stress and shear stress distribution in various sections.
- To explore the deflection of beams under the application of external forces.
- To gain knowledge on the performance of columns.
- To acquire practical skills on the behavior of various materials under tension , compression, shear and torsion.

UNIT I STRESS, STRAIN AND DEFORMATION

9

Introduction – Stress, Strain – Types – Elastic limit – Hooke's law – Stress Strain curves – Elastic constants and its relationships–Deformation of simple and compound bars– Principles of Superposition – Varying cross section – Thermal stress in composite bars – Principal stresses and principal planes.

UNIT II SHEAR FORCE AND BENDING MOMENT

9

Types of beams – Types of loads, supports and reactions–Bending moment and Shear force – Sign conventions – Point of contraflexure–Shear force and bending moment diagrams for concentrated load, uniformly distributed load and uniformly varying load.

UNIT III STRESSES IN BEAMS AND SHAFTS

9

Types of Bending stresses – Theory of simple bending – Derivation of flexure/bending equation – Bending stress distribution – Position of N.A and centroidal axis – Stiffness equation –Theory of Pure Torsion – Assumptions – Torsion equation– Shear stress distribution in circular section due to torsion.

UNIT IV DEFLECTION OF BEAMS

9

Beam Deflection – Slope - Sign conventions - Double integration method –Macaulay's Method – Moment area method – Mohr's Theorems – Conjugate beam method.

UNIT V THEORY OF COLUMN

9

Column and strut – Classification of columns – Slenderness ratio – Buckling load and factor – Effective length – Various end conditions–Euler's theory, assumptions, formula and limitations – Rankine's formula – Crippling load and Safe load.

LIST OF EXPERIMENTS

1. Tension test on mild steel / deformed steel bars.
2. Deflection test on Simply Supported Beams of(a) wood and (b) steel.
3. Impact Test on mild steel by performing Izod/Charpy tests.
4. Torsion test on mild steel bar to determine the Modulus of Rigidity.
5. Double Shear test on metal.





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6. Hardness test on metals (Rockwell and Brinell Hardness Tests).
7. Compression test on helical spring.
8. Deflection test on carriage spring.
9. Fatigue test on steel rod
10. Thermal expansion test on steel rod

TOTAL: 45+15 = 60 PERIODS

OUTCOMES

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

- Analyze the various types of stresses and strains developed in the member.
- Construct the shear force and bending moment diagram for beams under various loading conditions.
- Examine the bending and shear stresses in beams and shafts.
- Identify the slope and deflection of beams by different methods.
- Classify the failure modes for various types of columns.
- Apply the mechanical properties of steel.

TEXT BOOKS

1. Rajput R.K. "Strength of Materials", S. Chand & Company, Seventh Edition, 2019.
2. Bansal R.K. "Strength of Materials", Laxmi Publications, Sixth Edition, 2020.
3. Rattan.S.S., "Strength of Materials", Tata McGraw Hill Education Pvt. Ltd., Third Edition, 2019.

REFERENCES

1. William A .Nash, "Theory and Problems of Strength of Materials", Schaums Outline Series, Tata McGraw Hill Publishing Company Ltd, Eighth Edition, 2020.
2. Egor P Popov, "Engineering Mechanics of Solids", Prentice Hall of India, Fifth Edition, 2019.
3. Subramanian R, "Strength of Materials", Oxford University Press, Second Edition, 2021.

E-RESOURCES

1. [https://nptel.ac.in/courses/112/107/112107146\(Strength of Materials\)](https://nptel.ac.in/courses/112/107/112107146(Strength of Materials))
2. [https://nptel.ac.in/courses/105/105/105105108/\(Introduction to Strength of Materials\)](https://nptel.ac.in/courses/105/105/105105108/(Introduction to Strength of Materials))

Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	3	2	3	-	3	2	-	-	2	1	2	3	3
2	3	3	2	3	-	3	2	-	-	2	1	2	3	3
3	3	3	2	3	-	3	2	-	-	2	1	2	3	3
4	3	3	2	3	-	3	2	-	-	2	1	2	3	3
5	3	3	2	3	-	3	2	-	-	2	1	2	3	3
6	3	3	2	3	-	3	2	-	-	2	1	2	3	3
AVG.	3	3	2	3	-	3	2	-	-	2	1	2	3	3

1-Low 2-Medium 3-High '-' – No Correlation


Chairman - BOS





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23EEC301

PROFESSIONAL DEVELOPMENT

L T P C
0 0 2 1

OBJECTIVES

To be proficient in important Microsoft Office tools: MS WORD, EXCEL and POWERPOINT.

- To be proficient in using MS WORD to create quality technical documents, by using standard templates, widely acceptable styles and formats, variety of features to enhance the presentability and overall utility value of content.
- To be proficient in using MS EXCEL for all data manipulation tasks including the common statistical, logical, mathematical etc., operations, conversion, analytics, search and explore, visualize, interlink, and utilizing many more critical features offered.
- To be able to create and share quality presentations by using the features of MS PowerPoint, including: organization of content, presentability, aesthetics, using media elements and enhance the overall quality of presentations.

MS WORD:

10 Hours

Create and format a document
Working with tables
Working with Bullets and Lists
Working with styles, shapes, smart art, charts
Inserting objects, charts and importing objects from other office tools
Creating and Using document templates
Inserting equations, symbols and special characters
Working with Table of contents and References, citations
Insert and review comments
Create bookmarks, hyperlinks, endnotes footnote
Viewing document in different modes
Working with document protection and security
Inspect document for accessibility





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MS EXCEL:

10 Hours

- Create worksheets, insert and format data.
- Work with different types of data: text, currency, date, numeric etc.
- Split, validate, consolidate and Convert data
- Sort and filter data
- Perform calculations and use functions: (Statistical, Logical, Mathematical, date, Time etc.)
- Work with Lookup and reference formulae
- Create and Work with different types of charts
- Use pivot tables to summarize and analyze data
- Perform data analysis using own formulae and functions
- Combine data from multiple worksheets using own formulae and built-in functions to generate results
- Export data and sheets to other file formats
- Working with macros
- Protecting data and Securing the workbook

MS POWERPOINT:

10 Hours

- Select slide templates, layout and themes
- Formatting slide content and using bullets and numbering
- Insert and format images, smart art, tables, charts
- Using Slide master, notes and handout master
- Working with animation and transitions
- Organize and Group slides
- Import or create and use media objects: audio, video, animation
- Perform slideshow recording and Record narration and create presentable videos

TOTAL: 30 PERIODS





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OUTCOMES

Upon completion of the course, Students will be able to,

- Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements.
- Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding.
- Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects.

Mapping of COs-POs & PSOs

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2	3	3	2	2	3	-	-	-	-	-	2	1	2	2
3	2	1	2	-	3	-	-	-	-	2	3	-	2	2
AVG.	2.3	1.6	2	2	3	-	-	-	-	1.5	2.6	1	2	2

1-Low, 2-Medium, 3-High, "-" - No Correlation


Chairman - BoS





SEMESTER IV

23CET401

REINFORCED CONCRETE DESIGN

(IS 456: 2000 and SP 16 Code Books are to be Permitted)

L T P C

3 1 0 4

OBJECTIVES

- To inculcate the different types of philosophies related to design of basic structural elements.
- To impart knowledge on bond, anchorage, shear & torsion.
- To familiarize with the design of slab and staircase.
- To enhance the axial, uniaxial and biaxial eccentric loadings column.
- To foster the footing with reference to Indian standard code of practice.

UNIT I METHODS OF DESIGN OF CONCRETE STRUCTURES

9+3

Objective of structural design – Steps in RCC Structural Design Process – Type of Loads on Structures and Load combinations – Code of practices and Specifications – Concept of Working Stress Method, Ultimate Load Design and Limit State Design Methods for RCC – Properties of Concrete and Reinforcing Steel – Analysis and Design of Singly reinforced Rectangular beams by working stress method – Limit State philosophy as detailed in IS code – Advantages of Limit State Method over other methods – Analysis and design of singly and doubly reinforced rectangular beams by Limit State Method.

UNIT II LIMIT STATE DESIGN FOR BOND, ANCHORAGE SHEAR & TORSION

9+3

Behaviour of RC members in Shear, Bond and Anchorage – Design requirements as per current code – Behaviour of Rectangular RC beams in Shear and Torsion – Design of RC members for combined Bending, Shear and Torsion.

UNIT III LIMIT STATE DESIGN FOR FLEXURE AND STAIRCASE

9+3

Analysis and design of one way and two way rectangular slab subjected to uniformly distributed load for various boundary conditions and corner effects. Analysis and design of Flanged beams. Types of Staircases – Design of dog-legged Staircase.

UNIT IV LIMIT STATE DESIGN OF COLUMNS

9+3

Types of columns – Axially Loaded columns – Design of short Rectangular, Square and circular columns – Design of Slender columns – Design for Uniaxial and Biaxial bending using Column Curves.

UNIT V LIMIT STATE DESIGN OF FOOTING

9+3

Design of wall footing – Design of axially and eccentrically loaded rectangular footing – Design of combined rectangular footing for two columns only.

TOTAL: 45+15=60 PERIODS





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OUTCOMES

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

- Analyze the various design methodologies for the design of RCC elements.
- Examine the shear, bond and torsion effects in beams.
- Design the various types of slabs, flanged beams and staircase by limit state method.
- Construct the columns for axial, uniaxial and biaxial eccentric loadings.
- Design of footing by limit state method.

TEXT BOOKS

1. Subramanian N, "Design of Reinforced Concrete Structures", Oxford University Press, Fifth Edition, 2019.
2. Krishnaraju N, "Design of Reinforced Concrete Structures", CBS Publishers & Distributors Pvt. Ltd., Sixth Edition, 2022.
3. Varghese P.C, "Limited State Design of Reinforced Concrete", Prentice Hall of India, Third Edition, 2020.

REFERENCES

1. Shah V L Karve S R, "Limit State Theory and Design of Reinforced Concrete Structures", S Chand Publishers, Sixth Edition, 2020.
2. Punmia.B.C, Ashok Kumar Jain, Arun Kumar Jain, "Limit State Design of Reinforced Concrete", Laxmi Publication Pvt. Ltd., Forth Edition, 2021.
3. Sinha N C Roy S K, "Fundamentals of reinforced concrete", S Chand Publishers, Third Edition, 2019.

E-RESOURCES

1. <https://nptel.ac.in/courses/105/105/105105105/> (Design of reinforced concrete structures)
2. <https://nptel.ac.in/courses/105/105/105105104/> (Design of concrete structures)

Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	3	3	3	-	2	1	1	1	1	1	2	3	3
2	3	3	3	3	-	2	1	1	1	1	1	2	3	3
3	3	3	3	3	-	2	1	1	2	1	2	2	3	3
4	3	3	3	3	-	2	1	1	2	1	2	3	3	3
5	3	3	3	3	-	2	1	1	2	1	2	3	3	3
AVG.	3	3	3	3	-	2	1	1	1.6	1.0	1.6	2.4	3	3

1-Low 2-Medium 3-High '-' – No Correlation


Chairman - BoS





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23CET402

STRUCTURAL ANALYSIS

L T P C

3 0 0 3

OBJECTIVES

- To inculcate the basic concepts of structural analysis and the classical methods for analysis of buildings.
- To impart knowledge on the method of drawing influence lines and its uses in various applications like beams, bridges and plane trusses.
- To familiarize with the analysis procedure using slope deflection method
- To enhance the analysis procedure using moment distribution method
- To acquire knowledge on three hinged and two hinged arches.

UNIT I FUNDAMENTALS OF STRUCTURAL ANALYSIS

9

Determination of static indeterminacy and kinematic indeterminacy – Deficiency for beams, frames and pin jointed trusses – Behaviors of Structures – Principle of superposition – Analysis of pin jointed space trusses by method of tension coefficient.

UNIT II INFLUENCE LINE FOR STATICALLY DETERMINATE STRUCTURES

9

Influence line for Statically Determinate Beams for Bending moment and Shear force – Muller Breslau's Principles – Influence lines for forces in members for statically determinate trusses – Parallel chord truss – Reversal of stresses – Focal length.

UNIT III SLOPE DEFLECTION METHOD

9

Slope deflection equations – Equilibrium conditions – Analysis of continuous beams and rigid frames – Rigid frames with inclined members – Support settlements – Symmetric frames with symmetric and skew – Symmetric loadings.

UNIT IV MOMENT DISTRIBUTION METHOD

9

Stiffness and carry over factors – Distribution and carryover of moments – Analysis of continuous beams – Plane rigid frames with and without sway – Support settlement – Symmetric frames with symmetric and skew – Symmetric loadings.

UNIT V ANALYSIS OF ARCHES

9

Analysis of three hinged arches of parabolic and circular profiles – Analysis of two hinged symmetric parabolic and circular arches. Settlement and temperature effects – Influence lines for bending moment, normal thrust and radial shear at sections of an arch.

TOTAL: 45 PERIODS





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OUTCOMES

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

- Identify the static and kinematic indeterminacy of beam, truss and frame.
- Construct the influence line diagrams for determinate and indeterminate beams.
- Analyze the structures for internal forces by theorem of three moments and slope deflection method.
- Construct the structures for internal forces by Moment distribution method.
- Analyze the three hinged, two hinged, parabolic and circular arches.

TEXTBOOKS

1. Bhavikatti S.S, "Structural Analysis – Vol. I & II", Vikas Publishing Private Limited, Second Edition, 2019
2. Menon D, "Structural Analysis", Alpha Science International Limited, Ninth Edition, 2020.
3. Punmia B.C, Ashok Kumar J, Arun Kumar J, "Theory of Structures", Laxmi Publications, Third Edition, 2021.

REFERENCES

1. Wang, C.K, "Analysis of Indeterminate Structures", Tata McGraw-Hill Publishing Company, Sixth Edition, 2019.
2. Pandit.G.S, "Theory of Structures, Vol. – I", McGraw Hill Education Private Limited, Fifth Edition, 2017.
3. Reddy.C.S, "Basic Structural Analysis", Tata Mc Graw Hill Publishing Company, Seventh Edition, 2020.

E-RESOURCES

1. [https://nptel.ac.in/courses/105/105/105105166/\(StructuralAnalysis I\)](https://nptel.ac.in/courses/105/105/105105166/(StructuralAnalysis I))
2. [https://nptel.ac.in/courses/105/101/105101085/\(StructuralAnalysis I\)](https://nptel.ac.in/courses/105/101/105101085/(StructuralAnalysis I))

Mapping of COs-POs & PSOs

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

1-Low 2-Medium 3-High '-' – No Correlation


Chairman - BoS





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23CET403

HIGHWAY ENGINEERING

L T P C

3 0 0 3

OBJECTIVES

- To inculcate the basics of highway planning and its alignment.
- To familiarize with the various highway cross sectional elements.
- To enhance the desirable properties of highway materials and construction practice.
- To impart knowledge on the rigid and flexible pavements.
- To acquire the pavement evaluation and strengthening methods.

UNIT I HIGHWAY PLANNING AND ALIGNMENT

9

Scope of Highway Engineering - Highway Development and Planning in India – Jayakar Committee Recommendations and Realizations - Requirements of Ideal Alignment - Factors Controlling Highway Alignment - Engineering Surveys for Alignment – Classification of Roads (IRC).

UNIT II GEOMETRIC DESIGN OF HIGHWAYS

9

Highway Cross Sectional Elements – Sight Distances – Design of Horizontal Alignment – PIEV Theory – Widening of Curves – Transition Curves – Design of Vertical Alignment – Gradient and Curves.

UNIT III HIGHWAY MATERIALS AND CONSTRUCTION PRACTICE

9

Materials used in Highway Construction – Properties and Testing of Highway Materials – Features of Highway Construction.

UNIT IV FLEXIBLE AND RIGID PAVEMENTS

9

Flexible Pavements – Components and their Functions – Factors Affecting the Design of Flexible Pavements – Stresses in Flexible Pavement – Flexible Pavement Design Methods – Rigid Pavement - Components and their Functions – Factors Affecting the Design of Rigid Pavements – Stresses in Rigid (IRC Method and Recommendations).

UNIT V PAVEMENT MAINTENANCE AND EVALUATION

9

Types of Maintenance – Defects in Flexible Pavements – Types of Failures, Causes and Treatment – Defects in Rigid Pavement – Pavement Evaluation Techniques – Strengthening of Pavements.

TOTAL: 45 PERIODS





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OUTCOMES

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

- Examine the best highway planning and alignment.
- Analyze the geometric design of highway cross sectional elements.
- Develop the highway construction materials and their properties.
- Design the flexible and rigid pavements as per IRC codes.
- Identify the highway maintenance, evaluation and strengthening.

TEXT BOOKS

1. Khanna S.K, Justo.C.E.G, Veeraragavan A, "Highway Engineering", Nemchand Publishers, Tenth Edition, 2021.
2. Kadiyali L.R, Lal N.B, "Principles and Practice of Highway Engineering (Including expressways and Airport Engineering)", Khanna Publishers, Second Edition, 2019.
3. Partha Chakroborthy, Animesh Das, "Principles of Transportation Engineering", Prentice-Hall of India, Seventh Edition, 2020.

REFERENCES

1. Yang H Haung, "Pavement Analysis and Design", Pearson Education, Ninth Edition, 2019
2. Ian D Walsh, "ICE Manual of Highway Design and Management", ICE publishers, Thirteenth Edition, 2020.
3. Indian Road Congress (IRC), "Guidelines for the Design of Flexible Pavements", IRC:37-2012.

E-RESOURCES

1. <https://nptel.ac.in/courses/105/101/105101087/> (Pavement Design)
2. <https://nptel.ac.in/courses/105/105/105105107/> (Introduction to Transport Engineering)

Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	2	1	-	-	1	1	-	1	1	-	-	1	1
2	3	1	2	-	-	3	1	-	3	3	-	-	3	-
3	3	1	1	-	-	3	1	-	2	2	-	-	2	-
4	3	3	2	-	-	3	1	-	3	3	1	-	3	2
5	3	2	2	-	-	3	1	-	2	2	-	-	2	2
AVG.	3	1.8	1.6	-	-	2.6	1	-	2.2	2.2	1	-	2.2	1.7

1-Low 2-Medium 3-High '-' – No Correlation

Chairman - BOS





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23CEE401

FOUNDATION ENGINEERING
(Lab Embedded Theory Course)

L T P C
3 0 2 4

OBJECTIVES

- To inculcate the methods of soil exploration.
- To enhance the necessity of settlement.
- To familiarize with the bearing capacity and settlement of shallow foundation.
- To impart knowledge on the pile foundation.
- To foster the stability analysis of slopes.
- To acquire knowledge on the various earth pressure theories.

UNIT I SOIL INVESTIGATION AND CHOICE OF FOUNDATION

9

Methods of Soil Exploration – Boring – Sampling – Disturbed and undisturbed Sampling – Sampling techniques – Bore log and soil investigation report – Function and requirements of good foundation – Choice of foundation based on soil conditions.

UNIT II BEARING CAPACITY AND SETTLEMENT

9

Location and depth of foundations – Bearing capacity of shallow foundations on homogeneous deposit – Terzaghi's Theory – IS Code method – Problems – Field tests (SPT and SCPT) – Factors influencing Bearing Capacity – Settlement of foundations – Components of settlement – Allowable and maximum differential settlement.

UNIT III SHALLOW FOUNDATION

9

Types of footings – Contact pressure distribution: isolated footing – Combined footings – Proportioning – Mat foundation – Types and applications – Floating foundation.

UNIT IV PILE FOUNDATION

9

Need for deep foundations – Types of piles – Classification of piles – Load carrying capacity of piles in granular and cohesive soils – Static and Dynamic formulae – Pile carrying capacity by field tests – Pile load test – Group Capacity – Settlement of Pile groups – Negative skin friction – Introduction to pile raft.

UNIT V STABILITY OF SLOPES AND EARTH PRESSURE

9

Slopes – Infinite and finite slopes – Types of failure – Causes of failure – Procedure for slip circle method – Earth pressure in soils: active and passive states – Lateral earth pressure – Rankine's theory – Graphical method – Stabilization of soil using various methods – Landslide – Mechanics of landslide.





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LIST OF EXPERIMENTS

1. Grain Size Distribution – Sieve Analysis.
2. Grain Size distribution – Hydrometer Analysis.
3. Specific Gravity of Soil.
4. Relative density of Sands.
5. Field Density by Core Cutter Method and Sand Replacement Method.
6. Atterbergs Limits Test.
7. Coefficient of Permeability – Variable and Constant Head Method.
8. Unconfined Compression Test.
9. Direct Shear Test.
10. Standard Proctor Compaction Test.

TOTAL: 45+15=60 PERIODS

OUTCOMES

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

- Analyze the importance of soil investigation in various civil Engineering projects.
- Examine the bearing capacity incorporating IS codal provisions.
- Design the shallow foundation and get exposure in foundation analysis.
- Examine the pile group capacity and group efficiency for various types of soils.
- Construct the earth retaining structures for various soil conditions.
- Choose the correct soil methods in the field depending upon the requirement and site conditions.

TEXT BOOKS

1. Arora K.R, "Soil Mechanics and Foundation Engineering", Standard Publishers and Distributors, Seventh Edition, 2019.
2. Punmia B.C, "Soil Mechanics and Foundations", Laxmi Publications Pvt. Ltd., Sixteenth Edition, 2019.
3. Gopal Ranjan and Rao A.S.R, "Basic and applied Soil Mechanics", New Age International, Tenth Edition, 2020.

REFERENCES

1. Muni Budhu, "Soil Mechanics and Foundations", John Willey & Sons, Inc, Sixth Edition, 2020.
2. Kaniraj, S.R. "Design aids in Soil Mechanics and Foundation Engineering", Tata McGraw Hill publishing company Ltd., Fourth Edition, 2019.
3. Venkatramaiah C. "Geotechnical Engineering", New Age International, Fifth Edition, 2021.

E-RESOURCES

1. [https://nptel.ac.in/courses/105/105/105105176/\(FoundationEngineering\)](https://nptel.ac.in/courses/105/105/105105176/(FoundationEngineering))
2. [https://nptel.ac.in/courses/105/107/105107120/\(FoundationEngineering\)](https://nptel.ac.in/courses/105/107/105107120/(FoundationEngineering))





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Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
1	3	3	3	3	-	2	1	1	1	1	1	3	2
2	3	3	3	3	-	2	1	1	1	1	1	2	3
3	3	3	3	3	-	2	1	1	1	1	2	2	3
4	3	3	3	3	-	1	1	1	1	1	2	2	3
5	3	3	3	3	-	2	1	1	1	1	2	2	3
6	3	3	3	3	-	2	1	1	1	1	2	2	3
AVG.	3	3	3	3	-	1.8	1	1	1	1	1.7	2.2	2.8

1-Low 2-Medium 3-High '-' - No Correlation


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23CEE402

FLUID MECHANICS AND MACHINERY

(Lab Embedded Theory Course)

(Common to Civil and Mechanical Engineering)

L T P C

3 0 2 4

OBJECTIVES

- To inculcate the properties of fluid flow characteristics and its dynamics.
- To impart knowledge on the laminar and turbulent flow through circular conduits and losses in pipe flow.
- To familiarize with the dimensional and model analysis.
- To enhance the types of pumps, working principle, application and performance analysis of fluid pumps.
- To acquire knowledge on types of turbines, working principle, velocity triangle and performance curves of hydraulic turbines.
- To foster the principles studied in fluid mechanics theory by performing experiments in lab.

UNIT I FLOW CHARACTERISTICS AND DYNAMICS OF FLUID FLOW

9

Introduction - Properties of fluids - Flow characteristics - Rate of flow, concept of control volume and continuity equation for one dimensional flow. Dynamics of fluid flow - Euler's equation of motion, Bernoulli's equation and its application.

UNIT II FLUID FLOW TYPES AND FLOW THROUGH PIPES

9

Flow of viscous fluid through circular pipe- Hagen Poiseuille equation - Types of fluid flow - Steady and unsteady, Uniform and non-uniform, Laminar and Turbulent, Compressible and incompressible, Rotational and irrotational (Qualitative treatment). Flow through pipes (Loss of energy in pipes) - Major losses - Darcy-Weisbach equation and Chezy's formula - Minor losses - Moody diagram (Qualitative treatment) - Flow through pipes in series and in parallel.

UNIT III DIMENSIONAL AND MODEL ANALYSIS

9

Introduction - Derived quantities - Dimensional Homogeneity - Method of dimensional analysis - Rayleigh's method and Buckingham's π - theorem. Similitude - Types of similitude - Dimensionless numbers - Model laws - Application of dimensionless parameters - Model analysis.

UNIT IV HYDRAULIC PUMPS

9

Classification of pumps - Centrifugal pumps - Working principle - Heads and efficiencies- Velocity triangles - Work done by the impeller - Performance curves - Reciprocating pump working principle - Indicator diagram and its variations - Work saved by fitting air vessels - Rotary pumps.





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UNIT V HYDRAULIC TURBINE

9

Impact of jets - Velocity triangles - Theory of rotodynamic machines - Classification of turbines - Working principles - Pelton wheel - Modern Francis turbine - Kaplan turbine - Work done - Efficiencies - Draft tube - Specific speed - Performance curves for turbines.

LIST OF EXPERIMENTS

1. Coefficient of discharge of Venturi meter.
2. Coefficient of discharge of Orifice meter.
3. Determination of friction factor for a given set of pipes.
4. Determination of co-efficient of discharge for an external mouth piece.
5. Performance test on centrifugal pump.
6. Performance test on reciprocating pump.
7. Performance test on gear pump.
8. Performance analysis of Pelton wheel.
9. Performance analysis of Francis turbine.
10. Performance analysis of Kaplan turbine.

TOTAL: 45+15=60 PERIODS

OUTCOMES

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

- Analyze the dynamics of fluid flow and summarize the flow characteristics.
- Identify the concept of flow characteristics and calculate major and minor losses associated with pipe flow in piping networks.
- Examine the concept of model analysis, including how physical models are scaled and tested to simulate the real world fluid flow problems.
- Develop the performance of pumps.
- Construct the operating principles of various turbines and how they convert energy from fluids into mechanical work.
- Apply the Bernoulli's principle to find the coefficient of discharge, determine the friction factor for set of pipes, and analyze the performance characteristics of turbine and pumps.

TEXT BOOKS

1. Bansal R.K, "Fluid Mechanics and Hydraulic Machines", Laxmi Publications, Ninth Edition, 2019.
2. Modi P.N and Seth S.M, "Hydraulics and Fluid Mechanics including Hydraulic Machines", Standard Book House, Twenty Second Edition, 2019.
3. Rajput R.K, "Fluid Mechanics and Hydraulic Machines", S. Chand Publishing Limited, Sixth Edition, 2021.





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REFERENCES

1. K.L Kumar, "Engineering Fluid Mechanics", Eurasia Publishing House (P) Ltd., Seventh Edition, 2019.
2. Giles, R.V, Evett, J.B & Liu C, "Fluid Mechanics and Hydraulics", Tata McGraw Hill, Second Edition, 2020.
3. Khurmi R S, "Fluid mechanics & hydraulic Machines. (in S.I. units)", S Chand & Company Limited, Third Edition, 2019.

E-RESOURCES

1. [https://nptel.ac.in/courses/112/105/112105171/-](https://nptel.ac.in/courses/112/105/112105171/) (Fluid Mechanics)
2. [https://nptel.ac.in/courses/112/105/112105182/-](https://nptel.ac.in/courses/112/105/112105182/) (Introduction to Fluid Mechanics and Compressible flow)

Mapping of COs-POs & PSOs

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1	3	3	2	2	-	2	2	2	-	2	-	2	3	2
2	3	3	2	2	-	2	2	2	-	2	-	2	3	2
3	3	3	2	2	-	2	2	2	-	2	-	2	3	2
4	3	3	2	2	-	2	2	2	-	2	-	2	3	2
5	3	3	2	2	-	2	2	2	-	2	-	2	3	2
6	3	3	2	2	-	2	2	2	-	2	-	2	3	2
AVG.	3	3	2	2	-	2	2	2	-	2	-	2	3	2

1 - Low 2 - Medium 3 - High '-' - No Correlation


Chairman - BoS





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23GEE301

PROBLEM SOLVING AND PYTHON PROGRAMMING

(Lab Embedded Theory Course)

L T PC
3 0 2 4

OBJECTIVES

- To impart the fundamentals of computational thinking, algorithm design, and problem-solving techniques for developing efficient software solutions.
- To develop students proficiency in Python programming using data types, expressions, operators, statements, and debugging techniques.
- To enable students to apply control structures, functions, recursion, and string manipulation for solving computational problems.
- To train students to use lists, tuples, dictionaries, and advanced data processing techniques for structured programming.
- To inculcate the knowledge of file handling, exception handling, modules, packages, and data visualization for developing robust Python applications.
- To develop the students in analytical, programming, and computational skills through coding practices, and to solve real-world problems using Python.

UNIT I COMPUTATIONAL THINKING AND PROBLEM SOLVING

9

Fundamentals of Computing – Identification of Computational Problems –Algorithms, building blocks of algorithms(statements, state, control flow; functions),notation(pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion). Illustrative problems: find minimum in a list, insert a card in a list of sorted cards, guess an integer number in a range, Towers of Hanoi.

Coding practices:

1. Develop Algorithm and flowchart to find the greatest of three numbers.
2. Develop Algorithm and flowchart to find a minimum number in a List.

Problem-solving Assignments:

1. Develop Algorithm and Flowchart to solve Towers of Hanoi Problem.
2. Develop Algorithm, Pseudo code and flowchart for finding factorial of a given number using recursion.

UNIT II DATA TYPES, EXPRESSIONS, STATEMENTS

9

Python interpreter and interactive mode, debugging; values and types: int, float, Boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points

Coding practices:

1. Develop python program to find area of a Circle
2. Develop python program to convert Fahrenheit to Celsius.





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Problem-solving Assignments:

1. Develop Python program to find Quadratic Equation
2. Develop Python program to find Student mark statement based on 5 subjects.

UNIT III CONTROL FLOW, FUNCTIONS, STRINGS

9

Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.

Coding practices:

1. Develop python program to find GCD of a given number.
2. Develop python program to find factorial of a number.
3. Develop Python program to find sum of array of given numbers.

Problem-solving Assignments:

1. Develop Python program to find whether an element is found in the List by using (A) Linear Search and (B) Binary Search method
2. Develop Python program to print Fibonacci Series

UNIT IV LISTS, TUPLES, DICTIONARIES

9

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing – list comprehension; Illustrative programs: simple sorting, histogram, Students marks statement, Retail bill preparation.

Coding practices:

1. Develop python program for Insertion Sorting & Selection Sorting.
2. Develop python program for Histogram

Problem-solving Assignments:

1. Develop Python program for student mark statement using List
2. Develop Python program to print Retail bill statement

UNIT V FILES, MODULES, PACKAGES & DATA VISUALIZATION

9

Files and exceptions: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file – Importing Matplotlib – Introduction to plotting – visualizing errors – Histograms.

Coding practices:

1. Develop python program to append the contents of one file to another.
2. Develop python program to copy contents of one file to another file using command Line Arguments





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Problem-solving Assignments:

1. Develop a python program for calculator using python packages.
2. Develop a suitable python program to demonstrate each case in Exceptional Handling.
3. Develop a suitable python program using Matplotlib for Visualizing Errors.

LIST OF EXPERIMENTS

1. Identification and solving of simple real life or scientific or technical problems, and developing flow charts for the same. (Electricity Billing, Retail shop billing, Sin series, weight of a motorbike, Weight of a steel bar, compute Electrical Current in Three Phase AC Circuit, etc.)
2. Python programming using simple statements and expressions (exchange the values of two variables, circulate the values of n variables, distance between two points).
3. Scientific problems using Conditionals and Iterative loops.(Number series, Number Patterns, pyramid pattern)
4. Implementing real-time/technical applications using Lists, Tuples. (Items present in a library/Components of a car/ Materials required for construction of a building –operations of list & tuples)
5. Implementing real-time/technical applications using Sets, Dictionaries. (Language, components of an automobile, Elements of a civil structure, etc.- operations of Sets & Dictionaries)
6. Implementing programs using Functions.(Factorial, largest number In a list, area of shape)
7. Implementing programs using Strings.(reverse,palindrome,charactercount,replacingcharacters)
8. Implementing programs using written modules and Python Standard Libraries (pandas, numpy, Matplotlib, scipy)
9. Implementing real-time/technical applications using File handling. (copy from one file to another, word count, longest word)
10. Implementing real-time/technical applications using Exception handling.(divide by zero error, voter's age validity, student mark range validation)

TOTAL: 45 + 15 = 60 PERIODS

OUTCOMES

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

- Analyze computational problems to develop effective problem-solving strategies.
- Apply python constructs to develop programs for python applications.
- Apply control structures and functions to solve computational problems.
- Apply Python built-in data structures such as lists, tuples, and dictionaries to process and manipulate data efficiently.
- Analyze the operations of file handling, exception handling, modules, packages, and data visualization techniques for real-world applications.
- Implement python programs for solving various computational problems.





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TEXTBOOKS

1. Allen B. Downey, "Think Python: How to Think like a Computer Scientist", O'Reilly Publishers, Second Edition, 2016.
2. Karl Beecher, "Computational Thinking: A Beginner's Guide to Problem Solving and Programming", BCS Learning & Development Limited, First Edition, 2017.

REFERENCES

1. Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, First Edition, 2021.
2. G Venkatesh and Madhavan Mukund, "Computational Thinking: A Primer for Programmers and Data Scientists", Notion Press, First Edition, 2021.

E – RESOURCES

1. <https://nptel.ac.in/courses/106104074> (Introduction to Algorithms)
2. <https://archive.nptel.ac.in/courses/106/106/106106182/> (Joy of Computing)

Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	3	3	2	2	–	–	1	1	1	–	2	3	3
2	3	3	3	2	3	–	–	1	1	1	–	2	3	3
3	3	3	3	2	3	–	–	1	1	1	–	2	3	3
4	3	3	3	2	3	–	1	1	1	1	–	3	3	3
5	3	3	3	3	3	1	1	2	2	2	–	3	3	3
6	3	3	3	3	3	1	1	2	3	2	2	3	3	3
AVG	3.0	3.0	3.0	2.3	2.8	1.0	1.0	1.3	1.5	1.3	2.0	2.5	3.0	3.0

1 – Low 2 – Medium 3 – High '-' - No Correlation


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23EEC401

ONLINE CERTIFICATION COURSES

L T P C
3 0 0 3

Students may be permitted to study online courses (NPTEL, SWAYAM or any Proctored Assessment Certification Courses) with 3 credits during the 4th semester curriculum for all B.E./B.Tech. Programmes. Such courses offered to students shall be recommended by the Department Academic Committee (DAC). The DAC shall ensure that the courses offered are not core courses in their respective curriculum.

The number of credits and transfer of credits are based on the procedure explained in following Table. The mapping of marks with grades is applicable only if the student passes the course as per the guidelines of NPTEL.

S.No.	No. of Weeks	Credits
1	4	1
2	8	2
3	12	3
4	16	4


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DEPARTMENT OF CIVIL ENGINEERING

REGULATIONS – 2023

MINOR/HONOURS DEGREE CONSTRUCTION TECHNOLOGY

CURRICULUM AND SYLLABI



CURRICULUM AND SYLLABI

FOR B.E./B.Tech. DEGREE PROGRAMMES

(MINOR DEGREE/HONOURS- CONSTRUCTION TECHNOLOGY)

B.E. - CIVIL ENGINEERING

Course Code	Name of the Subject	Category	Periods /Week			Credit	Maximum Marks		
			L	T	P		C	CIA	ESE
THEORY									
23CECT01	Advanced Construction Materials	PC	3	0	0	3	40	60	100
23CECT02	Safety in Construction	PC	3	0	0	3	40	60	100
23CECT03	Sustainable Construction Engineering	PC	3	0	0	3	40	60	100
EMBEDDED COURSE									
23CECE01	Advanced Techniques in Concrete Construction	PC	3	0	2	4	40	60	100
EMPLOYABILITY ENHANCEMENT COURSE									
23CECP01	Project Work	EEC	0	0	12	6	60	40	100
TOTAL CREDITS					19				

PC : Professional Core
 EEC : Employability Enhancement Courses
 L : Lecture
 T : Tutorial
 P : Practical
 C : Credit Point
 CIA : Continuous Internal Assessment
 ESE : End Semester Examination
 TOT : Total



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23CECT01

ADVANCED CONSTRUCTION MATERIALS

L T P C
3 0 0 3

OBJECTIVES

- To inculcate the different construction materials.
- To enhance the role of ceramic materials in construction.
- To instruct the use of polymer materials.
- To gain knowledge on the techniques involved in waterproofing course.
- To familiarize with the fundamentals of admixtures of concrete.

UNIT I CONSTRUCTION MATERIALS

9

Classification of construction materials - Selection criteria for construction materials - Green building materials - waste products - Reuse and recycling.

UNIT II CERAMIC MATERIALS

9

Classification - glass wool - Thermal and electrical properties - Fire resistant materials - Uses and applications.

UNIT III POLYMERIC MATERIALS

9

Rubber and plastics - Polymers in civil engineering polymers - types of fibers - Fiber reinforced plastic in sandwich panels.

UNIT IV WATER PROOFING MATERIALS

9

Waterproofing materials and compounds - flooring materials - required materials.

UNIT V ADMIXTURES

9

Use of waste product and industrial by product:-Fly ash – silica - GGBS and other mineral products – Geo-textile and Geo-synthetics applications in civil engineering.

TOTAL: 45 PERIODS

OUTCOMES

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

- Identify the suitable construction materials.
- Apply the knowledge in ceramic materials.
- Construct the polymer materials for various construction applications.
- Analyze the water proofing material importance.
- Classify the admixture in fresh and hardened concrete.

TEXT BOOKS

1. Shetty M.S., "Concrete Technology", S.Chand and Company Ltd., Eighth Edition, 2019.
2. Krishnaraju N., "Advanced Concrete Technology", CBS Publishers, Tenth Edition, 2020.





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REFERENCES

1. Gambir, M.L. "Concrete Technology", Tata McGraw Hill, Publishing Co., Ltd, Sixth Edition, 2019.
2. Santhakumar, A.R., "Concrete Technology", Oxford University Press, Tenth Edition, 2020.

E-RESOURCES

1. <https://nptel.ac.in/courses/105/102/105102012/> (Concrete Technology)
2. <https://nptel.ac.in/courses/105/106/105106176/> (Advanced Concrete Technology)

Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
1	3	2	1	2	-	1	2	-	2	2	2	2	2
2	3	2	1	2	-	1	2	-	2	2	2	2	2
3	3	2	1	2	-	1	2	-	2	2	2	2	2
4	3	2	1	2	-	1	2	-	2	2	3	2	2
5	3	2	2	2	-	1	2	-	2	2	3	2	2
AVG	3	2	1.2	2	-	1	2	-	2	2	2.4	2	2

1-Low 2-Medium 3-High '-' – No Correlation


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23CECT02

SAFETY IN CONSTRUCTION

L T P C
3 0 0 3

OBJECTIVES

- To impart knowledge on the importance of safety in the construction.
- To inculcate the causes and remedies of construction accidents.
- To familiarize with the site safety precautionary measures to avoid accidents.
- To acquire the safety during construction, alteration, demolition works.
- To enhance the safe operating procedures in the construction.

UNIT I INTRODUCTION

9

Basic terminology in safety, safety standards and signs, signals in construction, role of stakeholders in construction safety.

UNIT II ACCIDENTS IN CONSTRUCTION

9

Accident patterns, theories of accident-causation, cost of injury vs investment in safety, types of injuries, safety program accident / incident investigation, safety pyramid, PPE in construction, a case study on construction safety.

UNIT III SAFETY PRECAUTIONS

9

Introduction to OSHA regulations; Role of stakeholders in safety Site safety programs - Job hazard analysis, HIRA(Hazard identification and risk assessment), accident investigation & accident indices-violation, Penalty.

UNIT IV SAFETY MEASURES IN CONSTRUCTION

9

Safety during construction, alteration, demolition works - Earthwork, steel construction, temporary structures, masonry & concrete construction, cutting & welding.

UNIT V SAFETY OPERATIONS

9

SoPs (Safe Operating Procedures) - Construction equipment, materials handling-disposal & hand tools, other hazards - fire, confined spaces, electrical safety; BIM & safety.

TOTAL: 45 PERIODS

OUTCOMES

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

- Apply the role of safety standards and signs in construction.
- Inspect the accidents in construction by investigating the accident patterns.
- Construct the role of stakeholders in safety site safety programs.
- Analyze safety measures in construction, alteration, demolition works
- Examine the safety operating procedures.

TEXT BOOKS

1. Haupt T.C, J. Hinze, " The Management of Construction Safety and Health", Taylor & Francis, Eighth Edition, 2020.
2. Charles D. Reese, James Vernon Eidson, "Handbook of OSHA construction safety and health", Taylor & Francis, Second Edition, 2019.



REFERENCES

1. IS 9457:1980, "Code of practice for safety colors and safety signs" BIS.
2. IS 13415:1992, "Protective barriers in and around building – code of safety" BIS.

E-RESOURCES

1. <https://nptel.ac.in/courses/105102206/> (Safety in Construction)
2. <https://nptel.ac.in/courses/110105094/> (Industrial Safety Engineering)

Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
1	3	3	3	2	2	1	1	-	-	-	-	3	3
2	3	3	2	2	1	1	1	-	-	-	-	3	2
3	3	3	3	2	2	1	1	-	-	-	-	3	3
4	3	3	2	2	1	1	1	-	-	-	-	3	2
5	3	3	3	2	1	1	1	-	-	-	-	3	3
AVG	3	3	2.6	2	1.4	1	1	-	-	-	-	3	2.6

1-Low 2-Medium 3-High '-' – No Correlation


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23CECT03

SUSTAINABLE CONSTRUCTION ENGINEERING

L T P C
3 0 0 3

OBJECTIVES

- To instruct the comprehensive overview of materials used for sustainable buildings
- To familiarize with the engineering practices in sustainable construction.
- To inculcate the role of assessment in sustainable construction.
- To acquire the innovative sustainable materials.
- To gain knowledge on the fundamentals of life cycle assessment.

UNIT I INTRODUCTION

9

Introduction to Sustainable Building Materials – Qualities - Uses - Examples - Natural building materials.

UNIT II SUSTAINABLE CONSTRUCTION ENGINEERING

9

Fundamentals of Sustainable Construction Engineering- Sustainability and resources, need, present practices at national and international level, The Sustainability Quadrant- challenges & Issues, Government initiatives.

UNIT III SUSTAINABILITY ASSESSMENT

9

Sustainability assessment using standard approaches- LEED/GRIHA rating evaluation process. Socio - economic feasibility of sustainable construction products.

UNIT IV SUSTAINABLE PRODUCT DESIGN

9

Innovative & customized sustainable product design based on social constraints, tools & aids available for sustainable construction products.

UNIT V SUSTAINABLE LIFE CYCLE

9

Life Cycle Assessment and Costing-Variou aspects related to construction cost, present value analysis, life cycle stages.

TOTAL: 45 PERIODS

OUTCOMES

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

- Identify the concept of sustainable materials in construction.
- Apply the knowledge in sustainable construction engineering.
- Analyze the role of LEED/GRIHA in construction.
- Design the innovative product in sustainable construction.
- Develop the importance of sustainable life cycle assessment.

TEXT BOOKS

1. Yates J K, "Sustainability in Engineering Design and Construction", CRC Press, Third Edition, 2019.
2. Edmundas Kazimieras Zavadskas, "Sustainability in Construction Engineering", MDPI AG, Sixth Edition, 2020.





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REFERENCES

1. Abhinandan R. Gupta, S.K Deshmukh, "Sustainable Construction Engineering & Management", Abhinandan Gupta Publications, Tenth Edition 2020.
2. Liv Haselbach, "Sustainable Construction for Engineers", McGraw-Hill Education, Seventh Edition, 2019.

E-RESOURCES

1. <https://nptel.ac.in/courses/105102195/> / (Sustainable Materials and Green Buildings)
2. <https://nptel.ac.in/courses/124107011/> / (Sustainable Architecture)

Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
1	3	2	2	2	1	1	2	-	-	-	1	3	2
2	3	2	2	2	1	1	1	-	-	-	1	3	2
3	3	2	2	1	1	1	2	-	-	-	1	3	3
4	3	2	2	2	1	2	1	-	-	-	1	3	2
5	3	1	2	2	1	2	2	-	-	-	1	2	2
AVG	3	1.8	2	1.8	1	1.4	1.6	-	-	-	1	2.8	2.2

1-Low 2-Medium 3-High '-' – No Correlation


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23CECE01

ADVANCED TECHNIQUES IN CONCRETE CONSTRUCTION
(Lab Embedded Theory Course)

L T P C
3 0 2 4

OBJECTIVES

- To gain systematic knowledge of concrete constituents.
- To instruct the concrete mix design principles.
- To impart knowledge on the basic concepts of special concrete.
- To enhance the techniques involved in properties of concrete.
- To inculcate the fundamentals of concreting testing and their qualities.
- To acquire practical skills the advanced NDT techniques for determining the quality of concrete.

UNIT I FUNDAMENTALS OF CONCRETE

9

Features of Recent Advances in Concrete, Types of Concrete to be dealt; Terminologies, Ingredients, Properties of Fresh & Hardened concrete, related tests, Production and use of concrete.

UNIT II MIX DESIGN PRINCIPLES

9

Concrete mix design, Basic considerations and choice a mix proportions, various methods of mix designs including IS Code method. Quality control and quality assurance of concrete, Acceptance criteria. High workability concrete/Self compacting concrete, Fiber reinforced concrete, Polymer-concrete composites.

UNIT III ADVANCES IN CONCRETE

9

Special Concretes: Definition & Introduction, General properties, Advantages, Disadvantages, Applications, Concreting practices, Guidelines for Mix design and use of following concretes: High density concrete, Shrinkage compensating concrete, Mass concrete, Roller compacted concrete.

UNIT IV PROPERTIES OF CONCRETE

9

Durability of Concrete: Definitions, Deterioration processes– Physical, Chemical, Environmental & Biological; Measures for ensuring durability, Corrosion of reinforcing steel, protective measures.

UNIT V TESTING AND QUALITY OF CONCRETE

9

Testing and Quality Control of Concrete: Classification of test methods, In-situ, Non-Destructive & Partially-Destructive tests for fresh concrete, hardened concrete and durability of concrete. Problems on the in-situ testing results and compared with Laboratory results.

LIST OF PRACTICALS

1. Study of IS code related to mix design.
2. Determine Compressive strength of High grade concrete by using different admixtures.
3. Study and performance on Rebound Hammer.
4. Study and performance on Ultrasonic Pulse Velocity.
5. Study and performance on Profometer.
6. Study and performance on Crack scope.
7. Study of Self Compacting Concrete.

TOTAL: 45+15 = 60 PERIODS

OUTCOMES

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

- Analyze the properties of the constituent materials of concrete.
- Design concrete mixes and apply statistical quality control techniques.
- Examine the special concrete technologies.
- Analyze the durability of concrete
- Identify the importance on properties of fresh and hardened concrete.
- Construct the compressive strength of concrete with admixtures.

TEXT BOOKS

1. Shetty M.S., "Concrete Technology", S.Chand and Company Ltd., Eighth Edition 2019.
2. Krishnaraju N., "Advanced Concrete Technology", CBS Publishers, Fourth Edition, 2020.

REFERENCES

1. Gambir M.L., "Concrete Technology", Tata McGraw Hill, Publishing Co,Ltd, Sixth Edition, 2017.
2. Santhakumar A.R., "Concrete Technology", Oxford University Press, Tenth Edition, 2018.

E-RESOURCES

1. <https://nptel.ac.in/courses/105/102/105102012/> (Concrete Technology)
2. <https://nptel.ac.in/courses/105/106/105106176/> (Advanced Concrete Technology)

Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
1	3	3	2	3	1	-	-	-	-	1	1	3	1
2	3	3	2	2	1	-	-	-	-	1	1	3	2
3	3	3	2	3	1	-	-	-	-	1	1	3	2
4	3	3	2	2	1	-	-	-	-	1	1	3	1
5	3	3	1	3	1	-	-	-	-	1	1	3	1
6	3	2	1	1	1	-	-	-	-	1	1	2	1
AVG	3	2.8	1.6	2.3	1	-	-	-	-	1	1	2.8	1.3

1-Low 2-Medium 3-High '-' – No Correlation


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23CECP01

PROJECT WORK

L T P C
0 0 12 6

OBJECTIVES

- To develop knowledge to formulate a real world problem and projects goals.
- To identify the various tasks of the project to determine standard procedures.
- To identify and learn new tools, algorithms and techniques.
- To understand the various procedures for validation of the product and analysis the cost effectiveness.
- To understand the guideline to Prepare report for oral demonstrations.

PROCESS DESCRIPTION

- For Project work out of 100 marks, the maximum marks for Continuous Internal Assessment is fixed as 60 and the End Semester Examination (project report evaluation and viva voce examination) carries 40 marks. Project work shall be assigned to a single student.
- The project work shall be undertaken by students either in industry or in the college.
- The total credit for project work in semester is 6.
- There shall be three reviews (Zeroth Review, (Review I and Review II, each 100 marks)) during the semester by a review committee. The student shall make presentation on the progress made before the committee. The Head of the Department shall constitute a review committee for each programme. There shall be a minimum of three members in the review committee.
- The committee shall consist of the Supervisor, Project Coordinator and one of the faculty members.
- The student(s) is expected to submit the project report on or before the last working day of the semester. The ESE for the project work shall consist of the evaluation of the final project report submitted by the student or students of the project group by an external examiner, followed by a viva-voce examination conducted separately for each student by a committee consisting of the external examiner and an internal examiner (other than supervisor). The project coordinator shall be the internal examiner. The COE shall appoint the External Examiner for the ESE of the Project Work. The project report shall be submitted as per the approved guidelines given by Controller of Examinations.

OUTCOMES

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

- Formulate real-world problems.
- Design and express technical solutions using appropriate tools and techniques.
- Test and validate prototypes for efficiency and cost-effectiveness, and present their work effectively through reports and oral demonstrations.

Mapping of COs-POs & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
Mapping outcome	3	3	3	3	3	3	3	3	3	3	3	3	3

1-Low, 2-Medium, 3-High, “-” - No Correlation

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CURRICULUM AND SYLLABI FOR B.E./B.Tech. DEGREE PROGRAMMES (MINOR/HONOURS DEGREE- CONSTRUCTION TECHNOLOGY)

CREDIT SUMMARY

B.E. - CIVIL ENGINEERING

Category	Credits Per Semester								Credit Total
	I	II	III	IV	V	VI	VII	VIII	
PC	-	-	3	3	3	4	-	-	13
EEC	-	-	-	-	-	-	6	-	6
Total	-	-	3	3	3	4	6	-	19





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MINOR DEGREE CURRICULUM & SYLLABUS INDIAN KNOWLEDGE SYSTEM (IKS)

Important Guidelines

- The following Subjects (IKS-I to IKS-XX) with each 3 credits are Suggested syllabus for the Open Electives and Minor Degree in the Indian Knowledge System (IKS).
- IKS I & IKS II are mandatory for the minor degree which are 3 credits each.
- Students can opt any 2 subjects with 3 credits each from the IKS –III to IKS – XI subjects and other two subjects with 3 credits each from the IKS – XII to IKS –XX given below.
- Students who have 7.5 CGPA are eligible for this IKS Minor degree and it shall be offered from III semester onwards.
- Students need a minimum of 18 credits to be awarded the minor degree.



CURRICULUM AND SYLLABI
FOR B.E./B.Tech. DEGREE PROGRAMMES
MINOR DEGREE - INDIAN KNOWLEDGE SYSTEM (IKS)

Course Code	Name of the Subject	Category	Periods /Week			Credit	Maximum Marks		
			L	T	P		C	CIA	ESE
THEORY									
23IKS01	Introduction to Indian Culture and Civilization	PC	3	0	0	3	40	60	100
23IKS02	Indian Culture and Civilization with its Knowledge Systems and Traditions	PC	3	0	0	3	40	60	100
23IKS03	Vision for a Human Society	PC	3	0	0	3	40	60	100
23IKS04	Indian Science, Engineering, and Technology - Past, Present & Future	PC	3	0	0	3	40	60	100
23IKS05	Indian Town Planning and Architecture	PC	3	0	0	3	40	60	100
23IKS06	Indian Mathematics and Astronomy	PC	3	0	0	3	40	60	100
23IKS07	Indian Aesthetics (including Music & Musical Instruments)/Arthashastra	PC	3	0	0	3	40	60	100
23IKS08	Indian Health, Wellness, and Psychology - including Ayurveda	PC	3	0	0	3	40	60	100
23IKS09	Indian System of Proof and Logic (including Nyay Shastra)	PC	3	0	0	3	40	60	100
23IKS10	Indian Linguistics and Phonetics	PC	3	0	0	3	40	60	100
23IKS11	Indian Governance, Administration, and Management Systems (including Arthashastra)	PC	3	0	0	3	40	60	100
23IKS12	Indian Physics (e.g., Vaisheshik)	PC	3	0	0	3	40	60	100
23IKS13	Textile Industry in India	PC	3	0	0	3	40	60	100
23IKS14	Shipbuilding and Maritime Trade	PC	3	0	0	3	40	60	100
23IKS15	Transport Systems in India	PC	3	0	0	3	40	60	100



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23IKS16	Principles and Practice of Mechanics and Machines	PC	3	0	0	3	40	60	100
23IKS17	Water Management in India	PC	3	0	0	3	40	60	100
23IKS18	Ecology and Geography in India	PC	3	0	0	3	40	60	100
23IKS19	Natural Agriculture and Horticulture Practices in India	PC	3	0	0	3	40	60	100
23IKS20	Indian Economics (Arthashastra)	PC	3	0	0	3	40	60	100
TOTAL CREDITS							60		

PC : Professional Core
EEC : Employability Enhancement Courses
L : Lecture
T : Tutorial
P : Practical
C : Credit Point
CIA : Continuous Internal Assessment
ESE : End Semester Examination
TOT : Total





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23IKS01

INTRODUCTION TO INDIAN CULTURE AND CIVILIZATION

L T P C
3 0 0 3

OBJECTIVES

- To inculcate the historical, cultural, and social development of Indian civilization.

UNIT I OVERVIEW OF INDIAN CIVILIZATION:

- Ancient India: Indus Valley Civilization, Vedic Period
- Major Dynasties: Mauryan, Gupta, Mughal

UNIT II CULTURAL CONTRIBUTIONS:

- Art and Architecture: Temples, Monuments, and Modern Innovations
- Literature and Music: Classical and Contemporary

UNIT III SOCIAL STRUCTURES AND PRACTICES:

- Traditional Social Systems: Caste, Family, and Community
- Modern Practices and Changes

UNIT IV CONTEMPORARY INDIAN CULTURE:

- Festivals and Rituals
- Impact of Globalization on Indian Traditions

OUTCOMES

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

- Analyze the impact of globalization on Indian traditions and cultural practices.


Chairman - BoS





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23IKS02

INDIAN CULTURE AND CIVILIZATION WITH ITS-
KNOWLEDGE SYSTEMS AND TRADITIONS

L T P C

3 0 0 3

OBJECTIVES

- To enhance the role of Indian knowledge systems in shaping cultural practices and societal norms.

UNIT I FOUNDATIONS OF INDIAN CULTURE:

- Historical Evolution: Key Periods and Events
- Major Cultural and Religious Traditions

UNIT II INDIAN KNOWLEDGE SYSTEMS:

- Traditional Systems: Ayurveda, Yoga, and Classical Sciences
- Philosophy and Spirituality: Major Schools of Thought

UNIT III INTEGRATION OF KNOWLEDGE AND TRADITION:

- Role of Knowledge Systems in Shaping Culture
- Preservation and Modern Adaptation of Traditions

UNIT IV CURRENT TRENDS AND FUTURE DIRECTIONS:

- Contemporary Challenges and Innovations
- Future Prospects for Indian Knowledge Systems and Culture

OUTCOMES

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

- Evaluate the influence of Indian knowledge systems on cultural development and the balance between tradition and modernity.


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23IKS03

VISION FOR A HUMAN SOCIETY

L T P C
3 0 0 3

OBJECTIVES

- To impart knowledge on the core values in Indian philosophy and compare them with ethical principles from global traditions.

UNIT I CONCEPT OF VASUDHAIVA KUTUMBAKAM:

- Ancient Indian Philosophy on Universal Unity
- Application in Modern Society

UNIT II HUMANISTIC VALUES AND ETHICAL PRINCIPLES:

- Core Values in Indian Philosophy
- Comparative Analysis with Global Philosophies

UNIT III SOCIAL HARMONY AND GLOBAL CITIZENSHIP:

- Practices and Strategies for Social Integration
- Case Studies of Global Harmony Initiatives

UNIT IV SUSTAINABLE DEVELOPMENT AND WELL-BEING:

- Indian Approaches to Sustainability
- Integrating Traditional Wisdom with Modern Development

OUTCOMES

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

- Apply traditional wisdom in creating sustainable and balanced development solutions.


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23IKS04

INDIAN SCIENCE, ENGINEERING, AND TECHNOLOGY - PAST,
PRESENT & FUTURE

L T P C

3 0 0 3

OBJECTIVES

- To acquire the major achievements and institutions in contemporary Indian science and technology, and assess current trends and future directions.

UNIT I ANCIENT INDIAN SCIENTIFIC CONTRIBUTIONS:

- Key Texts: Sulbasutras, Aryabhatiya, Sushruta Samhita
- Innovations in Mathematics, Medicine, and Astronomy

UNIT II MEDIEVAL AND EARLY MODERN CONTRIBUTIONS:

- Developments in Metallurgy, Navigation, and Architecture
- Influence on Islamic and European Science

UNIT III MODERN INDIAN SCIENCE AND TECHNOLOGY:

- Major Achievements and Institutions
- Current Trends and Future Directions

UNIT IV INTEGRATION OF TRADITIONAL AND MODERN KNOWLEDGE:

- Case Studies of Successful Integrations
- Challenges and Opportunities for Future Innovations

OUTCOMES

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

- Identify the developments in medieval and early modern Indian science and their global influence.


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23IKS05

INDIAN TOWN PLANNING AND ARCHITECTURE

L T P C
3 0 0 3

OBJECTIVES

- To gain knowledge on the sustainable urban planning practices and contemporary architectural innovations.

UNIT I ANCIENT AND MEDIEVAL TOWN PLANNING:

- Vedic, Mauryan, and Gupta Urban Planning
- Mughal Architecture and City Layouts

UNIT II CLASSICAL INDIAN ARCHITECTURE:

- Temples, Forts, and Palaces
- Architectural Styles and Techniques

UNIT III COLONIAL AND POST-COLONIAL URBAN DEVELOPMENT:

- Impact of British Urban Planning
- Modern Architectural Movements in India

UNIT IV CONTEMPORARY CHALLENGES AND INNOVATIONS:

- Sustainable Urban Planning
- Modern Indian Architectural Practices

OUTCOMES

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

- Evaluate the impact of colonial urban planning and identify key modern architectural movements in India.


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23IKS06

INDIAN MATHEMATICS AND ASTRONOMY

L T P C
3 0 0 3

OBJECTIVES

- To inculcate the mathematical achievements of Aryabhata, Brahmagupta, and Bhaskara, and their influence on the development of Indian mathematics..

UNIT I HISTORICAL DEVELOPMENT OF INDIAN MATHEMATICS:

- Key Figures: Aryabhata, Brahmagupta, Bhaskara
- Major Texts and Contributions

UNIT II INDIAN ASTRONOMY:

- Ancient Astronomical Texts: Siddhantas
- Contributions to Cosmology and Celestial Mechanics

UNIT III MATHEMATICAL TECHNIQUES AND INNOVATIONS IMPACT OF BRITISH URBAN PLANNING:

- Concepts of Zero, Decimal System, Algebra
- Mathematical Problems and Solutions

UNIT IV INFLUENCE ON GLOBAL MATHEMATICS AND ASTRONOMY:

- Transmission of Knowledge to the Arab World and Europe
- Legacy in Modern Scientific Thought

OUTCOMES

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

- Construct the significance of Indian mathematical and astronomical knowledge in global scientific development and its legacy in contemporary science.


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23IKS07

INDIAN AESTHETICS (INCLUDING MUSIC & MUSICAL
INSTRUMENTS)/ARTHASHASTRA

L T P C

3 0 0 3

OBJECTIVES

- To instruct the classical music traditions of Hindustani and Carnatic music, including their distinct features, evolution, and the role of musical instruments in these traditions.

UNIT I CLASSICAL INDIAN AESTHETICS KEY TEXTS:

- Principles of Rasa, Bhava, and Natya
- Key Texts: Natyashastra, Abhinavabharati

UNIT II INDIAN MUSIC TRADITIONS:

- Classical Music: Hindustani and Carnatic
- Musical Instruments and Their Evolution

UNIT III ARTHASHASTRA AND ECONOMIC THOUGHT:

- Key Concepts and Texts: Arthashastra by Kautilya
- Application of Economic Principles in Ancient India

UNIT IV INTEGRATION OF TRADITIONAL AND MODERN KNOWLEDGE:

- Case Studies and Historical Examples
- Modern Relevance and Application

OUTCOMES

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

- Apply the integration of aesthetic and economic principles in historical and modern contexts, recognizing their relevance in contemporary society.


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23IKS08

INDIAN HEALTH, WELLNESS, AND PSYCHOLOGY -
INCLUDING AYURVEDA

L T P C

3 0 0 3

OBJECTIVES

- To enhance the current trends in Indian health and wellness practices, including their impact on global health and wellness movements.

UNIT I INTRODUCTION TO AYURVEDA:

- Core Principles: Doshas, Dhatus, and Malas
- Traditional Healing Practices

UNIT II INDIAN CONCEPTS OF WELLNESS AND HEALTH:

- Yoga and Meditation: Techniques and Benefits
- Traditional Dietary Practices

UNIT III PSYCHOLOGICAL THEORIES AND PRACTICES:

- Ancient Indian Perspectives on Mind and Behavior
- Comparative Analysis with Modern Psychology

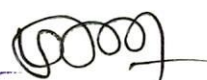
UNIT IV CONTEMPORARY APPLICATIONS:

- Integration of Ayurveda and Modern Medicine
- Current Trends in Indian Health and Wellness Practices

OUTCOMES

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

- Apply the integration of Ayurvedic and modern medical practices, and understand current trends in health and wellness..


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23IKS09

INDIAN SYSTEM OF PROOF AND LOGIC
(INCLUDING NYAY SHASTRA)

L T P C

3 0 0 3

OBJECTIVES

- To acquire the methodologies and techniques employed in Nyay Shastra for establishing logical proofs.

UNIT I FOUNDATIONS OF INDIAN LOGIC:

- Introduction to Nyay Shastra (Indian Logic)
- Key Concepts: Pramana (Means of Knowledge), Nyaya (Logic), and Tarka (Inference)

UNIT II SYSTEMATIC ANALYSIS OF PROOFS:

- Types of Proofs: Direct, Indirect, and Hypothetical
- Methodologies in Nyay Shastra

UNIT III COMPARISON WITH WESTERN LOGIC:

- Similarities and Differences
- Influence on Modern Logical Systems

OUTCOMES

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

- Evaluate the influence of Indian logical principles on modern logical systems and contemporary thought.


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23IKS10

INDIAN LINGUISTICS AND PHONETICS

L T P C
3 0 0 3

OBJECTIVES

- To gain knowledge on the classical and modern Indian languages, including their historical context, features, and contemporary relevance.

UNIT I PANINI'S GRAMMAR:

- Overview of Ashtadhyayi
- Key Concepts: Sandhi, Vibhakti, and Dhatu

UNIT II INDIAN PHONETICS:

- Articulation and Pronunciation
- Phonological Features in Indian Languages

UNIT III OVERVIEW OF INDIAN LANGUAGES:

- Classical Languages: Sanskrit, Tamil, Kannada
- Major Modern Languages: Hindi, Bengali, Urdu

OUTCOMES

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

- Examine the phonological features and systems used in various Indian languages.


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23IKS11

INDIAN GOVERNANCE, ADMINISTRATION, AND
MANAGEMENT SYSTEMS (INCLUDING ARTHASHASTRA)

L T P C

3 0 0 3

OBJECTIVES

- To instruct the governance methods and political strategies outlined in the Arthashastra and their application in ancient times.

UNIT I ARTHASHASTRA AND ANCIENT INDIAN ADMINISTRATION:

- Key Principles and Texts
- Governance and Political Strategies

UNIT II HISTORICAL ADMINISTRATIVE SYSTEMS:

- Mauryan and Gupta Administration
- Mughal and Colonial Administrations

UNIT III MODERN INDIAN GOVERNANCE:

- Constitutional Framework
- Administration and Management Practices

OUTCOMES

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

- Construct the Indian constitutional framework and contemporary administrative practices, enabling them to analyze current governance and management systems.


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23IKS12

INDIAN PHYSICS (E.G., VAISHESHIK)

L T P C
3 0 0 3

OBJECTIVES

- To inculcate how vaisheshik principles contributed to classical and quantum theories, and their relevance to modern physics..

UNIT I PRINCIPLES OF VAISHESHIK PHYSICS:

- Key Concepts: Atoms, Categories of Reality
- Contributions to Classical and Quantum Theories

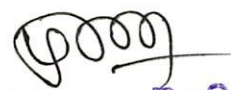
UNIT II HISTORICAL DEVELOPMENT:

- Evolution of Physical Theories in Ancient India
- Influence on Modern Physics

OUTCOMES

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

- Analyze how ancient Indian physical theories have influenced modern physics and their relevance to current scientific discussions..


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23IKS13

TEXTILE INDUSTRY IN INDIA

L T P C
3 0 0 3

OBJECTIVES

- To acquire the traditional and modern textile practices, including handloom weaving and dyeing techniques.

UNIT I HISTORICAL OVERVIEW:

- Traditional Textile Practices: Handloom, Dyeing Techniques
- Historical Significance of Indian Textiles

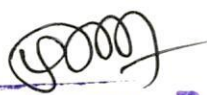
UNIT II MODERN TEXTILE INDUSTRY:

- Major Players and Technologies
- Challenges and Innovations

OUTCOMES

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

- Analyze the challenges faced by the textile industry and evaluate the innovations that are shaping its future


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23IKS14

SHIPBUILDING AND MARITIME TRADE

L T P C
3 0 0 3

OBJECTIVES

- To impart knowledge on the ancient shipbuilding techniques and innovations used in various civilizations.

UNIT I ANCIENT SHIPBUILDING TECHNIQUES:

- Traditional Textile Practices: Handloom, Dyeing Techniques
- Historical Significance of Indian Textiles

UNIT II MODERN MARITIME INDUSTRY:

- Shipbuilding Technologies
- Trade Policies and Economic Impact

OUTCOMES

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

- Construct the ancient and latest shipbuilding technologies and their applications in the maritime industry.


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23IKS15

TRANSPORT SYSTEMS IN INDIA

L T P C
3 0 0 3

OBJECTIVES

- To enhance the ancient and current state of railways, roadways, and airways, including their infrastructure and operational aspects.

UNIT I HISTORICAL TRANSPORT SYSTEMS:

- o Ancient Roadways and Waterways
- o Development During British and Post-Independence Period

UNIT II CONTEMPORARY TRANSPORT INFRASTRUCTURE SHIPBUILDING TECHNOLOGIES:

- o Railways, Roadways, Airways
- o Challenges and Future Prospects

OUTCOMES

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

- Analyze the ancient current challenges in the transport sector and evaluate future prospects and potential solutions.


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23IKS16

PRINCIPLES AND PRACTICE OF MECHANICS AND MACHINES

L T P C
3 0 0 3

OBJECTIVES

- To inculcate the ancient and current Indian contributions to mechanics, including notable inventions and principles.

UNIT I HISTORICAL MECHANICS:

- o Ancient Indian Contributions to Mechanics
- o Classical Texts on Engineering and Machinery

UNIT II MODERN APPLICATIONS:

- o Principles of Mechanics
- o Practical Applications and Innovations

OUTCOMES

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

- Identify practical applications and innovations in the field of mechanics and machinery..


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23IKS17

WATER MANAGEMENT IN INDIA

L T P C
3 0 0 3

OBJECTIVES

- To acquire the traditional and contemporary water management techniques and policies.

UNIT I TRADITIONAL WATER MANAGEMENT PRACTICES:

- o Ancient Indian Contributions to Mechanics
- o Historical Case Studies

UNIT II CONTEMPORARY WATER MANAGEMENT:

- o Modern Techniques and Policies
- o Challenges and Solutions

OUTCOMES

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

- Analyze traditional and current challenges in water management and evaluate possible solutions and strategies for improvement.

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23IKS18

ECOLOGY AND GEOGRAPHY IN INDIA

L T P C
3 0 0 3

OBJECTIVES

- To impart the India's biodiversity and the various conservation efforts aimed at preserving its natural resources and species.

UNIT I INDIAN ECOLOGY:

- Major Ecosystems: Forests, Deserts, Wetlands
- Biodiversity and Conservation Efforts

UNIT II INDIAN GEOGRAPHY:

- Physical and Human Geography
- Environmental Challenges and Policies

OUTCOMES

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

- Analyze environmental challenges and evaluate the effectiveness of policies and strategies designed to address these challenges.


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23IKS19

NATURAL AGRICULTURE AND HORTICULTURE PRACTICES IN INDIA

L T P C
3 0 0 3

OBJECTIVES

- To instruct the sustainable agricultural practices, including methods that enhance soil health, conserve water, and promote biodiversity.

UNIT I TRADITIONAL AGRICULTURAL PRACTICES:

- o Vriksha Ayurveda and Natural Farming Techniques
- o Historical and Cultural Significance

UNIT II MODERN PRACTICES:

- o Sustainable Agriculture
- o Innovations and Technological Advances

OUTCOMES

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

- Develop knowledge of sustainable agriculture practices and their importance for environmental health and productivity.


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23IKS20

INDIAN ECONOMICS (ARTHASHASTRA)

L T P C
3 0 0 3

OBJECTIVES

- To gain knowledge how the principles of the Arthashastra can be applied to modern economic strategies and policies.

UNIT I PRINCIPLES OF ARTHASHASTRA:

- Key Concepts and Economic Policies
- Historical Context and Influence

UNIT II ECONOMIC PRACTICES AND POLICIES:

- Comparison with Modern Economic Theories
- Application in Contemporary Economic Strategies

OUTCOMES

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

- Examine how ancient economic principles can be applied to contemporary economic strategies and policies, assessing their relevance and practicality.


Chairman - BoS

