

An Autonomous Institution Since 2011. Approved by AICTE / Affiliated to Anna University. Accredited by NAAC with 'A++' Grade. Tier-1\* - Accredited by NBA. Part of NIA Educational Institution

# **Curriculum and Syllabi**

Semesters I & II

**Regulations 2023** 

#### Programme Outcomes (POs) - Regulations 2023

On successful completion of B.E. Computer Science and Engineering programme, graduating students/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 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 for complex problems.

**PO5.** Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

**PO6.** The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO7.** Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9.** Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**PO11. Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments

**PO12. Life-long learning:** 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.

# Curriculum

- i) Core Stream
- ii) Circuit Stream
- iii) IT Stream



# Programme: B.E. Mechanical Engineering 2023 Regulations Curriculum for Semester I & II

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

#### Semester I

Type of	Course		Ηοι	urs/W	eek	Credit	Mark	Common to
Course	Code	Course Title	L	Т	Ρ	S	S	Programmes
AEC	23ENI101	Communication Skills I	2	0	2	3	100	All
Minor	23MAI102	Matrices and Calculus	3	0	2	4	100	AU,EA,EC,EE,EV, ME
Minor	23PHT102	Physics for Mechanical Sciences	3	0	0	3	100	AU,ME
Multi- disciplinary	23ADT101	Python Programming for Mechanical Sciences	3	0	0	3	100	AU,ME
Major	23MEL001	Engineering Drawing	1	0	3	2.5	100	AD,AM,AU,CS,EA ,EC,EE,EV,IT,ME, SC
Minor	23PHL102	Physics for Mechanical Sciences Laboratory	0	0	3	1.5	100	AU,ME
Multi- disciplinary	23ADL101	Python Programming Laboratory for Mechanical Sciences	0	0	3	1.5	100	AU,ME
VAC	23VAL102	Wellness for Students	0	0	2	1	100	All
VAC	23VAT101	தமிழர்மரபு / Heritage of Tamils	1	0	0	1	100	All
AEC	23SAL001	Studio Activities	0	0	2	-	-	All
		Total	13	0	17	20.5	900	

#### Semester II

Type of	Course		Ηοι	urs/W	eek	Credit	Mark	Common to
Course	Code	Course little	L	Т	Ρ	S	S	Programmes
AEC	23ENI201	Communication Skills II	2	0	2	3	100	All
Minor	23MAI202	Complex Variables and Transforms	3	0	2	4	100	AU,EC,EE,EV,ME
Minor	23CHT201	Chemistry for Mechanical Sciences	3	0	0	3	100	AU,ME
Major	23MEI201	Engineering Materials	3	0	2	4	100	AU,ME
Major	23MEL201	Computer Aided Drafting and Modelling Laboratory	1	0	3	2.5	100	AU,ME
Minor	23CHL201	Chemistry for Mechanical Sciences Laboratory	0	0	3	1.5	100	AU,ME
SEC	23MEL202	Engineering Practices Laboratory	0	0	3	1.5	100	AU,CE,ME
SEC	23ESL201	Employability Skills 1: Aptitude	0	0	2	1	100	All
VAC	23VAT201	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	1	0	0	1	100	All
Multi- disciplinary	23CHT202	Environmental Sciences	1	0	0	-	100	All
AEC	23SAL001	Studio Activities	0	0	2	-	-	All
		Total	14	0	19	21.5	1000	

Course	Course		Hours	/Week			Marks	Common
Туре	Code	Course Title	L	Т	Ρ	- Credits		to Programme s
							100	3
Minor	23XXXXX	Numerical Methods	3	1	0	4	100	-
Major	23XXXXX	Engineering Mechanics	3	0	0	3	100	-
Major	23XXXXX	Engineering Thermodynamics	3	0	0	3	100	-
Major	23XXXXX	Fluid Mechanics and Machinery	3	0	0	3	100	-
Major	23XXXXX	Manufacturing Processes I	3	0	0	3	100	-
Major	23XXXXX	Manufacturing Processes Laboratory	0	0	3	1.5	100	-
Major	23XXXXX	Fluid Mechanics and Machinery Laboratory	0	0	3	1.5	100	All
EEC	23XXXXX	EEC-II	0	0	2	1	100	-
	Total		18	1	8	20	800	

# Tentative Curriculum for Semester III to VIII Semester III

# Semester IV

Course	Irse Course		Course Title	Hou	rs/We	ek	Credit	Marka	Common to
Туре	Coc	le	Course Litle	L	т	Ρ	S	warks	Programme s
Minor	23>	XXXX	Probability and Statistics	3	1	0	4	100	-
Major	23>	XXXX	Strength of Materials	3	0	0	3	100	-
Major	23>	XXXX	Theory of Machines	3	0	0	3	100	-
Major	23>	XXXX	Manufacturing Processes II	3	0	0	3	100	-
Major	23>	XXXX	Metrology and Measurements	3	0	0	3	100	-
Major	23>	XXXX	Strength of Materials & Theory of Machines Laboratory	0	0	3	1.5	100	-
Major	23>	XXXX	Manufacturing Processes II Laboratory	0	0	3	1.5	100	All
EEC	23>	XXXX	EEC-III	0	0	2	1	100	-
	Tota			15	1	8	20	900	
Cour Cod	'se le	Cours	e Title	Durat	ion		Credits	Marks	5
23XXXXX		Internshi Skill De	p-I/ Research Internship/ velopment Program	4 Weel	ĸs		2	100	

Course	Course		Но	ours/	Week	Cradita	Marka	Common
Туре	Code	Course Title	L	т	Р	Creatts	warks	to
								Programme
								S
Minor	23XXXXX	Cyber Security	3	0	0	3	100	-
Major	23XXXXX	Design of Machine Elements	3	1	0	4	100	-
Multi disciplinary	23XXXXX	Electrical & Electronics	3	0	2	4	100	-
Major	23XXXXX	Professional Elective-I	3	0	0	3	100	-
Multi disciplinary	23XXXXX	Professional Elective-II	3	0	0	3	100	-
SEC	23XXXXX	Computer Aided Modelling and Drafting Laboratory	0	0	3	1.5	100	-
EEC	23XXXXX	EEC-IV	0	0	2	1	100	-
Minor		Reverse Engineering Project	0	0	6	3	100	
		Total	15	1	13	22.5	800	

### Semester V

### Semester VI

Course	Course		Но	ours/	Week	Credite	Marka	Common
Туре	Code	Course Title	L	т	Р	Credits	Warks	to Programme s
Major	23XXXXX	Research Methodology	3	0	0	3	100	-
Major	23XXXXX	Heat and Mass Transfer	3	0	2	4	100	-
Major	23XXXXX	Finite Element Analysis	3	0	0	3	100	-
Major	23XXXXX	Professional Elective -III	3	0	0	3	100	-
Major	23XXXXX	Professional Elective -IV	3	0	0	3	100	-
	23XXXXX	Open Elective-I	3	0	0	3	100	
SEC	23XXXXX	Computer Aided Engineering Laboratory	0	0	3	1.5	100	-
EEC	23XXXXX	EEC-V	0	0	2	1	100	All
		Total	18	0	7	21.5	800	

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

# **Semester VII**

Course Type	Course Code	Course Title	Ho L	ours/ T	Week P	Credit s	Mark s	Common to Programm
								es
Major	23XXXXX	Project Management	3	0	0	3	100	-
Major	23XXXXX	Electric Vehicles	3	0	2	4	100	-
Major	23XXXXX	CNC programming & Robotics	3	0	2	4	100	
Major	23XXXXX	Professional Elective- V	3	0	0	3	100	
Major	23XXXXX	Professional Elective- VI	3	0	0	3	100	-
Multi disciplinary	23XXXXX	Open Elective-II	3	0	0	3	100	-
	23XXXXX	Project Phase-I	0	0	8	4	100	-
		Total	18	0	12	24	700	

# Semester VIII

Course Type	Course Code	Course Title	Hours/Wee k			Credit	Mark	Common to
	oodo		L	т	Р	5	5	Programm es
Major	23XXXXX	Professional Elective -VII	3	0	0	3	100	-
Major	23XXXXX	Professional Elective -VIII	3	0	0	3	100	-
Major	23XXXXX	Project Phase-II	0	0	1 2	6	200	-
	Total		6	0	12	12	400	

Course Code	Course Title	Duration	Credits	Marks
23XXXXXX	Internship or Skill Development*	8 weeks	4	100

\*Refer to clause: 4.8 in UG academic regulations 2019

**Total Credits: 171** 



# Programme: B.E. Automobile Engineering 2023 Regulations Curriculum for Semester I & II

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

#### Semester I

Type of	Course		Но	urs/W	eek	Credite	Marka	Common to
Course	Code	Course Title	L	Т	Р	Creaits	warks	Programmes
AEC	23ENI101	Communication Skills I	2	0	2	3	100	All
Minor	23MAI102	Matrices and Calculus	3	0	2	4	100	AU,EA,EC,EE,EV, ME
Minor	23PHT102	Physics for Mechanical Sciences	3	0	0	3	100	AU,ME
Multi- disciplinary	23ADT101	Python Programming for Mechanical Sciences	3	0	0	3	100	AU,ME
Major	23MEL001	Engineering Drawing	1	0	3	2.5	100	AD,AM,AU,CS,EA ,EC,EE,EV,IT,ME, SC
Minor	23PHL102	Physics for Mechanical Sciences Laboratory	0	0	3	1.5	100	AU,ME
Multi- disciplinary	23ADL101	Python Programming Laboratory for Mechanical Sciences	0	0	3	1.5	100	AU,ME
VAC	23VAL102	Wellness for Students	0	0	2	1	100	All
VAC	23VAT101	தமிழர்மரபு / Heritage of Tamils	1	0	0	1	100	All
AEC	23SAL001	Studio Activities	0	0	2	-	-	All
		Total	13	0	17	20.5	900	

#### Semester II

Type of	Course	Course Title		urs/W	eek	Cradita	Marka	Common to
Course	Code	Course Thie	L	Т	Ρ	Credits	IVIAI KS	Programmes
AEC	23ENI201	Communication Skills II	2	0	2	3	100	All
Minor	23MAI202	Complex Variables and Transforms	3	0	2	4	100	AU,EC,EE,EV,ME
Minor	23CHT201	Chemistry for Mechanical Sciences	3	0	0	3	100	AU,ME
Major	23MEI201	Engineering Materials	3	0	2	4	100	AU,ME
Major	23MEL201	Computer Aided Drafting and Modelling Laboratory	1	0	3	2.5	100	AU,ME
Minor	23CHL201	Chemistry for Mechanical Sciences Laboratory	0	0	3	1.5	100	AU,ME
SEC	23MEL202	Engineering Practices Laboratory	0	0	3	1.5	100	AU,CE,ME
SEC	23ESL201	Employability Skills 1: Aptitude	0	0	2	1	100	All
VAC	23VAT201	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	1	0	0	1	100	All
Multi- disciplinary	23CHT202	Environmental Sciences	1	0	0	-	100	All
AEC	23SAL001	Studio Activities	0	0	2	-	-	All
		Total	14	0	19	21.5	1000	

Type of	Course	Course Title	Hours/Week			Credits	Marks	Common to
Course	Code		L	Т	Ρ			Programmes
Minor	23XXXXXX	Numerical Methods	3	1	0	4	100	-
Major	23XXXXXX	Production Processes	3	0	0	3	100	-
Major	23XXXXXX	Engineering Mechanics	3	1	0	4	100	-
Major	23XXXXXX	Fluid Mechanics and Hydraulic Machinery	2	1	0	3	100	-
Major	23XXXXXX	Engineering Thermodynamics and Heat Transfer	2	1	0	3	100	-
Major	23XXXXXX	Production Technology Laboratory	0	0	3	1.5	100	-
Major	23XXXXXX	Fluid Mechanics and Heat Power Laboratory	0	0	3	1.5	100	-
SEC	23XXXXXX	Employability Skills 2	0	0	2	1	100	-
VAC	23XXXXXX	Universal Human Values 2: Understanding Harmony	2	1	0	3	100	-
	÷	Total	15	5	8	24	900	

# Tentative Curriculum for Semesters III to VIII Semester III

# Semester IV

Type of	Course	Course Title	Hours/Week			Credits	Marks	Common to
Course	Code		L	Τ	Ρ			Programmes
Minor	23XXXXXX	Probability and Statistics	3	1	0	4	100	-
Major	23XXXXXX	Automotive Engines	2	0	2	3	100	-
Major	23XXXXXX	Strength of Materials	3	0	2	4	100	-
Major	23XXXXXX	Automotive Chassis and Transmission	3	0	3	4.5	100	-
Major	23XXXXXX	Mechanics of Machines	3	1	0	4	100	-
Major	23XXXXXX	Fuels, Engine Performance and Emission Testing Laboratory	0	0	3	1.5	100	-
SEC	23XXXXXX	Employability Skills 3	0	0	2	1	100	-
		Total	14	2	12	22	700	

Type of Course	Course Code	Course Title	Duration	Credits	Marks
SEC	23XXXXXX	Internship	2 Weeks	1	100

Semester \
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Type of	Course	Course Title	Hou	rs/W	/eek	Credits	Marks	Common to
Course	Code		L	Т	Ρ			Programmes
Multi - disciplinary	23XXXXXX	Cyber security	3	0	0	3	100	-
Major	23XXXXXX	Finite Element Analysis	3	1	0	4	100	-
Major	23XXXXXX	Design of Automotive Elements	3	1	0	4	100	-
Major	23XXXXXX	Professional Elective I	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective II	3	0	0	3	100	-
Major	23XXXXXX	Vehicle Maintenance Laboratory	0	0	3	1.5	100	-
Major	23XXXXXX	Simulation and Analysis Laboratory	0	0	3	1.5	100	-
SEC	23XXXXXX	Employability Skills 4	0	0	2	1	100	-
Project	23XXXXXX	Reverse Engineering Project	0	0	6	3	100	-
		Total	15	2	14	24	900	

# Semester VI

Type of	Course		Hou	rs/W	/eek	Credits	Marka	Common to	
Course	Code	Course The	L	Т	Ρ	Credits	Warks	Programmes	
Minor	23XXXXXX	Research Methodology	3	0	0	3	100	-	
Major	23XXXXXX	Vehicle Dynamics	3	1	0	4	100	-	
Major	23XXXXXX	Automotive Electrical, Electronics and Embedded Systems	2	0	2	3	100	-	
Major	23XXXXXX	Professional Elective III	3	0	0	3	100	-	
Major	23XXXXXX	Professional Elective IV	3	0	0	3	100	-	
Minor	23XXXXXX	Open Elective I	3	0	0	3	100	-	
Major	23XXXXXX	Automotive Embedded System Laboratory	0	0	3	1.5	100	-	
SEC	23XXXXXX	Employability Skills 5	0	0	2	1	100	-	
	Total					21.5	800		

Type of Course	Course Code	Course Title	Duration	Credits	Marks
SEC	23XXXXXX	Internship	4 Weeks	2	100

# Semester VII

Type of	Course	Course Title	Hou	rs/W	/eek	Credits	Marks	Common to Programmes
Course	Code		L	Т	Ρ			
Minor	23XXXXXX	Project Management	3	0	0	3	100	-
Multi- disciplinary	23XXXXXX	Artificial Intelligence and Machine Learning	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective V	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective VI	3	0	0	3	100	-
Minor	23XXXXXX	Open Elective II	3	0	0	3	100	-
Project	23XXXXXX	Project Phase 1	0	0	8	4	200	-
		15	0	8	19	700		

# Semester VIII

Type of	Course	Course Title	Hours/Week			Credits	Marks	Common to Programmes
Course	Code		L	Τ	Ρ			regrammee
Major	23XXXXXX	Professional Elective VII	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective VIII	3	0	0	3	100	-
Project	23XXXXXX	Project Phase 2	0	0	12	6	200	-
	Total					12	400	

Type of Course	Course Code	Course Title	Duration	Credits	Marks
SEC	23XXXXXX	Internship	12 Weeks	4	100

Total Credits – 171.5



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# Programme: B.E. - CIVIL ENGINEERING 2023 Regulations

# Curriculum for semester I & II

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

### **SEMESTER I**

Type of	Course		Ho	ours/W	/eek	Cradita	Morko	Common to
Course	Code	Course The	L	Т	Р	Credits	Widiks	Programmes
AEC	23ENI101	Communication Skills I	2	0	2	3	100	All
Minor	23MAI101	Linear Algebra and Calculus	3	0	2	4	100	-
Minor	23PHT101	Physics for Civil Engineering	3	0	0	3	100	-
Minor	23CET101	Civil Engineers and Society	3	0	0	3	100	-
Minor	23PHL101	Physics for Civil Engineering Laboratory	0	0	3	1.5	100	-
Minor	23CEL101	Engineering Drawing for Civil Engineering	1	0	3	2.5	100	-
VAC	23VAL102	Wellness for Students	0	0	2	1	100	All
VAC	23VAT101	தமிழர்மரபு / Heritage of Tamils	1	0	0	1	100	All
AEC	23SAL001	Studio Activities	0	0	2	-	-	All
		Total	13	0	14	19	800	

#### **SEMESTER II**

Type of	Course	Course Title	Ho	ours/W	/eek	Cradita	Morko	Common to
Course	Code	Course Title	L	Т	Р	Credits	IVIAI NO	Programmes
AEC	23ENI201	Communication Skills II	2	0	2	3	100	All
Minor	23MAI201	Ordinary Differential Equations and Complex Variables	3	0	2	4	100	-
Minor	23CHI201	Chemistry for Civil Engineering	3	0	2	4	100	-
Minor	23CET201	Engineering Mechanics	3	0	0	3	100	-
Multi- disciplinary	23ADT001	C Programming	3	0	0	3	100	CE, EA, EC, EV
SEC	23ADL001	C Programming Laboratory	0	0	3	1.5	100	CE, EA, EC, EV
SEC	23MEL202	Engineering Practices Laboratory	0	0	3	1.5	100	AU, CE, ME
SEC	23ESL201	Employability Skills 1: Aptitude	0	0	2	1	100	All
VAC	23VAT201	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	1	0	0	1	100	All
Multi- disciplinary	23CHT202	Environmental Sciences	1	0	0	-	100	All
AEC	23SAL001	Studio Activities	0	0	2	-	-	All
		Total	16	0	16	22	1000	

# **TENTATIVE CURRICULUM for Semester III to VIII**

# SEMESTER III

Course	Course	Course Title	Но	ours/W	/eek	Cradita	Marke	Common to
Туре	Code	Course The	L	L T P		Credits	IVIAI NS	Programmes
Minor	23XXXXXX	Transforms and Partial Differential Equations	3	1	0	4	100	
Major	23XXXXXX	Strength of Materials	3	0	0	3	100	
Major	23XXXXXX	Fluid Mechanics and Machineries	3	1	0	4	100	
Major	23XXXXXX	Construction Materials Techniques and Practices	2	0	2	3	100	
Major	23XXXXXX	Building Drawing Laboratory	0	0	2	2	100	
SEC	23XXXXXX	Employability Skills-2	0	0	2	1	100	
VAC	23XXXXXX	Universal Human Values 2 : Understanding Harmony	2	1	0	3	100	
		Total	13	3	6	20	700	

#### SEMESTER IV

Course	Course		Ho	ours/W	leek	Cradita	Marka	Common to
Туре	Code	Course Title	L	Т	Р	Credits	Widi KS	Programmes
Major	23XXXXXX	Structural Analysis I	3	1	0	4	100	
Major	23XXXXXX	Transportation Engineering	3	0	0	3	100	
Major	23XXXXXX	Concrete Technology	3	0	0	3	100	
Major	23XXXXXX	Surveying	2	0	2	3	100	
Major	23XXXXXX	Soil Mechanics	2	0	2	3	100	
Major	23XXXXXX	Fluid Mechanics / Strength of Materials Laboratory	0	0	3	3	100	
Major	23XXXXXX	Material Testing Laboratory	0	0	3	3	100	
SEC	23XXXXXX	Employability Skills-3	0	0	2	1	100	
	23XXXXXX	Internship-1 / Community Internship / Skill Development Program		2 weeł	ĸs	1	100	
		*** Survey Camp***		2 weel	ĸs	1	100	
		Total	13	1	12	25	1000	

# SEMESTER V

Type of	Course Code	Course Title	Но	urs/W	eek	Cradita	Marks	Common to
Course	Course Coue	Course The	L	Т	Р	Credits	IVIAI NS	Programmes
Major	23XXXXXX	Structural Analysis II	3	0	0	3	100	
Major	23XXXXXX	Design of Reinforced Concrete Elements	3	0	0	3	100	
Major	23XXXXXX	Water Supply Engineering	3	0	0	3	100	
Major	23XXXXXX	Foundation Engineering	3	0	0	3	100	
Major	23XXXXXX	Professional Elective-I	3	0	0	3	100	
Major	23XXXXXX	Professional Elective-I	3	0	0	3	100	
SEC	XXXXXXX	Employability Skills-4	0	0	2	1	100	
VAC	XXXXXXX	Reverse Engineering Project	0	0	6	3	100	
		Total	18	0	8	22	800	

#### SEMESTER VI

Type of	Course Code		Ho	ours/Wee	ek	Cradita	Marks	Common to
Course	Course Code	Course Title	L	Т	Р	Credits	Warks	Programmes
Major	23XXXXXX	Design of Steel Structures	3	0	0	3	100	
Major	23XXXXXX	Waste Water Engineering	3	0	0	3	100	
Major	23XXXXXX	Irrigation Engineering	3	0	0	3	100	
Major	23XXXXXX	Computer Aided Design and Drafting Laboratory	3	0	0	3	100	
Major	23XXXXXX	Professional Elective-III	3	0	0	3	100	
Major	23XXXXXX	Professional Elective-IV	3	0	0	3	100	
Major	23XXXXXX	Open Elective-I	3	0	0	3	100	
SEC	XXXXXXX	Employability Skills-5	0	0	2	1	100	
		Internship-2 / Community Internship / Skill Development Program		4 weeks		2	100	
		Total	21	0	8	24	900	

#### SEMESTER VII

Type of	Course Code	Course Title	He	ours/We	ek	Crodite	Marks	Common to
course	Course Coue	Course Title	L	Т	Р	Creans	IVIAI NS	Programmes
Major	23XXXXXX	Prestressed Concrete Structures	3	0	0	3	100	
Major	23XXXXXX	Estimation and Quantity Surveying	3	0	0	3	100	
Major	23XXXXXX	Construction Project Management	3	0	0	3	100	
Major	23XXXXXX	Professional Elective-V	3	0	0	3	100	
Major	23XXXXXX	Professional Elective- VI	3	0	0	3	100	
	23XXXXXX	Open Elective-II	3	0	0	3	100	
	XXXXXXX	Project Phase-I	0	0	8	4	100	
		Total	18	0	8	22	700	

#### SEMESTER VIII

Type of	Course Code	Course Title	He	ours/We	ek	Crodite	Marke	Common to
Course	Course Coue	Course Thie	L	Т	Р	Credits	Wialks	Frogrammes
Major	23XXXXXX	Professional Elective-VII	3	0	0	3	100	
Major	23XXXXXX	Professional Elective- VIII	3	0	0	3	100	
Major	23XXXXXX	Project Phase-II	0	0	12	6	200	
		Intership-3		8 Week	S	4	100	
		Total	6	0	12	16	500	

**Total Credits: 170** 



# Programme: B.E. Electronics and Communication Engineering 2023 Regulations Curriculum for Semester I & II

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

Type of	Course		Но	urs/W	eek	Cradita	Marka	Common to
Course	Code	Course The	L	Т	Ρ	Credits	IVIAI KS	Programmes
AEC	23ENI101	Communication Skills I	2	0	2	3	100	All
Minor	23MAI102	Matrices and Calculus	3	0	2	4	100	AU,EA,EC, EE,EV&ME
Minor	23CHI101	Chemistry for Electrical Sciences	3	0	2	4	100	EC,EE&EV
Major	23ECT101	Electron Devices	3	0	0	3	100	EA,EC&EV
Multi Disciplinary	23ADT001	C Programming	3	0	0	3	100	CE,EA,EC&EV
SEC	23ADL001	C Programming Laboratory	0	0	3	1.5	100	CE,EA,EC&EV
VAC	23VAL102	Wellness for Students	0	0	2	1	100	All
VAC	23VAT101	தமிழர்மரபு /Heritage of Tamils	1	0	0	1	100	All
AEC	23SAL001	Studio Activities	0	0	2	-	-	All
		Total	15	0	13	20.5	800	

#### Semester I

Type of	Course		Но	urs/W	eek			Common to
Course	Code	Course litle	L	Т	Ρ	Credits	Marks	Programmes
AEC	23ENI201	Communication Skills II	2	0	2	3	100	All
Minor	23MAI202	Complex Variables and Transforms	3	0	2	4	100	AU,EC,EE, EV & ME
Minor	23PHI201	Physics for Electrical Sciences	3	0	2	4	100	EA,EC,EE & EV
Major	23ECT001	Circuit Theory	3	0	0	3	100	EA,EC & EV
Multi Disciplinary	23ITT202	Problem Solving and Python Programming	3	0	0	3	100	EA,EC & EV
Multi Disciplinary	23MEL001	Engineering Drawing	1	0	3	2.5	100	AD,AM,AU,CS, EA,EC,EE,EV,IT, ME & SC
Major	23ECL001	Electric Circuits and Electron Devices Laboratory	0	0	3	1.5	100	EA,EC&EV
SEC	23ESL201	Employability Skills1:Aptitude	0	0	2	1	100	All
VAC	23VAT201	தமிழரும் தொழில்நுட்பமும்   / Tamils and Technology	1	0	0	1	100	All
Multi Disciplinary	23CHT202	Environmental Sciences	1	0	0	-	100	All
AEC	23SAL001	Studio Activities	0	0	2	-	-	All
		Total	17	0	16	23	1000	

# Semester II

# Tentative Curriculum for Semester III to VIII

Type of	Course		Но	urs/W	eek	Cradita	Marks	Common to
Course	Code	Course The	L	Т	Ρ	Credits	Warks	Programmes
Minor	23XXXXXX	Numerical Methods and Linear Algebra	3	1	0	4	100	
Major	23XXXXXX	Analog Circuits	3	0	0	3	100	
Major	23XXXXXX	Signals and Systems	3	1	0	4	100	
Major	23XXXXXX	Digital System Design	3	1	0	4	100	
Major	23XXXXXX	Analog Circuits Laboratory	0	0	3	1.5	100	
Major	23XXXXXX	Digital System Design Laboratory	0	0	3	1.5	100	
SEC	23XXXXXX	Employability Skills 2	0	0	2	1	100	All
VAC	23XXXXXX	Universal Human Values 2 :Understanding Harmony	2	1	0	3	100	All
		Total	14	4	8	22	800	

# Semester III

# Semester IV

Type of	Course	Course Title	Но	urs/W	eek	Cradita	Marks	Common to
Course	Code	Course The	L	Т	Ρ	Credits	IVIAI KS	Programmes
Minor	23XXXXXX	Probability and Statistics	3	1	0	4	100	
Major	23XXXXXX	Linear Integrated Circuits	3	0	0	3	100	
Major	23XXXXXX	Analog & Digital Communication	3	0	0	3	100	
Major	23XXXXXX	Transmission Lines and Waveguides	3	0	0	3	100	
Multi Disciplinary	23XXXXXX	Data Structures and Algorithms	3	0	2	4	100	
Major	23XXXXXX	Analog & Digital Communication lab	0	0	3	1.5	100	
SEC	23XXXXXX	Employability Skills 3	0	0	2	1	100	All
		Total	15	1	7	19.5	700	

Type of Course	Course Code	Course Title	Duration	Credits	Marks
Summer Internship	23XXXXXX	Internship 1/Community Internship /Skill Development Program	2 Weeks	1	100

Type of	Course		Но	urs/W	eek	Cradita	Marka	Common to		
Course	Code		L	Т	Р	Credits	Warks	Programmes		
Major	23XXXXXX	Control Systems	3	1	0	4	100			
Major	23XXXXXX	Digital Signal Processing	3	0	2	4	100			
Major	23XXXXXX	Antenna and Wave Propagation	3	0	0	3	100			
Major	23XXXXXX	Computer Networks	3	0	2	4	100			
Major	23XXXXXX	Professional Elective I	3	0	0	3	100			
Major	23XXXXXX	Professional Elective II	3	0	0	3	100			
SEC	23XXXXXX	Employability Skills 4	0	0	2	1	100	All		
Research Project	23XXXXXX	Reverse Engineering Project	0	0	6	3	100	All		
		Total	18	1	12	25	800			

# Semester V

# Semester VI

Type of	Course	Course Title	Но	urs/W	eek	Cradita	Marka	Common to
Course	Code	Course mile	L	Т	Р	Credits	IVIAI NS	Programmes
Major	23XXXXXX	VLSI System Design	3	0	0	3	100	
Major	23XXXXXX	Microcontroller and Its Interfacing Techniques	3	0	0	3	100	
Minor	23XXXXXX	Cyber security	3	0	0	3	100	All
Major	23XXXXXX	Professional Elective III	3	0	0	3	100	
Major	23XXXXXX	Professional Elective IV	3	0	0	3	100	
SEC	23XXXXXX	VLSI System Design Lab	0	0	3	1.5	100	
SEC	23XXXXXX	Microcontroller and Its Interfacing Techniques Lab	0	0	3	1.5	100	
Minor	23XXXXXX	Open Elective I	3	0	0	3	100	
SEC	23XXXXXX	Employability Skills 5	0	0	2	1	100	All
		Total	18	0	8	22	900	

Type of Course	Course Code	Course Title	Duration	Credits	Marks
Summer Internship	23XXXXXX	Internship 2/ Research Internship/ Skill Development Program	2 Weeks	1	100

Type of	Course		Hours/Week			Cradita	Marka	Common to		
Course	Code	Course Title	L	Т	Ρ	Credits	IVIAI KS	Programmes		
Major	23XXXXXX	Microwave Engineering	3	0	0	3	100			
Major	23XXXXXX	Artificial Intelligence and Machine Learning	3	0	0	3	100			
Major	23XXXXXX	Professional Elective V	3	0	0	3	100			
Major	23XXXXXX	Professional Elective VI	3	0	0	3	100			
SEC	23XXXXXX	Microwave and optical communication Laboratory	0	0	3	1.5	100			
Minor	23XXXXXX	Open Elective II	3	0	0	3	100			
Research Project	23XXXXXX	Project Phase I	0	0	8	4	100	All		
		Total	15	0	11	20.5	700			

# **Semester VII**

# Semester VIII

Type of	Course Code	Course Title	Hours/Week			Cradita	Marks	Common to
Course			L	Т	Ρ	Creats	IVIAI KS	Programmes
Major	23XXXXXX	Professional Elective VII	3	0	0	3	100	
Major	23XXXXXX	Professional Elective VIII	3	0	0	3	100	
Research Project	23XXXXXX	Project Phase II	0	0	12	6	200	
Summer Internship	23XXXXXX	Internship 3	8	Week	S	4	100	
		Total	6	0	12	16	500	

Total Credits: 170.5



#### Programme: B.E Electrical and Electronics Engineering 2023 Regulations Curriculum for Semesters I & II

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

Type of	Course	Course Title	Но	urs/W	eek	Credite	Marke	Common to
Course	Code	Course The	L	Т	Р	Creats	IVIAI KS	Programmes
AEC	23ENI101	Communication Skills I	2	0	2	3	100	All
Minor	23MAI102	Matrices and Calculus	3	0	2	4	100	AU, EA, EC, EE, EV, ME
Minor	23CHI101	Chemistry for Electrical Sciences	3	0	2	4	100	EC, EE, EV
Major	23EET101	Basics of Electrical Engineering	3	0	0	3	100	-
Multi Disciplinary	23MEL001	Engineering Drawing	1	0	3	2.5	100	AD, AM, AU, CS, EA, EC, EE, EV, IT, ME, SC
SEC	23EEL101	Workshop Practice for Electrical Engineers	0	0	3	1.5	100	-
VAC	23VAL102	Wellness for Students	0	0	2	1	100	All
VAC	23VAT101	தமிழர்மரபு /Heritage of Tamils	1	0	0	1	100	All
AEC	23SAL001	Studio Activities	0	0	2	-	-	All
		Total	13	0	15	20	800	-

#### Semester II

Type of	Course	Course Title	Ho	urs/W	eek	Cradita	Marka	Common to
Course	Code	Course The	L	Т	Р	Creats	IVIAI KS	Programmes
AEC	23ENI201	Communication Skills II	2	0	2	3	100	All
Minor	23MAI202	Complex Variables and Transforms	3	0	2	4	100	AU, EC, EE, EV, ME
Minor	23PHI201	Physics for Electrical Sciences	3	0	2	4	100	EA, EC, EE, EV
Major	23EET201	Solid State Devices	3	0	0	3	100	-
Multi Disciplinary	23CSI201	Problem Solving and Computer Programming	3	0	2	4	100	-
Major	23EEL201	Introduction to Programming with IoT	0	0	3	1.5	100	-
Major	23EEL202	Electron Devices Laboratory	0	0	3	1.5	100	-
SEC	23ESL201	Employability Skills 1:Aptitude	0	0	2	1	100	All
VAC	23VAT201	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	1	0	0	1	100	All
Multi Disciplinary	23CHT202	Environmental Sciences	1	0	0	-	100	All
AEC	23SAL001	Studio Activities	0	0	2	-	-	All
		Total	16	0	16	23	1000	-

Type of	Course		Ηοι	urs/W	eek	Credits	Marks	Common to
Course	Code	Course Title	L	Т	Р	Credits	Warks	Programmes
Minor	23MAXXXX	Numerical Methods and Linear Algebra	3	1	0	4	100	-
Major	23XXXXXX	DC Machines and Transformers	3	0	0	3	100	-
Major	23XXXXXX	Electric Circuits	3	1	0	4	100	-
Major	23XXXXXX	Digital Electronics	3	0	0	3	100	-
Multi Disciplinary	23XXXXXX	C Programming	3	0	0	3	100	-
Major	23XXXXXX	DC Machines and Transformers Laboratory	0	0	3	1.5	100	-
Multi Disciplinary	23XXXXXX	C Programming Laboratory	0	0	3	1.5	100	-
VAC	23XXXXXX	Employability Skills-2	0	0	2	1	100	-
VAC	23XXXXXX	Universal Human Values 2 :Understanding Harmony	2	1	0	3	100	-
		Total	17	3	6	24	900	-

# Tentative Curriculum from Semester III to VIII Semester III

# Semester IV

Type of	Course	Course Title	Ηοι	irs/W	eek	Cradita	Morko	Common to
Course	Code	Course The	L	Т	Р	Credits	IVIAI KS	Programmes
Minor	23XXXXXX	Probability and Statistics	3	1	0	4	100	-
Major	23XXXXXX	Synchronous and Induction Machines	3	0	0	3	100	-
Major	23XXXXXX	Electronic Circuits	3	0	0	3	100	-
Multi Disciplinary	23XXXXXX	Data Structures and Algorithms	2	0	2	3	100	-
Major	23XXXXXX	Control Systems	3	1	0	4	100	-
Major	23XXXXXX	Synchronous and Induction Machines Laboratory	0	0	3	1.5	100	-
Major	23XXXXXX	Analog and Digital Electronics Laboratory	0	0	3	1.5	100	-
SEC	23XXXXXX	Employability Skills-3	0	0	2	1	100	-
		Total	14	2	8	21	800	-

Type of Course	Type of Course	Course Title	Duration	Credits	Marks	Common to Programmes
SEC	23XXXXXX	Internship – 1/Community Internship /Skill Development Program	2 Weeks	1	100	-

# Semester V

Туре	Course		Ηοι	urs/W	eek	Oradita	Marka	Common to
Course	Code	Course little	L	Т	Ρ	Creaits	warks	Programmes
Major	23XXXXXX	Generation, Transmission and Distribution	3	0	0	3	100	-
Major	23XXXXXX	Microprocessor and Microcontroller	3	0	0	3	100	-
Major	23XXXXXX	Linear Integrated Circuits	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – I	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – II	3	0	0	3	100	-
Major	23XXXXXX	Integrated Circuits Laboratory	0	0	3	1.5	100	-
Major	23XXXXXX	Microprocessor and Microcontroller Laboratory	0	0	3	1.5	100	-
SEC	23XXXXXX	Employability Skills 4	0	0	2	1	100	-
Research Project	23XXXXXX	Reverse Engineering Project	0	0	6	3	100	-
	Total			0	6	22	1000	-

# Semester VI

Туре	Course		Hour	s/W	eek	Credite	Marke	Common to
Course	Code	Course The	L	т	Ρ	Creats	warks	Programmes
Major	23XXXXXX	Electrical Measurement and Instrumentation	3	0	0	3	100	-
Major	23XXXXXX	Digital Signal Processing	3	1	0	4	100	-
Major	23XXXXXX	Power Electronics	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – III	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – IV	3	0	0	3	100	-
Minor	23XXXXXX	Open Elective-I	3	0	0	3	100	-
Major	23XXXXXX	Power Electronics Laboratory	0	0	3	1.5	100	-
SEC	23XXXXXX	Employability Skills 5	0	0	2	1	100	-
		Total	17	1	4	21.5	800	-

Type of Course	Course Code	Course Title	Duration	Credits	Marks	Common to Programmes
SEC	23XXXXXX	Internship-2/ Research Internship/ Skill Development Program	2 Weeks	1	100	-

Type of	Course	Course Title	Но	urs/W	eek	Cradits	Marke	Common to
Course	Code	Course The	L	Т	Р	Credits	IVIAI NS	Programmes
Major	23XXXXXX	Power System Analysis and Stability	3	1	0	4	100	-
Major	23XXXXXX	Electric Drives and Control	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – V	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – VI	3	0	0	3	100	-
Minor	23XXXXXX	Open Elective – II	3	0	0	3	100	-
Major	23XXXXXX	Power System Lab	0	0	3	1.5	100	-
SEC	23XXXXXX	Electric Drives and Control lab	0	0	3	1.5	100	-
Research Project	23XXXXXX	Phase 1-Project	0	0	8	4	100	-
	Total		15	1	12	23	800	-

### Semester VIII

Type of	Course	Course Title	Но	urs/W	eek	Crodite	Marke	Common to
Course	Code	Course Title	L	Т	Р	Credits	IVIAI KS	Programmes
Major	23XXXXXX	Professional Elective – VII	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – VIII	3	0	0	3	100	-
Research Project	23XXXXXX	Phase 2-Project	0	0	16	8	200	-
	23XXXXXX	Internship	4	Week	S	2	100	-
		Total	0	0	16	16	500	-

Total Credits: 172.5



# Programme: B.E. Electronics and Communication Engineering (Advanced Communication Technology) 2023 Regulations

# Curriculum for Semester I & II

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

Type of	Course		Но	urs/W	eek	Cradita	Morke	Common to
Course	Code	Course Thie	L	Т	Ρ	Creats	iviai ks	Programmes
AEC	23ENI101	Communication Skills I	2	0	2	3	100	All
Minor	23MAI102	Matrices and Calculus	3	0	2	4	100	AU,EA,EC, EE,EV&ME
Major	23ECT101	Electron Devices	3	0	0	3	100	EA,EC&EV
Major	23ECT001	Circuit Theory	3	0	0	3	100	EA,EC&EV
Multi Disciplinary	23ADT001	C Programming	3	0	0	3	100	CE,EA,EC&EV
Major	23ECL001	Electric Circuits and Electron Devices Laboratory	0	0	3	1.5	100	EA,EC&EV
SEC	23ADL001	C Programming Laboratory	0	0	3	1.5	100	CE,EA,EC&EV
VAC	23VAL102	Wellness for Students	0	0	2	1	100	All
VAC	23VAT101	தமிழர்மரபு /Heritage of Tamils	1	0	0	1	100	All
AEC	23SAL001	Studio Activities	0	0	2	-	-	All
		Total	15	0	14	21	900	

### Semester I

Type of	Course		Но	urs/W	eek	One dite	Marka	Common to
Course	Code	Course little	L	Т	Ρ	Credits	warks	Programmes
AEC	23ENI201	Communication Skills II	2	0	2	3	100	All
Minor	23MAI204	Linear Algebra and Complex Variable	3	0	2	4	100	
Minor	23PHI201	Physics for Electrical Sciences	3	0	2	4	100	EA,EC,EE & EV
Major	23EAI201	Digital Principles and System Design	3	0	2	4	100	
Multi Disciplinary	23ITT202	Problem Solving and Python Programming	3	0	0	3	100	EA,EC & EV
Multi Disciplinary	23MEL001	Engineering Drawing	1	0	3	2.5	100	AD,AM,AU,CS, EA,EC,EE,EV,IT, ME & SC
SEC	23ESL201	Employability Skills1:Aptitude	0	0	2	1	100	All
VAC	23VAT201	தமிழரும் தொழில்நுட்பமும்   / Tamils and Technology	1	0	0	1	100	All
Multi Disciplinary	23CHT202	Environmental Sciences	1	0	0	-	100	All
AEC	23SAL001	Studio Activities	0	0	2	-	-	All
		Total	17	0	15	22.5	900	

# Semester II

# Tentative Curriculum for Semester III to VIII

Type of	Course	Course Title	Но	urs/W	eek	Cradita	Marka	Common to
Course	Code	Course The	L	Т	Ρ	Credits	IVIAI KS	Programmes
Minor	23XXXXXX	Probability Theory for Communication Engineers	3	1	0	4	100	
Major	23XXXXXX	Electronic Circuits	3	0	0	3	100	
Major	23XXXXXX	Analog Communication	3	0	0	3	100	
Major	23XXXXXX	Transmission Lines and Wave Guides	3	0	0	3	100	
Major	23XXXXXX	Signal Processing for Communication	3	0	0	3	100	
Major	23XXXXXX	Signal Processing Laboratory	0	0	3	1.5	100	
Major	23XXXXXX	Electronic Circuits Laboratory	0	0	3	1.5	100	
SEC	23XXXXXX	Employability Skills 2	0	0	2	1	100	All
VAC	23XXXXXX	Universal Human Values 2 :Understanding Harmony	2	1	0	3	100	All
		Total	17	2	8	23	900	

# Semester III

# Semester IV

Type of	Course	Course Title	Но	urs/W	eek	Cradita	Morko	Common to
Course	Code	Course ritte		Т	Ρ	Credits	IVIAI KS	Programmes
Minor	23XXXXXX	Numerical methods and optimization	3	1	0	4	100	
Major	23XXXXXX	Antenna Design Technologies	3	0	0	3	100	
Major	23XXXXXX	Microcontroller and its applications	3	0	0	3	100	
Major	23XXXXXX	Digital Communication	3	0	0	3	100	
Major	23XXXXXX	CMOS VLSI design	3	0	0	3	100	
Major	23XXXXXX	Analog and Digital Communication Laboratory	0	0	3	1.5	100	
Major	23XXXXXX	Microcontroller Laboratory	0	0	3	1.5	100	
SEC	23XXXXXX	Employability Skills 3	0	0	2	1	100	All
		Total	15	1	8	20	800	

Type of Course	Course Code	Course Title	Duration	Credits	Marks
Summer Internship	23XXXXXX	Internship 1/Community Internship /Skill Development Program	2 Weeks	1	100

# Semester V

Type of	Course		Но	urs/W	eek	Cradita	Marke	Common to
Course	Code	Course The	L	Т	Р	Credits	Warks	Programmes
Minor	23XXXXXX	Data Communication Networks	3	0	0	3	100	
Major	23XXXXXX	Broadband Wireless Communication Technologies	3	0	0	3	100	
Major	23XXXXXX	Microwave and optical communication	3	0	0	3	100	
Minor	23XXXXXX	Cyber security	3	0	0	3	100	All
SEC	23XXXXXX	Microwave and Optical Communication Laboratory	0	0	3	1.5	100	
Major	23XXXXXX	Professional Elective I	3	0	0	3	100	
Major	23XXXXXX	Professional Elective II	3	0	0	3	100	
SEC	23XXXXXX	Employability Skills 4	0	0	2	1	100	All
Research Project	23XXXXXX	Reverse Engineering Project	0	0	6	3	100	All
		Total	18	0	11	23.5	900	

# Semester VI

Type of Course		Course Title	Но	urs/W	eek	Cradita	Morko	Common to
Course	Code	Course The	L	Т	Ρ	Credits	IVIAI KS	Programmes
Major	23XXXXXX	Software Defined Radio	3	0	2	4	100	
Major	23XXXXXX	MIMO and OFDM techniques	3	0	2	4	100	
Major	23XXXXXX	Smart Antennas	3	0	0	3	100	
Major	23XXXXXX	Professional Elective III	3	0	0	3	100	
Major	23XXXXXX	Professional Elective IV	3	0	0	3	100	
Minor	23XXXXXX	Open Elective I	3	0	0	3	100	
SEC	23XXXXXX	Employability Skills 5	0	0	2	1	100	All
		Total	18	0	6	21	700	

Type of Course	Course Code	Course Title	Duration	Credits	Marks
Summer Internship	23XXXXXX	Internship 2/ Research Internship/ Skill Development Program	2 Weeks	1	100

Type of	Course		Но	urs/W	eek	Cradita	Marks	Common to
Course	Code	Course The	L	Т	Ρ	Credits	Warks	Programmes
Major	23XXXXXX	5G Communication Technologies	3	0	0	3	100	
Major	23XXXXXX	RF Circuit Design	3	0	0	3	100	
Major	23XXXXXX	Millimeter wave communication	3	0	0	3	100	
SEC	23XXXXXX	RF Circuit Design Laboratory	0	0	3	1.5	100	
Major	23XXXXXX	Professional Elective V	3	0	0	3	100	
Major	23XXXXXX	Professional Elective VI	3	0	0	3	100	
Minor	23XXXXXX	Open Elective II	3	0	0	3	100	
Research Project	23XXXXXX	Project Phase I	0	0	8	4	100	
		Total	18	0	11	23.5	800	

# Semester VII

### Semester VIII

Type of	Course	Course Title	Hours/Week			Crodite	Marks	Common to
Course	Code			Т	Ρ	Credits	Marks	Programmes
Major	23XXXXXX	Professional Elective VII	3	0	0	3	100	
Major	23XXXXXX	Professional Elective VIII	3	0	0	3	100	
Research Project	23XXXXXX	Project Phase II	0	0	12	6	200	
Summer Internship	23XXXXXX	Internship 3	8	Week	S	4	100	
		Total	6	0	12	16	500	

Total Credits: 172.5



# Programme: B.E. Electronics Engineering (VLSI Design and Technology) 2023 Regulations Curriculum for Semester I & II

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

#### Semester I

Type of	Course	Course Title	Но	urs/W	eek	Credits	Marks	Common to
Course	Code		L	Т	Ρ			Programmes
AEC	23ENI101	Communication Skills I	2	0	2	3	100	All
Minor	23MAI102	Matrices and Calculus	3	0	2	4	100	AU,EA,EC, EE,EV&ME
Minor	23CHI101	Chemistry for Electrical Sciences	3	0	2	4	100	EC,EE&EV
Major	23ECT101	Electron Devices	3	0	0	3	100	EA,EC&EV
Multi Disciplinary	23ADT001	C Programming	3	0	0	3	100	CE,EA,EC&EV
SEC	23ADL001	C Programming Laboratory	0	0	3	1.5	100	CE,EA,EC&EV
VAC	23VAL102	Wellness for Students	0	0	2	1	100	All
VAC	23VAT101	தமிழர்மரபு /Heritage of Tamils	1	0	0	1	100	All
AEC	23SAL001	Studio Activities	0	0	2	-	-	All
		Total	15	0	13	20.5	800	-

Semester II

Type of	Course	Course Title	Hou	irs/M	leek	Credits	Marks	Common to
Course	Code		L	Т	Ρ	orcans	marks	Programmes
AEC	23ENI201	Communication Skills II	2	0	2	3	100	All
Minor	23MAI202	Complex Variables and Transforms	3	0	2	4	100	AU,EC,EE, EV & ME
Minor	23PHI201	Physics for Electrical Sciences	3	0	2	4	100	EA,EC,EE & EV
Major	23ECT001	Circuit Theory	3	0	0	3	100	EA,EC & EV
Multi Disciplinary	23ITT202	Problem Solving and Python Programming	3	0	0	3	100	EA,EC & EV
Multi Disciplinary	23MEL001	Engineering Drawing	1	0	3	2.5	100	AD,AM,AU,CS, EA,EC,EE,EV,IT, ME & SC
Major	23ECL001	Electric Circuits and Electron Devices Laboratory	0	0	3	1.5	100	EA,EC&EV
SEC	23ESL201	Employability Skills1:Aptitude	0	0	2	1	100	All
VAC	23VAT201	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	1	0	0	1	100	All
Multi Disciplinary	23CHT202	Environmental Sciences	1	0	0	-	100	All
AEC	23SAL001	Studio Activities	0	0	2	-	-	All
	Total					23	1000	

Type of	Course		Ηοι	irs/W	eek	Credite	Marka	Common to
Course	Code	Course little	L	Т	Р	Creaits	Marks	Programmes
Minor	23MAXXXX	Numerical Methods and Linear Algebra	3	1	0	4	100	-
Major	23XXXXXX	Signals and Systems	3	0	0	3	100	-
Major	23XXXXXX	Network Theory	3	0	0	3	100	-
Major	23XXXXXX	Digital Electronics	3	0	0	3	100	-
Major	23XXXXXX	Analog Electronics	3	0	0	3	100	-
Major	23XXXXXX	Digital IC Lab	0	0	3	1.5	100	-
Major	23XXXXXX	Analog Electronics lab	0	0	3	1.5	100	-
VAC	23XXXXXX	Employability Skills-2	0	0	2	1	100	-
VAC	23XXXXXX	Universal Human Values 2 :Understanding Harmony	2	1	0	3	100	-
		Total	17	2	7	23	900	-

# Tentative Curriculum from Semester III to VIII Semester III

# Semester IV

Type of	Course	Course Title		irs/W	eek	Cradita	Marks	Common to
Course	Code		L	Т	Р	Credits	IVIA KS	Programmes
Minor	23XXXXXX	Probability and Statistics	3	1	0	4	100	-
Major	23XXXXXX	Linear Integrated Circuits	3	0	0	3	100	-
Major	23XXXXXX	Digital Signal Processing	3	0	0	3	100	-
Multi Disciplinary	23XXXXXX	Data Structures and Algorithms	2	0	2	3	100	-
Major	23XXXXXX	Microprocessors and Microcontrollers	3	0	0	3	100	-
Major	23XXXXXX	Microprocessors and Microcontrollers Laboratory	0	0	3	1.5	100	-
Major	23XXXXXX	Linear Integrated Circuits Laboratory	0	0	3	1.5	100	-
SEC	23XXXXXX	Employability Skills-3	0	0	2	1	100	-
		Total	14	1	8	20	800	-

Type of Course	Type of Course	Course Title	Duration	Credits	Marks	Common to Programmes
SEC	23XXXXXX	Internship – 1/Community Internship /Skill Development Program	2 Weeks	1	100	-

# Semester V

Туре	Course		Ηοι	ırs/W	eek	Credits N	Marka	Common to
Course	Code	Course little	L	Т	Ρ	Creaits	warks	Programmes
Major	23XXXXXX	VLSI Design	3	0	0	3	100	-
Major	23XXXXXX	Semiconductor Device Modelling	2	0	0	2	100	-
Major	23XXXXXX	Introduction to Micro fabrication	3	0	0	3	100	-
Major	23XXXXXX	Modern Communication System	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – I	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – II	3	0	0	3	100	-
Major	23XXXXXX	VLSI Design Laboratory	0	0	3	1.5	100	-
Major	23XXXXXX	Semiconductor Device Modelling Laboratory	0	0	3	1.5	100	-
SEC	23XXXXXX	Employability Skills 4	0	0	2	1	100	-
Research Project	23XXXXXX	Reverse Engineering Project	0	0	6	3	100	
Total			17	0	12	24	1000	-

## Semester VI

Туре	Course	October 714	Hour	s/W	eek		Maalaa	Common to
Course	Code	Course little	L	Т	Ρ	Creaits	warks	Programmes
Major	23XXXXXX	VLSI Verification and Testing	3	0	0	3	100	-
Major	23XXXXXX	CAD for IC Design	2	0	2	3	100	-
Minor	23XXXXXX	ASIC Design	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – III	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – IV	3	0	0	3	100	-
Minor	23XXXXXX	Open Elective-I	3	0	0	3	100	-
Major	23XXXXXX	VLSI Verification and Testing Laboratory	0	0	3	1.5	100	-
SEC	23XXXXXX	Employability Skills 5	0	0	2	1	100	-
		Total	17	0	6	20.5	800	-

Type of Course	Course Code	Course Title	Duration	Credits	Marks	Common to Programmes
SEC	23XXXXXX	Internship-2/ Research Internship/ Skill Development Program	2 Weeks	1	100	-

# Semester VII

Type of	Course		Ηοι	urs/W	leek	Credits	Marks	Common to
Course	Code	Course Title	L	Т	Р	Credits	IVIA KS	Programmes
Major	23XXXXXX	VLSI Technology	3	0	0	3	100	-
Major	23XXXXXX	CMOS Analog IC Design	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – V	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – VI	3	0	0	3	100	-
Minor	23XXXXXX	Open Elective –II (Research Methodology)	3	0	0	3	100	-
Major	23XXXXXX	VLSI Technology Laboratory	0	0	3	1.5	100	-
SEC	23XXXXXX	CMOS Analog IC Design Laboratory	0	0	3	1.5	100	-
Research Project	23XXXXXX	Phase 1-Project	0	0	8	4	100	-
	Total			1	12	22	800	-

#### **Semester VIII**

Type of	Course	Course Title	Ηοι	urs/W	eek	Crodite	Marks	Common to
Course	Code		L	Т	Ρ	Cieuns	IVIAI KS	Programmes
Major	23XXXXXX	Professional Elective – VII	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – VIII	3	0	0	3	100	-
Research Project	23XXXXXX	Project	0	0	16	8	200	-
	23XXXXXX	Internship	0	0	0	2	100	-
Total			6	0	16	16	500	-

**Total Credits: 171** 



# Programme: B.E. Computer Science and Engineering 2023 Regulations

# Curriculum for Semester I & II

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

#### Semester I

Type of	Course	Course Title	Но	urs/W	eek	Cradita	Marks	Common to
Course	Code	Course Title	L	Т	Р	Credits	IVIAI KS	Programmes
AEC	23ENI101	Communication Skills I	2	0	2	3	100	ALL
Minor	23MAI103	Linear Algebra and Infinite Series	3	0	2	4	100	AD,AM,CS,IT &SC
Major	23CST101	Problem Solving using C	3	0	0	3	100	AD,AM,CS,IT &SC
Multi Disciplinary	23EEI101	Basics of Electrical and Electronics Engineering	3	0	2	4	100	AD,AM,CS,IT &SC
Multi Disciplinary	23MEL001	Engineering Drawing	1	0	3	2.5	100	AD,AM,AU,CS, EA,EC,EE,EV,IT ,ME,SC
SEC	23CSL101	Problem Solving using C Laboratory	0	0	3	1.5	100	AD,AM,CS,IT &SC
VAC	23VAL102	Wellness for Students	0	0	2	1	100	ALL
VAC	23VAT101	தமிழர்மரபு /Heritage of Tamils	1	0	0	1	100	ALL
AEC	23SAL001	Studio Activities	0	0	2	-	-	ALL
		Total	13	0	16	20	800	-

# Semester II

Type of	Course		Но	urs/W	eek	Cradita	Marks	Common to
Course	Code		L	Т	Р	Credits	IVIAI NS	Programmes
AEC	23ENI201	Communication Skills II	2	0	2	3	100	ALL
Minor	23MAI203	Calculus and Transforms	3	0	2	4	100	AD,AM,CS,IT &SC
Minor	23PHT001	Physics for Information Sciences	3	0	0	3	100	AD,AM,CS,IT &SC
Major	23ITT201	Data Structures	3	0	0	3	100	AD,AM,CS,IT &SC
Multi Disciplinary	23EEI201	Digital System Design	2	0	2	3	100	AD,AM,CS,IT &SC
Minor	23PHL001	Physics for Information Sciences Laboratory	0	0	3	1.5	100	Minor
SEC	23ITL201	Data Structures Laboratory	0	0	3	1.5	100	AD,AM,CS,IT &SC
SEC	23CSL201	IT Practices Laboratory	0	0	4	2	100	AD,AM,CS,IT &SC
SEC	23ESL201	Employability Skills 1: Aptitude	0	0	2	1	100	ALL
VAC	23VAT201	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	1	0	0	1	100	ALL
Multi Disciplinary	23CHT202	Environmental Sciences	1	0	0	-	100	ALL
AEC	23SAL001	Studio Activities	0	0	2	-	-	ALL
	Total					23	1100	

# Tentative Curriculum for Semester III to VIII

# Semester III

Course	Course		Ηοι	urs/W	/eek	Cradita	Marke	Common to
Туре	Code	Course little	L	Т	Р	Creats	Warks	Programmes
Minor	23XXXXXX	Discrete Mathematics	3	1	0	4	100	-
Major	23XXXXXX	Design and Analysis of Algorithms	3	0	2	4	100	-
Minor	23XXXXXX	Computer Architecture	3	0	0	3	100	-
Major	23XXXXXX	Database Systems	3	0	2	4	100	-
Major	23XXXXXX	Internet Programming Laboratory	0	0	3	1.5	100	-
Major	23XXXXXX	Java Programming Laboratory	0	0	3	1.5	100	-
SEC	23XXXXXX	Employability Skills 2	0	0	2	1	100	-
VAC	23XXXXXX	Universal Human Values 2 :Understanding Harmony	2	1	0	3	100	-
		Total	14	2	12	22	800	

### Semester IV

Course	Course	Course Title	Hours/Week			Cradita	Marks	Common to
Туре	Code		L	т	Ρ	Creats	Warks	Programmes
Minor	23XXXXXX	Probability and Statistics	3	1	0	4	100	-
Major	23XXXXXX	Computer Networks	3	0	2	4	100	-
Major	23XXXXXX	Operating Systems	3	0	0	3	100	-
Minor	23XXXXXX	Microcontrollers and IoT	3	0	2	4	100	-
Major	23XXXXXX	Data Warehousing and Mining	3	0	0	3	100	-
Major	23XXXXXX	Python Programming Laboratory	0	0	4	2	100	-
SEC	23XXXXXX	Employability Skills 3	0	0	2	1	100	-
Internship	23XXXXXX	Internship – 1/Community Internship /Skill Development Program	2	Wee	ks	1	100	-
		Total	15	1	10	22	800	

# Semester V

Course	Course		Hou	rs/W	eek	Cradita	Marks	Common to
Туре	Code	Course The	L	Т	Ρ	Credits	Warks	Programmes
Major	23XXXXXX	Formal Languages and Automata Theory	3	1	0	4	100	-
Major	23XXXXXX	Object Oriented Software Engineering	3	0	0	3	100	-
Major	23XXXXXX	Object Oriented Software Engineering Laboratory	0	0	3	1.5	100	-
Major	23XXXXXX	Cyber security	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – I	2	0	2	3	100	-
Major	23XXXXXX	Professional Elective – II	3	0	0	3	100	-
SEC	23XXXXXX	Employability Skills 4	0	0	2	1	100	-
Project	23XXXXXX	Reverse Engineering Project	1	0	4	3	100	-
		Total	15	1	11	21.5	800	

# Semester VI

Course	Course	Course Title	Hours/Week			Credits	Marks	Common to
Туре	Code		L	Т	Ρ	Cleans	Walks	Programmes
Major	23XXXXXX	Compiler Design	3	1	0	4	100	-
Major	23XXXXXX	Artificial Intelligence	3	0	0	3	100	-
Major	23XXXXXX	Artificial Intelligence Laboratory	0	0	3	1.5	100	-
Major	23XXXXXX	Professional Elective – III	2	0	2	3	100	-
Major	23XXXXXX	Professional Elective – IV	3	0	0	3	100	-
Minor	23XXXXXX	Open Elective - I	3	0	0	3	100	-
SEC	23XXXXXX	Employability Skills 5	0	0	2	1	100	-
Internship	23XXXXXX	Internship-2/ Research Internship/ Skill Development Program	4 Weeks		2	100	-	
		Total	14	1	7	19.5	800	
# Semester VII

Course	Course	Course Course Title			eek	Crodite	Marks	Common to
Туре	Code		L	Т	Ρ	Creans	IVIAI KS	Programmes
Major	23XXXXXX	Cloud Technology	2	0	2	3	100	-
Major	23XXXXXX	Open Source Software Development Laboratory	0	0	4	2	100	-
Major	23XXXXXX	Software Project Management	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – V	2	0	2	3	100	-
Major	23XXXXXX	Professional Elective – VI	3	0	0	3	100	-
Minor	23XXXXXX	Open Elective – II	3	0	0	3	100	-
Project	23XXXXXX	Project Phase-I	0	0	8	4	100	-
		Total	13	0	16	21	700	

## Semester VIII

Course	Course	Course Title	Hours/Week			Credits	Marks	Common to
Туре	Code	Course mile	L	Т	Ρ	Credits	iviai KS	Programmes
Major	23XXXXXX	Professional Elective – VII	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – VIII	3	0	0	3	100	-
Project	23XXXXXX	Project Phase-II	0	0	12	6	200	-
Internship	23XXXXXX	Internship-3	8 Weeks		4	100	-	
		Total	6	0	12	16	500	

**Total Credits: 165** 



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#### Programme: B.Tech. Information Technology 2023 Regulations Curriculum for Semester I & II

	Туре	of Course	Course Code	Course T	itle		D	uration	Credits	Marks	
		VAC	23VAL101	Induction Progr	am		3	Weeks	-	100	
				Semest	er I						
Ty	/pe of	Course	Cours	se Title	Hou	lours/Week		Credits	Marks	Commo	on to
0		Coue			L	T	Ρ			Flogran	IIIIe3
1	AEC	23ENI101	Communicatio	on Skills I	2	0	2	3	100	All	
Ν	linor	23MAI103	Linear Algebra Series	a and Infinite	3	0	2	4	100	AD,AM,CS	S,IT,SC
Ν	<i>l</i> inor	23PHT001	Physics for Inf Sciences	ormation	3	0	0	3	100	AD,AM,CS	S,IT,SC
Ν	Лаjor	23CST101	Problem Solvi	ng using C	3	0	0	3	100	AD,AM,CS	S,IT,SC
M cip	ultidis olinary	23EEI101	Basics of Electronics Er	ctrical and gineering	3	0	2	4	100	AD,AM,CS	S,IT,SC
Ν	Ainor	23PHL001	Physics for Inf Sciences Labo	ormation pratory	0	0	3	1.5	100	AD,AM,CS	S,IT,SC
ł	SEC	23CSL101	Problem Solvi Laboratory	ng using C	0	0	3	1.5	100	AD,AM,CS	S,IT,SC
	VAC	23VAL102	Wellness for S	Students	0	0	2	1	100	ALL	-
,	VAC	23VAT101	தமிழர்மரபு /He Tamils	eritage of	1	0	0	1	100	ALL	-
	AEC	23SAL001	Studio Activitie	es	0	0	2	-	-	ALL	-
	Total					0	16	22	900		

#### Semester II

Type of	Course	Course Title		urs/W	eek	Credits	Marks	Common to
Course	Code		L	Т	Ρ			Programmes
AEC	23ENI201	Communication Skills II	2	0	2	3	100	ALL
Minor	23MAI203	Calculus and Transforms	3	0	2	4	100	AD,AM,CS,IT,SC
Major	23ITT201	Data Structures	3	0	0	3	100	AD,AM,CS,IT,SC
Multidisc iplinary	23EEI201	Digital System Design	2	0	2	3	100	AD,AM,CS,IT,SC
Multidisc iplinary	23MEL001	Engineering Drawing	1	0	3	2.5	100	AD,AM,AU, CS,EA,EC,EE,EV, IT,ME,SC
SEC	23ITL201	Data Structures Laboratory	0	0	3	1.5	100	AD,AM,CS,IT, SC
SEC	23CSL201	IT Practices Laboratory	0	0	4	2	100	AD,AM,CS,IT,SC
SEC	23ESL201	Employability Skills 1:Aptitude	0	0	2	1	100	ALL

VAC	23VAT201	தமிழரும் தொழில்நுட்பமும்  / Tamils and Technology	1	0	0	1	100	ALL
Multidisc iplinary	23CHT202	Environmental Sciences	1	0	0	-	100	ALL
AEC	23SAL001	Studio Activities	0	0	2	-	-	ALL
		Total	13	0	20	21	1000	

## Tentative Curriculum for Semester III to VIII

Course	Courso		Но	urs/W	eek			Common to
Туре	Code	Course Title	L	Т	Ρ	Credits	Marks	Programmes
Minor	23XXXXXXX	Discrete Mathematics	3	1	0	4	100	-
Major	23XXXXXXX	Design and Analysis of Algorithms	3	0	0	3	100	-
Major	23XXXXXXX	Object Oriented Programming using Java	3	0	0	3	100	-
Minor	23XXXXXXX	Computer Organization and Microprocessor	3	0	2	4	100	-
Major	23XXXXXXX	Software Engineering	3	0	0	3	100	-
Major	23XXXXXXX	Object Oriented Programming using Java Laboratory	0	0	3	1.5	100	-
SEC	23XXXXXXX	Employability Skills-2	0	0	2	1	100	-
VAC	23XXXXXXX	Universal Human Values 2 :Understanding Harmony	2	1	0	3	100	-
	Total				7	22.5	800	

#### Semester III

#### Semester IV

Course	Course		Но	urs/W	eek	Credit	Marke	Common to
туре	Code	Course ritte	L	Т	Ρ	S	IVIA KS	Programmes
Minor	23XXXXXXX	Probability and Statistics	3	1	0	4	100	-
Major	23XXXXXXX	Operating System	3	0	0	3	100	-
Major	23XXXXXXX	Computer Networks	3	0	2	4	100	-
Major	23XXXXXXX	Database Management Systems	3	0	2	4	100	-
Major	23XXXXXXX	Programming with Python Laboratory	1	0	3	2.5	100	-

SEC	23XXXXXXX	Employability Skills-3	0	0	2	1	100	-
Internship	23XXXXXXX	Internship – 1/Community Internship /Skill Development Program	2	Week	S	1	100	-
		Total	13	1	9	19.5	700	

# Semester V

Course	Course	Course Title	Ηοι	urs/W	leek	Cradita	Marks	Common to
Туре	Code	Course Title	L	Т	Ρ	Credits	WIALKS	Programmes
Major	23XXXXXXX	Web Technology	3	0	0	3	100	-
Major	23XXXXXXX	Data Mining	3	0	2	4	100	-
Major	23XXXXXXX	Web Technology Laboratory	0	0	3	1.5	100	-
Major	23XXXXXXX	Cyber security	3	0	0	3	100	-
Major	23XXXXXXX	Professional Elective – I	2	0	2	3	100	-
Major	23XXXXXXX	Professional Elective – II	3	0	0	3	100	-
SEC	23XXXXXXX	Employability Skills 4	0	0	2	1	100	-
Project	23XXXXXXX	Reverse Engineering Project	0	0	6	3	100	-
		Total	14	0	15	21.5	800	

## Semester VI

Course	Course	Course Title	Hours/Week			Credits	Marks	Common to Programmes
Гуре	Code	LTF		Р				
Major	23XXXXXXX	Cloud Computing	3	0	0	3	100	-
Major	23XXXXXXX	Internet of Things	3	0	2	4	100	-
Major	23XXXXXXX	Cloud Computing Laboratory	0	0	3	1.5	100	-
Major	23XXXXXXX	Professional Elective – III	2	0	2	3	100	-
Major	23XXXXXXX	Professional Elective – IV	3	0	0	3	100	-
Minor	23XXXXXXX	Open Elective-I	3	0	0	3	100	-
SEC	23XXXXXXX	Employability Skills 5	0	0	2	1	100	-
Internship	23XXXXXXX	Internship-2/ Research Internship/ Skill Development Program	4 Weeks		1	100	-	
	Total					19.5	800	

#### **Semester VII**

Course	Course	Course Title	Но	urs/V	Veek	Crodite	Marke	Common to
Туре	Code	Course Title	L	Т	Р	Credits	iviai ko	Programmes
Major	23XXXXXXX	Artificial Intelligence and Machine Learning	3	0	2	4	100	-
Major	23XXXXXXX	Data Science Laboratory	1	0	4	3	100	-
Major	23XXXXXXX	Project Management	3	0	0	3	100	-
Major	23XXXXXXX	Professional Elective – V	2	0	2	3	100	-
Major	23XXXXXXX	Professional Elective – VI	3	0	0	3	100	-
Minor	23XXXXXXX	Open Elective – II	3	0	0	3	100	-
Project	23XXXXXXX	Project Phase-I	0	0	8	4	100	-
	Total					23	700	

#### Semester VIII

Course	Course	Course Title	Но	urs/	Week	Credits	Marks	Common to
Туре	Code	Course The	L	Т	Р	Credits	iviai K5	Programmes
Major	23XXXXXXX	Professional Elective – VII	3	0	0	3	100	-
Major	23XXXXXXX	Professional Elective – VIII	3	0	0	3	100	-
Project	23XXXXXXX	Project Phase- II	0	0	12	6	200	-
Internship	23XXXXXXX	Internship-3	8	3 We	eks	4	100	-
		Total	6	0	12	16	500	

**Total Credits: 165** 



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## Programme: B.Tech Artificial Intelligence and Data Science 2023 Regulations Curriculum for Semester I & II

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

#### Semester I

Type of	Course		Но	urs/W	eek	Cradita	Marka	Common to
Course	Code	oourse mile		Т	Р	Credits	Warks	Programmes
AEC	23ENI101	Communication Skills I	2	0	2	3	100	All
Minor	23MAI103	Linear Algebra and Infinite Series	3	0	2	4	100	AD,AM,CS,IT&SC
Major	23PHT001	Physics for Information Sciences	3	0	0	3	100	AD,AM,CS,IT&SC
Major	23CST101	Problem Solving using C	3	0	0	3	100	AD,AM,CS,IT&SC
Multi disciplinary	23EEI101	Basics of Electrical and Electronics Engineering	3	0	2	4	100	AD,AM,CS,IT&SC
Minor	23PHL001	Physics for Information Sciences Laboratory	0	0	3	1.5	100	AD,AM,CS,IT&SC
SEC	23CSL101	Problem Solving using C Laboratory	0	0	3	1.5	100	AD,AM,CS,IT&SC
VAC	23VAL102	Wellness for Students	0	0	2	1	100	All
VAC	23VAT101	தமிழர்மரபு /Heritage of Tamils	1	0	0	1	100	All
AEC	23SAL001	Studio Activities	0	0	2	-	-	All
		Total	15	0	16	22	900	

#### Semester II

Type of	Course		Но	urs/W	eek	Cradita	Marka	Common to
Course	Code	Course Intie	L	Т	Р	Creaits	warks	Programmes
AEC	23ENI201	Communication Skills II	2	0	2	3	100	ALL
Minor	23MAI203	Calculus and Transforms	3	0	2	4	100	AD,AM,CS,IT&SC
Major	23ITT201	Data Structures	3	0	0	3	100	AD,AM,CS,IT&SC
Multi disciplinary	23EEI201	Digital System Design	2	0	2	3	100	AD,AM,CS,IT&SC
Multi disciplinary	23MEL001	Engineering Drawing	1	0	3	2.5	100	AD,AM,AU,CS,EA ,EC,EE,EV,IT,ME, SC
SEC	23ITL201	Data Structures Laboratory	0	0	3	1.5	100	AD,AM,CS,IT&SC
SEC	23CSL201	IT Practices Laboratory	0	0	4	2	100	AD,AM,CS,IT&SC
SEC	23ESL201	Employability Skills 1:Aptitude	0	0	2	1	100	ALL
VAC	23VAT201	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	1	0	0	1	100	ALL
Multi disciplinary	23CHT202	Environmental Sciences	1	0	0	-	100	ALL
AEC	23SAL001	Studio Activities	0	0	2	-	-	ALL
		Total	13	0	20	21	1000	

# Tentative Curriculum for Semester III & VIII

Туре	Course		Ηοι	urs/W	/eek	Cradita	Marka	Common to Programmes
Course	Code	Course ritle	L	т	Р	Credits	IVIAI KS	riogrammee
Minor	23XXXXXX	Probability and Statistics for Data Science	3	1	0	4	100	-
Major	23XXXXXX	Design and Analysis of Algorithms	3	0	2	4	100	-
Minor	23XXXXXX	Computer Architecture	3	0	0	3	100	-
Major	23XXXXXX	Database Systems	3	0	2	4	100	-
Major	23XXXXXX	Internet Programming Laboratory	0	0	3	1.5	100	-
Major	23XXXXXX	Java Programming Laboratory	0	0	4	2	100	-
SEC	23XXXXXX	Employability Skills-2	0	0	2	1	100	-
VAC	23XXXXXX	Universal Human Values 2 :Understanding Harmony	2	1	0	3	100	-
		Total	14	2	12	22	800	

#### Semester III

#### Semester IV

Type of	Course	Course Title	Но	urs/W	eek	Crodite	Marke	Common to Programmes
Course	Code	Course mile	L	т	Ρ	Creans	iviai ks	
Minor	23XXXXXX	Discrete Mathematics for Artificial Intelligence	3	1	0	4	100	-
Major	23XXXXXX	Computer Networks	3	0	2	4	100	-
Major	23XXXXXX	Operating Systems	3	0	0	3	100	-
Major	23XXXXXX	Data Mining	3	0	0	3	100	-
Major	23XXXXXX	Artificial Intelligence –I	3	0	0	3	100	-
Major	23XXXXXX	Intelligent systems - I Laboratory	0	0	4	2	100	-
Major	23XXXXXX	Python Programming Laboratory	0	0	4	2	100	-
SEC	23XXXXXX	Employability Skills-3	0	0	2	1	100	-
Internship	23XXXXXX	Internship – 1/Community Internship /Skill Development Program	2	2 Weeks		1	100	-
		Total	15	1	10	23	900	

# Semester V

Туре	Course		Hou	rs/W	eek	Cradita	Marka	Common to
Course	Code	Course Title	L	Т	Р	Credits	warks	Programmes
Major	23XXXXX	Exploratory Data Analysis	3	0	0	3	100	-
Major	23XXXXX	Artificial Intelligence –II	3	0	0	3	100	-
Major	23XXXXX	Cyber security	3	0	0	3	100	-
Major	23XXXXX	Professional Elective – I	2	0	2	3	100	-
Major	23XXXXX	Professional Elective – II	3	0	0	3	100	-
Major	23XXXXX	Exploratory Data Analysis Laboratory	0	0	4	2	100	-
SEC	23XXXXX	Employability Skills 4	0	0	2	1	100	-
Project	23XXXXX	Reverse Engineering Project	1	0	4	3	100	-
		Total	15	1	11	21	800	

## Semester VI

Type of	Course	Course Title	Ηοι	ırs/W	eek	Crodite	Marke	Common to
Course	Code	Course mile	L	Т	Ρ	Credits	IVIAI NO	Frogrammes
Major	23XXXXX	Big Data Analytics	3	0	2	4	100	-
Major	23XXXXX	Deep Learning Techniques	3	0	2	4	100	-
Major	23XXXXX	Cloud Computing Laboratory	1	0	4	3	100	-
Major	23XXXXX	Professional Elective – III	2	0	2	3	100	-
Major	23XXXXX	Professional Elective – IV	3	0	0	3	100	-
Minor	23XXXXX	Open Elective – I	3	0	0	3	100	-
SEC	23XXXXX	Employability Skills 5	0	0	2	1	100	-
Internship	23XXXXX	Internship-2/ Research Internship/ Skill Development Program	4	4 Weeks		2	100	-
		Total	14	1	7	23	800	

## **Semester VII**

Туре	Course		Ηοι	urs/W	eek	Credite	Marka	Common to
Course	Code	Course Inte	L	T P		Creaits	warks	Programmes
Major	23XXXXX	Computational Foundation for Robotics	3	0	2	4	100	-
Major	23XXXXX	Information security	3	0	0	3	100	-
Major	23XXXXX	Business Intelligence and Analytics Laboratory	0	0	4	2	100	-
Major	23XXXXX	Professional Elective – V	2	0	2	3	100	-
Major	23XXXXX	Professional Elective – VI	3	0	0	3	100	-
Minor	23XXXXX	Open Elective – II	3	0	0	3	100	-
Project	23XXXXX	Project Phase-I	0	0	8	4	100	-
Total			13	0	16	21	700	

## Semester VIII

Type of	Course	Course Title	Но	urs/W	leek	Crodite	Marke	Common to
Course	Code	Course ritte	L	L T		Credits	Wial KS	Programmes
Major	23XXXXX	Professional Elective – VII	3	0	0	3	100	-
Major	23XXXXX	Professional Elective – VIII	3	0	0	3	100	-
Project	23XXXXX	Project Phase-II	0	0	12	6	200	-
Internship	23XXXXX	Internship-3	8	8 Weel	٢S	4	100	-
		Total	6	0	12	16	500	

**Total Credits: 169** 



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## Programme: B.E. Computer Science and Engineering (Artificial Intelligence and Machine Learning) 2023 Regulations Curriculum for Semester I & II

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

#### Semester I

Type of	Course		Но	urs/W	eek	Cradita	Marka	Common to
Course	Code	Course Thie	L	Т	Р	Credits	Marks	Programmes
AEC	23ENI101	Communication Skills I	2	0	2	3	100	All
Minor	23MAI103	Linear Algebra and Infinite Series	3	0	2	4	100	AD,AM,CS,IT&SC
Major	23PHT001	Physics for Information Sciences	3	0	0	3	100	AD,AM,CS,IT&SC
Major	23CST101	Problem Solving using C	3	0	0	3	100	AD,AM,CS,IT&SC
Multi disciplinary	23EEI101	Basics of Electrical and Electronics Engineering	3	0	2	4	100	AD,AM,CS,IT&SC
Minor	23PHL001	Physics for Information Sciences Laboratory	0	0	3	1.5	100	AD,AM,CS,IT&SC
SEC	23CSL101	Problem Solving using C Laboratory	0	0	3	1.5	100	AD,AM,CS,IT&SC
VAC	23VAL102	Wellness for Students	0	0	2	1	100	All
VAC	23VAT101	தமிழர்மரபு /Heritage of Tamils	1	0	0	1	100	All
AEC	23SAL001	Studio Activities	0	0	2	-	-	All
		Total	15	0	16	22	900	

#### Semester II

Type of	Course	Course Title	Но	urs/W	eek	Crodite	Marke	Common to
Course	Code	Course The	L	Т	Р	Credits	IVIAI NS	Programmes
AEC	23ENI201	Communication Skills II	2	0	2	3	100	ALL
Minor	23MAI203	Calculus and Transforms	3	0	2	4	100	AD,AM,CS,IT&SC
Major	23ITT201	Data Structures	3	0	0	3	100	AD,AM,CS,IT&SC
Multi disciplinary	23EEI201	Digital System Design	2	0	2	3	100	AD,AM,CS,IT&SC
Multi disciplinary	23MEL001	Engineering Drawing	1	0	3	2.5	100	AD,AM,AU,CS,EA ,EC,EE,EV,IT,ME, SC

SEC	23ITL201	Data Structures Laboratory	0	0	3	1.5	100	AD,AM,CS,IT&SC
SEC	23CSL201	IT Practices Laboratory	0	0	4	2	100	AD,AM,CS,IT&SC
SEC	23ESL201	Employability Skills 1:Aptitude	0	0	2	1	100	ALL
VAC	23VAT201	தமிழரும் தொழில்நட்பமும் / Tamils and Technology	1	0	0	1	100	ALL
Multi disciplinary	23CHT202	Environmental Sciences	1	0	0	-	100	ALL
AEC	23SAL001	Studio Activities	0	0	2	-	-	-
		Total	13	0	20	21	1000	

## Tentative curriculum for Semester III to VIII

#### Semester III

Type of	Course	Course Title	Но	urs/W	eek	Crodite	Marke	Common to	
Course	Code	Course ride	L	т	Р	Credits	IVIAI NO	Programmes	
Minor	23XXXXXX	Discrete Mathematics	3	1	0	4	100	CS, IT, AM & SC	
Major	23XXXXXX	Data Structures and Algorithm Analysis	3	0	2	4	100	SC & AM	
Major	23XXXXXX	Computer Organization and Architecture	3	0	0	3	100	SC & AM	
Major	23XXXXXX	Principles of Artificial Neural Networks	3	0	0	3	100	-	
Major	23XXXXXX	Database Design	3	0	2	4	100	SC & AM	
Major	23XXXXXX	Programming using Java Laboratory	0	0	3	1.5	100	SC & AM	
Major	23XXXXXX	Programming using Python Laboratory	0	0	3	1.5	100	SC & AM	
VAC	23XXXXXX	Universal Human Values 2: Understanding Harmony	2	1	0	3	100	All	
VAC	23XXXXXX	One Credit Course	0	0	2	1	100	-	
VAC	23XXXXXX	தமிழரும் தொழில்நுட்பமும் / / Tamils and Technology	1	0	0	1	100	All	
		Total	18	2	12	26	1000		

#### **Semester IV**

Type of	Course	Course Title	Но	urs/W	eek	Crodite	Marke	Common to
Course	Code	Course The	L	т	Р	Credits	IVIAI NO	Programmes
Minor	23XXXXXX	Probability and Statistics	3	1	0	4	100	All
Major	23XXXXXX	Basics of Operating Systems	3	0	2	4	100	SC & AM
Major	23XXXXXX	Machine Learning Algorithms and Application	3	0	0	3	100	-
Major	23XXXXXX	Neural Computing in Machine Learning	3	0	0	3	100	-
Major	23XXXXXX	Machine Learning Laboratory	0	0	4	2	100	-
Major	23XXXXXX	Neural Networks and Al Laboratory	0	0	4	2	100	-
Project	23XXXXXX	Mini – Project	0	0	4	2	100	-
VAC	23XXXXXX	One Credit Course	0	0	2	1	100	-
		Total	12	1	16	21	800	

Course Code	Course Title	Duration	Credits	Marks
23XXXXXX	Internship or Skill Development*	2 Weeks	1	100

# Semester V

Type of	Course	Course Title	Но	urs/W	eek	Cradita	Marks	Common to
Course	Code	Course The	L	Т	Ρ	Credits	IVIAI NO	Programmes
Major	23XXXXXX	Deep Learning and Application	3	0	0	3	100	-
Major	23XXXXXX	Predictive Analytics	3	0	2	4	100	-
Major	23XXXXXX	Software Engineering in AI	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – I	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – II	3	0	0	3	100	-
Major	23XXXXXX	Open Elective - I	3	0	0	3	100	-
SEC	23XXXXXX	Deep Learning and Application Laboratory	0	0	3	1.5	100	-
SEC	23XXXXXX	Software Engineering in Al Laboratory	0	0	3	1.5	100	-
SEC	23XXXXXX	Employability Skills 1: Teamness and Interpersonal Skills	0	0	2	1	100	All
		Total	18	0	10	23	900	

## Semester VI

Type of	Course	Course Title	Но	urs/W	eek	Cradita	Marka	Common to
Course	Code	Course ride	L	Т	Ρ	Credits	IVIAI KS	Programmes
Minor	23XXXXXX	AI Natural Language Processing	3	0	0	3	100	-
Major	23XXXXXX	Vision and Image Processing	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – III	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – IV	3	0	0	3	100	-
Major	23XXXXXX	Open Elective - II	3	0	0	3	100	-
Major	23XXXXXX	AI Natural Language Processing Laboratory	0	0	3	1.5	100	-
VAC	23XXXXXX	Vision and Image Processing Laboratory	0	0	3	1.5	100	-
VAC	23XXXXXX	Innovative and Creative Project	0	0	4	2	100	-
		Total	15	0	12	21	900	

Course Code	Course Title	Duration	Credits	Marks
XXXXXX	Internship or Skill Development*	2 or 4 Weeks	1	100

## Semester VII

Type of	Course	Course Title		urs/W	eek	Crodite	Marke	Common to
Course	Code		L	Т	Р	Credits	IVIAI NO	Programmes
Major	23XXXXXX	Big data Technology	3	0	0	3	100	-
Major	23XXXXXX	Reinforcement Learning	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – V	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – VI	3	0	0	3	100	-
Major	23XXXXXX	Open Elective - III	3	0	0	3	100	-
Major	23XXXXXX	Big data Technology Laboratory	0	0	3	1.5	100	-
Major	23XXXXXX	Reinforcement Learning Laboratory	0	0	3	1.5	100	-
		Total	15	0	6	18	700	

## Semester VIII

Type of	Course	Course Title		Hours/Week			Credits	Marke	Common to
Course	Code	Course ritte		L	Т	Р	oreans	IVIAI NO	Programmes
Project	23XXXXXX	Project		0	0	16	8	200	-
		-	Total	0	0	16	8	200	

Course Code	ourse Course Title		Credits	Marks
XXXXXX	Internship or Skill Development*	8 or 16 Weeks	4	100

Total Credits: 166



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## **Programme: B.E. Computer Science and Engineering** (Cyber Security) 2023 Regulations Curriculum for Semester I & II

	Type Cour	of se	Cou	rse Code	Course Tit	le	Duration		Credits	Marks		
	V	VAC 23VAL101 Induction Program				3 Weeks		-	100			
L		Semester I									1	
Тур	e of	Cou	rse	0		Но	urs/W	/eek	Credit		Com	mon to
Col	Course	Code			Course Title		Т	Ρ	Credit	s warks	Progr	ammes
A	EC	23EN	1101	Communic	ation Skills I	2	0	2	3	100		All
Mi	nor	23MA	1103	Linear Alge Series	ebra and Infinite	3	0	2	4	100	AD,AM,	CS,IT&SC
Ма	ajor	23PH	T001	Physics for Sciences	r Information	3	0	0	3	100	AD,AM,	CS,IT&SC
Ма	ajor	23CS	T101	Problem S	olving using C	3	0	0	3	100	AD,AM,	CS,IT&SC

Basics of Electrical and

**Electronics Engineering** Physics for Information

Sciences Laboratory Problem Solving using C

Wellness for Students

**Studio Activities** 

தமிழர்மரபு /Heritage of

Laboratory

Tamils

Multi

disciplinary

Minor

SEC

VAC

VAC

AEC

23EEI101

23PHL001

23CSL101

23VAL102

23VAT101

23SAL001

3

0

0

0

1

0

15

0

0

0

0

0

0

0

2

3

3

2

0

2

16

4

1.5

1.5

1

1

-

22

100

100

100

100

100

-

900

AD,AM,CS,IT&SC

AD, AM, CS, IT&SC

AD, AM, CS, IT&SC

All

All

All

# Semester II

Total

Type of	Course	Course Title	Ho	urs/W	eek	Cradita	Marke	Common to
Course	Code			Р	Credits	iviai KS	Programmes	
AEC	23ENI201	Communication Skills II	2	0	2	3	100	ALL
Minor	23MAI203	Calculus and Transforms	3	0	2	4	100	AD,AM,CS,IT&SC
Major	23ITT201	Data Structures	3	0	0	3	100	AD,AM,CS,IT&SC
Multi disciplinary	23EEI201	Digital System Design	2	0	2	3	100	AD,AM,CS,IT&SC
Multi disciplinary	23MEL001	Engineering Drawing	1	0	3	2.5	100	AD,AM,AU,CS,EA ,EC,EE,EV,IT,ME, SC

SEC	23ITL201	Data Structures Laboratory	0	0	3	1.5	100	AD,AM,CS,IT&SC
SEC	23CSL201	IT Practices Laboratory	0	0	4	2	100	AD,AM,CS,IT&SC
SEC	23ESL201	Employability Skills 1:Aptitude	0	0	2	1	100	ALL
VAC	23VAT201	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	1	0	0	1	100	ALL
Multi disciplinary	23CHT202	Environmental Sciences	1	0	0	-	100	ALL
AEC	23SAL001	Studio Activities	0	0	2	-	-	-
		Total	13	0	20	21	1000	

## Tentative Curriculum for Semester III to VIII

## Semester III

Type of	Course	Course Title	Но	urs/W	eek	Cradite	Marks	Common to
Course	Code	Course Thie	L	Т	Р	Credits	iviai KS	Programmes
Minor	23XXXXXX	Discrete Mathematics	3	1	0	4	100	CS, IT, AM & SC
Major	23XXXXXX	Data Structures and Algorithm Analysis	3	0	2	4	100	SC & AM
Major	23XXXXXX	Computer Organization and Architecture	3	0	0	3	100	SC & AM
Major	23XXXXXX	Principles of Communication and Cyber Attacks	3	0	0	3	100	-
Major	23XXXXXX	Database Design	3	0	2	4	100	SC & AM
Major	23XXXXXX	Programming using Java Laboratory	0	0	3	1.5	100	SC & AM
Major	23XXXXXX	Programming using Python Laboratory	0	0	3	1.5	100	SC & AM
VAC	23XXXXXX	Universal Human Values 2: Understanding Harmony	2	1	0	3	100	All
VAC	23XXXXXX	One Credit Course	0	0	2	1	100	-
VAC	23XXXXXX	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	1	0	0	1	100	All
		Total	18	2	12	26	1000	

## Semester IV

Type of	Course	Course Title	Но	urs/W	eek	Crodite	Marks	Common to	
Course	Code	Course Thie	L	т	Р	Credits	IVIAI NO	Programmes	
Minor	23XXXXXX	Probability and Statistics	3	1	0	4	100	All	
Major	23XXXXXX	Basics of Operating Systems	3	0	2	4	100	SC & AM	
Major	23XXXXXX	Computer Networks and Attacks	3	0	0	3	100	-	
Major	23XXXXXX	Cryptography and Security	3	0	0	3	100	-	
Major	23XXXXXX	Computer Network & Cyber Laboratory	0	0	4	2	100	-	
Major	23XXXXXX	Cryptography and Security Laboratory	0	0	4	2	100	-	
Project	23XXXXXX	Mini – Project	0	0	4	2	100	-	
VAC	23XXXXXX	One Credit Course	0	0	2	1	100	-	
		Total	12	1	16	21	800		

Course Code	Course Title	Duration	Credits	Marks
23XXXXXX	Internship or Skill Development*	2 Weeks	1	100

# Semester V

Type of	Course		Но	urs/W	eek	Cradita	Marka	Common to
Course	Code	Course Thie	L	т	Р	Credits	IVIAI NO	Programmes
Major	23XXXXXX	Applied Cryptography	3	0	0	3	100	-
Major	23XXXXXX	System Security	3	0	2	4	100	-
Major	23XXXXXX	Secure Coding	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective - I	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective - II	3	0	0	3	100	-
Major	23XXXXXX	Open Elective - I	3	0	0	3	100	-
SEC	23XXXXXX	Applied Cryptography Laboratory	0	0	3	1.5	100	-
SEC	23XXXXXX	System Security Laboratory	0	0	3	1.5	100	-
SEC	23XXXXXX	Employability Skills 1: Teamness and Interpersonal Skills	0	0	2	1	100	All
		Total	18	0	10	23	900	

## Semester VI

Type of	Course		Но	urs/W	eek	Cradita	Marka	Common to
Course	Code	Course Thie	L	Т	Р	Credits	Warks	Programmes
Minor	23XXXXXX	Cyber Forensics	3	0	0	3	100	-
Major	23XXXXXX	Network Security	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – III	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – IV	3	0	0	3	100	-
Major	23XXXXXX	Open Elective - II	3	0	0	3	100	-
Major	23XXXXXX	Advanced Protocol Engineering and Security Laboratory	0	0	4	2	100	-
VAC	23XXXXXX	Innovative and creative project	0	0	4	2	100	-
VAC	23XXXXXX	Employability Skills 2: Campus to Corporate	0	0	2	1	100	-
		Total	15	0	10	20	800	

Course Course Title		Duration	Credits	Marks
XXXXXX	Internship or Skill Development*	2 or 4 Weeks	1	100

# Semester VII

Type of Course		Course Title	Hours/Week			Credits	Marke	Common to
Course	Course Code		L	Т	Ρ	Credits	IVIAI NO	Programmes
Major	23XXXXXX	Web Application Security	3	0	0	3	100	-
Major	23XXXXXX	Cloud Computing and Security	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – V	3	0	0	3	100	-
Major	23XXXXXX	Professional Elective – VI	3	0	0	3	100	-
Major	23XXXXXX	Open Elective - III	3	0	0	3	100	-
Major	23XXXXXX	Web Application Security Laboratory	0	0	3	1.5	100	-
Major	23XXXXXX	Cloud Computing and Security Laboratory	0	0	3	1.5	100	-
		Total	15	0	6	18	900	

## Semester VIII

Type of	Course	Course Title		Hours/Week		Credits	Marke	Common to	
Course Co	Code	Course Thie		L	Т	Р	Credits	iviai NS	Programmes
Project	23XXXXXX	Project		0	0	16	8	200	-
			Total	0	0	16	8	200	

Course Code	Course Title	Duration	Credits	Marks
XXXXXX	Internship or Skill Development*	8 or 16 Weeks	4	100

Total Credits : 165

# Syllabus – Semester I

# Offered by

- i) Science and Humanities
- ii) Core Stream
- iii) Circuit Stream
- iv) IT Stream

Course Code:23VAL10	1	Course Title: Induction Program (Common to all B.E/B.Tech Programmes)		
Course Category: VAC		Course Level: Introductory		
Duration: 3 weeks	Mandatory Non- Credit Course	Max Marks:100		

#### **Pre-requisites**

≻ NIL

#### **Course Objectives**

The course is intended to:

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

## List of Activities:

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

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

#### **Course Articulation Matrix**

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

High : 3, Medium :2, Low: 1

## Text Book(s):

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

## Reference Book(s):

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

#### Web References:

- 1. https://youtube.com/playlist?list=PLYwzG2fd7hzc4HerTNkc3pS\_lvcCfKznV
- 2. https://www.youtube.com/watch?v=P4vjfEVk&list=PLWDeKF97v9SO0frdgmpaghDMjkom1
- 3. https://fdp-si.aicte-india.org/download/AboutSIP/About%20SIP.pdf

Course Code: 23ENI101	Course Title: Communication Skills I (Common to all B.E/B.Tech Programmes)					
Course Category: AEC		Course Level: Introducto	ory			
L:T:P(Hours/Week) 2:0:2	Credits: 3	Total Contact Hours:60	Max Marks:100			

#### **Course Objectives**

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

#### Module I

#### 20 Hours

**Grammar:** Tense forms - Modals - Gerunds - Passives - Reported Speech - Evaluations and comparisons with adjectives.

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

**Speaking:** Introducing oneself - Exchanging personal information -Describing personality traits - Describing landmarks, monuments and festivals - Making polite requests, invitations and excuses - Discussing facts - Asking for and giving information - Expressing wishes - Talking about lifestyle changes - Talking about transportation and its problems - Describing positive and negative features of things and places - Making comparisons.

**Reading:** Reading for gist and specific information -Reading various text types - Reading for specific information - Unusual landmarks, surveys and reports - Reading and comprehending online posts and emails.

**Writing:** Letter writing (Permission letters - Online cover letter for job applications) - Instructions - Recommendations - Write a blog on city Guide - Report Writing - Writing online texts - formal and informal emails.

#### Module II

## 20 Hours

**Grammar:** Sequence adverbs - Two part verbs - Relative clauses - Imperatives - Infinitives - Conditionals.

**Listening:** Listening to description of food items and carnivals - Listening to results of surveys-Listening to radio and TV programs - Listening to suggestions - Listening to people's Predicaments.

**Speaking:** Expressing likes and dislikes - Describing a favourite snack - Making requests and giving excuses - Giving advices and suggestions - Predicaments - Speculating about past and futureEvents.

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

**Writing:** Process Descriptions - Writing request messages- Writing for travel websites - ReviewingMovie and social media feeds/posts.

## List of Experiments:

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

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

## Course Articulation Matrix

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

High-3; Medium-2;Low-1

# Textbooks:

- T1. Jack C. Richards, Jonathan Hull, and Susan Proctor, "Interchange Student's book 2", 5<sup>th</sup>Edition, Cambridge University Press, South Asia Edition, 2022.
- T2. Jack C. Richards, Jonathan Hull, and Susan Proctor, "Interchange Student's Book 1", 5<sup>th</sup>Edition, Cambridge University Press, South Asia Edition, 2022.

# Reference Book(s):

- R1. David Bohlke, Jack C. Richards, "Four Corners", 2<sup>nd</sup> Edition, Cambridge University Press, 2018.
- R2. Adrian Doff, Craig Thaine, Herbert Puchta, Jeff Stranks, Peter Lewis-Jones, Graham Burton, Empower B1 Student's Book, Cambridge University Press, 2020.
- R3. Raymond Murphy, "Intermediate English Grammar" 30<sup>th</sup> Edition, Cambridge University Press, 2022.

## Web References:

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

Course Code: 23MA	1101	Cou	Course Title: Linear Algebra and Calculus				
Course Category: M	inor		Course Level : Introductory				
L:T:P(Hours/Week) 3:0:2	Credits: 4		Total Contact Hours:75	Max Marks:100			

#### **Course Objectives:**

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

#### Module I

## 23 Hours

#### Matrices

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

#### **Sequences and Series**

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

#### **Differential Calculus I**

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

## Module II

## 22 Hours

## Differential Calculus II

Evolute and Envelope of standard curves.

## Multivariable Differentiation

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

## Multiple Integral

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

## List of Experiments:

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

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

## **Course Articulation Matrix**

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

High-3; Medium-2;Low-1

## Text Book(s):

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

## Reference Book(s):

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

Reprint, 2002.

- R2. B.S.Grewal, Higher Engineering Mathematics, Khanna Publishers, 36<sup>th</sup> Edition, 2010.
- R3. P.Sivaramakrishna Das, C. Vijayakumari, "Engineering Mathematics "2017, Pearson India.

## Web References:

- 1. https://nptel.ac.in/courses/111107112
- 2. https://nptel.ac.in/courses/111104031

Course Code: 23MA	1102	Cou (Coi	rse Title: MATRICES AND CALCULUS mmon to EC, EE, ME, AU, EA & EV)				
Course Category: M	inor		Course Level: Introductory				
L:T:P(Hours/Week) 3:0 :2	Credits: 4		Total Contact Hours:75	Max Marks:100			

#### **Course Objectives:**

The students are able to understand the use of matrix algebra techniques for practical applications, familiarize themselves with differential calculus and acquire knowledge of mathematical tools to evaluate multiple integrals.

#### Module I

#### 23 Hours

#### Matrices

Definitions and examples of symmetric, skew symmetric and orthogonal matrices - Eigenvalues and Eigenvectors – Properties of Eigenvalues and Eigenvectors-Diagonalization of matrices through orthogonal transformation - Cayley-Hamilton Theorem (without proof) – verification problems and properties - Transformation of quadratic forms to canonical forms through orthogonal transformation.

#### **Differential and Integral Calculus**

Curvature – Radius of curvature –Centre of curvature- Circle of curvature - Evolutes and Involutes - Evaluation of definite and improper integrals - Beta and Gamma functions – Properties and applications.

#### Multivariable Differentiation I

Limit – continuity - Mean value theorems and partial derivatives - Taylor's series and Maclaurin's series – Jacobian of functions of several variables.

## Module II

## **Multivariable Differentiation II**

Maxima, Minima and saddle points of functions of several variables - Method of Lagrange's multipliers.

#### **Multiple Integral**

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

## Ordinary Differential Equations Of Second and Higher Orders

Second and higher order linear differential equations with constant coefficients – Second order linear differential equations with variable coefficients (Cauchy - Euler equation, Legendre's equation) – Method of variation of parameters – Solution of first order simultaneous linear ordinary differential equations

#### 22 Hours

## List of Experiments:

- 1. Introduction to MATLAB.
- 2. Rank of matrix and solution of system of linear equations.
- 3. Finding Eigen values and Eigen vectors of a matrix.
- 4. Solving ordinary differential equation.
- 5. Gram Schmidt Procedure.
- 6. Finding Maxima, Minima of a function.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
<b>CO1:</b> Determine the canonical form of a quadratic form using orthogonal transformation.	Apply
<b>CO2:</b> Identify the evolute of a curve and solve the improper integralsusing beta gamma functions.	Apply
<b>CO3:</b> Examine the extreme value of multivariate functions.	Apply
<b>CO4:</b> Evaluate the area and volume using multiple integrals and solve the higher order differential equations.	Apply
<b>CO5:</b> Demonstrate the understanding of calculus concepts through modern tools.	Apply

#### **Course Articulation Matrix**

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

High-3; Medium-2;Low-1

## Text Book(s):

T1. Erwinkreyzig, Advanced Engineering Mathematics, 9<sup>th</sup> edition, John Wiley& Sons, 2006.

T2. Veerarajan T., Engineering Mathematics for first year, 3<sup>rd</sup> edition, Tata McGraw-Hill, 2019.

#### Reference Book(s):

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

#### Web References:

- 1. https://nptel.ac.in/courses/111107112
- 2. https://nptel.ac.in/courses/111104031

Course Code: 23MAI1	03	Course Title: Linear Algebra and Infinite Series (Common to CS,IT,AD,AM &SC)				
Course Category: Min	or	Course Level: Introductory				
L:T:P(Hours/Week) 3:0:2	Credits: 4	Total Contact Hours: 75	Max Marks: 100			

#### **Course Objectives:**

The course is intended to impart knowledge on Linear Algebra in Mathematics and to have a strong foundation in science and engineering. The fundamental notions of vector spaces are to be studied thoroughly viz linear dependence, basis and dimension and linear transformations.

#### Module I

#### 23 Hours

**Solutions to System of Linear Equations:** Matrices- Rank of a matrix -Consistency of a system of linear equations- Row echelon form-Row reduced echelon form- Gauss elimination method- Crout's method.

**Basis and Dimension of Vector Spaces:** Vector spaces -Linear Independent and dependent of vectors-Basis, dimension, row space, column space, null space, rank nullity theorem.

**Orthogonality and Inner Product Space:** Inner product of vectors-Inner product spaceslength of a vector, distance between two vectors, orthogonality of vectors-orthogonal projection of a vector-Gram-Schmidt process- orthonormal basis.

#### Module II

#### 22 Hours

30 Hours

**Eigen Values and Eigen Vectors:** Eigen values and vectors-symmetric, skew symmetric and orthogonal matrices- Diagonalization of matrix through orthogonal transformation-Reduction of quadratic forms to canonical form-rank ,index, signature and nature of quadratic forms-Singular Value decomposition.

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

## List of Experiments(using suitable software):

- 1. Introduction to MATLAB
- 2. Row Echelon form and Row reduced Echelon form of a matrix.
- 3. Rank of a matrix and solution of a system of linear equations
- 4. Dimension of row space, column space and null space.
- 5. Gram-Schmidt Orthogonalization.
- 6. Eigenvalues and Eigenvectors of matrices.

Course Outcomes	Cognitive Level	
At the end of this course, students will be able to:		
<b>CO 1:</b> Apply matrix techniques for solving system of linear equations and Apply the process of orthogonalization to find orthogonal vectors.	Apply	
<b>CO 2:</b> Determine the canonical form of a quadratic form using orthogonal transformation in Science and Engineering problem solving.	Apply	
<b>CO 3:</b> Apply different tests to find convergence and divergence of series in the problem solving.	Apply	
<b>CO 4:</b> Demonstrate the understanding of linear algebra concepts through modern tool.	Apply	

## **Course Articulation Matrix**

СО	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	3	-	-	-	-	-	-	-	-	-

High-3; Medium-2;Low-1

## Text Book(s):

- T1. Erwin Kreyszig, Advanced Engineering Mathematics, 10<sup>th</sup> edition, John Wiley & sons, 2010.
- T2. David C Lay, Linear Algebra and its Applications, 3<sup>rd</sup> edition, Pearson India, 2011.
- T3. Howard Anton, Chris Rorres, Elementary Linear Algebra Applications version,11<sup>th</sup> edition, Wiley India edition, 2013.

## Reference Book(s):

- R1. T. Veerarajan, Engineering Mathematics for first year, 3<sup>rd</sup> edition, Tata McGraw-Hill, 2019.
- R2. V. Krsihnamurthy, V. P. Mainra and J. L. Arora, An introduction to Linear Algebra, Affiliated East-West press, Reprint 2005.
- R3. P. Sivaramakrishna Das , C. Vijayakumari , Engineering Mathematics, Pearson India, 2017.

## Web References:

- 1. https://nptel.ac.in/courses/111106051
- 2. https://www.classcentral.com/course/matrix-algebra-engineers-11986

Course Code: 23PH	Г101	Course Title: Physics for Civil Engineering					
Course Category: M	inor	Course Level: Introductory					
L:T:P(Hours/Week) 3: 0: 0	Credits: 3	Total Contact Hours: 45	Max Marks: 100				

#### **Course Objectives:**

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

#### Module I

## 22 Hours

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

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

**Thermal Physics:** Introduction – Modes of Heat Transfer – Thermal Conductivity – Newton's law of cooling – Specific Heat Capacity determination – Advantages and disadvantages of Newton's law of cooling method – Verification of Newton's law of cooling – Rectilinear flow of heat (Linear flow of heat) – Lee's disc method for the determination of thermal conductivity of a bad conductor – Cylindrical flow of heat – Determination of Thermal conductivity of a rubber – Conduction of Heat through a compound media : Bodies in both series and Parallel.

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

#### Module II

#### 23 Hours

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

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

**Non-Destructive Testing (NDT):** Introduction – Advantages of NDT over conventional testing techniques – Methods of NDT. Liquid Penetrant Testing (LPT): Steps of LPT – Materials used in LPT – Advantages and Limitations of LPT. Ultrasonic Inspection: Pulse Echo method and through transmission method. Data presentation: A-Scan, B-Scan and C-Scan displays. X-ray radiography – working principle with diagram. Basic setup of X-ray radiography: X-ray source, Photographic film and displacement method. Advantages and limitations. **Sensors:** Sensors for Structural Health Monitoring – Accelerometer – Vibrating wire sensors – Strain Gauges – Inclinometer – Acoustic emission sensor – Temperature sensors.

Course Outcomes	Cognitive
At the end of this course, students will be able to:	Level
<b>CO1:</b> Understand the concepts of properties of matter, thermal physics, nanomaterials, architectural acoustics and NDT	Understand
<b>CO2:</b> Apply the concepts of properties of matter, thermal physics, nanomaterials, architectural acoustics and NDT to solve appropriate parameters.	Apply
<b>CO3:</b> Build proto-type model for real life applications using the fundamentals of properties of matter, thermal physics, nanomaterials, architectural acoustics and NDT.	Analyze

CO4: Perform as a member of team in analyzing the current	
technology involved in civil engineering utilizing the concepts of	Apolyza
properties of matter, thermal physics, nanomaterials, architectural	Analyze
acoustics, NDT and make an oral presentation.	

#### **Course Articulation Matrix**

CO Vs PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1														
CO2	3	1												
CO3		3			1				1	1				
CO4									1	3				

High-3; Medium-2; Low-1

## Text Book(s):

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

## Reference Book(s):

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

## Web References:

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

Course Code: 23PH1	102	Cοι	Course Title: Physics for Mechanical Sciences (Common to AU & ME)						
Course Category: Mi	nor		Course Level: Introductory						
L:T:P(Hours/Week) 3: 0: 0	Credits:	3	Total Contact Hours: 45	Max Marks: 100					

#### **Course Objectives:**

The course is intended to develop capacity to predict the effect of force and motion in the design functions of engineering and to impart knowledge on the fundamental concepts of heat transfer and applications of laws of thermodynamics.

#### Module I

#### 22 Hours

**Basics of Mechanics:** Classification of mechanics, Review of fundamental laws of mechanics – Physical quantities – scalars, vectors – Newton's law of mechanics, Gravitational law. Particles and rigid body, Resolution of forces in to components, Rectangular components of forces,-Free body diagram-principle of transmissibility-Resultant force-equilibrium conditions-equilibrium of particles subjected to coplanar and non-coplanar force system – equilibrium of particles subjected to coplanar system of forces - Triangle law, Parallelogram law and Lami's theorem.

**Kinematics and Kinetics of Particles:** Kinematic parameters – displacement, velocity, acceleration and time. Types of motion – uniform, non-uniform motion, motion of particles in a plane – Rectinlear and curvilinear motion of particles – normal and tangential component – motion of projectile – Relative motion – Dependent motion. Kinetics of particles – Force and acceleration - D'Alembert's principle – Work energy, and impulse momentum method.

**Properties of Matter:** Introduction – Concept of Load, Stress and Strain – Hooke's law – Stress-Strain Diagram – Elastic and Plastic Materials – Factors affecting Elastic Properties – Three Moduli of Elasticity – Relation between Young's, Rigidity and Bulk moduli (Qualitative – No derivation) – Bending Moment of a Beam – Determination of Young's modulus using a Cantilever – I-Shaped Girders

#### Module II

#### 23 Hours

**Properties of Matter:** Twisting Couple of a wire – Determination of Rigidity Modulus of a thin wire using Torsional Pendulum. Viscosity – Coefficient of Viscosity – Experimental determination of coefficient of viscosity: Poiseuille's method and Stoke's method.

**Thermal Physics:** Introduction – Modes of Heat Transfer – Thermal Conductivity – Newton's law of cooling – Specific Heat Capacity determination – Advantages and disadvantages of Newton's law of cooling method – Verification of Newton's law of

cooling – Rectilinear flow of heat (Linear flow of heat) – Lee's disc method for the determination of thermal conductivity of a bad conductor – Cylindrical flow of heat – Determination of Thermal conductivity of a rubber – Conduction of Heat through a compound media : Bodies in both series and Parallel.

**Elements of Thermodynamics:** Concept of temperature – heat – thermodynamics – work – heat in thermodynamics – comparison of heat and work – internal energy – first law of thermodynamics – applications of the first law– limitations of first law, second law of thermodynamics-Statements of second law – the Carnot cycle – heat engine – heat pump – refrigerators – third law of thermodynamics.

Course Outcomes	Cognitive								
At the end of the course students will able to	Level								
<b>CO1:</b> Understand the concepts of basic mechanics at equilibrium and									
non-equilibrium conditions, kinetics and kinematics of particles,	Understand								
elasticity and viscosity, heat flow and thermodynamics.									
CO2: Apply the concepts of basic mechanics at equilibrium and non-									
equilibrium conditions, kinetics and kinematics of particles, elasticity	Apply								
and viscosity, heat flow and thermodynamics to solve the analytical	Арріу								
problems.									
<b>CO3:</b> Build proto-type model for real life applications using the concept									
of basic mechanics at equilibrium and non-equilibrium conditions,	Δηρίνσο								
kinetics and kinematics of particles, elasticity and viscosity, heat flow									
and thermodynamics.									
CO4: Perform as a member of team in analyzing the recent									
advancements of mechanical engineering related to the concepts of									
basic mechanics at equilibrium and non-equilibrium conditions, kinetics	Analyze								
and kinematics of particles, elasticity and viscosity, heat flow and									
thermodynamics and make an oral presentation.									

## **Course Articulation Matrix**

CO Vs PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	1	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	3	-	-	1	-	-	-	1	1	-	-	-	-
CO4	-	-	-	-	-	-	-	-	1	3	-	-	-	-

High-3; Medium-2; Low-1

## Text Book(s):

- T1. R. C. Hibbeller, "Engineering Mechanics: Combined Static and Dynamics", Prentice Hall, 2010.
- T2. M.N.Avadhanulu and P.G.Kshirsagar, "Text Book of Engineering Physics", S. Chand & Company Ltd., New Delhi, 2018.

## Reference Book(s):

- R1. Balasubramaniam "Callister's Material Science and Engineering", John Wiley and Sons Inc., 2<sup>nd</sup> Edition, 2015.
- R2. Yunus A Sengel, Michel A Boles, Thermodynamics: An Engineering Approach, MCGraw Hill, 9<sup>th</sup> Edition, 2017.
- R3. P.K.Nag, Engineering Thermodynamics, MCGraw Hill, 6<sup>th</sup> Edition, 2017.

## Web References:

- 1. http://www.physicsclassroom.com/class/thermal.
- 2. https://nptel.ac.in/courses/112105123
- 3. https://nptel.ac.in/courses/112106286
| Course Code: 23PH            | Γ001       | Course Title: Physics for Information Sciences<br>(Common to AD, AM, CS, IT & SC) |                |  |  |  |  |
|------------------------------|------------|---|----------------|--|--|--|--|
| Course Category: M           | inor       | Course Level: Introductory  |                |  |  |  |  |
| L:T:P(Hours/Week)<br>3: 0: 0 | Credits: 3 | Total Contact Hours: 45   | Max Marks: 100 |  |  |  |  |

#### **Course Objectives:**

The course is intended to impart the knowledge on working mechanism of laser, fiber optics, display devices and introduce the concepts of integrated circuits, nanotechnology

#### Module I

#### 22 Hours

**Laser:** Characteristics of laser light- Einstein's theory of matter and radiation – A & B Coefficients- Stimulated and spontaneous emission of radiation - Population inversion and pumping methods – Types of laser: Nd: YAG laser and Carbon di oxide (CO2) molecular gas laser - Semiconductor laser (Homo junction and hetero junction) – Applications: Hologram and Holographic data storage (record/read).

**Fiber Optics:** Optical fibers – Principle of light propagation through optical fibers -Expressions for numerical aperture and acceptance angle - Types of optical fibers based on material, refractive index, and mode of propagation- Fabrication of optical fiber: Double crucible method- Dispersion and attenuation in optical fiber - Photo detectors: PN, PIN & Avalanche photo diodes- Fiber optic communication system and its advantages.

**Nano Technology and Quantum Computing:** Introduction – Importance of Nanotechnology – Nanomaterials – Nanoparticles – Synthesis of Nanoparticles: Highenergy ball milling (top-down approach) – Sol-gel process (bottom-up approach) – Application of Nanomaterials.

#### Module II

#### 23 Hours

Nano Technology and Quantum Computing: Introduction to Quantum Computing -Uses and Benefits of Quantum Computing - Features of Quantum Computing : Superposition, Entanglement, Decoherence - Limitations of Quantum Computing – Comparison of Quantum Computer with Classical Computer - Quantum Computers In Development : Google, IBM, Microsoft and others.

**Integrated Circuits:** Introduction to semiconductors: Intrinsic and extrinsic semiconductors- Advantages of Integrated circuits (ICs) over discrete components- IC classification- Construction of bipolar transistor: Silicon Wafer Preparation - Epitaxial growth - Oxidation- Photolithography- Isolation diffusion - Base diffusion - Emitter diffusion - Contact mask- Aluminium metallization – Passivation- Structures of integrated PNP transistor.

**Display Devices:** Human vision - Red, Blue, and Green (RGB) color scheme – Primary and secondary colors- Color addition and subtraction-Optical Emissions: Luminescence, photoluminescence, cathodoluminescence- electroluminescence -Injection electro Luminescence- Displays (Working principles): Plasma display, LED display, Liquid crystal display (LCD) and Numeric display.

Course Outcomes	Cognitive							
At the end of this course, students will be able to:	Level							
<b>CO1:</b> Understand the basic principles of laser, fibre optics, nanotechnology, quantum computing, fabrication of integrated circuits and working mechanism of various display devices.								
<b>CO2:</b> Apply the concept of laser, fibre optics, nanotechnology, quantum computing, fabrication of integrated circuits and working mechanism of various display devices, to obtain the necessary parameter.	Apply							
<b>CO3:</b> Build a model using the concepts of laser, fibre optics, integrated circuits and display devices.	Analyze							
<b>CO4:</b> Perform as a member of team in analyzing the applications of laser, fibre optics, nanotechnology, quantum computing, integrated circuits and principles of display devices and make an oral presentation.	Analyze							

#### **Course Articulation Matrix**

CO Vs PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1														
CO2	3	1												
CO3		3			1				1	1				
CO4									1	3				

High-3; Medium-2; Low-1

# Text Book(s):

- T1. M. N. Avadhanulu and P. G. Kshirsagar, "Text Book of Engineering Physics", S. Chand & Company Ltd., New Delhi, 2018.
- T2. David Armitage, "Introduction to Micro displays", John Wiley & Ltd, 2006.
- T3. D.Roy Choudhry, Shail Jain, "Linear Integrated Circuits", New Age International Pvt.
   Ltd, 3<sup>rd</sup> Edition, 2010

# Reference Book(s):

- R1. D. Halliday., R. Resnick and J. Walker, "Fundamentals of Physics", Wiley Publications, 10<sup>th</sup> Edition, 2014.
- R2. Ajoy Ghatak, "Optics", Tata McGraw-Hill Education, New Delhi, 5<sup>th</sup> Edition, 2012.
- R3. A. Marikani, "Engineering Physics", PHI Learning, New Delhi, 2<sup>nd</sup> Edition, 2014.

- 1. https://onlinecourses.nptel.ac.in/noc22\_ph32/preview
- 2. http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html
- 3. https://www.investopedia.com/terms/q/quantum-computing.asp

Course Code: 23PHL101	Course Title: Pl	hysics for Civil Engineering Laboratory					
Course Category: Minor		Course Level: Introductory	,				
L:T:P (Hours/Week) 0:0:3	Credits:1.5	Total Contact Hours: 45	Max Marks: 100				

# Course Objectives

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

# List of Experiments:

- 1. Determination of Young's Modulus of the material Cantilever bending method.
- 2. Determination of Young's Modulus of the material Uniform bending method.
- 3. Determination of Rigidity modulus of the metallic wire Torsion Pendulum method.
- 4. Determination of Viscosity of low viscous liquid Poiseuille's method.
- 5. Determination of Viscosity of high viscous liquid –Stoke's method.
- 6. Lee's Disc method Determination of thermal conductivity of the bad conductor.
- Ultrasonic interferometer Determination of velocity of ultrasonics and compressibility of given liquid.
- 8. Determination of Numerical aperture and Acceptance angle of Fiber optic cable.
- 9. Determination of wavelength of the Laser using plane transmission grating.
- 10. Estimation of particle size of fine lycopodium powder using laser.

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

# **Course Articulation Matrix**

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

High-3; Medium-2; Low-1

# Reference Book(s):

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

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

Course Code: 23PHL	102	Course Title: Physics for Me Laboratory (Common to	chanical Sciences AU & ME)				
Course Category: Min	nor	Course Level: Introductory					
L:T:P (Hours/Week) 0:0:3	Credits: 1.5	Total Contact Hours: 45	Max Marks: 100				

# **Course Objectives**

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

# List of Experiments:

- 1. Verify Lami's theorem using triangle law of forces.
- 2. Verify the parallelogram law of forces.
- 3. Determination of Young's modulus Cantilever bending method.
- 4. Determination of Young's modulus Uniform bending method.
- 5. Determination of Rigidity modulus of the metallic wire Torsion Pendulum.
- 6. Determination of viscosity of low viscous liquid Poiseuille's method.
- 7. Determination of viscosity of high viscous liquid Stoke's method.
- 8. Determination of thermal conductivity of the bad conductor Lee's Disc method.
- 9. Determination of velocity of ultrasonic waves and compressibility of the given liquid Ultrasonic interferometer.
- 10. Determination of Wavelength of laser using plane transmission grating hence estimate particle size of lycopodium powder.

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

# **Course Articulation Matrix**

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

High-3; Medium-2; Low-1

# Reference Book(s):

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

- 1. https://archive.nptel.ac.in/courses/115/105/115105110/
- 2. https://vlab.amrita.edu/index.php?sub=1&brch=280
- 3. https://vlab.amrita.edu/index.php?sub=1&brch=194

Course Code: 23PHL	001	Course Title: Physics for Information Sciences Laboratory (Common to AD, AM, CS, IT & SC)					
Course Category: Mir	nor	Course Level: Introductory					
L:T:P (Hours/Week) 0:0:3	Credits:1.5	Total Contact Hours: 45	Max Marks: 100				

# **Course Objectives**

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

# List of Experiments:

- 1. Determination of wavelength of the Laser using plane transmission grating.
- 2. Estimation of particle size of fine lycopodium powder using laser.
- Measurement of acceptance angle and numerical aperture of an optical fiber Laser diffraction method.
- 4. Determination of band gap of semiconducting materials Thermistor (Germanium).
- 5. Light Illumination characteristics of Light dependent resistor (LDR).
- 6. Measurement of thickness of thin material Air wedge method.
- 7. Determination of wavelength of the spect ral lines of mercury spectrum using grating.
- 8. I-V characteristics of solar cell.
- 9. I-V characteristics of photo diode.
- 10. Verification of truth tables of logic gates.

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

# **Course Articulation Matrix**

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

High-3; Medium-2; Low-1

# Reference Book(s):

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

- 1. https://bop-iitk.vlabs.ac.in/List%20of%20experiments.html
- 2. https://vlab.amrita.edu/index.php?sub=1&brch=281
- 3. https://vlab.amrita.edu/index.php?sub=1&brch=189

Course Code: 23CHI101	Course Title: Chemistry for Electrical Sciences (Common to EC, EE & EV)								
Type of Course: Minor	Course Lev	Course Level: Introductory							
L:T:P (Hours/Week) 3: 0:2	Credits:4	Total Contact Hours:75	Max Marks:100						

### **Course Objectives**

The course is intended to impart the knowledge of chemistry involved in Electrochemistry, Corrosion and its control, Spectroscopic technique, Fuels and Nanomaterials.

# Module: I

# 23 Hours

# Electrochemistry and Batteries:

Electrochemistry - Basic terminologies - Potentiometric titration – Nernst equation – Batteries – Types and Characteristics, Construction, working and applications - Lead –Acid battery, Lithium-ion battery – Fuel cells - Construction, working and applications – Hydrogen Oxygen fuel cell.

# **Corrosion and its Control:**

Corrosion – Dry and Wet corrosion – Mechanism of electrochemical corrosion – Galvanic corrosion and Concentration cell corrosion, Factors influencing corrosion. Corrosion Control methods – Cathodic protection methods, Metallic coating – Galvanizing, Tinning – Chrome plating and Electroless plating of Nickel

# Spectroscopic Techniques:

Spectroscopy- Electromagnetic spectrum, Absorption and Emission spectroscopy – Relationship between absorbance and concentration – Derivation of Beer-Lambert's law (problems).

# Module: II

# 22 Hours

# **Spectroscopic Techniques:**

UV - Visible Spectroscopy, Atomic Absorption Spectroscopy, Flame photometry - Principle, Instrumentation, and applications.

# **Biofuels and Lubricants:**

Biomass - Biogas - Constituents, manufacture and uses. General outline of fermentation process - manufacture of ethyl alcohol by fermentation process. Combustion - Calorific values - Gross and Net calorific value - Problems based on calorific value. Lubricants - Classification of lubricants - Properties of liquid lubricants and their significance - Greases - Common grease types and properties. Components of grease – Base oil, additives and thickener.

# Synthesis and Applications of Nano Materials:

Introduction - Difference between bulk and Nano materials - size dependent properties. Nano scale materials - Particles, clusters, rods, and tubes. Synthesis of Nanomaterials: Sol-Gel process, Electro deposition, Hydrothermal methods. Applications of Nano materials in Electronics, Energy science and Medicines. Risk and future perspectives of nano materials.

# LIST OF EXPERIMENTS

- 1. Estimation of  $Fe^{2+}$  by potentiometric titration.
- 2. Determination of corrosion rate by weight loss method.
- 3. Estimation of iron in water by spectrophotometry
- 4. Determination of Cloud and Pour Point.
- 5. Green Synthesis of Silver Nanoparticles by Neem leaf.
- 6. Conductometric titration of strong acid against strong base.

Course Outcomes	Cognitive	
At the end of this course, students will be able to:	Level	
CO1: Understand and explain the chemistry involved in Electrochemistry, Corrosion, Spectroscopic techniques, Fuels and Nanomaterials.	Understand	
CO2: Apply the acquired knowledge of chemistry to solve the Engineering problems.	Apply	
CO3: Analyze the Engineering problems through the concept of Electro chemistry, Spectroscopic techniques, Fuels, and Nanomaterials.	Analyze	
CO4: Apply the knowledge of chemistry to investigate Engineering materials by volumetric and instrumental methods and analyze, interpret the data to assess and address the issues of Environmental Pollution	Evaluate	

#### **Course Articulation Matrix**

СО	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	P011	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	3	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	3	-	-	-	-	-	-	-	-	-	-

# Text book(s):

**T1.** Jain and Jain, Engineering Chemistry, 17<sup>th</sup> Edition, Dhanpat Rai Publishing Company, New Delhi, 2018.

T2. Wiley Engineering Chemistry, 2<sup>nd</sup> Edition, Wiley India Pvt Ltd, New Delhi, 2011.

#### Reference Book(s):

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

- 1. http://nptel.ac.in/courses/122101001/downloads/lec.23.pdf
- 2. https://nptel.ac.in/courses/104106075/Week1/MODULE%201.pdf
- 3. https://nptel.ac.in/courses/103102015/

Course Code: 23VAL	_102	Cou (Coi	Course Title: Wellness for Students (Common to all B.E/B.Tech Programmes)						
Course Category: V	AC		Course Level: Introductory						
L:T:P(Hours/Week) 0: 0 :2	Credits:1		Total Contact Hours:30	Max Marks:100					

### **Course Objectives:**

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

# Module I

#### 15 Hours

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

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

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

#### Module II

#### 15 Hours

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

# PRACTICES FOR MENTAL WELLNESS

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

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

# PUTTING INTO PRACTICE

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

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

# **Course Articulation Matrix**

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

High-3; Medium-2;Low-1

# Text Book(s):

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

# Reference Book(s):

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

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

#### **Pre-requisites**

> NIL

#### **Course Objectives**

மாணவாகள் இப்பாடத்தை கற்றலின் மூலம்

- CO.1 மொழி மற்றும் இலக்கியம், பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை சிற்பக் கலை, நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள், திணைக் கோட்பாடுகள் மூலம் தமிழர் மரபை அறிந்து கொள்ள இயலும்.
- CO.2இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பை அறிந்து கொள்ள இயலும்.

# தமிழர் மரபு

#### அலகு 1 – மொழி மற்றும் இலக்கியம்

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

#### அலகு 2 – மரபு – பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை – சிற்பக் கலை

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

#### அலகு 3 – நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள்

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

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#### அலகு 4 – தமிழா்களின் திணைக் கோட்பாடுகள்

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

#### அலகு 5 – இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு 3

இந்திய விடுதலைப் போரில் தமிழர்களின் பங்கு – இந்தியாவின் பிறபகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் – சுய மரியாதை இயக்கம் – இந்திய மருத்துவத்தில் சித்த மருத்துவத்தின் பங்கு – கல்வெட்டுகள், கையெ முத்துப் படிகள்– தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.

# **TOTAL : 15 PERIODS**

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

#### **Course Articulation Matrix**

СО	P01	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	1	-	-

High-3; Medium-2; Low-1

# **TEXT - CUM REFERENCE BOOKS**

- 1 தமிழக வரலாறு மக்களும் பண்பாடும் கே.கே.பிள்ளை வெளியீடு. தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்)
- 2. கணினித் தமிழ் முனைவா் இல. சுந்தரம் (விகடன் பிரசுரம்)
- 3. கீழடி வைகை நதிக்கரையில் சங்க கால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
- 4. பொருநை ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு)
- Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL
   (in print)
- 6. Social Life of the Tamils The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
- 7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
- 8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
- 9. Keeladi 'Sangam City C ivilization on the banks of river Vaigai' (Jointly Published by:

Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

- 10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
- 11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
- 12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) Reference Book.

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

### **Pre-requisites**

> NIL

#### **Course Objectives**

The course is intended to:

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

# HERITAGE OF TAMILS

3

# UNIT I LANGUAGE AND LITERATURE

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

# UNIT II HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE 3

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

# UNIT III FOLK AND MARTIAL ARTS

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

# UNIT IV THINAI CONCEPT OF TAMILS

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

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

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

# **TOTAL : 15 PERIODS**

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

# **Course Articulation Matrix**

СО	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	1	-	-

High-3; Medium-2; Low-1

3

# **TEXT - CUM REFERENCE BOOKS**

- 1 தமிழக வரலாறு மக்களும் பண்பாடும் கே.கே.பிள்ளை வெளியீடு. தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்)
- 2. கணினித் தமிழ் முனைவா் இல. சுந்தரம் (விகடன் பிரசுரம்)
- 3. கீழடி வைகை நதிக்கரையில் சங்க கால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
- 4. பொருநை ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு)
- Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL

   (in print)
- 6. Social Life of the Tamils The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
- 7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
- 8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
- 9. Keeladi 'Sangam City C ivilization on the banks of river Vaigai' (Jointly Published by:

Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

- 10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
- 11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
- 12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) Reference Book.

Course Code: 23MEI	001	Course Title: ENGINEERING MATERIALS (Common to AU,ME)					
Course Category: Ma	jor	Course Level: Introductory					
L:T:P(Hours/Week) 2: 0: 2	Credits: 3	Total Contact Hours:60	Max Marks:100				

#### **Course Objectives:**

The course is intended to

To impart knowledge on crystal structure, phase analysis and heat treatment of ferrous alloy.

#### Module I

#### 15Hours

**Crystal Physics:** Crystalline and Non crystalline materials. Single crystal , Polycrystalline materials Anisotrophic crystal parameters: Atomic radius, Number of atoms per unit cell, Coordination number, atomic packing factor for SC , BCC , FCC and HCP- Crystal planes: Miller indices, Braggs law . Interplanar distance- Polymorphism and allotrophy. Crystal imperfections: Point , line , surface and volume , grain boundary and its role in mechanical properties. Deformation – Slip-twinning-strain hardening of single crystal.

**Constitution of Alloys and Phase diagram:** Constitution of alloys- Solid solutions- Substitutional and Interstitial. Phase diagrams- Interpretation of Phase diagram, Lever rule, Gibbs phase rule. cooling curve for pure metal, binary solid solution and binary eutectic system. Iron – Iron Carbide equilibrium diagram. Micro constituents in Fe<sub>3</sub>C diagram (Austenite, Ferrite, Cementite, Pearlite, Martensite, Bainite), Pearlite transformation.

**Ferrous alloy:** Effect of alloying elements on properties of steel (Mn, Si, Cr, Mg, V and W). Properties and applications of stainless steel and Tool steel, Cast Iron-White, Malleable, Grey and Spheroidal Cast Iron-Properties and Applications

# Module II

#### 15 Hours

**Non-Ferrous:** Aluminium and its alloys, Copper and its alloys, Magnesium and its alloys, Titanium and its alloys, Nickel and its alloys- Composition, Properties and Applications.

Industrial standards for alloys and other materials - alloying elements and inclusion of ceramics materials..

**Powder Metallurgy:** Need of powder metallurgy products-Advantages and limitation of P/M-Stages in P/M-Need for additives in P/M-secondary process of P/M products-mechanical-physical-chemical methods of powder production-compaction and sintering techniques of P/M-particle size analysis.

**Heat Treatment:** Heat treatment process-purpose heat treatment – Process parameters. Bulk treatment: Annealing, Normalizing, Tempering, Quenching (Process parameter, application). Isothermal transformation Diagram (TTT Diagram). Cooling curves superimposed on TTT diagram.CCR - CCT. Harden ability- Definition. Method to determine Harden ability- Jominy end quench test.

#### List of Experiments

#### 30 Hours

- 1. Conduct the annealing operation on given steel and cast iron.
- 2. Conduct the normalizing operation on given steel and cast iron.
- 3. Conduct the Quenching operation on given steel and cast iron.
- 4. Determine the microstructure on given sample.
- 5. Determine the micro hardness for the given sample.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO 1: Explain the crystal parameters for different crystal structure and its	Understand
influences on mechanical properties of bulk materials.	
<b>CO2:</b> Apply the knowledge of composition changes in phase diagram for suitable	Apply
application.	
CO3: Apply the knowledge for choosing the suitable alloying elements for	Apply
Ferrous and Non Ferrous alloys.	
CO4: Explain the powder metallurgy technique, based on the functional	Understand
requirement of the product.	
CO5: Apply the knowledge on heat treatment process for the given non-ferrous	Apply
alloy such as steel, cast iron for a suitable application.	
CO6: Conduct experiments to demonstrate concepts related to heat treatment	Analyze
process and analyze the variations of microstructure.	

#### Textbook:

T1. William D Callister "Material Science and Engineering", John Wiley and Sons, 2014.

#### Reference Book(s):

- R1. Dieter G. E., "Mechanical Metallurgy", McGraw Hill Book Company, 2013.
- R2. Sidney H Avner "Introduction to Physical Metallurgy", Tata McGRAW-Hill, 2017.

R3. Raghavan.V "Materials Science and Engineering", Prentice Hall of India Pvt., Ltd., 2015.

- 1 http://nptel.ac.in/courses/113106032/
- 2 https://www.coursera.org/specializations/ physical metallurgy

# **Course Articulation Matrix**

СО	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	3	-	2	-	-	-	-	2	2	-	-	-	-

High-3; Medium-2; Low-1

Course Code: 23MEL	001	(Common to AD,AM,AU,CS,EA ,EC,EE,EV,IT,ME, SC)					
Course Category: Major		Course Level: Introductory					
L:T:P(Hours/Week) 1: 0: 3	Credits:2.5	Total Contact Hours: 60	Max Marks:100				

#### **Course Objectives:**

The course is intended to

• To impart knowledge on basic dimensioning. 2D and 3 D drawings such as points, lines, planes and solids on first quadrant.

#### Module I

#### 8 Hours

**Basics of Engineering Drawing:** Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning. Basic Geometrical constructions –Orthographic projection- Free hand Sketching.

**Projection of Points, Lines:** First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces by rotating object method.

**Projection of Solids:** Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one of the principal planes by rotating object method. Practicing three dimensional modeling of simple objects by CAD Software (Not for examination).

# Module II

**Sectioned Solids:** Sectioning of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by cutting planes inclined to one reference plane and perpendicular to the other – Orthographic views of sections of simple solids.

**Development of Surfaces:** Development of lateral surfaces of simple and truncated solids – Prisms, pyramids, cylinders using straight line and radial line method.

**Isometric Projection:** Principles of isometric projection – Isometric scale –Isometric projections of simple solids and truncated solids. Practicing three dimensional modeling of isometric projection of simple objects by CAD Software (Not for examination).

#### 7 Hours

# List of Experiments

- 1. Lettering & Dimensioning
- 2. Projection of Points & Lines
- 3. Orthographic projections
- 4. Projection of Simple Solids
- 5. Projection of Section of Simple Solids
- 6. Development of Surfaces
- 7. Isometric Projections

# **Course Outcomes:**

<b>CO 1:</b> Apply the concepts related to free hand sketching, orthographic and Isometric	Understand
projection in first quadrant.	
<b>CO2:</b> Apply the concepts and draw projections of points in four different quadrants	Apply
and lines located first quadrant.	
<b>CO3:</b> Apply the concepts and draw projections and sections of simple solids using	Apply
rotatingobject method.	
CO4: Apply the concepts and draw lateral surface of simple solids using straight	Apply
line andradial line development methods.	
<b>CO5:</b> Apply the concepts and draw isometric view of simple solids and truncated	Apply
solids using principles of isometric projection.	
<b>CO6:</b> Conduct experiments to demonstrate concepts, implement and analyze the	Analyze
drawing concepts using engineering tool : Using AutoCAD.	

# **Textbook:**

T1. Cencil Jensen, Jay D.Helsel and Dennis R. Short, "Engineering Drawing and Design", Tata McGraw Hill India, New Delhi, 3<sup>rd</sup> edition, 2019.

# Reference Book(s):

- R1. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill India, New Delhi, 2<sup>nd</sup> edition, 2014.
- R2. Dhananjay A. Jolhe, "Engineering Drawing with an introduction to AutoCAD" Tata McGraw India, New Delhi, 3<sup>rd</sup> edition, 2010.
- R3. Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, Gujarat, 54<sup>rd</sup> edition, 2023.

# PUBLICATIONS OF BUREAU OF INDIAN STANDARDS

- IS 10711 2001: Technical products Documentation Size and lay out of drawing sheets.IS 9609 (Parts 0 & 1) – 2001: Technical products Documentation – Lettering.
- IS 10714 (Part 20) 2001 & SP 46 2003: Lines for technical drawings.IS 11669 1986 & SP 46 – 2003: Dimensioning of Technical Drawings.
- IS 15021 (Parts 1 to 4) 2001: Technical drawings Projection Methods. The mode of delivery is like practical.

# Web References:

- 1 http://nptel.ac.in/courses/112103019/
- 2 https://www.coursera.org/specializations/autodesk-cad-cam-cae-mechanical-engineering

# **Course Articulation Matrix**

СО	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	3	-	-	3	-	-	-	1	1	-	1	-	-

High-3; Medium-2; Low-1

Course Code: 23CE	Г101	Cou	ourse Title: Civil Engineers and Society					
Course Category: M	inor		Course Level: Introductory					
L:T:P(Hours/Week) 3: 0: 0	Credits:3		Total Contact Hours:45	Max Marks:100				

#### **Course Objectives:**

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

#### Module I

#### Introduction

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

# Fundamentals of Civil Engineering

Introduction to Civil Engineering –Branches in Civil Engineering – Elements of Building Construction - General Requirement of Building, Elementary principles and basic requirements of a building Planning, Importance of Planning – Possible scopes for a career.

# **Overview of National Planning for Construction and Infrastructure development**

Types of Infrastructures - Impact of infrastructural development on economy and environment of country – Position of Construction Industry five year plan outlays for construction – Current budget for infrastructure works - Role of Civil Engineer in Society.

#### Module II

#### 23 Hours

# **Engineering as Social Experimentation**

The concept of profession – Importance of ethics in engineering – Role of codes of ethics – Professional responsibilities of engineers – Overview of ethical theories and applications - Engineering as Experimentation – Engineers as responsible Experimenters.

#### **Sustainability**

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

# 22 Hours

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	•••9• _••••
<b>CO.1</b> Identify and analyze the graduate attributes in their course of study.	Apply
<b>CO.2</b> Explain the importance of Civil Engineering towards nation's economy.	Understand
<b>CO.3</b> Identify and apply the ethical interest of stake in real world situation or practice.	Apply
<b>CO.4</b> Engage in independent study as a member of a team and make an effective oral presentation on the application of graduate attributes and ethical values.	Apply

# **Course Articulation Matrix**

СО	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	3	-	-	-	-	-	-
CO4	-	-	-	-	-	3	3	3	3	3	-	3	3	-

High-3; Medium-2;Low-1

# Text Book(s):

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

# Reference Book(s):

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

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

Course Code: 23CEL101	Course Title: Engineering Drawing for Civil Engineering								
Course Category: Minor		Course Level: Introducto	ory						
L:T:P(Hours/Week) 1: 0 : 3	Credits: 2.5	Total Contact Hours:60	Max Marks: 100						

#### **Course Objectives:**

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

#### Module I

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

#### Module II

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

#### List of Experiments:

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

#### 7 Hours

#### 45 Hours

# 8 Hours

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	••• <u>9</u> •
CO 1: Apply the knowledge of lettering and dimensioning as per	vlaaA
the standards in projection of points, lines and simple solids.	
CO 2: Apply the principles to draw the isometric and perspective	Apply
projections of simple solids and buildings.	Арріу
<b>CO 3:</b> Illustrate the projection of solids by applying the drawing tools	Apply
available in CAD software.	Арріу

# **Course Articulation Matrix**

СО	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	3	-	-	-	-	-	-	2	-	-

High-3; Medium-2;Low-1

# Text Book(s):

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

#### Reference Book(s):

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

# Publications of Bureau of Indian Standards:

1. IS 10711 - 2001: Technical Product Documentation - Sizes and layout of drawing sheets.

2. IS 9609 (Part- 0 & 1) - 2001: Technical Product Documentation - Lettering.

3. IS 10714 (Part 20) - 2001: Technical Drawings- General Principles of Presentation-Basic Conventions for Lines.

- 4. IS 11669 1986: General Principles of Dimensioning on Technical Drawings.
- 5. IS 15021 (Part- 1 to 4) 2001: Technical Drawings Projection Methods.
- 6. SP 46 2003: Engineering Drawing Practice for Schools & Colleges.

Course Code: 23EC	Г101	Cou	ε EV)	
Course Category: M	ajor		Course Level: Introductor	<b>y</b>
L:T:P(Hours/Week) 3: 0: 0	Credits:3		Total Contact Hours:45	Max Marks:100

### **Course Objective:**

The course is intended to impart knowledge of basic electronic devices such as diodes, Bipolar junction Transistors and Field effect transistors.

# Module I

**Semiconductor Diode:** PN junction - forward and reverse bias conditions. V-I Characteristics and its Temperature dependence – Diode specifications - Diode Resistance – Diode junction Capacitance – Transition and Diffusion capacitances - Rectifiers - Clipper - Clamper

**Special Diodes:** Zener diode - Characteristics of Zener diode - Avalanche and Zener breakdown - Application of Zener diode :Voltage regulator - Varactor diode, Tunnel diode, Light emitting diodes – Photo diodes

**Bipolar Junction Transistors**: Bipolar Junction Transistor and its types: NPN and PNP Transistor - Transistor operation - Configurations of BJT : Input and output characteristics of CE, CB and CC configurations - Transistor as a Switch and Amplifier.

# Module II

#### 22 Hours

**Field Effect Transistors:** JFET and its types, construction and operation of n- channel and pchannel JFETs – characteristics curves – FET applications – Comparison of BJT and JFET **MOSFETS and Power Devices:** MOSFETs: Depletion MOSFETs and Enhancement MOSFETs – construction and operation - Drain and Transfer characteristics - Differences between JFETs and MOSFETs – Precaution in handling MOSFETs - MOSFET as a switch.

Construction, operation and characteristics of SCR, DIAC, TRIAC, Power transistor and IGBT

Course Outcomes	Cognitive Level	
At the end of this course, students will be able to:		
CO 1: Understand and explain the construction and characteristics of PN	Understand	
junction diode, special diodes, BJTs, FETs and Power devices.		
CO 2: Identify a suitable electronic device and develop appropriate circuit for the given application.	Analyze	
CO 3: Engage in independent study as a member of a team and make an	Apply	
effective oral presentation on the applications of various Electron		
devices.		

# 23 Hours

# **Course Articulation Matrix**

СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P011	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	2	2	-	1	1	-

High-3; Medium-2; Low-1

# Text Book:

T1. Millman J., Halkias C. C. "Electronic Devices and Circuits ", Tata McGraw Hill, New Delhi, 2011.

# Reference Book(s):

- R1. Salivahanan.S, Suresh kumar.N and Vallavaraj.A, "Electronic Devices and Circuits", Second Edition, TMH, New Delhi, 2008.
- R2. Robert Boylestad and Louis Nashelsky, "Electron Devices and Circuit Theory", Pearson Prentice Hall, Tenth Edition, 2008.
- R3. Streetman Ben G. and Banerjee Sanjay, "Solid State Electronic devices", PHI, Sixth Edition, 2006
- R4. David A. Bell, "Electronic Devices and Circuits", Oxford University Press, Fifth Edition, 2008

- 1. http://nptel.ac.in/video.php?subjectId=117103063
- 2. http://nptel.ac.in/video.php?subjectId=117106091
- 3. www.youtube.com/watch?v=Wf19II0ts84

Course Code: 23EC	T001	Cou	EV)	
Course Category: M	ajor		Course Level: Introductor	ry
L:T:P(Hours/Week) Credits:3 3:0:0			Total Contact Hours:45	Max Marks:100

#### Course Objective:

The course is intended to impart knowledge of the fundamentals of Electric circuits and its analysis.

#### Module I

# 23 Hours

**Fundamentals of Electric Circuits:** Ohm's law - Kirchoff's Laws –Series resistive circuit-Voltage division rule- Parallel resistive circuit – Current division rule– Source transformation – Star to delta and delta to star transformation

Time period, Frequency, Angular frequency, Average value, Root mean square value, Form factor and Peak factor of sinusoidal.

Analysis of DC and AC Circuits: Mesh and node method of analysis - Networks theorem:

Superposition Theorem , Thevenin's Theorem, Norton's theorem and Maximum power transfer theorem.

#### Module II

# 22 Hours

**Resonance and Coupled Circuits:** Series resonance-Voltage and Current in a series resonance, Impedance and phase angle. Parallel resonance-Resonant frequency - Variation of Impedance with frequency Coupled circuits- mutual inductance, Coefficient of coupling.

**Transient Response of Networks:** Steady state and Transient response - Response of an R-L, R-C and R-L-C circuits under DC excitation.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1: Define, understand, and explain the various laws for analyzing	Understand
Electric circuits.	
CO2: Apply the knowledge of network laws and theorems to the given	Apply
electric circuit to obtain the required parameters.	
CO3: Analyze the resonance and transient behaviour of the given electric	Analyze
circuit using appropriate mathematical tools.	

# **Course Articulation Matrix**

СО	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	P011	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	1	1	-
CO3	-	3	-	-	-	-	-	-	-	-	-	-	-	-

High-3; Medium-2; Low-1

# Text Book(s):

T1.Sudhakar A, Shyammohan S. Pillai "Circuits and Networks -Analysis and Synthesis", McGraw Hill., New Delhi, 2015

# Reference Book(s):

- R1. William H. Hayt and Jack E. Kemmerly, "Engineering Circuit Analysis ", McGraw Hill International Edition, 2006
- R2. Singh "Network Analysis and Synthesis", McGraw-Hill Education., New Delhi, 2013
- R3. M. Arumugham and N.Prem kumar, "Electric Circuit Theory", Khanna publishers, 2010
- R4. Alexander C, Sadiku M. N. O "Fundamentals of Electric Circuits", Tata McGraw Hill., New Delhi, 2013

- 1. http://nptel.ac.in/video.php?subjectId=108102042
- 2. http://nptel.ac.in/courses/108102042/
- 3. http://nptel.ac.in/courses/108105053/
- 4. http://freevideolectures.com/Course/2336/Circuit-Theory/

Course Code: 23ECL001			Course Title: Electric Circuits and Electron Devices Laboratory (Common to EA, EC & EV)				
Course Category: Ma	jor	Course Level: Introductory			vel: Introductory		
L:T:P (Hours/Week) 0:0:3	Credits:1.5		Total Contact Ho	ours:45	Max Marks:100		

# **Course Objective:**

The course is intended to verify the electric circuit, network theorems and characteristics of the basic electronic devices.

# List of Experiments:

- 1. PN Junction Diode and Zener diode Characteristics
- 2. Half wave and Full wave Rectifier circuits
- 3. Regulator using Zener diode
- 4. Wave shaping circuits: Clippers and clampers
- 5. Characteristics of Common Emitter configuration
- 6. Characteristics of Common Base configuration
- 7. FET characteristics and its application as a switch
- 8. Verification of Kirchhoff's Voltage and Current laws
- 9. Verification of Super Position Theorem
- 10. Verification of Thevenin's and Norton's theorems
- 11. Verification of Maximum Power transfer theorem
- 12. Determination of Resonance frequency of Series & Parallel RLC Circuits

Course Outcomes	Cognitive	
At the end of this course, students will be able to:	Level	
CO1: Conduct experiments to verify the characteristics of devices and theorems for Electric circuits.	Evaluate	
CO2: Compare the experimental results obtained during verification of network theorems with simulation results.	Analyze	

#### **Course Articulation Matrix**

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

High-3; Medium-2; Low-1

# **Reference:**

1. Laboratory Manual Prepared by Faculty of Electronics and Communication Engineering,

Dr. Mahalingam College of Engineering and Technology.

Course Code:23EET101 Co			ourse Title: Basics of Electrical Engineering						
Course Category: Major			Course Level: Introductory						
L:T:P(Hours/Week) Credits:3 3: 0: 0			Total Contact Hours:45	Max Marks:100					

#### **Course Objectives:**

The course is intended to impart the knowledge on basic DC and AC circuits, magnetic and electro-magnetic circuit. Also the course details single phase and three phase system, safety protection and wiring concepts.

#### Module I

#### 22 Hours

**Electric circuits:** Definition, symbol and unit of quantities – Active and Passive elements – Ohm's Law: statement, illustration and limitation – Kirchhoff's Laws: statement and illustration, voltage division rule –current division rule - Method of solving a circuit by Kirchhoff's laws – Star to Delta and Delta to Star transformation - problems.

**Magnetic Circuits:** Definition of magnetic quantities – Basic Terminology: MMF, field strength, flux density, reluctance – comparison between electric and magnetic circuits – Series and parallel magnetic circuits with composite materials, numerical problems.

**Electromagnetic Induction:** Faraday's laws, problems, Lenz's law – statically induced and dynamically induced emfs – Self-inductance and mutual inductance, coefficient of coupling.

#### Module II

# **AC Fundamentals:** Generation of single phase alternating EMF – Terminology — Representation of sinusoidal waveforms: frequency, period, Root Mean Square (RMS)Average value of AC – form factor – Phasor representation of alternating quantities – Pure – Resistive, Inductive and Capacitive circuits – Problems .3 Phase System: line and phase values, relation between line and phase values – phase sequence -3 Wire and 4 Wire system.

**Electrical Wiring:** Connectors and switches, systems of wiring, domestic wiring installation, sub circuits in domestic wiring, simple control circuit in domestic installation, industrial electrification - circuit protection devices, fuses, MCB, ELCB and relays.

**Safety and Protection:** Safety, electric shock, first aid for electric shock and other hazards, safety rules, use of multi-meters, grounding, importance of grounding, equipment grounding for safety.

# 23 Hours
Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1: Apply the basic engineering fundamentals in solving Electric,	Apply
Magnetic and Electromagnetic Circuits.	
CO2: Apply the fundamentals of single phase AC circuits in Pure	Apply
Resistive, Inductive and Capacitive circuits and basics of 3 phase	
AC system.	
CO3: Understand the fundamental concepts of Three Phase System.	Understand
CO4: Report the financial requirement of installation of electrical wiring,	Analyze
safety standards and protection systems using case studies	

СО	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	1	-	-	-	1	-	1	-	-	1	-	-	-

High-3; Medium-2;Low-1

#### Text Book(s):

- T1. R.Muthusubramanian and S.Salivahanan, "Basic Electrical and Electronics Engineering", McGraw Hill India Limited, New Delhi, 2014.
- T2. Kothari DP and I.J Nagrath, "Basic Electrical and Electronics Engineering", Second Edition, McGraw Hill Education, 2020.

#### Reference Book(s):

- R1. B.L Theraja, "Fundamental of Electrical Engineering and Electronics", S.Chand Limited 2006.
- R2. J.B. Gupta, "Basic Electrical and Electronics Engineering", S.K. Kataria & Sons, 2009.
- R3. Smarajit Ghosh, "Fundamental of Electrical and Electronics Engineering", 2<sup>nd</sup> Edition, PHI Learning Private Limited New Delhi, 2010.
- R4. S. K. Sadhev, "Basic Electrical Engineering and Electronics", Tata McGraw Hill, 2017.

- 1. https://www.nptel.ac.in/courses/108108076/
- 2. https://www.oreilly.com/library/view/basic-electrical-and/9789332579170/
- 3. http://www.ait.ac.jp/en/faculty/lab-enginnering/latter/elec-material/
- 4. http://www.electrical4u.com

Course Code: 23EEI101 Cou Eng			Irse Title: Basics of Electrical and Electronics Jineering (Common to AD,AM,CS,IT and SC)					
Course Category: Multidisciplinary			Course Level: Introductory					
L:T:P(Hours/Week) Credits:4 3: 0: 2			Total Contact Hours:75 Max Marks:100					

The course is intended to impart knowledge on engineering fundamentals of DC&AC circuits, Electrical machines, Electron devices, Carpentry and plumbing.

#### Module I

#### 22 Hours

**Fundamentals of DC Circuits:** Definition, symbol and unit of quantities – Active and Passive elements – Ohm's Law: statement, – Kirchhoff's Laws: statement and illustration – Resistance in series and voltage division rule – Resistance in parallel and current division rule – Star to Delta and Delta to Star transformation- circuit simplification.

**AC Fundamentals:** Magnetic Circuits: Definition of magnetic quantities – Law of electromagnetic induction – Generation of single phase alternating EMF – Terminology – 3 Phase System: 3-Wire and 4 Wire system – Root Mean Square (RMS) – Average value of AC

**DC Machines:** DC Generator and DC Motor: Construction, Working Principle. **Module II** 

#### 23 Hours

**AC Machines:** Single phase transformer: Construction, working principle - Single phase induction motor: Capacitor start and run -Three phase induction motor: An introduction.

**Semiconductor Devices:** Theory of Semiconductor: PN junction diode, Forward Bias Conduction, Reverse Bias Conduction, V-I Characteristics – Bipolar Junction Transistor: Operation of NPN and PNP Transistor, Common Emitter Configuration – MOSFET: construction and working principle.

**Opto-Electronic Devices and Transducers:** Opto-Electronic Devices: Working principle of Photoconductive Cell, Photovoltaic Cell-solar cell Transducers: Capacitive and Inductive Transducer, Thermistors, Piezoelectric and Photoelectric Transducer.

#### List of Experiments

#### **Electrical & Electronics :**

- 1) Identification of resistor and capacitor values
- 2) Soldering practice of simple circuit and checking the continuity
- 3) Fluorescent tube, staircase and house wiring
- 4) Characteristics of PN Diode

# Civil & Mechanical:

- 1) Make a wooden Tee joint to the required dimension
- 2) Make a tray in sheet metal to the required dimension
- 3) Assemble the pipeline connections with different joining components for the given layout

Course Outcomes	Cognitive
At the end of this course, students will be able to:	Level
CO 1: Apply the basic laws and simplification techniques of electrical	Apply
Engineering in DC and AC Circuits.	
CO2: Summarize the construction and working of Motors, Generator and	
transformer.	Understand
CO3: Analyze the characteristics of diodes and transistors based on its	Analyze
construction and working principle.	
CO4: Summarize the working of opto-electronic devices and transducers	Understand
CO5: Examine and report the analysis of different resistors, capacitors,	Analyze
house wiring concepts, wooden joints and pipeline connection.	

#### **Course Articulation Matrix**

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

High-3; Medium-2;Low-1

#### 30 Hours

# Textbooks:

- T1. R.Muthusubramanian and S.Salivahanan, "Basic Electrical and Electronics Engineering", McGraw Hill India Limited, New Delhi, 2014.
- T2. S. K. Sadhev, "Basic Electrical Engineering and Electronics", Tata Mcgraw Hill, 2017.

# Reference Book(s):

- R1. B.L Theraja, "Fundamental of Electrical Engineering and Electronics", S.Chand Limited, 2022.
- R2. J.B.Gupta, "Basic Electrical and Electronics Engineering", S.K.Kataria & Sons, 2013.
- R3. Smarajit Ghosh, "Fundamental of Electrical and Electronics Engineering", 2<sup>nd</sup> Edition,
   PHI Learning Private Limited New Delhi, 2010.

- 1. https://www.nptel.ac.in/courses/108108076
- 2. https://archive.nptel.ac.in/courses/108/105/108105112
- 3. https://archive.nptel.ac.in/courses/108/101/108101091

Course Code:23EEL	101	Course Title:Workshop Practice for Electrical Engineers				
Course Category: Ma	ajor	Course Level: Introductory				
L:T:P(Hours/Week) 0:0:3	Credits:1.5	Total Contact Hours:45	Max Marks:100			

The course is intended to impart knowledge on electrical equipments, basic house wiring, and identification of resistors, capacitors and computers. Also the course provide an insight on soldering ,fitting, carpentry and plumbing experience

#### List of Exercises:

- 1. Introduction to switches, fuses, indicators and lamps Basic switch board wiring with lamp, fan and three pin socket.
- 2. Staircase wiring.
- 3. Fluorescent Lamp wiring with introduction to CFL and LED types.
- 4. Energy meter wiring and related calculations/calibration.
- 5. Study of Iron Box wiring and assembly.
- 6. Study of Fan Regulator (Resistor type and Electronic type using Diac/Triac/quadrac)
- 7. Study of resistors and capacitors.
- 8. Soldering simple electronic circuits and checking continuity.
- 9. Assembly and dismantle of computer.
- 10. Fitting Trade: Demonstration and practice of fitting tools, Preparation of T-Shape, DovetailJoint, Dissembling and Reassembling of Tail Stock, Bench vice etc.
- 11.Carpentry: Demonstration and practice of carpentry tools, Preparation of Cross Half lap joint/ Mortise Tenon Joint.
- 12. Plumbing: Demonstration and practice of Plumbing tools, Preparation of Pipe joints with coupling for same diameter and with reducer for different diameters.

Course Outcomes	Cognitive					
At the end of this course, students will be able to:	Level					
CO1: Conduct experiment and report the basic house wiring circuit by						
following professional engineering safety standards.						
CO2: Examine and report the working of different electrical equipment with its						
technical advancements and sustainable development.	Analyze					
CO3: Apply soldering procedure and identify the values of resistors and						
capacitors in simple circuits and report it.	Арріу					
CO4: Explain the function of different parts of a computer.	Understand					
CO5: Analyze and report fitting, carpentry and plumbing practices.	Analyze					

со	P01	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	-	-	-	-	1	-	1	-	3	-	-	1	-
CO2	-	2	-	-	-	-	1	-	-	3	-	1	-	-
CO3	2	-	-	-	-	-	-	-	-	3	-	-	1	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	2	-	-	-	-	-	-	-	3	-	-	-	-

High-3; Medium-2; Low-1

# Text Book(s):

- T1.Felix W, "Basic Workshop Technology: Manufacturing Process", Independently Published, 2019.
- T2.Bruce J. Black "Workshop Processes, Practices and Materials", Routledge publishers, 5<sup>th</sup> Edn. 2015.
- T3. Engineering Practices Laboratory Manual, Ramesh Babu.V., VRB Publishers Private Limited, Chennai, Revised Edition, 2013 2014.

# Reference Book(s):

R1. B.S. Raghuwanshi,"A Course in Workshop Technology" Vol I. & II, Dhanpath Rai & Co., 2015 & 2017.

- R2. S. K. Hajra Choudhury, "Elements of Workshop Technology", Vol. I & Vol. II, Media
   Promoters and Publishers, Mumbai. 14<sup>th</sup> Edition, 2007.
- R3. T.Jeyapoovan, "Engineering Practices Lab Manua", Vikas Pub, 4<sup>th</sup> Edn.2008.
- R4. Soni P.M., Upadhyay P.A., Atul Prakashan, "Wiring Estimating, Costing and Contracting", 2021.

#### Web References:

1. https://bharatskills.gov.in.

Different Trade E-Books (Fitting, Plumbing, Welding, Carpentry, Foundryman, Turner and House Wiring etc.) developed by National Instructional Media Institute, Chennai. Directorate General of Training, Ministry of Skill Development & Entrepreneurship, Govt. of India.

Course Code: 23CS	Г101	Course Title: Problem Solving using C (common to AD,AM,CS,IT&SC)				
Course Category: M	ajor	Course Level: Introductory				
L:T:P(Hours/Week) 3: 0: 0	Credits: 3	Total Contact Hours: 45	Max Marks: 100			

Course Objectives: The course is intended to impart knowledge on basic concepts of C.

#### Module I

#### 23 Hours

**C Programming Basics:** General Problem solving strategy – Program development cycle - Problem Solving Techniques : Algorithm, Pseudocode and Flow Chart - Overview of C – Structure of C program – C Character set – keywords - Identifiers – Variables and Constants – Data types – typedef- Type conversion – Operators and Expressions – Managing formatted and unformatted Input & Output operation.

**Control Structures:** Storage classes - Statements: Selection statements - Jump statements - Iteration statements.

**Arrays:** Characteristics of Array – Single-dimensional array – Two-dimensional array – Array Operations – Applications: Linear search, Selection sort, Matrix Operations.

**Functions:** Declaration & Definition – Return statement – Classification of functions – Parameter passing methods: call by value – call by reference – Passing Array to a Function– Returning Array from a function – Recursion.

#### Module II

# 22 Hours

**Strings:** Declaration and Initialization of string – Display of strings with different formats – String library Functions – String conversion functions.

**Pointers:** Features - Types of Pointers: Null and Void pointer – Operations on pointers – Pointers to an Array.

**Structures:** Declaration & Initialization of Structures – Structure within Structure – Array of Structures – Pointer to Structures.

Union: Declaration & Initialization of Union – Enumerations.

**Files:** Introduction to Files – Streams and File Types – File operations (Open, close, read, write) – Command line arguments.

Preprocessor Directives: Macro Expansion, File Inclusion, Conditional Compilation.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to	D:
CO1: Understand the fundamental concepts of	f programming, such Understand
as variables, data types, control structur	es, and functions.
CO2: Design and develop C programs for real	world applications Apply
CO3: Apply problem-solving skills and programming constructs to solve a giver	knowledge of c Apply
CO4: Analyze and debug C programs to identi	fy and fix errors. Analyze
CO5: Apply modular programming technique complex programs into smaller, manager	es to break down Apply able modules

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

High-3; Medium-2;Low-1

# Text Book(s):

- T1. Yashavant P.Kanetkar, "Let Us C", 19<sup>th</sup> Edition, BPB Publications, 2022.
- T2. Ashok N.Kamthane, Amit.N.Kamthane, "Programming in C", 3<sup>rd</sup> Edition, Pearson Education, 2015.

#### Reference Book(s):

- R1. Ajay Mittal, "Programming in C A Practical Approach", 3<sup>rd</sup> Edition, Pearson Education, 2010.
- R2. Brian W.Kernighan and Dennis M.Ritchie,"The C Programming Language" 2<sup>nd</sup> Edition, Pearson Education, 2015.
- R3. Venit S, and Drake E, "Prelude to Programming Concepts and Design", 6<sup>th</sup> Edition, Pearson Education, 2014
- R4. Pradip Dey, Manas Ghosh, "Computer Fundamentals and Programming in C", 2<sup>nd</sup> Edition, Oxford University Press, 2013.

- 1. http://www.cprogramming.com/
- 2. http://www.c4learn.com/

Course Code: 23CS	L101	Course Title: Problem Solving using C Laboratory (common to AD,AM,CS,IT&SC)				
Course Category: S	EC	Course Level: Introductory				
L:T:P(Hours/Week) 0:0:3	Credits:1.5	Total Contact Hours: 45	Max Marks:100			

The course is intended to enable the students for writing simple programs in C.

#### List of Experiments:

- 1. Develop Algorithm, Flowchart and Pseudo code for given problem.
- 2. Develop C programs using data types, I/O statements, Operators and Expressions.
- 3. Develop C programs using Decision-making constructs.
- 4. Implement C programs using looping statements.
- 5. Design C programs to implement the concept of arrays.
- 6. Design C programs to implement the concept of strings
- 7. Develop C programs using functions.
- 8. Develop C programs using pointers.
- 9. Implement the concept of structures using C.
- **10.** Implement C programs to perform file operations.

Course Outcomes	Cognitive
At the end of this course, students will be able to:	Levei
<b>CO1:</b> Demonstrate proficiency in using development environments, compilers, and debugging tools for C programming	Apply
<b>CO2:</b> Apply C programming concepts to practical programming tasks	Apply
<b>CO3:</b> Demonstrate an understanding of the importance of code efficiency and optimization in C programming	Analyze
<b>CO4:</b> Work as a team in a laboratory environment to develop and demonstrate projects with an oral presentation	Apply

#### **Course Articulation Matrix**

СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P011	PO12	PSO1	PSO2
CO1	-	3	3	-	3	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	3	-	-	-	-	2	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	3	1	1		3	-

High-3; Medium-2;Low-1

# Reference Book(s):

- R1. Ashok N.Kamthane, Amit.N.Kamthane, "Programming in C", 3<sup>rd</sup> Edition, Pearson Education, 2015.
- R2. Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", Pearson Education, 2013.
- R3. Yashwant Kanetkar, Let us C, 17<sup>th</sup> Edition, BPB Publications, 2020.
- R4. ReemaThareja, "Programming in C", Oxford University Press, 2<sup>nd</sup> Edition, 2016.

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

Course Code: 23ADT101 Cou			rse Title: Python Programming for Mechanical Sciences (Common to AU & ME)					
Course Category: Multidisciplinary			Course Level: Introductory					
L:T:P(Hours/Week) Credits:3 3: 0: 0			Total Contact Hours:45 Max Marks:100					

The course is intended to provide the basic knowledge of Python. The course imparts the fundamentals concepts of python for writing the simple application.

#### Module I

#### 22 Hours

**Computational Thinking and Problem Solving:** 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).

**Data Types, Expressions, Statements:** Python interpreter and interactive mode, debugging-values and data types –int, float, boolean, string and list – variables – expressions – statements – tuple assignment – precedence of operators – comments

**Control Flow :** Conditionals: Boolean values and operators – conditional (if) – alternative (if-else) – chained conditional (if-elif-else) – Iteration: state, while, for, break, continue, pass

# Module II

#### 23 Hours

**Functions and Strings:** 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

Lists, Tuples, Dictionaries: 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

**Files, Modules, Packages:** Files and exception: text files – reading and writing files – format operator – command line arguments – errors and exceptions – handling exceptions – modules – packages

Course Outcomes	Cognitive
At the end of this course, students will be able to:	Level
<b>CO1:</b> Develop algorithmic solutions to simple computational probler including read, write and execute the simple python programs	ns Apply
<b>CO2:</b> Analyze Python programming effectively, using variables, data types functions, recursion, and file handling to solve practical problems and build functional applications	, Analyze
<b>CO3:</b> Decompose a python program into functions for reusability and easy debugging	Apply
<b>CO 4:</b> Represent compound data using python lists, tuples, dictionaries	Apply
CO 5: Manipulate the data from/to files in python programs.	Apply
<b>CO 6:</b> Utilize built-in packages for developing simple python application	Apply

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

High-3; Medium-2;Low-1

# Text Book(s):

- T1. Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, 1st Edition, 2021.
- T2. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2<sup>nd</sup> edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016
- T3. Guido van Rossum and Fred L. Drake Jr, "An Introduction to Python Revised and updated for Python 3.2", Network Theory Ltd., 2011.

# Reference Book(s):

- R1. John V Guttag, "Introduction to Computation and Programming Using Python", Revised and expanded Edition, MIT Press, 2013
- R2. Robert Sedgewick, Kevin Wayne, Robert Dondero, "Introduction to Programming in Python: An Interdisciplinary Approach", Pearson India Education Services Pvt. Ltd., 2016.

- 1. Python Basics: https://www.w3schools.com/python/
- 2. Python user manual: https://realpython.com/
- 3. Nptel course on python: https://nptel.ac.in/courses/106106145

Course Code: 23ADT001 Con			urse Title: C Programming nmon to CE,EA,EC & EV)				
Course Category: M	ulti-disciplina	ary	Course Level: Introductor	у			
L:T:P(Hours/Week) 3: 0: 0	Credits:3		Total Contact Hours:45	Max Marks:100			

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

#### Module I

22 Hours

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

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

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

#### Module II

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

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

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

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

#### 23 Hours

CO	P01	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	2	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	-	-	-
CO4	2	-	1	-	-	-	-	-	-	-	-	-
CO5	3	-	-	1	-	-	-	-	-	-	-	-
CO6	-	1	-	3	2	-	-	-	2	-	-	2

High-3; Medium-2; Low-1

# Text Book(s):

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

#### Reference Book(s):

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

- 1. NPTEL course content on Introduction To Programming In https://onlinecourses.nptel.ac.in/noc22\_cs40
- 2. Complete guide on Learn C programming: http://www.cprogramming.com/
- 3. Complete reference manual on C programming: http://www.c4learn.com/

Course Category: Mu	Iti-displicinary	ý	Course Level: Introductory		
L:T:P (Hours/Week) 0:0:3	Credits:1.5	Total Contact Ho	ours:45	Max Marks:100	

The course is intended to impart the programming knowledge. This will enable the students to develop simple applications in Python.

# List of Experiments:

- **1.** Draw the flowchart and algorithm for finding the weight of a steel bar for the given cross section, length and density of the material
- 2. Implement programs using data types, operators and expressions
- 3. Implement programs using branching statements
- 4. Implement programs using looping statements to form a pyramid pattern
- 5. Develop programs with all the list/tuple operations for the given list/ tuples
- 6. Develop a dictionary consisting of auto components and apply the dictionary operations
- 7. Implement program to find the factorial of the given number using function
- 8. Implement program for string operations.
- **9.** Develop the program to count the number of words and characters in the given TXT file using file handling methods.
- **10.** Implement the program to plot the components of a given force for the different angle ranges.

Course Outcomes	Cognitive	
At the end of this course, students will be able to:	Level	
CO1: Construct the flowchart and algorithm for any given scenario	Apply	
<b>CO2:</b> Analyze the business logic problems and solve a problem using branching and looping statements	Analyze	
<b>CO3:</b> Apply advanced data structure techniques in Python, utilizing functions, methods, and operators to efficiently manipulate lists, tuples, sets, dictionaries, and strings for various computational tasks	Apply	
<b>CO4:</b> Recommend the string operations, file handling methods and Matplotlib library function to get insights of real time dataset	Evaluate	

CO	PO1	PO2	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	PO8	PO9	PO10	P011	PO12
CO1	3	-	-	-	3	-	-	-	-	-	-	-
CO2	-	3	-	-	3	-	-	-	-	-	-	-
CO3	3	-	-	-	3	-	-	-	-	-	-	-
CO4	-	-	-	3	3	-	-	-	-	-	-	1

High-3; Medium-2;Low-1

# Text Book(s):

- T1. Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, 1st Edition, 2021.
- T2. Peter Wentworth, Jeffrey Elkner, Allen B. Downey, and Chris Meyers, "How to Think Like a Computer Scientist: Learning with Python", 3rd Edition, O'Reilly, 2016.
- T3. Mark Lutz, "Powerful Object Oriented Programming Python", 4<sup>th</sup> Edition, O'Reilly, 2012.

# Reference Book(s):

- R1. Mark Lutz, "Learning Python, Powerful OOPs", 5th Edition, O'Reilly, 2013.
- R2. Zelle, John M, "Python Programming: An Introduction to Computer Science", Franklin Beedle& Associates, 2003.

- 1. Python tutorial: https://docs.python.org/3/tutorial/
- 2. Python manual: https://www.learnpython.org/
- 3. Python programs:https://www.pyschools.com/

Course Code:23ADL001			Course Title: C Programming Laboratory (Common to CE,EA,EC & EV)				
Course Category: M	ulti-discip	lina	ry	Course Le	evel: Introductory		
L:T:P(Hours/Week) 0:0:3	Credits:1	.5	Total Contact Ho	ours:45	Max Marks:100		

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

#### List of Experiments:

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

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

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

High-3; Medium-2; Low-1

# Text Book(s):

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

# Reference Book(s):

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

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

# Syllabus – Semester II

# Offered by

- i) Science and Humanities
- ii) Core Stream
- iii) Circuit Stream
- iv) IT Stream

Course Code: 23ENI201	Course (Comm	e Title: Communication Skills II non to all B.E/B.Tech Programmes)				
Course Category: AEC		Course Level: Introductory				
L:T:P(Hours/Week) 2:0:2	Credits: 3	Total ContactHours:60	Max Marks:100			

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

#### 20 Hours

#### Module

**Grammar:** Countable & Uncountable Nouns – Prepositions - Infinitives - Linking Words - financial Terms - Perfect forms – Collocations – Passives - Sentence Completion - Articles - Tense changes inreported speech.

**Listening:** Listening to short conversations - Note - taking and summarizing - Listening for gist and respond - Listening for detail - Listening to simple exchanges in various business contexts - Listening for details - Responding to straightforward questions.

**Speaking:** Making statements of facts - Agreeing and disagreeing to opinions - Role play - Respond toqueries - Short presentations - Group Discussion.

**Reading:** Skimming and Scanning - Identifying main ideas - Comprehending and interpreting non-verbal text types such as graphs and reports - Making inferences - Drawing conclusions from texts

**Writing:** Website entries - Essay Writing: General and Argumentative - Emails: Giving information - Making enquiries - Responding to enquiries - Letters of enquiry - Business Proposals

#### Module II

# 20 Hours

Grammar: Expressions of cause and result – Concord - Compound and Complex sentences.

**Listening:** Listening for identifying main points - Listening and responding appropriately to other points of view- Responding to a range of questions about different topics - Listening to identify relevant information - Using sub skills of listening to comprehend listening texts.

**Speaking:** Short talks – Extempore - Summarizing and Paraphrasing views in formal interactions.

**Reading:** Reading to evaluate texts – Memo - Intensive Reading: Comprehending business articles, reports and proposals and company websites.

Writing: Memo - Industrial Visit Report - Letter of complaints and products launches.

# List of Experiments:

- 1. Group Discussion
- 2. Impromptu Speaking
- 3. Listening, Mind Mapping & Summarization
- 4. Watching Movies and Writing a Review
- 5. Reading Comprehension
- 6. Report Writing IV

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

#### **Course Articulation Matrix**

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

High-3; Medium-2;Low-1

# Textbooks:

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

# Reference Book(s):

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

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

Course Code: 23MA	Course Title: ORDINARY DIFFERENTIAL EQUATION COMPLEX VARIABLES (CE)							
Course Category: M		Course Level: Introductory						
L:T:P(Hours/Week) 3:0 :2	Crea	Credits: 4		tal Contact F	lours:75	Max Marks:100		

The objective of this course is to familiarize the graduate engineers with techniques in vector calculus, complex variables and ordinary differential equations. It aim to equip the students with standard concepts and tools from intermediate to advanced level that will help them to solve difficult mathematical problems in science and engineering.

# Module I

# 23 Hours

# Vector Calculus

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

# **Complex Variables (Differentiation)**

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

# **Complex Variables I (Integration)**

Contour integrals – Cauchy Integral formula– Cauchy Integral theorem – Taylor's series– Singularities of analytic functions – Laurent's series.

# Module II

# 22 Hours

# **Complex Variables II (Integration)**

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

# **Ordinary Differential Equations of Higher Orders**

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

# Laplace Transform

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

# List of Experiments:

- 1. Evaluating gradient, divergence and curl
- 2. Evaluating line integrals and work done.
- 3. Verifying Green's theorem in the plane
- 4. Evaluating Laplace Transform and inverse Laplace transforms of functions including impulse.
- 5. Solving second order ordinary differential equation.
- 6. Applying the technique of Laplace transform to solve differential equations.

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

#### **Course Articulation Matrix**

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

High-3; Medium-2;Low-1

# Text Book(s):

- T1. Erwinkreyzig, Advanced Engineering Mathematics, 9<sup>th</sup> edition, John Wiley& Sons, 2006.
- T2. Veerarajan T., Engineering Mathematics for first year, 3<sup>rd</sup> edition, Tata McGraw-Hill,

New Delhi, 2019.

#### Reference Book(s):

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

#### Web References:

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

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

Course Code: 23MA	1202	Cou (Coi	urse Title: Complex Variables and Transforms mmon to EC, EE, ME, AU & EV)				
Course Category: M	inor		Course Level: Introductory				
L:T:P(Hours/Week) 3:0 :2 Credits: 4			Total Contact Hours:75	Max Marks:100			

This course aims at providing the student to acquire the knowledge on the calculus of functions of complex variables. The student develops the idea of using continuous/discrete transforms.

#### Module I

# **Vector Calculus**

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

# **Complex Variables (Differentiation)**

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

# **Complex Variables I (Integration)**

Contour integrals – Cauchy Integral formula – Cauchy Integral theorem – Taylor's series – Singularities of analytic functions – Laurent's series.

# Module II

# **Complex Variables II (Integration)**

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

# Laplace Transform

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

# **Fourier Series**

Dirichlet's condition -Fourier series – Even and odd functions- Half range sine and cosine series - Parseval's identity- Complex form of Fourier series -Harmonic Analysis.

# List of Experiments:

- 1. Evaluating gradient , divergence and curl
- 2. Evaluating line integrals and work done.
- 3. Verifying Green's theorem in the plane
- 4. Evaluating Laplace Transform and inverse Laplace transforms of functions including impulse.
- 5. Applying the technique of Laplace transform to solve differential equations.
- 6. Implementation of Fourier Series up to 'n' Harmonics

# 22 Hours

#### 30 Hours

# 23 Hours

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
<b>CO1:</b> Explain the concepts of Vector Differentiation and Integration.	Apply
<b>CO2:</b> Using the concept of complex variables to construct analytical functions and evaluate definite integrals.	Apply
<b>CO3:</b> Apply Laplace transform techniques to solve ordinary differential equations.	Apply
<b>CO4:</b> Compute the Fourier series expansion for given periodic functions.	Apply
<b>CO5:</b> Demonstrate the concepts of complex variables and transform through modern tools.	Apply

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

High-3; Medium-2;Low-1

# Text Book(s):

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

# Reference Book(s):

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

- 1. https://nptel.ac.in/courses/111107112
- 2. https://nptel.ac.in/courses/111104031

Course Code: 23MAI203		Course Title: Calculus and Transforms (Common to CS,IT,AD,AM &SC)				
Course Category: Minor		Course Level: Introductory	/			
L:T:P(Hours/Week) : 3 0 2	Credits: 4	Total Contact Hours: 75	Max Marks: 100			

The course is intended to impart knowledge on differential calculus, vector calculus and ordinary differential equations to devise engineering solutions for given situations. An understanding of Fourier Series and Z transform helps to solve real world problems.

#### Module I

# 23 Hours

**Differential Calculus:** Curvature-Cartesian and Polar coordinates- radius of curvature-center of curvature- circle of curvature- Evolutes and Involutes.

**Multivariable Calculus:** Partial derivatives-total derivatives-Jacobian- maxima and minima and saddle points- Constrained maxima and minima: Method of Lagrange multipliers--Gradient- directional derivative- curl and divergence.

**Ordinary Differential Equations of Second and Higher Orders:** Second and higher order linear differential equations with constant coefficients – Second order linear differential equations with variable coefficients (Cauchy - Euler equation, Legendre's equation) – Method of variation of parameters – Solution of first order simultaneous linear ordinary differential equations.

# Module II

# 22 Hours

**Fourier Series:** Dirichlet's condition -Fourier series – Even and odd functions- Half range sine and cosine series - Parseval's identity -Harmonic Analysis.

**Z Transforms:** Z transform- region of convergence- properties of z transforms- inverse transform-Solution to homogeneous linear constant difference equations.

# List of Experiments(Using suitable software):

- 1. Curve tracing.
- 2. Maxima and Minima of a function of one variable.
- 3. Maxima and Minima of a function of two variables.
- 4. Solving second order ordinary differential equations.
- 5. Fourier series analysis.
- 6. Solving difference equations.

# 30 Hours

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO 1: Apply differential calculus to find curvature of a curve,	Apply
Jacobian, extremum of functions of several variables and vector	
quantities to solve problems in Science and Engineering.	
CO 2: Solve the second and higher order ordinary differential	Apply
equations using various techniques.	
<b>CO 3:</b> Determine the Fourier series of periodic functions and solve	Apply
finite difference equations using Z-transforms.	
CO 4: Demonstrate the understanding of calculus through modern	Apply
tool.	

СО	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	3	-	-	-	-	-	-	-	-	-

High-3; Medium-2;Low-1

# Text Book(s):

- T1. Erwin Kreyszig, Advanced Engineering Mathematics, 10<sup>th</sup> Edition, John Wiley & sons, 2010.
- T2. B.S.Grewal, Higher Engineering Mathematics, 44<sup>th</sup> Edition, Khanna Publishers, 2015.

# Reference Book(s):

- R1. Veerarajan T., Engineering Mathematics for first year, 3<sup>rd</sup> edition, Tata McGraw-Hill, New Delhi, 2019.
- R2. Srimanta Pal & Subodh C. Bhunia. "Engineering Mathematics", 1<sup>st</sup> Edition, Oxford University Press, 2015.
- R3. P. Sivaramakrishna Das , C. Vijayakumari , Engineering Mathematics, Pearson India, 2017.

- 1. https://nptel.ac.in/courses/111104092
- 2. https://www.classcentral.com/course/differential-equations-engineers-13258

Course Code: 23MA	1204	Course Title: Linear Algebra and Complex Variables (EA)					
Course Category: M	inor	Course Level: Introductory					
L:T:P(Hours/Week) 3: 0: 2	Credits: 4	Total Contact Hours: 75	Max Marks: 100				

This course aims at providing the student to acquire the knowledge on the linear algebra and calculus of functions of complex variables.

#### Module I

# Systems of linear equations

Gaussian elimination and Gauss Jordan methods - Elementary matrices- permutation matrix - inverse matrices - System of linear equations - LU factorizations.

#### Vector spaces

Euclidean space and vector space - subspace - linear combination - span - linearly independent and dependent - bases - dimensions - finite dimensional vector space.

#### Subspace Properties

Row and column spaces -Rank and nullity - Bases for subspace - inevitability-Application in interpolation.

#### Module II

# **Complex Variables (Differentiation)**

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

# Complex Variables (Integration)

Contour integrals – Cauchy Integral formula – Cauchy Integral theorem – Taylor's series - Singularities of analytic function - Laurent's series - Residues - Cauchy Residue theorem - Evaluation of real definite integrals around unit circle and semi-circle (Excluding poles on the real axis)

# List of Experiments:

- 1. Row Echelon form and Row reduced Echelon form of a matrix.
- 2. Curve fitting and Interpolation
- 3. Dimension of row space, column space and null space.
- 4. Evaluating Laplace Transform and inverse Laplace transforms of functions including impulse.
- 5. Dimension of row space, column space and null space.
- 6. Evaluating Laplace Transform and inverse Laplace transforms of functions

# 23 Hours

#### 30 Hours

# 22 Hours

Course Outcomes	Cognitive Level
	ooginave Level
At the end of this course, students will be able to:	
<b>CO 1:</b> Apply the concepts of matrices and system of linear	Apply
equations using decomposition methods and concept of	
vector spaces and subspaces.	
CO 2: Compute the basis and dimension of sub spaces, row and	Apply
column space.	
<b>CO 3:</b> Use the concepts of complex variables to construct analytical	Apply
function.	
CO 4: Use the concepts of complex integration to evaluate definite	Apply
integrals.	
CO 5: Demonstrate the understanding of complex variables and	Apply
transform through modern tools.	

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

High-3; Medium-2;Low-1

# Text Book(s):

- T1. David C Lay, Linear Algebra and its Applications, 3<sup>rd</sup> Edition, Pearson Education, 2009.
- T2. Erwin Kreyzig, Advanced Engineering Mathematics, 10<sup>th</sup> edition, John Wiley & Sons, 2015.

# Reference Book(s):

- R1. K. Hoffman and R. Kunze, Linear Algebra, Pearson, 2015.
- R2. Gilbert Strang, Linear Algebra and its Applications, 3<sup>rd</sup>, Harcourt College Publishers, 2005.
- R3. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 43<sup>rd</sup> edition, 2014.

- 1. <u>https://nptel.ac.in/courses/111106051</u>
- 2. https://www.classcentral.com/course/matrix-algebra-engineers-11986

Course Code: 23PHI	201	Course Title: Physics for Electrical Sciences (Common to EA, EC, EE & EV)					
Course Category: M	inor	Course Level: Introductory					
L:T:P(Hours/Week) 3: 0: 2	Credits: 4	Total Contact Hours:75	Max Marks:100				

The course is intended to impart knowledge on the fundamental laws and relations in electricity, magnetism, electromagnetism and electromagnetic waves.

#### Module I

#### 22 Hours

**Electrostatics:** Definition of electric charge-Coulomb's Law – Electric field intensity – Field intensity due to point and line charges – Electric flux density -Gauss's law-Application of Gauss's law: Determine the field due to a line charge and a plane sheet of charge – Electric potential-Equipotential surfaces-Potential gradient.

**Magnetostatics:** Definition of magnetic flux- magnetic field intensity-Lorentz Law of force- Biot – Savart law, Ampere's Law- Application of Ampere's Law: Magnetic induction due to a long linear conductor and solenoid - Magnetic field due to straight conductors-circular loop – Magnetic flux density (B) - Magnetic potential.

**Electric and Magnetic Fields in Materials:** Dielectrics: An atomic view - Dielectric Polarization- Dielectrics and Gauss's law- Dielectric Strength- Energy stored in a dielectric medium - Capacity of a condenser - Capacitance - coaxial, Spherical capacitor-Poisson and Laplace Equation.

#### Module II

#### 23 Hours

**Electric and Magnetic Fields in Materials:** Magnetic susceptibility and permeabilityproperties of dia, para and ferro magnetic materials-hysteresis loop.

**Electromagnetic Induction:** Faraday's law – Lenz's law – Time varying magnetic field - self Inductance - self Inductance of a solenoid- Mutual inductance- Mutual inductance of two solenoids. Charge conservation law - continuity equation- displacement current-Maxwell's equations.

**Electromagnetic Waves:** Electromagnetic waves in free space - Poynting vector - Propagation of electromagnetic waves in dielectrics – Phase velocity- Propagation of electromagnetic waves through conducting media- penetration or skin depth.

# List of Experiments

- 1. Verification of Ohms' law.
- 2. Test the Faraday's hypothesis of magnetic field induction.
- 3. Determination of specific resistance of the given material using Carey foster's bridge.
- 4. Measurement of capacitance using Schering Bridge.
- 5. Measurement of inductance using Maxwell Bridge.
- 6. Determination of wavelength of the given light source using spectrometer.

Course Outcomes	Cognitive
At the end of the course students will able to	Level
CO 1: Understand the basic concepts of Electrostatics, Magneto-	
statics, Electric and magnetic fields in materials, Electromagnetic	Understand
Induction and Electromagnetic Waves.	
CO 2: Apply the concepts of Electrostatics, Magnetostatics, Electric	
and magnetic fields in materials, Electromagnetic Induction and	Apply
Electromagnetic Waves to obtain the desired parameters.	
CO 3: Use appropriate concept of physics in electric and magnetic	Analyze
fields to analyze problems.	Analyze
CO 4: Conduct, Analyze and Interpret the data and results from the	Evaluate
physics laboratory experiments.	

# **Course Articulation Matrix**

CO Vs PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1														
CO2	3	1												
CO3		3							1					
CO4				3										

High-3; Medium-2; Low-1

#### Textbooks:

- T1.R.K.Gaur and S.L.Gupta, "Engineering Physics", Dhanpat Rai publications, New Delhi, 8<sup>th</sup> Edition, 2011.
- T2.W. H. Hayt and John A. Buck, "Engineering Electromagnetics", Tata McGraw Hill, New Delhi, 6<sup>th</sup> Edition, 2014.

#### Reference Book(s):

- R1. David Griffiths, "Introduction to Electrodynamics", Pearson Education, 4<sup>th</sup> Edition, 2013
- R2. K. A. Gangadhar and P. M. Ramanathan, " Electromagnetic Field Theory", Khanna
- R3. Publishers, New Delhi, 5<sup>th</sup> Edition, 2013.
  Mathew. N. O. Sadiku, "Elements of Electromagnetics", Oxford University Press, 4<sup>th</sup> Edition, 2009.

- 1. http://nptel.iitm.ac.in
- 2. http://openems.de/start/index.php
- 3. https://bop-iitk.vlabs.ac.in/List%20of%20experiments.html

Course Code: 23PHT001 (Common to AD, AM, CS, IT & SC)												
Course Category: Minor Course Level: Introductory												
L:T:P(Hours/Week) 3: 0: 0 Credits: 3 Total Contact Hours: 45 Max Marks: 100												
Course Objectives: The course is intended to impart the knowledge on working mechanism of laser, fiber												
optics, display devices and introduce the concepts of integrated circuits, nanotechnology												
and quantum computing												
Module I 22 Hours												
Laser: Characteristics of laser light- Einstein's theory of matter and radiation – A &												
Coefficients- Stimulated and spontaneous emission of radiation - Population inversion an												
pumping methods - Types of laser: Nd: YAG laser and Carbon di oxide (CO2) molecula												
gas laser - Semiconductor laser (Homo junction and hetero junction) - Application												
Hologram and Holographic data storage (record/read).												
Fiber Optics: Optical fibers - Principle of light propagation through optical fibers												
Expressions for numerical aperture and acceptance angle - Types of optical fibers base												
on material, refractive index, and mode of propagation- Fabrication of optical fiber: Doub												
crucible method- Dispersion and attenuation in optical fiber - Photo detectors: PN, PIN												
Avalanche photo diodes- Fiber optic communication system and its advantages.												
Nano Technology and Quantum Computing: Introduction - Importance												
Nanotechnology - Nanomaterials - Nanoparticles - Synthesis of Nanoparticles: High												
energy ball milling (top-down approach) - Sol-gel process (bottom-up approach)												
Application of Nanomaterials.												
Module II 23 Hours												
Nano Technology and Quantum Computing: Introduction to Quantum Computing												
Uses and Benefits of Quantum Computing - Features of Quantum Computing												
Superposition, Entanglement, Decoherence - Limitations of Quantum Computing												
Comparison of Quantum Computer with Classical Computer - Quantum Computers												
Development : Google, IBM, Microsoft and others.												
Integrated Circuits: Introduction to semiconductors: Intrinsic and extrins												
semiconductors- Advantages of Integrated circuits (ICs) over discrete components- IC												
classification- Construction of bipolar transistor: Silicon Wafer Preparation - Epitaxi												
growth - Oxidation- Photolithography- Isolation diffusion - Base diffusion - Emitter diffusion												
- Contact mask- Aluminium metallization - Passivation- Structures of integrated PN												
transistor.												

**Display Devices:** Human vision - Red, Blue, and Green (RGB) color scheme – Primary and secondary colors- Color addition and subtraction-Optical Emissions: Luminescence, photoluminescence, cathodoluminescence- electroluminescence -Injection electro Luminescence- Displays (Working principles): Plasma display, LED display, Liquid crystal display (LCD) and Numeric display.

Course Outcomes	Cognitive	
At the end of this course, students will be able to:	Level	
<b>CO1:</b> Understand the basic principles of laser, fibre optics, nanotechnology, quantum computing, fabrication of integrated circuits and working mechanism of various display devices.	Understand	
<b>CO2:</b> Apply the concept of laser, fibre optics, nanotechnology, quantum computing, fabrication of integrated circuits and working mechanism of various display devices, to obtain the necessary parameter.	Apply	
<b>CO3:</b> Build a model using the concepts of laser, fibre optics, integrated circuits and display devices.	Analyze	
<b>CO4:</b> Perform as a member of team in analyzing the applications of laser, fibre optics, nanotechnology, quantum computing, integrated circuits and principles of display devices and make an oral presentation.	Analyze	

# Course Articulation Matrix

CO Vs PO	РО 1	PO 2	PO 3	РО 4	PO 5	PO 6	PO 7	PO 8	РО 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1														
CO2	3	1												
CO3		3			1				1	1				
CO4									1	3				

High-3; Medium-2; Low-1
# Text Book(s):

- T1. M. N. Avadhanulu and P. G. Kshirsagar, "Text Book of Engineering Physics", S. Chand & Company Ltd., New Delhi, 2018.
- T2. David Armitage, "Introduction to Micro displays", John Wiley & Ltd, 2006.
- T3. D.Roy Choudhry, Shail Jain, "Linear Integrated Circuits", New Age International Pvt.
   Ltd, 3<sup>rd</sup> Edition, 2010

# Reference Book(s):

- R1. D. Halliday., R. Resnick and J. Walker, "Fundamentals of Physics", Wiley Publications, 10<sup>th</sup> Edition, 2014.
- R2. Ajoy Ghatak, "Optics", Tata McGraw-Hill Education, New Delhi, 5<sup>th</sup> Edition, 2012.
- R3. A. Marikani, "Engineering Physics", PHI Learning, New Delhi, 2<sup>nd</sup> Edition, 2014.

- 1. https://onlinecourses.nptel.ac.in/noc22\_ph32/preview
- 2. http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html
- 3. https://www.investopedia.com/terms/q/quantum-computing.asp

Course Code: 23PHL	001	Course Title: Physics for Information Sciences Laboratory (Common to AD, AM, CS, IT & SC)						
Course Category: Mir	nor	Course Level: Introductory						
L:T:P (Hours/Week) 0:0:3	Credits:1.5	Total Contact Hours: 45	Max Marks: 100					

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

# List of Experiments:

- 1. Determination of wavelength of the Laser using plane transmission grating.
- 2. Estimation of particle size of fine lycopodium powder using laser.
- Measurement of acceptance angle and numerical aperture of an optical fiber Laser diffraction method.
- 4. Determination of band gap of semiconducting materials Thermistor (Germanium).
- 5. Light Illumination characteristics of Light dependent resistor (LDR).
- 6. Measurement of thickness of thin material Air wedge method.
- 7. Determination of wavelength of the spect ral lines of mercury spectrum using grating.
- 8. I-V characteristics of solar cell.
- 9. I-V characteristics of photo diode.
- 10. Verification of truth tables of logic gates.

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

## **Course Articulation Matrix**

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

High-3; Medium-2; Low-1

# Reference Book(s):

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

- 1. https://bop-iitk.vlabs.ac.in/List%20of%20experiments.html
- 2. https://vlab.amrita.edu/index.php?sub=1&brch=281
- 3. https://vlab.amrita.edu/index.php?sub=1&brch=189

Course Code : 23CHT201		Course Title: Chemistry for Mechanical					
		Sciences					
		(Common to AU & ME)					
Type of Course: Minor		Course Level: Introductory					
L:T:P(Hours/Week):3:0:0	Credits: 3	Total Contact Hours :45	Max Marks:100				

The Course is intended to impart the knowledge of Chemistry involved in water technology, Electrochemical cells, Corrosion and its control, Engineering materials and fuels and lubricants.

### Module:

## 23 Hours

**Water Technology:** Water quality parameters- Hardness (Definition, types, units)-Estimation of Hardness (EDTA method). Boiler feed water -formation of deposits in steam boilers and heat exchangers (scale, sludge and caustic embrittlement). Water softening- Demineralization (Ion exchange method)- Desalination- Reverse Osmosis method. Roles and responsibility of women and individual in conservation of water.

**Batteries and Fuel cells:** Electrochemistry- Basic Terminologies - Conductometric, Potentiometric and pH titrations- Batteries- types and Characteristics. Construction, working and applications of Alkaline, Lead acid, and Lithium ion batteries. Fuels cells- $H_2O_2$  fuel cell.

**Corrosion and control:** Corrosion- dry and wet corrosion, Galvanic series, Galvanic corrosion, differential aeration corrosion. Factors influencing corrosion.

## Module:II

## 22 Hours

**Corrosion and control:** Corrosion control method- material selection and design, cathodic protection techniques. Metallic coating- Galvanizing and Tinning, Electroplating- Nickel plating.

**Engineering materials:** Polymer-Classification, Functionality, degree of polymerization, number and weight average molecular weight (definition only). Thermo plastic and thermosets, Compounding of plastics. Polymer processing by injection and blow techniques. Polymer composites. Nano materials- Introduction – Difference between bulk and nanomaterials, size dependent properties. Application of nanomaterials in electronics, energy science and medicine.

**Fuels and Lubricants:** Automotive fuels- Petrol, diesel, CNG, blended fuels – Composition, properties and uses. Petroleum- refining, knocking in petrol and diesel engine- octane and cetane rating of fuels. Calorific value- Gross and Net calorific value. Catalytic convertors. Lubricants- Importance and classification, properties of liquid lubricants and its significance. Greases – common greases, types and properties

Course Outcomes			
At the end of this course ,students will able to:	Cognitive Level		
<b>CO1:</b> Understand and explain the chemistry involved in water treatment, batteries and fuel cells, corrosion, polymer and	Understand		
fuels and lubricants.			
<b>CO2:</b> Apply the acquired knowledge of chemistry to solve the Engineering problems.	Apply		
<b>CO3:</b> Analyze the Engineering problems through the concept of electro chemistry, water technology, Engineering materials and fuels.	Analyze		

# **Course Articulation Matrix**

со	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	3	-	-	-	-	-	-	-	-	-	-	-	-

# High-3; Medium-2; Low-1

## Text Book(s):

- T1. Jain&Jain, Engineering Chemistry (All India), 17<sup>th</sup> Edition, Dhanpat Rai Publishing Company Pvt Ltd,New Delhi, 2018.
- T2. Wiley Engineering Chemistry, 2<sup>nd</sup>, Wiley India Pvt Ltd, New Delhi, 2011.

# Reference Book(s):

- R1. Dara S.S., and Umare S.S., A text book of Engineering Chemistry, S. Chand& Co Ltd, New Delhi , 2014.
- R2. V.R.Gowariker, N.V.Viswanathan and Jayadev Sreedhar, Polymer Science, New Age International Pvt Ltd,, Chennai , 2006.
- **R3**. Renu Bapna and Renu Gupta, Engineering Chemistry, Macmillan India Publisher Ltd, 2010.

- 1. http://nptel.ac.in/courses/122101001/downloads/lec.23.pdf
- 2. https://nptel.ac.in/courses/104106075/Week1/MODULE%201.pdf
- 3. https://nptel.ac.in/courses/103102015/

Course Code:23CHI201	Course Tit	Course Title: Chemistry for Civil Engineering							
Course Category: Minor	Course Le	vel: Introductory							
L:T:P (Hours/Week) 3: 0: 2	Credits:4	Total Contact Hours:75	Max Marks:100						

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

## Module: I

## 22 Hours

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

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

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

## Module: II

## 23 Hours

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

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

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

## LIST OF EXPERIMENTS:

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

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

## **Course Articulation Matrix**

СО	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	3	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	3	-	-	-	-	-	-	-	-	-	-

## High-3; Medium-2; Low-1

## Text Book(s):

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

## Reference Book(s):

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

## Web References: Edition

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

Course Code: 23CHL201		Course Title: Chemistry for Mechanical Sciences Laboratory (Common to AU & ME)					
Course Category: Minor		Course Level: Introductory					
L:T:P(Hours/Week):0:0:3	credits:1.5	Total Contact Hours :45	Max Marks:100				

The Course is intended to analyze the Dissolved Oxygen, Hardness, Iron, Chloride content, and Corrosion rate, Molecular weight of polymer and Properties of various lubricants.

# List of experiments:

- 1. Determination of Total, Temporary and 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 the water sample by Argentometric method.
- 5. Estimation of iron content of the water sample using Spectrophotometer.
- 6. Conductometric titration of strong acid Vs strong base.
- 7. Estimation of  $Fe^{2+}$  by potentiometric titration.
- 8. Determination of strength of given hydrochloric acid using P<sup>H</sup> meter.
- 9. Corrosion experiment weight loss method.
- 10. Determination of molecular weight of Polyvinyl alcohol using Ostwald viscometer.
- 11. Green synthesis of silver nanoparticles by Neem leaf.
- 12. Determination of Cloud and Pour Point.

Course Outcomes	
At the end of this course, students will able to:	Cognitive Level
<b>CO1:</b> Understand the concept of volumetric and instrumental methods through chemistry laboratory.	Understand
<b>CO2:</b> Apply the knowledge of chemistry to investigate engineering materials by volumetric and instrumental methods and analyze, interpret the data to assess and address the issues of Environmental Problems.	Evaluate

### **Course Articulation Matrix**

СО	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	3	-	-	-	-	-	-	-	-	-	-

### High-3; Medium-2; Low-1

### Reference Book(s):

- **R1**. A Text book on Experiments and calculations in Engineering Chemistry by SS Dara, 9<sup>th</sup> Edition, S Chand publications,2015.
- **R2**. Instrumental methods of chemical analysis, Chatwal and Anand,5<sup>th</sup> Himalaya Publications,2023.
- **R3.** Lab manual of Chemistry for Mechanical Sciences Laboratory prepared by Chemistry faculty members.

- 1. https://archive.nptel.ac.in/courses/104/106/104106121/
- 2. https://academic.oup.com/book/42038/chapterabstract/355779823?redirectedFrom=fulltext

Course Code: 23ESI	_201	Cou (Coi	ourse Title: Employability Skills 1 : Aptitude ommon to all B.E/B.Tech Programmes)					
Course Category: S	EC		Course Level: Introductory					
L:T:P(Hours/Week) 0:0:2	Credits: 1		Total Contact Hours: 30	Max Marks: 100				

- To improve verbal ability skill and communicative skill of the students.
- To enhance the analytical skill and problem-solving skill of the students.
- To make them prepare for various public and private sector exams & placement drives.

### Module I

**18 Hours** 

## **Quantitative Aptitude:**

### Number System

Introduction – Understanding Numbers – Real and Imaginary Numbers – Rational and Irrational Numbers – Integers and Fractions – Divisibility Rile of Numbers – Rule to be Followed for Remainders – Factors, LCM and HCF – Concept of Last Digit.

#### **Ratio and Proportion**

Introduction – Properties of Ratios – Applications of Ratios: Partnership Problems – Bags and Coins – Raves and Games

#### **Problems on Ages**

Introduction - Problem Types Based on Ades

### Soft Skills:

Introduction - Self Introspection - Presentation Skills - Telephone Etiquette - Netiquette

### Module II

#### 12 Hours

### **Quantitative Aptitude:**

### Percentage

Introduction – Percentage Equivalent of Fractions – Concept of Multiplication Factor – Base and Base Change – Percentage Points – Successive Percentage Change Rule. **Time and Work** 

Introduction – Problems Involving Individual Efficiencies – Problems Involving Group

# Soft Skills:

Digital Body Language - Team Work - Active Listening & Interpersonal Skills

Course Outcomes	Cognitive Level		
At the end of this course, students will be able to:			
<b>CO 1:</b> To enhance their problem solving skills, to improve the basic mathematical & Logical Skills for any type of competitive examinations.	Remembering Understanding Apply		
<b>CO 2:</b> Provide self-analysis, present on a topic and have understood the etiquettes followed in the process of interaction.	Remembering Understanding Apply		

## **Course Articulation Matrix:**

CO	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	-	-	-	-	-	-	-	1	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	1	-	-	-	-

High-3; Medium-2; Low-1

## Text Book(s):

- T1. P. A. Anand. "Quantitative Aptitude for Competitive Examinations", Wiley India Pvt Ltd, New Delhi, 2016.
- T2. Prof. Peeta Bobby Vardhan and Dr. Krishnaveer Abhishek Challa. "A Complete Textbook on Soft Skills", Publisher: Kanishka, Edition: 2020.
- T3. M. S. Rao. "Soft Skills Enhancing Employability: Connecting Campus with Corporate", I K International Publishing House Pvt. Ltd, December 2013.

## Reference Book(s):

- R1. Dr. R. S. Aggarwal. "Quantitative Aptitude for Competitive Examinations" Sultan Chand & Sons Pvt. Ltd, New Delhi, 2018.
- R2. R. V. Praveen. "Quantitative Aptitude and Reasoning" 2<sup>nd</sup> Edition, Prentice-Hall of India Pvt.Ltd, 2013.
- R3. Arun Sharma. "Quantitative Aptitude for Common Aptitude Test", McGraw Hill Publications, 5<sup>th</sup> Edition, 2020.
- R4. Dr. M Sen Gupta. "Skills for Employability: A Handbook", IP Innovative Publication Pvt. Ltd. Edition: First Edition, 2017
- R5. Vivekanand Rayapeddi. "Soft Skills: To Ace All Interviews" Notion Press, First Edition, December 2019
- R6. Dr. Alex K. "Soft Skills" S Chand & Company; First Edition (1 January 2014).

- 1. www.indiabix.com
- 2. www.geeksforgeeks.org
- 3. www.javatpoint.com
- 4. https://unacademy.com/course/quantitative-aptitude-for-lacements/E7A2N4BL
- 5. https://www.thebalancecareers.com/list-of-soft-skills-2063770
- 6. https://www.thebalancecareers.com/what-are-soft-skills-2060852
- 7. https://www.wikijob.co.uk/content/interview-advice/competencies/soft-skills

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

#### **Pre-requisites**

> NIL

#### **Course Objectives**

மாணவாகள் இப்பாடத்தை கற்றலின் மூலம்

- CO.1 நெசவு மற்றும் பானைத் தொழில்நுட்பம், வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம், உற்பத்தீத் தொழில்நுட்பம், வேளாண்மை மற்றும் நீா்ப்பாசனத் தொழில்நுட்பம் ஆகியன குறித்து அறிந்து கொள்ள இயலும்.
- CO.2 அறிவியல் தமிழ் மற்றும் கணினித் தமிழ் குறித்து அறிந்து கொள்ள இயலும்.

## தமிழரும் தொழில்நுட்பமும்

#### அலகு 1 – நெசவு மற்றும் பானைத் தொழில்நுட்பம்

சங்க காலத்தில் நெசவுத் தொழில் – பானைத் தொழில்நுட்பம் – கருப்பு சிவப்பு பாண்டங்கள் – பாண்டங்களில் கீறல் குறியீடுகள்

#### அலகு 2 – வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்

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

#### அலகு 3 – உற்பத்தித் தொழில்நுட்பம்

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

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#### அலகு 4 வேளாண்மை மற்றும் நீாப்பாசனத் தொழில்நுட்பம்

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

#### அலகு 5 – அறிவியல் தமிழ் மற்றும் கணினித் தமிழ்

அறிவியல் தமிழின் வளா்ச்சி – கணினித் தமிழ் வளா்ச்சி – தமிழ் நூல்களை மின் பதீப்பு செய்தல் – தமிழ் மென் பொருட்கள் உருவாக்கம் – தமிழ் இணையக் கல்விக் கழகம் – தமிழ் மின் நூலகம் – இணையத்தில் தமிழ் அகராதிகள் – சொற்குவைத் திட்டம்.

## **TOTAL : 15 PERIODS**

Cours	se Outcomes			
மாண	வா்கள் இப்பாடத்தை கற்றபின்	Cognitive Level		
CO.1	நெசவு மற்றும் பானைத் தொழில்நுட்பம், வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம், உற்பத்தித் தொழில்நுட்பம், வேளாண்மை மற்றும் நீா்ப்பாசனத் தொழில்நுட்பம் ஆகியன குறித்து அறிந்து கொள்வாா்கள்.	அறிதல் (Understand)		
CO.2	அறிவியல் தமிழ் மற்றும் கணினித் தமிழ் குறித்து அறிந்து கொள்வார்கள்.	அறிதல் (Understand)		

### **Course Articulation Matrix**

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

High-3; Medium-2; Low-1

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# **TEXT - CUM REFERENCE BOOKS**

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

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

#### **Pre-requisites**

> NIL

#### **Course Objectives**

The course is intended to:

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

## TAMILS AND TECHNOLOGY

### UNIT I WEAVING AND CERAMIC TECHNOLOGY

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

3

3

3

### UNIT II DESIGN AND CONSTRUCTION TECHNOLOGY

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

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

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

# UNIT V SCIENTIFIC TAMIL & TAMIL COMPUTING

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

## **TOTAL : 15 PERIODS**

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

## **Course Articulation Matrix**

СО	PO1	PO2	PO3	PO4	PO5	PO6	P07	P08	PO9	PO10	P011	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	1	-	-

High-3; Medium-2; Low-1

3

3

# **TEXT - CUM REFERENCE BOOKS**

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

Course Code: 23CHT2	02	Course Title: Environmental Sciences (Common to all B.E/B.Tech Programmes)					
Course Category: Man	datory No	Course Level: Introductory					
L:T:P(Hours/Week) 1: 0: 0	Credits:	Total Contact Hours: 15	Max Marks:100				

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

### Module I

# Natural Resources

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

# **Environmental Pollution and Disaster Management**

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

# **Environmental Ethics and Legislations**

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

## Module II

# **Environmental Issues and Public Awareness**

Public awareness - Environment and human health.

## **Environmental Activities**

## (a) Awareness Activities:

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

# (b) Actual Activities:

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

### 7 Hours

8 Hours

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

## **Course Articulation Matrix**

СО	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	3	3	-	-	-	-
CO3	3	-	-	-	-	3	3	-	3	3	-	-

High-3; Medium-2;Low-1

## Text Book(s):

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

## Reference Book(s):

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

- 1. https://onlinecourses.nptel.ac.in/noc23\_hs155/preview.
- 2. https://en.wikipedia.org/wiki/Environmental\_science.

		Course Title: COMPUTER AIDED DRAFTING AND					
Course Code: 23MEL2	D1	MODELING LABORATORY					
		(Cor	mmon to AU,ME)				
Course Category: Majo	or	Course Level: Practice					
L:T:P(Hours/Week)	Crodite:2.5	Total Contact Hours: 15	Max Marke:100				
0: 0: 3	Greails.2.5	Total Contact Hours.45	max marks. 100				

The course is intended to create a CAD model as per the given part/assembly drawing.

# List of Experiments

- 1. Construction of 2D sketches using AutoCAD.
- 2. Construction of 2D sketches with dimensions using AutoCAD.
- 3. Construction of simple 3D models with basic features using CAD tool.
- 4. Construction of 3D models with advanced features such as holes, pattern, swept, and etc. using a CAD tool.
- 5. Develop the part drawing of 3D models using a CAD tool.
- 6. Develop the production drawing of given machine component using a CAD tool.

# 7. Develop the assembly drawing of given machine component using a CAD tool.

Course Outcomes	Cognitive							
At the end of this course, students will be able to:	Level							
CO1: Understand the knowledge of engineering drawing in simple machine	Understand							
components.								
CO2: Apply the methods of dimensioning, general rules for sizes and placement of Apply								
dimensions for holes, centers, curved and tapered features.								
CO3: Apply the concepts to conduct experiments for design, draft and detailing of 2D	Apply							
modelling								
CO4: Apply the concepts to design 3D modelling and assembly using modern software	Apply							
tools.								

## Textbooks:

- T1. Cencil Jensen, Jay D.Helsel and Dennis R. Short, "Engineering Drawing and Design", TataMcGraw Hill India, New Delhi, 7th Edition, 2017.
- T2. Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, Gujarat, 53rdedition, 2015.
- T3. K. V. Natrajan, "A Text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 48th edition, 2018.

## Reference Book(s):

R1 Louis Gary Lamit, "PTC Creo Parametric 3.0", Global engineering, Cengage learning, USA. R2 John K.C., "Engineering Graphics", PHI Learning, Delhi, 1st edition, 2009.

R3 Dhananjay A. Jolhe, "Engineering Drawing with an introduction to AutoCAD" TataMcGraw India, New Delhi, 3rd edition, 2008.

## Web References:

- 1. https://nptel.ac.in/courses/112104031
- 2. https://www.coursera.org/specializations/autodesk-cad-cam-cae-mechanical-engineering
- 3. https://www.coursera.org/specializations/autodesk-cad-cam-cae-engineering drawing

СО	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	2	-	-	-	-	-	-	-	-	-	-	-	-	2
CO3	2	-	2	2	-	-	-	-	-	-	-	-	-	2
CO4	-	-	2	-	2	-	-	-	-	-	-	-	-	2

### **Course Articulation Matrix**

Course Code:	23MEL202	Course Title: ENGINEERING PRACTICES LABORATORY (Common to AU,CE,ME)					
Course Categ	gory: SEC	Course Level: Practice					
L:T:P(Hours/Week) 0: 0: 3	Credits:2.5	Total Contact Hours:45	Max Marks:100				

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

## List of Experiments

#### **Electrical & Electronics**

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

### **Civil & Mechanical**

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

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
<b>CO 1:</b> Understand the basic symbols of electrical and electronic components	Understand
from a given circuit.	
<b>CO2:</b> Apply engineering knowledge to conduct experiments and analyze the	Apolyzo
electrical and electronic connections as per the given circuit.	Analyze
<b>CO3:</b> Apply to make wooden 'T' joint, and pipeline connection individually	
using various workshop tools as per the given dimensions.	Apply
<b>CO4:</b> Apply to make metal 'V' joint with various joining components and a	
permanent joint as per the given dimensions using modern workshop tools and	Apply
engineering principles.	

## Reference Book(s):

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

R2. 19EPL21 - Engineering practices laboratory Manual.

## Web References:

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

## **Course Articulation Matrix**

СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	2	-	2	-	-	-	-	2	-	-	-	-	-
CO3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	2	-	-	-	2	-	-	-	-	-	-	-	-	-

High-3; Medium-2; Low-1

Course Code: 23MEI	001	Course Title: ENGINEERING MATERIALS (Common to AU,ME)					
Course Category: Ma	jor	Course Level: Introductory					
L:T:P(Hours/Week) 2: 0: 2	Credits: 3	Total Contact Hours:60	Max Marks:100				

The course is intended to

To impart knowledge on crystal structure, phase analysis and heat treatment of ferrous alloy.

#### Module I

#### 15Hours

**Crystal Physics:** Crystalline and Non crystalline materials. Single crystal , Polycrystalline materials Anisotrophic crystal parameters: Atomic radius, Number of atoms per unit cell, Coordination number, atomic packing factor for SC , BCC , FCC and HCP- Crystal planes: Miller indices, Braggs law . Interplanar distance- Polymorphism and allotrophy. Crystal imperfections: Point , line , surface and volume , grain boundary and its role in mechanical properties. Deformation – Slip-twinning-strain hardening of single crystal.

**Constitution of Alloys and Phase diagram:** Constitution of alloys- Solid solutions- Substitutional and Interstitial. Phase diagrams- Interpretation of Phase diagram, Lever rule, Gibbs phase rule. cooling curve for pure metal, binary solid solution and binary eutectic system. Iron – Iron Carbide equilibrium diagram. Micro constituents in Fe<sub>3</sub>C diagram (Austenite, Ferrite, Cementite, Pearlite, Martensite, Bainite), Pearlite transformation.

**Ferrous alloy:** Effect of alloying elements on properties of steel (Mn, Si, Cr, Mg, V and W). Properties and applications of stainless steel and Tool steel, Cast Iron-White, Malleable, Grey and Spheroidal Cast Iron-Properties and Applications

### Module II

#### 15 Hours

**Non-Ferrous:** Aluminium and its alloys, Copper and its alloys, Magnesium and its alloys, Titanium and its alloys, Nickel and its alloys- Composition, Properties and Applications.

Industrial standards for alloys and other materials - alloying elements and inclusion of ceramics materials..

**Powder Metallurgy:** Need of powder metallurgy products-Advantages and limitation of P/M-Stages in P/M-Need for additives in P/M-secondary process of P/M products-mechanical-physical-chemical methods of powder production-compaction and sintering techniques of P/M-particle size analysis.

**Heat Treatment:** Heat treatment process-purpose heat treatment – Process parameters. Bulk treatment: Annealing, Normalizing, Tempering, Quenching (Process parameter, application). Isothermal transformation Diagram (TTT Diagram). Cooling curves superimposed on TTT diagram.CCR - CCT. Harden ability- Definition. Method to determine Harden ability- Jominy end quench test.

### List of Experiments

#### 30 Hours

- 1. Conduct the annealing operation on given steel and cast iron.
- 2. Conduct the normalizing operation on given steel and cast iron.
- 3. Conduct the Quenching operation on given steel and cast iron.
- 4. Determine the microstructure on given sample.
- 5. Determine the micro hardness for the given sample.

Course Outcomes	Cognitive Level									
At the end of this course, students will be able to:										
CO 1: Explain the crystal parameters for different crystal structure and its	Understand									
influences on mechanical properties of bulk materials.										
<b>CO2:</b> Apply the knowledge of composition changes in phase diagram for suitable	Apply									
application.										
CO3: Apply the knowledge for choosing the suitable alloying elements for	Apply									
Ferrous and Non Ferrous alloys.										
CO4: Explain the powder metallurgy technique, based on the functional	Understand									
requirement of the product.										
CO5: Apply the knowledge on heat treatment process for the given non-ferrous	Apply									
alloy such as steel, cast iron for a suitable application.										
CO6: Conduct experiments to demonstrate concepts related to heat treatment	Analyze									
process and analyze the variations of microstructure.										

### Textbook:

T1. William D Callister "Material Science and Engineering", John Wiley and Sons, 2014.

### Reference Book(s):

- R1. Dieter G. E., "Mechanical Metallurgy", McGraw Hill Book Company, 2013.
- R2. Sidney H Avner "Introduction to Physical Metallurgy", Tata McGRAW-Hill, 2017.

R3. Raghavan.V "Materials Science and Engineering", Prentice Hall of India Pvt., Ltd., 2015.

- 1 http://nptel.ac.in/courses/113106032/
- 2 https://www.coursera.org/specializations/ physical metallurgy

# **Course Articulation Matrix**

СО	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	3	-	2	-	-	-	-	2	2	-	-	-	-

High-3; Medium-2; Low-1

Course Code: 23MEL	001	(Common to AD,AM,AU,CS,EA ,EC,EE,EV,IT,ME, SC)					
Course Category: Major		Course Level: Introductory					
L:T:P(Hours/Week) 1: 0: 3	Credits:2.5	Total Contact Hours: 60	Max Marks:100				

The course is intended to

• To impart knowledge on basic dimensioning. 2D and 3 D drawings such as points, lines, planes and solids on first quadrant.

#### Module I

#### 8 Hours

**Basics of Engineering Drawing:** Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning. Basic Geometrical constructions –Orthographic projection- Free hand Sketching.

**Projection of Points, Lines:** First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces by rotating object method.

**Projection of Solids:** Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one of the principal planes by rotating object method. Practicing three dimensional modeling of simple objects by CAD Software (Not for examination).

## Module II

**Sectioned Solids:** Sectioning of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by cutting planes inclined to one reference plane and perpendicular to the other – Orthographic views of sections of simple solids.

**Development of Surfaces:** Development of lateral surfaces of simple and truncated solids – Prisms, pyramids, cylinders using straight line and radial line method.

**Isometric Projection:** Principles of isometric projection – Isometric scale –Isometric projections of simple solids and truncated solids. Practicing three dimensional modeling of isometric projection of simple objects by CAD Software (Not for examination).

#### 7 Hours

## List of Experiments

- 1. Lettering & Dimensioning
- 2. Projection of Points & Lines
- 3. Orthographic projections
- 4. Projection of Simple Solids
- 5. Projection of Section of Simple Solids
- 6. Development of Surfaces
- 7. Isometric Projections

# **Course Outcomes:**

<b>CO 1:</b> Apply the concepts related to free hand sketching, orthographic and Isometric	Understand
projection in first quadrant.	
<b>CO2:</b> Apply the concepts and draw projections of points in four different quadrants	Apply
and lines located first quadrant.	
<b>CO3:</b> Apply the concepts and draw projections and sections of simple solids using	Apply
rotatingobject method.	
CO4: Apply the concepts and draw lateral surface of simple solids using straight	Apply
line andradial line development methods.	
<b>CO5:</b> Apply the concepts and draw isometric view of simple solids and truncated	Apply
solids using principles of isometric projection.	
<b>CO6:</b> Conduct experiments to demonstrate concepts, implement and analyze the	Analyze
drawing concepts using engineering tool : Using AutoCAD.	

## **Textbook:**

T1. Cencil Jensen, Jay D.Helsel and Dennis R. Short, "Engineering Drawing and Design", Tata McGraw Hill India, New Delhi, 3<sup>rd</sup> edition, 2019.

## Reference Book(s):

- R1. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill India, New Delhi, 2<sup>nd</sup> edition, 2014.
- R2. Dhananjay A. Jolhe, "Engineering Drawing with an introduction to AutoCAD" Tata McGraw India, New Delhi, 3<sup>rd</sup> edition, 2010.
- R3. Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, Gujarat, 54<sup>rd</sup> edition, 2023.

# PUBLICATIONS OF BUREAU OF INDIAN STANDARDS

- IS 10711 2001: Technical products Documentation Size and lay out of drawing sheets.IS 9609 (Parts 0 & 1) – 2001: Technical products Documentation – Lettering.
- IS 10714 (Part 20) 2001 & SP 46 2003: Lines for technical drawings.IS 11669 1986 & SP 46 – 2003: Dimensioning of Technical Drawings.
- IS 15021 (Parts 1 to 4) 2001: Technical drawings Projection Methods. The mode of delivery is like practical.

## Web References:

- 1 http://nptel.ac.in/courses/112103019/
- 2 https://www.coursera.org/specializations/autodesk-cad-cam-cae-mechanical-engineering

# **Course Articulation Matrix**

СО	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	3	-	-	3	-	-	-	1	1	-	1	-	-

High-3; Medium-2; Low-1

Course Code: 23CE	Г201	Course Title: Engineering Mechanics			
Course Category: Minor		Course Level: Introductory			
L:T:P(Hours/Week) 3: 0: 0	Credits:3	Total Contact Hours:45	Max Marks:100		

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

# Module I

### 22 Hours

## **Statics of Particles**

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

## **Equilibrium of Rigid Bodies**

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

## **Centroids of Surfaces And Solids**

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

### Module II

### **Properties of Surfaces And Solids**

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

#### Friction

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

#### **Dynamics of Particles**

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

Course Outcomes	Cognitive Level		
At the end of this course, students will be able to:			
<b>CO 1:</b> Determine the resultant of various force systems.	Apply		
CO 2: Calculate the centroid, moment of inertia and solve	Apply		
problems related to friction.	Арріу		
<b>CO 3:</b> Calculate the position, velocity and acceleration of particle	Apply		
using the principles of Kinematics.	дрру		
<b>CO 4:</b> Calculate the position, velocity and acceleration of particle	Apply		
using the principles of Kinetics and Work – Energy principle.	Арріу		
<b>CO.5</b> Engage in independent study as a member of a team and			
make an effective oral presentation on the application of statics and	Apply		
dynamics in solving real time problem.			

#### **Course Articulation Matrix**

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

# Text Book(s):

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

## Reference Book(s):

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

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

Course Code: 23ECT001			Course Title: Circuit Theory (Common to EA ,EC&EV)				
Course Category: Major			Course Level: Introductory				
L:T:P(Hours/Week) 3:0:0	Credits:3		Total Contact Hours:45	Max Marks:100			

The course is intended to impart knowledge of the fundamentals of Electric circuits and its analysis.

### Module I

## 23 Hours

**Fundamentals of Electric Circuits:** Ohm's law - Kirchoff's Laws –Series resistive circuit-Voltage division rule- Parallel resistive circuit – Current division rule– Source transformation – Star to delta and delta to star transformation

Time period, Frequency, Angular frequency, Average value, Root mean square value, Form factor and Peak factor of sinusoidal.

Analysis of DC and AC Circuits: Mesh and node method of analysis - Networks theorem:

Superposition Theorem , Thevenin's Theorem, Norton's theorem and Maximum power transfer theorem.

### Module II

## 22 Hours

**Resonance and Coupled Circuits:** Series resonance-Voltage and Current in a series resonance, Impedance and phase angle. Parallel resonance-Resonant frequency - Variation of Impedance with frequency Coupled circuits- mutual inductance, Coefficient of coupling.

**Transient Response of Networks:** Steady state and Transient response - Response of an R-L, R-C and R-L-C circuits under DC excitation.

Course Outcomes	Cognitive Level													
At the end of this course, students will be able to:														
CO1: Define, understand, and explain the various laws for analyzing	Understand													
Electric circuits.														
CO2: Apply the knowledge of network laws and theorems to the given	Apply													
electric circuit to obtain the required parameters.														
CO3: Analyze the resonance and transient behaviour of the given electric	Analyze													
circuit using appropriate mathematical tools.														
СО	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	P011	PO12	PSO1	PSO2
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	1	1	-
CO3	-	3	-	-	-	-	-	-	-	-	-	-	-	-

High-3; Medium-2; Low-1

# Text Book(s):

T1.Sudhakar A, Shyammohan S. Pillai "Circuits and Networks -Analysis and Synthesis", McGraw Hill., New Delhi, 2015

# Reference Book(s):

- R1. William H. Hayt and Jack E. Kemmerly, "Engineering Circuit Analysis ", McGraw Hill International Edition, 2006
- R2. Singh "Network Analysis and Synthesis", McGraw-Hill Education., New Delhi, 2013
- R3. M. Arumugham and N.Prem kumar, "Electric Circuit Theory", Khanna publishers, 2010
- R4. Alexander C, Sadiku M. N. O "Fundamentals of Electric Circuits", Tata McGraw Hill., New Delhi, 2013

- 1. http://nptel.ac.in/video.php?subjectId=108102042
- 2. http://nptel.ac.in/courses/108102042/
- 3. http://nptel.ac.in/courses/108105053/
- 4. http://freevideolectures.com/Course/2336/Circuit-Theory/

Course Code: 23ECL	001	Со	Course Title: Electric Circuits and Electron Devices Laboratory (Common to EA, EC & EV)					
Course Category: Ma	jor	Course Level: Introductory			vel: Introductory			
L:T:P (Hours/Week) 0:0:3	Week) Credits:1.5		Total Contact Ho	ours:45	Max Marks:100			

The course is intended to verify the electric circuit, network theorems and characteristics of the basic electronic devices.

# List of Experiments:

- 1. PN Junction Diode and Zener diode Characteristics
- 2. Half wave and Full wave Rectifier circuits
- 3. Regulator using Zener diode
- 4. Wave shaping circuits: Clippers and clampers
- 5. Characteristics of Common Emitter configuration
- 6. Characteristics of Common Base configuration
- 7. FET characteristics and its application as a switch
- 8. Verification of Kirchhoff's Voltage and Current laws
- 9. Verification of Super Position Theorem
- 10. Verification of Thevenin's and Norton's theorems
- 11. Verification of Maximum Power transfer theorem
- 12. Determination of Resonance frequency of Series & Parallel RLC Circuits

Course Outcomes	Cognitive
At the end of this course, students will be able to:	Level
CO1: Conduct experiments to verify the characteristics of devices and theorems for Electric circuits.	Evaluate
CO2: Compare the experimental results obtained during verification of network theorems with simulation results.	Analyze

#### **Course Articulation Matrix**

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

High-3; Medium-2; Low-1

# **Reference:**

1. Laboratory Manual Prepared by Faculty of Electronics and Communication Engineering,

Dr. Mahalingam College of Engineering and Technology.

Course Code: 23EET	201	Cou	Course Title: Solid State Devices					
Course Category: Ma	ajor		Course Level: Introductory					
L:T:P(Hours/Week)	Credits: 3		<b>Total Contact Hours: 45</b>	Max Marks: 100				
3: 0: 0								

The course is intended to impart knowledge about the diodes, and transistors in electronic circuits.

#### Module I

# 22 Hours

Formation of energy bands, Fermi level, energy- band models, direct and indirect band gap, electrons and holes, doping, intrinsic and extrinsic semiconductors, elemental and compound semiconductor, generation, recombination and injection of carriers, Drift and Diffusion of carriers, basic governing equations in semiconductors.

PN Junctions, Formation of Junction, Physical operation of diode, Contact potential and Space Charge phenomena, I - V Characteristics, Zener diode, Physical operation of special diodes (Tunnel diode, LED, Varactor diode and Photo Diode). DC Analysis – Small Signals and Large signal models of PN junction diode and AC equivalent circuit. Simple Problems using diode circuits.

# Module II

# 23 Hours

Bipolar Junction Transistor: Device structure and physical operation, current – voltage characteristics. Field Effect Transistor (FET): MOS Capacitor: Device Structure and mode of operation, C- V Characteristics, Threshold Voltage. DC Analysis of BJT Circuits, CB, CE and CC Configuration, Biasing BJT Circuits, Switch. Field Effect Transistor (FET): DC Analysis of MOSFET Circuits, biasing circuits. MOSFET CS, CG and Source Follower Circuits-Simple Problems

Course Outcomes	Cognitive
At the end of this course, students will be able to:	Level
CO 1: Define, understand and explain the concepts related to semiconductors	Understand
CO 2: Apply the knowledge of engineering fundamentals in construction and working of diodes and transistors	Apply
CO3: Model and analyze the characteristics of PN junction diode, Zener diode and Special diodes report the inference for the datasheet specification using hardware and software tool	Analyze
CO4: Design and Implement the hobby project using the transistors to provide simple solutions in societal and environmental contexts and relate the chosen application with its construction and working.	Create

СО	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	P011	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	3	-	-	1	-	-	-	-	1	-	-	-	-
CO4	-	-	3	-	-	1	1	-	-	-	-	1	-	-

High-3; Medium-2;Low-1

#### Textbooks:

- T1. Adel S. Sedra, Kenneth C. Smith & Arun N. Chandorkar, Microelectronic Theory and Applications, 5<sup>th</sup> Edition, Reprint, Oxford University press, New York, USA, 2013.
- T2.B G.Streetman and S.Banerjee, Solid State Electronic Education 7<sup>th</sup> Edition, New Delhi, India, 2015.

#### Reference Book(s):

- R1.Anil K Maini, Varsha Agarwal, "Electronic Devices and Circuits", Wiley India Private Limited, New Delhi, 1<sup>st</sup> Edition, 2015.
- R2.Salivahanan. S, Suresh Kumar. N, Vallavaraj.A, "Electronic Devices and circuits", Tata McGraw Hill, New Delhi, 4<sup>th</sup> Edition, 2016.
- R3.R. Muthusubramanian and S Salivahanan, "Basic Electrical and Electronics Engineering", McGraw Hill India Limited, New Delhi, 2014
- R4.Robert L Boylestad and Louis Nashelsky, "Electron Devices and Circuit Theory", Pearson Prentice Hall, New Delhi, 11<sup>th</sup> Edition, 2014.

- 1. https://nptel.ac.in/courses/108108122
- 2. https://nptel.ac.in/courses/108108122
- 3. https://nptel.ac.in/courses/108108122
- 4. https://archive.nptel.ac.in/courses/108/102/108102145/

Course Code: 23EEI201	Cou	rse Title: Digital System Design (common to AD,AM,CS,IT and SC)					
Course Category: Multidisc	iplinary	Course Level: Introductory					
L:T:P(Hours/Week) Credit	s:3	Total Contact Hours:60	Max Marks:100				
2: 0: 2							

The course is intended to impart knowledge on basics of logic gates, number system and different types of implementation of digital circuits with its simplification methods. Also course describes the analysis of synchronous and asynchronous sequential circuit. At the end of the course the basics in design of computer system is discussed.

#### Module I

Number System Representation and Conversion - Logic Gates, Universal Gates - Boolean Algebra and Simplification Techniques: SOP – POS and Karnaugh Map Methods for Boolean Expression Simplification. Implementation of Combinational Logic - Arithmetic Circuits: Full Adder – Full Subtraction - Magnitude Comparator – Multiplexer – De-Multiplexer – Encoder and Decoder.

# Module II

Flip-Flop: RS - JK – T and D – Types of Triggering. Analysis of synchronous sequential circuit -Shift Register. Analysis of asynchronous sequential circuit – Hazards – Static, Dynamic and Essential Hazards

Computer System – Computer Memory - Random Access Memory - Read Only Memory - Expanding Memory Capacity – Secondary Storage - Input / Output Devices.

# List of Experiments

- 1. Verification of Boolean theorems using digital logic gates
- 2. Implementation of combinational circuits using basic gates
- 3. Logic verification of half adder and full adder
- 4. Logic verification of Multiplexer / De-Multiplexer
- 5. Logic verification of 4 bit shift register
- 6. Logic verification of 3 bit binary counter

# 30 Hours

#### 15 Hours

15 Hours

Course Outcomes	Cognitive
At the end of this course, students will be able to:	LEVEI
CO1: Understand the numbers system representation, operation of logic gates and design of computer system	Understand
CO2: Apply the fundamental concepts of Boolean algebra in simplification of digital circuits	Apply
CO3: Design and implement the arithmetic circuits using combinational logic circuits.	Create
CO4: Analyze the sequential logic circuit and infer the results.	Analyze
CO5: Analyze and interpret the digital circuits by performing hardware implementations and report the inference as a team or individual.	Evaluate

со	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	3	-	-	-	-	-	-	-	-	-	-	-
CO4	-	3	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	3	-	-	-	-	1	1	-	-	-	-

High-3; Medium-2;Low-1

# Text Book(s):

- T1. M. Morris Mano, "Digital Logic and Computer Design", 1<sup>st</sup> Edition, Pearson Publication, New Delhi, 2016.
- T2. Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Naraig Manjikian, "Computer Organization and Embedded Systems", 6<sup>th</sup> Edition, McGraw-Hill, 2011.

# Reference Book(s):

- R1. Anil K. Maini, "Digital Electronics Principles, Devices and Applications", John Wiley & Sons,1<sup>st</sup> Edition, 2007.
- R2. Charles H.Roth, Jr. "Fundamentals of Logic Design", 7<sup>th</sup> Edition, Jaico publishing House, New Delhi, 2014.
- R3. S.Salivahanan and S. Arivazhagan, Digital Circuits and Design, Oxford University Press, 5<sup>th</sup> Edition, 2018.
- R4. Leach P Donald, Albert Paul Malvino and Goutam Saha, "Digital Principles and Applications", 7<sup>th</sup> Edition, Mcgraw Hill, 2010.

- 1. http://www.nptel.ac.in/courses/ 108105132
- 2. https://de-iitr.vlabs.ac.in
- 3. https://nptel.ac.in/courses/117105080

Course Code: 2	23EEL201	Со	urse Title: Introduction to Programming with IoT				
Course Catego	ry: Major			Course Level: Introductory			
L:T:P (Hours/Week) 0:0:3	Credits:1	.5	Total Contact Ho	ours:45	Max Marks:100		

The course is intended to discuss the basics of electronics components and their connections, the basics of Python programming for the Raspberry Pi, and the sensor interface with the Raspberry Pi. Also the course includes smart system technologies and their role in real-time applications.

# List of Experiments:

# 1. Electronic components and connections outline

# List of Experiments

- a) Simple circuit using LED, resistor and breadboard
- b) Pushbutton and its connections
- c) LCD display and its connections
- d) Relay and its driver circuit
- e) Common mistakes when using breadboard to make connections
- f) Demonstration of all the above components

# 2. Introduction to Raspberry pi outline

# List of Experiments

- a) Blink the LED using python programming
- b) Control the blinking of tricolor LED using Pushbutton using python programming
- c) Display a count on the LCD. Count is increased whenever the pushbutton is pressed using python programming.
- d) Control the speed and direction of a DC motor using python programming

# 3. Sensor interfacing

# List of Experiments

 a) Detect the real time temperature and humidity values using DHT11 sensor by interfacing with Raspberry pi module.  b) Design the line following robot using IR sensors, ultrasonic sensor and DC motor.

# 4. Wireless connectivity and Programming with IoT

# List of Experiments

- a) Control the lamp using webserver.
- b) Monitor the real time temperature and humidity values from the webserver.

Course Outcomes	Cognitive	
At the end of this course, students will be able to:	Level	
CO1:Apply the concept of engineering fundamentals in LCD,LED,		
Relay, Sensor and Push Button by interfacing with Raspberry pi	Apply	
using python programming		
CO2:Design the line following robot by applying the management	Create	
principles and budget analysis		
CO3: Investigate and Report the technical advancement in wireless	Evaluate	
connectivity by building simple hobby project as an individual or		
team.		

**Course Articulation Matrix** 

со	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	3	-	-	-	-	-	-		1	-	-	-
CO3	-	-	-	3	-	-	-	-	1	2	-	2	-	-

High-3; Medium-2;Low-1

# Text Book(s):

T1.Maneesh Rao," Internet of Things with Raspberry Pi 3: Leverage the power of Raspberry

Pi 3 and JavaScript to build exciting IoT projects", Packt Publishing,2018

T2. Arsheep Bahga &Vijay Madisetti,"Internet of Things - A Hands-On Approach" 1<sup>st</sup> Edition, Orient Blackswan Private Limited - New Delhi 2015.

# Reference Book(s):

**R1:** "Introduction to Programming with IoT " Manual prepared by Department of Electrical and Electronics Engineering, MCET, Pollachi.

- 1.https://onlinecourses.nptel.ac.in/noc22\_cs53
- 2.https://archive.nptel.ac.in/noc/courses/noc20/SEM2/noc20-cs66

Course Code: 2	23EEL202	Со	Irse Title: Electron Devices Laboratory				
Course Category: Major				Course Level: Introductory			
L:T:P (Hours/Week) 0:0:3	Credits:1	.5	Total Contact Ho	ours:45	Max Marks:100		

The course is intended to designate the characteristics of the basic electronic devices using hardware implementation, CAD tools and programming.

# List of Experiments:

- 1. PN Junction diode and Zener diode Characteristics
- 2. Voltage Regulator using Zener diode
- 3. Transistor as an Amplifier under CE configuration.
- 4. Characteristics of Common Base configuration
- 5. FET characteristics and its application as a switch
- 6. Simulation of PN diode circuits and its characteristics using CAD tool
- 7. Simulation of transistor circuits and its characteristics using CAD tool
- 8. Program the characteristics of a diode using its datasheet
- 9. Program the characteristics of a transistor using its datasheet
- 10. Measure the operating regions of LED.
- 11. Light emitting diode safety and safety standards

Course Outcomes	Cognitive
At the end of this course, students will be able to:	Level
CO1: Estimate the concept of engineering fundamentals in diodes and transistors using hardware implementation and report the inference	Evaluate
CO2: Model the diodes and transistor circuits using appropriate simulation tools and programming.	Analyse
CO3: Conduct experiment to analyse the operating regions of LED and Photodiode	Analyse
CO4: Identify and list the safety/safety standards applied in LED	Apply

#### **Course Articulation Matrix**

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

High-3; Medium-2;Low-1

# Text Book(s):

- T1.Millman J., Halkias C. C. "Electronic Devices and Circuits ", Tata McGraw Hill, New Delhi, 2011.
- T2. Salivahanan.S, Suresh kumar.N and Vallavaraj.A, "Electronic Devices and Circuits", 2<sup>nd</sup> Edition, TMH, New Delhi, 2008.

# Reference Book(s):

R1. "Electron Devices" Manual prepared by Department of Electrical and Electronics Engineering, MCET, Pollachi.

Course Code: 23EAI2	201	Course Title: Digital Principles and System Design				
Course Category: Ma	jor	Course Level: Introductory				
L:T:P(Hours/Week) 3:0:2	Credits:4	Total Contact Hours:75	Max Marks:100			

The course is intended to impart knowledge on the design of combination and sequential digital circuits

#### Module I

#### 22 Hours

**Number System:** Review of decimal, binary, octal and hexadecimal numbers – Complements: 1's and 2's – Arithmetic operation of Signed binary numbers - Digital Logic Gates – Universal gate Implementation.

**Boolean algebra:** Basic Theorems, properties and– Representation of Boolean functions in Canonical and standard forms

**Minimization Techniques:** Simplifications of Boolean expression using 3 and 4 variable K map method and Mc-Cluskey method.

Logic Families: Characteristics and operation of TTL, ECL, CMOS logic.

**Combinational Circuits:** Design Procedure of adder-half adder, full adder,4-bit RCA, Subtractor: half subtractor, full subtractor,4-bit subtractor, Comparator: 4-bit magnitude comparator, code converters-binary to excess-3,binary to gray,Encoders-8 to 3, Decoders- 3 to 8, Multiplexers-8 X 1 and De-multiplexers-1 X 8.

# Module II

# 23 Hours

# **Synchronous Sequential Logic**

**Flip flops**: SR, JK, T, D – Level and Edge Triggering – Analysis of sequential circuits - Design of sequential circuits– **Registers:** Shift registers – SISO, SIPO, PISO, PIPO –**Counters:** Design of 3-bit synchronous and ripple counter.

# Asynchronous Sequential Logic

Analysis of Asynchronous Sequential Circuits - Design of Asynchronous Sequential Circuits with primitive flow table, state reduction and state assignment – Races, Cycles and Hazards: Static, Dynamic, Essential, Hazards elimination.

# List of Experiments:

## 30 Hours

- 1. Design and implementation of combinational circuits using basic gates for arbitrary functions, code converters.
- 2. Design and implement Half/Full Adder and Subtractor.
- 3. Design and implement combinational circuits using MSI devices: Parity generator / checker, Application using multiplexers
- 4. Design and implement shift-registers.
- 5. Design and implement synchronous counters.
- 6. Design and implement asynchronous counters.
- 7. Self-study: Verilog HDL

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1:Understand number system and Boolean algebra.	Understand
CO2:Design and implement various combinational circuits	Apply
using various minimization techniques.	
CO3:Analyze a given requirement and design a hazard free	Analyze
Sequential circuit.	
CO4:Participate in individual study and make an oral presentation	Apply
as a team on HDL concepts.	Арріу

#### **Course Articulation Matrix**

СО	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	2	-	2	-	-	-	-	-	-	-	-	-	2	2
CO3	-	3	-	-	-	-	2	-	-	-	-	-	2	2
CO4	-	-	-	-	-	-	-	-	2	-	-	2	-	-

High-3; Medium-2;Low-1

# Text Book(s):

T1. M. Morris Mano, Digital Design, 3<sup>rd</sup> Edition, Prentice Hall of India Pvt. Ltd,2002

T2. Donald D. Givone, "Digital Principles and Design", McGraw-Hill , 2003

# Reference Book(s):

R1. John F. Wakerly ,"Digital Design : Principles and Practices", 4<sup>th</sup> Edition,

Pearson education,2008

- R2. Charles Roth Jr , Eugene John, Larry Kinney "Fundamental of Logic Design" Enhanced Edition, CL Engineering,2020
- R3. Samir Palnitkar," Verilog HDL: A Guide to Digital Design and Synthesis", 2<sup>nd</sup> Edition, Pearson India,2003

- 1. https://nptel.ac.in/courses/117105080
- 2. https://www.tutorialspoint.com/digital\_circuits/index.htm
- 3. https://www.circuitlab.com/

Course Code: 23CS	201	Course Title: Problem Solving & Computer Programming					
Course Category: M	ultidisciplinary	Course Level: Introductory					
L:T:P(Hours/Week) 3:0:2	Credits: 4	Total Contact Hours: 75	Max Marks:100				

The course is intended to develop problem solving skills and knowledge in computer programming.

#### Module I

#### 22 Hours

23 Hours

**Programming Constructs:** Python interpreter and interactive mode – Python Basics: Data Types – Variables – Keywords – Literals – Usage of Operators – Comments – Indentation – Python standards in Coding.

**Control structures:** Sequential Statements – Selection Statements: conditional (if), alternative (if-else), chained conditional (if elif- else) – Iterative Control statements: while, for, nested loops, break, continue, pass.

**Functions:** Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one of the principal planes by rotating object method.

# Module II

# **Strings and Files:** String – Creating String – String operations: Concatenation, Repetition, Indexing, Splitting, Slicing – String conversion – Looping through a string – String Methods. Files: Open, Close, Write, Read.

**List, Tuple, Dictionary, Set:** Mutable & Immutable Data Types – Lists: List operations – List slicing – List methods – Looping through a list; Tuples: Tuple assignment – Indexing – Tuple Methods; Dictionaries: Operations – Iterating Dictionary – Dictionary Methods; Sets: Operations on set – Frozen set – Set Methods.

# List of Exercises

- 1. Implement data types, operators and expressions.
- 2. Implementation of branching statements and looping constructs.
- 3. Implementation of recursive and non-recursive functions.
- 4. Implementation of string methods.
- 5. Implementation of list and tuple.
- 6. Implementation of Dictionary and set.

# 30 Hours

Course Outcomes	Cognitive
At the end of this course, students will be able to:	Level
CO1: Implement basic programming constructs in python for solving simple	Apply
problems.	
CO2: Examine the usage of Control structures and Functions for solving a given problem.	Analyze
CO3: Design and implement programs using the Strings, Files, List, Tuple, Dictionary, Set for solving real time applications.	Create
CO4:Conduct and investigate experiments with appropriate IT tools in modeling the Programming Constructs, Control structures, functions, Strings, Files, List, Tuple, Dictionary, and Set using appropriate programs and report the inference.	Evaluate

СО	P01	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	3	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	3	3	-	-	-	1	1	-	1	-	-

High-3; Medium-2; Low-1

# Textbooks:

- T1. Allen B. Downey, "Think Python: How to Think like a Computer Scientist", 2<sup>nd</sup> Edition, O'Reilly Publishers, 2016.
- T2. Karl Beecher, "Computational Thinking: A Beginner's Guide to Problem-Solving and programming", 1<sup>st</sup> Edition, BCS Learning & Development Limited, 2017.

# Reference Book(s):

- R1. Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill India, New Delhi, 2<sup>nd</sup> edition, 2014.
- R2. Dhananjay A. Jolhe, "Engineering Drawing with an introduction to AutoCAD" Tata McGraw India, New Delhi, 3<sup>rd</sup> edition, 2010.

# PUBLICATIONS OF BUREAU OF INDIAN STANDARDS

- Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, 1<sup>st</sup> Edition, 2021.
- 2. G Venkatesh and Madhavan Mukund, "Computational Thinking: A Primer for Programmers and Data Scientists", 1<sup>st</sup> Edition, Notion Press, 2021.
- Eric Matthes, "Python Crash Course, A Hands on Project Based Introduction to Programming", 2<sup>nd</sup> Edition, No Starch Press, 2019.

- 1. https://onlinecourses.nptel.ac.in/noc22\_cs32
- 2. Python tutorial URL:https://docs.python.org/3/tutorial
- 3. https://www.coursera.org/learn/python-crash-course?specialization=google-itautomation

Course Code:23CSL2	201	Course Title: IT Practices Laboratory (common to AD,AM,CS,IT&SC)					
Course Category: SE	C	Course Level: Introductory					
L:T:P (Hours/Week) 0:0:4	Crec	lits: 2	Total Contact Hours: 60	Max Marks:100			

The course is intended to impart knowledge on developing web and mobile applications.

#### List of Experiments:

60 Hours

- 1. Study of Peripheral Devices and PC Hardware.
- 2. Study of different communication protocols

USB HDMI WIFI

Bluetooth

- 3. Develop a web page with image, text, links, tables, Menus, Navigations bars, containers and Media.
- 4. Construct a web page to display resume.
- 5. Construct a web page to display the products of a company.
- 6. Create an application using GUI widgets, Layouts, Media and Event handlers.
- 7. Develop a calculator application to perform all arithmetic operations.
- 8. Construct an application to calculate BMI.

Course Outcomes	Cognitive	
At the end of this course, students will be able to:	Level	
CO1: Identify the components of PC hardware.	Understand	
CO2: Design and develop websites, mobile applications for the given scenario using open source tools.	Apply	
CO3: Optimize web application performance by considering factors such as page load times, resource usage, and caching mechanisms for ensuring efficient user experiences.	Apply	
CO4: Demonstrate the developed web and mobile applications with an oral presentation.	Apply	

#### **Course Articulation Matrix**

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

High-3; Medium-2; Low-1

# Reference(s):

- R1. Peter Abel, Niyaz Nizamuddin, "IBM PC Assembly Language and Programming", Pearson Education, 2007.
- R2. Harvey M. Deitel, Paul J. Deitel, "Internet and World Wide Web How to Program", 4<sup>th</sup> Edition ,Pearson Education Asia, 2009.
- R3. David Wolber, Hal Abelson, Ellen Spertus, Liz Looney, "App Inventor 2: Create Your Own Android Apps", 2<sup>nd</sup> Edition, O'Reilly Media, 2014.

- 1. Open Element Tool: https://www.openelement.uk/index.htm
- 2. MIT App Inventor Tutorials: https://appinventor.mit.edu/explore/ai2/tutorials

Course Code: 23ITT201 Cou (Con			rse Title: Data Structures nmon to AD,AM CS,IT &SC)				
Course Category: Ma	ajor		Course Level: Introductory				
L:T:P(Hours/Week) 3: 0: 0			Total Contact Hours:45	Max Marks:100			

The objective of the course is to impart knowledge of fundamental data structures and how they are implemented. Additionally, learn how to apply the right data structures for solving problems. 22 Hours

# Module I

Linked List: Introduction- Types of Data Structures- Abstract Data type

List ADT: Array Implementation of list - Linked List Implementation list – Doubly Linked List – Circularly Linked List-Applications: Radix sort.

Stack ADT: Stack Model – Array and Linked List Implementation of Stack - Applications: Balancing Symbols - Postfix Expressions- Infix to Postfix Conversion

Queue ADT: Queue Model – Array and Linked List Implementation of Queue-Double ended **Queue-** Applications of Queue

**Trees**: Implementation of Trees - Tree Traversals -Binary Trees: Implementation – Expression Trees – Binary Search Tree: Implementation

# Module II

# 23 Hours

**AVL Trees:** Implementation -Single Rotation – Double Rotation.

**Binary Heap:** Min Heap-Max Heap

Graphs: Definitions – Representation of Graphs – Graph Traversals: Breadth First Search – Depth First Search - Topological Sort

Shortest Path Algorithms: Unweighted Shortest Paths – Dijkstra's Algorithm – Critical Path

All Pairs Shortest Path: Floyds Algorithm

**Minimum Spanning Tree:** Prim's Algorithm – Krushkal's Algorithm.

Internal Sorting:-Insertion Short-Shell Sort-Merge Sort-Quick sort

**External sorting:** Simple Algorithm-Multiway Merge

Hashing: Hash Functions-Separate Chaining-Open Addressing-Rehashing-Extendible hashing

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
<b>CO1:</b> Implement principles of Data Structures that efficiently manage dynamic collections of data in real-world applications.	Apply
<b>CO2:</b> Categorize the linear data structures list, stack and queue to various applications	Analyze
<b>CO3:</b> Relate the nonlinear data structures trees and graph concepts to various applications	Analyze
<b>CO4:</b> Interpret various internal and external sorting techniques to solve real world problems across different domain	Apply
<b>CO5</b> : Analyze different hash function properties for efficient data storage and retrieval systems	Analyze
<b>CO6:</b> Develop solutions with ethical standards as a team to the practical problems using Data Structures Concepts	Create

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

High-3: Medium-2:Low-1 Text Book(s):

T1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2<sup>nd</sup> Edition, Pearson Education Asia, New Delhi, 2015.

# Reference Book(s):

- R1. Sahni Horowitz, "Fundamentals of Data Structures in C", 2<sup>nd</sup> Edition Tata McGraw-Hill, New Delhi, 2008.
- R2. Seymour "Lipschutz, Data Structures with C", McGraw Hill, 2014.
- R3. Thomas H Cormen, Charles E Leiserson, Ronald L Revest, Clifford Stein, "Introduction to Algorithms" 3<sup>rd</sup> ed., The MIT Press Cambridge, 2014

- 1. https://www.coursera.org/specializations/data-structures-algorithms
- 2. https://archive.nptel.ac.in/courses/106/106/106106127/
- 3. http://freevideolectures.com/Course/2279/Data-Structures-And-Algorithms

Course Code: 23ITT202			ourse Title: Problem solving and Python ogramming ommon to EA, EC & EV)				
Course Category: Multidisciplinary			Course Level: Introductory				
L:T:P(Hours/Week) 3: 0: 0			Total Contact Hours:45	Max Marks:100			

The objective of the course is to introduce learners to the fundamentals of programming using the Python language. The course aims to equip participants with the necessary skills and knowledge to write efficient, readable, and maintainable Python code.

#### Module I

#### 23 Hours

**Basics of Python:** Features - Variables and Data Types - Expressions and Statements - Operators.

**Control Flow:** Conditional Statements – Looping and Iterative Statements

**Functions and File Handling:** Introduction to Functions - Recursive Functions - Introduction to Files and File Handling

Data Structures in Python: Lists: Functions and Methods - Tuples: Operations and Built-in

Functions - Sets: Functions and Methods - Dictionaries: Functions and Methods - Strings: Operators and Built-In String Functions

**OOP Concepts:** Classes and Objects: Modifiers in Classes - Method Invocation in Classes - Inheritance and Polymorphism.

# Module II

# 22 Hours

**Exception Handling:** Errors and Exceptions

GUI Programming with TKinter: GUI Basics - Working with the TKinter Library

**Widgets and Events:** Adding Widgets and Binding Events - Message and Entry Widgets - Checkboxes and Radio Buttons - Menus and Lists - Canvas for Drawing

**Data Visualization with Matplotlib:** Introduction to Matplotlib Library - Line and Bar Plots - Scatter Plots - Pie Charts - Working with Multiple Figures - 3D Plots - Plotting Using Files.

Course Outcomes	Cognitive Level
At the end of this course, students will be able to:	
CO1: Apply Python programming constructs and data structure techniques to solve practical problems and build functional applications.	Apply
CO2: Categorize the OOPs concepts to create modular and extensible Python programs.	Analyze

CO3: Infer the errors and exceptions in Python programs using exception	Analyze
handling techniques to ensure robust and fault-tolerant code	
CO4: Build graphical user interfaces (GUIs) using TKinter, effectively	Apply
incorporating various widgets and event binding to create interactive	
and visually appealing applications	
CO5:. Employ the Matplotlib library for data visualization to present data	Apply
and insights in a visually impactful method	
CO6: Combine the Python language features and libraries to provide	Create
solutions collaboratively with Ethical values to the practical problems	

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

High-3; Medium-2; Low-1

# Text Book(s):

T1. Peter Wentworth, Jeffrey Elkner, Allen B. Downey, and Chris Meyers, "How to Think Like a Computer Scientist: Learning with Python",3<sup>rd</sup> Edition, O'Reilly, 2020.

T2. Mark Lutz, "Powerful Object-Oriented Programming Python", 4<sup>th</sup> Edition, O'Reilly, 2013.

# Reference Book(s):

R1. Mark Lutz, "Learning Python, Powerful OOPs", 5<sup>th</sup> Edition, O'Reilly, 2013.

R2. Zelle, John M, "Python Programming: An Introduction to Computer Science", Franklin Beedle& Associates, 2003.

- 1. https://docs.python.org/3/tutorial/
- 2. https://www.learnpython.org/
- 3. https://www.pyschools.com/
- 4. https://archive.nptel.ac.in/courses/106/106/106106182/

Course Code: 23ITL201	Course Tit (Common to	tle: Data Structures Laboratory AD,AM,CS,IT & SC)				
Course Category: SEC		Course Level: Introductory				
L:T:P(Hours/Week) 0:0:3	Credits:1.5	Total Contact Hours:45	Max Marks:100			

The objective of the course is to improve students' abilities to create and analyze basic linear and nonlinear data structures. It improves students' capacity to pick and use the ideal data

# List of Experiments:

- 1. Array based implementation of List ADT
- 2. Array based implementation of Stack ADT and Queue ADT
- 3. Linked list implementation of List ADT
- 4. Linked list implementation of Stack ADT and Queue ADT
- 5. Implementation of Binary Tree traversals
- 6. Implementation of Binary Search Tree
- 7. Implementation of Graph traversals
- 8. Implementation of Floyds Algorithms
- 9. Implementation of insertion sort
- **10.** Implementation of Quick sort

Course Outcomes	Cognitive
At the end of this course, students will be able to:	Levei
CO1: Implement linear data structure operations using C programs	Apply
<b>CO2:</b> Predict the solution using non-linear data structure data structures using C programs	Evaluate
<b>CO3 :</b> Evaluate the efficiency of sorting algorithms using relevant data structures	Evaluate

#### **Course Articulation Matrix**

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

High-3; Medium-2; Low-1

# Reference Book(s):

- R1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2<sup>nd</sup> Edition, Pearson Education Asia, New Delhi, 2015.
- R2. Sahni Horowitz , "Fundamentals of Data Structures in C", 2<sup>nd</sup> Edition Tata McGraw-Hill, New Delhi, 2008.

- 1. https://www.coursera.org/specializations/data-structures-algorithms
- 2. https://archive.nptel.ac.in/courses/106/106/106106127/
- 3. http://freevideolectures.com/Course/2279/Data-Structures-And-Algorithms

Course Code: 23ADT001 Con			<pre>Irse Title: C Programming nmon to CE,EA,EC &amp; EV )</pre>					
Course Category: M	ulti-disciplina	ary	Course Level: Introductor	у				
L:T:P(Hours/Week) Credits:3 3: 0: 0			Total Contact Hours:45	Max Marks:100				

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

#### Module I

22 Hours

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

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

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

#### Module II

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

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

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

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

#### 23 Hours

CO	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	2	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	-	-	-
CO4	2	-	1	-	-	-	-	-	-	-	-	-
CO5	3	-	-	1	-	-	-	-	-	-	-	-
CO6	-	1	-	3	2	-	-	-	2	-	-	2

High-3; Medium-2; Low-1

# Text Book(s):

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

#### Reference Book(s):

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

- 1. NPTEL course content on Introduction To Programming In https://onlinecourses.nptel.ac.in/noc22\_cs40
- 2. Complete guide on Learn C programming: http://www.cprogramming.com/
- 3. Complete reference manual on C programming: http://www.c4learn.com/

Course Code:23ADL001		Course Title: C Programming Laboratory (Common to CE,EA,EC & EV)				
Course Category: M	ulti-discip	lina	ry	Course Level: Introductory		
L:T:P(Hours/Week) 0:0:3	Credits:1	.5	Total Contact Hours:45		Max Marks:100	

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

#### List of Experiments:

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

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

СО	P01	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	3	-	-	-	-	-	-	-
CO2	3	-	-	-	3	-	-	-	-	-	-	-
CO3	-	2	-	-	3	-	-	-	-	-	-	-
CO4	-	-	-	3	3	-	-	-	-	-	-	1

High-3; Medium-2; Low-1

# Text Book(s):

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

# Reference Book(s):

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

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