



Semester-Wise General Scheme Structure & Important Guidelines for Flexible Curriculum

(Batch admitted in Academic Session 2024-25 onwards)

Abbreviations Used

L	Lecture
T	Tutorial
P	Practical
HSMC	Humanities and Social Sciences including Management Courses
BSC	Basic Science Courses
ESC	Engineering Science Courses
DC	Departmental Core
DE	Departmental Elective
SPC	Specialization Courses
OC	Open Category
DLC	Departmental Laboratory Courses
MOOC	Massive Open Online Course
MWS	Mandatory Workshop
SP	Semester Proficiency
SIP	Skill Internship Program
SLP	Self-learning Presentation
PDC	Professional Development Component
PBL	Project Based Learning
PC	Professional Certification
MAC	Mandatory Audit Course
NEC	Novel Engaging Course



S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation	Duration of Major Evaluation
				Theory Block				Practical Block			L	T	P				
				Continuous Evaluation			Major Evaluation	Continuous Evaluation Lab Work & Sessional	Major Evaluation								
				Minor Evaluation I	Minor Evaluation II	Quiz/Assignment											
1.	11241101	DC	Civil Engineering Materials & Construction	20	20	30	30	-	-	100	3	-	-	3	Face to Face	PP	2 Hrs
2.	11241102	ESC	Computer Programming	20	20	30	30	-	-	100	2	-	-	2	Face to Face	MCQ	2 Hrs
3.	11241103	DC	Engineering Mechanics	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
4.	11241104	DC	Building Design & Drawing	20	20	30	30	-	-	100	2	1	-	3	Face to Face	PP	2 Hrs
5.	11241105	ESC	Basic Electrical & Electronics Engineering	20	20	30	30	-	-	100	2	-	-	2	Face to Face	MCQ	2 Hrs
6.	11241106	DLC	Computer Programming Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
7.	11241107	DLC	Electrical & Electronics Engineering Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
8.	11241108	SP	Semester Proficiency [§]	-	-	-	-	50	-	50	-	-	2	1	Face to Face	SO	-
9.	11241109	PBL	Micro Project-I [#]	-	-	-	-	70	30	100	-	-	2	1	Experiential	SO	-
10.	11241110	ESC	Engineering Chemistry Lab ^{§§}	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
11.	NECXXXXX	NEC	Novel Engaging Course (Activity Based Learning)	-	-	-	-	-	50	50	-	1	-	1	Interactive	SO	-
Total				100	100	150	150	330	170	1000	11	03	10	19	-	-	-
12.	11241111	MAC	Universal Human Values & Professional Ethics (UHVPE)	20	20	30	30	-	-	100	2	-	-	GRADE	Blended	MCQ	1.5 Hrs
13.	11241112	MWS	Mandatory Workshop on Indian Constitution and Traditional Knowledge at Department Level (Duration: Two Days)											GRADE	Interactive	MCQ	-
Induction programme of three weeks (MC): Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Dept./Branch & Innovations.																	
Skill Internship Program (Soft Skill): Minimum 45 hours duration: To be credited in II Semester.																	

[§]Semester Proficiency– includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in the semester courses.

MCQ: Multiple Choice Question **AO:** Assignment + Oral **PP:** Pen Paper **SO:** Submission + Oral **OB:** Open Book

^{§§} This course will be distributed in the I Year Group wise among the programmes where ever required.

[#] Micro Project-I will be presented and evaluated through an interdisciplinary project evaluation committee.

HSMC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
0	0	3	3	0	0	0	2	1	1	0	0	0	1	1	1

Mode of Learning						Mode of Examination						Total Credits
Theory		Lab		Lab		Theory		Lab		NEC		
Face to Face	Online	Interactive	Face to Face	Experiential	Experimental	PP	AO	MCQ	OB	SO	AO	
13		1	1	1	3	6		7		2	3	1
68.42%		5.26%	5.26%	5.26%	15.8%	31.6%		36.84%		10.52%	15.8%	5.26%



S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation	Duration of Major Evaluation
				Theory Block			Practical Block				L	T	P				
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation								
				Minor Evaluation I	Minor Evaluation II	Quiz/Assignment											
1.	11241201	DC	Surveying	20	20	30	30	-	-	100	3	-	-	3	Face to Face	MCQ	2 Hrs
2.	11241202	DC	Strength of Material	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
3.	11241203	DC	Concrete Technology	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
4.	11241204	DC	Fluid Mechanics – I	20	20	30	30	-	-	100	2	1	-	3	Face to Face	PP	2 Hrs
5.	11241205	BSC	Matrices & Calculus	20	20	30	30	-	-	100	3	-	-	3	Face to Face	PP	2 Hrs
6.	11241206	DLC	Building Materials & Construction Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
7.	11241207	DLC	Problem Solving through Python Programming	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
8.	11241208	SP	Semester Proficiency ^{\$}	-	-	-	-	50	-	50	-	-	2	1	Face to Face	SO	-
9.	11241209	PBL	Micro Project-II [#]	-	-	-	-	70	30	100	-	-	2	1	Experiential	SO	-
10.	11241210	ESC	Engineering Physics Lab ^{\$\$}	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
11.	11241211	HSMC	Language Lab	-	-	-	-	70	30	100	-	-	2	1	Blended	AO	-
12.	NECXXXXX	NEC	Novel Engaging Course (Activity Based Learning)	-	-	-	-	-	50	50	-	1	-	1	Interactive	SO	-
13.	SIP1XXXX	SIP	Skill Internship Program (Soft Skills)	-	-	-	-	42	18	60	-	-	-	2**	Experiential	SO	-
Total				100	100	150	150	442	218	1160	12	04	12	24	-	-	-
14.	11241212	MAC	Sustainability & Environmental Science	20	20	30	30	-	-	100	2	-	-	GRADE	Blended	MCQ	1.5 Hrs
15.	11241213	MWS	Mandatory Workshop on Indian Knowledge System at Department Level (Duration: Two Days)	-	-	-	-	-	-	-	-	-	-	GRADE	Interactive	MCQ	-

Summer Semester of six-eight weeks duration will be conducted for makeup of I & II semester examination.

^{\$}Semester Proficiency– includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in the semester courses

MCQ: Multiple Choice Question AO: Assignment + Oral PP: Pen Paper SO: Submission + Oral OB: Open Book

^{\$\$} This course will be distributed in the I Year Group wise among the programmes where ever required.

^{**} These credits will be transferred from Skill Internship Program (Soft Skills).

[#] Micro Project-II will be presented and evaluated through an interdisciplinary project evaluation committee.

HSMC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
1	1	1	4	0	0	0	2	1	1	1	0	0	1	1	1

Mode of Learning							Mode of Examination						Total Credits	
Theory		NEC	Lab				Theory			Lab		NEC		
Face to Face	Online	Interactive	Face to Face	Blended	Experiential	Experimental	PP	AO	MCQ	OB	SO	AO		SO
15		1	1	1	3	3	6		9		4	4	1	24
62.5%		4.17%	4.17%	4.17%	12.5%	12.5%	25%		37.5%		16.67%	16.67%	4.17%	Credits %



S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation	Duration of Major Evaluation
				Theory Block			Practical Block				L	T	P				
				Continuous Evaluation			Major Evaluation	Continuous Evaluation Lab Work & Sessional	Major Evaluation								
				Minor Evaluation I	Minor Evaluation II	Quiz/Assignment											
1.	11242101	BSC	Transforms & Vector Calculus	20	20	30	30	-	-	100	3	-	-	3	Face to Face	PP	2 Hrs
2.	11242102	DC	Data Structures	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
3.	11242103	DC	Fluid Mechanics – II	20	20	30	30	-	-	100	2	1	-	3	Face to Face	PP	2 Hrs
4.	11242104	DC	Geotechnical Engineering	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
5.	11242105	DC	Structural Analysis	20	20	30	30	-	-	100	2	1	-	3	Face to Face	OB	2 Hrs
6.	11242106	DLC	Fluid Mechanics Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
7.	11242107	DLC	Survey Practice Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	SO	-
8.	11242108	SP	Semester Proficiency [§]	-	-	-	-	50	-	50	-	-	2	1	Face to Face	SO	-
9.	11242109	PBL	Macro Project-I [#]	-	-	-	-	70	30	100	-	-	2	1	Experiential	SO	-
10.	11242110	SLP	Self-learning/Presentation ^{\$\$\$} (SWAYAM/NPTEL/MOOC)	-	-	-	-	40	-	40	-	-	2	1	Mentoring	SO	-
11.	NECXXXXX	NEC	Novel Engaging Course (Activity Based Learning)	-	-	-	-	-	50	50	-	1	-	1	Interactive	SO	-
Total				100	100	150	150	300	140	940	11	05	10	21	-	-	-
12.	11242111	MAC	Cyber Security	20	20	30	30	-	-	100	2	-	-	GRADE	Blended	MCQ	1.5 Hrs
13.	11242112	MWS	Mandatory Workshop on Internet of Things (IoT) at Department Level (Duration: Two Days)	-	-	-	-	-	-	-	-	-	-	GRADE	Interactive	MCQ	-

Skill Internship Program (Institute Level) (Qualifier): Minimum 30 hours duration: To be credited in IV Semester

[§]Semester Proficiency– includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in the semester courses

MCQ: Multiple Choice Question **AO:** Assignment + Oral **PP:** Pen Paper **SO:** Submission + Oral **OB:** Open Book

[#] Macro Project-I will be presented and evaluated through an interdisciplinary project evaluation committee.

^{\$\$\$} Compulsory registration for one online course using SWAYAM/NPTEL/ MOOC, evaluation through attendance and presentation.

HSMC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
0	1	0	4	0	0	0	2	1	1	0	1	0	1	1	1

Mode of Learning							Mode of Examination						Total Credits	
Theory		NEC		Lab			Theory			Lab		NEC		
Face to Face	Online	Interactive	Face to Face	Mentoring	Experiential	Experimental	PP	AO	MCQ	OB	SO	AO		SO
15		1	1	1	1	2	6		6	3	4	1	1	21
71.5%		4.76%	4.76%	4.76%	4.76%	9.5%	28.6%		28.6%	14.3%	19.05%	4.76%	4.76%	Credits %



S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation	Duration of Major Evaluation
				Theory Block				Practical Block			L	T	P				
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation								
				Minor Evaluation I	Minor Evaluation II	Quiz/Assignment											
1.	11242201	DC	Highway Engineering	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
2.	11242202	DC	Water Supply Engineering	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
3.	11242203	DC	Estimating Costing & Contracting	20	20	30	30	-	-	100	2	1	-	3	Face to Face	PP	2 Hrs
4.	11242204	DC	Foundation Engineering	20	20	30	30	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
5.	11242205	DC	Structural Design & Drawing (RCC)	20	20	30	30	-	-	100	3	-	-	3	Face to Face	PP	2 Hrs
6.	11242206	DLC	Highway Engineering Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
7.	11242207	DLC	Geotechnical Engineering Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
8.	11242208	DLC	Strength of Materials Lab	-	-	-	-	70	30	100	-	-	2	1	Experimental	AO	-
9.	11242209	SP	Semester Proficiency [§]	-	-	-	-	50	-	50	-	-	2	1	Face to Face	SO	-
10.	11242210	PBL	Macro Project-II [#]	-	-	-	-	70	30	100	-	-	2	1	Experiential	SO	-
11.	11242211	PC	Professional Certification	-	-	-	-	50	-	50	-	-	2	1	Blended	SO	-
12.	NECXXXXX	NEC	Novel Engaging Course (Activity Based Learning)	-	-	-	-	-	50	50	-	1	-	1	Interactive	SO	-
13.	SIP2XXXX	SIP	Skill Internship Program (Institute Level)	-	-	-	-	42	18	60	-	-	-	2**	Experiential	SO	-
Total				100	100	150	150	422	188	1110	11	05	12	24	-	-	-
14.	11242212	MAC	Project Management, Economics & Financing	20	20	30	30	-	-	100	2	-	-	GRADE	Blended	MCQ	1.5 Hrs
15.	11242213	MWS	Mandatory Workshop on Computer Vision at Department Level (Duration: Two Days)	-	-	-	-	-	-	-	-	-	-	GRADE	Interactive	MCQ	-
16.	11242214	MWS	Mandatory Workshop on Life Skills at Department Level (Duration: Two Days)	-	-	-	-	-	-	-	-	-	-	GRADE	Interactive	MCQ	-

Summer Semester of six-eight weeks duration will be conducted for makeup of previous semester examination.

Additional Course for Honours or Minor Degree: Permitted to opt for maximum two additional courses for the award of Honours or Minor Degree

[§]Semester Proficiency- includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in the semester courses

MCQ: Multiple Choice Question AO: Assignment + Oral PP: Pen Paper SO: Submission + Oral OB: Open Book

[#] Macro Project-II will be presented and evaluated through an interdisciplinary project evaluation committee.

^{**} These credits will be transferred from Skill Internship Program (Institute Level).

PC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
1	0	0	5	0	0	0	3	1	1	1	0	0	1	1	2

Mode of Learning							Mode of Examination							Total Credits
Theory		NEC		Lab			Theory			Lab		NEC		
Face to Face	Online	Interactive	Face to Face	Blended	Experiential	Experimental	PP	AO	MCQ	OB	SO	AO	SO	
15		1	1	1	3	3	6		9		5	3	1	
62.5%		4.17%	4.17%	4.17%	12.5%	12.5%	25%		37.5%		20.83%	12.5%	4.17%	Credits %



Scheme of Evaluation

B. Tech. V Semester (Civil Engineering)

(for batch admitted in academic session 2024-25)

S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted								Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation	Duration of Major Evaluation
				Theory Block				Practical Block		MOOCs			L	T	P				
				Continuous Evaluation			Major Evaluation	Continuous Evaluation Lab Work & Sessional	Major Evaluation	Assignment	Exam								
				Minor Evaluation I	Minor Evaluation II	Quiz/Assignment													
1.	11243101	DC	Waste Water Engineering	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
2.	11243102	DC	Structural Design & Drawing (Steel)	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	PP	2 Hrs
3.	11243103	DC	Data Science	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
4.	112431XX	DE	Departmental Elective* (DE-1)	-	-	-	-	-	-	25	75	100	3	-	-	3	Online	MCQ	3 Hrs
5.	112431XX	SPC	Specialization Course (SPC-1)	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	PP	2 Hrs
6.	11243104	DLC	Environmental Lab	-	-	-	-	70	30	-	-	100	-	-	2	1	Experimental	AO	-
7.	11243105	DLC	Data Science Lab	-	-	-	-	70	30	-	-	100	-	-	2	1	Experimental	AO	-
8.	11243106	SP	Semester Proficiency [§]	-	-	-	-	50	-	-	-	50	-	-	2	1	Face to Face	SO	-
9.	11243107	PBL	Cornerstone Project	-	-	-	-	70	30	-	-	100	-	-	4	2	Experiential	SO	-
Total				80	80	120	120	260	90	25	75	850	11	04	10	20	-	-	-
10.	11243108	MAC	Supply Chain Management	20	20	30	30	-	-	-	-	100	2	-	-	GRADE	Blended	MCQ	1.5 Hrs
11.	11243109	MWS	Mandatory Workshop on Blockchain at Department Level (Duration: Two Days)	-	-	-	-	-	-	-	-	-	-	-	-	GRADE	Interactive	MCQ	-

Additional Course for Honours or Minor Degree: Permitted to opt for maximum two additional courses for the award of Honours or Minor Degree

[§]Semester Proficiency– includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in the semester courses

MCQ: Multiple Choice Question AO: Assignment + Oral PP: Pen Paper SO: Submission + Oral OB: Open Book

* Course run through SWAYAM/NPTEL/ MOOC Learning Based Platform

HSMC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
0	0	0	3	1	1	0	2	0	1	0	0	0	1	1	1

Mode of Learning					Mode of Examination						Total Credits
Theory		Lab			Theory			Lab			
Face to Face	Online	Face to Face	Experiential	Experimental	PP	AO	MCQ	OB	SO	AO	
12	3	1	2	2	6		9		3	2	20
60%	15%	5%	10%	10%	30%		45%		15%	10%	Credits %



Scheme of Evaluation

B. Tech. VI Semester (Civil Engineering)

(for batch admitted in academic session 2024-25)

S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted								Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation	Duration of Major Evaluation
				Theory Block				Practical Block		MOOCs			L	T	P				
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation	Assignment	Exam								
				Minor Evaluation I	Minor Evaluation II	Quiz/Assignment													
1.	11243201	DC	Engineering Hydrology & Irrigation	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
2.	11243202	DC	Artificial Intelligence & Machine Learning	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
3.	112432XX	DE	Departmental Elective* (DE-2)	-	-	-	-	-	-	25	75	100	3	-	-	3	Online	MCQ	3 Hrs
4.	112432XX	OC	Open Category Course (OC-1)	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	PP	2 Hrs
5.	112432XX	SPC	Specialization Course (SPC-2)	20	20	30	30	-	-	-	-	100	3	-	-	3	Face to Face	PP	2 Hrs
6.	11243203	DLC	Civil Engineering Drawing Lab	-	-	-	-	70	30	-	-	100	-	-	2	1	Experimental	SO	-
7.	11243204	DLC	Artificial Intelligence & Machine Learning Lab	-	-	-	-	70	30	-	-	100	-	-	2	1	Experimental	AO	-
8.	11243205	SP	Semester Proficiency [§]	-	-	-	-	50	-	-	-	50	-	-	2	1	Face to Face	SO	-
9.	11243206	PBL	Capstone Project	-	-	-	-	70	30	-	-	100	-	-	4	2	Experiential	SO	-
Total				80	80	120	120	260	90	25	75	850	12	03	10	20	-	-	-
10.	11243207	MAC	Disaster Management	20	20	30	30	-	-	-	-	100	2	-	-	GRADE	Blended	MCQ	1.5 Hrs
11.	11243208	MWS	Mandatory Workshop on Intellectual Property Rights at Department Level (Duration: Two Days)	-	-	-	-	-	-	-	-	-	-	-	-	GRADE	Interactive	MCQ	-

Skill Enhancement Program/Research Internship/On Job Training for Four weeks duration (Optional)

Summer Semester of six-eight weeks duration will be conducted for makeup of previous semester examination.

Additional Course for Honours or Minor Degree: Permitted to opt for maximum two additional courses for the award of Honours or Minor Degree

[§]Semester Proficiency– includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in the semester courses

MCQ: Multiple Choice Question **AO:** Assignment + Oral **PP:** Pen Paper **SO:** Submission + Oral **OB:** Open Book

* Course run through SWAYAM/NPTEL/ MOOC Learning Based Platform.

HSMC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
0	0	0	2	1	1	1	2	0	1	0	0	0	1	1	1

Mode of Learning					Mode of Examination						Total Credits
Theory		Lab			Theory			Lab			
Face to Face	Online	Face to Face	Experiential	Experimental	PP	AO	MCQ	OB	SO	AO	
12	3	1	2	2	6		9		4	1	20
60%	15%	5%	10%	10%	30%		45%		20%	5%	Credits %



Scheme of Evaluation

B. Tech. VII Semester (Civil Engineering)

(for batch admitted in academic session 2024-25)

S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted								Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation	Duration of Major Evaluation
				Theory Block				Practical Block		MOOCs			L	T	P				
				Continuous Evaluation			Major Evaluation	Continuous Evaluation Lab Work & Sessional	Major Evaluation	Assignment	Exam								
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment													
1.	112441XX	DE	Departmental Elective (DE-3)	20	20	30	30	-	-	-	-	100	3	-	-	3	Face to Face	PP	2 Hrs
2.	112441XX	DE	Departmental Elective* (DE-4)	-	-	-	-	-	-	25	75	100	3	-	-	3	Online	MCQ	3 Hrs
3.	112441XX	OC	Open Category Course (OC-2)	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	PP	2 Hrs
4.	112441XX	SPC	Specialization Course (SPC-3)	20	20	30	30	-	-	-	-	100	2	1	-	3	Face to Face	MCQ	2 Hrs
5.	11244101	SP	Semester Proficiency [§]	-	-	-	-	50	-	-	-	50	-	-	2	1	Face to Face	SO	-
6.	11244102	DLC	Creative Problem Solving	-	-	-	-	70	30	-	-	100	-	-	2	1	Experiential	SO	-
Total				60	60	90	90	120	30	25	75	550	10	02	04	14	-	-	-
7.	11244103	MWS	Mandatory Workshop on Advanced Intellectual Property Rights at Department Level (Duration: Two Days)											GRADE	Interactive	MCQ	-		

Additional Course for Honours or Minor Degree: Permitted to opt for maximum two additional courses for the award of Honours or Minor Degree

[§]Semester Proficiency– includes the weightage towards ability/ skill/ competency /knowledge level /expertise attained etc. in the semester courses.

MCQ: Multiple Choice Question **AO:** Assignment + Oral **PP:** Pen Paper **SO:** Submission + Oral **OB:** Open Book

* Course run through SWAYAM/NPTEL/ MOOC Learning Based Platform.

HSMC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
0	0	0	0	2	1	1	1	0	1	0	0	0	0	0	1

Mode of Learning					Mode of Examination				Total Credits	
Theory		Lab			Theory			Lab		
Face to Face	Online	Face to Face	Experiential	Experimental	PP	AO	MCQ	OB		SO
9	3	1	1		6		6		2	
64.28%	21.42%	7.14%	7.14%		42.85%		42.85%		14.3%	
										Credits %



Scheme of Evaluation

B. Tech. VIII Semester (Civil Engineering)

(for batch admitted in academic session 2024-25)

S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted								Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Major Evaluation	Duration of Major Evaluation
				Theory Block				Practical Block		MOOCs			L	T	P				
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation	Assignment	Exam								
				Minor Evaluation I	Minor Evaluation II	Quiz/Assignment													
1.	112442XX	DE	Departmental Elective* (DE-5)	-	-	-	-	-	-	25	75	100	3	-	-	3	Online	MCQ	3 Hrs
2.	112442XX	OC	Open Category Course* (OC-3)	-	-	-	-	-	-	25	75	100	3	-	-	3	Online	MCQ	3 Hrs
3.	11244201	PBL	Industry Internship/ Research Internship/ Innovation & Start-up	-	-	-	-	280	120	-	-	400	-	-	20	10	Experiential	SO	-
4.	11244202	PDC	Professional Development ^{##}	-	-	-	-	-	50	-	-	50	-	-	4	2	Interactive	SO	-
Total				-	-	-	-	280	170	50	150	650	06	-	24	18	-	-	-
Summer Semester of six-eight weeks duration will be conducted to complete any backlog courses.																			
Additional Course for Honours or Minor Degree: Permitted to opt for maximum two additional courses for the award of Honours or Minor Degree																			

MCQ: Multiple Choice Question **AO:** Assignment + Oral **PP:** Pen Paper **SO:** Submission + Oral **OB:** Open Book

*Course run through SWAYAM/NPTEL/ MOOC Learning Based Platform

^{##} Evaluation will be based on participation/laurels brought by the students to the institution in national/state level technical and other events during the complete tenure of the UG programme (participation in professional chapter activities, club activities, cultural events, sports, personality development activities, collaborative events, MOOCs, technical events, institute/department committees, etc.)

HSMC	BSC	ESC	DC	DE	SPC	OC	DLC	NEC	SP	SIP	SLP	PDC	PBL	MAC	MWS
0	0	0	0	1	0	1	0	0	0	0	0	1	1	0	0

Mode of Learning					Mode of Examination				Total Credits	
Theory		Lab			Theory			Lab		
Face to Face	Online	Interactive	Experiential	Experimental	PP	AO	MCQ	OB		SO
	6	2	10				6		12	18
	33.33%	11.11%	55.56%				33.33%		66.67%	Credits %



DEPARTMENT OF CIVIL ENGINEERING

Specialization in Structures					
Description		This module will help in providing in-depth knowledge of advanced topics like design of bridge, tall buildings etc. so that students can demonstrate their expertise in designing structural projects and also ensure development of safe, resilient, and Efficient structures.			
Courses and Credits required		3 courses and 9 credits			
Course Category	Course ID	Course Title	Contact Hours per week		
			L	T	P
SPC-1 (Core)		Advanced Structural Analysis	3	0	0
SPC-2 (Core)		Advanced Reinforced Concrete Design	3	0	0
SPC-3	Elective-1	Advanced Structural Design (Steel)	3	0	0
	Elective-2	Structural Dynamics	3	0	0

Specialization in Construction Management					
Description		This module will help in providing in-depth knowledge of various aspects of construction management like project scheduling, resource allocation, advanced equipment's etc. This specialization will help students to pursue careers as construction project managers.			
Courses and Credits required		3 courses and 9 credits			
Course Category	Course ID	Course Title	Contact Hours per week		
			L	T	P
SPC-1 (Core)		Contract Management	3	0	0
SPC-2 (Core)		Basic Scheduling Techniques	3	0	0
SPC-3	Elective-1	Infrastructure & Finance	3	0	0
	Elective-2	Building Services & Maintenance	3	0	0

Specialization in Environmental Engineering					
Description		This module will help in providing interdisciplinary knowledge and skills so that students can address environmental challenges, comply with environmental standards and contribute positively to society.			
Courses and Credits required		3 courses and 9 credits			
Course Category	Course ID	Course Title	Contact Hours per week		
			L	T	P
SPC-1 (Core)		Solid Waste Management	3	0	0
SPC-2 (Core)		Air Pollution & Control	3	0	0
SPC-3	Elective-1	Environmental Impact Assessment	3	0	0
	Elective-2	Industrial Waste Management	3	0	0



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed University)
(Declared Under Distinct Category by Ministry of Education, Government of India)
NAAC Accredited with A++ Grade



DEPARTMENT OF CIVIL ENGINEERING

<i>Departmental Elective Courses</i>
1. Hydraulic Structure
2. Railway Airport & Tunnel Engineering
3. Traffic Engineering & Design
4. Engineering Geology
5. Pavement Management System
6. Applied Stress Analysis
7. Green Buildings
8. Advanced Surveying
9. Bridge Engineering
10. Groundwater Development
11. River Hydraulics
12. Design of Earthquake Resistant Structures
13. Remote Sensing & GIS Applications in Civil Engineering
14. Ground Improvement Techniques
15. Rock Engineering
16. Building Information Modelling
17. Seismic Hazard Analysis
18. Watershed Management
19. Hydropower Engineering
20. Rehabilitation of Structures
21. Ecology and Stream Pollution
22. Finite Element Methods
23. Strategic Management in Construction
24. Energy Efficient Buildings



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed University)
(Declared Under Distinct Category by Ministry of Education, Government of India)



NAAC Accredited with A++ Grade

25. Design of Bridges
26. Sustainable Construction & Practices
27. Lean Construction
28. Photogrammetry and UAV
29. Geodesy and GNSS
<i>Open Category Courses</i>
1. Maintenance Management
2. Integrated Waste Management System
3. Air Pollution & Noise Pollution
4. Sustainable Materials & Green Buildings
5. Safety & Quality Management
6. Ecology and Stream Pollution
7. Environmental Impact Assessment
8. Greenfield Projects
9. Engineering Economics and Project Appraisal
10. Entrepreneurship for Engineers



Course Code: 11241101

Course Name: Civil Engineering Materials & Construction

L	T	P	Credit
3	0	0	3

Course Objective:

The course aims to equip students with a fundamental understanding of various building materials, their properties, and construction techniques. It focuses on material selection, sustainable practices, and the application of standards to ensure quality and safety in construction projects.

SYLLABUS

Unit-I

Stones: General, classification of rocks, sources of stones, rock forming minerals, texture and structure of rock, fracture of rock, uses of stones, test for stones, qualities of a building stone, Stone quarrying, tools for blasting, materials for blasting, Process of blasting, dressing of stones, deterioration of stones, preservation of stones, common building stones in India.

Bricks: Properties and uses of good brick earth, harmful ingredients in brick earth, classification of brick earth, manufacture of bricks, comparison between clamp burning and kiln burning, Bricks (classification, characteristics, preparation of clay, manufacturing, testing, types).

Unit II

Timber: Timber, (Classification, Structure & characteristics, seasoning and its methods, defects & diseases, preservation & various treatment testing), wood products and their applications.

Ferrous metals, steel, non-ferrous metals & alloys: Iron ores, manufacture of pig iron, types of pig iron, cast iron, castings, wrought iron, manufacture of steel, uses of steel, factors affecting physical properties of steel, magnetic properties of steel, defects in steel, market forms of steel, mechanical treatment of steel, Aluminum (its alloys & uses). Copper (its alloys & uses), Ceramics (classification, properties, commercial forms).

Paints: Paint varnishes & enamels (types, composition, method of application, defects)

Unit III

Mortar: Definition, sand, natural sources of sand, classification of sand, bulking of sand, properties of good sand, function of sand in mortar, test for sand, substitutes for sand, classification of mortars, properties, preparation uses of mortar, selection of mortar and tests.

Cement: Definition, composition of ordinary Portland cement, function of cement ingredients, harmful constituents of cement, manufacture, physical tests, storage & uses.

Lime: Classification of binding materials, sources of lime, constituents of limestone, classification of limestone, classification of limes, comparison between fat lime and hydraulic lime, manufacture of fat lime, natural hydraulic lime & artificial hydraulic lime, test for limestone.

Unit IV

Masonry construction, masonry classification, stone V/s brick masonry, Terms & Definition in stone & brick masonry, Comparison of brickwork and stonework, joints in stone masonry, dressing of stone. Brick masonry (bonds in brick masonry, characteristics of bonds, type of bonds), typical structures in brickwork.



Unit V

Damp prevention (causes, effects, control & prevention techniques, material used for damp proofing), Anti termite treatment, water proofing treatment, Arches & lintels, stair & stair case, (types & design of stair case), Types of floor & flooring, Roof & roof covering.

Industrial waste materials – fly ash, blast furnace slag, granite & marble polishing waste and their uses. Agro waste materials (rice husk, bagasse, coir fibers and their uses. Special processed construction materials- geosynthetic, ferrocrete, artificial timber, artificial sand and their uses.

Books

1. Building materials by: - M.L. Gambhir, Tata Mc-grawHil education Pvt. Ltd.
2. Building material by :- S.K. Duggal ,New Age Publishers
3. Building construction by :- S.P.Arora, Bindra, Dhanpat Rai & Sons
4. Building construction by:- B.C. Punamia, A.K.Jain, Laxmi Publishers New Delhi
5. Building material by:- B.C. Punmia, Laxmi Publishers New Delhi

Course Outcomes

Upon completion of the course, a student will be able to

CO1: Classify rocks, stones and bricks understand their properties, uses, and preservation techniques.

CO2: Describe the characteristics, seasoning, preservation, and applications of timber and wood products and understand the manufacturing, properties, and applications of ferrous and non-ferrous metals, alloys, ceramics, and paints

CO3: Explain the properties and preparation of mortar, cement & Lime including the function and testing of mortar, cement & lime.

CO4: Compare stone and brick masonry, and the construction techniques, bonds, and jointing methods.

CO5: Determine the causes and prevention techniques for dampness, including anti-termite and waterproofing treatments.

Course Articulation Matrix

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

1 - Slightly; 2 - Moderately; 3 – Substantially



Course Code: 11241102

Course Name: Computer Programming

L	T	P	Credit
2	0	0	2

Course Objective:

- To understand the fundamentals of C programming including keywords, data type, functions etc.
- To acquire the ability to write a computer program to solve specified problems.
- To familiar with program structure and debugging process.
- To implement basic programming solutions using array, pointer, structures and file handling.

SYLLABUS

Unit I: Introduction to C Programming, Machine Level Languages, Assembly Level Languages, High Level Languages, Program Execution, Translation Process and compiler Installation, Problem solving using Algorithms and Flowcharts, Identifiers, Data Types, Constants, Keywords, Input/output Instruction, Operators and Expressions, Precedence of operators, ASCII codes.

Unit II: Decision Control, if statement, if-else statement, Nested if else statements, if else ladder, The conditional expression, Switch statement, Loops, While loop, do-while loop, For loop, nesting of for loops, Break and continue statement.

Unit III: Array, type of array, One dimensional Arrays, 2D array, Multidimensional Arrays, Strings, Basics of Pointers & Addresses, type of pointers, Application of pointers, Pointer to Pointer, Pointer to Array, Array of Pointers, Pointer to Strings.

Unit IV: Function Basics, Function Prototypes, Call by value, call by reference, passing string and array to function, Function returning address, Recursion, Structures, Dynamic memory allocation by malloc/calloc function, Union, Enumerators, typedef in c.

Unit V: File Handling, Defining and Opening a file, reading and writing in file, Closing Files, Input/output Operations on Files, Predefined Streams, Storage class, preprocessor commands, Command Line Arguments.

Recommended Books

1. Brian W. Kernighan and Dennis M. Ritchie, **The C Programming Language**, Prentice Hall of India.
2. Yashavant Kanetkar, **Let Us C**, BPB publication.
3. E. Balagurusamy, **Programming in ANSI C**, Tata McGraw-Hill.
4. Byron Gottfried, **Schaum's Outline of Programming with C**, McGraw-Hill.
5. Paul Deitel and Harvey M. Deitel, **How to Program**, Pearson Publication.

Course Outcomes

Upon completion of the course, a student will be able to

CO1: Define basic programming terms, syntax, algorithm and flow chart.

CO2: Solve computational problems using decision control and loops.

CO3: Design a program using the concept of Array, pointer and functions.



CO4: Explore file handling operations to work efficiently with files.

CO5: Apply programming concept to implement, debug and test any C program.

Course Articulation Matrix

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

1 - Slightly; 2 - Moderately; 3 – Substantially



Course Code: 11241103

Course Name: Engineering Mechanics

L	T	P	Credit
2	1	0	3

Course Objective:

The course intends to provide an understanding of the properties of areas and principles of statics and dynamics and its application for different engineering problems.

SYLLABUS

Unit-I

Forces and Equilibrium: Resolution and resultant of forces; Graphical and Analytical methods of concurrent and non-concurrent coplanar forces, free body Diagram, Introduction to force system in space; Applications of Equilibrium Concepts.

Unit-II

Friction: Laws of Coulomb friction, inclined plane; ladder friction; wedge friction, square threaded screws; belt friction; rolling resistance

Unit-III

Analysis of plane Trusses, method of joints, method of Sections. Shear force and bending moment diagram for statically determinate beams subjected to different types of loadings.

Unit-IV

Centroid of plane areas, Moments of inertia, theorem of parallel axis and theorem of perpendicular axis; product of inertia of areas, polar moment of inertia, principal axes and principal moments of inertia.

Unit-V

Kinematics and Kinetics of particles: Particle dynamics; Free Vibrations of undamped Single degree of Freedom system

Text book

1. R. C. Hibbeler, Engineering Mechanics (Statics and Dynamics), Pearson Education Asia Pvt. Ltd
2. R. S. Khurmi and N. Khurmi, A Textbook of Engineering Mechanics, S. Chand and Co. Ltd.
3. R. K. Rajput, Engineering Mechanics, Dhanpat Rai Publications (P) Limited
4. J. L. Meriam and L.G. Kraige, Engineering Mechanics (Static & Dynamics), John Wiley

Reference books

1. F. P. Beer and E. R. Johnston, Mechanics for Engineers (Static & Dynamics), McGraw Hill
2. S. P. Timoshenko, D. H. Young, and J. V. Rao, Engineering Mechanics, Tata-McGraw Hill.

Course Outcomes

Upon completion of the course, a student will be able to

CO1: Apply basic laws of Mechanics for different types of force systems.

CO2: Apply the Laws of friction in engineering problems.

CO3: Apply the concept of equilibrium in statically determinate beams and trusses.



CO4: Determine the properties of areas for different shapes.

CO5: Apply the concepts of Kinematics and Kinetics for engineering problems.

Course Articulation Matrix

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

1 - Slightly; 2 - Moderately; 3 – Substantially



Course Code: 11241104

Course Name: Building Design & Drawing

L	T	P	Credit
2	1	0	3

Course Objective:

Main objective of the subject is to introduce students about basic principles of Building planning & principles of Architectural composition to enable them to plan various types of buildings. The course is also designed to familiarize the students with fundamental of various features & details of the major components of the buildings. Subject study will impart drafting skill of engineering & building drawing and drafting, floor plan, elevation, section to reveal salient features, knowledge of study of town planning will guide students to follow rules & regulations of town planning while designing a building.

SYLLABUS

Unit-1 Concept of Engineering Drawing:

Basics of instruments, Plane geometrical constructions, Plain and diagonal scale, Unit conversion and Exercises based on linear, area, volume and speed, scale of chord, curved and Arches.

Unit-2 Isometric projections:

Introduction, isometric scale, isometric axis, isometric view and isometric projections from orthographic views, orthographic views from pictorial view and exercise. Computer Aided Drafting using Auto CAD: Introduction, software's basic commands.

Unit-3 Drawings of Building elements:

Free-hand drawings of various building elements like, Various types of footings, Open foundations, grillage, pile, R.C.C. and Well foundations, Drawing & detailing of reinforcement in Building components, Drawings of door-Window frames, Various types of doors windows and ventilators, Lintels and Arches, Stairs and stair cases, Trusses, Floorings, Roofing, etc.,

Unit-4 Building Planning:

Provision of NBC, Building by-laws, Rules and regulations, Open area, Setbacks. F.A.R. Terminology, Principle of Architectural Composition (i.e. Unity, contrast, symmetry, Rhythm, Mass composition. etc.), Principles of planning, Solar path, Orientation.

Unit-5 Town Planning:

History & development of cities & towns, Rules & Regulation of town & country planning. Types of towns & cities i.e. Ribbon development, Satellite town, Centralized, Garden city etc, Problems of metro cities, case study – Chandigarh, Gandhi Nagar Pondicherry etc., planning of cities & amenities, smart city concept, Integrated facilities requirement for smart cities.

Reference Books

- i) Building Design and Drawing by Mallick and Mao
- ii) Building Drawing and Design by Sah, Kale and Pathi
- iii) Building Design and Drawing by Gurucharan Singh
- iv) Building Design and drawing by Y.S.Sane
- v) N.B.C. (Latest Edition).



vi) Auto cad Software & Manual.

Courses Outcomes

Upon completion of the course, a student will be able to

CO1: Apply the skill of engineering drawing & drawing of various building elements.

CO2: Implement the rules & regulations according by-laws & NBC provision.

CO3: Apply various techniques of perspective drawing.

CO4: Develop planning insight and make acquaintance with various town planning related exercises.

Course Articulation Matrix

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

1 - Slightly; 2 - Moderately; 3 – Substantially



Course Code: 11241105

Course Name: Basic Electrical & Electronics Engineering

L	T	P	Credit
2	0	0	2

Course Objectives:

- To impart basic knowledge of the DC and AC circuits and their applications.
- To familiarize the students with the basic knowledge of magnetic circuits, transformer, rotating electrical machine and its terminology.
- To make familiarize the students about the working of various electronic circuits and its importance.

SYLLABUS

Unit- I D.C. Circuits Analysis:

Voltage and Current Sources: Dependent and independent source, Source conversion, Kirchhoff's Law, Mesh and Nodal analysis. Network theorems: Superposition theorem, Thevenin's theorem & Norton's theorem and their applications.

Unit- II Single-phase AC Circuits:

Generation of sinusoidal AC voltage, definitions: Average value, R.M.S. value, Form factor and Peak factor of AC quantity, Concept of Phasor, analysis of R-L, R-C, R-L-C Series and Parallel circuit, Power and importance of Power factor.

Unit- III Magnetic Circuits & Resonance:

Magnetic Circuits: Concept of MMF, flux and magnetic reluctance, Self and mutual inductances, Dot convention, coefficient of coupling and coupled circuits. Resonance: Series and Parallel resonance, Bandwidth, Q-factor and selectivity.

Unit- IV Single-phase Transformer & Rotating Electrical Machines:

Single phase transformer, Basic concepts, construction and working principle, Ideal Transformer and its phasor diagram at No Load, Voltage, current and impedance transformation, Equivalent circuits and its Phasor diagram, voltage regulation, losses and efficiency, testing of transformers, Construction & working principle of DC and AC machine.

Unit –V Digital Electronics, Devices & Circuits:

Number systems used in digital electronics, decimal, binary, octal, hexadecimal, their complements, operation and conversion, Demorgan's theorem, Logic gates- symbolic representation and their truth table, Introduction to semiconductors, Diodes, V-I characteristic, Bipolar junction transistors and their working, Introduction to CB, CE & CC transistor configurations.

Recommened Books

1. Basic Electrical and Electronics Engineering, D.P. Kothari & I.J. Nagrath-Tata McGraw Hill
2. Basic Electrical and Electronics Engineering, V N Mittle & Arvind Mittal -Tata McGraw Hill
3. Basic Electrical and Electronics Engineering, S. K Bhattacharya -Pearson
4. Electrical Machinery- A.E. Fitzgerald, C. Kingsley and Umans - TMH
5. Principles of Electrical Engineering- Vincent Del Toro- Prentice Hall.



6. Basic Electrical Engineering -A,E. Fitzgerald, Higginbotham and Grabel -TMH
7. Integrated Electronics- Millmann & Halkias

Courses Outcomes

Upon completion of the course, a student will be able to

CO 1. Solve dc & ac circuits by applying fundamental laws & theorems

CO 2. Analyze magnetic circuits and resonance characteristics of ac electric circuits

CO 3. Describe the working principle, construction, applications of single phase transformer & rotating electrical machines

CO 4. Select the logic gates for various applications in digital electronic circuits.

CO 5. Explain the characteristics and parameters of Diode and Transistor.

Course Articulation Matrix

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

1 - Slightly; 2 - Moderately; 3 – Substantially



Course Code: 11241106

Course Name: Computer Programming Lab

L	T	P	Credit
0	0	2	1

Laboratory Objectives:

- To Develop a knowledge of Computer Programming
- To Enhance Practical programming Skills to solve real world problems.

LIST OF EXPERIMENT'S

1. Write a program to add two numbers and display its sum.
2. Write a Program to calculate and display the volume of a cylinder for height and radius parameters to be input from the user.
3. Write a program to take input of name, roll number and marks obtained by a student in 5 subjects of 100 marks each and display the name, roll number with percentage score secured.
4. Write a program to swap values of two variables with and without using the third variable.
5. Write a program to illustrate the use of unary prefix and postfix increment and decrement operators.
6. Write a program to find the largest of three numbers using ternary operators.
7. Write a program to find the roots of quadratic equation.
8. Write a Program to Check Whether a Number is Prime or not.
9. Write a program to compute the grade of students using if else ladder as per MITS norms.
10. Write a program to check whether the entered year is leap year or not (a year is leap if it is divisible by 4 and divisible by 100 or 400.)
11. Write a program to print the sum of digits of a number using for loop.
12. Write a program to Display Fibonacci Sequence.
13. Write a program to display different kind of pyramid patterns using for loops.
14. Write a program to add two matrices of the same order.
15. Write a program to show the working of predefined functions in string.
16. Write a program to illustrate concept of function and different type of functions.
17. Write a program to find factorial of a number using recursion.
18. Write a program to find sum of natural numbers using recursion.
19. Write a program to illustrate concept of structure and union in c programming.
20. Write a program to show concept of file handling.

Course Outcomes:

Upon completion of the course, a student will be able to

- CO 1.** Write computer program in C language.
- CO 2.** Apply knowledge of programming to solve real-world problems



- CO 3. Apply programming syntax to implement program.
- CO 4. Acquire teamwork skill for working effectively in groups
- CO 5. Prepare an organized practical file on experiments conducted in the laboratory.

Course Articulation Matrix

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

1 - Slightly; 2 - Moderately; 3 – Substantially



Course Code: 11241107

Course Name: Electrical & Electronics Engineering Lab

L	T	P	Credit
0	0	2	1

LIST OF EXPERIMENT'S

1. To verify Kirchoff's Current Law & Kirchoff's Voltage Law.
2. To verify Superposition Theorem
3. To determine resistance & inductance of a choke coil.
4. To determine active & reactive power in a single phase A.C circuit.
5. To determine voltage ratio & current ratio of a single phase transformer.
6. To determine the polarity of a single phase transformer.
7. To perform open circuit & short circuit test on a single phase transformer.
8. To study multimeter & measure various electrical quantities
9. To study of constructional details of DC machine.
10. To determine the V-I characteristics of diode in forward bias & reverse bias condition.

Course Outcomes:

Upon completion of the course, a student will be able to

- CO 1. **Verify** circuit theorems.
- CO 2. **Perform** tests on transformer for determination of losses, efficiency & polarity.
- CO 3. **Acquire** teamwork skills for working effectively in groups
- CO 4. **Prepare** an organized technical report on experiments conducted in the laboratory

Course Articulation Matrix

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

1 - Slightly; 2 - Moderately; 3 – Substantially



Course Code: 11241109

Course Name: Micro Project – I

L	T	P	Credit
0	0	2	1

LIST OF MICRO PROJECTS

1. Build a model of a common household item (e.g., a lamp or a fan) and analyze the forces and moments to ensure it is in equilibrium.
2. Build a model of a simply supported beam and analyze the forces due to self weight and support reactions
3. Model a crane arm and investigate how various loads affect its equilibrium. Students can use free body diagrams and solve for forces and reactions.
4. Prepare list of the documents required for obtaining permission for construction of residential building/apartment from competent authority and write report.
5. Prepare report on Provisions given in National Building Code 2005.
6. Construct an inclined plane with adjustable angles and measure the frictional force for different materials and inclinations
7. Analyze and measure the friction forces acting on a ladder leaning against a wall and identify the conditions for ladder stability
8. Design a small pulley system with belts and study the effects of friction on the transmission of force and motion.
9. Collect and study building Bye laws, rules and regulation for planning as per local competent authority.
10. Study of Sustainable Building Materials
11. Thermal Insulation Properties of Building Materials
12. Build a truss bridge model and use the method of joints and sections to analyze the internal forces in the truss members.
13. Construct a physical or virtual model of a beam under various loads and draw shear force and bending moment diagrams.
14. Create a truss structure (e.g., a small tower) and test its ability to carry different loads, analyzing the forces in each member.
15. Draw developed plan, Elevation, section, site plan of public building.
16. Prepare list of the documents required for obtaining permission for construction of commercial building from competent authority and write report.
17. Brick Masonry Bond Strength Study
18. Fire Resistance of Construction Materials
19. Use different geometric shapes (e.g., circles, rectangles) cut from cardboard or similar materials to experimentally determine their centroid.



20. Create composite shapes from simpler geometries and calculate their centroid and using both theoretical and experimental methods.
21. Verify the principal moment of inertia by measuring and computing of different geometrical shapes.
22. Prepare a model of a simple building using card board showing different components with suitable colour.
23. Draw the plan of 2BHK house with suitable plot size.
24. Plan an acoustic effects for an auditorium.
25. Construct a simple mass-spring system and measure its natural frequency and amplitude of oscillations.
26. Analyze the motion of a rolling ball down an inclined plane, studying its acceleration and the forces involved
27. Design and test a simple undamped single degree of freedom system to study its free vibration characteristics.
28. Identification of different rock minerals with their properties.
29. Deterioration of stones with their causes and remedies.
30. Common building stones used in India with proper reasoning.
31. Different types of brick bonds with their applications.
32. Different types of masonry joints with their applications.
33. Damp in building- causes and control.
34. Comparison of stone work and brick work with proper applications.
35. Study on the Use of agro waste materials in construction.
36. Waterproofing Techniques for Concrete Structures
37. Corrosion in reinforcement- causes and control measures.
38. Study of artificial sand for construction.

Course Outcomes:

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

CO1: Identify the characteristics of various building materials.

CO2: Develop plan and model of buildings.

CO3: Analyze the friction forces, shear force, bending moment and single degree of freedom system.

CO4: Cooperate to work within group.

CO5: Develop the writing skills to prepare reports.

CO6: Display lifelong learning.



Course Articulation Matrix

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

1 - Slightly; 2 - Moderately; 3 – Substantially



Course Code: 11241110

Course Name: Engineering Chemistry Lab

L	T	P	Credit
0	0	2	1

Course Objectives: The main objective of the course is to enable the students to become familiar with the concepts of Modern Engineering Chemistry, and impart knowledge on the fundamental concepts of chemistry involved in application of several important engineering materials that are used in the industry/day-to-day life.

Syllabus:

UNIT -I Water Analysis

Source and impurities, alkalinity, pH, hardness of water, interrelationship between alkalinity and hardness, degree of hardness, Boiler troubles, Methods of hardness removal, Standards of water for drinking purposes.

UNIT -II Lubricants & Lubrication

Introduction, functions of lubricants, types and classification of lubricants, mechanism of lubrication, physical & chemical properties, testing of lubricants, types of greases, application of lubricants.

UNIT- III Chemical Fuels

Definition and classification of chemical fuels, Requirements of a good fuel. Calorific Value – HCV and LCV. Coal and its Ranking. Proximate and Ultimate analysis of coal. Knocking & Octane and Cetane numbers.

UNIT -IV Polymeric Material

Introduction, types and classification of polymers, Types of polymerization: addition or chain polymerization, condensation polymerization and their mechanism, Preparation of Phenol formaldehyde, Urea formaldehyde Resin.

UNIT- V Analytical Methods

Chromatography- Introduction & Principle of Chromatography, Introduction of Column, Thin layer, paper. Separation of colour pigments by Paper chromatography experiment.

Spectroscopy-Principle Instrumentation and Applications of Ultra-Violet, and Visible Spectroscopy, Absorption law, Verification of Lambert Beer's law, determination of concentration of solute in sample, and determination of λ max of sample solution.

Course Outcomes: Upon completion of the course the student will be able to:

CO 1: Select the best technique for Industrial and domestic water treatment.

CO 2: Describe the types, properties and application of lubricants.

CO 3: Distinguish the chemistry of various fuels and their combustion.

CO 4: Describe types, classification properties and applications of polymers and mechanisms of polymerization.

CO 5: Explain the concept of chromatography and spectroscopy for various engineering application.



Course Articulation Matrix

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

1 - Slightly; 2 - Moderately; 3 – Substantially

LIST OF EXPERIMENT'S

At least 10 of the following experiments must be performed during the session.

S. No.	Aim of experiment
1	Determination of Total hardness by Complexometric titration.
2	Determination of temporary and permanent hardness by Complexometric titration.
3	Determination of alkalinity of given water sample by neutralization Titration. (a) OH^- & CO_3^{2-} (b) CO_3^{2-} & HCO_3^-
4	Determination of percentage of Fe in Iron alloy solution by redox titration.
5	Determination of percentage of Cr in Chromium alloy solution by back titration.
6	Determination of Cu in Copper alloys solution by Iodometric Titration.
7	Determination of Viscosity of given oil sample by Redwood viscometer No.1
8	Determination of Flash & fire points of given oil sample by Pensky Martin close cup Apparatus.
9	Determination of Flash & fire point of given oil sample by Cleveland's open cup Apparatus.
10	Determination of Moisture content, volatile matter content, Ash content and fixed Carbon of a given sample of coal by proximate analysis.
11	Separation of the colour pigment of spinach leaf by paper chromatography.
12	Preparation of phenol formaldehyde resin by condensation polymerization.
13	Preparation of urea formaldehyde resin by condensation polymerization.

Lab Course Outcomes: Upon completion of the course the student will be able to:

CO 1: Develop experimental skill required for application of chemistry in engineering.

CO 2: Operate different chemicals and instruments specified in course safely and efficiently.

CO 3: Analyse water sample, lubricants, fuel, alloys and ores for different properties.

CO 4: Function as a member of a team for problem solving.



Lab Course Articulation Matrix

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

1 - Slightly; 2 - Moderately; 3 – Substantially



Course Code: 11241111

Course Name: Universal Human Values & Professional Ethics

L	T	P	Credit
2	0	0	GRADE

Mode of teaching: The course is intended to be taught through lectures, discussions, case Studies, practice sessions, and assessment by self, peers, and instructor/teacher.

Course Objectives: The objective of the course is four fold:

1. Sensitization of student towards self, family (relationship), society and nature.
2. Understanding (or developing clarity) of nature, society and larger systems, on the basis of human relationships and resolved individuals.
3. Strengthening of self-reflection.
4. Development of commitment and courage to act.

Course Content:

1: Course Introduction - Need, Basic Guidelines, Content and Process for Value Education:

- Self-Exploration—what is it? - Its content and process; ‘Natural Acceptance’ and Experiential Validation- as the process for self-exploration
- Continuous Happiness and Prosperity- A look at basic Human Aspirations
- Right understanding, Relationship and Physical Facility- the basic requirements for fulfilment of aspirations of every human being with their correct priority
- Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario

2: Understanding Harmony in the Human Being:

- Understanding human being as a co-existence of the sentient ‘I’ and the material ‘Body’
- Understanding the needs of Self (‘I’) and ‘Body’ - happiness and physical facility
- Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer)
- Understanding the characteristics and activities of ‘I’ and harmony in ‘I’
- Understanding the harmony of ‘I’ with the Body

3: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship:

- Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship
- Understanding the meaning of Trust; Difference between intention and competence
- Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship
- Understanding the harmony in the society (society being an extension of family): Resolution,



Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals

- Visualizing a universal harmonious order in society

4: Understanding Harmony in the Nature and Existence - existence as Coexistence:

- Understanding the harmony in the Nature
- Interconnectedness and mutual fulfilment among the four orders of nature recyclability and self-regulation innature
- Understanding Existence as Co-existence of mutually interacting units in all pervasive space
- Holistic perception of harmony at all levels of existence.

5: Holistic Understanding of Harmony on Professional Ethics:

- Natural acceptance of human values
- Definitiveness of Ethical Human Conduct
- Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
- Competence in professional ethics:
 - a. Ability to utilize the professional competence for augmenting universal human order
 - b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems,
 - c. Ability to identify and develop appropriate technologies and management patterns for above production systems.
- Strategy for transition from the present state to Universal Human Order:
 - a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers
 - b. At the level of society: as mutually enriching institutions and organizations

6: Gender Sensitization:

- Introduction to Sex, Gender & Culture
- Introduction to Women Studies and Socialisation, including man-woman relationship, work distribution
- A brief review of Feminism, Patriarchy, Feminist Studies, Feminist Ideologies.
- Women and Law Constitutional Provisions and Fundamental rights related to Women.

Course Outcomes: At the end of the course student will be able to

CO1. Become more aware of their surroundings, society, social problems and their sustainable solutions.

CO2. Become sensitive to their commitment towards what they believe in (humane values. humane relationships and humane society).

CO3. Apply what they have learnt to their own self in different day-to-day settings in real life.

CO4. Sustain human relationships and human nature in mind.



CO5. Have better critical ability.

CO6. Negotiate living in harmony with self and others.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	-	-	-	-	2	-	1	1	-	1	-	-
CO2	-	1	-	-	-	-	1	-	1	1	-	1	-	-
CO3	1	-	-	-	-	-	-	-	1	2	-	1	-	-
CO4	-	-	-	-	-	-	2	-	1	1	-	2	-	-
CO5	2	1	-	-	-	-	-	-	2	2	-	2	-	-
CO6	-	-	-	-	-	-	2	-	2	1	-	2	-	-

1 - Slightly; 2 - Moderately; 3 – Substantially

Text Book

1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010

Reference Book

1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5. On Education - J Krishnamurthy
6. Siddhartha - Hermann Hesse
7. Old Path White Clouds - Thich Nhat Hanh
8. On Education - The Mother
9. Diaries of Anne Frank - Anne Frank
10. Life and Philosophy of Swami Vivekananda
11. Swami Vivekananda on Himself
12. Small is Beautiful - E. F Schumacher.
13. Slow is Beautiful - Cecile Andrews
14. Economy of Permanence - J C Kumarappa
15. Bharat Mein Angreji Raj - Pandit Sunderlal
16. Mahatma and the Rose
17. The Poet and the Charkha



18. Rediscovering India - by Dharampal
19. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
20. Swaraj by Arvind Kejriwal
21. India Wins Freedom - Maulana Abdul Kalam Azad
22. Ramakrishna ki jeevani - Romain Rolland (English)
23. Vivekananda - Romain Rolland (English)
24. Gandhi - Romain Rolland (English)
25. Autobiography of a Yogi – by Paramhansa Yogananda
26. Gandhi and Question of Science – Sahatsrabudhe