



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**  
**KAKINADA – 533 003, Andhra Pradesh, India**

**DEPARTMENT OF CIVIL ENGINEERING**

## **COURSE STRUCTURE AND SYLLABUS**

**For UG – R20**

**B. TECH - CIVIL ENGINEERING**

*(Applicable for batches admitted from 2020-2021)*



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**COURSE STRUCTURE**

**I Year – I SEMESTER**

S. No	Course Code	Subjects	L	T	P	Credits
1	BSC1101	Mathematics – I (Calculus & Differential Equations)	3	0	0	3
2	HSMC1101	Communicative English	3	0	0	3
3	BSC1102	Engineering Physics	3	0	0	3
4	ESC1101	Engineering Drawing	1	0	4	3
5	ESC1102	Engineering Geology (Integrated) (Theory & Lab)	2	0	2	3
6	HSMC1102	English Communication Skills Laboratory	0	0	3	1.5
7	BSC1103	Engineering Physics Lab	0	0	3	1.5
8	ESC1103	Basics of Civil Engg. Work Shop (Lab)	0	0	3	1.5
<b>Total Credits</b>			<b>19.5</b>			

**I Year – II SEMESTER**

S. No	Course Code	Subjects	L	T	P	Credits
1	BSC1201	Mathematics – II (Linear Algebra & Numerical Methods)	3	0	0	3
2	BSC1202	Engineering Chemistry	3	0	0	3
3	ESC1201	Engineering Mechanics	3	0	0	3
4	ESC1202	Programming for Problem Solving Using C	3	0	0	3
5	ESC1203	Building Materials and Concrete Technology	3	0	0	3
6	BSC1203	Engineering Chemistry Lab	0	0	3	1.5
7	ESC1204	Programming for problem Solving Using C Lab	0	0	3	1.5
8	ESC1205	Building Planning and Computer Aided Building Drawing	0	0	3	1.5
9	MC1201	Environmental Science (M. C)	2	0	0	0
<b>Total Credits</b>			<b>19.5</b>			

\*Breakup of credits for Engineering Graphics/Engineering Workshop shall be 1-0-4 (as per AICTE model curriculum)

Universities/Institutions may swap a few courses between 1<sup>st</sup> and 2<sup>nd</sup> semesters to balance the work load of teaching and laboratory schedule.



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**II Year – I SEMESTER**

S. No	Course Code	Course Title	L	T	P	Credits
1	BSC301	Mathematics -III (Vector Calculus, Transforms and PDE)	3	0	0	3
2	PCC301	Strength of Materials - I	3	0	0	3
3	PCC302	Fluid Mechanics	3	0	0	3
4	PCC302	Surveying and Geometrics	3	0	0	3
5	PCC303	Highway Engineering	3	0	0	3
6	PCC304	Concrete Technology Lab	0	0	3	1.5
7	PCC305	Highway Engineering Lab	0	0	3	1.5
8	PCC306	Surveying Field Work – I (Lab)	0	0	3	1.5
9	SC301	<b>Skill oriented course*</b>	1	0	2	2
10	MC301	Constitution of India	2	0	0	0
		<b>Total Credits</b>				<b>21.5</b>

**II YEAR – II SEMESTER**

S. No.	Course Code	Course Title	L	T	P	Credits
1	PC401	Complex Variables and Statistical Methods	3	0	0	3
2	PC402	Strength of Materials -II	3	0	0	3
3	ES401	Hydraulics and Hydraulic Machinery	3	0	0	3
4	PC403	Environmental Engineering	3	0	0	3
5	PC404	Managerial Economics & Financial Analysis	3	0	0	3
6	PC405	Environmental Engineering Lab	0	0	3	1.5
7	PC406	Strength of Material Lab	0	0	3	1.5
8	PC407	Fluid Mechanics & Hydraulics Machinery Lab	0	0	3	1.5
9	SC401	<b>Skill oriented course*</b>	1	0	2	2
		<b>Total Credits</b>				<b>21.5</b>
<b>Honors/ Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)</b>			3	1	0	4



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**III YEAR-ISEMESTER**

S. No	Course Code	CourseTitle	L	T	P	Credits
1	PC501	Professional Core courses (STRUCTURAL ANALYSIS)	3	0	0	3
2	PC502	Professional Core courses (DESIGN AND DRAWING OF REINFORCED CONCRETE STRUCTURES)	3	0	0	3
3	PC503	Professional Core courses (GEOTECHNICAL ENGINEERING-1)	3	0	0	3
4	OE501	Open Elective Course/Job Oriented elective (OE-1)	3	0	0	3
5	PE501	Professional Elective courses	3	0	0	3
6	PC504	Professional Core courses Lab Survey Camp (Field work)	0	0	3	1.5
7	PC505	Professional Core courses Lab (GEOTECHNICAL ENGINEERING LAB)	0	0	3	1.5
8	PC501	Skill advanced course/ soft skill course* Design of Special Structure,Chimney, Hinge Tanks designs, spill ways etc.,	1	0	2	2
9	MC501	Mandatory Course (AICTE Suggested) Professional Ethics and Human Values	2	0	0	0
10	PR501	Summer Internship 2Months (Mandatory) after second year (to be evaluated during V semester)	0	0	3	1.5
		Total Credits				<b>21.5</b>
		<b>Honors/ Minorcourses (The hoursdistribution can be 3-0-2or3-1-0also)</b>	3	1	0	4



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**III YEAR-II SEMESTER**

S.No.	Course Code	CourseTitle	L	T	P	Credits
1	PC601	Professional Core courses (DESIGN AND DRAWING OF STEEL STRUCTURES)	3	0	0	3
2	PC602	Professional Core courses (WATER RESOURCE ENGINEERING)	3	0	0	3
3	PC603	Professional Core courses (GEOTECHNICAL ENGINEERING-II)	3	0	0	3
4	PE601	Professional Elective courses	3	0	0	3
5	OE601	Open Elective Course/Job oriented elective (OE-2)	3	0	0	3
6	PC604	Professional Core courses Lab (ESTIMATION, COSTING AND CONTRACTS)	0	0	3	1.5
7	PC605	Professional Core courses Lab (REMOTE SENSING & GIS LAB)	0	0	3	1.5
8	PC606	Professional Core courses Lab CIVIL ENGINEERING PRACTICE	0	0	3	1.5
9	SC601	Skill advanced course/ soft skill course* Computational Tools	1	0	2	2
10	MC601	Mandatory course (AICTE) (EMPLOYABILITY SKILLS)	2	0	0	0
11	PR601	Industrial/Research Internship (Mandatory) 2 Months	0	0	3	1.5
		Total Credits				<b>23</b>
		<b>Honors/ Minorcourses</b> <b>(The hoursdistribution can be 3-0-2or3-1-0also)</b>	3	1	0	4



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**IVYEAR–ISEMESTER**

S.No.	Course Code	CourseTitle	L	T	P	Credits
1	PE701	Professional Elective -III	3	0	0	3
2	PE702	Professional Elective -IV	3	0	0	3
3	PE703	Professional Elective -V	3	0	0	3
4	OE701	Open Elective Courses/ Job oriented elective (OE-III)	2	0	2	3
5	OE702	Open Elective Course/Job oriented elective (OE-IV)	2	0	2	3
6	HSC701	*Humanities and Social Science Elective	3	0	0	3
7	SC701	Skill advanced course/ soft skill course* Project planning, town planning,	1	0	2	2
8	PR701	Industrial/Research Internship 2 Months (Mandatory) after third year (to be evaluated during VII semester)	0	0	3	1.5
		<b>Total Credits</b>				<b>21.5</b>
		<b>Honors/ Minorcourses (The hoursdistribution can be 3-0-2or3-1-0also)</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>

**\*ThereisaprovisionfortheUniversities/InstitutionstoimplementAICTE mandatorycourse“UniversalHumanValues2:UnderstandingHarmony”underHumanitiesandsocialscienceElectiveinseventhsemesterfor3credits.**



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**IV YEAR-II SEMESTER**

S.NO	CATEGORY	COURSE TITLE	L	T	P/D	C
1	Major Project	PROJ	-	-	-	12
		INTERNSHIP (6 Months)				
		<b>Total Credits</b>				<b>12</b>

**Major Project-12;**

**Internship-6 Months;**

**Total-12**



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**Professional Electives R20 (5 PE x 3 = 15 Credits)**

**(Department can offer Maximum 2 Subjects from Each PE, elected by the students)**

**Note: Student must choose subjects which were not opted earlier  
 PE starts from III-I**

<b>Professional Elective-I</b>	<b>Professional Elective-II</b>	<b>Professional Elective-III</b>	<b>Professional Elective-IV</b>	<b>Professional Elective-IV</b>
a) Construction Technology & Management	a) Advanced Structural Analysis	a) Advanced Structural Engineering	a) Ground Improvement Techniques	a) Design & Drawing of Irrigation Structures
b) Remote Sensing and GIS	b) Architecture and Town Planning	b) Bridge Engineering	b) Geo-Spatial Technologies	b) Earth & Rock fill Dams
c) Environmental Impact Assessment	c) Road Safety Engineering	c) Structural Dynamics	c) Disaster Management & Mitigation	c) Urban Hydrology
d) Low Cost Housing	d) Traffic Engineering	d) Urban Transportation Planning	d) Soil dynamics & Machine Foundations	SWAYAM / NPTEL /MOOCS COURSES (12 weeks duration)





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**HONORS R20 (Starts from II-II)**

**(4x4+2MOOCS/NPTELx2=20Credits) for Civil Engg. Students**

**Note: Student must choose subjects which were not opted earlier**

**(Any FOUR courses may be chosen by the Student from each Pool)**

<b>Structural Engineering</b>	<b>Geotechnical Engineering</b>	<b>Environment and Water Resource Engineering</b>	<b>Transportation Engineering</b>	<b>Construction Technology and Management</b>
Finite Element Methods	Reinforced Soil Structures	Urban Hydrology	Traffic Engineering	Construction Technology and Management
Matrix Analysis of Structures	Advanced Foundation Engineering	Water and Wastewater Management	Intelligent Transportation System	Architecture & Town Planning
Earthquake Resistant Design	Earth Retaining Structures	Water Resources Planning and Management	Railway, Harbor and Airport Engineering	Repairs and Maintenance of Structures
Pre-stressed concrete	Geoenvironmental Engineering	Environmental Impact Assessment	Pavement Management System	Disaster Management and Mitigation
Repair & Retro-fitting of Buildings	Earth & Rock Fill Dams	Air Pollution and Control	Urban Transportation Planning	Precast and Prefabricated Structures



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**OPEN ELECTIVES R20**

**(40 Ex3=12 Credits)**

**Note: Student must choose subjects which were not opted earlier.**  
**(OE Starts from III-I)**

<b>Open Elective-I/ Open Elective-III (Offered in Odd Semesters)</b>	<b>Open Elective-II/ Open Elective-IV (Offered in Even Semesters)</b>
a) Strength of Materials b) Fluid Mechanics c) Surveying and Geomatics d) Highway Engineering e) Safety Engineering f) Environmental Management g) Urban Planning	a) Elements of Civil Engineering b) Environmental Engineering c) Disaster Management d) Water Resource Engineering e) Hydraulics and Hydraulic Machinery f) Green Technologies g) Remote Sensing & GIS



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**Minor R20 (Starts from II-II)**  
**(4x4+2MOOCS/NPTELx2=20 Credits)**

**Note: Student must choose subjects which were not opted earlier**

<b>Minor-I/Minor-III (Offered in Odd Semesters)</b>	<b>Minor-II/Minor-IV (Offered in Even Semesters)</b>
a) Environmental Engineering and Management b) Solid Mechanics c) Irrigation Engineering d) Geoinformatics	a) Construction Technology and Infrastructure Management b) Seismology and Earthquake Engineering c) Railways, Harbours and Docks d) Architecture and Smart City