



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**  
**KAKINADA – 533 003, Andhra Pradesh, India**  
**DEPARTMENT OF CIVIL ENGINEERING**

**COURSE STRUCTURE**

**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	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 workload 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
10	PR401	Industrial/Research Internship (Mandatory) 2 Months... to be evaluated in III year I semester				
		<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 – I SEMESTER**

S. No	Course Code	Course Title	L	T	P	Credits
1	PC501	Structural Analysis	3	0	0	3
2	PC502	Design and Drawing of Reinforced Concrete Structures	3	0	0	3
3	PC503	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 course - I	3	0	0	3
6	PC504	Professional Core courses Lab Survey Camp (Field work)	0	0	3	1.5
7	PC505	Geotechnical Engineering Lab	0	0	3	1.5
8	PC501	Skill advanced course: Design of Special Structure, Chimney, Hinge Tanks, spill ways etc.,	1	0	2	2
9	MC501	Essence of Indian Traditional Knowledge	2	0	0	0
10	PR501	Summer Internship 2Months (Mandatory) after second year (to be evaluated during V semester)				1.5
		Total Credits				<b>21.5</b>
		<b>Honors/ Minor courses</b> (The hours distribution can be 3-0-2 or 3-1-0 also)	3	1	0	4



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**III YEAR – II SEMESTER**

S. No	Course Code	Course Title	L	T	P	Credits
1	PC601	Design and Drawing of Steel Structures	3	0	0	3
2	PC602	Water Resource Engineering	3	0	0	3
3	PC603	Geotechnical Engineering-2	3	0	0	3
4	PE601	Professional Elective course -II	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	Employability Skills	2	0	0	0
11	PR601	Industrial/Research Internship (Mandatory) 2 Months... to be evaluated in IV year I semester				
		Total Credits				<b>21.5</b>
		<b>Honors/ Minor courses</b> (The hours distribution can be 3-0-2 or 3-1-0also)	3	1	0	4



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**IV YEAR – I SEMESTER**

S. No	Course Code	Course Title	L	T	P	Credits
1	PE701	Professional Core course - III	3	0	0	3
2	PE702	Professional Core course - IV	3	0	0	3
3	PE703	Professional Core course - 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	Universal Human Values-2: Understanding Harmony	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)				3
		Total Credits				<b>23</b>
<b>Honors/ Minor courses</b> (The hours distribution can be 3-0-2or3-1-0also)			3	1	0	4

**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-V</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+2 MOOCS/NPTELx2=20 Credits) 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**  
**(4 OE x 3 = 12 Credits)**

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

**Open Elective-1 in III year I semester:**

- a) Strength of Materials
- b) Fluid Mechanics
- c) Surveying and Geomatics

**Open Elective-2 in III year II semester:**

- a) Elements of Civil Engineering
- b) Environmental Engineering
- c) Disaster Management

**Open Elective-3 in IV year I semester:**

- a) Highway Engineering
- b) Safety Engineering
- c) Environmental Management
- d) Urban Planning

**Open Elective-4 in IV year II semester:**

- a) Water Resource Engineering
- b) Hydraulics and Hydraulic Machinery
- c) Green Technologies
- d) Remote Sensing & GIS



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

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

**Minor-1 in II year II semester:**

- a) Construction Technology and Infrastructure Management
- b) Seismology and Earthquake Engineering

**Minor-2 in III year I semester:**

- a) Environmental Engineering and Management
- b) Solid Mechanics

**Minor-3 in III year II semester:**

- a) Railways, Harbours and Docks
- b) Architecture and Smart City

**Minor-4 in IV year I semester:**

- a) Irrigation Engineering
- b) Geoinformatics