Jawaharlal Nehru Technological University Anantapur

(Established by Govt. of A.P., Act. No. 30 of 2008)

Ananthapuramu–515 002 (A.P) India

B.Tech - Course Structures and Syllabi

under R20 Regulations

Semester-0

Induction Program: 3 weeks
(Common for All Branches of Engineering)

S.No	Course No	Course Name	Category	L-T-P-C
1		Physical Activities -- Sports, Yoga and Meditation, Plantation	MC	0-0-6-0
2		Career Counselling	MC	2-0-2-0
3		Orientation to all branches -- career options, tools, etc.	MC	3-0-0-0
4		Orientation on admitted Branch -- corresponding labs, tools and platforms	EC	2-0-3-0
5		Proficiency Modules & Productivity Tools	ES	2-1-2-0
6		Assessment on basic aptitude and mathematical skills	MC	2-0-3-0
7		Remedial Training in Foundation Courses	MC	2-1-2-0
8		Human Values & Professional Ethics	MC	3-0-0-0
9		Communication Skills -- focus on Listening, Speaking, Reading, Writing skills	BS	2-1-2-0
10		Concepts of Programming	ES	2-0-2-0

Civil Engineering

S.No	Course No	Course Name	Category	L-T-P/D	Credits
		Semester - 1 (Theory - 5, Lab - 4)			
1.	20A54101	Linear Algebra and Calculus	BS	3-0-0	3
2.	20A56101T	Engineering Physics	BS	3-0-0	3
3.	20A52101T	Communicative English	HS	3-0-0	3
4.	20A02101T	Basic Electrical & Electronics Engineering	ES	3-0-0	3
5.	20A03101T	Engineering Drawing	ES	1-0-0/2	2
6.	20A03101P	Engineering Graphics Lab	ES	0-0-2	1
7.	20A56101P	Engineering Physics Lab	BS	0-0-3	1.5
8.	20A52101P	Communicative English Lab	HS	0-0-3	1.5
9.	20A02101P	Basic Electrical & Electronics Engineering Lab	ES	0-0-2	1.5
				Total	**19.5**

S.No	Course No	Course Name	Category	L-T-P	Credits
		Semester – 2 (Theory – 5, Lab – 5)			
1.	20A54201	Differential Equations and Vector Calculus	BS	3-0-0	3
2.	20A51201T	Engineering Chemistry	BS	3-0-0	3
3.	20A05201T	C-Programming & Data Structures	ES	3-0-0	3
4.	20A01201T	Strength of Materials	ES	3-0-0	3
5.	20A03202	Engineering Workshop	ES	0-0-3	1.5
6.	20A05202	IT Workshop	ES	0-0-3	1.5
7.	20A05201P	C-Programming & Data Structures Lab	ES	0-0-3	1.5
8.	20A51201P	Engineering Chemistry Lab	BS	0-0-3	1.5
9.	20A01201P	Strength of Materials Lab	ES	0-0-3	1.5
10	20A99201	Environmental Science	MC	3-0-0	0.0
				Total	**19.5**

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CIVIL ENGINEERING

II B.TECH.

S.No.	Course Code	Course Name	Category	L	T	P	Credits
		SEMESTER - III					
1.	20A54301	Probability and Statistics for Civil Engineering	BS	3	0	0	3
2.	20A01301	Advanced Strength of Materials	PC	3	0	0	3
3.	20A01302T	Fluid Mechanics and Hydraulic Machines	PC	3	0	0	3
4.	20A01303T	Surveying	PC	3	0	0	3
5.	20A52301 20A52302 20A52303	**Humanities Elective– I** Managerial Economics & Financial Analysis Organizational Behavior Business Environment	HS	**3**	0	0	3
6.	20A01304	Basic Civil Engineering Laboratory	PC	0	0	3	1.5
7.	20A01302P	Fluid Mechanics and Hydraulic Machines Lab	PC	0	0	3	1.5
8.	20A01303P	Surveying Lab	PC	0	0	3	1.5
9.	20A05305	**Skill oriented course - I** Application development with Python	SC	1	0	2	2
10.	20A52201	**Mandatory noncredit course – II** Universal Human Values	MC	3	0	0	0
11.	20A99301	NSS/NCC/NSO Activities	-	-	-	2	0
						Total	**21.5**

S.No.	Course Code	Course Name	Category	L	T	P	Credits
		SEMESTER - IV					
1.	20A54401	Mathematical Modeling& Optimization Techniques	BS	3	0	0	3
2.	20A01401T	Engineering Geology	ES	3	0	0	3
3.	20A01402	Structural Analysis – I	PC	3	0	0	3
4.	20A01403T	Concrete Technology	PC	3	0	0	3
5.	20A01404T	Environmental Engineering - I	PC	3	0	0	3
6.	20A01401P	Engineering Geology Lab	ES	0	0	3	1.5
7.	20A01405	Concrete Materials Lab	PC	0	0	3	1.5
8.	20A01404P	Environmental Engineering Lab	PC	0	0	3	1.5
9.	20A52401	**Skill oriented course – II** Soft Skills	SC	1	0	2	2
10.	20A99401	**Mandatory non-credit course - III** Design Thinking for Innovation	MC	**2**	**1**	**0**	0
						Total	**21.5**
Mandatory Community Service Internship for 6 weeks duration during Summer Vacation							

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CIVIL ENGINEERING
Course Structure (R20) – III & IV Year

S.No.	Course Code	Course Name	L	T	P	Credits
		Semester–V				
1.	20A01501	Design of Reinforced Concrete Structures	3	0	0	3
2.	20A01502T	Geotechnical Engineering	3	0	0	3
3.	20A01503	Building Materials and Construction	3	0	0	3
4.	20A01504a 20A01504b 20A01504c	**Professional Elective Course – I** 1. Structural Analysis – II 2. Open Channel Flow 3. Building Construction Management	3	0	0	3
5.		**Open Elective Course – I**	3	0	0	3
6.	20A01506	CAD Lab	0	0	3	1.5
7.	20A01502P	Geotechnical Engineering Lab	0	0	3	1.5
8.	20A01507	**Skill oriented course - III** Building Planning and Drawing	1	0	2	2
9.	20A01508	Evaluation of Community Service Project/ Internship				1.5
		Total				**21.5**

Open Elective – I

S.No	Course Code	Course Name	Offered by the department
1	20A02505	Electric Vehicles	EEE
2	20A03505	3D Printing Technology	ME
3	20A04505	Digital Electronics	ECE
4	20A05505a	Java Programming	CSE & Allied/IT
5	20A05505b	Introduction to Machine Learning	CSE/IT
6	20A12502	Mobile Application Development using Android	
7	20A27505	Computer Applications in Food Processing	FT
8	20A54501	Optimization Techniques	Mathematics
9	20A56501	Materials Characterization Techniques	Physics
10	20A51501	Chemistry of Energy Materials	Chemistry
11	20A52501	Academic Writing and Public Speaking	HSMC

Note:

1. A student is permitted to register for Honours or a Minor in IV semester after the results of III Semester are declared and students may be allowed to take maximum two subjects per semester pertaining to their Minor from V Semester onwards.

2. A student shall not be permitted to take courses as Open Electives/Minor/Honours with content substantially equivalent to the courses pursued in the student's primary major.

3. A student is permitted to select a Minor program only if the institution is already offering a Major degree program in that discipline

		Semester–VI				
S.No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
1.	20A01601	Design of Steel Structures	3	0	0	3
2.	20A01602	Highway Engineering	3	0	0	3
3.	20A01603	Hydrology and Irrigation Engineering	3	0	0	3
4.	20A01604a 20A01604b 20A01604c	**Professional Elective Course– II** 1. Experimental Stress Analysis 2. Foundation Engineering 3. Environmental Impact Assessment	3	0	0	3
5.		**Open Elective Course – II**	3	0	0	3
6.	20A01605	Design Studio Lab with STAAD Pro.	0	0	3	1.5
7.	20A01606	Highway Materials Lab	0	0	3	1.5
8.	20A01607	Concrete Technology Lab	0	0	3	1.5
9.	20A01608	**Skill oriented course - IV** BIM Fundamentals for Civil Engineers	1	0	2	2
10.	20A99601	**Noncredit mandatory Course** Intellectual Property Rights & Patents	2	0	0	0
Total						**21.5**
Industry Internship (Mandatory) for 6 - 8 weeks duration during summer vacation						

Open Elective – II

S.No	Course Code	Course Name	Offered by the department
1	20A02605	Smart Electric Grid	EEE
2	20A03605	Non-Conventional sources of energy	ME
3	20A04704	Signal Processing	ECE
4	20A04701b	Introduction to Internet of Things	ECE/CSE
5	20A05605a	Principles of Operating Systems	CSE & Allied/IT
6	20A05605b	Artificial Intelligence	
7	20A12603	Data Analytics Using R	
8	20A27605	Food Refrigeration and Cold Chain Management	FT
9	20A54701	Wavelet Transforms & its applications	Mathematics
10	20A56701	Physics Of Electronic Materials and Devices	Physics
11	20A51701	Chemistry of Polymers and its Applications	Chemistry
12	20A52702	English Literary Spectrum	HSMC

S.No.	Course Code	Course Name	L	T	P	Credits
		Semester-VII				
1.	20A01701a 20A01701b 20A01701c	**Professional Elective Course– III** 1. Finite Element Analysis 2. Railways, Airport and harbour Engineering 3. Ground Improvement Techniques	3	0	0	3
2.	20A01702a 20A01702b 20A01702c	**Professional Elective Course– IV** 1. Prestressed Concrete 2. Hydraulic structures and Waterpower engineering 3. Industrial Waste and Wastewater Management	3	0	0	3
3.	20A01703a 20A01703b 20A01703c	**Professional Elective Course– V** 1.Remote Sensing and GIS 2.Bridge Engineering 3.Design and Drawing of Irrigation Structures	3	0	0	3
4.	20A52701a 20A52701b 20A52701c	**Humanities Elective – II** 1. Entrepreneurship and Incubation 2. Management Science **3.** Enterprise Resource Planning	3	0	0	3
5.		**Open Elective Course – III**	3	0	0	3
6.		**Open Elective Course – IV**	3	0	0	3
7.	20A01707	**Skill oriented course - V** Estimation, Costing and Valuation	1	0	2	2
8.	20A01708	Evaluation of Industry Internship				3
Total						**23**

Open Elective – III

S.No	Course Code	Course Name	Offered by the department
1	20A02704	IOT Applications in Electrical Engineering	EEE
2	20A03704	Introduction to Hybrid and Electric Vehicles	ME
3	20A04705	Electronic Sensors	ECE
4	20A05704a	Web Technologies	CSE & Allied/IT
5	20A05704b	VR & AR for Engineers	
6	20A05704c	Agile Methodologies	
7	20A27704	Human Nutrition	FT
8	20A54702	Numerical Methods for Engineers	Mathematics
9	20A56702	Sensors And Actuators for Engineering Applications	Physics
10	20A51702	Chemistry of Nanomaterials and Applications	Chemistry
11	20A52703	Indian Constitution	HSMC

Open Elective – IV

S.No	Course Code	Course Name	Offered by the department
1	20A02705	Renewable Energy Systems	EEE
2	20A03705	Introduction to Composite Materials	ME
3	20A04706	Microcontrollers and Applications	ECE
4	20A05705a	Cyber Security	CSE & Allied/IT
5	20A05705b	Full Stack Development	
6	20A12705	Industrial IoT	
7	20A27705	Waste and Effluent Management	FT
8	20A54703	Number theory & its applications	Mathematics
9	20A56703	Smart Materials and Devices	Physics
10	20A51703	Green Chemistry and Catalysis for Sustainable	Chemistry
11	20A52704	Gender Studies	HSMC

Semester-VIII							
S.No.	Course Code	Course Name	Category	L	T	P	Credits
1.	20A01801	Full Internship & Project work	PR	-	-	-	12
						Total	12

COURSES OFFERED FOR HONOURS DEGREE IN CIVIL ENGINEERING

S.No.	Course Code	Course Title	Contact Hours per week		Credits
			L	T	
1	20A01H01	Soil Dynamics and Machine Foundation	3	1	4
2	20A01H02	Advanced Structural Design	3	1	4
3	20A01H03	Repair & Rehabilitation of Structures	3	1	4
4	20A01H04	Construction Economics & Finance	3	1	4
SUGGESTED MOOCs					
5	20A01H05	Introduction to Multimodal Urban Transportation Systems https://nptel.ac.in/courses/105/105/105105204/			2
6	20A01H06	Sustainable River Basin Management https://nptel.ac.in/noc/courses/noc15/SEM2/noc15-ce03/			2
					20

LIST OF MINORS OFFERED TO CIVIL ENGINEERING

S.No.	Minor Title	Department offering the Minor
1.	Energy Systems	EEE
2.	3D Printing	ME
3.	Industrial Engineering	ME
4.	Internet of Things	ECE
5.	Food Science	Food Technology
6.	Artificial Intelligence &Data Science	CSE & Allied /IT
7.	Virtual & Augmented Reality	
8.	Blockchain	