



# **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**



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR**  
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ANANTAPUR – 515 002 (A.P) INDIA

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**Semester-0**

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

<b>S.No</b>	<b>Course No</b>	<b>Course Name</b>	<b>Category</b>	<b>L-T-P-C</b>
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



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**CSE**  
**Course Structure (R20)**

Semester - 1 (Theory - 5, Lab - 4)					
S.No	Course No	Course Name	Category	L-T-P	Credits
1.	20A54101	Linear Algebra and Calculus	BS	3-0-0	3
2.	20A51101T	Chemistry	BS	3-0-0	3
3.	20A05201T	C-Programming & Data Structures	ES	3-0-0	3
4.	20A02101T	Basic Electrical & Electronics Engineering	ES	3-0-0	3
5.	20A03202	Engineering Workshop	LC	0-0-3	1.5
6.	20A05202	IT Workshop	LC	0-0-3	1.5
7.	20A51101P	Chemistry Lab	BS	0-0-3	1.5
8.	20A05201P	C-Programming & Data Structures Lab	ES	0-0-3	1.5
9.	20A02101P	Basic Electrical & Electronics Engineering Lab	ES	0-0-2	1.5
<b>Total</b>					<b>19.5</b>

Semester – 2 (Theory – 5, Lab – 5)					
S.No	Course No	Course Name	Category	L-T-P/D	Credits
1.	20A54202	Probability & Statistics	BS	3-0-0	3
2.	20A56201T	Applied Physics	BS	3-0-0	3
3.	20A52101T	Communicative English	HS	3-0-0	3
4.	20A05101T	Python Programming & Data Science	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.	20A52101P	Communicative English Lab	HS	0-0-3	1.5
8.	20A56201P	Applied Physics Lab	BS	0-0-3	1.5
9.	20A05101P	Python Programming & Data Science Lab	ES	0-0-3	1.5
10	20A52201	Universal Human Values	MC	3-0-0	0.0
<b>Total</b>					<b>19.5</b>



*R 20 Regulations*

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**Computer Science & Engineering**

**II B.TECH.**

**Semester-III**

S.No	Course Code	Course Name	Category	Hours per week			Credits
				L	T	P	
1.	20A54304	Discrete Mathematics & Graph Theory	BS	3	0	0	3
2.	20A04304T	Digital Electronics& Microprocessors	ES	3	0	0	3
3.	20A05301T	Advanced Data Structures & Algorithms	PC	3	0	0	3
4.	20A05302T	Object Oriented Programming Through Java	PC	3	0	0	3
5.	20A05303	Computer Organization	PC	3	0	0	3
6.	20A04304P	Digital Electronics& Microprocessors Lab	ES	0	0	3	1.5
7.	20A05301P	Advanced Data Structures and Algorithms Lab	PC	0	0	3	1.5
8.	20A05302P	Object Oriented Programming Through Java Lab	PC	0	0	3	1.5
9.	20A05304	<b>Skill Oriented Course – I</b> Web application Development	SC	1	0	2	2
10.	20A99201	<b>Mandatory noncredit course - II</b> Environmental Science	MC	3	0	0	0
<b>Total</b>							<b>21.5</b>

**Semester-IV**

S.No	Course Code	Course Name	Category	Hours per week			Credits
				L	T	P	
1.	20A54404	Deterministic & Stochastic Statistical Methods	BS	3	0	0	3
2.	20A05401T	Database Management Systems	PC	3	0	0	3
3.	20A05402T	Operating Systems	PC	3	0	0	3
4.	20A05403T	Software Engineering	PC	3	0	0	3
5.	20A52301 20A52302 20A52303	<b>Humanities Elective– I</b> Managerial Economics & Financial Analysis Organizational Behaviour Business Environment	HS	3	0	0	3
6.	20A05401P	Database Management SystemsLab	PC	0	0	3	1.5
7.	20A05402P	Operating SystemsLab	PC	0	0	3	1.5
8.	20A05403P	Software Engineering Lab	PC	0	0	3	1.5
9.	20A05404	<b>Skill Oriented Course– II</b> Exploratory Data Analysis with R	SC	1	0	2	2
10.	20A99401	<b>Mandatory noncredit course – III</b> Design Thinking for Innovation	MC	2	1	0	0
11.	20A99301	NSS/NCC/NSO Activities	MC	0	0	2	0
<b>Total</b>							<b>21.5</b>
Community Service Internship/Project(Mandatory) for 6 weeks duration during summer vacation							



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**B.TECH. - COMPUTER SCIENCE & ENGINEERING**  
Course Structure (R20) – III & IV Year

<b>Semester-V</b>						
<b>S.No.</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
1.	20A05501T	Computer Networks	3	0	0	3
2.	20A05502T	Artificial Intelligence	3	0	0	3
3.	20A05503	Formal Languages and Automata Theory	3	0	0	3
4.		<b>Professional Elective Course – I</b>	3	0	0	3
	20A05504a	Software Project Management				
	20A05504b	Digital Image Processing				
	20A05504c	Big Data Technologies				
5.		<b>Open Elective Course – I</b>	3	0	0	3
6.	20A05501P	Computer Networks Lab	0	0	3	1.5
7.	20A05502P	Artificial Intelligence Lab	0	0	3	1.5
8.		<b>Skill oriented course – III</b>	1	0	2	2
	20A05506	Advanced Web Application Development				
9.	20A05507	Evaluation of Community Service Project/ Internship				1.5
<b>Total</b>						<b>21.5</b>

**Open Elective-I**

<b>S.No</b>	<b>Course Code</b>	<b>Course Name</b>	<b>Offering Branch</b>
1	20A01505	Building Technology	CE
2	20A02505	Electric Vehicles	EEE
3	20A03505	3D Printing Technology	ME
4	20A04505	Digital Electronics	ECE
5	20A27505	Computer Applications in Food Processing	FT
6	20A54501	Optimization Techniques	Mathematics
7	20A56501	Materials Characterization Techniques	Physics
8	20A51501	Chemistry of Energy Materials	Chemistry
9	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



<b>Semester–VI</b>						
<b>S.No</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
1.	20A05601T	Compiler Design	3	0	0	3
2.	20A05602T	Machine Learning	3	0	0	3
3.	20A05603T	Internet of Things	3	0	0	3
4.		<b>Professional Elective Course– II</b>	3	0	0	3
	20A05604a	Software Testing				
	20A05604b	Advanced Computer Architecture				
	20A05604c	Computer Vision				
5.		<b>Open Elective Course – II</b>	3	0	0	3
6.	20A05601P	Compiler Design Lab	0	0	3	1.5
7.	20A05602P	Machine Learning Lab	0	0	3	1.5
8.	20A05603P	Internet of Things Lab	0	0	3	1.5
9.		<b>Skill oriented course - IV</b>	1	0	2	2
	20A52401	Soft Skills				
10.		<b>Mandatory Non-credit Course</b>	2	0	0	0
	20A99601	Intellectual Property Rights & Patents				
<b>Total</b>						<b>21.5</b>
Industry Internship (Mandatory) for 6 – 8 weeks duration during summer vacation						

**Open Elective-II**

<b>S.No</b>	<b>Course Code</b>	<b>Course Name</b>	<b>Offering Branch</b>
1	20A01704	Environmental Economics	CE
2	20A02605	Smart Electric Grid	EEE
3	20A03605	Non-Conventional sources of energy	ME
4	20A04704	Signal Processing	ECE
5	20A27605	Food Refrigeration and Cold Chain Management	FT
6	20A54701	Wavelet Transforms & its applications	Mathematics
7	20A56701	Physics Of Electronic Materials and Devices	Physics
8	20A51701	Chemistry of Polymers and its Applications	Chemistry
9	20A52702	English Literary Spectrum	HSMC



<b>Semester-VII</b>						
<b>S.No.</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
<b>1.</b>	20A05701a 20A05701b 20A05701c	<b>Professional Elective Course– III</b> Cloud Computing Agile Methodologies Vehicular Adhoc Networks	3	0	0	3
<b>2.</b>	20A05702a 20A05702b 20A05702c	<b>Professional Elective Course– IV</b> Fundamentals of AR/VR Cryptography & Network Security Natural Language Processing	3	0	0	3
<b>3.</b>	20A05703a 20A05703b 20A05703c	<b>Professional Elective Course– V</b> Full Stack Development Block chain Technology and Applications Deep Learning	3	0	0	3
<b>4.</b>	20A52701a 20A52701b 20A52701c	<b>Humanities Elective – II</b> Entrepreneurship and Incubation Management Science Enterprise Resource Planning	3	0	0	3
<b>5.</b>		<b>Open Elective Course – III</b>	3	0	0	3
<b>6.</b>		<b>Open Elective Course – IV</b>	3	0	0	3
<b>7.</b>	20A05706	<b>Skill oriented course – V</b> Mobile Application Development	1	0	2	2
<b>8.</b>	20A05707	Evaluation of Industry Internship				3
<b>Total</b>						<b>23</b>

**Open Elective-III**

<b>S.No</b>	<b>Course Code</b>	<b>Course Name</b>	<b>Offering Branch</b>
1	20A01705	Cost Effective Housing Techniques	CE
2	20A02704	IOT Applications in Electrical Engineering	EEE
3	20A03704	Introduction to Hybrid and Electric Vehicles	ME
4	20A04705	Electronic Sensors	ECE
5	20A27704	Human Nutrition	FT
6	20A54702	Numerical Methods for Engineers	Mathematics
7	20A56702	Sensors And Actuators for Engineering	Physics
8	20A51702	Chemistry of Nanomaterials and Applications	Chemistry
9	20A52703	Indian Constitution	HSMC

**Open Elective-IV**

<b>S.No</b>	<b>Course Code</b>	<b>Course Name</b>	<b>Offering Branch</b>
1	20A01706	Health, Safety & Environmental management	CE
2	20A02705	Renewable Energy Systems	EEE
3	20A03705	Introduction to Composite Materials	ME
4	20A04706	Microcontrollers and Applications	ECE
5	20A27705	Waste and Effluent Management	FT
6	20A54703	Number theory & its Applications	Mathematics
7	20A56703	Smart Materials and Devices	Physics
8	20A51703	Green Chemistry and Catalysis for Sustainable	Chemistry
9	20A52704	Gender Studies	HSMC



<b>Semester-VIII</b>							
<b>S.No.</b>	<b>Course Code</b>	<b>Course Name</b>	<b>Category</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>
1.	20A05801	Full Internship & Project work	PR	-	-	-	12
<b>Total</b>							<b>12</b>

### **COURSES OFFERED FOR HONOURS DEGREE IN CSE**

<b>S.No.</b>	<b>Code</b>	<b>Course Name</b>	<b>Contact Hours per week</b>		<b>Credits</b>
			<b>L</b>	<b>T</b>	
1	20A05H01	Privacy preserving and Data Publishing	4	0	4
2	20A05H02	NoSQL Databases	4	0	4
3	20A05H03	Software Defined Data Center	4	0	4
4	20A05H04	Robotics and Intelligent Systems	4	0	4
5	20A05H05	MOOC - 1			2
6	20A05H05	MOOC - 2			2

#### **Suggested MOOCs:**

1. Multi-Core Computer Architecture – Storage and Interconnects
2. User-centric Computing for Human-Computer Interaction
3. GPU Architectures and Programming
4. Introduction to Quantum Computing
5. Real Time Operating Systems

### **LIST OF MINORS OFFERED TO CSE**

<b>S.No.</b>	<b>Minor Title</b>	<b>Department offering the Minor</b>
1.	Construction Technology	Civil Engineering
2.	Environmental Geotechnology	Civil Engineering
3.	Energy Systems	EEE
4.	3D Printing	ME
5.	Industrial Engineering	ME
7.	Internet of Things	ECE
8.	Food Science	Food Technology