



# **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 (Artificial Intelligence and Machine Learning)**  
**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>



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**B.TECH. - CSE (ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**  
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.	20A30502a	Software Engineering for AI	3	0	0	3
2.	20A05602T	Machine Learning	3	0	0	3
3.	20A05703c	Deep Learning	3	0	0	3
4.		<b>Professional Elective Course – I</b>	3	0	0	3
	20A05504c	Big Data Technologies				
	20A05501T	Computer Networks				
	20A31501a	Robotic Process Automation				
5.		<b>Open Elective Course – I</b>	3	0	0	3
6.	20A05602P	Machine Learning Lab	0	0	3	1.5
7.	20A31502	Deep Learning Lab	0	0	3	1.5
8.		<b>Skill oriented course – III</b>	1	0	2	2
	20A30503	Web Application Design				
9.	20A33501	Evaluation of Community Service Project				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>Offered by the Dept.</b>
1	20A01505	Building Technology	CE
2	20A02505	Electric Vehicles	EEE
3	20A03505	3D Printing Technology	ME
4	20A04507	MATLAB Programming for Engineers	ECE/EEE
5	20A04508	Introduction to Control Systems	ECE/EEE
6	20A27505	Computer Applications in Food Processing	FT
7	20A54501	Optimization Techniques	Mathematics
8	20A56501	Materials Characterization Techniques	Physics
9	20A51501	Chemistry of Energy Materials	Chemistry

**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.	20A05702c	Natural Language Processing	3	0	0	3
2.	20A33601T	Advanced Machine Learning	3	0	0	3
3.	20A05701a	Cloud Computing	3	0	0	3
4.		<b>Professional Elective Course- II</b>	3	0	0	3
	20A31601a	Robotics				
	20A33602a	Automation of Model Building				
	20A05604c	Computer Vision				
5.		<b>Open Elective Course – II</b>	3	0	0	3
6.	20A30603	Natural Language Processing Lab	0	0	3	1.5
7.	20A33601P	Advanced Machine Learning Lab	0	0	3	1.5
8.	20A12604	Cloud Computing 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>Offered by the Dept.</b>
1	20A01704	Environmental Economics	CE
2	20A02605	Smart Electric Grid	EEE
3	20A04605	Signal Processing	ECE
4	20A04606	Basic VLSI Design	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



<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>	20A31701a 20A30701b 20A30701c	<b>Professional Elective Course– III</b> Recommender Systems Intelligent Information Retrieval Systems Knowledge Representation and Reasoning	3	0	0	3
<b>2.</b>	20A31702a 20A30702b 20A33701a	<b>Professional Elective Course– IV</b> Optimization Techniques In AI AI for Image Analysis Machine Learning for Unstructured data	3	0	0	3
<b>3.</b>	20A30703a 20A05703b 20A30703b	<b>Professional Elective Course– V</b> Dev Ops Block Chain Technology and Applications Reinforcement 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>	20A30704	<b>Skill oriented course – V</b> Conversational AI	1	0	2	2
<b>8.</b>	20A33702	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>Offered by the Dept.</b>
1	20A01704	Cost Effective Housing Techniques	CE
2	20A02704	IOT Applications in Electrical Engineering	EEE
3	20A03704	Product Design & Development	ME
4	20A04704	Electronic Sensors	ECE
5	20A04506	Principles of Communication Systems	ECE
6	20A27704	Human Nutrition	FT
7	20A54702	Numerical Methods for Engineers	Mathematics
8	20A56702	Sensors And Actuators for Engineering Applications	Physics
9	20A51702	Chemistry of Nanomaterials and Applications	Chemistry

**Open Elective-IV**

<b>S.No</b>	<b>Course Code</b>	<b>Course Name</b>	<b>Offered by the Dept.</b>
1	20A01705	Health, Safety & Environmental management	CE
2	20A02705	Renewable Energy Systems	EEE
3	20A03705	Introduction to Composite Materials	ME
4	20A04705	Microcontrollers and Applications	ECE
5	20A04706	Principles of Cellular & Mobile Communications	ECE
6	20A27705	Waste and Effluent Management	FT
7	20A54703	Number theory & its applications	Mathematics
8	20A56703	Smart Materials and Devices	Physics
9	20A51703	Green Chemistry and Catalysis for Sustainable	Chemistry



<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.	20A33801	Full Internship & Project work	PR				12
<b>Total</b>							<b>12</b>

**COURSES OFFERED FOR HONOURS DEGREE IN CSE (AI & ML)**

<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	20A30H01	Virtual and Augmented reality	3	1	4
2	20A33H01	Software Project Management using Agile	3	1	4
3	20A30H03	Ethics and Privacy in AI	3	1	4
4	20A30H04	Medical Image Data Processing	3	1	4
5	20A33H02	MOOC - I			2
6	20A33H03	MOOC - II			2

MOOC Courses for a Total of 2 credits	AI Chatbots without Programming	2 weeks	<a href="https://www.edx.org/course/AI-chatbots-without-programming">https://www.edx.org/course/AI-chatbots-without-programming</a>
	Robot Development	6 weeks	<a href="https://www.edx.org/course/developmental-robotics">https://www.edx.org/course/developmental-robotics</a>
MOOC Course for 2 credits	Introduction to Watson AI	8 weeks	<a href="https://www.edx.org/course/intro-to-watson-AI">https://www.edx.org/course/intro-to-watson-AI</a>
MOOC Course for 2 credits	Artificial Intelligence A-Z: Learn How to Build an AI (Paid Course)	Equivalent to 8 Weeks	<a href="https://www.udemy.com/course/artificial-intelligence-az/">https://www.udemy.com/course/artificial-intelligence-az/</a>
MOOC Course for 2 credits	Introduction to Haskell Programming	8 weeks	<a href="https://onlinecourses.nptel.ac.in/noc22_cs69/preview">https://onlinecourses.nptel.ac.in/noc22_cs69/preview</a>
MOOC Course for 2 credits	Applied Accelerated Artificial Intelligence	12 weeks (To be considered only for 8 weeks)	<a href="https://onlinecourses.nptel.ac.in/noc22_cs83/preview">https://onlinecourses.nptel.ac.in/noc22_cs83/preview</a>

**LIST OF MINORS OFFERED TO CSE (AI & ML)**

<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
6.	Food Science	Food Technology