



**Jawaharlal Nehru Technological
University Anantapur College of Engineering
Pulivendula –516 390 (A.P) India**

**B.Tech. in Computer Science and Engineering
Course Structure and Syllabi
under R20 Regulations
Effective from AY 2021-22**

COMPUTER SCIENCE AND ENGINEERING

Semester –0			
S.No	Course Name	Category	L-T-P-C
1	Physical Activities -- Sports, Yoga and Meditation, Plantation	MC	0-0-6-0
2	Career Counseling	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	2-0-0-0
5	Proficiency Modules & Productivity Tools	ES	2-0-0-0
6	Assessment on basic aptitude and mathematical skills	MC	2-0-3-0
7	Remedial Training in Foundation Courses	MC	2-0-3-0
8	Human Values & Professional Ethics	MC	3-0-3-0
9	Communication Skills -- focus on Listening, Speaking, Reading, Writing skills	BS	2-0-2-0
10	Concepts of Programming	ES	2-0-0-0

B.Tech I Year I Semester

Semester –1					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	20ABS05	Linear Algebra And Calculus	BS	3-0-0	3
2	20ABS03	Chemistry	BS	3-0-0	3
3	20ACS03	Python Programming	ES	3-0-0	3
4	20ABEE01	Basic Electrical & Electronics Engineering	ES	3-0-0	3
5	20AME04	Engineering Workshop	ES	0-0-3	1.5
6	20ACS05	IT Workshop	ES	0-0-3	1.5
7	20ABS04	Chemistry Lab	BS	0-0-3	1.5
8	20ACS04	Python Programming Lab	ES	0-0-3	1.5
9	20ABEE02	Basic Electrical & Electronics Engineering Lab	ES	0-0-3	1.5
				Total	19.5

B.Tech I Year II Semester

Semester – 2					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	20ABS06	Differential Equations & Vector Calculus	BS	3-0-0	3
2	20ABS10	Applied Physics	BS	3-0-0	3
3	20AHS01	Communicative English	HS	3-0-0	3
4	20ACS08	C Programming & Data Structures	ES	3-0-0	3
5	20AME01	Engineering Graphics	ES	1-0-4	3
6	20AHS02	Communicative English Lab	HS	0-0-3	1.5
7	20ABS11	Applied Physics Lab	BS	0-0-3	1.5
8	20ACS09	C Programming & Data Structures Lab	ES	0-0-3	1.5
				Total	19.5

B.Tech II Year I Semester

Semester – 3					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	20ABS14	Discrete Mathematics & Graph Theory	BS	3-0-0	3
2	20ACS14	Computer Organization	PC	3-0-0	3
3	20ACS16	Data Base Management System	PC	3-0-0	3
4	20ACS18	Object Oriented Programming Using Java	PC	3-0-0	3
5		Humanities Elective 1	HS	3-0-0	3
	20AHS04	Managerial Economics & Financial Analysis			
	20AHS05	Entrepreneurship			
6	20ACS20	Web development (Skill Oriented Course – I)	SC	1-0-2	2
7	20ACS15	Computer Organization Lab	PC	0-0-3	1.5
8	20ACS17	Data Base Management System Lab	PC	0-0-3	1.5
9	20ACS19	Object Oriented Programming Using Java Lab	PC	0-0-3	1.5
10	20AMC01	NSS activities	MC	0-0-2	0
11	20ABS09	Environmental Science	MC	3-0-0	0
Total					21.5

B.Tech II Year II Semester

Semester – 4					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	20ABS15	Numerical Methods & Probability statistics	BS	3-0-0	3
2	20ACS22	Formal Language and Automata Theory	ES	3-0-0	3
3	20ACS23	Operating Systems	PC	3-0-0	3
4	20ACS25	Design and Analysis of Algorithms	PC	3-0-0	3
5	20ACS27	Software Engineering	PC	3-0-0	3
6	20AHS03	Universal Human Values	MC	3-0-0	3
7	20ACS29	Mobile application development (MAD) (Skill Oriented Course – II)	SC	1-0-2	2
8	20ACS24	Operating Systems Lab	PC	0-0-3	1.5
9	20ACS26	Design and Analysis of Algorithms Lab	PC	0-0-3	1.5
10	20ACS28	Software Engineering Lab	PC	0-0-3	1.5
11	20AMC02	Aptitude and Reasoning Skills	MC	3-0-0	0
Total					24.5
Mandatory Community Service Project/ Internship during Summer Vacation					

- ❖ Eligible & interested students are 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 Honours or a Minor from V Semester onwards.
- ❖ A student is permitted to select a Minor program only if the institution is already offering a Major degree program in that discipline.


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B.Tech III Year I Semester

Semester - 5					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	20ACS51	Computer Networks	PC	3-0-0	3
2	20ACS52	Compiler Design	PC	3-0-0	3
3	20ACS53	Artificial Intelligence	PC	3-0-0	3
4	20ACS54	Professional Elective – I	PE	3-0-0	3
	20ACS54A	Big Data and Analytics			
	20ACS54B	Data mining			
	20ACS54C	Data Visualization with Python			
5	20ACS55	Open Elective Course– I	OE	3-0-0	3
6	20ACS50	Web Technologies (Skill oriented course – III)	SC	1-0-2	2
7	20ACS57	Computer Networks Lab	PC	0-0-3	1.5
8	20ACS58	Artificial Intelligence lab	PC	0-0-3	1.5
9	20AHS11	Indian Constitution	MC	3-0-0	0
10	20ACS59	Evaluation of Community Service Project/Internship	PR	-----	1.5
Total					21.5

Open Elective I (Interdisciplinary)

Branch	Subject Code	Subject
Mathematics	20ABS55A	Fuzzy Set Theory, Arithmetic and Logic
Physics	20ABS55B	Functional Nanomaterials for Engineers
Chemistry	20ABS55C	Chemistry of Energy Materials
CIVIL	20ACE55A	Basics of Civil Engineering
EEE	20AEE55A	Basics of Non-Conventional Energy Sources
ME	20AME55A	3D Printing
	20AME55B	Smart Materials
ECE	20AEC55A	Fundamentals of Electronics and Communication Engineering
	20AEC55B	Transducers and Sensors

Note: 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.


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B.Tech III Year II Semester

Semester - 6					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	20ACS61	Internet of Things	PC	3-0-0	3
2	20ACS62	Data Science	PC	3-0-0	3
3	20ACS63	Cyber Security	PC	3-0-0	3
4	20ACS64	Professional Elective – II (MOOC-I)	PE	3-0-0	3
5	20ACS65	Open Elective Course –II	OE	3-0-0	3
6	20ACS66	Internet of Things Lab	PC	0-0-3	1.5
7	20ACS67	Data Science Lab	PC	0-0-3	1.5
8	20ACS68	Cyber security Lab	PC	0-0-3	1.5
9	20AHS10	Soft Skills (Skill Oriented Course – IV)	SC	1-0-2	2
10	20ACS60	Design Thinking and Innovation for Product Innovation	MC	3-0-0	0
Total					21.5
Industry Internship (Mandatory) for 6 - 8 weeks duration during summer vacation					

Open Elective II (Interdisciplinary)

Branch	Subject Code	Subject Name
Mathematics	20ABS65A	Numerical Techniques
Physics	20ABS65B	Materials Characterization Techniques
Chemistry	20ABS65C	Polymers and their applications
CIVIL	20ACE65A	Environmental Impact Assessment
EEE	20AEE65A	Energy Conservation and Management
ME	20AME65A	Programming of Robots and Control
	20AME65B	Non-Conventional sources of Energy
ECE	20AEC65A	Introduction to Microcontrollers & Applications
	20AEC65B	Principles of Digital Signal Processing

Note: Student shall register for MOOC Course in NPTEL/SWAYAM in concurrence with the department before commencement of semester. The advanced courses should opt which is not repetitive regular courses and syllabus.


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B.Tech IV Year I Semester

Semester - 7					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	20ACS71	Professional Elective – III	PE	3-0-0	3
	20ACS71A	Software project Management			
	20ACS71B	Software Testing			
	20ACS71C	Software Architecture			
2	20ACS72	Professional Elective – IV	PE	3-0-0	3
	20ACS72A	Micro services			
	20ACS72B	Cloud Computing			
	20ACS72C	Ad-hoc and sensor networks			
3	20ACS73	Professional Elective –V	PE	3-0-0	3
	20ACS73A	Block chain technologies			
	20ACS73B	Virtual Reality			
	20ACS73C	Statistical Analysis using R			
4	20ACS75	Open Elective – III	OE	3-0-0	3
5	20ACS76	Open Elective – IV (MOOC-II)	OE	3-0-0	3
6		Humanities Elective – II	HS	3-0-0	3
	20AHS12	Management Science			
	20AHS13	Business Environment			
7	20ACS70	Advanced Web Technologies (Skill oriented course – V)	SC	1-0-2	2
8	20ACS79	Evaluation of Internship	PR	-----	3
				Total	23

Open Elective III (Interdisciplinary)

Branch	Subject Code	Subject Name
Mathematics	20ABS75A	Mathematical Modeling
Physics	20ABS75B	Sensors and Actuators for Engineering Applications
Chemistry	20ABS75C	Chemistry of Nano-materials and applications
CIVIL	20ACE75A	Disaster Management and Mitigation
EEE	20AEE75A	IOT Applications in Electrical Engineering
ME	20AME75A	Introduction to Composite Materials
	20AME75B	Customer Relationship Management
ECE	20AEC75A	Fundamentals of Image Processing
	20AEC75B	Basics of VLSI Design

Open Elective-IV shall opt any of branch which shall not match with regular course and syllabus.

B.Tech IV Year II Semester

Semester - 8					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	20ACS99	Full Internship & Project work	PR	-----	12
				Total	12



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Courses offered for Honours degree

1. Network Security

S.No.	Course Code	Course Title	Offered in Semester	Prerequisite if any	Contact Hours per week		Credits
					L	T	
1	20ACSH01	Network Security and Cyber Laws	V	Basics of Networks	3	1	4
2	20ACSH02	Social Mobile Analytics & Cloud	VI	Basics of cloud	3	1	4
3	20ACSH03	Storage Area Networks	VI	Basics of Data Base	3	1	4
4	20ACSH04	High Performance Computing	VII	Basics of computing techniques	3	1	4
5	20ACSH05	Natural Language Processing (MOOC Course)	V	Fundamentals of compiler design			2
6	20ACSH06	Multi Agent Systems (MOOC Course)	VII	Basics of sharing between two systems			2

Title of the Minor Degree
(Disciplines to which the Minor is offered)

S. No	Branch	Name of the Minor degree	Course Code	Course Title	Offered in Semester	Contact Hours per week			Credits
						L	T	P	
1	CSE	Web Design & Development	20ACSM01	User Interface Design	V	3	1	0	4
2			20ACSM02	Advanced Java Script	VI	3	1	0	4
3			20ACSM03	Content Management & Distributed systems	VI	3	1	0	4
4			20ACSM04	Advance web technologies	VII	3	1	0	4
5			20ACSM05	Mongo DB	VII	3	1	0	4
6			20ACSM06	MOOC Course	VII				2
1	CSE	Data Science	20ACSM07	Data Science	V	3	1	0	4
2			20ACSM08	Data Analytics using Python and Lab	V	3	0	2	4
3			20ACSM09	Data Visualization	VII	3	1	0	4
4			20ACSM10	Machine Learning	VI	3	1	0	4
5			20ACSM11	MOOC Course	VI				2
6			20ACSM12	MOOC Course	VII				2
1	CE	Construction Technology	20ACEM01	Building Materials	V	3	1	0	4
2			20ACEM02	Building Construction	V	3	1	0	4
3			20ACEM03	Building planning and Drawing	VI	3	1	0	4
4			20ACEM04	Surveying	VI	3	1	0	4
5			20ACEM05	MOOC Course	VII				2
6			20ACEM06	MOOC Course	VII				2
1	EEE	Electrical Systems	20AEEM01	Basic Electric Circuits and Analysis	V	3	1	0	4
2			20AEEM02	Principles of Electrical Measurements	V	3	1	0	4
3			20AEEM03	Basics of Power Electronics and Devices	VI	3	1	0	4
4			20AEEM04	Fundamentals of Control Systems	VI	3	1	0	4
5			20AEEM05	MOOC Course	VII				2
6			20AEEM06	MOOC Course	VII				2

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Computer Science and Engineering (Course Structure)

1	ME	3D Printing	20AMEM07	Materials science for Engineers	V	3	1	0	4
2			20AMEM08	Computer Aided Machine Drawing	V	3	1	0	4
3			20AMEM09	3D Printing materials	VI	3	1	0	4
4			20AMEM10	Applications of 3D Printing	VII	3	1	0	4
5			20AMEM11	MOOC Course	VI				2
6			20AMEM12	MOOC Course	VII				2
1	ME	Robotics and Automation	20AMEM13	Introduction to Robotics	V	3	1	0	4
2			20AMEM14	Industrial Automation	V	3	1	0	4
3			20AMEM15	Hydraulic and Pneumatic circuits	VI	3	1	0	4
4			20AMEM16	Programming and control of Robot	VII	3	1	0	4
5			20AMEM17	MOOC Course	VI				2
6			20AMEM18	MOOC Course	VII				2
1	ME	Industrial Engineering	20AMEM19	Production Planning and Control	V	3	1	0	4
2			20AMEM20	Marketing Management	VI	3	1	0	4
3			20AMEM21	Customer Relationship Management	VI	3	1	0	4
4			20AMEM22	Six Sigma & Lean Manufacturing	VII	3	1	0	4
5			20AMEM23	MOOC Course	V				2
6			20AMEM24	MOOC Course	VII				2
1	ECE	Electronics & Communication Engineering	20AECM01	Electronic Circuits	V	3	1	0	4
2			20AECM02	Digital Electronics	V	3	1	0	4
3			20AECM03	Principles of Communications	VI	3	1	0	4
4			20AECM04	Electronic Instrumentation	VI	3	1	0	4
5			20AECM05	MOOC Course	VII				2
6			20AECM06	MOOC Course	VII				2

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