



**Jawaharlal Nehru Technological
University anantapur College of Engineering
Pulivendula**

(Accredited by NAAC with 'A' Grade)

Pulivendula –516 390 (A.P) India

**B.Tech. in Computer Science and Engineering
Course Structure and Syllabi
Under R23 Regulations**

Effective from AY 2023-24

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	23ABS05	Linear Algebra & Calculus	BS	3-0-0	3
2	23ABS03	Chemistry	BS	3-0-0	3
3	23AHS01	Communicative English	HM	2-0-0	2
4	23ACME01	Basic Civil & Mechanical Engineering	ES	3-0-0	3
5	23ACS01	Introduction to Programming	ES	3-0-0	3
6	23ABS04	Chemistry Lab	BS	0-0-2	1
7	23AHS02	Communicative English Lab	HM	0-0-2	1
8	23AME02	Engineering Workshop	ES	0-0-3	1.5
9	23ACS02	Computer Programming Lab	ES	0-0-3	1.5
10	23ABS06	Health and wellness, Yoga and Sports	HM	0-0-1	0.5
				Total	19.5

B.Tech I Year II Semester

Semester – 2					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	23ABS08	Differential Equations & Vector Calculus	BS	3-0-0	3
2	23ABS01	Engineering Physics	BS	3-0-0	3
3	23ABEE01	Basic Electrical & Electronics Engineering	ES	3-0-0	3
4	23AME01	Engineering Graphics	ES	1-0-4	3
5	23ACS04	Data Structures	ES	3-0-0	3
6	23ACS03	IT Workshop	ES	0-0-2	1
7	23ABS02	Engineering Physics Lab	BS	0-0-2	1
8	23ABEE02	Electrical & Electronics Engineering Workshop	ES	0-0-3	1.5
9	23ACS05	Data Structures Lab	ES	0-0-3	1.5
10	23ABS07	NSS/NCC/Scouts & Guides/Community service	HM	0-0-1	0.5
				Total	20.5


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B.Tech III Year I Semester

Semester - 5					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	23ACS51	Artificial Intelligence	PC	3-0-0	3
2	23ACS52	Computer Networks	PC	3-0-0	3
3	23ACS53	Automata Theory And Compiler Design	PC	3-0-0	3
4	23AMC51	Introduction To Quantum Technologies and Applications	PC	3-0-0	3
5		Professional Elective-I	PE	3-0-0	3
	23ACS54a	Object Oriented Analysis and Design			
	23ACS54b	Quantum Computing and Algorithm Development Using Qiskit			
	23ACS54c	Microprocessors & Microcontrollers			
	23ACS54d	Data Warehousing & Data Mining			
6	23ACS55	Open Elective- I	OE	3-0-0	3
7	23ACS56	Full Stack Development –II (Skill Enhancement Course-III)	SC	0-1-2	2
8	23ACS57	Artificial Intelligence Lab	PC	0-0-3	1.5
9	23ACS58	Computer Networks Lab	PC	0-0-3	1.5
10	23ACS59	Tinkering Lab	PC	0-0-2	1
11	23ACS50	Evaluation Of Community Service Internship	PR		2
				Total	26

Open Elective I (Interdisciplinary)

Branch	Subject Code	Subject
CE	23ACE55a	Green Buildings
	23ACE55b	Construction Technology and Management
EEE	23AEE55a	Electrical Safety Practices and Standards
ME	23AME55a	Sustainable Energy Technologies
	23AME55b	Supply Chain and Management
	23AME55c	Nanotechnology
	23AME55d	Industry 4.0
	23AME55e	Entrepreneurship
ECE	23AEC55a	Electronic Circuits
Mathematics	23ABS55a	Mathematics For Machine Learning and AI
Physics	23ABS55b	Materials Characterization Techniques
Chemistry	23ABS55c	Chemistry of Energy Systems
H&S	23AHS55a	English For Competitive Examinations
	23AHS55b	Entrepreneurship and New Venture Creation

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 II Year I Semester

Semester – 3					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	23ABS35	Discrete Mathematics	BS	3-0-0	3
2	23AHS31	Universal Human Values–Understanding Harmony & Ethical Human Conduct	HM	2-1-0	3
3	23ACS31	Digital Logic And Computer Organization	PC	3-0-0	3
4	23ACS32	Advanced Data Structures & Algorithms Analysis	PC	3-0-0	3
5	23ACS33	Object-Oriented Programming Through Java	PC	3-0-0	3
6	23ACS37	Advanced Data Structures & Algorithms Analysis Lab	PC	0-0-3	1.5
7	23ACS38	Object-Oriented Programming Through Java Lab	PC	0-0-3	1.5
8	23ACS49	Python Programming (Skill Oriented Course -I)	SC	0-1-2	2
Total					20

B.Tech II Year II Semester

Semester – 4					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	23ACS41	Operating Systems	PC	3-0-0	3
2	23ACS42	Database Management Systems	PC	3-0-0	3
3	23ACS43	Software Engineering	PC	3-0-0	3
4	23ABS42	Probability & Statistics	BS	3-0-0	3
5	Management Course-I		HM	3-0-0	2
	23AHS03A	Managerial Economics and Financial Analysis			
	23AHS03B	Organizational Behavior			
	23AHS03C	Business Environment			
6	23ACS47	Operating Systems Lab	PC	0-0-3	1.5
7	23ACS48	Database Management Systems Lab	PC	0-0-3	1.5
8	23ACS46	Full Stack Development-1(Skill Oriented Course -II)	SC	1-0-2	2
9	23AMC41	Design Thinking & Innovation	HM	1-0-2	2
10	23AMC31	Environmental Science	MC	2-0-0	0
Total					21
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.
- ❖ Mandatory Community Service Project & Internship of 4 weeks duration is to be done in the summer break between IV Semester & V Semester. & evaluated during V Semester.


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Open Elective IV (Interdisciplinary)

Branch	Subject Code	Subject
CE	23ACE75a	Geo-Spatial Technologies
	23ACE75b	Solid Waste Management
EEE	23AEE75a	Electric Vehicles
ME	23AME75a	Total Quality Management
	23AME75b	Optimization Techniques
	23AME75c	Advanced Manufacturing Systems
	23AME75d	Operations Management
	23AME75e	Energy Auditing
ECE	23AEC75a	Transducers and Sensors
Mathematics	23ABS75a	Financial Mathematics
Physics	23ABS75b	Sensors And Actuators For Engineering Applications
Chemistry	23ABS75c	Chemistry of Nanomaterials and Applications
H&S	23AHS75a	Literary Vibes

B.Tech IV Year II Semester

Section IV: Year II Semester					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	23ACS89	Full Internship	PR	-----	4
2	23ACS99	Project Work			8
Total					12

COURSES OFFERED FOR HONOURS DEGREE IN CSE

S.No.	Course Code	Course Title	Category	L-T-P	Credits
1	23ACSH01	Quantum Computing	PC	3-0-0	3
2	23ACSH02	No SQL Databases	PC	3-0-0	3
3	23ACSH03	Software Defined Data Centre	PC	3-0-0	3
4	23ACSH04	Robotics And Intelligent Systems	PC	3-0-0	3
5	23ACSH05	Cloud Security	PC	3-0-0	3
6	23ACSH06	No SQL Lab	PC	0-0-3	1.5
7	23ACSH07	Quantum & Cloud Computing Lab	PC	0-0-3	1.5
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MINOR DEGREE COURSES OFFERED TO COMPUTER SCIENCE AND ENGINEERING

S.No.	Minor Title	Offered Branch	Subject Code	Course Name	Category	L-T-P	Credits
1	Building Planning & Construction Technology	Civil	23ACEM01	Construction Materials	PC	3-0-0	3
2			23ACEM02	Construction Methods	PC	3-0-0	3
3			23ACEM03	Building Planning And Drawing	PC	3-0-0	3
4			23ACEM04	Surveying	PC	3-0-0	3
5			23ACEM05	Concrete Technology	PC	3-0-0	3
6			23ACEM06	Concrete Technology Lab	PC	0-0-3	1.5
7			23ACEM07	Surveying Lab	PC	0-0-3	1.5

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Computer Science and Engineering (Course Structure)

R23

1	Energy Systems	EEE	23AEEM01	Energy Audit and Management	PC	3-0-0	3
2			23AEEM02	Energy Management in Building	PC	3-0-0	3
3			23AEEM03	Energy Storage Technologies	PC	3-0-0	3
4			23AEEM04	Energy Scenario and Energy Policy	PC	3-0-0	3
5			23AEEM05	Waste Energy Management	PC	3-0-0	3
6			23AEEM06	Project in Energy Systems	PC	0-0-6	3
1	Micro Grid Technology	EEE	23AEEM11	Futuristic Power Systems	PC	3-0-0	3
2			23AEEM12	Power Electronic Converters for Energy Sources	PC	3-0-0	3
3			23AEEM13	Micro grid Power and Control Architecture	PC	3-0-0	3
4			23AEEM14	Micro grid System Design	PC	3-0-0	3
5			23AEEM15	Analysis of Smart Grid Systems	PC	3-0-0	3
6			23AEEM16	Project in Micro Grid Technology	PC	0-0-6	3
1	Industrial Engineering	ME	23AMEM01	Production Planning and Control	PC	3-0-0	3
2			23AMEM02	Introduction to Optimization Techniques	PC	3-0-0	3
3			23AMEM03	Introduction to Supply Chain Management	PC	3-0-0	3
4			23AMEM04	Six sigma and lean manufacturing	PC	3-0-0	3
5			23AMEM05	Industry 5.0 for Engineers	PC	3-0-0	3
6			23AMEM06	Industrial Engineering Lab	PC	0-0-3	1.5
7			23AMEM07	Optimization through MATLAB Lab	PC	0-0-3	1.5
1	Machine Design	ME	23AMEM08	Strength of Materials	PC	3-0-0	3
2			23AMEM09	Kinematics of Machinery	PC	3-0-0	3
3			23AMEM10	Design of machine elements	PC	3-0-0	3
4			23AMEM11	Product Design	PC	3-0-0	3
5			23AMEM12	Introduction to Tool design	PC	3-0-0	3
6			23AMEM13	Strength of Materials Lab	PC	0-0-3	1.5
7			23AMEM14	Kinematics of Machinery Lab	PC	0-0-3	1.5
1	Additive Manufacturing	ME	23AMEM15	Introduction to Computer Aided Machine Drawing	PC	3-0-0	3
2			23AMEM16	CAD	PC	3-0-0	3
3			23AMEM17	3D Printing Materials	PC	3-0-0	3
4			23AMEM18	3D Printing Processes	PC	3-0-0	3
5			23AMEM19	Applications of Additive Manufacturing	PC	3-0-0	3
6			23AMEM20	CAD Lab	PC	0-0-3	1.5
7			23AMEM21	3D printing Lab	PC	0-0-3	1.5
1	Robotics and Automation	ME	23AMEM22	Introduction to Robotics	PC	3-0-0	3
2			23AMEM23	Industrial Automation.	PC	3-0-0	3
3			23AMEM24	Hydraulic and Pneumatic Circuits for Robots	PC	3-0-0	3
4			23AMEM25	Programming of robot	PC	3-0-0	3
5			23AMEM26	Robot Operating Systems	PC	3-0-0	3
6			23AMEM27	Hydraulic and Pneumatic Circuits Lab	PC	0-0-3	1.5
7			23AMEM28	Robot Programming Lab	PC	0-0-3	1.5
1	Electronic and Communication Engineering	ECE	23AECM01	Electronic Circuits	PC	3-0-0	3
2			23AECM02	Digital Electronics	PC	3-0-0	3
3			23AECM03	Principles of Communication Engineering	PC	3-0-0	3
4			23AECM04	Electronic Instrumentation	PC	3-0-0	3
5			23AECM05	Microprocessors and Microcontrollers	PC	3-0-0	3
6			23AECM06	Electronic Circuits and Digital Electronics Lab	PC	0-0-3	1.5
7			23AECM07	Microprocessors and Microcontrollers Lab	PC	0-0-3	1.5


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B.Tech III Year II Semester

Semester - 6					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	23ACS61	Machine Learning	PC	3-0-0	3
2	23ACS62	Cloud Computing	PC	3-0-0	3
3	23ACS63	Cryptography & Network Security	PC	3-0-0	3
4		(Professional Elective-II)			
	23ACS64a	Software Testing Methodologies	PE	3-0-0	3
	23ACS64b	Cyber Security			
	23ACS64c	Devops			
	23ACS64d	Embedded Systems Design			
5		Professional Elective-III			
	23ACS66a	Software Project Management	PE	3-0-0	3
	23ACS66b	Mobile Adhoc Networks			
	23ACS66c	Natural Language Processing			
	23ACS66d	Introduction To Quantum Mechanics			
6	23ACS65	Open Elective- II	OE	3-0-0	3
7	23AHS56	Soft Skills (Skill Enhancement Course-IV)	SC	0-1-2	2
8	23ACS67	Machine Learning Lab	PC	0-0-3	1.5
9	23ACS68	Cryptography & Network Security Lab	PC	0-0-3	1.5
10	23AHS61	Technical Paper Writing & IPR (Audit Course)	MC	2-0-0	--
				Total	23
Industry Internship (Mandatory) for 8 weeks duration during summer vacation					

Open Elective II (Interdisciplinary)

Branch	Subject Code	Subject
CE	23ACE65a	Disaster Management
	23ACE65b	Sustainability In Engineering Practices
EEE	23AFF65a	Renewable Energy Sources
ME	23AMF65a	Introduction to Industrial Robotics
	23AME65b	Work Study and Industrial Ergonomics
	23AME65c	Customer Relationship Management
	23AME65d	Hybrid Vehicles
	23AME65e	Industrial Safety
ECE	23AEC65a	Digital Electronics
Mathematics	23ABS65a	Optimization Techniques for Engineers
	23ABS65d	Mathematical Foundation of Quantum Technologies
Physics	23ABS65b	Physics of Electronic Materials And Devices
Chemistry	23ABS65c	Chemistry of Polymers And Applications
H&S	23AHS65a	Academic Writing and Public Speaking

Note: Industry Internship of 8 weeks duration to be done by student during Summer break between VI Semester & VII Semester & evaluated during VII Semester.


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B.Tech IV Year I Semester

Semester - 7					
S.No	Course No	Course Name	Category	L-T-P	Credits
1	23ACS71	Deep Learning	PC	3-0-0	3
2	Management Course-II		HM	2-0-0	2
	23AHS71a	Business Ethics and Corporate Governance			
	23AHS71b	E-Business			
	23AHS71c	Management Science			
3		Professional Elective-IV	PE	3-0-0	3
	23ACS72a	Software Architecture & Design Patterns			
	23ACS72b	Block chain Technology			
	23ACS72c	Augmented Reality & Virtual Reality			
	23ACS72d	Internet of Things			
4		Professional Elective-V	PE	3-0-0	3
	23ACS73a	Agile Methodologies			
	23ACS73b	Metaverse			
	23ACS73c	Quantum Computing			
	23ACS73d	Cyber Physical Systems			
5	23ACS74	Open Elective -III	OE	3-0-0	3
6	23ACS75	Open Elective -IV	OE	3-0-0	3
7	23ACS76	Prompt Engineering (Skill Enhancement Course V)	SC	0-1-2	2
8	23AMC71	Gender Sensitization (Audit Course)	MC	2-0-0	0
9	23ACS70	Evaluation of Industry Internship	PR	-----	2
					21

Open Elective III (Interdisciplinary)

Branch	Subject Code	Subject
CE	23ACE74a	Building Materials and Services
	23ACE74b	Environmental Impact Assessment
EEE	23AEE74a	Smart Grid Technologies
ME	23AME74a	3D Printing Technologies
	23AME74b	Introduction to Mechatronics
	23AME74c	Robot Programming
	23AME74d	Product Design and Development
	23AME74e	Digital Marketing Management
ECE	23AEC74a	Microprocessors and Microcontrollers
Mathematics	23ABS74a	Wavelet transforms and its Applications
Physics	23ABS74b	Smart Materials And Devices
	23ABS74e	Introduction to Quantum Mechanics
Chemistry	23ABS74c	Green Chemistry And Catalysis For Sustainable Environment
H&S	23AHS74a	Employability Skills

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