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CODE:URCE

USHA RAMA
COLLEGE OF ENGINEERING AND TECHNOLOGY
On NH-16, Telaprolu, Near Gannavaram, Krishna District - 521109.
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(Autonomous)
COURSE STRUCTURE – UR20
COMPUTER SCIENCE AND ENGINEERING
(Applicable for batches admitted from 2020-2021)
FIRST SEMESTER

S.No	Course Code	Course Title	L	T	P	Contact Hrs/WK	Credits
1	C111	Problem Solving And Programming using C	3	0	0	3	3
2	C112	Communicative English	3	0	0	3	3
3	C113	Applied Chemistry	3	0	0	3	3
4	C114	Linear Algebra & Calculus	3	0	0	3	3
5	C115	Engineering Graphics & Drafting	1	0	4	5	3
6	C116	Problem Solving and Programming using C Lab	0	0	3	3	1.5
7	C117	Communicative English Lab	0	0	3	3	1.5
8	C118	Applied Chemistry Lab	0	0	3	3	1.5
Total			13	0	13	26	19.5

SECOND SEMESTER

S.No	Course Code	Course Title	L	T	P	Contact Hrs./WK	Credits
1	C121	Python Programming	3	0	0	3	3
2	C122	Digital Logic Design	3	0	0	3	3
3	C123	Applied Physics	3	0	0	3	3
4	C124	Differential Equations & Vector Calculus	3	0	0	3	3
5	C125	Engineering Workshop & IT Tools	1	0	4	5	3
6	C126	Python Programming Lab	0	0	3	3	1.5
7	C127	Digital Logic Design Lab	0	0	3	3	1.5
8	C128	Applied Physics Lab	0	0	3	3	1.5
		Total	13	0	13	26	19.5
9		Science, Technology & Society	3	0	0	3	0
10		Social Service Activity NCC/NSS/Social service club	0	0	0	2	0

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THIRD SEMESTER

S.No	Course Code	Course Title	L	T	P	Contact Hrs./Wk	Credits
1	C211	Numerical Methods & Transforms	3	0	0	3	3
2	C212	Data Structures through C++	3	0	0	3	3
3	C213	Computer Organization	3	0	0	3	3
4	C214	Software Engineering	3	0	0	3	3
5	C215	Mathematical Foundations of Computer Science	3	0	0	3	3
6	C216	Data Structures through C++ Lab	0	0	3	3	1.5
7	C217	R Programming Lab	0	1	2	3	2
8	C218	Software Engineering Lab	0	0	2	2	1
9	C219	Skill oriented Course I Numpy & Simple Full Stack Web Application Design	0	0	4	4	2
		Total	15	1	11	31	21.5
10		Constitution of India	0	0	0	2	0
11		Social Service Activity - II NCC/NSS/Social service club	0	0	0	2	0

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FOURTH SEMESTER

S.No	Course Code	Course Title	L	T	P	Contact Hrs./Wk	Credits
1	C221	Probability and Statistics	3	0	0	3	3
2	C222	Database Management Systems	3	0	0	3	3
3	C223	Operating Systems	3	0	0	3	3
4	C224	Object Oriented Programming through Java.	3	0	0	3	3
5	C225	Managerial Economics and Financial Accountancy	3	0	0	3	3
6	C226	Database Management Systems Lab	0	0	3	3	1.5
7	C227	Operating Systems Lab	0	0	3	3	1.5
8	C228	Object Oriented Programming through Java Lab	0	0	3	3	1.5
9	C229	Skill oriented Course II Pandas & Front End Design using Full Stack	0	0	4	4	2
10	C230	Community Service Project	0	0	0	0	4
		Total	15	0	13	28	25.5
11		Minor Course	3	1	0	4	4

S.No	Course Code	Courses	L	T	P	Contact Hrs./W k	Credits
1	C311	Computer Networks	3	0	0	3	3
2	C312	Design and Analysis of Algorithms	3	0	0	3	3
3	C313	Data Warehousing and Data Mining	3	0	0	3	3
4	C314	**Open Elective-I** Open Electives offered by other departments/ Optimization in Operations Research (Job oriented course)	3	0	0	3	3
5	C315	**Professional Elective-I** Artificial Intelligence Software Project Management Distributed Systems Advanced Unix Programming	3	0	0	3	3
6	C316	Data Warehousing and Data Mining Lab	0	0	3	3	1.5
7	C317	Computer Networks Lab	0	0	3	3	1.5
8	C318	**Skill Oriented Course – III** Animation course: Animation Design **OR** Continuous Integration and Continuous Delivery using DevOps	0	0	4	4	2
9	C319	Summer Internship 2 Months (Mandatory) after second year (to be evaluated during V Semester	0	0	0	0	1.5
	Total		15	0	10	25	21.5
	Mandatory Course						
10		Employability Skills-I	0	0	0	3	0
11		Environmental Science	0	0	0	3	0
		Minor Course	3	0	2	5	4

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SIXTH SEMESTER

S.No	Course Code	Courses	L	T	P	Contact Hrs./WK	Credits
1	C321	Machine Learning	3	0	0	3	3
2	C322	Compiler Design	3	0	0	3	3
3	C323	Cryptography and Network Security	3	0	0	3	3
4	C324	**Professional Elective-II** Mobile Computing Big Data Analytics Object Oriented Analysis and Design Network Programming	3	0	0	3	3
5	C325	**Open Elective-II** Open Electives offered by other departments/ MEAN Stack Development *(Job Oriented)*	3	0	0	3	3
6	C326	Machine Learning using Python Lab	0	0	3	3	1.5
7	C327	Compiler Design Lab	0	0	3	3	1.5
8	C328	Cryptography and Network Security Lab	0	0	3	3	1.5
9	C329	**Skill Oriented Course – IV** Big Data: Spark **OR** MEAN Stack Technologies-Module I (HTML 5, JavaScript, Node.js, Express.js and TypeScript)	0	0	4	4	2
		Total	15	0	13	28	21.5
		Mandatory Course					
10		Employability skills-II	0	0	0	3	0
Minor course			3	0	2	**5**	**4**
Minor course through SWAYAM							

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SEVENTH SEMESTER

S.No	Course Code	Courses	L	T	P	Contact Hrs./W k	C
1	C411	Professional Elective-III Cloud Computing Neural Networks and Soft Computing Ad-hoc and Sensor Networks Cyber Security & Forensics	3	0	0	3	3
2	C412	Professional Elective-IV Deep Learning Techniques Social Networks & Semantic Web Computer Vision 4.MOOCS-NPTEL/SWAYAM*	3	0	0	3	3
3	C413	Professional Elective-V Block-Chain Technologies Wireless Network Security Ethical Hacking MOOCS-NPTEL/SWAYAM*	3	0	0	3	3
4	C414	Open Elective-III Open Electives offered by other departments/API and Microservices (Job Oriented Course)	3	0	0	3	3
5	C415	Open Elective-IV Open Electives offered by other departments/Secure Coding Techniques(Job Oriented Course)	3	0	0	3	3
6	C416	Universal Human Values II: Understanding Harmony	3	0	0	3	3
7	C417	PYTHON: Deep Learning OR MEAN Stack Technologies-Module II- Angular JS and MongoDB OR APSSDC offered Courses	0	0	4	4	2
8	C418	Industrial/Research Internship 2 months (Mandatory) after third year (to be evaluated during VII S emester	0	0	0	3	3
		Total	18	0	4	25	23
		Minor Course	3	0	2		4
		Minor course through SWAYAM					

EIGTH SEMESTER

S.No	Course Code	Course Title	L	T	P	Contact Hours	C
1	C421	Project Work, Seminar Internship in Industry	-	-	-	-	08
Total Credits							08

Note:
For MOOC Courses: Based on the student's interest, student can register and complete a 12 week course one year advance, by prior information to the concern.

For courses with L-T-P-C:3-0-2-4/2-0-2-3, the distribution shall be 30 marks for internal evaluation (15 marks for day–to–day work & lab internal exam and 15 marks for mid exam from theory part) and 70 marks for semester end examination. There shall be two mid exams in a semester for 15 marks each and final marks can be calculated with 80% weightage for better of the two mids and 20% weightage for other mid and these are to be added to the marks obtained in day-to-day work & lab internal exam.

List of Open Electives Offered by the Institute
Open Electives offered by CE department for other branches
(Except for CE branch)

Open Elective-I								
S. No	Course Category	Course Code	Course Name	L	T	P	Contact Hrs./wk	C
1	OEC	**Open Elective-I**	Remote Sensing and GIS	3	0	0	3	3
2	OEC	**Open Elective-I**	Environmental Pollution Control	3	0	0	3	3
3	OEC	**Open Elective-I**	Conservation of Water Resources	3	0	0	3	3
Open Elective-II								
1	OEC	**Open Elective-II**	Environmental Engineering	3	0	0	3	3
2	OEC	**Open Elective-II**	Disaster Management	3	0	0	3	3
3	OEC	**Open Elective-II**	Green Technologies	3	0	0	3	3
Open Elective-III								
1	OEC	**Open Elective-III**	Safety Engineering	3	0	0	3	3
2	OEC	**Open Elective-III**	Water Resources Engineering	3	0	0	3	3
3	OEC	**Open Elective-III**	Elements of Civil Engineering	3	0	0	3	3
Open Elective-IV								
1	OEC	**Open Elective-IV**	Air Pollution Control Engineering	3	0	0	3	3
2	OEC	**Open Elective-IV**	Urban Planning	3	0	0	3	3
3	OEC	**Open Elective-IV**	Environmental Impact Assessment	3	0	0	3	3

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Open Electives offered by CSE department for other branches
(Except for CSE branch)

Open Elective-I								
S. No	Course Category	Course Code	Course Name	L	T	P	Contact Hrs./wk	C
1	OEC	**Open Elective-I**	Data Structures	3	0	0	3	3
2	OEC	**Open Elective-I**	Object Oriented Programming through JAVA	3	0	0	3	3
3	OEC	**Open Elective-I**	Data Base Management Systems	3	0	0	3	3
4	OEC	**Open Elective-I**	Computer Graphics	3	0	0	3	3
5	OEC	**Open Elective-I**	Advanced UNIX Programming	3	0	0	3	3
6	OEC	**Open Elective-I**	Computer Organization and Architecture	3	0	0	3	3
7	OEC	**Open Elective-I**	Operating Systems	3	0	0	3	3
Open Elective-II								
1	OEC	**Open Elective-II**	Python Programming	3	0	0	3	3
2	OEC	**Open Elective-II**	Web Technologies	3	0	0	3	3
3	OEC	**Open Elective-II**	Soft Computing	3	0	0	3	3
4	OEC	**Open Elective-II**	Distributed Computing	3	0	0	3	3
5	OEC	**Open Elective-II**	AI and ML for Robotics	3	0	0	3	3
6	OEC	**Open Elective-II**	Computer Networks	3	0	0	3	3
7	OEC	**Open Elective-II**	Big Data Analytics	3	0	0	3	3
8	OEC	**Open Elective-II**	Computational Tools	3	0	0	3	3
Open Elective-III								
1	OEC	**Open Elective-III**	AI Tools & Techniques	3	0	0	3	3
2	OEC	**Open Elective-III**	Image Processing	3	0	0	3	3
3	OEC	**Open Elective-III**	Information Security	3	0	0	3	3
4	OEC	**Open Elective-III**	Mobile Application Development	3	0	0	3	3
5	OEC	**Open Elective-III**	Data Science	3	0	0	3	3
6	OEC	**Open Elective-III**	Cyber Security	3	0	0	3	3
7	OEC	**Open Elective-III**	Introduction to Internet of Things	3	0	0	3	3

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Open Elective-IV

1	OEC	**Open Elective-IV**	MEAN Stack Technologies	3	0	0	3	3
2	OEC	**Open Elective-IV**	Deep Learning Techniques	3	0	0	3	3
3	OEC	**Open Elective-IV**	Cloud computing with AWS	3	0	0	3	3
4	OEC	**Open Elective-IV**	Block Chain Technologies	3	0	0	3	3
5	OEC	**Open Elective-IV**	Cryptography & Network Security	3	0	0	3	3
6	OEC	**Open Elective-IV**	Introduction to Machine Learning	3	0	0	3	3
7	OEC	**Open Elective-IV**	Machine Learning with Python	3	0	0	3	3

Open Electives offered by ECE department for other branches
(Except for ECE branch)

Open Elective-I

S. No	Course Category	Course Code	Course Name	L	T	P	Contact Hrs./wk	C
1	OEC	**Open Elective-I**	Basic Electronics	3	0	0	3	3
2	OEC	**Open Elective-I**	Basics of Signals and systems	3	0	0	3	3
3	OEC	**Open Elective-I**	Digital logic design	3	0	0	3	3
4	OEC	**Open Elective-I**	Consumer Electronics	3	0	0	3	3

Open Elective-II

1	OEC	**Open Elective-II**	Electronic measurements and Instrumentation	3	0	0	3	3
2	OEC	**Open Elective-II**	Principles of communications	3	0	0	3	3
3	OEC	**Open Elective-II**	Industrial Electronics	3	0	0	3	3
4	OEC	**Open Elective-II**	Fundamentals of Microprocessors and Microcontrollers	3	0	0	3	3

Open Elective-III

1	OEC	**Open Elective-III**	IC Applications	3	0	0	3	3
2	OEC	**Open Elective-III**	Transducers and Sensors	3	0	0	3	3
3	OEC	**Open Elective-III**	Data Communications	3	0	0	3	3
4	OEC	**Open Elective-III**	Bio Medical Instrumentation	3	0	0	3	3

Open Elective-IV

1	OEC	**Open Elective-IV**	IOT and applications	3	0	0	3	3
2	OEC	**Open Elective-IV**	Remote Sensing and GIS	3	0	0	3	3
3	OEC	**Open Elective-IV**	Soft computing Techniques	3	0	0	3	3
4	OEC	**Open Elective-IV**	Principles of Signal Processing	3	0	0	3	3

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Open Electives offered by EEE department for other branches
(Except for EEE branch)

Open Elective-I								
S. No	Course Category	Course Code	Course Name	L	T	P	Contact Hrs./wk	C
1	OEC	**Open Elective-I**	Renewable Energy Sources	3	0	0	3	3
2	OEC	**Open Elective-I**	Concepts of Optimization Techniques	3	0	0	3	3
3	OEC	**Open Elective-I**	Concepts of Control Systems	3	0	0	3	3
Open Elective-II								
1	OEC	**Open Elective-II**	Battery Management Systems and Charging Stations	3	0	0	3	3
2	OEC	**Open Elective-II**	Fundamentals of utilization of Electrical Energy	3	0	0	3	3
3	OEC	**Open Elective-II**	Indian Electricity Act	3	0	0	3	3
Open Elective-III								
1	OEC	**Open Elective-III**	Concepts of Microprocessors and Microcontrollers	3	0	0	3	3
2	OEC	**Open Elective-III**	Fundamentals of Electric Vehicles	3	0	0	3	3
3	OEC	**Open Elective-III**	Concepts of Internet of Things	3	0	0	3	3
Open Elective-IV								
1	OEC	**Open Elective-IV**	Concepts of Power System Engineering	3	0	0	3	3
2	OEC	**Open Elective-IV**	Concepts of Smart Grid Technologies	3	0	0	3	3

Open Electives offered by IT department for other branches
(Except for IT branch)

Open Elective-I								
S. No	Course Category	Course Code	Course Name	L	T	P	Contact Hrs./wk	C
1	OEC	**Open Elective-I**	Full Stack Technologies	2	0	2	4	3
2	OEC	**Open Elective-I**	R-Programming	2	0	2	4	3
3	OEC	**Open Elective-I**	Scripting Languages	2	0	2	4	3
Open Elective-II								
1	OEC	**Open Elective-II**	Basics of AWS Framework	2	0	2	4	3
2	OEC	**Open Elective-II**	Mobile Application Development	2	0	2	4	3
3	OEC	**Open Elective-II**	NoSQL Databases	2	0	2	4	3

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Open Elective-III								
1	OEC	**Open Elective-III**	Advanced python Programming	2	0	2	4	3
2	OEC	**Open Elective-III**	Deep Learning	2	0	2	4	3
3	OEC	**Open Elective-III**	Web Technologies	2	0	2	4	3
Open Elective-IV								
1	OEC	**Open Elective-IV**	Network Programming	2	0	2	4	3
2	OEC	**Open Elective-IV**	Big Data Technologies	2	0	2	4	3
3	OEC	**Open Elective-IV**	Data Science	2	0	2	4	3

Open Electives offered by ME department for other branches
(Except for ME branch)

Open Elective-I								
S. No	Course Category	Course Code	Course Name	L	T	P	Contact Hrs./wk	C
1	OEC	**Open Elective-I**	Robotics	3	0	0	3	3
2	OEC	**Open Elective-I**	Fundamentals of Hybrid Vehicles	3	0	0	3	3
3	OEC	**Open Elective-I**	Industrial Safety and Environment	3	0	0	3	3
Open Elective-II								
1	OEC	**Open Elective-II**	Fundamentals of Operations Research	3	0	0	3	3
2	OEC	**Open Elective-II**	Finite Element Analysis	3	0	0	3	3
3	OEC	**Open Elective-II**	Principles of Nano Technology	3	0	0	3	3
Open Elective-III								
1	OEC	**Open Elective-III**	Sustainable energy Technologies	3	0	0	3	3
2	OEC	**Open Elective-III**	Optimization Techniques	3	0	0	3	3
3	OEC	**Open Elective-III**	Advanced materials	3	0	0	3	3
Open Elective-IV								
1	OEC	**Open Elective-IV**	Fundamentals of Mechatronics	3	0	0	3	3
2	OEC	**Open Elective-IV**	Industrial Engineering & Quality Control	3	0	0	3	3
3	OEC	**Open Elective-IV**	Rapid prototyping	3	0	0	3	3

Suggested Courses MINOR DEGREE in CSE

SN O	Course Category	Courses	L	T	P	Contact Hrs./Wk	C
1	MD	Operating Systems	3	0	2	5	4
2	MD	Data Structures and Algorithms	3	0	2	5	4
3	MD	Software Engineering	3	0	2	5	4
4	MD	Computer Networks	3	0	2	5	4
5	MD	Database Management Systems	3	0	2	5	4
1	MD	Computational Thinking	4	0	0	4	4
2	MD	Object Oriented Programming through JAVA	3	0	2	5	4
3	MD	Data Analytics using Python	3	0	2	5	4
4	MD	Artificial Intelligence	4	0	0	4	4
5	MD	Unix and Shell Programming	3	0	2	5	4
6	MD	Cloud Computing	4	0	0	4	4

Note:

Any THREE courses need to be studied from PART-A.

Any ONE course need to be studied from PART-B.

TWO, NPTEL courses of EIGHT week duration covering a total of 4 credits (offered by CSE Department only), Student can register at any time after the completion of II B.Tech. I Sem.

Students can pursue suggested MOOC Courses via NPTEL from II B.Tech II Sem and onwards, by prior information to the concern.

PART A			
S.No	Subject	Course available in NPTEL	NPTEL Link
1	Operating Systems	Operating Systems	https://onlinecourses.swayam2.ac.in/cec21_cs20/preview
2	Data Structures and Algorithms	Data Structures Programming, Data Structures and Algorithms using Python	https://onlinecourses.swayam2.ac.in/cec22_cs10/preview https://onlinecourses.nptel.ac.in/noc22_cs26/preview
3	Software Engineering	Software Engineering	https://onlinecourses.swayam2.ac.in/cec21_cs21/preview
4	Computer Networks	Computer Networks	https://onlinecourses.swayam2.ac.in/cec22_cs05/preview
5	Database Management Systems	Data Base Management System (noc22-cs51)	https://onlinecourses.nptel.ac.in/noc22_cs51/preview

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PART-B			
S.No	**Subject**	**Course available in NPTEL**	**NPTEL Link**
1	Computational Thinking	Physics through Computational Thinking	https://onlinecourses.nptel.ac.in/noc22_ph12/preview
2	Object Oriented Programming through JAVA	Data Analytics with Python	
3	Data Analytics using Python		https://onlinecourses.nptel.ac.in/noc22_cs8/preview
4	Artificial Intelligence	Artificial Intelligence: Knowledge Representation And Reasoning (noc22-cs02), An Introduction to Artificial Intelligence (noc22-cs56), AI: Constraint Satisfaction (noc22-cs06)	https://onlinecourses.nptel.ac.in/noc22_cs56/preview https://onlinecourses.swayam2.ac.in/cec21_cs08/preview
5	Unix and Shell Programming		
6	Cloud Computing	Cloud Computing and Distributed Systems (noc22-cs18), Cloud computing(noc22-cs20)	https://onlinecourses.nptel.ac.in/noc22_cs18/preview https://onlinecourses.nptel.ac.in/noc22_cs20/preview

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Suggested Courses for Honors Program

POOL1- AI & ML	**POOL2- Systems Engineering**
Mathematics for Machine Learning	Data Communications and InformationCoding Theory
Text Mining and Time Series Analysis	Internet of Things
Natural Language Processing	Service Oriented Architectures
Reinforcement Learning	Design of Secure Protocols
	Network Coding
POOL3- Information Security	**POOL4 – Data Science**
Computational Number Theory	Statistical Foundations for Data Science
Cryptanalysis	Mining Massive Data Sets
Elliptic Curve Cryptography	Data Visualization
Introduction to Quantum Computing andQuantum Cryptography	Medical Image Data Processing
Public Key Infrastructure andTrust Management Information Security Analysis andAudit Principles of Cyber SecurityCloud and IoT Security Web Security Block Chain Architecture Design and Use Cases	

Open Electives to be offered by CSE for other Branches:

Open Elective-I:	**Open Elective-II:**
Data Structures	Python Programming
Object Oriented Programming throughJAVA	Web Technologies
Data Base Management Systems	Soft Computing
Computer Graphics	Distributed Computing
Advanced UNIX Programming	AI and ML for Robotics
Computer Organization and Architecture	Computer Networks
Operating Systems	Big Data Analytics
	Computational Tools
Open Elective-III:	**Open Elective-IV:**
AI Tools & Techniques	MEAN Stack Technologies
Image Processing	Deep Learning Techniques
Information Security	Cloud computing with AWS
Mobile Application Development	Block Chain Technologies
Data Science	Cryptography & Network Security
Cyber Security	Introduction to Machine Learning
Introduction to Internet of Things	Machine Learning with Python