

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI
(AUTONOMOUS)
B.Tech-CSE(DATA SCIENCE)
(Effective for the batches admitted in 2022-23)**

Semester I (First year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	BS	20ABS9901	Algebra & Calculus	3	0	0	3	30	70	100
2	BS	20ABS9902	Applied Physics	3	0	0	3	30	70	100
3	ES	20AES0501	Problem Solving and Programming	3	0	0	3	30	70	100
4	ES	20AES0301	Engineering Graphics	1	0	4	3	30	70	100
5	HS	20AHS9901	Communicative English	3	0	0	3	30	70	100
6	HS LAB	20AHS9902	Communicative English Lab	0	0	3	1.5	30	70	100
7	BS LAB	20ABS9907	Applied Physics Lab	0	0	3	1.5	30	70	100
8	ES LAB	20AES0503	Problem Solving and Programming Lab	0	0	3	1.5	30	70	100
Total credits							19.5	240	560	800

Semester II (First year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	BS	20ABS9904	Chemistry	3	0	0	3	30	70	100
2	BS	20ABS9911	Probability and Statistics	3	0	0	3	30	70	100
3	ES	20AES0505	Information Technology and Numerical Methods	3	0	0	3	30	70	100
4	ES	20AES0502	Data Structures	3	0	0	3	30	70	100
5	ES	20AES0509	Python Programming	1	0	4	3	30	70	100
6	ES LAB	20AES0506	Computer Science and Engineering Workshop	0	0	3	1.5	30	70	100
7	BS LAB	20ABS9909	Chemistry Lab	0	0	3	1.5	30	70	100
8	ES LAB	20AES0504	Data Structures Lab	0	0	3	1.5	30	70	100
9	MC	20AMC9903	Environmental Studies	2	0	0	0	30	0	30
Total credits							19.5	270	560	830

Semester III (Second year) – AK20

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	BS	20ABS9914	Discrete Mathematical Structures	3	0	0	3	30	70	100
2	PC	20APC0503	Digital Electronics & Microprocessors	3	0	0	3	30	70	100
3	PC	20APC0502	Database Management Systems	3	0	0	3	30	70	100
4	PC	20APC0526	Basics of Python Programming	3	0	0	3	30	70	100
5	ES	20AES0205	Basics of Electrical and Electronics Engineering	3	0	0	3	30	70	100
6	PC Lab	20APC0505	Database Management Systems Lab	0	0	3	1.5	30	70	100
7	PC Lab	20APC0527	Basics of Python Programming Lab	0	0	3	1.5	30	70	100
8	ES Lab	20AES0206	Basics of Electrical and Electronics Engineering Lab	0	0	3	1.5	30	70	100
9	SC	20ASC0501	Client Side Scripting	1	0	2	2	100	0	100
10	MC	20AMC9902	Constitution of India	2	0	0	0	30	0	30
Total credits							21.5	370	560	930

Semester IV (Second year) – AK20

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	PC	20APC0506	Computer Organization	3	0	0	3	30	70	100
2	PC	20APC0511	Design And Analysis Of Algorithms	3	0	0	3	30	70	100
3	PC	20APC0512	Object Oriented Programming through Java	3	0	0	3	30	70	100
4	PC	20APC0515	Operating Systems	3	0	0	3	30	70	100
5	HS	20AHSMB01	Managerial Economics and Financial Analysis	3	0	0	3	30	70	100
6	HS	20AHS9905	Universal Human Values	3	0	0	3	30	70	100
7	PC Lab	20APC0504	Computer Organization Lab	0	0	2	1	30	70	100
8	PC Lab	20APC0514	Object Oriented Programming through Java Lab	0	0	4	2	30	70	100
9	PC Lab	20APC0513	Operating Systems Lab	0	0	3	1.5	30	70	100
10	SC	20ASC0502	Server Side Scripting	1	0	2	2	100	0	100
Total credits							24.5	370	630	1000
Community service Project with credits										
(To visit the selected community to conduct survey (Socio-economic & domain survey) and conduct sensitization/awareness program/activities at the end of IV- semester before commencement of V-semester and complete immersion programme also during V-Semester and submit report in V - semester. Assessment will be done at the end of V-Semester).										
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)				4	0	0	4	0	0	0

Semester V (Third year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	PC	20APC0516	Computer Networks	3	0	0	3	30	70	100
2	PC	20APC0518	Formal Languages & Automata Theory	3	0	0	3	30	70	100
3	PC	20APC0519	Software Engineering	3	0	0	3	30	70	100
4	OE-1	20APE0417 20AOE0303 20AOE9925	Sensors and IoT Optimization Techniques Deterministic & Stochastic Statistical Methods	3	0	0	3	30	70	100
5	PE-1	20APE0501 20APE0502 20APE0503	Data Warehousing and Mining Design Patterns Computer Graphics	3	0	0	3	30	70	100
6	PC Lab	20APC0520	Software Engineering Lab	0	0	3	1.5	30	70	100
7	PC Lab	20APC0517	Computer Networks Simulation Lab	0	0	3	1.5	30	70	100
8	SC	20ASA0503	Mobile Application Development	1	0	2	2	100	0	100
9	MC	20AMC9901	Biology for Engineers	2	0	0	0	30	0	30
10	CSP	20CSP0501	Community service project	0	0	0	1.5	100	0	100
Total credits							21.5	440	490	930
Honors/Minor courses (The hours distribution can be 3-0- 2 or 3-1-0 also)				4	0	0	4	0	0	0

Semester VI (Third year)

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	PC	20APC0521	Artificial Intelligence	3	1	0	3	30	70	100
2	PC	20APC0523	Compiler Design	3	0	0	3	30	70	100
3	PC	20APC0528	Cloud Computing	3	0	0	3	30	70	100
4	PE-2	20APE0504 20APE0505 20APE0506	Machine Learning Real Time Operating Systems Blockchain Technology	3	0	0	3	30	70	100
5	OE-2/ JOE (MOOCS-1)		Introduction to robotics Design, Technology and Innovation Introduction to Smart Grid Introduction to Wireless and Cellular Communications Stochastic control and communication Real-Time Digital Signal Processing VLSI Interconnects Developing Soft Skills and Personality Body language: Key to professional Success Psychology of Everyday	-	-	-	3	-	-	100

			Educational Leadership Entrepreneurship And IP Strategy Globalization And Culture Consumer Psychology Public Speaking Project Management Training Of Trainers Decision-Making Under Uncertainty Game Theory Organizational Behavior Customer Relationship Management Decision Support System For Managers Stress Management							
6	PC Lab	20APC0522	Artificial Intelligence Lab	0	0	3	1.5	30	70	100
7	PC Lab	20APC0524	Compiler Design Lab	0	0	3	1.5	30	70	100
8	PC Lab	20APC0529	Cloud Computing Lab	0	0	3	1.5	30	70	100
9	SC	20ASA0502	Soft Skills	1	0	2	2	100	0	100
10	MC	20AMC9904	Professional Ethics and Human Values	2	0	0	0	30	0	30
			Total credits				21.5	340	490	930
			Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)	4	0	0	4	0	0	0
Industry Internship (Mandatory) for 6-8 Weeks duration during summer vacation										

Semester VII (Fourth year)

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	PE-3		Cyber Security Agile Methodologies Adhoc & Sensor Networks Soft Computing Distributed Systems	3	1	0	3	30	70	100
2	PE-4		Predictive Analytics Natural Language Processing Data Analytics Information Retrieval Techniques Human-Computer Interfaces	3	0	0	3	30	70	100
3	PE-5 (MOOCS-2)		Reinforcement Learning Introduction to Quantum Computing: Quantum Algorithms and Qiskit Advanced Distributed systems Parameterized Algorithms Spatial Informatics Demystifying Networking Design & Implementation of Computational Complexity	-	-	-	3	-	-	100
4	OE-3/JOE		Cryptography and Network Security Embedded Systems Fundamentals of Robotics	2	0	2	3	30	70	100
5	OE-4/JOE		Data Science Information Retrieval Systems Advanced Computer Networks	2	0	2	3	30	70	100
6	HE		Management Science Mathematical Modelling Simulation Entrepreneurship Development	3	0	0	3	30	70	100
7	SA	20ASA0504	Data Analysis using R	1	0	2	2	100	0	100
8	PR	20APR0501	Evaluation of Industry Internship(III-II Summer Internship)	0	0	0	3	100	0	100
Total credits							23	350	350	800
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)				4	0	0	4	0	0	0

Semester VIII (Fourth year)

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	PR	20APR0502	Project Project work, seminar and internship in industry	0	0	0	12	60	140	200
Total credits							12	60	140	200

HONOURS IN COMPUTER SCIENCE AND ENGINEERING – DATA SCIENCE

S.NO	SUB.CODE	COURSE NAME	CREDITS
1	20AHN3201	DESIGN AND IMPLEMENTATION OF HUMAN COMPUTER INTERFACES	3
2	20AHN3202	SOCIAL NETWORKS	3
3	20AHN3203	NO SQL DATABASES	3
4	20AHN3204	ADVANCED IOT APPLICATIONS	3
5	20AHN3205	INTRODUCTION TO INDUSTRY 4.0 AND INDUSTRIAL INTERNET OF THINGS	3
6	20AHN3206	COMPETITIVE PROGRAMMING-1/International Collegiate Programming Contest(ICPC) Laboratory-1	2.5
7	20AHN3207	COMPETITIVE PROGRAMMING-2/International Collegiate Programming Contest(ICPC) Laboratory-2	2.5
		TOTAL	20

MINOR DEGREE IN DATA SCIENCE FOR ECE, EEE, CE & ME

S.NO	SUB.CODE	COURSE NAME	CREDITS
1	20AMN3201	OPERATING SYSTEMS	3
2	20AMN3202	COMPUTER ORGANIZATION	3
3	20AMN3203	COMPUTER NETWORKS	3
4	20AMN3204	DESIGN AND ANALYSIS OF ALGORITHMS	3
5	20AMN3205	OBJECT ORIENTED PROGRAMMING THROUGH JAVA	3
6	20AMN3206	MINOR DISCIPLINE PROJECT	5
		TOTAL	20