1.1.3-CSE file 3.

_R15

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., Act. No. 30 of 2008)
ANANTHAPURAMU – 515 002 (A.P.) INDIA.

Course Structure for B.Tech-R15 Regulations

COMPUTER SCIENCE AND ENGINEERING

I B.Tech. - I Semester

S.No	Course code	Subject	L	T	P	Drg	C
1.	15A52101	Functional English	3	1	-	-	3
2.	15A54101	Mathematics – I	3	1	-	-	3
3.	15A05101	Computer Programming	3	1	-	-	3
4.	15A56101	Engineering Physics	3	1	-	-	3
5.	15A03101	Engineering Drawing	-	-	-	6	3
6.	15A52102	English Language Communication Skills Lab	-	-	4	-	2
7.	15A56102	Engineering Physics Lab	-	-	4	-	2
8.	15A05102	Computer Programming Lab	-	-	4	-	2
		Total	12	4	12	6	21

I-II Semester

S.No	Course code	Subject	L	T	P	C
1.	15A52201	English for Professional Communication	3	1	-	3
2.	15A54201	Mathematics – II	3	1	-	3
3.	15A05201	Data Structures	3	1	-	3
4.	15A51101	Engineering Chemistry	3	1	-	3
5.	15A01101	Environmental Studies	3	1	-	3
6.	15A05202	Data Structures Lab	-	-	4	2
7.	15A51102	Engineering Chemistry Lab	-	-	4	2
8.	15A99201	Engineering & IT Workshop	-	-	4	2
		Total	15	5	12	21

*** L - Lecture hours**
***T - Tutorial hours**
***P - Practical hours**
***Drg - Drawing**

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

II B. Tech – I Sem

S. No	Course Code	Subject	L	T	P	C
1	15A54301	Mathematics III	3	1	-	3
2	15A05301	Database Management Systems	3	1	-	3
3	15A05302	Discrete Mathematics	3	1	-	3
4	15A99301	Basic Electrical and Electronics Engineering	3	1	-	3
5	15A04306	Digital Logic Design	3	1	-	3
6	15A52301	Managerial Economics and Financial Analysis	3	1	-	3
7	15A05303	Database Management Systems Laboratory	-	-	4	2
8	15A99302	Basic Electrical and Electronics Laboratory	-	-	4	2
		Total	18	06	08	22

II B. Tech – II Sem

S. No	Course Code	Subject	L	T	P	C
1	15A54401	Probability and Statistics	3	1	-	3
2	15A05401	Software Engineering	3	1	-	3
3	15A05402	Computer Organization	3	1	-	3
4	15A04407	Microprocessors & Interfacing	3	1	-	3
5	15A05403	Object Oriented Programming using Java	3	1	-	3
6	15A05404	Formal Languages and Automata Theory	3	1	-	3
7	15A04408	Microprocessors & Interfacing Laboratory	-	-	4	2
8	15A05405	Java Programming Laboratory	-	-	4	2
9	15A05406	Comprehensive Online Examination-I	-	-	-	1
		Total	18	06	08	23

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

B.Tech III-I Semester (CSE)

S. No.	Course Code	Subject	L	T	P	C
1.	15A05501	Operating Systems	3	1	-	3
2.	15A05502	Computer Networks	3	1	-	3
3.	15A05503	Object Oriented Analysis and Design	3	1	-	3
4.	15A05504	Principles of Programming Languages	3	1	-	3
5.	15A05505	Software Testing	3	1	-	3
6.	15A05506 15A05507 15A05508	**MOOCS-I** a. Introduction to Big Data b. R Programming c. Introduction to Operations Management	3	1	-	3
7.	15A05509	Object Oriented Analysis and Design & Software Testing Laboratory	-	-	4	2
8.	15A05510	Operating Systems Laboratory	-	-	4	2
9.	15A99501	Social Values & Ethics (Audit Course)	2	-	2	-
		Total	**20**	**06**	**10**	**22**

B.Tech III-II Semester (CSE)

S. No.	Course Code	Subject	L	T	P	C
1.	15A05601	Compiler Design	3	1	-	3
2.	15A05602	Data Warehousing & Mining	3	1	-	3
3.	15A05603	Design Patterns	3	1	-	3
4.	15A05604	Design and Analysis of Algorithms	3	1	-	3
5.	15A05605	Web and Internet Technologies	3	1	-	3
6.	15A05606 15A05607 15A05608 15A01608	**CBCC-I** a. Artificial Intelligence b. Linux Environment System c. System Applications & Product (SAP) d. Intellectual Property Rights	3	1	-	3
7.	15A05609	Web and Internet Technologies Laboratory	-	-	4	2
8.	15A05610	Data Warehousing & Mining Laboratory	-	-	4	2
9.	15A52602	Advanced English Language Communication Skills(AELCS) Laboratory)	-	-	2	-

HEAD
Dept. of Computer Science
Annamacharya Institute of
Technology & Sciences, Tirupati-5

		(Audit Course)				
10.	15A05611	Comprehensive Online Examination-II	-	-	-	1
		Total	**18**	**06**	**10**	**23**

B.Tech IV-I Semester (CSE)

S. No.	Course Code	Subject	L	T	P	C
1.	15A52601	Management Science	3	1	-	3
2.	15A05701	Grid & Cloud Computing	3	1	-	3
3.	15A05702	Information Security	3	1	-	3
4.	15A05703	Mobile Application Development	3	1	-	3
5.	15A05704 15A05705 15A05706	**CBCC-II** a. Software Architecture b. Computer Graphics c. Machine Learning	3	1	-	3
6.	15A05707 15A05708 15A05709	**CBCC-III** a. Software Project Management b. Distributed Systems c. Real Time Systems	3	1	-	3
7.	15A05710	Grid & Cloud Computing Laboratory	-	-	4	2
8.	15A05711	Mobile Application Development Laboratory	-	-	4	2
		Total	**18**	**06**	**08**	**22**

B.Tech IV-II Semester (CSE)

S. No.	Course Code	Subject	L	T	P	C
1.	15A05801 15A05802 15A05803	**MOOCS-II** a. Data Analytics b. Mobile Computing c. Innovations and IT Management	3	1	-	3
2.	15A05804 15A05805 15A05806	**MOOCS-III** a. Building Large Scale Software Systems b. Enabling Technologies for Data Science & Analytics : IoT	3	1	-	3

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

		c. Cyber Security				
3.	15A05807	Comprehensive Viva-Voce	-	-	4	2
4.	15A05808	Technical Seminar	-	-	4	2
5.	15A05809	Project Work	-	-	24	12
		Total	6	2	32	22

Minor Discipline in CSE

S. No.	Course Code	Subject	L	T	P	C
1	15A05201	Data Structures	3	1	-	3
2	15A05301	Database Management Systems	3	1	-	3
3	15A05401	Software Engineering	3	1	-	3
4	15A05501	Operating Systems	3	1	-	3
5	15M05101	Minor Discipline Project	-	-	-	8
		Total	**12**	**4**	**-**	**20**

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

1.1.3 files

AK-19 CSE

I B. Tech – I Semester (Theory – 3, Lab – 4)

S.No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
THEORY										
1	BS	19ABS9901	Algebra & Calculus	3	1	0	4	30	70	100
2	BS	19ABS9904	Chemistry	3	0	0	3	30	70	100
3	ES	19AES0501	Problem Solving and Programming	3	1	0	4	30	70	100
PRACTICAL										
4	ES	19AES0301	Engineering Graphics Lab	1	0	4	3	30	70	100
5	LC	19ALC0301	Engineering Workshop	0	0	2	1	30	70	100
6	BS	19ABS9909	Chemistry Lab	0	0	3	1.5	30	70	100
7	ES	19AES0503	Problem Solving and Programming Lab	0	0	4	2	30	70	100
TOTAL							**18.5**	**210**	**490**	**700**

I B. Tech – II Semester (Theory – 5, Lab – 5)

S.No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
THEORY										
1	ES	19AES0202	Basics of Electrical and Electronics Engineering	3	0	0	3	30	70	100
2	BS	19ABS9911	Probability and Statistics	3	1	0	4	30	70	100
3	BS	19ABS9902	Applied Physics	3	0	0	3	30	70	100
4	ES	19AES0502	Data Structures	3	0	0	3	30	70	100
5	HS	19AHS9901	Communicative English - I	0	0	2	2	30	70	100
PRACTICAL										
5	LC	19ALC0501	Computer Science and Engineering Workshop Lab	0	0	2	1	30	70	100
6	HS	19AHS9902	Communicative English - I Lab	0	0	2	1	30	70	100
7	ES	19AES0204	Basics of Electrical and Electronics Engineering Lab	0	0	3	1.5	30	70	100
8	BS	19ABS9907	Applied Physics Lab	0	0	3	1.5	30	70	100
9	ES	19AES0504	Data Structures Lab	0	0	3	1.5	30	70	100
						TOTAL	**21.5**	**300**	**700**	**1000**

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5.

II B. Tech – I Semester (Theory – 7, Lab – 3)

S. No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
THEORY										
1	BS	19ABS9921	Numerical Methods	3	0	0	3	30	70	100
2	ES	19AES0509	Basics of Python Programming	2	0	0	2	30	70	100
3	ES	19AES0104	Basic Civil & Mechanical Engineering	3	0	0	3	30	70	100
4	PC	19APC0501	Discrete Mathematics	3	0	0	3	30	70	100
5	PC	19APC0502	Database Management Systems	3	0	0	3	30	70	100
6	PC	19APC0503	Digital Logic Design	3	0	0	3	30	70	100
7	MC	19AMC9901	Biology for Engineers	2	0	0	0	30	-	30
PRACTICAL										
8	ES	19AES0510	Basics of Python Programming Lab	0	0	2	1	30	70	100
9	ES	19AES0105	Basic Civil & Mechanical Engineering Lab	0	0	3	1.5	30	70	100
10	PC	19APC0505	Database Management Systems Lab	0	0	4	2	30	70	100
						TOTAL	21.5	300	630	930

II B. Tech – II Semester (Theory – 7, Lab – 5)

S. No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
THEORY										
1	PC	19APC0512	Object Oriented Programming through Java	3	0	0	3	30	70	100
2	HS	19AHS9903	Communicative English II	2	0	0	2	30	70	100
3	ES	19AES0302	Design Thinking & Product Innovation	2	0	0	2	30	70	100
4	PC	19APC0506	Computer Organization	3	0	0	3	30	70	100
5	PC	19APC0511	Design and Analysis of Algorithms	3	0	0	3	30	70	100
6	PC	19APC0509	Formal Languages and Automata Theory	3	0	0	3	30	70	100
7	MC	19AMC9903	Environmental Studies	2	0	0	0	30	-	30
PRACTICAL										
8	PR	19APR0501	Socially Relevant Project (15 Hrs / Sem)	0	0	0	0.5	50	-	50
9	HS	19AHS9904	Communicative English II Lab	0	0	2	1	30	70	100
10	ES	19AES0303	Design Thinking & Product Innovation Lab	0	0	2	1	30	70	100
11	PC	19APC0504	Computer Organization Lab	0	0	2	1	30	70	100
12	PC	19APC0514	Object Oriented Programming through Java Lab	0	0	4	2	30	70	100
						TOTAL	21.5	380	700	1080

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5.

III B. Tech – I Semester (Theory – 7, Lab – 4) – AK19

S. No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
THEORY										
1	PC	19APC0515	Operating Systems	3	0	0	3	30	70	100
2	PC	19APC0521	Artificial Intelligence	3	0	0	3	30	70	100
3	PC	19APC0520	Compiler Design	3	0	0	3	30	70	100
4	PC	19APC0507	Software Engineering	2	0	0	2	30	70	100
5	OE	19APE0417 19AOE0303 19APC0428	Open Elective I Sensors and IoT Optimization Techniques Microprocessor and Interfacing	3	0	0	3	30	70	100
6	PE	19APE0501 19APE0502 19APE0503	Professional Elective I Data Warehousing and Mining Design Patterns Computer Graphics	3	0	0	3	30	70	100
7	MC	19AMC9904	Professional Ethics and Human Values	3	0	0	0	30	-	30
PRACTICAL										
8	PR	19APR0502	Socially Relevant Projects (15 Hrs/Semester)	0	0	0	0.5	50	-	50
9	PC	19APC0517	Operating System Lab	0	0	3	1.5	30	70	100
10	PC	19APC0522	Artificial Intelligence Lab	0	0	3	1.5	30	70	100
11	PC	19APC0508	Compiler Design Lab	0	0	2	1	30	70	100
						TOTAL	**21.5**	**350**	**630**	**980**

III B. Tech – II Semester (Theory – 7, Lab – 4) – AK19

S. No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
THEORY										
1	PC	19APC0510	Computer Networks	3	0	0	3	30	70	100
2	PC	19APC0516	Grid and Cloud Computing	3	0	0	3	30	70	100
3	PC	19APC0513	Machine Learning	3	0	0	3	30	70	100
4	PC	19APC0523	Web Programming	3	0	0	3	30	70	100
5	PE	19APE0504 19APE0505 19APE0506	Professional Elective II Object Oriented Analysis and Design Cyber Security Big Data Analytics	3	0	0	3	30	70	100
6	OE	19AHEMB02 19APC0216 19APE0413	Open Elective II (Inter-Disciplinary Elective II) Entrepreneurship Development Neural Networks and Fuzzy Logic Cellular and Mobile Communications	3	0	0	3	30	70	100
7	MC	19AMC9902	Constitution of India	3	0	0	0	30	-	30
PRACTICAL										
8	PR	19APR0503	Socially Relevant Projects (15 Hrs / Sem)	0	0	0	0.5	50	-	50
9	PC	19APC0525	Computer Networks Lab	0	0	2	1	30	70	100
10	PC	19APC0518	Grid and Cloud Computing Lab	0	0	2	1	30	70	100
11	PC	19APC0524	Web Programming Lab	0	0	2	1	30	70	100
12	Internship has to be carried during Summer Break. Evaluation will be done in next semester.									
						TOTAL	**21.5**	**350**	**630**	**980**

HEAD
Dept. of Computer Science & Engg.
Annamacharya Institute of
Technology & Sciences, Tirupati-5

IV B. Tech – I Semester (Theory – 6, Lab – 4) – AK19

S. No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
THEORY										
1	PC	19APC0519	Cryptography and Network Security	2	0	0	2	30	70	100
2	PC	19APC0526	Mobile Application Development	2	0	0	2	30	70	100
3	OE		Open Elective III (Inter Discipline Elective III) 19APC0423 Digital Image Processing 19APE0411 Embedded Systems 19APE0418 Enabling Technologies For Data Science & Analytics: IoT	3	0	0	3	30	70	100
4	PE		Professional Elective III 19APE0507 Deep Learning Techniques 19APE0508 Real Time Operating Systems 19APE0513 Agile Methodologies 19APE0514 Adhoc & Sensor Networks	3	0	0	3	30	70	100
5	PE		Professional Elective IV 19APE0510 Data Analytics 19APE0511 Natural Language Processing 19APE0512 Software Project Management 19APE0515 Linux Environment System 19APE0516 Distributed Systems	3	0	0	3	30	70	100
6	HE		Humanities Elective I 19AHE9903/ Professional Communication 19AHE9910/ Mathematical Modeling and Simulation 19AHSMB01 Managerial Economics and Financial Analysis	2	0	0	2	30	70	100
PRACTICAL										
7	PC	19APC0528	Cryptography and Network Security Lab	0	0	2	1	30	70	100
8	PC	19APC0527	Mobile Application Development Lab	0	0	2	1	30	70	100
9	PR	19APR0504	Socially Relevant Projects (15 Hrs / Sem)	0	0	0	0.5	50	-	50
10	PR	19APR0505	Industrial Training / Internship / Research Projects in National Laboratories / Academic Institutions	0	0	3	1.5	50	-	50
						TOTAL	**19**	**340**	**560**	**900**

IV B. Tech – II Semester (Theory – 2, Lab – 2) – AK19

S.No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
THEORY										
1	JOE		**Job Oriented Elective I (MOOCs)** **19AJOE0501 Blockchain and its Applications** **19AJOE0501B Introduction to Cyber Security** 19AJOE0502 Model Checking 19AJOE0503 System and usable security 19AJOE0504 Introduction to soft computing 19AJOE0505 Hardware security 19AJOE0506 GPU Architectures and Programming	3	0	0	3	25	75	100
2	PE		**Professional Elective V (MOOC's)** **19APE0517 Data Analytics with Python** 19APE0518 Data science for Engineers 19APE0519 Reinforcement Learning 19APE0520 Computer networks and Internet Protocol	3	0	0	3	25	75	100
PRACTICAL										
3	PR	19APR0506	Project Work	0	0	18	9	60	140	200
4	PR	19APR0507	Technical Paper Presentation/Seminar	-	-	-	0	50	0	50
						TOTAL	**15**	**110**	**140**	**250**

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

1.1.3 f'63 AK-20 CSE

fANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI
(AUTONOMOUS)

COMPUTER SCIENCE AND ENGINEERING

(Effective for the batches admitted in 2020 - 21)

Vision

To achieve excellence in the field of Computer Science and Engineering with professional competency.

Mission

- Provide quality education to achieve excellence.
- Upgrade infrastructure and technologies to meet the learner's needs.
- Establish linkages with Government and Industry to enhance technical skills, entrepreneurship and innovations.
- Support research to serve the needs of the society.

Institutional Objectives

- To create a conducive and competitive environment for students through curricular and extra-curricular activities.
- Promote the culture of research among the faculty.
- To promote synergetic alliances with premier Institutions, Industry, CSIR laboratories and various Government organizations for Collaborative Research Projects.
- To promote economic and social enrichment of the society through Skill Development Programmes, Entrepreneurship and extension activities.
- To introduce demand driven new UG & PG academic programmes.
- To ensure a high degree of quality in terms of providing infrastructure, research ambience, faculty and staff development.

Core Values

- Thirst for Quality Education: The stake holders of the institute particularly management, employees and students of the institution have a consistent thirst for quality improvement of the processes and services in the institution.
- Life Long Learning: In the fast changing technological world, acquiring a special skill at one point of time will not be enough for ever long survival. Hence to flourish in the work place and to bring in innovations in the ways of doing, employee, student as well as alumni must be continuous learners and tech savvy.
- Diversity and Participation: AITS promotes the involvement of faculty, staff, and students from all social, economic, ethnic, cultural and religious backgrounds to get the synergy of combining the diversified agents. The focus is on involving students to exhibit their talent in various curricular and co-curricular activities and strengthening alumni link to share their experiences to the students.
- Academic Integrity and Accountability: Management induces accountability in the employees for the career of the students and the academic leadership establishes a mentoring mechanism for realization of responsibilities of students towards their parents and in turn to the society

HEAD
Dept. of Computer Science & Engg.
Annamacharya Institute of
Technology & Sciences, Tirupati-517

Competencies and Performance Indicators (UG - CSE)

PO 1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems.

Competency	Indicators	
1.1 Demonstrate competence in mathematical modeling	1.1.1	Apply the knowledge of discrete structures, linear algebra, statistics and numerical techniques to solve problems
	1.1.2	Apply the concepts of probability, statistics and queuing theory in modeling of computer based system, data and network protocols.
1.2 Demonstrate competence in basic sciences	1.2.1	Apply laws of natural science to an engineering problem
1.3 Demonstrate competence in engineering fundamentals	1.3.1	Apply engineering fundamentals
1.4 Demonstrate competence in specialized engineering knowledge to the program	1.4.1	Apply theory and principles of computer science engineering to solve an engineering problem

PO 2: Problem analysis: Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Competency	Indicators	
2.1 Demonstrate an ability to identify and formulate complex engineering problem	2.1.1	Evaluate problem statements and identifies objectives
	2.1.2	Identifies processes/modules/algorithms of a computer based system and parameters to solve a problem
	2.1.3	Identifies mathematical algorithmic knowledge that applies to a given problem
2.2 Demonstrate an ability to formulate a solution plan and methodology for an engineering problem	2.2.1	Reframe the computer based system into interconnected subsystems
	2.2.2	Identifies functionalities and computing resources.
	2.2.3	Identify existing solution/methods to solve the problem, including forming justified approximations and assumptions
	2.2.4	Compare and contrast alternative solution/methods to select the best methods
	2.2.5	Compare and contrast alternative solution processes to select the best process.
2.3 Demonstrate an ability to formulate and interpret a model	2.3.1	Able to apply computer engineering principles to formulate modules of a system with required applicability and performance.
	2.3.2	Identify design constraints for required performance criteria.
2.4 Demonstrate an ability to execute a solution process and analyze results	2.4.1	Applies engineering mathematics to implement the solution
	2.4.2	Analyze and interpret the results using contemporary tools.
	2.4.3	Identify the limitations of the solution and sources/causes.
	2.4.4	Arrive at conclusions with respect to the objectives.

PO 3: Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.

Competency	Indicators	
3.1 Demonstrate an ability to define a complex / open- ended problem in engineering terms	3.1.1	Able to define a precise problem statement with objectives and scope.
	3.1.2	Able to identify and document system requirements from stake holders.
	3.1.3	Ability to review state of the art literature to synthesize system requirements.
	3.1.4	Ability to choose appropriate quality attributes as defined by ISO/IEC/IEEE standard.
	3.1.5	Explore and synthesize system requirements from larger social and professional concerns.
	3.1.6	Ability to develop software requirement specifications (SRS).
3.2 Demonstrate an ability to generate a diverse set of alternative design solutions	3.2.1	Ability to explore design alternatives.
	3.2.2	Ability to produce a variety of potential design solutions suited to meet functional requirements.
	3.2.3	Identify suitable non functional requirements for evaluation of alternate design solutions.
3.3 Demonstrate an ability to select optimal design	3.3.1	Ability to perform systematic evaluation of the degree to

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

scheme for further development		which several design concepts meet the criteria.
	3.3.2	Consult with domain experts and stakeholders to select candidate engineering design solution for further development
3.4 Demonstrate an ability to advance an engineering design to defined end state	3.4.1	Ability to refine architecture design into a detailed design within the existing constraints.
	3.4.2	Ability to implement and integrate the modules.
	3.4.3	Ability to verify the functionalities and validate the design.

PO 4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Competency	Indicators	
4.1 Demonstrate an ability to conduct investigations of technical issues consistent with their level of knowledge and understanding	4.1.1	Define a problem for purposes of investigation, its scope and importance
	4.1.2	Ability to choose appropriate procedure/algorithm, data set and test cases.
	4.1.3	Ability to choose appropriate hardware/software tools to conduct the experiment
	4.1.4	Design and develop appropriate procedures/methodologies based on the study objectives
4.2 Demonstrate an ability to design experiments to solve open ended problems	4.2.1	Design and develop appropriate procedures/methodologies based on the study objectives
4.3 Demonstrate an ability to analyze data and reach a valid conclusion	4.3.1	Use appropriate procedures, tools and techniques to collect and analyze data
	4.3.2	Critically analyze data for trends and correlations, stating possible errors and limitations
	4.3.3	Represent data (in tabular and/or graphical forms) so as to facilitate analysis and explanation of the data, and drawing of conclusions
	4.3.4	Synthesize information and knowledge about the problem from the raw data to reach appropriate conclusions

PO 5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

Competency	Indicators	
5.1 Demonstrate an ability to identify / create modern engineering tools, techniques and resources	5.1.1	Identify modern engineering tools, techniques and resources for engineering activities
	5.1.2	Create/adapt/modify/extend tools and techniques to solve engineering problems
5.2 Demonstrate an ability to select and apply discipline specific tools, techniques and resources	5.2.1	Identify the strengths and limitations of tools for (i) acquiring information, (ii) modeling and simulating, (iii) monitoring system performance, and (iv) creating engineering designs.
	5.2.2	Demonstrate proficiency in using discipline specific tools
5.3 Demonstrate an ability to evaluate the suitability and limitations of tools used to solve an engineering problem	5.3.1	Discuss limitations and validate tools, techniques and resources
	5.3.2	Verify the credibility of results from tool use with reference to the accuracy and limitations, and the assumptions inherent in their use

PO 6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

Competency	Indicators	
6.1 Demonstrate an ability to describe engineering roles in a broader context, e.g. pertaining to the environment, health, safety, legal and public welfare	6.1.1	Identify and describe various engineering roles; particularly as pertains to protection of the public and public interest at global, regional and local level
6.2 Demonstrate an understanding of professional engineering regulations, legislation and standards	6.2.1	Interpret legislation, regulations, codes, and standards relevant to your discipline and explain its contribution to the protection of the public

PO 7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Competency	Indicators	
7.1 Demonstrate an understanding of the impact of engineering and industrial practices on social, environmental and in economic contexts	7.1.1	Identify risks/impacts in the life-cycle of an engineering product or activity
	7.1.2	Understand the relationship between the technical, socio economic and environmental dimensions of sustainability

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

	7.2.1	Describe management techniques for sustainable development
7.2 Demonstrate an ability to apply principles of sustainable design and development	7.2.2	Apply principles of preventive engineering and sustainable development to an engineering activity or product relevant to the discipline

PO 8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Competency	Indicators	
8.1 Demonstrate an ability to recognize ethical dilemmas	8.1.1	Identify situations of unethical professional conduct and propose ethical alternatives
8.2 Demonstrate an ability to apply the Code of Ethics	8.2.1	Identify tenets of the ASME professional code of ethics
	8.2.2	Examine and apply moral & ethical principles to known case studies

PO 9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Competency	Indicators	
	9.1.1	Recognize a variety of working and learning preferences; appreciate the value of diversity on a team
9.1 Demonstrate an ability to form a team and define a role for each member	9.1.2	Implement the norms of practice (e.g. rules, roles, charters, agendas, etc.) of effective team work, to accomplish a goal.
9.2 Demonstrate effective individual and team operations-- communication, problem solving, conflict resolution and leadership skills	9.2.1	Demonstrate effective communication, problem solving, conflict resolution and leadership skills
	9.2.2	Treat other team members respectfully
9.3 Demonstrate success in a team based project	9.3.1	Present results as a team, with smooth integration of contributions from all individual efforts

PO 10: Communication: Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions

Competency	Indicators	
	10.1.1	Read, understand and interpret technical and non- technical information
10.1 Demonstrate an ability to comprehend technical literature and document project work	10.1.2	Produce clear, well-constructed, and well-supported written engineering documents
	10.1.3	Create flow in a document or presentation - a logical progression of ideas so that the main point is clear
	10.2.1	Listen to and comprehend information, instructions, and viewpoints of others
10.2 Demonstrate competence in listening, speaking, and presentation	10.2.2	Deliver effective oral presentations to technical and non-technical audiences
	10.3.1	Create engineering-standard figures, reports and drawings to complement writing and presentations
10.3 Demonstrate the ability to integrate different modes of communication	10.3.2	Use a variety of media effectively to convey a message in a document or a presentation

PO 11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Competency	Indicators	
11.1 Demonstrate an ability to evaluate the economic and financial performance of an engineering activity	11.1.1	Analyze different forms of financial statements to evaluate the financial status of an engineering project
11.2 Demonstrate an ability to compare and contrast the costs/benefits of alternate proposals for an engineering activity	11.2.1	Analyze and select the most appropriate proposal based on economic and financial considerations.
	11.3.1	Identify the tasks required to complete an engineering activity, and the resources required to complete the tasks.
11.3 Demonstrate an ability to plan/manage an engineering activity within time and budget constraints	11.3.2	Use project management tools to schedule an engineering project so it is completed on time and on budget

PO 12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Competency	Indicators	
	12.1.1	Describe the rationale for requirement for continuing professional development
12.1 Demonstrate an ability to identify gaps in knowledge and a strategy to close these gaps	12.1.2	Identify deficiencies or gaps in knowledge and demonstrate an ability to source information to close this gap
12.2 Demonstrate an ability to identify changing	12.2.1	Identify historic points of technological advance in

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

trends in engineering knowledge and practice		engineering that required practitioners to seek education in order to stay current
	12.2.2	Recognize the need and be able to clearly explain why it is vitally important to keep current regarding new developments in your field
12.3 Demonstrate an ability to identify and access sources for new information	12.3.1	Source and comprehend technical literature and other credible sources of information
	12.3.2	Analyze sourced technical and popular information for feasibility, viability, sustainability, etc.

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI
(AUTONOMOUS)
COMPUTER SCIENCE AND ENGINEERING (CSE)
(Effective for the batches admitted in 2020-21)

Semester I (First year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	BS	20ABS9901	Algebra & Calculus	3	0	0	3	30	70	100
2	BS	20ABS9904	Chemistry	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	ES	20AES0505	Information Technology and Numerical Methods	3	0	0	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	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	C			
1	BS	20ABS9902	Applied Physics	3	0	0	3	30	70	100
2	BS	20ABS9911	Probability and Statistics	3	0	0	3	30	70	100
3	HS	20AHS9901	Communicative English	3	0	0	3	30	70	100
4	ES	20AES0502	Data Structures	3	0	0	3	30	70	100
5	ES	20AES0507	Web Design	1	0	4	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	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**

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester III (Second year) – AK20

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
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	C			
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

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester V (Third year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
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	C			
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 Agile Methodologies	3	0	0	3	30	70	100
5	OE-2/ JOE (MOOCS-1)	**20AJOE0501** **20AJOE0501B** 20AJOE0502 20AJOE0503 20AJOE0504 20AJOE0505 20AJOE0506	**Job Oriented Elective I (MOOCs)** **Blockchain and its Applications** **Introduction to Cyber Security** Model Checking System and usable security Introduction to soft computing Hardware security GPU Architectures and Programming	3	-	-	3	-	-	100
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										

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester VII (Fourth year)

Sl. No.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	PE-3		Cyber Security 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	C			
1	PR	20APR0502	Project Project work, seminar and internship in industry	0	0	0	12	60	140	200
			Total credits				12	60	140	200

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

HONOURS IN COMPUTER SCIENCE AND ENGINEERING

S.NO	SUB.CODE	COURSE NAME	CREDITS
1	20AHN0501	DESIGN AND IMPLEMENTATION OF HUMAN COMPUTER INTERFACES	3
2	20AHN0502	SOCIAL NETWORKS	3
3	20AHN0503	NO SQL DATABASES	3
4	20AHN0504	ADVANCED IOT APPLICATIONS	3
5	20AHN0505	INTRODUCTION TO INDUSTRY 4.0 AND INDUSTRIAL INTERNET OF THINGS	3
6	20AHN0506	COMPETITIVE PROGRAMMING-1/International Collegiate Programming Contest(ICPC) Laboratory-1	2.5
7	20AHN0507	COMPETITIVE PROGRAMMING-2/International Collegiate Programming Contest(ICPC) Laboratory-2	2.5
		TOTAL	**20**

MINOR DEGREE IN COMPUTER SCIENCE AND ENGINEERING FOR ECE, EEE, CE & ME

S.NO	SUB.CODE	COURSE NAME	L	T	P	CREDITS
1	20AMN0501	OPERATING SYSTEMS	2	1	0	3
2	20AMN0502	COMPUTER ORGANIZATION	2	1	0	3
3	20AMN0503	COMPUTER NETWORKS	2	1	0	3
4	20AMN0504	DESIGN AND ANALYSIS OF ALGORITHMS	3	0	0	3
5	20AMN0505	OBJECT ORIENTED PROGRAMMING THROUGH JAVA	2	1	0	3
6	20AMN0506	MINOR DISCIPLINE PROJECT	-	-	-	5
		TOTAL				**20**

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

HONOURS IN COMPUTER SCIENCE AND ENGINEERING

S.NO	SUB.CODE	COURSE NAME	CREDITS
1	20AHN0501	DESIGN AND IMPLEMENTATION OF HUMAN COMPUTER INTERFACES	3
2	20AHN0502	SOCIAL NETWORKS	3
3	20AHN0503	NO SQL DATABASES	3
4	20AHN0504	ADVANCED IOT APPLICATIONS	3
5	20AHN0505	INTRODUCTION TO INDUSTRY 4.0 AND INDUSTRIAL INTERNET OF THINGS	3
6	20AHN0506	COMPETITIVE PROGRAMMING-1/International Collegiate Programming Contest(ICPC) Laboratory-1	2.5
7	20AHN0507	COMPETITIVE PROGRAMMING-2/International Collegiate Programming Contest(ICPC) Laboratory-2	2.5
		TOTAL	**20**

MINOR DEGREE IN COMPUTER SCIENCE AND ENGINEERING FOR ECE, EEE, CE & ME

S.NO	SUB.CODE	COURSE NAME	L	T	P	CREDITS
1	20AMN0501	OPERATING SYSTEMS	2	1	0	3
2	20AMN0502	COMPUTER ORGANIZATION	2	1	0	3
3	20AMN0503	COMPUTER NETWORKS	2	1	0	3
4	20AMN0504	DESIGN AND ANALYSIS OF ALGORITHMS	3	0	0	3
5	20AMN0505	OBJECT ORIENTED PROGRAMMING THROUGH JAVA	2	1	0	3
6	20AMN0506	MINOR DISCIPLINE PROJECT	-	-	-	5
		TOTAL				**20**

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

1.1 3-1st AK-20 AIDS

ANNAMACHARYA INSTITUTE OF TECHNOLOGY ANDSCIENCES, TIRUPATI
(AUTONOMOUS)
B. Tech - Artificial Intelligence & Data Science (AI & DS)
(Effective for the batches admitted from 2020-21)

Semester I (First year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	BS	20ABS9901	Algebra and Calculus	3	0	0	3	30	70	100
2	BS	20ABS9902	Applied Physics	3	0	0	3	30	70	100
3	HS	20AHS9901	Communicative English	3	0	0	3	30	70	100
4	ES	20AES0301	Engineering Graphics	1	0	4	3	30	70	100
5	ES	20AES0501	Problem Solving and Programming	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	C			
1	BS	20ABS9911	Probability and Statistics	3	0	0	3	30	70	100
2	BS	20ABS9921	Numerical Methods	3	0	0	3	30	70	100
3	ES	20AES0509	Basics of Python Programming	3	0	0	3	30	70	100
4	ES	20AES0502	Data Structures	3	0	0	3	30	70	100
5	ES	20AES0507	Web Design	1	0	4	3	30	70	100
6	ES LAB	20AES0510	Basics Of Python Programming Lab	0	0	3	1.5	30	70	100
7	BS LAB	20ABS9918	Computational 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**

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester III (Second year)

Sl	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	BS	20ABS9914	Discrete Mathematical Structures	3	0	0	3	30	70	100
2	PC	20APC3001	Digital Electronics and Microprocessor	3	0	0	3	30	70	100
3	PC	20APC3002	Database Management Systems	3	0	0	3	30	70	100
4	PC	20APC3004	Object Oriented Programming through Java	3	0	0	3	30	70	100
5	PC	20APC3006	Computer Organization	3	0	0	3	30	70	100
6	PC	20APC3003	Database Management Systems Lab	0	0	3	1.5	30	70	100
7	PC	20APC3005	Object Oriented Programming through Java Lab	0	0	3	1.5	30	70	100
8	PC	20APC3007	Computer Organization Lab	0	0	3	1.5	30	70	100
9	SOC	20ASC3001	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)

Sl.	Category	Course Code	Course Title	Hour per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	PC	20APC3008	Formal Languages and Automata Theory	3	0	0	3	30	70	100
2	PC	20APC3009	Computer Networks	3	0	0	3	30	70	100
3	PC	20APC3011	Data warehousing and Mining	3	0	0	3	30	70	100
4	PC	20APC3013	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	1	0	3	30	70	100
7	PC	20APC3010	Computer Networks Lab	0	0	3	1.5	30	70	100
8	PC	20APC3012	Data warehousing and Mining Lab	0	0	3	1.5	30	70	100
9	PC	20APC3014	Operating Systems Lab	0	0	3	1.5	30	70	100
10	SOC	20ASC3002	Server Side Scripting	1	0	2	2	100	0	100
			Total credits				**24.5**	**370**	**630**	**1000**
Community Service Project (Mandatory) for 6 weeks duration during summer vacation. (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)				**0**	**0**	**0**	**3**	0	0	0

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester V (Third year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	PC	20APC3015	Principles of Data Science	3	0	0	3	30	70	100
2	PC	20APC3017	Artificial Intelligence	3	0	0	3	30	70	100
3	PC	20APC3019	Big data Technologies	3	0	0	3	30	70	100
4	OE –I	20AOE9925	Deterministic and Stochastic Statistical Methods	3	0	0	3	30	70	100
		20AOE0303	Optimization Techniques	3	0	0				
		20AOE0552	Internet of Things	3	0	0				
5	PE - I	20APE3001	Design And Analysis of Algorithms	3	0	0	3	30	70	100
		20APE3002	Computer Graphics	3	0	0				
		20APE3003	Adhoc & Sensor Networks	3	0	0				
6	PC LAB	20APC3018	Artificial Intelligence Lab	0	0	3	1.5	30	70	100
7	PC LAB	20APC3016	Principles of Data Science Lab	0	0	3	1.5	30	70	100
8	SC	20ASC3003	Conversational AI	1	0	2	2	100	0	100
9	MandatoryCourse (AICTE Suggested)	20AMC9901	Biology for Engineers	2	0	0	0	30	0	30
10	CSP	20CSP3001	Evaluation of 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**

HEAD
Dept. of Computer Science & Engg.
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester VI (Third year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	PC	20APC3020	Big Data Analytics	3	1	0	3	30	70	100
2	PC	20APC3022	Machine Learning	3	0	0	3	30	70	100
3	PC	20APC3024	Cloud Computing	3	0	0	3	30	70	100
4	PE - 2	20APE3004	Software Engineering for AI	3	0	0	3	30	70	100
		20APE3005	Game Programming	3	0	0				
		20APE3006	Introduction To NoSQL Database	3	0	0				
5	OE-2/ JOE (MOOCS-1)	20AJOE3001 20AJOE3001B 20AJOE3002 20AJOE3003 20AJOE3004 20AJOE3005 20AJOE3006	**Job Oriented Elective I (MOOCs)** **Blockchain and its Applications** **Introduction to Cyber Security** Model Checking System and usable security Introduction to soft computing Hardware security GPU Architectures and Programming	3	-	-	3	-	-	100
6	PC LAB	20APC3021	Big Data Analytics Lab	0	0	3	1.5	30	70	100
7	PC LAB	20APC3023	Machine Learning Lab	0	0	3	1.5	30	70	100
8	PC LAB	20APC3025	Cloud Computing Lab	0	0	3	1.5	30	70	100
9	SC	20ASA0502	Soft Skills	1	0	2	2	100	0	100
10	Mandatory Course (AICTE Suggested)	20AMC9904	Professional Ethics and Human Values	2	0	0	0	30	0	30
			Total credits				**21.5**	**370**	**490**	**930**
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)				**0**	**0**	**0**	**3**	0	0	0
Industrial/Research Internship (Mandatory) 2 Months during summer vacation										

Semester VII (Fourth year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	PE - 3	20APE3007	Natural Language Processing	3	0	0	3	30	70	100
		20APE3008	Intelligent Information Retrieval Systems	3	0	0				
		20APE3009	Health Care Analytics	3	0	0				
2	PE - 4	20APE3010	Applications of AI	3	0	0	3	30	70	100
		20APE3011	Virtual Reality	3	0	0				
		20APE3012	Computer Vision	3	0	0				

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5.

3	PE – 5 (MOOCS-2) **NPTEL***	20APE3013	Quantum Computing	3	0	0	3	-	-	100
		20APE3014	Cyber Security	3	0	0				
		20APE3015	Deep Learning	3	0	0				
4	OE - 3	20APE0415	Speech Processing	2	0	2	3	30	70	100
		20AOE3004	Dev Ops	2	0	2				
		20AOEMB02	Knowledge Engineering	2	0	2				
5	OE - 4	20AOE3005	Introduction to Watson AI	2	0	2	3	30	70	100
		20AOE3006	Robotic Process Automation	2	0	2				
		20AOE3007	Reinforcement Learning	2	0	2				
6	HSE		Professional Communication Mathematical Modeling Simulation Entrepreneurship Development	3	0	0	3	30	70	100
7	SC	20ASC3005	Statistical Computing And Data Analysis UsingR Programming	1	0	2	2	100	0	100
Industrial/Research Internship 2 Months (Mandatory) after third year (to be evaluated during VII Semester)				**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.	**Category**	**CourseCode**	**Course Title**	**Hours per week**			**Credits**	**CIE**	**SEE**	**TOTAL**
				L	**T**	**P**	**C**			
1	MAJOR PROJECT	20APR3002	Project, Project work, seminar and internship in industry	0	0	0	12	60	140	200
			Total credits				**12**	**60**	**140**	**200**

Guidelines for MOOC Courses @ AITS::Tirupati

1. Two MOOC courses are introduced in AK20 curriculum in III B.Tech II and IV B.Tech I Semester (6th and 7th Semester) Students should compulsorily submit the pass certificate generated by NPTEL for verification and for consideration of credits. As understood, Certificate by NPTEL will be issued only when a registered students submit assignments regularly as per schedule given and get a minimum of 10 out of 25 marks; and obtain a minimum of 30 marks out of 75 marks in the end examination. (Both criteria should be met to declare pass by NPTEL).
2. Out of two MOOC courses introduced, one MOOC shall be with 'Professional Elective Nature and another with 'open Elective' nature: Head of the department will announce options available on the NPTEL platform, and the students have to select 3 credited courses only to fit into the existing credit scheme.
3. Courses with minimum 8 weeks learning duration only shall be chosen for MOOC courses.
4. Marks or percentage obtained will be converted to grade points and reflects on the grade sheet.
5. Swayam NPTEL Courses will be notified on this platform before 1st November for January semester; and will be notified before 1st June for July semester. Accordingly HOD shall issue notification/circular to the teachers connected and to the concerned student groups.

Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

6. In case the student fails/ absent in the MOOC courses in the regular examination he/she will be all owed to register for next supply examination in manual mode as he can't avail MOOC platform to clear the pending course during the next season. The pattern of examination for manual mode in supplementary will be same as that of NPTEL question paper.

7. Examination fee paid for the 8th semester to the exam branch of the college is only for project work, internships and seminars. The exam fee payable for taking NPTEL online courses shall be borne by the students only

8. Teachers connected to the student group for guidance of MOOC courses shall also register for the course, go though the e-content in it to provide proper guidance to the students and also to get his 'mentor certificate'.

9. Registration facility – extension of dates if any shall be continuously monitored by the HOD & students.

HONOURS IN ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

S.NO	SUB.CODE	COURSE NAME	CREDITS
1	20AHN3001	DESIGN AND IMPLEMENTATION OF HUMAN COMPUTER INTERFACES	3
2	20AHN3002	SOCIAL NETWORKS	3
3	20AHN3003	NO SQL DATABASES	3
4	20AHN3004	ADVANCED IOT APPLICATIONS	3
5	20AHN3005	INTRODUCTION TO INDUSTRY 4.0 AND INDUSTRIAL INTERNET OF THINGS	3
6	20AHN3006	COMPETITIVE PROGRAMMING-1/International Collegiate Programming Contest(ICPC) Laboratory-1	2.5
7	20AHN3007	COMPETITIVE PROGRAMMING-2/International Collegiate Programming Contest(ICPC) Laboratory-2	2.5
		TOTAL	20

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

S.NO	SUB.CODE	COURSE NAME	CREDITS
1	20AMN3001	OPERATING SYSTEMS	3
2	20AMN3002	COMPUTER ORGANIZATION	3
3	20AMN3003	COMPUTER NETWORKS	3
4	20AMN3004	ARTIFICIAL INTELLIGENCE	3
5	20AMN3005	DATA SCIENCE	3
6	20AMN3006	MINOR DISCIPLINE PROJECT	5
		TOTAL	20

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

1.1.3. 1/107 AK-20 CIC

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI

(AUTONOMOUS)

B.Tech

(COMPUTER SCIENCE AND ENGINEERING - INTERNET OF THINGS AND CYBER SECURITY INCLUDING BLOCKCHAIN TECHNOLOGY)

(Effective for the batches admitted in 2020-2021)

INDUCTION PROGRAM (3 weeks duration)
❖ Physical activity ❖ Creative Arts ❖ Universal Human Values ❖ Literary ❖ Proficiency Modules ❖ Lectures by Eminent People ❖ Visits to local Areas ❖ Familiarization to Dept./Branch & Innovations

Semester I (First year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	BS	20ABS9901	Algebra & Calculus	3	0	0	3	30	70	100
2	BS	20ABS9904	Chemistry	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	ES	20AES0505	Information Technology and Numerical Methods	3	0	0	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	20AES0503	Problem Solving and Programming Lab	0	0	3	1.5	30	70	100
			Total credits				**19.5**	**240**	**560**	**800**

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester II (First year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	BS	20ABS9902	Applied Physics	3	0	0	3	30	70	100
2	BS	20ABS9911	Probability and Statistics	3	0	0	3	30	70	100
3	HS	20AHS9901	Communicative English	3	0	0	3	30	70	100
4	ES	20AES0502	Data Structures	3	0	0	3	30	70	100
5	ES	20AES0507	Web Design	1	0	4	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	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**

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester III (Second year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	BS	20ABS9914	Discrete Mathematical Structures	3	0	0	3	30	70	100
2	PC	20APC3601	Digital Electronics and Microprocessors	3	0	0	3	30	70	100
3	PC	20APC3602	Database Management Systems	3	0	0	3	30	70	100
4	PC	20APC3604	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	20APC3603	Database Management Systems Laboratory	0	0	3	1.5	30	70	100
7	PC Lab	20APC3605	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	20ASC3601	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**

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester IV (Second year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	PC	20APC3606	Computer Organization	3	0	0	3	30	70	100
2	PC	20APC3607	Computer Networks	3	0	0	3	30	70	100
3	PC	20APC3609	Object Oriented Programming through Java	3	0	0	3	30	70	100
4	PC	20APC3611	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	1	0	3	30	70	100
7	PC Lab	20APC3608	Computer Networks Lab	0	0	3	1.5	30	70	100
8	PC Lab	20APC3610	Object Oriented Programming through Java Lab	0	0	3	1.5	30	70	100
9	PC Lab	20APC3612	Operating Systems Lab	0	0	3	1.5	30	70	100
10	SC	20ASC3602	Server Side Scripting	1	0	2	2	100	0	100
			Total credits				**24.5**	**370**	**630**	**1000**
Community Service Project (Mandatory) for 6 weeks duration during summer vacation. (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)				0	0	0	3	0	0	0

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester V (Third year)

SL	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	PC	20APC3613	Cryptography and Network Security	3	0	0	3	30	70	100
2	PC	20APC3615	Embedded Systems and Internet of Things	3	0	0	3	30	70	100
3	PC	20APC3617	Fundamentals of Blockchain Technology	3	0	0	3	30	70	100
4	OE1	20AOE9926 20AOE0303 20APC0213	Mathematical Modeling and Simulation Optimization Techniques Control Systems	3	0	0	3	30	70	100
5	PE1	20APE3601 20APE3602 20APE3603	Software Engineering Distributed Database Automata Theory and Compiler Design	3	0	0	3	30	70	100
6	PC Lab	20APC3614	Cryptography and Network Security Lab	0	0	3	1.5	30	70	100
7	PC Lab	20APC3616	Embedded Systems and Internet of Things Lab	0	0	3	1.5	30	70	100
8	SC	20ASA0502	Soft Skills	1	0	2	2	100	0	100
9	MC	20AMC9901	Biology for Engineers	2	0	0	0	30	0	30
10	CSP	20CSP3601	Evaluation of 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

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester VI (Third year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	PC	20APC3618	Cyber Security	3	1	0	3	30	70	100
2	PC	20APC3620	Advanced IoT Programming	3	0	0	3	30	70	100
3	PC	20APC3622	Building Private Block chain	3	0	0	3	30	70	100
4	PE2	20APE3604 20APE3605 20APE3606	Mobile Application Development Real time Operating System Design and Analysis of Algorithms	3	0	0	3	30	70	100
5	OE-2/ JOE (MOOCS-1)	**20AJOE3601** **20AJOE3601B** 20AJOE3602 20AJOE3603 20AJOE3604 20AJOE3605 20AJOE3606	**Job Oriented Elective I (MOOCs)** **Introduction to Machine Learning** **Introduction to Cyber Security** Model Checking System and usable security Introduction to soft computing Hardware security GPU Architectures and Programming	3	-	-	3	-	-	100
6	PC Lab	20APC3619	Cyber Security Lab	0	0	3	1.5	30	70	100
7	PC Lab	20APC3621	Advanced IoT Programming Lab	0	0	3	1.5	30	70	100
8	PC Lab	20APC3623	Building Private Block chain Lab	0	0	3	1.5	30	70	100
9	SC	20ASA0501	Basics of Cloud Computing	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**	**370**	**560**	**930**
Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)				**4**	**0**	**0**	**4**	0	0	0
Industrial/Research Internship (Mandatory) 2 Months during summer vacation										

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester VII
(Fourth year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	PE-3	20APE3607 20APE3608 20APE3609	Smart Sensor Technology for IoT Cognitive IoT Big Data Analytics for IoT	3	0	0	3	30	70	100
2	PE-4	20APE3610 20APE3611 20APE3612	Cyber Security Risk Management and Mitigation Cloud Security Offensive, Defensive Cyber Security Techniques	3	0	0	3	30	70	100
3	PE-5 (MOOCS – 2)	20APE3613 20APE3614 20APE3615	Artificial Intelligence Machine Learning Deep Learning	-	-	-	3	-	-	100
4	OE-3 – JOE	20AOE3604 20AOE3605 20AOE3606	Blockchain Technologies and Use Cases Cryptocurrencies Fundamentals Bit Coin Technology	2	0	2	3	30	70	100
5	OE-4 JOE	20AOE3607 20AOE3608 20AOE3609	Programming for the Internet of Things Project Cyber security and its 10 domains Blockchain Applications and Limitation	2	0	2	3	30	70	100
6	HE		Management Science Deterministic Stochastic and statistical Method Entrepreneurship Development	3	0	0	3	30	70	100
7	SC	20ASC3601	Industrial and Medical IOT	1	0	2	2	100	0	100
8	PR	20APR3602	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

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester VIII
(Fourth year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	PR	20APR3603	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 - CIC

S.NO	SUB.CODE	COURSE NAME	CREDITS
1	20AHN3601	DESIGN AND IMPLEMENTATION OF HUMAN COMPUTER INTERFACES	3
2	20AHN3602	SOCIAL NETWORKS	3
3	20AHN3603	NO SQL DATABASES	3
4	20AHN3604	ADVANCED IOT APPLICATIONS	3
5	20AHN3605	INTRODUCTION TO INDUSTRY 4.0 AND INDUSTRIAL INTERNET OF THINGS	3
6	20AHN3606	COMPETITIVE PROGRAMMING-1 / International Collegiate Programming Contest(ICPC) Laboratory-1	2.5
7	20AHN3607	COMPETITIVE PROGRAMMING-2 / International Collegiate Programming Contest(ICPC) Laboratory-2	2.5
		TOTAL	20

MINOR DEGREE IN CIC FOR ECE, EEE, CE & ME

S.NO	SUB.CODE	COURSE NAME	CREDITS
1	20AMN3601	OPERATING SYSTEMS	3
2	20AMN3602	COMPUTER ORGANIZATION	3
3	20AMN3603	COMPUTER NETWORKS	3
4	20AMN3604	CYBER SECURITY	3
5	20AMN3605	INTERNET OF THINGS	3
6	20AMN3606	MINOR DISCIPLINE PROJECT	5
		TOTAL	20

HEAD
Dept. of Computer Science & Engg.
Annamacharya Institute of
Technology & Sciences, Tirupati-5

1.1.3-file3 AK-20 AIML

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI
(AUTONOMOUS)

(COMPUTER SCIENCE AND ENGINEERING-ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)
(Effective for the batches admitted in 2021-22)

Vision

"To achieve excellence in the field of Artificial Intelligence and Machine Learning with professional competency".

Mission

- To educate, train and develop highly qualified engineers capable of meeting the challenges of a rapidly growing artificial intelligence system and capable of handling other diverse issues in data science engineering.
- To educate students towards the design and development of intelligent products and services meeting global demands and standards
- Best utilize Industry Institute linkages to acquire professional competency.
- Create facilities of training and research in new thrust areas of computing thus promoting continuing education facilities.
- To enable the graduates to adapt to the rapidly changing technology with strong fundamentals

Institutional Objectives

- To create a conducive and competitive environment for students through curricular and extra-curricular activities.
- Promote the culture of research among the faculty.
- To promote synergetic alliances with premier Institutions, Industry, CSIR laboratories and various Government organizations for Collaborative Research Projects.
- To promote economic and social enrichment of the society through Skill Development Programmes, Entrepreneurship and extension activities.
- To introduce demand driven new UG & PG academic programmes.
- To ensure a high degree of quality in terms of providing infrastructure, research ambience, faculty and staff development.

Core Values

- Thirst for Quality Education: The stake holders of the institute particularly management, employees and students of the institution have a consistent thirst for quality improvement of the processes and services in the institution.
- Life Long Learning: In the fast changing technological world, acquiring a special skill at one point of time will not be enough for ever long survival. Hence to flourish in the work place and to bring in innovations in the ways of doing, employee, student as well as alumni must be continuous learners and tech savvy.
- Diversity and Participation: AITS promotes the involvement of faculty, staff, and students from all social, economic, ethnic, cultural and religious backgrounds to get the synergy of combining the diversified agents. The focus is on involving students to exhibit their talent in various curricular and co-curricular activities and strengthening alumni link to share their experiences to the students.
- Academic Integrity and Accountability: Management induces accountability in the employees for the career of the students and the academic leadership establishes a mentoring mechanism for realization of responsibilities of students towards their parents and in turn to the society.

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI
(AUTONOMOUS)

B. Tech - CSE (Artificial Intelligence & Machine Learning)
(Effective for the batches admitted from 2021-22)

INDUCTION PROGRAM (3 weeks duration)
❖ Physical activity ❖ Creative Arts ❖ Universal Human Values ❖ Literary ❖ Proficiency Modules ❖ Lectures by Eminent People ❖ Visits to local Areas ❖ Familiarization to Dept./Branch &Innovations

Semester I (First year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
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	HS	20AHS9901	Communicative English	3	0	0	3	30	70	100
4	ES	20AES0301	Engineering Graphics	1	0	4	3	30	70	100
5	ES	20AES3301	Problem Solving and Programming	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	20AES3302	Problem Solving and Programming Lab	0	0	3	1.5	30	70	100
			Total credits				**19.5**	**240**	**560**	**800**

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester II (First year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	BS	20ABS9911	Probability and Statistics	3	0	0	3	30	70	100
2	BS	20ABS9921	Numerical Methods	3	0	0	3	30	70	100
3	ES	20AES3303	Basics of Python Programming	3	0	0	3	30	70	100
4	ES	20AES3305	Data Structures	3	0	0	3	30	70	100
5	ES	20AES3307	Web Design	1	0	4	3	30	70	100
6	ES Lab	20AES3304	Basics Of Python Programming Lab	0	0	3	1.5	30	70	100
7	BS Lab	20ABS9918	Computational Lab	0	0	3	1.5	30	70	100
8	ES Lab	20AES3306	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)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	BS	20ABS9914	Discrete Mathematical Structures	3	0	0	3	30	70	100
2	PC	20APC3301	Digital Electronics and Microprocessors	3	0	0	3	30	70	100
3	PC	20APC3302	Database Management Systems	3	0	0	3	30	70	100
4	PC	20APC3304	Object Oriented Programming through Java	3	0	0	3	30	70	100
5	PC	20APC3306	Computer Organization and Architecture	3	0	0	3	30	70	100
6	PC Lab	20APC3303	Database Management Systems Lab	0	0	3	1.5	30	70	100
7	PC Lab	20APC3305	Object Oriented Programming through Java Lab	0	0	3	1.5	30	70	100
8	PC Lab	20APC3307	Computer Organization and Microprocessor Lab	0	0	3	1.5	30	70	100
9	SOC	20ASC3301	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**

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester IV (Second year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	PC	20APC3308	Software Engineering for AI	3	0	0	3	30	70	100
2	PC	20APC3309	Artificial Intelligence	3	0	0	3	30	70	100
3	PC	20APC3311	Data Mining and Data Warehousing	3	0	0	3	30	70	100
4	PC	20APC3313	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	1	0	3	30	70	100
7	PC Lab	20AES3310	Artificial Intelligence Lab	0	0	3	1.5	30	70	100
8	PC Lab	20APC3312	Data Mining and Data Warehousing Lab	0	0	3	1.5	30	70	100
9	PC Lab	20APC3314	Operating Systems Lab	0	0	3	1.5	30	70	100
10	SOC	20ASC3302	Server Side Scripting	1	0	2	2	100	0	100
			Total credits				**24.5**	**370**	**630**	**1000**
Community Service Project (Mandatory) for 6 weeks duration during summer vacation. (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)				**0**	**0**	**0**	**3**	0	0	0

HEAD
Dept. of Computer Science & Engg.
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester V (Third year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	PC	20APC3315	Big data Technologies	3	0	0	3	30	70	100
2	PC	20APC3316	Machine Learning	3	0	0	3	30	70	100
3	PC	20APC3318	Deep Learning	3	0	0	3	30	70	100
4	OE - 1	20AOE3301	Automata theory and compiler design	2	0	2	3	30	70	100
		20AOE3302	Information Retrieval	2	0	2				
		20AES3008	Deterministic and Stochastic Statistical Methods	2	0	2				
5	PE - 1	20APE3301	Computer Networks	3	0	0	3	30	70	100
		20APE3302	Cryptography and Network Security	3	0	0				
		20APE3303	Game Programming	3	0	0				
6	PC Lab	20APC3317	Machine Learning Lab	0	0	3	1.5	30	70	100
7	PC Lab	20APC3019	Deep Learning Lab	0	0	3	1.5	30	70	100
8	SOC	20ASC3303	Conversational AI	1	0	2	2	100	0	100
9	MC	20AMC9904	Professional Ethics and Human Values	2	0	0	0	30	0	30
10	CSP	20CSP3301	Evaluation of 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**

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester VI (Third year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	PC	20APC3320	Natural Language Processing	3	1	0	3	30	70	100
2	PC	20APC3322	Advanced Machine Learning	3	0	0	3	30	70	100
3	PC	20APC3324	Cloud Computing	3	0	0	3	30	70	100
4	PE - 2	20APE3304	Computational Intelligence	3	0	0	3	30	70	100
		20APE3305	Industry 4.0	3	0	0				
		20APE3306	Advanced Databases	3	0	0				
5	OE – 2 (MOOCS-1) NPTEL*	20AOE3304	Robotic Sensors, Vision And Hardware Implementation	-	-	-	3	-	-	100
		20APE0416	Wireless Sensor Networks							
		20APC0323	Operation Research							
			Computer Graphics							
6	PC Lab	20APC3321	Natural Language Processing Lab	0	0	3	1.5	30	70	100
7	PC Lab	20APC3323	Advanced Machine Learning Lab	0	0	3	1.5	30	70	100
8	PC Lab	20APC3325	Cloud Computing Lab	0	0	3	1.5	30	70	100
9	SOC	20ASC3304	Soft Skills	1	0	2	2	100	0	100
10	MC	20AMC9901	Biology for Engineers	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)				**0**	**0**	**0**	**3**	0	0	0
Industrial/Research Internship (Mandatory) 2 Months during summer vacation										

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

Semester VII (Fourth year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	PE - 3	20APE3307	Data Science	3	0	0	3	30	70	100
		20APE3308	Business Process Management	3	0	0				
		20APE3309	Health Care Analytics	3	0	0				
2	PE - 4	20APE3310	Block Chain	3	0	0	3	30	70	100
		20APE3311	Cloud Security and Privacy	3	0	0				
		20APE3312	Social Network Analysis	3	0	0				
3	PE – 5 (MOOCS-2) NPTEL*	20APE3313	Cyber Security	-	-	-	3	-	-	100
		20APE3314	Virtual Reality							
		20APE3315	Quantum Computing							
4	OE - 3	20APE0415	Speech Processing	2	0	2	3	30	70	100
		20AOE3004	Internet of Things	2	0	2				
		20AOEMB02	Knowledge Engineering	2	0	2				
5	OE - 4	20AOE3305	Introduction to Watson AI	2	0	2	3	30	70	100
		20AOE3306	Data Science Tools	2	0	2				
		20AOE3307	Automation Anywhere - RPA	2	0	2				
6	HSE	20A5270	Entrepreneurship and Incubation	3	0	0	3	30	70	100
			Management Science	3	0	0				
			Enterprise Resource Planning	3	0	0				
7	SOC	19MBA0105	Statistical Computing And Data Analysis Using R Programming	1	0	2	2	100	0	100
8	INTERNSHIP	20AIN3302	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)				**0**	**0**	**0**	**4**	**0**	**0**	**4**

Semester VIII (Fourth year)

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P	C			
1	MAJOR PROJECT	20APR3301	Project, Project work, seminar and internship in industry	0	0	0	12	60	140	200
			Total credits				**12**	**60**	**140**	**200**

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

HONOURS IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

S.NO	SUB.CODE	COURSE NAME	CREDITS
1	20AHN0501	HUMAN COMPUTER INTERACTION	3
2	20AHN0502	SOCIAL NETWORKS	3
3	20AHN0503	NOSQL DATABASES	3
4	20AHN0504	COMPUTER VISION	3
5	20AHN0505	INDUSTRY 4.0 AND INDUSTRIALIZATION	3
6	20AHN0506	COMPETITIVE PROGRAMMING-1/International Collegiate Programming Contest(ICPC) Laboratory-1	2.5
7	20AHN0507	COMPETITIVE PROGRAMMING-2/International Collegiate Programming Contest(ICPC) Laboratory-2	2.5
		TOTAL	**20**

MINOR DEGREE IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING FOR ECE, EEE, CE & ME

S.NO	SUB.CODE	COURSE NAME	CREDITS
1	20AMN0501	OPERATING SYSTEMS	3
2	20AMN0502	COMPUTER ORGANIZATION	3
3	20AMN0503	COMPUTER NETWORKS	3
4	20AMN0504	ARTIFICIAL INTELLIGENCE	3
5	20AMN0505	MACHINE LEARNING	3
6	20AMN0506	MINOR DISCIPLINE PROJECT	5
		TOTAL	**20**

HEAD
Dept. of Computer Science & Eng.
Annamacharya Institute of
Technology & Sciences, Tirupati-5

1.1.3-files R-17, M Tech CSE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE STRUCTURE AND SYLLBI FOR

M.Tech-Computer Science & Engineering and M. Tech - Computer Science

w.e.f. 2017-18 Admitted Batch onwards

M.Tech I Semester

S.No	Subject Code	Subject	L	T	P	C
1.	17D58101	Advanced Data Structures and Algorithms	4	-	-	4
2.	17D58102	Fundamentals of Data Science	4	-	-	4
3.	17D58103	Software Patterns	4	-	-	4
4.	 17D25205 17D58104 17D58105 17D58106	Elective-I a. Software Project Management b. Information Security c. Distributed Databases d. Neural Networks	4	-	-	4
5.	 17D25106 17D58107 17D58108 17D58109	Elective-II a. Professional Aspects In Software Engineering b. Artificial Intelligence c. Internals of Operating Systems d. Multicore Architecture & Programming	4	-	-	4
6.	17D58110	Advanced Data Structures and Algorithms Lab	-		4	2
7.	17D58111	R & Analytics Lab	-		4	2
8.	17D58112	Software Patterns Lab	-		4	2
		Total	20		12	26

M.Tech II Semester

S.No	Subject Code	Subject	L	T	P	C
1.	17D25201	Advances in Software Testing	4	-	-	4
2.	17D58201	Big Data Analytics	4	-	-	4
3.	17D58202	Mobile Application Development	4	-	-	4
4.	 17D58203 17D58204 17D08102 17D58205	Elective-III a. Internet of Things b. Distributed Computing c. Network Security & Cryptography d. NOSQL Databases	4	-	-	4
5.	 17D58206 17D58207 17D25207 17D58208	Elective-IV a. Machine Learning b. Cloud Computing c. Software Configuration Management d. Natural Language Processing	4	-	-	4
6.	17D25209	Advances in Software Testing Lab	-	-	4	2
7.	17D58209	Map Reduce Programming Lab	-	-	4	2
8.	17D58210	Mobile Application Development Lab	-	-	4	2
		Total	20		12	26

HEAD
Dept. of Computer Science & Engg.
Annamacharya Institute of
Technology & Sciences, Tirupati-5

M.Tech III Semester

S.No	Subject Code	Subject	L	T	P	C
1.	17D20301 17D20302 17D20303	Elective-V (Open Elective) 1.Research Methodology 2.Human Values & Professional Ethics 3.Intellectual Property Rights	4	-	-	4
2.	17D58301	Elective-VI (MOOCs)	-	-	-	-
3.	17D58302	Comprehensive Viva-Voice	-	-	-	2
4.	17D58303	Seminar	-	-	-	2
5.	17D58304	Teaching Assignment	-	-	-	2
6.	17D58305	Project work Phase-I	-	-	-	4
		Total	04	-	-	14

M.Tech IV Semester

S.No.	Subject Code	Subject	L	T	P	C
1.	17D58401	Project work Phase - II	-		-	12
		Total	-		-	12

Project Viva Voce Grades:

A: Satisfactory

B: Not Satisfactory

HEAD

Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

1.1.3-163 M.Tech AK-19 CSE

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES::TIRUPATI
(AUTONOMOUS)

M.Tech (COMPUTER SCIENCE AND ENGINEERING)
(Effective for the batches admitted from 2019-20)

M. Tech – I Semester

S.No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
THEORY										
1	PC	19DPC0501	Advanced Data Structures and Algorithms	3	0	0	3	40	60	100
2	PC	19DPC0502	Fundamentals of Data Science	3	0	0	3	40	60	100
3	PC	19MBA0110	Research Methodology and IPR	2	0	0	2	40	60	100
4	PE	19DPE0501/ 19DPE0502/ 19DPE0503	Elective I – Software Project Management / Advanced Computer Networks/ Artificial Neural Networks	3	0	0	3	40	60	100
5	PE	19DPE0504/ 19DPE0505/ 19DPE0506	Elective II – Artificial Intelligence / Internals of Operating Systems/ Multicore Architecture & Programming	3	0	0	3	40	60	100
6	MC	19DMC___	Audit Course 1: 19DMC9901: English for Research Paper Writing 19DMC0101: Disaster Management 19DMC9902: Sanskrit for Technical Knowledge 19DMC9903: Value Education	2	0	0	0	40	0	40
PRACTICAL										
7	PC	19DPC0504	Advanced Data Structures and Algorithms Lab	0	0	4	2	40	60	100
8	PC	19DPC0505	R & Analytics Lab	0	0	4	2	40	60	100
						TOTAL	18	320	420	740

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5

M.Tech II Semester

S.No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
THEORY										
1	PC	19DPC5806	Big Data Analytics	3	0	0	3	40	60	100
2	PC	19DPC5807	Mobile Application Development	3	0	0	3	40	60	100
3	PE	19DPE5807/ 19DPE5808/ 19DPE5809	Elective-III Internet of Things/ Network Security and Cryptography / NOSQL Databases	3	0	0	3	40	60	100
4	PE	19DPE5810/ 19DPE5811/ 19DPE5812	Elective-IV Machine Learning/ Cloud Computing/ Natural Language Processing	3	0	0	3	40	60	100
5	MC	19DMC_ _ _ _	Audit Course 2: 19AMC9904: Constitution of India 19DMC5801: Pedagogy Studies 19DMC9905: Stress Management by Yoga 19DMC9906: Personality Development through Life Enlightenment Skills	2	0	0	0	40	0	40
PRACTICAL										
6	PC	19DPC5808	Map Reduce Programming Lab	0	0	4	2	40	60	100
7	PC	19DPC5809	Mobile Application Development Lab	0	0	4	2	40	60	100
8	PR	19DPR5801	Mini Project with Seminar	2	0	0	2	40	60	100
						TOTAL	18	320	420	740

HEAD
Dept. of Computer Science & Engg.
Annamacharya Institute of
Technology & Sciences, Tirupati-5.

M.Tech III Semester

S.No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
THEORY										
1	PE	19DPE5813/ 19DPE5814/ 19DPE5815	Program Elective 5 – Data Preparation and Analysis/ Secure Software Design & Enterprise Computing/ Computer Vision	3	0	0	3	40	60	100
2	OE	19DOE____	Open Elective: 19DOE5801: Business Analytics 19DOE9001: Industrial Safety 19DOE9002:Operations Research 19DOE2002:Project Management 19DOE9004:Composite Materials 19DOE2001:Waste to Energy	3	0	0	3	40	60	100
3	PR	19DPR5802	Dissertation-I /Industrial Project	0	0	20	10	40	60	100
						TOTAL	**16**	**120**	**180**	**300**

M.Tech IV Semester

S.No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
1	PR	19DPR5803	Dissertation II	0	0	32	16	60	140	200
						TOTAL	**16**	**60**	**140**	**200**

HEAD
Dept. of Computer Science & Engg.
Annamacharya Institute of
Technology & Sciences, Tirupati-5

1.1.2 file J M.Tech AK-22 CSE

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: TIRUPATI
(AUTONOMOUS)

Department of Computer Science and Engineering

Effective for the batches admitted from 2022-23

M. Tech – I Semester

S.No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
THEORY										
1	PC	22DPC5801	Advanced Data Structures and Algorithms	3	0	0	3	40	60	100
2	PC	22DPC5802	Fundamentals of Data Science	3	0	0	3	40	60	100
3	PE		**Program Elective-I**	3	0	0	3	40	60	100
		22DPE5801	1. Software Project Management							
		22DPE5802	2. Advanced Computer Networks							
		22DPE5803	3. Artificial Neural Networks							
4	PE		**Program Elective-II**	3	0	0	3	40	60	100
		22DPE5804	1.Artificial Intelligence							
		22DPE5805	2. Internals of Operating Systems							
		22DPE5806	3. Multi-core Architecture & Programming							
5	ML	22MBA0110	Research Methodology and IPR	2	0	0	2	40	60	100
6	MC		**Audit course I**	2	0	0	0	40	-	40-
		22DMC9901	1. English for Research Paper Writing							
		22DMC2001	2. Disaster Management							
		22DMC9902	3. Sanskrit for Technical Knowledge							
		22DMC9903	4. Value Education							
PRACTICAL										
7	PC	22DPC5803	Advanced Data Structures and Algorithms Lab	0	0	4	2	40	60	100
8	PC	22DPC5804	R & Analytics Lab	0	0	4	2	40	60	100
Total							18			740

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of Technology & Sciences, Tirupati

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: TIRUPATI
(AUTONOMOUS)

Department of Computer Science and Engineering
Effective for the batches admitted from 2022-23

M. Tech – II Semester

S.No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
THEORY										
1	PC	22DPC5805	Big Data Analytics	3	0	0	3	40	60	100
2	PC	22DPC5806	Mobile Application Development	3	0	0	3	40	60	100
3	PE		**Program Elective III**	3	0	0	3	40	60	100
		22DPE5807	1. Internet of Things							
		22DPE5808	2. Network Security and Cryptography							
		22DPE5809	3. NOSQL Databases							
4	PE		**Program Elective IV**	3	0	0	3	40	60	100
		22DPE5810	1. Machine Learning							
		22DPE5811	2. Cloud Computing							
		22DPE5812	3. Natural Language Processing							
5	MC		**Audit course 2**	2	0	0	0	40	-	40
		22DMC9904	1.Constitution of India							
		22DMC5801	2. Pedagogy Studies							
		22DMC9905	3. Stress Management by Yoga							
		22DMC9906	4. Personality Development through Life Enlightenment Skills.							
PRACTICAL										
6	PC	22DPC5807	Map Reduce Programming Lab	0	0	4	2	40	60	100
7	PC	22DPC5808	Mobile Application Development Lab	0	0	4	2	40	60	100
8	PR	22DPR5801	Technical Seminar	0	0	4	2	100	00	100
Total							18			740

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: TIRUPATI
(AUTONOMOUS)

Department of Computer Science and Engineering

Effective for the batches admitted from 2022-23

M. Tech –III Semester

S.No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
THEORY										
1	PE		**Program Elective IV**	3	0	0	3	40	60	100
		22DPE5813	1. Data Preparation and Analysis							
		22DPE5814	2. Secure Software Design & Enterprise Computing							
		22DPE5815	3. Computer Vision							
2	OE		**Open Elective**	3	0	0	3	40	60	100
		22DOE5801	1. Business Analytics							
		22DOE9001	2. Industrial Safety							
		22DOE9002	3. Operations Research							
		22DOE2002	4. Project Management							
		22DOE9004	5. Composite Materials							
		22DOE2001	6. Waste to Energy							
3	PR	22DPR5802	Dissertation Phase – I	0	0	20	10	100	00	100
4	PR	22DPR5803	Co-curricular Activities	0	0	0	2			
TOTAL							18			300

M. Tech – IV Semester

S.No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
THEORY										
1	PR	22DPR5804	Dissertation Phase – 2	0	0	32	16	100	100	200
TOTAL							16			200

HEAD
Dept. of Computer Science & Engg
Annamacharya Institute of
Technology & Sciences, Tirupati-5