

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, 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				
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
<b>Total credits</b>							<b>19.5</b>	<b>240</b>	<b>560</b>	<b>800</b>

**Semester II (First year)**

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
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
<b>Total credits</b>							<b>19.5</b>	<b>270</b>	<b>560</b>	<b>830</b>

**Semester III (Second year)**

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	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
<b>Total credits</b>							<b>21.5</b>	<b>370</b>	<b>560</b>	<b>930</b>

**Semester IV (Second year)**

Sl.	Category	Course Code	Course Title	Hour per week			Credits	CIE	SEE	TOTAL
				L	T	P				
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
<b>Total credits</b>							<b>24.5</b>	<b>370</b>	<b>630</b>	<b>1000</b>
<p><b>Community Service Project (Mandatory) for 6 weeks duration during summer vacation.</b>                      (To visit the selected community to conduct survey (Socio-economic &amp; 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)</p>										
<b>Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)</b>				<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Semester V (Third year)**

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
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	Mandatory Course (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
<b>Total credits</b>							<b>21.5</b>	<b>440</b>	<b>490</b>	<b>930</b>
<b>Honors/Minor courses (The hours distribution can be 3-0- 2 or 3-1-0 also)</b>				<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Semester VI (Third year)**

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
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 (MOOCS-1) NPTEL*		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 Educational Leadership Entrepreneurship And IP Strategy Globalization And Culture Consumer Psychology Public Speaking Project Management Training Of Trainers Decision-Making Under	-	-	-	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
<b>Total credits</b>							<b>21.5</b>	<b>370</b>	<b>490</b>	<b>930</b>
<b>Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)</b>				<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Industrial/Research Internship (Mandatory) 2 Months during summer vacation</b>										

**Semester VII (Fourth year)**

S I.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
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				
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 Modeling Mathematical 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
<b>Industrial/Research Internship 2 Months (Mandatory) after third year (to be evaluated during VII Semester)</b>				<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>100</b>	<b>0</b>	<b>100</b>
<b>Total credits</b>							<b>23</b>	<b>350</b>	<b>350</b>	<b>800</b>
<b>Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)</b>				<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Semester VIII (Fourth year)**

SI .	Category	CourseCode	Course Title	Hours per week			Credit s	CIE	SEE	TOTAL
				L	T	P				
1	MAJOR PROJECT	20APR3002	Project, Project work, seminar and internship in industry	0	0	0	12	60	140	200
<b>Total credits</b>							<b>12</b>	<b>60</b>	<b>140</b>	<b>200</b>

### 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 (6<sup>th</sup> and 7<sup>th</sup> 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 1<sup>st</sup> November for January semester; and will be notified before 1<sup>st</sup> June for July semester. Accordingly HOD shall issue notification/circular to the teachers connected and to the concerned student groups.
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 8<sup>th</sup> 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	HUMAN COMPUTER INTERACTION	3
2	20AHN3002	SOCIAL NETWORKS	3
3	20AHN3003	NOSQL DATABASES	3
4	20AHN3004	COMPUTER VISION	3
5	20AHN3005	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
		<b>TOTAL</b>	<b>20</b>

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

S.NO	SUB.CODE	COURSE NAME	L	T	P	CREDITS
1	20AMN3001	OPERATING SYSTEMS	2	1	0	3
2	20AMN3002	COMPUTER ORGANIZATION	2	1	0	3
3	20AMN3003	COMPUTER NETWORKS	2	1	0	3
4	20AMN3004	ARTIFICIAL INTELLIGENCE	3	0	0	3
5	20AMN3005	DATA SCIENCE	2	1	0	3
6	20AMN3006	MINOR DISCIPLINE PROJECT	-	-	-	5
		<b>TOTAL</b>				<b>20</b>