

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in CSE(Data Science)
(Applicable from the academic session 2020-2021)

Curriculum Structure
First Year First Semester

Mandatory Induction Program- 3 week's duration

Sl No.	Category	Subject Code	Subject Name	Total Number of Contact hours			Credits
				L	T	P	
Theory							
1	Basic Science Course	BS-PH101/	Physics-I (Gr-A)/	3	1	0	4
		BS-CH101	Chemistry-I(Gr-B)				
2	Basic Science Course	BS-M101/	Mathematics –IA*/	3	1	0	4
		BS-M102	Mathematics –IB *				
3	Engineering Science Courses	ES-EE101	Basic Electrical Engineering	3	1	0	4
		Total Theory		9	3	0	12
Practical							
1	Basic Science Course	BS-PH191/ BS-CH191	Physics-I Laboratory(Gr-A) / Chemistry-I Laboratory (Gr-B)	0	0	3	1.5
2	Engineering Science Courses	ES-EE191	Basic Electrical Engineering Laboratory	0	0	2	1
3	Engineering Science Courses	ES-ME191/ ES-ME192	Engineering Graphics & Design(Gr-B)/ Workshop/Manufacturing Practices(Gr-A)	1	0	4	3
		Total Practical		1	3	9	5.5
		Total credit for First Semester		10	3	9	17.5

* **Mathematics –IA (BS-M101) - CSE, IT, AI&ML and DS**
Mathematics –IB (BS-M102) - All stream except CSE, IT, AI&ML and DS

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in CSE(Data Science)
(Applicable from the academic session 2020-2021)

Second Semester							
Sl No.	Category	Subject Code	Subject Name	Total Number of Contact hours			Credits
				L	T	P	
Theory							
1	Basic Science Course	BS-PH201/ BS-CH201	Physics-I (Gr-B)/ Chemistry-I (Gr-A)	3	1	0	4
2	Basic Science Course	BS-M201/ BS-M202	Mathematics –IIA#/ Mathematics –IIB #	3	1	0	4
3	Engineering Science Courses	ES-CS201	Programming for Problem Solving	3	0	0	3
4	Humanities and Social Sciences including Management Courses	HM-HU201	English	2	0	0	2
		Total Theory		11	2	0	13
Practical							
1	Basic Science courses	BS-PH291/ BS-CH291	Physics-I Laboratory (Gr-B)/ Chemistry-I Laboratory (Gr-A)	0	0	3	1.5
2	Engineering Science Courses	ES-CS291	Programming for Problem Solving	0	0	4	2
3	Engineering Science Courses	ES-ME291/ ES-ME292	Engineering Graphics & Design(Gr-A)/ Workshop/Manufacturing Practices(Gr-B)	1	0	4	3
4	Humanities and Social Sciences including Management courses	HM-HU291	Language Laboratory	0	0	2	1
		Total Practical		1	0	13	7.5
		Total of Second Semester		12	2	13	20.5

Mathematics –II (BS-M201) - CSE , IT, AI&ML and DS
Mathematics –II (BS-M202) - All stream except CSE, IT, AI&ML and DS

	Group-A	Group-B
1st Year 1st Semester	Physics-I (BS-PH101); Workshop/Manufacturing Practices (ES-ME192)	Chemistry-I (BS-CH101); Engineering Graphics & Design (ES-ME191)
1st Year 2nd Semester	Chemistry-I (BS-CH201); Engineering Graphics & Design (ES-ME291)	Physics-I (BS-PH201); Workshop/Manufacturing Practices (ES-ME292)

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in CSE(Data Science)
(Applicable from the academic session 2020-2021)

Third Semester							
Sl No.	Category	Subject Code	Subject Name	Total Number of Contact hours			Credits
				L	T	P	
Theory							
1	Engineering Science Course	ESC301	Analog and Digital Electronics	3	0	0	3
2	Professional Core Courses	PCC-CS301	Data Structure & Algorithms	3	0	0	3
3	Professional Core Courses	PCC-CS302	Computer Organization	3	0	0	3
4	Professional Core Courses	PCC-DS301	Introduction to Data Science	3	0	0	3
5	Basic Science course	BSC 301	Mathematics-III (Differential Calculus)	2	0	0	2
6	Humanities & Social Sciences including Management Courses	HSMC 301	Economics for Engineers (Humanities-II)	3	0	0	3
		Total Theory		14	0	0	17
Practical							
1	Professional Core Courses	PCC-CS391	Data Structure & Algorithms Lab	0	0	4	2
2	Engineering Science Course	ESC391	Analog and Digital Electronics Lab	0	0	4	2
3	Professional Core Courses	PCC-CS392	Computer Organization	0	0	4	2
4	Professional Core Courses	PCC- DS391	Data Science Lab using Python	0	0	4	2
		Total Practical		0	0	16	8
		Total Credit for Third Semester		25			

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in CSE(Data Science)
(Applicable from the academic session 2020-2021)

Fourth Semester								
Sl No.	Category	Subject Code	Subject Name	Total Number of Contact hours			Credits	
				L	T	P		
Theory								
1	Professional Core Courses	PCC- CS401	Discrete Mathematics	3	1	0	4	
2	Professional Core Courses	PCC-DS 401	Database Management System	3	0	0	3	
3	Professional Core Courses	PCC-CS403	Formal Language & Automata Theory	3	0	0	3	
4	Professional Core Courses	PCC-CS 404	Design & Analysis of Algorithms	3	0	0	3	
5	Professional Core Courses	PCC-DS 402	Data Mining	3	0	0	3	
6	Basic Science Courses	BSC 401	Biology	2	1	0	3	
7	Mandatory Courses	MC401	Environmental Sciences	1	0	0	0	
		Total Theory		18	1	0	19	
Practical								
1	Professional Core Courses	PCC-DS 491	Database Management System Lab	0	0	4	2	
2	Professional Core Courses	PCC- CS 494	Design & Analysis of Algorithms Lab	0	0	4	2	
3	Professional Core Courses	PCC- DS492	Data Mining Lab	0	0	4	2	
		Total Practical		0	0	12	6	
		Total credit for Fourth Semester						25

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in CSE(Data Science)
(Applicable from the academic session 2020-2021)

Fifth Semester							
Sl No.	Category	Subject Code	Subject Name	Total Number of Contact hours			Credits
				L	T	P	
Theory							
1	Engineering Science Course	ESC501	Software Engineering	3	0	0	3
2	Professional Core Courses	PCC- DS501	Statistics for Data Science	3	0	0	3
3	Professional Core Courses	PCC- CS502	Operating Systems	3	0	0	3
4	Professional Core Courses	PCC-CS503	Object Oriented Programming	3	0	0	3
5	Humanities & Social Sciences Including Management Courses	HSMC-501	Introduction to Industrial Management (Humanities III)	3	0	0	3
6	Professional Elective Courses	PEC-DS 501A/B/C/D/E	(Elective-I) Theory of Computation/Mobile Computing and Applications / Advanced Computer Architecture/ Computer Graphics/ Compiler Design	3	0	0	3
7	Mandatory Courses	MC- CS501A/B	Constitution of India/ Essence of Indian Knowledge Tradition	0	0	0	0
		Total Theory		18	0	0	18
Practical							
1	Professional Core Courses	ESC-591	Software Engineering Lab		0	4	2
2	Professional Core Courses	PCC-CS592	Operating Systems Lab		0	4	2
3	Professional Core Courses	PCC-CS593	Object Oriented Programming Lab		0	4	2
		Total Practical I		0	0	12	6
		Total credit for Fifth Semester					24

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in CSE(Data Science)
(Applicable from the academic session 2020-2021)

Sixth Semester							
Sl No.	Category	Subject Code	Subject Name	Total Number of Contact hours			Credits
				L	T	P	
Theory							
1	Professional Core Courses	PCC- DS601	Artificial Intelligence	3	0	0	3
2	Professional Core Courses	PCC- DS602	Data Communication and Computer Networks	3	0	0	3
3	Professional Core Courses	PCC- DS603	Big Data Technology	3	0	0	3
4	Professional Elective Courses	PEC- DS601A/B/C/D/E	(Elective-II) Advanced Algorithms/ Distributed Systems/ Information Security / Image Processing/ Machine Learning	3	0	0	3
5	Professional Elective Courses	PEC- DS602A/B/C/D	(Elective-III) Parallel and Distributed Algorithms/ Data Warehousing and Data Mining /Human Computer Interaction/ Data Analysis and Modeling Technique	3	0	0	3
6	Open Elective Courses	OEC- DS601A/B/C	(Open Elective-) Numerical Methods/Human Resource Development and Organizational Behaviour/ Social Computing	3	0	0	3
7	Project	PROJ-DS601	Research Methodology	3	0	0	3
		Total Theory		21	0	0	19
Practical							
1	Professional Core Courses	PCC- DS691	Artificial Intelligence Lab	0	0	4	2
2	Professional Core Courses	PCC-DS692	Data Communication and Computer Networks Lab	0	0	4	2
3	Professional Core Courses	PCC-DS693	Big Data Technology and OLAP Lab	0	0	4	2
		Total Practical		0	0	12	6

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in CSE(Data Science)
(Applicable from the academic session 2020-2021)

	Total of Sixth Semester	25
--	-------------------------	----

Seven Semester							
Sl No.	Category	Subject Code	Subject Name	Total Number of Contact hours			Credits
				L	T	P	
Theory							
2	Professional Core Courses	PEC-DS701A/B/C/D/E/F	(Elective-IV) Quantum Computing/ Cloud Computing/ Digital Signal Processing/Multi-agent Intelligent Systems/ Time Series Analysis and Forecasting / Data Visualization	3	0	0	3
3	Professional Elective Courses	PEC- DS 702A/B/ C/D/E/F	(Elective-V) Neural Networks and Deep Learning/ Soft Computing/ Ad-Hoc and Sensor Networks/Information Theory and Coding/Surveillance and Cyber Security / Pattern Recognition	3	0	0	3
4	Open Elective courses	OEC- DS 701A/B/ C	(Open Elective-II) Operations Research/Multimedia Technology/ Soft Skill & Interpersonal Communication	3	0	0	3
5	Humanities & Social Sciences including Management Courses	HSMC701	Project Management and Entrepreneurship	2	1	0	3
6	Project	PROJ-CS781	Project-II	0	0	12	6
Total credit for Seven Semester				18			

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in CSE(Data Science)
(Applicable from the academic session 2020-2021)

Eight Semester							
Sl No.	Category	Subject Code	Subject Name	Total Number of Contact hours			Credits
				L	T	P	
Theory							
1	Professional Elective courses	PEC- DS 801A/B/C/D/E	(Elective-VI) Signals and Networks/Quantum Cryptography and Network Security / Natural Language Processing Computer Vision/ Web and Internet Technology/Internet of Things	3	0	0	3
2	Open Elective courses	OEC- DS801A/B/C/D	Open Elective-III Big Data Analysis/Cyber Law and Ethics/ Mobile Computing/Robotics	3	0	0	3
3	Open Elective courses	OEC- DS 802A/B/C	Open Elective-III Business Analytics /Data Science Ethics / Number Theory	3	0	0	3
4	Project	PROJ- DS881	Project-III	0	0	12	6
Total of Eight Semester				15			