SYLLABUS

Executive M.Tech - Data Science & Data Analytics

Executive M.Tech. (DSDA)

About the Program

The M.Tech. Executive in Data Science & Data Analytics at IIT Bhilai equips working professionals with the skills to analyze complex datasets, derive meaningful insights, and build data-driven solutions. This program emphasizes foundational knowledge, advanced analytics, and real-world applications of data science, including machine learning, big data technologies, and statistical modeling.

Designed for flexibility, the program offers online classes, electives, and project-based learning. It prepares participants for roles such as data scientists, business analysts, and AI/ML specialists in various industries.

Program Learning Objectives (PLOs)

	Learning Objective
PLO1	Build a strong foundation in data science principles, statistical methods, and computational tools.
PLO2	Gain expertise in big data technologies and advanced machine learning techniques.
PLO3	Develop the ability to analyze, visualize, and interpret complex datasets to solve real-world problems.
PLO4	Understand the ethical, legal, and societal implications of data science and AI applications.
PLO5	Foster innovation in creating data-driven solutions for diverse industries such as healthcare, finance, and IoT.
PLO6	Cultivate leadership and collaboration skills for managing multidisciplinary data analytics projects.

Program Outcomes (POs)

	Program Outcome
PO1	Demonstrate expertise in core data science concepts, including data preprocessing, analytics, and modeling.
PO2	Apply machine learning and advanced analytics techniques to solve complex business and scientific problems.
PO3	Design, develop, and implement big data systems for scalable and efficient data processing.
PO4	Ensure ethical data usage and address privacy, governance, and compliance in data-driven decision-making.
PO5	Communicate data-driven insights and recommendations effectively to technical and non-technical audiences.
PO6	Commit to continuous learning, staying updated with emerging trends and technologies in data science and analytics.

Course Structure For Executive M.Tech. (DSDA)

Semester I (Total Credits - 10)

Course Code	Course Name	L	T	P	C	Category
DSDA01	Programming for Data Science and Data Analytics	2	1	0	3	Core Course
DSDA02	Mathematics for Data Science and Data Analytics	3	1	0	4	Core Course
DSDA03	Introduction to Machine Learning	2	0	2	3	Core Course

Semester II - Total Credits - 9

Course Code	Course Name	L	T	P	C	Category
DSDA04	Big Data Technologies	2	0	2	3	Core Course
DSDAEXX	Elective in Machine Learning	3	0	0	3	Elective -1
DSDAEXX	Elective in Advanced Analytics	3	0	0	3	Elective -2

Semester III - Total Credits - 9

Course Code	Course Name	L	T	P	C	Category
DSDAEXX	Expertise-Oriented Electives	3	0	0	3	Elective 3
DSDAEXX	Elective-4 (Any)	3	0	0	3	Elective 4
DSDAEXX	Elective-4 (Any)	3	0	0	3	Elective 4

Semester IV (Total Credits - 12)

Course Code	Course Name	L	T	P	C	Category
DSDAP01	Capstone Project	0	0	24	12	MTech Project
OR						
DSDAT01*	Thesis	x	x	x	12	MTech Thesis

Semester - V* (Total Credits - 14)

Course Code	Course Name	L	T	P	C	Category
DSDAT01*	Thesis	x	x	x	14	MTech Thesis

*** Only for those who have opted for the equivalent degree to the regular MTech Program**

Students registered only for the Executive MTech (Online) Program:
Total Credits : 10 (Semester I)+ 9 (Semester II)+ 9 (Semester - III) + 12 (Semester - IV) = 40

Students opted for the equivalent degree to the regular MTech Program
Total Credits : 10 (Semester I) + 9 (Semester II) + 9 (Semester III) + 12 (Semester - IV) + 14 (Semester V) =54

Additional Notes:

- **Program Equivalency:** The Executive MTech (Online) Program is not equivalent to the regular offline MTech program at IIT Bhilai.
- **Thesis Requirements:** To achieve equivalency with the regular offline MTech program, the candidate must complete a total of 26 thesis credits on campus from the fourth semester onwards.

Bucket for Electives

Category	Sem	Course Code	Course Name	L	T	P	C
Elective in Advanced Analytics	2/3	DSDAE01	Text Mining and Natural Language Processing	3	0	0	3
	2/3	DSDAE02	Time Series Analysis and Forecasting	3	0	0	3
	2/3	DSDAE03	Network Data Analytics	3	0	0	3
	2/3	DSDAE04	Data Analytics in the Cloud	2	0	2	3

Category	Sem	Course Code	Course Name	L	T	P	C
Elective in Machine Learning	2/3	DSDAE05	Deep Learning	3	0	0	3
	2/3	DSDAE06	Computer Vision	3	0	0	3
	2/3	DSDAE07	Reinforcement Learning	3	0	0	3

Category	Sem	Course Code	Course Name	L	T	P	C
Expertise-Oriented Electives	3/4	DSDAE08	Business Intelligence and Analytics	3	0	0	3
	3/4	DSDAE09	Information Security	3	0	0	3
	3/4	DSDAE10	Data Governance and Compliance	3	0	0	3
	3/4	DSDAE11	Advanced Data Visualization Techniques	3	0	0	3
		DSDAE12	Data-Driven Decision Making	3	0	0	3

Electives will be floated based on the availability of faculty members. This list may be updated from time to time and change batch-wise.