



भारतीय विज्ञान शिक्षा एवं अनुसंधान संस्थान भोपाल

Indian Institute of Science Education and Research Bhopal

(Estb. by Ministry of Education, Govt. of India)

Department of Data Science and Engineering

Curriculum for B.Tech in Data Science and Engineering (DSE)

Semester	Course No.	Course Name	Credits	Total
I	CHM 101	General Chemistry	3	21
	MTH 101	Calculus of One Variable	3	
	PHY 101	Mechanics	3	
	EES 101	Introduction to Earth Sciences	3	
	CHE 103	Engineering Design And Drawing	3	
	HSS 101	English for Communication	2	
	PHY 103	General Physics Laboratory-I	1	
BIO 101* or ECO 101	ECO 101* BIOLOGY I: Biomolecules or Principles of Economics-I	3		
II	CHM 112	Basic Organic Chemistry-I	3	19
	MTH 102	Linear Algebra	3	
	PHY 102	Modern Physics	3	
	EES 102	Introduction to Environmental Sciences	3	
	ECS 102	Introduction to Programming	3	
	CHM 114	Chemistry Laboratory-I	1	
BIO 102* or ECO 102*	Biology II: Fundamentals of Cell Biology OR Principles of Economics-II	3		
III		Engineering Mathematics	3	21
		Probability and Random Processes	3	
		Data Structures and Algorithms	3	
		Signals and Systems	3	
		Optimization Techniques	3	
		Data Structures Lab	3	
IV		Database Management System	3	18
		Advanced Programming	3	
		Algorithms	3	
		Data Science in Practice	4	
		Machine Learning	4	
V		Computer Organization	4	20
		Deep Learning	4	
		Deep Learning Lab	2	
		Computer Vision	4	
		Artificial Intelligence	3	
	Discrete Mathematics	3		

		DSE Elective	4	
VI		Natural Language Processing	4	20
		Open Elective	4	
		Open Elective	4	
		DSE Elective	4	
		DSE Elective	4	
VII		DSE Elective	4	20
		DSE Elective	4	
		Open Elective	4	
		Open Elective	4	
		Open Elective	4	
VIII		B.Tech Thesis		18
Curriculum for an additional year to obtain B.Tech-M. Tech in DSE				
IX	#ECO 500	Law Related to Intellectual Property and Patents	1	19
	DSE ***	DSE Electives (2 courses)	2*4 = 8	
	DSE 501	M. Tech Thesis	10	
X	DSE 502	M. Tech Thesis	20	20

List of DSE Elective Courses (B. Tech and B.Tech-M.Tech)

<ol style="list-style-type: none"> 1) Natural Language Processing (NLP) 2) Transfer Learning in Computer Vision (CV) 3) Advanced NLP 4) Biometrics 5) Biomedical Text Mining 6) Machine Learning for Bio-Pharma 7) Digital Image Processing 8) Data Analysis and Structure of GeoScience 9) Spatial Data Science and Applications 10) Advanced Deep Learning 11) Social Computing 12) Generative Artificial Intelligence (AI) 13) Ethics in AI/Responsible AI 14) Advanced Biometrics and Pattern Analysis 15) Deep Learning for CV 	<ol style="list-style-type: none"> 16) Reinforcement Learning 17) Game Theory 18) 3D Vision 19) 3D Deep Learning and Applications 20) Signal Processing for Machine Learning 21) AI for Sports Analytics 22) AI for Climate Modeling 23) Applied Accelerated AI 24) Data Visualization 25) Cloud Computing 26) Scalable Machine Learning 27) Human-Computer Interaction 28) Statistical Learning Theory 29) Online Learning
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