

**B. Tech. Engineering Program (After 10)**  
**Tentative Course Structure for Batch admitted in 2021-22**

First Year (Common for All Branches)	
Semester - I	Semester - II
Mathematics-I	Mathematics-II
Physics-I	Physics-II
Chemistry-I	Introduction to Electrical and Electronics Engineering
Engineering Drawing	Fundamentals of Mechanics-Statics
Mechanical Workshop	Introduction to IT Systems
Preparatory Course in English	Electrical and Computer Workshop

**B. Tech. (After 10) - Tentative Course Structure (Mechanical Engineering)**

B. Tech. Integrated (Mechanical Engineering) Second Year , Third Year & Fourth Year	
Semester-III	Semester-IV
Mathematics-III	Mathematics-IV
Physics-III	Physics-IV
Chemistry-II	Basic Thermodynamics
Elements of Mechanical Engineering	Solid Mechanics
Engineering Graphics & Design	Mechanical Measurement and Control
Basics of Manufacturing Engineering	Manufacturing Workshop
	Constitution of India
Semester-V	Semester-VI
Calculus	Linear Algebra and ordinary differential equations
Theory of Machines and Mechanism	Introduction to 3D Modeling
Basics of Machine Drawing	Industrial Engineering
Materials Science	Python for Mechanical Engineers
Programming for Problem Solving	Fundamentals of Engineering Design
Design Thinking	Critical Thinking
English Communication	Professional Ethics

B. Tech. Integrated (Mechanical Engineering) Fourth Year	
Semester -VII	Semester - VIII
Thermal Engineering	Mechanical Measurements and Metrology
Industrial Engineering	Design of Machine Elements-II
Design of Machine Elements-I	Hydraulic & Pneumatic systems
Fluid Machinery	Environmental Studies
Management Accounting for Engineers	Heat Transfer
Industrial Electronics	Principles of Economics & Management
	Open Elective - I (Basic Sci)
B. Tech. Integrated (Mechanical Engineering) Fifth Year & Sixth Year Specialization: Artificial Intelligence and Automation	
Semester -IX	Semester - X
Additive Manufacturing	Internet of Things
Finite Element Analysis	Robotics and Automation
Machine Learning	Automatic Control Systems

Sensors & Transducers	Artificial Intelligence
Department Elective – I	Department Elective - II
Open Elective - II (Management Pool)	
<b>Semester –XI</b>	<b>Semester - XII</b>
Automation Systems Design	Major Project (Industry/Institute)
Object Recognition and Speech Processing	
Microprocessors & Microcontrollers	
Department Elective – III	
Open Elective - IV (Mixed Pool)	
Minor Project	
<b>B. Tech. Integrated (Mechanical Engineering) Fifth Year &amp; Sixth Year Specialization: Design and Manufacturing</b>	
<b>Semester –IX</b>	<b>Semester - X</b>
Finite Element Analysis	Design of Mechanical Systems
Vibration Engineering	Product Design and Development
Additive Manufacturing	Design of HVAC systems
Metal Forming Operation	Automatic Control Systems
Department Elective – I	Department Elective - II
Open Elective - II (Management Pool)	Open Elective - III (Mixed Pool)
<b>Semester –XI</b>	<b>Semester - XII</b>
Electric and Hybrid Automotive Technology	Major Project (Industry/Institute)
Computational Fluid Dynamics	
Micro and Nano Manufacturing	
Department Elective – III	
Open Elective - IV (Mixed Pool)	
Minor Project	

### B. Tech. (After 10) - Tentative Course Structure (Computer Engineering)

<b>B. Tech. Integrated (Computer Engineering ) Second Year &amp; Third Year</b>	
<b>Semester - III</b>	<b>Semester - IV</b>
Mathematics-III	Mathematics-IV
Physics-III	Chemistry-II
C Programming	Physics-IV
Basic Electronics	Python Programming
Computer Hardware and Maintenance	Multimedia and Animation
Constitution of India	
<b>Semester -V</b>	<b>Semester - VI</b>
Calculus	Linear Algebra and ordinary differential equations
Intelligence of Biological Systems	Computer Graphics
Programming for Problem Solving	Fundamentals of Ecommerce
Basic Data Structures	Java Programming
Fundamentals of Website Designing	Design Thinking
Critical Thinking	English Communication
Professional Ethics	

**B. Tech. Integrated (Computer Engineering) Fourth Year, Fifth Year & Sixth Year  
Specialization: Artificial Intelligence**

Semester –VII	Semester - VIII
Discrete Mathematics	Environmental Science
Random Processes and Estimation Techniques	Statistical Methods
Principles of Economics and Management	Machine Learning
Digital Electronics and Microprocessor	Signal and Image Processing
Principles of Operating Systems	Optimization Techniques
Computer Organization and Architecture	Management Accounting for Engineers
Introduction to Artificial Intelligence	Open Elective - I (Technical Pool)
Community Service	
Semester –IX	Semester - X
Computer Vision	Artificial Intelligence
Deep Learning	Robotics
Basic Control Theory	Computer Networks
Elective - I (Basket I)	Elective - V (Basket II)
Elective - II (Basket II)	Elective - VI (Basket II)
Elective - III (Basket II)	Elective - VII (Basket III)
Elective - IV (Basket III)	Open Elective - III (Humanities)
Open Elective II (Basic Sciences)	Open Elective - IV (Technical Pool)
Semester –XI	Semester - XII
Human Computer Interaction	Major Project (Industry/Institute)
Natural Language Processing	
Distributed Computing	
Open Elective - V (Mixed Pool)	
Open Elective - VI (Mixed Pool)	
Elective - VIII (Basket II)	
Summer Internship	
Minor Project	
Electives Basket I	Electives Basket II
Soft Computing	Sentiment / Web Analytics
Cyber Security	Adversarial Machine Learning
Web Programming	Speech Systems
Software Engineering	Reinforcement learning
Unix Programming	Information Retrieval and Web Search
Information storage and Management	Data Wrangling
Software quality assurance and Testing	Data visualization
Software Project Management	Machine Learning with Big Data
Microcontroller and Embedded Programming	Data Mining
Cloud Computing	Database Organization
Information theory and coding	Gaming Theory
	Cognitive Science
	Bayesian Computational Stats
	Probabilistic Graphical Models

<b>Electives Basket III</b>	Information Security
Ethics and Values in AI	Intelligent Text Analysis and Knowledge Management
Research Methodology	Application of AI in Agriculture
Bioengineering	Bioinformatics
AI and Humanity	Application of AI in Health Care
	AI in Manufacturing
	Gene Editing
	Brain Machine Interfaces
	Non linear Control Techniques
	Predictive and Prescriptive Analytics
	Big Data Technology

<b>B. Tech. Integrated (Computer Engineering) Fourth Year, Fifth Year &amp; Sixth Year Specialization: System Security</b>	
<b>Semester –VII</b>	<b>Semester - VIII</b>
Discrete Mathematics	Probability and Statistics
Environmental Science	Image and Video Processing
Principles of Economics and Management	Operating Systems
Digital Logic & System Design	Computer Networks
Database Management Systems	Web Programming
Computer Architecture	Introduction to Cryptography
Object Oriented Programming	Open Elective - I (Mixed Pool)
Community Service	
<b>Semester –IX</b>	<b>Semester - X</b>
Cybersecurity Fundamentals	Management Accounting for Engineers
Network Security	Vulnerability Assessment and Penetration Testing
Software Engineering	Machine Learning
Elective - I (Any One)	Cybersecurity Risk management
Elective - II (Any One)	System Administration
Open Elective - II (Mixed Pool)	Elective - III (Any One)
Open Elective - III (Humanities)	Elective - IV (Any One)
	Open Elective - IV (Basic Science)
	Open Elective - V (Technical Pool)
<b>Semester –XI</b>	<b>Semester - XII</b>
Elective - V (Any One)	Major Project (Industry/Institute)
Elective - VI (Any One)	
Human and Legal Aspects of Cybersecurity	
Digital Forensics and Incident Response	
Open Elective - VI (Technical Pool)	
Summer Internship	
Minor Project	
<b>Electives Basket I</b>	<b>Electives Basket II</b>
AI and Robotics	Application Security Testing
Internet of Things	Cryptanalysis
Advanced Database Management Systems	Mobile Forensics

Human Computer Interaction	ICS Security and Forensics
Advanced Computer Networks	Reverse Engineering and Malware Analysis
Cloud Computing	Designing Security Policies
Deep Learning	Advanced topics in Cybersecurity
Data Warehousing and Mining	Blockchain Security and Forensics
Information Theory and Coding	Elliptic Curve Cryptography
<b>Electives Basket III</b>	
Security Operation Center	
SecDevOps	
Threat Modelling	
Threat Intelligence	
Security Metrics	
Reverse Engineering of Mobile and IoT Devices	
Virtualization Security and Forensics	
Advanced Topics in Cryptology	
Quantum Cryptography	

## B. Tech. (After 10) - Tentative Course Structure (Information Technology)

B. Tech. Integrated (Information Technology) Second Year , Third Year & Fourth Year	
Semester - III	Semester - IV
Mathematics - III	Mathematics -IV
Physics-III	Chemistry-III
Communication Skill	Physics-IV
Chemistry-II	Data Structures and Algorithms
Programming for Problem Solving	Python Programming
Constitution of India	Professional Ethics
Semester -V	Semester - VI
Calculus	Linear Algebra and ordinary differential equations
Intelligence of Biological Systems	Unix Shell Programming
Introduction to Data Communication and Networks	Introduction to Web Development
Multimedia and Animation	Life Skills
Introduction to IT Infrastructure Landscape	Implementation of Technology
Design Thinking	Critical Thinking
	Innovation and Entrepreneurship

B. Tech. Integrated (Information Technology) Second Year , Third Year & Fourth Year	
Semester -VII	Semester - VIII
Discrete Mathematics	Probability and Statistics
Environmental Science	Image & Video Processing
Principles of Economics and Management	Operating Systems
Digital Logic & System Design	Computer Networks
Database Management Systems	Web Programming
Computer Architecture	Principles of Artificial Intelligence
Object Oriented Programming	Open Elective - I (Mixed Pool)
Community Service	

<b>B. Tech. Integrated (Information Technology) Fifth Year &amp; Sixth Year</b>	
<b>Semester –IX</b>	<b>Semester - X</b>
Human Computer Interaction	Management Accounting for Engineers
Embedded Systems	Mobile Application Development
Software Engineering	Machine Learning
Elective - I (Any One)	Software Project Management
Elective - II (Any One)	System Administration
Open Elective - II (Mixed Pool)	Elective - III (Any One)
Open Elective - III (Humanities)	Elective - IV (Any One)
	Open Elective - IV (Basic Science)
	Open Elective - V (Technical Pool)
<b>Elective Basket I</b>	<b>Elective Basket II</b>
Management Information Systems	Software Quality Assurance
Advanced Data Structures	UI and UX Design
Foundations of Cryptography	Cyber Forensics
Service Oriented Architecture	Image and Video Processing
Data Warehousing & Mining	Advanced Machine Learning
Programming for Analytics	Advanced Database Management Systems
AI and Robotics	IoT
Computer Graphics	E-Commerce
Advanced Computer Networks	Natural Language Processing
<b>Elective Basket III</b>	
Software Testing	
Deep Learning	
Advanced Web Programming	
Visual Analytics	
Database Administration	
Ethical Hacking	
Distributed Systems	
Computer Vision	
Network design	
<b>Semester –XI</b>	<b>Semester - XII</b>
Elective - V (Any One)	Major Project (Industry/Institute)
Elective - VI (Any One)	
Information Systems Security	
Cloud Computing	
Open Elective - VI (Technical Pool)	
Summer Internship	
Minor Project	
<b>Elective Basket I</b>	<b>Elective Basket II</b>
Management Information Systems	Software Quality Assurance
Advanced Data Structures	UI and UX Design
Foundations of Cryptography	Cyber Forensics
Service Oriented Architecture	Image and Video Processing
Data Warehousing & Mining	Advanced Machine Learning
Programming for Analytics	Advanced Database Management Systems

AI and Robotics	IoT
Computer Graphics	E-Commerce
Advanced Computer Networks	Natural Language Processing
<b>Elective Basket III</b>	
Software Testing	
Deep Learning	
Advanced Web Programming	
Visual Analytics	
Database Administration	
Ethical Hacking	
Distributed Systems	
Computer Vision	
Network design	

### B. Tech. (After 10) - Tentative Course Structure (Data Science)

B. Tech. Integrated (Computer Engineering) Second Year & Third Year	
Semester - III	Semester - IV
Mathematics-III	Mathematics-IV
Physics-III	Chemistry-II
C Programming	Physics-IV
Basic Electronics	Python Programming
Computer Hardware and Maintenance	Multimedia and Animation
	Constitution of India
Semester - V	Semester - VI
Calculus	Linear Algebra and Ordinary Differential Equations
Intelligence of Biological Systems	Computer Graphics
Programming for Problem Solving	Fundamentals of Ecommerce
Basic Data Structures	Java Programming
Fundamentals of Website Designing	Critical Thinking
Design Thinking	Professional Ethics
English Communication	

B. Tech. Integrated (Data Science) Fourth Year, Fifth Year & Sixth Year [ 2020-2021]	
Semester - VII	Semester - VIII
Data Gathering and Cleaning - ETL Process	Advanced Database Management System
Data Structure and Algorithm	Operations Research
Database Management System	Cyber Security
Applied Mathematics – III	Operating Systems
Business Visualization	Internet of Things
Environmental Studies	Statistical Method – I
Managing Uncertainty	Computer Organization and Architecture
Semester - IX	Semester - X
Business Economics	Big Data
Artificial Intelligence	Deep Learning
Machine Learning	Computer Vision
Image and Signal Processing	Predictive Modelling

Applied Mathematics – IV	Natural Language Processing
Data Science Ethics	Financial Institution and Market
Research Methodology	Marketing Management
Statistical Method – II	
<b>Semester - XI</b>	<b>Semester - XII</b>
Capstone project	Major Project (Industry/Institute)
Elective I - Management (Choose any one)	
Elective II - Technical (Choose any one)	
Elective III - Management/Technical **	
<b>Elective I – Management</b>	
Financial Engineering and Risk Management (Elective)	
Marketing Analytics (Elective)	
Operation and Supply Chain Analytics (Elective)	
Human Resource Analytics (Elective)	
Design Thinking (Elective)	
<b>Elective II – Technical</b>	
Network Analytics (Elective)	
Advanced Neural Network (Elective)	
Cloud Computing (Elective)	
Web Analytics (Elective)	
Block Chain (Elective)	
Simulation Modeling (Elective)	