4 Year B. Tech. Degree Course-Mathematics and Computing w.e.f. 2024-25 Batch

(Formal Approval in Progress)

FIRST SEMESTER

Sr. No.	Course		Course Category	Contact Hours				
	No.	Title		L	T	P	Total	
1.	XXXXXXX	Mathematics-1	BSC	3	1	-	4	4
2.	XXXXXXX	Physics-I	BSC	3	1	-	4	4
3.	XXXXXXX	Software Development Fundamentals-I	ESC	3	1	-	4	4
4.	XXXXXXX	English	HSC	1	-	2	3	2
5.	XXXXXXX	Physics Lab-1	BSC	-	-	2	2	1
6.	XXXXXXX	Software Development Lab-I	ESC	-	-	2	2	1
7.	XXXXXXX	Workshop	ESC	-	-	3	3	1.5
8	XXXXXXX	Electrical Science	ESC	3	1	-	4	4
9	XXXXXXX	Electrical Science Lab	ESC	-	-	2	2	1
		TOTAL					28	22.5

SECOND SEMESTER

Sr. No.	Course		Course Category	Contact Hours				Credits
	No.	Title		L	T	P	Total	
1.	XXXXXXX	Mathematics-2	BSC	3	1	-	4	4
2.	XXXXXXX	Physics-2	BSC	3	1	-	4	4
3	XXXXXXX	Software Development Fundamentals-II	ESC	3	1	-	4	4
4.	XXXXXXX	Physics Lab-2	BSC	-	-	2	2	1
5	XXXXXXX	Software Development Lab-II	ESC	-	-	2	2	1
6.	XXXXXXX	Life Skills & Professional Communication Lab	HSC	-	-	2	2	Qualifying
7.	XXXXXXX	Engineering Drawing & Design	ESC	-	-	3	3	1.5
8	XXXXXXX	Universal Human Values (UHV)	HSC	2	1	-	3	3
		TOTAL					24	18.5

THIRD SEMESTER

Sr. No.	Course		Course Category	Contact Hours				Credits
	No.	Title		L	T	P	Total	
1.	XXXXXXX	Probability and Statistics	BSC	3	1	-	4	4
2.	XXXXXXX	PCC-1 (Discrete Mathematics)	PCC	3	1	-	4	4
3.	XXXXXXX	PCC-2 (Data Structure)	PCC	3	1	-	4	4
	XXXXXXX	PCC-3 (Database Systems and Web)	PCC	3	1	-	4	4
4.	XXXXXXX	Environmental Science	OMC	3	-	-	3	Qualifying
5.	XXXXXXX	PCC-1 Lab (Data Structure lab)	PCC	-	-	2	2	1
6.	XXXXXXX	PCC-2 Lab (Database Systems and Web lab)	PCC	-	-	2	2	1
7.	XXXXXXX	PCC-3 Lab -II (Information Security lab)	PCC	-	-	2	2	1
8.	XXXXXXX	Economics	HSC	2	1	-	3	3
9	XXXXXXX	Summer Training-I (4 weeks)	PRC	-	-	-	-	2
		TOTAL					28	24

FOURTH SEMESTER

Sr. No.	Course		Course Category	Contact Hours				Credits
	No.	Title		L	T	P	Total	
1.	XXXXXXX	HSS Elective – 1	HSC	2	1	-	3	3
2.	XXXXXXX	PCC-4 (Linear Algebra)	PCC	3	1	-	4	4
3.	XXXXXXX	PCC-5 (Computer Organization and Architecture)	PCC	3	1	-	4	4
4.	XXXXXXX	PCC-6 (Algorithms and Problem Solving)	PCC	3	1	-	4	4
5.	XXXXXXX	PCC-7 (Modern Algebra)	PCC	3	-	-	3	3
6.	XXXXXXX	PCC-4 Lab (Open Source Software lab)	PCC	-	-	2	2	1
7	XXXXXXX	PCC-5 Lab (Computer Organization and Architecture Lab)	PCC	-	-	2	2	1
8	XXXXXXX	PCC-6 Lab (Algorithms and Problem-Solving Lab)	PCC	-	-	2	2	1
9	XXXXXXX	Discipline Elective -1	PEC	3	-	-	3	3
		TOTAL					27	24

FIFTH SEMESTER

Sr. No.	Course		Course Category	Contact Hours				Credits
	No.	Title		L	T	P	Total	
1.	XXXXXXX	PCC-8 (Real Analysis)	PCC	3	1	-	4	4
2.	XXXXXXX	PCC-9 (Operating Systems and Systems Programming)	PCC	3	1	-	4	4
3	XXXXXXX	PCC-8 Lab (R-Software Lab)	PCC	-	-	2	2	1
4.	XXXXXXX	PCC-9 Lab (Operating Systems and Systems Programming Lab)	PCC	-	-	2	2	1
5.	XXXXXXX	Discipline Elective – 2	PEC	3	-	-	3	3
6	XXXXXXX	Discipline Elective – 3	PEC	3	-	-	3	3
7	XXXXXXX	Science Elective	BSC	3		-	3	3
8	XXXXXXX	Indian Constitution & Traditional Knowledge	OMC	3	-	-	3	Qualifying
9	XXXXXXX	Summer Training-II (6 weeks)	PRC	-	-	-	-	2
		TOTAL					24	21

SIXTH SEMESTER

Sr. No.	Course		Course Category	Contact Hours				Credits
	No. Title			L	T	P	Total	
1.	XXXXXXX	PCC-10 (Computer Networks and Internet of Things)	PCC	3	-	-	3	3
2.	XXXXXXX	PCC-11 (Artificial Intelligence)	PCC	3		-	3	3
3.	XXXXXXX	PCC-12 (Theory of Computation)	PCC	3		-	3	3
4.	XXXXXXX	Discipline Elective – 4	PEC	3	-	-	3	3
5	XXXXXXX	Discipline Elective -5	PEC	3	-	-	3	3
6	XXXXXXX	Open Elective - 1	OEC	3			3	3
7	XXXXXXX	Selected Value-Added Course	Value added	2			2	Audit
8	XXXXXXX	PCC-10 Lab (Computer Networks and Internet of Things Lab)	PCC	-	-	2	2	1
9	XXXXXXX	PCC-11 Lab (Artificial Intelligence Lab)	PCC	-	-	2	2	1
10	XXXXXXX	Minor Project	PRC	-	-	4	4	2
		TOTAL					28	22

SEVENTH SEMESTER

Sr. No.	Course No.	Title	Category	Contact Hours L	T	P	Total	Credits
1.	XXXXXXX	Discipline Elective – 6	PEC	3	-	-	3	3
2.	XXXXXXX	Open Elective - 2	OEC	3	-	-	3	3
3.	XXXXXXX	Major Project Part-1	PRC	-	-		8	4
4.	XXXXXXX	Summer Training-III (6 weeks)	PRC	-	-	-	-	4
		TOTAL					14	14

EIGHTH SEMESTER

Sr. No.	Course No.	Title	Category	Contact Hours L	T	P	Total	Credits
1.	XXXXXXX	Discipline Elective - 7	PEC	3	-	-	3	3
2.	XXXXXXX	Open Elective -3	OEC	3	-	-	3	3
3.	XXXXXXX	Major Project Part-2	PRC	-	-	12	12	6
4	XXXXXXX	Seminar and Term Paper	PRC	0	0	4	4	2
		TOTAL					22	14

Total Credits for B. Tech. –160

Mandatory Internships/Summer Trainings

Summer Training -I (4 weeks) (In summer vacation after second semester)

Sr. No.	Course		Course Category	Contact Hours				Credits
	No.	Title		L	T	P	Total	
1.	XXXXXX	Inter/Intra institutional activities (Training with higher Institutions; Soft skill training organized by Training and Placement Cell of the respective institutions; contribution at incubation/ innovation /entrepreneurship cell of the institute; participation in conferences/ workshops/ competitions etc.; Learning at Departmental Lab/ Tinkering Lab/ Institutional workshop; Working for consultancy/ research project within the institutes and Participation in all the activities of Institute's Innovation Council for eg: IPR workshop/Leadership Talks/ Idea/ Design/ Innovation/ Business Completion/ Technical Expos etc.)	PRC1	0		6	6	2
		TOTAL					6	2

Summer Training -II (6 weeks) (In summer vacation after fourth semester)

Sr. No.	Course		Course Category	Contact Hours				Credits
	No.	Title		L	T	P	Total	
1.	XXXXXX	Industrial/Govt./ NGO/MSME/ Rural Internship/ Innovation / Entrepreneurship (Students may choose either to work on innovation or entrepreneurial activities resulting in start-up or undergo internship with industry/ NGO's/ Government organizations/ Micro/ Small/ Medium enterprises to make themselves ready for the industry. In case student want to pursue their family business and don't want to undergo internship, a declaration by a parent may be submitted directly to the TPO.)	PRC1	0		6	6	2
		TOTAL					6	2

Summer Training -III (6 weeks) (In summer vacation after sixth semester)

Sr. No.	Course		Course Category	Contact Hours				Credits
	No.	Title		L	T	P	Total	
1.	XXXXXX	Industrial/Govt./ NGO/MSME/ Rural Internship/ Innovation /Entrepreneurship (Students may choose either to work on innovation or entrepreneurial activities resulting in start-up or undergo internship with industry/ NGO's/ Government organizations/ Micro/ Small/ Medium enterprises to make themselves ready for the industry. In case student want to pursue their family business and don't want to undergo internship, a declaration by a parent may be submitted directly to the TPO.)	PRC1	0		8	8	4
		TOTAL					8	4

Electives:

Discipline Elective-1	Fundamentals of Machine Learning
	Fundamentals of Computer Security
	Introduction to Big Data and Data Analytics
	Object oriented Analysis and Design using JAVA
	Image Processing and Computer Vision
	Automata Theory and its applications

Discipline Elective-2	Operations Research
	Basic Numerical Methods
	Number Theory
	Complex Analysis

Discipline Elective-3	Smart systems and IoT
	Big Data with Hadoop and Spark
	Introduction to Deep Learning
	Secure Design of Software System

Discipline Elective-4	Cryptography
	Applied Mathematical Methods
	Topology
	Fuzzy set and Fuzzy Logic
	Mathematical Modelling and Simulation

Discipline Elective-5	Machine Learning and Big Data
	Computing for Data Science
	Introduction to DevOps
	Cloud computing Essentials: Azure and AWS
	IoT Analytics

Discipline Elective-6	Optimization Techniques
	Applicational Aspects of Differential Equations
	Statistics
	Multi Attribute Decision making
	Multivariate Analysis
	Matrix Computation

Discipline Elective-7	Machine Learning and Naturl Language
	Fog and Edge Computing
	Social Network Analysis
	Ethical Hacking and Prevention
	Software Construction using kubernetes and microservices
	Cryptocurrency Technologies

Open Elective-1	Waste to Energy Conversion
	Solid State Elctronic Devices
	Photovoltaic Techniques
	Applied Statictical Mechanics
	Medical and Inductrial Applications of Nuclear Radiations
	Cyber Security
	Introduction to Information Theory
	Sociology of Youth
Open Elective-2	Healthcare Marketplace
	Stress: Biology, Behaviour and Management
	HUMAN RESOURCE ANALYTICS
	Superconducting Materials, Magnets and Devices
	Introduction to Quantum Information Processing
	Nanoscience and Technology
	Algorithm and Analysis and AI
Open Elective-3	Machine Learning Tools in Bioinformatics
	Gender Studies
	International Studies
	Urban Sociology
	Solar Engineering
	Photonics and Applications
	Astrophysics
	Biophysics
	Plasma Physics

HSS Elective-1	Positive Psychology
	Financial Management
	Introduction to Contemporary forms of Literature
	Sociology of Media
	Management Accounting
	Technology and Culture
	Planning and Economic Development

Value Added	Java Programming
	Problem Solving using C and C++
	Non-linear Data Structures & problem solving
	Front End Programming
	BIORISK AND BIOSECURITY
	TELECOMMUNICATION NETWORKS
	VLSI Design
	Mechatronics
	Renewable Energy-value added
	Workplace Communication
	Theatre and Performance
	Basics of creative writing
	Biorisk AND BIOSECURITY

***Science Electives (to be decided)**

**Note: Proposed Curriculum, subject to approval from Academic Council/BOS.