Bachelor of Technology (B.Tech) in Computer Science Engineering with specialization in Artificial Intelligence & Machine earning (AI & ML)

1. Department Vision Statement	
	To produce students with a comprehensive understanding of the essentials of the theory and application of Artificial Intelligence.
	To enable students to become leaders in the industry and academia nationally and internationally.
	To meet the persistent demands in the area of Artificial Intelligence.

2. Department Mission Statement	
	To develop, test, iterate and demonstrate how Artificial Intelligence can be used to tackle the problems in divergent domains that serves the nation and humanity.
	To collaborate with other disciplines that includes but not limited to Engineering and Technology, Science, Humanities, Medicines, Agriculture, Management, Law, etc.
	To advance the research collaboration with communities for a healthy, and sustainable world.
	To impart societal, safety, cultural, environmental and ethical responsibilities in the professional activities.
	To produce successful Artificial Intelligence graduates with the ability to work in multidisciplinary teams and commitment to lifelong learning.

3. Program Education Objectives (PEO)	
	Graduates will be able to analyze the problems by applying the principles of computer science, mathematics, and scientific investigation and to design and implement industry accepted solutions using latest AI technologies.
	Graduates will be able to develop a basic understanding of the building blocks of AI in terms of intelligent agents like Search, Knowledge representation, inference, logic, and learning.
	Graduates will be able to aid computers perform intellectual tasks such as decision making, problem solving, perception, understanding human communication in any language, and translate among them.
	Graduates will be able to be work productively in supportive, leadership and entrepreneurial roles with multidisciplinary teams through effective communication and high regard to legal and ethical responsibilities.
	Successfully pursue higher education in reputed institutions.
	Be able to embrace lifelong learning to meet ever changing developments in computer science.

Program Structure: Bachelor of Technology (B.Tech) in Computer Science Engineering with specialization in Artificial Intelligence & Machine earning (AI & ML)

1. Humanities & Social Sciences including Management Courses (H)					
Course Code	Course Title	Hours/Week			
		L	T	P	C
	English	2	0	2	3
	Foreign language	2	0	2	3
	General Aptitude	0	0	2	1
	Professional Ethics of Artificial Intelligence	2	0	0	2
	Employability Skills and Practices	0	0	2	0
	Total Learning Credits				**9**

2. Basic Science Courses (B)					
Course Code	Course Title	Hours/Week			
		L	T	P	C
	Calculus and Linear Algebra	3	1	0	4
	Advanced Calculus and Complex Analysis	3	1	0	4
	Engineering Physics, Chemistry and Biology	3	1	2	5
	Transforms and Boundary Value Problems	3	1	0	4
	Numerical Methods and Analysis	3	1	0	4
	Probability and Applied Statistics	3	1	0	4
	Discrete Mathematics for Engineers	3	1	0	4
	Total Learning Credits				**29**

3. Engineering Science Courses (S)					
Course Code	Course Title	Hours/Week			
		L	T	P	C
	Introduction to MATLAB for Artificial Intelligence	1	0	4	3
	Basic Electrical and Electronics Engineering	3	1	2	5
	Programming for Problem Solving	3	0	4	5
	Smart Manufacturing	1	0	4	3

	Linear Systems and Signal Processing	3	0	0	3
	Digital Logic and Computer Architecture	3	0	0	3
	Computer Networks and Communications	2	0	2	3
	Total Learning Credits				**25**

4. Professional Core Courses (C)					
Course Code	Course Title	Hours/Week			
		L	T	P	C
	Foundation of Data Analysis	3	0	2	4
	Foundation of Artificial Intelligence	2	0	2	3
	Data Structure and its Applications	3	0	2	4
	Object Oriented Design and Programming	3	0	2	4
	Software Engineering Principles	3	0	0	3
	Neural Networks and Machine Learning	3	0	2	4
	Analysis and Design of Algorithms	3	0	2	4
	Database Management Systems for Artificial Intelligence	2	0	2	3
	Operating System Design	2	0	2	3
	Foundation of Metric Spaces	1	0	0	1
	Deep Learning Techniques	3	0	2	4
	Web Programming for Artificial Intelligence	3	0	2	4
	Formal Language and Automata Theory	3	0	0	3
	Reinforcement Learning Techniques	2	0	2	3
	Inferential Statistics and Predictive Analytics	2	0	0	2
	Design of Artificial Intelligence Products	2	0	2	3
	Competitive Professional Skills - I	0	0	2	1
	Competitive Professional Skills- II	0	0	2	1
	Competitive Professional Skills – III	0	0	2	1
	Comprehension	0	1	0	1
	Total Learning Credits				**56**

5. Professional Elective Courses (E) (Any 6 Elective Courses)					
Course Code	Course Title	Hours/Week			
		L	T	P	C
	Optimization Techniques	3	0	0	3
	Stochastic Decision Making	3	0	0	3
	Information Theory and Coding	3	0	0	3
	Cognitive Science & Analytics	3	0	0	3
	Internet of Things Architecture and Protocols	3	0	0	3
	Intelligent Autonomous Systems	3	0	0	3
	Intelligence of Biological Systems	3	0	0	3
	Marketing Analytics	3	0	0	3
	Information Retrieval	3	0	0	3
	Text Processing	3	0	0	3
	Advanced Social, Text and Media Analytics	3	0	0	3
	Image and Video processing	3	0	0	3
	Biometrics	3	0	0	3
	Pattern Recognition Techniques	3	0	0	3
	Surveillance Video Analytics	3	0	0	3
	Medical Signal Processing	3	0	0	3
	Speech Recognition and Understanding	3	0	0	3
	Logic and Knowledge Representation	3	0	0	3
	Matrix theory for Artificial Intelligence	3	0	0	3
	Soft Computing and its Applications	3	0	0	3
	Artificial Intelligence and High Performance Computing	3	0	0	3
	Business Intelligence and Analytics	3	0	0	3
	Artificial Intelligence and Internet of Things	3	0	0	3
	Compiler Design	3	0	0	3
	Virtual Reality and Augmented Reality	3	0	0	3
	Data Mining and Analytics	3	0	0	3
	Time Series Analysis	3	0	0	3
	Cloud Computing	3	0	0	3
	Distributed Systems	3	0	0	3
	Big Data Analytics: Hadoop, Spark and NoSQL	3	0	0	3
	Brain Machine Interface	3	0	0	3
	Nature Inspired Computing	3	0	0	3
	Bio Informatics	3	0	0	3

	Theoretical and Computational Neuroscience	3	0	0	3
	Autonomous Navigation and Vehicles	3	0	0	3
	Mobile Game Development	3	0	0	3
	Total Learning Credits				**18**

6. Open Elective Courses (O) (Any 3 Open Elective Courses)					
Smart Healthcare					
Course Code	Course Title	Hours/Week			
		L	T	P	C
	Biomaterials and Artificial Organs	3	0	0	3
	Machine Vision in Medical Technology	3	0	0	3
	Home Medicare Technology	3	0	0	3
	Computational Methods for Signal and Image Processing	3	0	0	3
	Acoustics and Optical Imaging	3	0	0	3
	Body Area Networks and Mobile Healthcare	3	0	0	3
	Medical Electronics	3	0	0	3
	Human Genetics	3	0	0	3
	Recombinant DNA Technology	3	0	0	3
Robotics					
	Fundamentals of Robotics	3	0	0	3
	Machine Vision and Image Processing	3	0	0	3
	Sensors and Signal Conditioning	3	0	0	3
	Robot Kinematics and Dynamics	3	0	0	3
	Robot Control Programming	3	0	0	3
	Intelligent Vehicle Technology	3	0	0	3
	Automotive Communication Protocols	3	0	0	3
Infrastructure					
	Intelligent Transportation Systems	3	0	0	3
	Urban Planning And Sustainable Development	3	0	0	3
	Intelligent Irrigation System	3	0	0	3
	Geographical Information System	3	0	0	3
	Remote Sensing And Its Applications	3	0	0	3
	RS And GIS For Environmental Engineering	3	0	0	3
Business Analytics					
	Information Management	3	0	0	3
	Managerial Skills and Communication	3	0	0	3
	Research Methods in Business	3	0	0	3
	Social Media and Digital Marketing	3	0	0	3

Cyber Security and Intelligence					
	Cryptography and Network Security	3	0	0	3
	Security Scripting and Analysis	3	0	0	3
	Storage Management and Security	3	0	0	3
	Cyber Law and Ethics	3	0	0	3
Agriculture					
	Agricultural Finance and Cooperation	3	0	0	3
	Fundamentals of Agricultural Extension Education	3	0	0	3
	Agricultural Marketing Trade and Prices	3	0	0	3
	Entrepreneurship Development and Business communication	3	0	0	3
	Total Learning Credits				**9**

7. Project Work, Seminar, Internship In Industry / Higher Technical Institutions (P)					
Course Code	Course Title	Hours/Week			
		L	T	P	C
	MOOC / Industrial Training / Seminar 1	0	0	2	1
	MOOC / Industrial Training / Seminar 2	0	0	2	1
	Project (Phase-I) Internship (4-6weeks)	0	0	6	3
	Project (Phase-II) / Semester Internship	0	0	20	10
	Total Learning Credits				**15**

8. Mandatory Courses (M)					
Course Code	Course Title	Hours/Week			
		L	T	P	C
	Professional Skills & Practices	0	0	2	0
	Constitution of India	1	0	0	0
	Physical and Mental Health using Yoga	0	0	2	0
	Value Education	1	0	1	0
	NCC / NSS / NSO	0	0	2	0
	Competencies in Social Skills	0	0	2	0
	Entrepreneurial Skill Development	0	0	2	0
	Critical and Creative Thinking Skills	0	0	2	0
	Business Basics for Entrepreneurs	0	0	2	0
	Environmental Science	1	0	0	0
	Analytical and Logical Thinking Skills	0	0	2	0

	Entrepreneurship Management	0	0	2	0
	Indian Traditional Knowledge	1	0	0	0
	Indian Art Form	0	0	2	0
	Total Learning Credits				**0**

Bachelor of Technology (B.Tech) in Computer Science Engineering with specialization in Artificial Intelligence & Machine earning (AI & ML) (4 years) Curriculum

Semester - I					
Course Code	Course Title	Hours/Week			
		L	T	P	C
	English	2	0	2	3
	Calculus and Linear Algebra	3	1	0	4
	Introduction to MATLAB for Artificial Intelligence	1	0	4	3
	Basic Electrical and Electronics Engineering	3	1	2	5
	Programming for Problem Solving	3	0	4	5
	Professional Skills & Practices	0	0	2	0
	Constitution of India	1	0	0	0
	Physical and Mental Health using Yoga	0	0	2	0
	Total Learning Credits				**20**

Semester - II					
Course Code	Course Title	Hours/Week			
		L	T	P	C
	Foreign Language	2	0	2	3
	Advanced Calculus and Complex Analysis	3	1	0	4
	Foundation of Data Analysis	3	0	2	4
	Engineering Physics, Chemistry and Biology	3	1	2	5
	Smart Manufacturing	1	0	4	3
	General Aptitude	0	0	2	1
	Value Education	1	0	1	0
	NCC / NSS / NSO	0	0	2	0
	Total Learning Credits				**20**

Semester - III					
Course Code	Course Title	Hours/Week			
		L	T	P	C
	Transforms and Boundary Value Problems	3	1	0	4
	Foundation of Artificial Intelligence	2	0	2	3

	Data Structure and its Applications	3	0	2	4
	Object Oriented Design and Programming	3	0	2	4
	Software Engineering Principles	3	0	0	3
	Linear Systems and Signal Processing	3	0	0	3
	Digital Logic and Computer Architecture	3	0	0	3
	Competencies in Social Skills	0	0	2	0
	Entrepreneurial Skill Development				
	Total Learning Credits				**24**

Semester - IV					
Course Code	Course Title	Hours/Week			
		L	T	P	C
	Numerical Methods and Analysis	3	1	0	4
	Neural Networks and Machine Learning	3	0	2	4
	Analysis and Design of Algorithms	3	0	2	4
	Database Management Systems for Artificial Intelligence	2	0	2	3
	Operating System Design	2	0	2	3
	Computer Networks and Communications	2	0	2	3
	Foundation of Metric Spaces	1	0	0	1
	Professional Ethics of Artificial Intelligence	2	0	0	2
	Competitive Professional Skills - I	0	0	2	1
	Critical and Creative Thinking Skills	0	0	2	0
	Business Basics for Entrepreneurs				
	Environmental Science	1	0	0	0
	Total Learning Credits				**25**

Semester - V					
Course Code	Course Title	Hours/Week			
		L	T	P	C
	Probability and Applied Statistics	3	1	0	4
	Deep Learning Techniques	3	0	2	4
	Web Programming for Artificial Intelligence	3	0	2	4

	Formal Language and Automata Theory	3	0	0	3
	Competitive Professional Skills-II	0	0	2	1
	Professional Elective – 1	3	0	0	3
	Professional Elective – 2	3	0	0	3
	Open Elective – 1	3	0	0	3
	MOOC / Industrial Training / Seminar 1	0	0	2	1
	Analytical and Logical Thinking Skills	0	0	2	0
	Entrepreneurship Management				
	Indian Traditional Knowledge	1	0	0	0
	Total Learning Credits				**26**

Semester - VI					
Course Code	Course Title	Hours/Week			
		L	T	P	C
	Discrete Mathematics for Engineers	3	1	0	4
	Reinforcement Learning Techniques	2	0	2	3
	Inferential Statistics and Predictive Analytics	2	0	0	2
	Design of Artificial Intelligence Products	2	0	2	3
	Competitive Professional Skills – III	0	0	2	1
	Comprehension	0	1	0	1
	Professional Elective – 3	3	0	0	3
	Professional Elective – 4	3	0	0	3
	Open Elective – 2	3	0	0	3
	Employability Skills and Practices	0	0	2	0
	Indian Art Form				
	MOOC / Industrial Training / Seminar 2	0	0	2	1
	Total Learning Credits				**24**

Semester - VII					
Course Code	Course Title	Hours/Week			
		L	T	P	C
	Professional Elective –5	3	0	0	3
	Professional Elective – 6	3	0	0	3
	Open Elective – 3	3	0	0	3
	Project (Phase-I) Internship (4-6weeks)	0	0	6	3
	Total Learning Credits				**12**

Semester - VIII					
Course Code	Course Title	Hours/Week			
		L	T	P	C
	Project (Phase-II) / Semester Internship	0	0	20	10
	Total Learning Credits				**10**