EASA COLLEGE
OF ENGINEERING & TECHNOLOGY (ECET)
ULTIMATE DESTINATION FOR TECHNICAL EXCELLENCE
APPROVED BY AICTE, NEW DELHI | AFFILIATED TO ANNA UNIVERSITY, CHENNAI

NH - 47, PALAKKAD MAIN ROAD, NAVAKKARAI (P.O), COIMBATORE, TAMIL NADU - 641105

Course Outcome Statements

Regulation 2017
DEPARTMENT OF DARTIFICIAL INTELLIGENCE&DATA SCIENCE

Programme: B.Tech ARTIFICIAL INTELLIGENCE&DATA SCIENCE	
Year & Semester:	I & I
Course Code & Name:	HS8151&Communicative English
Year of Study :	2020-2021

Course Code and Name : C101 & HS8151-Communicative English		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C101.1	**Enable** the development in sharing information about family and friends.	K3
C101.2	**Strengthen** general comprehending skills and present lucid skills in free writing.	K2
C101.3	**Understand** the basic grammar techniques and utilize it in enhancing language development.	K2
C101.4	**Foster** an environment for reading and develop good language skills.	K2
C101.5	**Develop** flair for any kind of writing with rich vocabulary and proper syntax.	K2

Programme: B.Tech ARTIFICIAL INTELLIGENCE&DATA SCIENCE	
Year & Semester:	I& I
Course Code & Name:	MA8151&Engineering Mathematics – I
Year of Study :	2020-2021

Course Code and Name :C102 & MA8151-Engineering Mathematics -1		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C102.1	**Use** both the limit definition and rules of differentiation to differentiate functions	K3
C102.2	**Apply** differentiation to solve maxima and minima problems.	K3
C102.3	**Evaluate** integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus. Apply techniques of integration to compute multiple integrals and evaluate convergent improper Integrals	K3
C102.4	**Apply** integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.	K3
C102.5	**Apply** various techniques in solving differential equations	K3

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Programme: B.Tech ARTIFICIAL INTELLIGENCE&DATA SCIENCE	
Year & Semester:	I& I
Course Code & Name:	PH8151& Engineering Physics
Year of Study :	2020-2021

Course Code and Name :C103 & PH8151- Engineering Physics		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C103.1	**Gain** knowledge on the basics of properties of mater and its applications.	K2
C103.2	**Acquire** knowledge on the concepts of waves and optical devices and their application in fiber optic s	K2
C103.3	Have a**dequate** knowledge on the concepts of thermal properties of material and their in application in expansion joints and heat exchanger.	K3
C103.4	**Got** knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscope.	K2
C103.5	**Understand** the basics of crystals, their structures and different crystal growth technique.	K2

Programme: B.Tech ARTIFICIAL INTELLIGENCE&DATA SCIENCE	
Year & Semester:	I& I
Course Code & Name:	CY8151&Engineering Chemistry
Year of Study :	2020-2021

Course Code and Name : C104 & CY8151- Engineering Chemistry		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C104.1	**Understand** about various water treatment technique and its uses.	K2
C104.2	**Know** the surface phenomena of molecules and its applications	K2
C104.3	**Understand** the phase diagram and predict the composition of alloys.	K2
C104.4	**Analyze** the quality of fuels and its various uses. Gain the knowledge about energy sources and its applications.	K4
C104.5	**Gain** the knowledge about energy sources and its applications.	K2

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Programme: B.Tech ARTIFICIAL INTELLIGENCE&DATA SCIENCE	
Year & Semester:	I& I
Course Code & Name:	GE8151&Problem Solving and Python Programming
Year of Study :	2020-2021

Course Code and Name : C105 & GE8151-Problem solving and python programming		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C105.1	**Develop** algorithmic solutions to simple computational problems	K4
C105.2	**Read, write, execute** by hand simple Python programs and Structure simple Python programs for solving problems.	K2
C105.3	**Decompose** a Python program into functions.	K3
C105.4	**Represent** compound data using Python lists, tuples, dictionaries.	K3
C105.5	**Read and write** data from/to files in Python Programs.	K2

Programme: B.Tech ARTIFICIAL INTELLIGENCE&DATA SCIENCE	
Year & Semester:	I & I
Course Code & Name:	GE8152&Engineering Graphics
Year of Study :	2020-2021

Course Code and Name:GE8152&Engineering Graphics		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C106.1	**Familiarize** with the fundamentals and standards of Engineering graphics	K3
C106.2	**Perform** freehand sketching of basic geometrical constructions and multiple views of objects.	K3
C106.3	**Project** orthographic projections of lines and plane surfaces.	K2
C106.4	**Draw** projections and solids and development of surfaces.	K4
C106.5	**Visualize** and to project isometric and perspective sections of simple solids.	K3

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Programme: B.Tech ARTIFICIAL INTELLIGENCE&DATA SCIENCE	
Year & Semester:	I& I
Course Code & Name:	GE8161&Problem Solving And Python Programming Laboratory
Year of Study :	2020-2021

Course Code and Name :GE8161&Problem Solving And Python Programming Laboratory		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C107.1	To **write, test, and debug** simple Python programs.	K3
C107.2	To **implement** Python programs with conditionals and loops.	K3
C107.3	**Use functions** for structuring Python programs.	K3
C107.4	**Represent** compound data using Python lists, tuples, dictionaries.	K3
C107.5	**Read and write** data from/to files in Python.	K3

Programme: B.Tech ARTIFICIAL INTELLIGENCE&DATA SCIENCE	
Year & Semester:	I& I
Course Code & Name:	BS8161& Physics And Chemistry Laboratory
Year of Study :	2020-2021

Course Code and Name : C108 & BS8161-Physics and chemistry laboratories		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C108.1	**Determine** Young's modulus of beam and Rigidity modulus.	K3
C108.2	**Apply** the principle of optics and Laser in engineering field	K3
C108.3	**Calculate** conductivity, and band gap of a semiconductor and velocity of sound waves.	K3
C108.4	**Analyze** the effect of chlorides in water DO present in sample water	K3
C108.5	**Identify** basicity, acidity and pH of the material	K2

Programme: B.Tech ARTIFICIAL INTELLIGENCE&DATA SCIENCE	
Year & Semester:	I& II
Course Code & Name:	HS8251&Technical English
Year of Study :	2020-2021

Course Code and Name :C109 & HS8251- Technical English		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C109.1	**Breakdown** the ideas in to its elementary constituents, analyze and act after a meaning full thought process.	K2
C109.2	**Analyze** the phrase and passage and explicitly pass on the ideas meaning fully.	K3
C109.3	**Manage** to interpret the given phrase or the graphical rendering and review the contents well individually or as a group.	K3
C109.4	**Concentrate** on the communication aspect of complicated ideas and respond positively.	K2
C109.5	**Debate** the issues and find the rudiments of the problem individually and as a group.	K2

Programme: B.Tech ARTIFICIAL INTELLIGENCE&DATA SCIENCE	
Year & Semester:	I& II
Course Code & Name:	MA8252& Linear Algebra
Year of Study :	2020-2021

Course Code and Name :MA8252 &Linear Algebra		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C110.1	Test the consistency and **solve** system of linear equations	K2
C110.2	**Find** the basis and dimension of vector space	K3
C110.3	**Obtain** the matrix of linear transformation and its eigen values and eigenvectors	K4
C110.4	**Find** orthonormal basis of inner product space and find least square approximation	K2
C110.5	**Find** orthonormal basis of inner product space and find least square approximation	K3

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Programme: B.Tech.ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	I&II
Course Code & Name:	AD8251&Data Structures Design
Year of Study :	2020-2021

Course Code and Name:AD8251 &Data Structures Design		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C111.1	**Explain** abstract data types	K2
C111.2	Design, implement, and **analyse** linear data structures, such as lists, queues, and stacks,	K4
C111.3	Design according to the needs of **different** applications	K6
C111.4	Design, implement, and **analyse** efficient tree structures to meet requirements such as searching, indexing, and sorting	K4
C111.5	Model problems as graph problems and implement efficient graph algorithms to **solve** them	K4

Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	I& II
Course Code & Name:	GE8291&Environmental Science And Engineering
Year of Study :	2020-2021

Course Code and Name :C113 & GE8291-Environmental Science And Engineering		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C112.1	**Realize** the nature and facts of environment and bio-diversity.	K1
C112.2	**Understand** the Environmental Pollution (Causes, Effects and Control Measures)	K2
C112.3	**Identify** various natural recourses and save nature.	K2
C112.4	**Inference** on Social issues and the Environment.	K2
C112.5	**Understand** the population and technological effects on environment.	K2

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Programme: B.TechARTIFICIAL INTELLIGENCE&DATA SCIENCE	
Year & Semester:	I& II
Course Code & Name:	BE8255&Basic Electrical, Electronics And Measurement Engineering
Year of Study :	2020-2021

Course Code and Name : C112 & BE8255 Basic Electrical, Electronics and Measurement Engineering		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C113.1	**Discuss** the essentials of electric circuits and analysis.	K2
C113.2	**Discuss** the basic operation of electric machines and transformers	K2
C113.3	**State** the renewable sources and common domestic loads.	K2
C113.4	**Understand** the fundamentals of electronic circuit constructions	K2
C113.5	**Describe** the measurement and metering for electric circuits.	K2

Programme: B.Tech ARTIFICIAL INTELLIGENCE&DATA SCIENCE	
Year & Semester:	I& II
Course Code & Name:	AD8252&Digital Principles And Computer Organization
Year of Study :	2020-2021

Course Code and Name : AD8252&Digital Principles And Computer Organization		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C114.1	**Design** various combinational digital circuits using logic gates	K3
C114.2	**Design** sequential circuits and analyze the design procedures	K3
C114.3	**State** the fundamentals of computer systems and **analyze** the execution of an instruction	K2
C114.4	**Analyze** different types of control design and identify hazards	K4
C114.5	**Identify** the characteristics of various memory systems and I/O communication	K3

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Programme: B.Tech ARTIFICIAL INTELLIGENCE&DATA SCIENCE	
Year & Semester:	I & II
Course Code & Name:	GE8261& Engineering Practices Laboratory
Year of Study :	2020-2021

Course Code and Name : C115 & GE8261- Engineering Practices Laboratory		
Course Code	CO Statements	Knowledge Level
The students should be able to		
C115.1	**Fabricate** carpentry components and pipe connections including plumbing works and Use welding equipments to join the structures.	K4
C115.2	**Carryout** the basic machining operations and Make the models using sheet metal works	K4
C115.3	**Illustrate** on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings.	K4
C115.4	**Carry out** basic home electrical works and appliances and Measure the electrical quantities	K4
C115.5	**Elaborate** on the components, gates, soldering practices.	K4

Programme: B.Tech ARTIFICIAL INTELLIGENCE&DATA SCIENCE	
Year & Semester:	I& II
Course Code & Name:	AD8261&Data Structures Design Laboratory
Year of Study :	2020-2021

Course Code and Name :AD8261&Data Structures Design Laboratory		
Course Code	CO Statements	Knowledge Level
The students should be able to		
C116.1	**Implement** ADTs as Python classes	K3
C116.2	**Design, implement, and analyze** linear data structures, such as lists, queues, and stacks, according to the needs of different applications	K4
C116.3	**Design, implement, and analyze** efficient tree structures to meet requirements such as searching, indexing, and sorting	K6
C116.4	Model problems as graph problems and implement efficient graph algorithms to **solve** them	K6
C116.5	Model problems as tree problems and implement efficient graph algorithms to **solve** them	K6

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Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	II&III
Course Code & Name:	MA8354&DISCRETE MATHEMATICS
Year of Study :	2021-2022

Course Code and Name: MA3354&Discrete Mathematics		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C201.1	**Knowledge** of the concepts needed to test the logic of a program.	K1
C201.2	**Understanding** in identifying structures on many levels	K2
C201.3	Be aware of a class of functions **which** transform a finite set into another finite set which relates to input and output functions in Computer science.	K1
C201.4	**List** of the counting principles.	K1
C201.5	**Concepts** and properties of algebraic structures such as groups, rings and field.	K3

Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	II&III
Course Code & Name:	AD8301- Introduction To Operating Systems
Year of Study :	2021-2022

Course Code and Name :AD8301- Introduction To Operating Systems		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C202.1	**Outline** the basic services and functionalities of operating systems	K2
C202.2	**Analyse** various scheduling algorithms, and understand the different deadlock, prevention and avoidance schemes	K4
C202.3	**Illustrate** the different memory management schemes	K2
C202.4	**Outline** the functionality of file systems	K2
C202.5	**Compare and contrast** Linux, Windows and mobile operating systems	K2

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Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	II&III
Course Code & Name:	AD8302&Fundamentals of Data Science
Year of Study :	2021-2022

Course Code and Name :AD8302 &Fundamentals of Data Science		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C203.1	**Apply** the skills of data inspecting and cleansing.	K3
C203.2	**Determine** the relationship between data dependencies using statistics	K5
C203.3	Can **handle** data using primary tools used for data science in Python	K3
C203.4	**Represent** the useful information using mathematical skills	K3
C203.5	Can **apply** the knowledge for data describing and visualization using tools.	K3

Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	II & III
Course Code & Name:	CS8392Object Oriented Programming
Year of Study :	2021-2022

Course Code and Name : CS8392 Object Oriented Programming		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C204.1	**Develop** Java programs using OOP principles	K6
C204.2	**Develop** Java programs with the concepts inheritance and interfaces	K6
C204.3	**Build** Java applications using exceptions and I/O streams	K3
C204.4	**Develop** Java applications with threads and generics classes	K6
C204.5	**Develop** interactive Java programs using swings	K6

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Programme: B.Tech ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	II & III
Course Code & Name:	AD8351 Design and Analysis Algorithms
Year of Study :	2021-2022

Course Code and Name : AD8351 Design and Analysis Algorithms		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C204.1	**Design** algorithms for various computing problems.	K6
C204.2	**Analyze** the time and space complexity of algorithms.	K4
C204.3	**Critically analyze** the different algorithm design techniques for a given problem.	K4
C204.4	**Modify** existing algorithms to improve efficiency	K6
C204.5	**Ability** to implement techniques in solving real time problems	K3

Programme: B.Tech ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	II & III
Course Code & Name:	AD8311&Data Science Laboratory
Year of Study :	2021-2022

Course Code and Name : AD8311&Data Science Laboratory		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C205.1	**Develop** relevant programming abilities	K3
C205.2	**Demonstrate** knowledge of statistical data analysis techniques	K2
C205.3	**Exhibit** proficiency to build and assess data-based models	K6
C205.4	**Demonstrate** skill in Data management & processing tasks using Python	K2
C205.5	**Apply** data science concepts and methods to solve problems in real-world contexts and will communicate these solutions effectively	K3

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Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	II&III
Course Code & Name:	CS8383 Object Oriented Programming Laboratory
Year of Study :	2021-2022

Course Code and Name : CS8383 OBJECT ORIENTED PROGRAMMING LABORATORY		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C206.1	**Develop** and implement Java programs for simple applications that make use of classes,packages and interfaces.	K6
C206.2	**Develop** and implement Java programs with array list, exception handling and multithreading	K6
C206.3	**Design applications** using file processing, generic programming and event handling.	K6
C206.4	**Develop** applications using stream I/O and file I/O	K6
C206.5	**Implement** simple graphical user interface	K6

Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	II&III
Course Code & Name:	C207 & HS8381 Interpersonal Skills/Listening & Speaking
Year of Study :	2021-2022

Course Code and Name : HS8381 - Interpersonal Skills/Listening & Speaking		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C207.1	Listen and respond appropriately especially in academic contexts	K1
C207.2	**Participate** in group discussions with special emphasis on stress and intonation	K2
C207.3	**Develop** lexical accuracy and fluency in articulation	K3
C207.4	**Assess** conversations and offer Verbal and Non-Verbal feedbacks	K3
C207.5	**Plan** and devise effective presentations	K4

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Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	II& IV
Course Code & Name:	MA8391 Probability and Statistics
Year of Study :	2021-2022

Course Code and Name: MA8391 Probability and Statistics		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C208.1	**Understand** the fundamental knowledge of the concepts of probability and have knowledge of standard distributions, which can describe real life phenomenon.	K4
C208.2	**Understand** the basic concepts of one and two dimensional random variables and apply in engineering applications	K2
C208.3	**Apply** the concept of testing of hypothesis for small and large samples in real life problems.	K5
C208.4	**Apply** the basic concepts of classifications of design of experiments in the field of agriculture and statistical quality control.	K1
C208.5	**Have the notion** of sampling distributions and statistical techniques used in engineering and management problems.	K4

Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	II& IV
Course Code & Name:	AD8401&Database Design And Management
Year of Study :	2021-2022

Course Code and Name:AD8401&Database Design And Management		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C209.1	**Understand** the database development life cycle and apply conceptual modeling	K2
C209.2	**Apply** SQL and programming in SQL to create, manipulate and query the database	K3
C209.3	**Apply** the conceptual-to-relational mapping and normalization to design relational dataabse	K3
C209.4	**Determine** the serializability of any non-serial schedule using concurrency techniques	K5
C209.5	**Apply** the data model and querying in Object-relational and No-SQL data basses.	K3

Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	II&IV
Course Code & Name:	AD8402 Artificial Intelligence I
Year of Study :	2021-2022

Course Code and Name : AD8402 Artificial Intelligence I		
Course Code	CO Statements	Knowledge Level
The students should be able to		
C210.1	**Explain** autonomous agents that make effective decisions in fully informed, partially observable, and adversarial settings	K2
C210.2	Choose **appropriate** algorithms for solving given AI problems	K3
C210.3	**Design and implement** logical reasoning agents	K3
C210.4	**Design** agents that can reason under uncertainty	K3
C210.5	**Implement** agents that can reason under uncertainty	K3

Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	II&IV
Course Code & Name:	AD8403 Data Analytics
Year of Study :	2021-2022

Course Code and Name : AD8403 Data Analytics		
Course Code	CO Statements	Knowledge Level
The students should be able to		
C211.1	**Understand** the concept of sampling	K2
C211.2	**Apply** the knowledge to derive hypotheses for given data	K3
C211.3	**Demonstrate** the skills to perform various tests in the given data	K2
C211.4	**Ability** to derive inference using Predictive Analytics	K3
C211.5	**Perform** statistical analytics on a data set	K3

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Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	II& IV
Course Code & Name:	C212 & AD8411&Database Design And Management Laboratory
Year of Study :	2021-2022

Course Code and Name:AD8411& Database Design And Management Laboratory		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C212.1	**Understand** the database development life cycle	K2
C212.2	**Design** relational database using conceptual-to-relational mapping, Normalization	K4
C212.3	**Apply** SQL for creation, manipulation and retrieval of data	K3
C212.4	**Develop** a database applications for real-time problems	K5
C212.5	**Design and query** object-relational databases	K5

Programme: B.E.ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	II&IV
Course Code & Name:	AD8412Data Analytics Laboratory
Year of Study :	2021-2022

Course Code and Name :AD8412Data Analytics Laboratory		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C213.1	To become **skilled** to use various packages in Python	K4
C213.2	**Demonstrate** the understanding of data distribution with various samples	K3
C213.3	Ability to **Implement** T-Test ,Anova and Z-Test on sample data sets	K4
C213.4	**Understanding** of Mathematical models in real world problems.	K2
C213.5	**Conduct** time series analysis and draw conclusion.	K4

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Programme: B.E.ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	II&IV
Course Code & Name:	C214 & AD8412Artificial Intelligence – I Laboratory
Year of Study :	2021-2022

Course Code and Name : AD8412Artificial Intelligence – I Laboratory		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C214.1	**Implement** simple PEAS descriptions for given AI tasks	K3
C214.2	**Develop** programs to implement simulated annealing and genetic algorithms	K3
C214.3	**Demonstrate** the ability to solve problems using searching and backtracking	K3
C214.4	Ability to **Implement** simple reasoning systems using either backward or forward inference mechanisms	K3
C214.5	Will be able to choose and **implement** a suitable technics for a given AI task	K4

Programme: B.E.ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	II&IV
Course Code & Name:	C215 & HS8461 &Advanced Reading And Writing
Year of Study :	2021-2022

Course Code and Name : HS8461 Advanced Reading And Writing		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C215.1	**Strengthen** the reading and writing skills of the students	K2
C215.2	**Comprehend** and interpret data into coherent paragraphs	K3
C215.3	**Evaluate** texts critically	K3
C215.4	**Draft** winning Job applications	K4
C215.5	**Write** impressive project proposals with critical acumen	K1

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Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III & V
Course Code & Name:	C301 &AD8501 Optimization Techniques
Year of Study :	2022-2023

Course Code and Name:AD8501 OPTIMIZATION TECHNIQUES		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C301.1	**Formulate and solve** linear programming problems (LPP)	K5
C301.2	**Evaluate** Integer Programming Problems, Transportation and Assignment Problems.	K5
C301.3	**Obtain** solution to network problems using CPM and PERT techniques.	K3
C301.4	Able to **optimize** the function subject to the constraints	K4
C301.5	**Identify and solve** problems under Markovian queuing models	K4

Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III &V
Course Code & Name:	C302 &CW8691 Computer Networks
Year of Study :	2022-2023

Course Code and Name :CW8691 COMPUTER NETWORKS		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C302.1	**Comprehend** the basic layers and its functions in computer networks.	K2
C302.2	**Evaluate** the performance of a network.	K5
C302.3	**Understand** the basics of how data flows from one node to another.	K2
C302.4	**Analyze and design** routing algorithms.	K5
C302.5	**Design** protocols for various functions in the network.	K4

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Programme: B.Tech ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III&V
Course Code & Name:	C303&AD8502 Data Exploration and Visualization
Year of Study :	2022-2023

Course Code and Name :AD8502 DATA EXPLORATION AND VISUALIZATION		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C303.1	**Understand** the basics of Data Exploration	K2
C303.2	**Use** Univariate and Multivariate Analysis for Data Exploration	K3
C303.3	**Explain** various Data Visualization methods	K2
C303.4	**Apply** the concept of Data Visualization on various datasets	K3
C303.5	**Apply** the data visualization techniques using R language	K3

Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III&V
Course Code & Name:	C304& AD8551 BUSINESS ANALYTICS
Year of Study :	2022-2023

Course Code and Name : AD8551 BUSINESS ANALYTICS		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C304.1	**Explain** the real world business problems and model with analytical solutions.	K2
C304.2	**Identify** the business processes for extracting Business Intelligence	K3
C304.3	**Apply** predictive analytics for business fore-casting	K3
C304.4	**Apply** analytics for supply chain and logistics management	K3
C304.5	**Use** analytics for marketing and sales	K3

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Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III&V
Course Code & Name:	C305& AD8552 Machine Learning
Year of Study :	2022-2023

Course Code and Name :AD8552 Machine Learning		
Course Code	CO Statements	Knowledge Level
The students should be able to		
C305.1	**Understand** the basics of ML	K2
C305.2	**Explain** various Z Machine Learning methods	K2
C305.3	**Demonstrate** various ML techniques using standard packages.	K3
C305.4	**Explore** knowledge on Machine learning and Data Analytics	K3
C305.5	**Apply** ML to various real time examples	K6

Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III & V
Course Code & Name:	C306 & OCE551 Air Pollution and Control Engineering
Year of Study :	2022-2023

Course Code and Name :OCE551 Air Pollution and Control Engineering		
Course Code	CO Statements	Knowledge Level
The students should be able to		
C306.1	An **understanding** of the nature and characteristics of air pollutants, noise pollution and basic concepts of air quality management	K2
C306.2	**Ability** to identify, formulate and solve air and noise pollution problems	K3
C306.3	**Ability** to design stacks and particulate air pollution control devices to meet applicable standards.	K4
C306.4	**Ability** to select control equipment's.	K3
C306.5	**Ability** to ensure quality, control and preventive measures.	K4

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Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III & V
Course Code & Name:	C307 & AD8511& Machine Learning Laboratory
Year of Study :	2022-2023

Course Code and Name :AD8511& Machine Learning Laboratory		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C307.1	**Understand** the implementation procedures for the machine learning algorithms.	K2
C307.2	**Design** Java/Python programs for various Learning algorithms.	K6
C307.3	**Apply** appropriate Machine Learning algorithms to data sets	K3
C307.4	**Identify** Machine Learning algorithms to solve real world problems.	K4
C307.5	**Apply**Machine Learning algorithms to solve real world problems.	K3

Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III & V
Course Code & Name:	C308 & AD8512 & Mini Project On Data Science Pipeline
Year of Study :	2022-2023

Course Code and Name :AD8512 & Mini Project On Data Science Pipeline		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C308.1	**Install** analytical tools and configure distributed file system	K1
C308.2	Have skills in **developing** and executing analytical procedures in various distributed frameworks and databases.	K2
C308.3	**Develop**, implement and deploy simple applications on very large datasets.	K2
C308.4	**Implement** simple to complex data modeling in NoSQL databases	K3
C308.5	**Implement** real world applications by using suitable analytical framework and tools.	K3

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Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III &VI
Course Code & Name:	C309 &AD8601 Artificial Intelligence II
Year of Study :	2022-2023

Course Code and Name:AD8601 Artificial Intelligence II		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C309.1	**Explain** the probabilistic reasoning using Bayesian inference	K2
C309.2	**Apply** appropriate Probabilistic reasoning techniques for solving uncertainty problems	K3
C309.3	**Explain** use of game theory for decision making.	K3
C309.4	**Explain** and apply probabilistic models for various use cases	K3
C309.5	**Apply** AI techniques for robotics	K3

Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III &VI
Course Code & Name:	C310 &AD8602 Data and Information Security
Year of Study :	2022-2023

Course Code and Name :AD8602 DATA AND INFORMATION SECURITY		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C310.1	**Understand** the fundamentals of security and the significance of number theory in computer security	K2
C310.2	**Learn** the public key cryptographic standards and authentication scheme	K1
C310.3	Able to **apply** the security frameworks for real time applications	K3
C310.4	**Understand** the security threats and attacks in IoT, Cloud	K2
C310.5	Able to **develop** appropriate security algorithms understanding the possible threats	K5

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Programme: B.Tech ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III&VI
Course Code & Name:	C311 & IT8501 WEB TECHNOLOGY
Year of Study :	2022-2023

Course Code and Name : IT8501 WEB TECHNOLOGY		
Course Code	CO Statements	Knowledge Level
The students should be able to		
C311.1	**Design** simple web pages using markup languages like HTML and XHTML.	K4
C311.2	**Create** dynamic web pages using DHTML and java script that is easy to navigate and use.	K4
C311.3	**Program** server side web pages that have to process request from client side web pages.	K4
C311.4	**Represent** web data using XML and develop web pages using JSP	K4
C311.5	**Understand** various web services and how these web services interact	K2

Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III&VI
Course Code & Name:	C312 & CW8591 SOFTWARE ARCHITECTURE
Year of Study :	2022-2023

Course Code and Name :CW8591 SOFTWARE ARCHITECTURE		
Course Code	CO Statements	Knowledge Level
The students should be able to		
C312.1	**Develop** Software applications starting from software architecture and design.	K4
C312.2	**Learn and evaluate** existing software architectures.	K4
C312.3	Realize **importance** of architectural documentation and document them.	K4
C312.4	**Employ** various software architecture design components.	K5
C312.5	**Design** methods for improving software quality from the perspective of software architecture	K5

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Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III&VI
Course Code & Name:	C313 & AD8007 SOFTWARE TESTING & QUALITY ASSURANCE
Year of Study :	2022-2023

Course Code and Name :C314 & AD8007 SOFTWARE TESTING & QUALITY ASSURANCE		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C313.1	**Perform** functional and non-functional tests in the life cycle of the software product.	K5
C313.2	**Understand** system testing and test execution process.	K2
C313.3	**Identify** defect prevention techniques and software quality assurance metrics.	K3
C313.4	**Apply** techniques of quality assurance for typical applications.	K3
C313.5	**Execute** test case to achieve ideal result.	K5

Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III &VI
Course Code & Name:	C314 & IT8511 Web Technology Laboratory
Year of Study :	2022-2023

Course Code and Name :IT8511 & Web Technology Laboratory		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C314.1	**Design** simple web pages using markup languages like HTML and XHTML.	K6
C314.2	**Create** dynamic web pages using DHTML and java script that is easy to navigate and use.	K6
C314.3	**Program** server side web pages that have to process request from client side web pages.	K3
C314.4	**Represent** web data using XML and develop web pages using JSP.	K3
C314.5	**Understand** various web services and how these web services interact	K2

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Programme: B.Tech. ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III & VI
Course Code & Name:	C315 & AD8611& Artificial Intelligence – II Laboratory
Year of Study :	2022-2023

Course Code and Name :AD8611& Artificial Intelligence – II Laboratory		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C315.1	**Solve** basic AI based problems	K6
C315.2	**Implement** the concept of Bayesian Network.	K6
C315.3	**Apply** AI techniques to real-world problems to develop intelligent systems	K6
C315.4	**Implement** HMM for real-world application.	K6
C315.5	**Use** Reinforcement Learning to implement various intelligent systems.	K1

Programme: B.Tech ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III & VI
Course Code & Name:	C316 & HS8581 & Professional Communication
Year of Study :	2022-2023

Course Code and Name :HS8581 & Professional Communication		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C316.1	**Make** effective presentations	K2
C316.2	**Participate** confidently in Group Discussions.	K2
C316.3	**Attend** job interviews and be successful in them.	K2
C316.4	**Develop** adequate Soft Skills required for the workplace	K5
C316.5	**Implement** the protocol for career management	K3

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Programme: B.Tech ARTIFICIAL INTELLIGENCE & DATA SCIENCE	
Year & Semester:	III&VI
Course Code & Name:	C317 & AD8612 & Socially Relevant Project
Year of Study :	2022-2023

Course Code and Name :AD8612 & Socially Relevant Project		
Course Code	**CO Statements**	**Knowledge Level**
The students should be able to		
C317.1	The students are expected to **use** different platforms and tools like SAS, Python	K4
C317.2	**Use** platforms and tools like R, Scala	K4
C317.3	**Develop** usingBig Data: Hadoop Ecosystem (Hive, Pig, Sqoop , Flume), Big Data Lakes ,No SQL, Apache 66 Spark, Spark MLLib , HPCC, Strom.	K4
C317.4	**Develop** usingBusiness Intelligence : SQL, Microsoft Power BI, SAP BI, Tableau, Oracle Fusion,	K4
C317.5	**Develop** usingMachine Learning and Deep Learrning : TensorFlow , Keras , Artificial Neural Networks, Deep NeuralNets, Convolution Neural Networks, Auto encoders	K4