

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

REGULATION 2017

Course Code/Course Name: MA8351/Discrete Mathematics

CO No.	Course Outcomes (COs)
C201.1	Infer the concepts needed to test the logic of a program
C201.2	Demonstrate identifying structures on many levels
C201.3	Summarize the class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.
C201.4	Experiment with counting principles
C201.5	Identify concepts and properties of algebraic structures such as groups, rings and fields.

Course Code/Course Name: AD8301/ Introduction to Operating Systems

CO No.	Course Outcomes (COs)
C202.1	Outline the basic services and functionalities of operating systems
C202.2	Analyse various scheduling algorithms, and understand the different deadlock, prevention and avoidance schemes
C202.3	Illustrate the different memory management schemes
C202.4	Outline the functionality of file systems
C202.5	Compare and contrast Linux, Windows and mobile operating systems

Course Code/Course Name: AD8302/ Fundamentals of Data Science

CO No.	Course Outcomes (COs)
C203.1	Apply the skills of data inspecting and cleansing.
C203.2	Show the relationship between data dependencies using statistics
C203.3	Infer data handling using primary tools used for data science in Python
C203.4	Model the useful information using mathematical skills
C203.5	Apply the knowledge for data describing and visualization using tools.

Course Code/Course Name: CS8392/ Object Oriented Programming

CO No.	Course Outcomes (COs)
C204.1	Develop simple java programs using OOP Principles
C204.2	Construct Java programs with the concepts of inheritance and interfaces
C204.3	Build Java applications using exceptions and I/O streams
C204.4	Utilize threads and generics classes in Java applications development.
C204.5	Make use of AWT and Swing components for interactive GUI applications.

Course Code/Course Name: AD8351/ Design and Analysis of Algorithms

CO No.	Course Outcomes (COs)
C205.1	Design algorithms for various computing problems.
C205.2	Analyze the time and space complexity of algorithms.
C205.3	Analyze the different algorithm design techniques for a given problem.
C205.4	Rephrase existing algorithms to improve efficiency.
C205.5	Utilize implement techniques in solving real time problems.

Course Code/Course Name: AD8311/ Data Science Laboratory

CO No.	Course Outcomes (COs)
C206.1	Develop relevant programming abilities.
C206.2	Demonstrate knowledge of statistical data analysis techniques
C206.3	Extend proficiency to build and assess data-based models.
C206.4	Demonstrate skill in Data management & processing tasks using Python
C206.5	Apply data science concepts and methods to solve problems in real-world contexts and will communicate these solutions effectively

Course Code/Course Name: CS8383/ Object Oriented Programming Laboratory

CO No.	Course Outcomes (COs)
C207.1	Develop and implement Java programs for real-world applications.
C207.2	Construct applications that make use of classes, packages.
C207.3	Develop and implement Java programs with interfaces and array list.
C207.4	Construct Java programs with exception handling and multithreading.
C207.5	Build applications using file processing, generic programming and event handling.

Course Code/Course Name: MA8391/ Probability and Statistics

CO No.	Course Outcomes (COs)
C209.1	Relate the concepts of probability and standard distributions in real life phenomenon.
C209.2	Summarize notions of covariance, correlation and regression in engineering applications
C209.3	Summarize the testing of hypothesis for small and large samples in real life problems
C209.4	Translate the view of classifications of design of experiments in the field of agriculture and statistical quality control.
C209.5	Infer the notion of sampling distributions and statistical techniques used in engineering and management problems.

Course Code/Course Name: AD8401/ Database Design and Management

CO No.	Course Outcomes (COs)
C210.1	Relate the database development life cycle and apply conceptual modelling
C210.2	Apply SQL and programming in SQL to create, manipulate and query the database
C210.3	Apply the conceptual-to-relational mapping and normalization to design relational database
C210.4	Demonstrate the serializability of any non-serial schedule using concurrency techniques
C210.5	Apply the data model and querying in Object-relational and No-SQL databases.

Course Code/Course Name: AD8402/ Artificial Intelligence I

CO No.	Course Outcomes (COs)
C211.1	Explain autonomous agents that make effective decisions in fully informed, partially observable, and adversarial settings
C211.2	Choose appropriate algorithms for solving given AI problems
C211.3	Make use of game theory to give optimal decision
C211.4	Build and implement logical reasoning agents
C211.5	Model and implement agents that can reason under uncertainty

Course Code/Course Name: AD8403/ Data Analytics

CO No.	Course Outcomes (COs)
C212.1	Infer the concept of Sampling
C212.2	Experiment the Knowledge to derive hypotheses for given data
C212.3	Demonstrate the skills to perform various tests in the given data
C212.4	Derive inference using Predictive Analytics
C212.5	Perform statistical analytics on a data set

Course Code/Course Name: AD8001/ Software Development Processes

CO No.	Course Outcomes (COs)
C213.1	Illustrate the software process phases in the cycle of software development
C213.2	Infer knowledge of software economics, project organization, project control and process instrumentation
C213.3	Identify the major and minor milestones, artifacts and metrics from management and technical perspective
C213.4	Develop the software product using conventional and modern principles of software project management
C213.5	Classify the real time software development processes

Course Code/Course Name: AD8411/ Database Design and Management Laboratory

CO No.	Course Outcomes (COs)
C214.1	Understand the database development life cycle
C214.2	Build relational database using conceptual-to-relational mapping, Normalization
C214.3	Apply SQL for creation, manipulation and retrieval of data
C214.4	Develop a database applications for real-time problems
C214.5	Make use of query object-relational databases

Course Code/Course Name: AD8412/ Data Analytics Laboratory

CO No.	Course Outcomes (COs)
C215.1	Experiment with various packages in Python
C215.2	Demonstrate the understanding of data distribution with various samples
C215.3	Extend to Implement T-Test , Anova and Z-Test on sample data sets
C215.4	Relate Mathematical models in real world problems.
C215.5	Utilize time series analysis and draw conclusion.

Course Code/Course Name: AD8413/ Artificial Intelligence –I Laboratory

CO No.	Course Outcomes (COs)
C216.1	Make use of simple PEAS descriptions for given AI tasks
C216.2	Develop programs to implement simulated annealing and genetic algorithms
C216.3	Demonstrate the ability to solve problems using searching and backtracking
C216.4	Infer simple reasoning systems using either backward or forward inference mechanisms
C216.5	Choose and implement a suitable technics for a given AI task

Course Code/Course Name: AD8501/ Optimization Techniques

CO No.	Course Outcomes (COs)
C301.1	Solve and formulate linear programming problems (LPP)
C301.2	Extend Integer Programming Problems, Transportation and Assignment Problems.
C301.3	Solve network problems using CPM and PERT techniques.
C301.4	Relate function optimization subject to the constraints.
C301.5	Identify and solve problems under Markovian queuing models

Course Code/Course Name: CW8691/ Computer Networks

CO No.	Course Outcomes (COs)
C302.1	Interpret the basic layers and its functions in computer networks
C302.2	Identify the functionalities of data link and media access control protocols
C302.3	Apply routing algorithms for different kinds of networks
C302.4	Make use of the transport layer's functionalities and protocols.
C302.5	Explain the working of application layer protocols

Course Code/Course Name: AD8502/ Data Exploration and Visualization

CO No.	Course Outcomes (COs)
C303.1	Understand the basics of Data Exploration
C303.2	Understand the Univariate and Multivariate Analysis for Data Exploration
C303.3	Explain various Data Visualization methods
C303.4	Apply the concept of Data Visualization on various datasets
C303.5	Apply the data visualization techniques using R language

Course Code/Course Name: AD8551/ Business Analytics

CO No.	Course Outcomes (COs)
C304.1	Explain the real world business problems and model with analytical solutions.
C304.2	Identify the business processes for extracting Business Intelligence
C304.3	Apply predictive analytics for business fore-casting
C304.4	Apply analytics for supply chain and logistics management
C304.5	Utilize analytics for marketing and sales.

Course Code/Course Name: AD8552/ Machine Learning

CO No.	Course Outcomes (COs)
C305.1	Demonstrate the fundamentals, scope and types of machine learning.
C305.2	Outline the concept of machine learning methods that make to system learn.
C305.3	Utilize the various ML techniques and standard packages
C305.4	Relate machine learning and data analytics processes to transform data into useful information
C305.5	Make use of machine learning methods for various applications.

Course Code/Course Name: OCE552/ Geographic Information System

CO No.	Course Outcomes (COs)
C306.1	Encompass the basic idea about the fundamentals of GIS.
C306.2	Classify the types of data models
C306.3	Acquire knowledge about data input and topology
C306.4	Discover the information on data quality and standards.
C306.5	Illustrate data management functions and data output

Course Code/Course Name: AD8511/ Machine Learning Laboratory

CO No.	Course Outcomes (COs)
C307.1	Apply suitable algorithms for selecting the appropriate features for analysis
C307.2	Build and Implement supervised machine learning algorithms on standard datasets and evaluate the performance.
C307.3	Apply unsupervised machine learning algorithms on standard datasets and evaluate the performance
C307.4	Build the graph based learning models for standard data sets.
C307.5	Compare the performance of different ML algorithms and select the suitable one based on the application.

Course Code/Course Name: AD8512 / Mini Project on Data Sciences Pipeline

CO No.	Course Outcomes (COs)
C308.1	Install analytical tools and configure distributed file system.
C308.2	Develop and executing analytical procedures in various distributed frameworks and databases
C308.3	Develop, implement and deploy simple applications on very large datasets.
C308.4	Implement simple to complex data modeling in NoSQL databases.
C308.5	Implement real world applications by using suitable analytical framework and tools.

Course Code/Course Name:AD8601/ ARTIFICIAL INTELLIGENCE II

CO No.	Course Outcomes (COs)
C309.1	Explain the probabilistic reasoning using Bayesian inference
C309.2	Apply appropriate Probabilistic reasoning techniques for solving uncertainty problems
C309.3	Explain use of game theory for decision making.
C309.4	Explain and apply probabilistic models for various use cases
C309.5	Apply AI techniques for robotics

Course Code/Course Name: AD8602/ DATA AND INFORMATION SECURITY

CO No.	Course Outcomes (COs)
C310.1	Understand the fundamentals of security and the significance of number theory in computer security
C310.2	Learn the public key cryptographic standards and authentication scheme
C310.3	Able to apply the security frameworks for real time applications
C310.4	Understand the security threats and attacks in IoT, Cloud.
C310.5	Able to develop appropriate security algorithms understanding the possible threats

Course Code/Course Name: IT8501/ WEB TECHNOLOGY

CO No.	Course Outcomes (COs)
C311.1	Design simple web pages using markup languages like HTML and XHTML.
C311.2	Create dynamic web pages using DHTML and java script that is easy to navigate and use.
C311.3	Program server side web pages that have to process request from client side web pages.
C311.4	Represent web data using XML and develop web pages using JSP.
C311.5	Understand various web services and how these web services interact.

Course Code/Course Name: IT8511/ WEB TECHNOLOGY LABORATORY

CO No.	Course Outcomes (COs)
C314.1	Design simple web pages using markup languages like HTML and XHTML.
C314.2	Create dynamic web pages using DHTML and java script that is easy to navigate and use.
C314.3	Program server side web pages that have to process request from client side web pages.
C314.4	Represent web data using XML and develop web pages using JSP.
C314.5	Understand various web services and how these web services interact.

**Course Code/Course Name:AD8611/ARTIFICIAL INTELLIGENCE-II
LABORATORY**

CO No.	Course Outcomes (COs)
C315.1	Solve basic AI based problems.
C315.2	Implement the concept of Bayesian Network.
C315.3	Apply AI techniques to real-world problems to develop intelligent systems
C315.4	Implement HMM for real-world application.
C315.5	Use Reinforcement Learning to implement various intelligent systems.

Course Code/Course Name: HS8581/PROFESSIONAL COMMUNICATION

CO No.	Course Outcomes (COs)
C316.1	Make effective presentations
C316.2	Participate confidently in Group Discussions.
C316.3	Attend job interviews and be successful in them.
C316.4	Develop adequate Soft Skills required for the workplace
C316.5	Develop their confidence and help them attend interviews successfully.

Course Code/Course Name: AD8612/ SOCIALLY RELEVANT PROJECT

CO No.	Course Outcomes (COs)
C317.1	The students are expected to use different platforms and tools like SAS, Python, R, Scala
C317.2	Big Data: Hadoop Ecosystem (Hive, Pig, Sqoop, Flume), Big Data Lakes, NoSQL, Apache, Spark, Spark MLlib, HPC, Storm
C317.3	Business Intelligence : SQL, Microsoft Power BI, SAP BI, Tableau, Oracle Fusion
C317.4	Machine Learning and Deep Learning : TensorFlow, Keras, Artificial Neural Networks
C317.5	Deep NeuralNets, Convolution Neural Networks, Auto encoders

Course Code/Course Name:AD8701/DEEP LEARNING

CO No.	Course Outcomes (COs)
C401.1	Explain the basics in deep neural networks
C401.2	Apply Convolution Neural Network for image processing
C401.3	Explain the basics of Artificial Intelligence using deep learning
C401.4	Apply deep learning algorithms for data science
C401.5	Apply deep learning algorithms for variety applications

Course Code/Course Name:AD8702/TEXT ANALYTICS

CO No.	Course Outcomes (COs)
C402.1	Design text extraction techniques
C402.2	Devise clustering techniques for text mining
C402.3	Design classification techniques for text mining
C402.4	Apply visualization techniques and perform anomaly & trend detection
C402.5	Perform Event operations in Text streams

Course Code/Course Name:AD8703/BASICS OF COMPUTER VISION

CO No.	Course Outcomes (COs)
C403.1	Explain low level processing of image and transformation techniques applied to images.
C403.2	Explain the feature extraction, segmentation and object recognition methods.
C403.3	Apply Histogram transform for detection of geometric shapes like line, ellipse and objects.
C403.4	Illustrate 3D vision process and motion estimation techniques.
C403.5	Apply vision techniques to real time applications

Course Code/Course Name:AD8704/BIG DATA MANAGEMENT

CO No.	Course Outcomes (COs)
C404.1	Describe big data and use cases from selected business domains.
C404.2	Explain NoSQL big data management.
C404.3	Install, configure, and run Hadoop and HDFS.
C404.4	Perform map-reduce analytics using Hadoop.
C404.5	Use Hadoop related tools such as HBase, Cassandra, Pig, and Hive for big data analytics

Course Code/Course Name:AD8705/AI AND ROBOTICS

CO No.	Course Outcomes (COs)
C405.1	Explain the types of Robots
C405.2	Narrate the kinematics of Robots
C405.3	Implement image processing algorithms
C405.4	Devise Localization algorithms

Course Code/Course Name:AD8711/DEEP LEARNING LABORATORY

CO No.	Course Outcomes (COs)
C406.1	Apply deep neural network for simple problems
C406.2	Apply Convolution Neural Network for image processing
C406.3	Apply Recurrent Neural Network and its variants for text analysis
C406.4	Apply generative models for data augmentation
C406.5	Develop a real world application using suitable deep neural networks