

COURSE OUTCOMES

Course Code / Course Name: HS3152 PROFESSIONAL ENGLISH I

CO No.	Course Outcomes (COs)
C101.1	To use appropriate words in a professional context
C101.2	To gain understanding of basic grammatic structures and use them in right context.
C101.3	To read and infer the denotative and connotative meanings of technical texts
C101.4	To write definitions, descriptions, narrations and essays on various topics

Course Code / Course Name: MA3151 MATRICES AND CALCULUS

CO No.	Course Outcomes (COs)
C102.1	Use the matrix algebra methods for solving practical problems.
C102.2	Apply differential calculus tools in solving various application problems.
C102.3	Able to use differential calculus ideas on several variable functions.
C102.4	Apply different methods of integration in solving practical problems.
C102.5	Apply multiple integral ideas in solving areas, volumes and other practical problems.

Course Code / Course Name: PH3151 / ENGINEERING PHYSICS

CO No.	Course Outcomes (COs)
C103.1	Understand the importance of mechanics.
C103.2	Express their knowledge in electromagnetic waves.
C103.3	Demonstrate a strong foundational knowledge in oscillations, optics and lasers.
C103.4	Understand the importance of quantum physics.
C103.5	Comprehend and apply quantum mechanical principles towards the formation of energy bands.

Course Code / Course Name: CY3151 / ENGINEERING CHEMISTRY

CO No.	Course Outcomes (COs)
C104.1	To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.
C104.2	To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.
C104.3	To apply the knowledge of phase rule and composites for material selection requirements.
C104.4	To recommend suitable fuels for engineering processes and applications.
C104.5	To recognize different forms of energy resources and apply them for suitable applications in energy sectors.

Course Code / Course Name: GE3151 / PROBLEM SOLVING AND PYTHON PROGRAMMING

CO No.	Course Outcomes (COs)
C105.1	Develop algorithmic solutions to simple computational problems.
C105.2	Develop and execute simple Python programs.
C105.3	Write simple Python programs using conditionals and loops for solving problems.
C105.4	Decompose a Python program into functions.
C105.5	Represent compound data using Python lists, tuples, dictionaries etc.
C105.6	Read and write data from/to files in Python programs.

Course Code / Course Name: GE3152 / ENGINEERING GRAPHICS

CO No.	Course Outcomes (COs)
C106.1	Illustrate about conics and orthographic views of engineering components.
C106.2	Show the projection of points, lines and planes.
C106.3	Construct the solids and projection of solids at different positions.
C106.4	Model the sectioned view of solids and development of surface.
C106.5	Develop the isometric projection and perspective views of an object/solid.

Course Code / Course Name: GE3161 / PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY

CO No.	Course Outcomes (COs)
C107.1	Develop algorithmic solutions to simple computational problems.
C107.2	Develop and execute simple Python programs.
C107.3	Implement programs in Python using conditionals and loops for solving problems.
C107.4	Deploy functions to decompose a Python program.
C107.5	Process compound data using Python data structures.
C107.6	Utilize Python packages in developing software applications.

Course Code / Course Name: BS3171 / PHYSICS & CHEMISTRY LABORATORY

CO No.	Course Outcomes (COs)
C108.1	Understand the functioning of various physics laboratory equipment.
C108.2	Use graphical models to analyze laboratory data.
C108.3	Use mathematical models as a medium for quantitative reasoning and describing physical reality.
C108.4	Access, process and analyze scientific information.
C108.5	Solve problems individually and collaboratively.

Course Code / Course Name: HS 3251/ PROFESSIONAL ENGLISH – II

CO No.	Course Outcomes (COs)
C109.1	To compare and contrast products and ideas in technical texts.
C109.2	To identify and report cause and effects in events, industrial processes through technical texts
C109.3	To analyse problems in order to arrive at feasible solutions and communicate them in the written format.
C109.4	To present their ideas and opinions in a planned and logical manner
C109.5	To draft effective resumes in the context of job search

Course Code / Course Name: MA3251 / STATISTICS AND NUMERICAL METHODS

CO No.	Course Outcomes (COs)
C110.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C110.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
C110.3	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
C110.4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
C110.5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

Course Code / Course Name: PH3256 / PHYSICS FOR INFORMATION SCIENCE

CO No.	Course Outcomes (COs)
C111.1	Gain knowledge on classical and quantum electron theories, and energy band structures
C111.2	Acquire knowledge on basics of semiconductor physics and its applications in various devices
C111.3	Get knowledge on magnetic properties of materials and their applications in data storage
C111.4	Outline the necessary understanding on the functioning of optical materials for optoelectronics
C111.5	Understand the basics of quantum structures and their applications and BASICS of quantum computing

Course Code / Course Name: BE3251/ BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

CO No.	Course Outcomes (COs)
C112.1	Compute the electric circuit parameters for simple problems
C112.2	Explain the working principle and applications of electrical machines
C112.3	Analyse the characteristics of analog electronic devices
C112.4	Explain the basic concepts of digital electronics
C112.5	Explain the operating principles of measuring instruments

Course Code / Course Name: GE3251 / ENGINEERING GRAPHICS

CO No.	Course Outcomes (COs)
C113.1	Use BIS conventions and specifications for engineering drawing.
C113.2	Construct the conic curves, involutes and cycloid.
C113.3	Solve practical problems involving projection of lines.
C113.4	Draw the orthographic, isometric and perspective projections of simple solids.
C113.5	Draw the development of simple solids.

Course Code / Course Name: AD3251 / DATA STRUCTURES DESIGN

CO No.	Course Outcomes (COs)
C114.1	Explain abstract data types
C114.2	Design, implement, and analyse linear data structures, such as lists, queues, and stacks, according to the needs of different applications
C114.3	Design, implement, and analyse efficient tree structures to meet requirements such as searching, indexing, and sorting
C114.4	Model problems as graph problems and implement efficient graph algorithms to solve them

**Course Code / Course Name: GE3271 / ENGINEERING PRACTICES
LABORATORY**

CO No.	Course Outcomes (COs)
C115.1	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work.
C115.2	Wire various electrical joints in common household electrical wire work.
C115.3	Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipment's; Make a tray out of metal sheet using sheet metal work.
C115.4	Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.

**Course Code / Course Name: AD3271 / DATA STRUCTURES DESIGN
LABORATORY**

CO No.	Course Outcomes (COs)
C116.1	Implement ADTs as Python classes
C116.2	Design, implement, and analyse linear data structures, such as lists, queues, and stacks, according to the needs of different applications
C116.3	Design, implement, and analyse efficient tree structures to meet requirements such as searching, indexing, and sorting
C116.4	Model problems as graph problems and implement efficient graph algorithms to solve them
C116.5	Develop an application using the core concepts in C.

Course Code / Course Name: MA3354 / DISCRETE MATHEMATICS

CO No.	Course Outcomes (COs)
C201.1	Have knowledge of the concepts needed to test the logic of a program.
C201.2	Have an understanding in identifying structures on many levels.
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.
C201.4	Be aware of the counting principles.
C201.5	Be exposed to concepts and properties of algebraic structures such as groups, rings and fields.

**Course Code / Course Name: CS3351/DIGITAL PRINCIPLES AND SYSTEM
DESIGN**

CO No.	Course Outcomes (COs)
C202.1	Design various combinational digital circuits using logic gates
C202.2	Design sequential circuits and analyze the design procedures
C202.3	State the fundamentals of computer systems and analyze the execution of an instruction
C202.4	Analyze different types of control design and identify hazards
C202.5	Identify the characteristics of various memory systems and I/O communication

Course Code / Course Name: AD3391 / DATABASE DESIGN AND MANAGEMENT

CO No.	Course Outcomes (COs)
C203.1	Understand the database development life cycle and apply conceptual modeling
C203.2	Apply SQL and programming in SQL to create, manipulate and query the database
C203.3	Apply the conceptual-to-relational mapping and normalization to design relational database
C203.4	Determine the serializability of any non-serial schedule using concurrency techniques
C203.5	Apply the data model and querying in Object-relational and No-SQL databases.

Course Code / Course Name: AD3351 / DESIGN AND ANALYSIS OF ALGORITHMS

CO No.	Course Outcomes (COs)
C204.1	Analyze the efficiency of recursive and non-recursive algorithms mathematically
C204.2	Analyze the efficiency of brute force, divide and conquer, decrease and conquer, Transform and conquer algorithmic techniques
C204.3	Implement and analyze the problems using dynamic programming and greedy algorithmic techniques.
C204.4	Solve the problems using iterative improvement techniques for optimization.
C204.5	Compute the limitations of algorithmic power and solve the problems using backtracking and branch and bound techniques.

Course Code / Course Name: AD3301/ DATA EXPLORATION AND VISUALIZATION

CO No.	Course Outcomes (COs)
C205.1	Understand the fundamentals of exploratory data analysis.
C205.2	Design relational database using conceptual-to-relational mapping, Normalization
C205.3	Apply SQL for creation, manipulation and retrieval of data
C205.4	Develop a database applications for real-time problems
C205.5	Design and query object-relational databases

Course Code / Course Name: AL3391 ARTIFICIAL INTELLIGENCE

CO No.	Course Outcomes (COs)
C206.1	Explain intelligent agent frameworks
C206.2	Apply problem solving techniques
C206.3	Apply game playing and CSP techniques
C206.4	Perform logical reasoning
C206.5	Perform probabilistic reasoning under uncertainty

Course Code / Course Name: AD3381 DATABASE DESIGN AND MANAGEMENT LABORATORY

CO No.	Course Outcomes (COs)
C207.1	Understand the database development life cycle
C207.2	Design relational database using conceptual-to-relational mapping, Normalization
C207.3	Apply SQL for creation, manipulation and retrieval of data
C207.4	Develop a database application for real-time problems
C207.5	Design and query object-relational databases

Course Code / Course Name: AD3311 ARTIFICIAL INTELLIGENCE LABORATORY

CO No.	Course Outcomes (COs)
C208.1	Design and implement search strategies
C208.2	Implement game playing and CSP techniques
C208.3	Develop logical reasoning systems
C208.4	Develop probabilistic reasoning systems

Course Code / Course Name: GE3361 PROFESSIONAL DEVELOPMENT

CO No.	Course Outcomes (COs)
C209.1	Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements
C209.2	Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding
C209.3	Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects.

Course Code / Course Name: MA3391 PROBABILITY AND STATISTICS

CO No.	Course Outcomes (COs)
C210.1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
C210.2	Understand the basic concepts of one and two dimensional random variables and apply in engineering applications.
C210.3	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C210.4	Apply the basic concepts of classifications of design of experiments in the field of agriculture and statistical quality control.
C210.5	Have the notion of sampling distributions and statistical techniques used in engineering and management problems.

Course Code / Course Name: AL3452 OPERATING SYSTEMS

CO No.	Course Outcomes (COs)
C211.1	Analyze various scheduling algorithms and process synchronization.
C211.2	Explain deadlock, prevention and avoidance algorithms.
C211.3	Compare and contrast various memory management schemes.
C211.4	Explain the functionality of file systems I/O systems, and Virtualization
C211.5	Compare iOS and Android Operating Systems.

Course Code / Course Name: AL3451 MACHINE LEARNING

CO No.	Course Outcomes (COs)
C212.1	Explain the basic concepts of machine learning.
C212.2	Construct supervised learning models.
C212.3	Construct unsupervised learning algorithms.
C212.4	Evaluate and compare different models

Course Code / Course Name: AD3491 FUNDAMENTALS OF DATA SCIENCE AND ANALYTICS

CO No.	Course Outcomes (COs)
C213.1	Explain the data analytics pipeline
C213.2	Describe and visualize data
C213.3	Perform statistical inferences from data
C213.4	Analyze the variance in the data
C213.5	Build models for predictive analytics

Course Code / Course Name: CS3591 COMPUTER NETWORKS

CO No.	Course Outcomes (COs)
C214.1	Explain the basic layers and its functions in computer networks.
C214.2	Understand the basics of how data flows from one node to another.
C214.3	Analyze routing algorithms.
C214.4	Describe protocols for various functions in the network.
C214.5	Analyze the working of various application layer protocols.

Course Code / Subject Name: GE3451 ENVIRONMENTAL SCIENCES AND SUSTAINABILITY

CO No.	Course Outcomes (COs)
C215.1	To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.
C215.2	To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society.
C215.3	To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.
C215.4	To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development.
C215.5	To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.

Course Code / Course Name: AD3411 DATA SCIENCE AND ANALYTICS LABORATORY

CO No	Course Outcomes (COs)
C216.1	Write python programs to handle data using Numpy and Pandas
C216.2	Perform descriptive analytics
C216.3	Perform data exploration using Matplotlib
C216.4	Perform inferential data analytics
C216.5	Build models of predictive analytics

Course Code / Course Name: AD3461 MACHINE LEARNING LABORATORY

CO No.	Course Outcomes (COs)
C217.1	Apply suitable algorithms for selecting the appropriate features for analysis.
C217.2	Implement supervised machine learning algorithms on standard datasets and evaluate the performance.
C217.3	Apply unsupervised machine learning algorithms on standard datasets and evaluate the performance.
C217.4	Build the graph-based learning models for standard data sets.
C217.5	Assess and compare the performance of different ML algorithms and select the suitable one based on the application.

Course Code / Course Name: AD3501 DEEP LEARNING

CO No.	Course Outcomes (COs)
C301.1	Explain the basics in deep neural networks
C301.2	Apply Convolution Neural Network for image processing
C301.3	Apply Recurrent Neural Network and its variants for text analysis
C301.4	Apply model evaluation for various applications
C301.5	Apply autoencoders and generative models for suitable applications

Course Code / Course Name: CW3551 DATA AND INFORMATION SECURITY

CO No.	Course Outcomes (COs)
C302.1	Understand the basics of data and information security
C302.2	Understand the legal, ethical and professional issues in information security
C302.3	Understand the various authentication schemes to simulate different applications.
C302.4	Understand various security practices and system security standards
C302.5	Understand the Web security protocols for E-Commerce applications

Course Code / Course Name: CS3551 DISTRIBUTED COMPUTING

CO No.	Course Outcomes (COs)
C303.1	Explain the foundations of distributed systems
C303.2	Solve synchronization and state consistency problems
C303.3	Use resource sharing techniques in distributed systems
C303.4	Apply working model of consensus and reliability of distributed systems
C303.5	Explain the fundamentals of cloud computing

Course Code / Course Name: CCS334 BIG DATA ANALYTICS

CO No.	Course Outcomes (COs)
C304.1	Describe big data and use cases from selected business domains.
C304.2	Explain NoSQL big data management.
C304.3	Install, configure, and run Hadoop and HDFS.
C304.4	Perform map-reduce analytics using Hadoop.
C304.5	Use Hadoop-related tools such as HBase, Cassandra, Pig, and Hive for big data analytics.

Course Code / Course Name: AD3511 DEEP LEARNING LABORATORY

CO No.	Course Outcomes (COs)
C305.1	Apply deep neural network for simple problems
C305.2	Apply Convolution Neural Network for image processing
C305.3	Apply Recurrent Neural Network and its variants for text analysis
C305.4	Apply generative models for data augmentation
C305.5	Develop real-world solutions using suitable deep neural networks

Course Code / Course Name: CS3691 EMBEDDED SYSTEMS AND IOT

CO No.	Course Outcomes (COs)
C306.1	Explain the architecture of embedded processors.
C306.2	Write embedded C programs.
C306.3	Design simple embedded applications.
C306.4	Compare the communication models in IOT
C306.5	Design IoT applications using Arduino/Raspberry Pi /open platform.

Course Code / Course Name: AD3512 SUMMER INTERNSHIP

CO No.	Course Outcomes (COs)
C307.1	Industry Practices, Processes, Techniques, technology, automation and other core aspects of software industry
C307.2	Analyze, Design solutions to complex business problems
C307.3	Build and deploy solutions for target platform
C307.4	Preparation of Technical reports and presentation

Course Code / Course Name: AD3811 PROJECT WORK / INTERNSHIP

CO No.	Course Outcomes (COs)
C401.1	Gain Domain knowledge and technical skill set required for solving
C401.2	Provide solution architecture, module level designs, algorithms
C401.3	Implement, test and deploy the solution for the target platform
C401.4	Prepare detailed technical report, demonstrate and present the work