

AURORA'S TECHNOLOGICAL AND RESEARCH INSTITUTE

(Approved by AICTE and Affiliated to JNTUH) (Accredited by NAAC with 'A' Grade)

Parvathapur, Uppal, Medipally (M), Medchal (D), Telangana, Hyderabad - 500 098



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING(AI & ML) COURSE OUTCOMES (COs) B.Tech. 1st Year I Sem Syllabus (AI & ML)

Course Code	Course Title / Name	Course Outcomes
MA101BS	Mathematics – I	<p>At the end of this course, each student should be able to:</p> <p>CO1: Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations.</p> <p>CO2: Find the Eigen values and Eigen vectors.</p> <p>CO3: Reduce the quadratic form to canonical form using orthogonal transformations.</p> <p>CO4: Analyse the nature of sequence and series.</p> <p>CO5: Solve the applications on the mean value theorems.</p> <p>CO6: Evaluate the improper integrals using Beta and Gamma functions.</p> <p>CO7: Find the extreme values of functions of two variables with/ without constraints.</p>
AP102BS	Applied Physics	<p>At the end of this course, each student should be able to:</p> <p>CO1: The student would be able to learn the fundamental concepts on Quantum behaviour of matter in its micro state.</p> <p>CO2: The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fibre optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.</p> <p>CO3: Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.</p> <p>CO4: The course also helps the students to be</p>

		<p>exposed to the phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials.</p>
CS103ES	Programming for Problem Solving	<p>At the end of this course, each student should be able to:</p> <p>CO1: To write algorithms and to draw flowcharts. for solving problems.</p> <p>CO2: To convert the algorithms/flowcharts to C programs.</p> <p>CO3: To code and test a given logic in C programming language.</p> <p>CO4: To decompose a problem into functions and to develop modular reusable code.</p> <p>CO5: To use arrays, pointers, strings and structures to write C programs.</p> <p>CO6: Searching and sorting problems.</p>
ME104ES	Engineering Graphics	<p>At the end of this course, each student should be able to:</p> <p>CO1: Preparing working drawings to communicate the ideas and information.</p> <p>CO2: Read, understand and interpret engineering drawings</p>

AP105BS	Applied Physics Lab	<p>At the end of this course, each student should be able to:</p> <p>CO1 : Apply the various procedures and techniques for the experiments.</p> <p>CO2 : Use the different measuring devices and meters to record the data with precision.</p> <p>CO3 : Apply the mathematical concepts/equations to obtain quantitative results.</p> <p>CO4 : Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting Results.</p>
CS106ES	Programming for Problem Solving Lab	<p>At the end of this course, each student should be able to:</p> <p>CO1: Formulate the algorithms for simple Problems.</p> <p>CO2: Translate given algorithms to a working and correct program.</p> <p>CO3: Correct syntax errors as reported by the compilers .</p> <p>CO4: Identify and correct logical errors encountered during execution.</p> <p>CO5: Represent and manipulate data with arrays, strings and structures.</p> <p>CO6: Use pointers of different types .</p> <p>CO7: Create, read and write to and from simple text and binary files.</p> <p>CO8: Modularize the code with functions so that they can be reused.</p>
*MC109ES	Environmental Science	<p>At the end of this course, each student should be able to:</p> <p>Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development</p>

B.Tech. 1st Year II Sem Syllabus (AI & ML)

Course Code	Course Title / Name	Course Outcomes
MA201BS	Mathematics – II	<p>At the end of this course, each student should be able to:</p> <p>CO1: Identify whether the given differential equation of first order is exact or not.</p> <p>CO2: Solve higher differential equation and apply the concept of differential equation to real world problems .</p> <p>CO3: Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelepiped.</p> <p>CO4: Evaluate the line, surface and volume integrals and converting them from one to Another.</p>
CH202BS	Chemistry	<p>At the end of this course, each student should be able to:</p> <p>CO1: The knowledge of atomic, molecular and electronic changes, band theory related to conductivity.</p> <p>CO2: The required principles and concepts of electrochemistry, corrosion and in understanding the problem of water and its treatments.</p> <p>CO3: The required skills to get clear concepts on basic spectroscopy and application to medical and other fields.</p> <p>CO4: The knowledge of configurational and conformational analysis of molecules and Reaction mechanisms.</p>

EE203ES	Basic Electrical Engineering	<p>At the end of this course, each student should be able to:</p> <p>CO1: To analyze and solve electrical circuits using network laws and theorems.</p> <p>CO2: To understand and analyze basic Electric and Magnetic circuits.</p> <p>CO3: To study the working principles of Electrical Machines.</p> <p>CO4: To introduce components of Low Voltage Electrical Installations .</p>
ME205ES	Engineering Workshop	<p>At the end of this course, each student should be able to:</p> <p>CO1: Study and practice on machine tools and their operations .</p> <p>CO2: Practice on manufacturing of components using workshop trades including plumbing, fitting, carpentry, foundry, house wiring and welding.</p> <p>CO3: Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.</p> <p>CO4: Apply basic electrical engineering knowledge for house wiring practice.</p>
EN205HS	English	<p>At the end of this course, each student should be able to:</p> <p>CO1: Use English Language effectively in spoken and written forms.</p> <p>CO2: Comprehend the given texts and respond appropriately.</p> <p>CO3: Communicate confidently in various contexts and different cultures.</p> <p>CO4: Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.</p>

CH206BS	Engineering Chemistry Lab	<p>At the end of this course, each student should be able to:</p> <p>CO1: Determination of parameters like hardness and chloride content in water.</p> <p>CO2: Estimation of rate constant of a reaction from concentration – time relationships.</p> <p>CO3: Determination of physical properties like adsorption and viscosity.</p> <p>CO4: Calculation of R_f values of some organic molecules by TLC technique.</p>
EN207HS	English Language and Communication Skills Lab	<p>At the end of this course, each student should be able to:</p> <p>CO1: Better understanding of nuances of English language through audio- visual experience and group activities .</p> <p>CO2: Neutralization of accent for intelligibility.</p> <p>CO3: Speaking skills with clarity and confidence which in turn enhances their employability skills.</p>
EE208ES	Basic Electrical Engineering Lab	<p>At the end of this course, each student should be able to:</p> <p>CO1: Get an exposure to basic electrical laws.</p> <p>CO2: Understand the response of different types of electrical circuits to different excitations.</p> <p>CO3: Understand the measurement, calculation and relation between the basic electrical parameters.</p> <p>CO4: Understand the basic characteristics of transformers and electrical machines.</p>

B.Tech. II Year I Sem. Syllabus (AI & ML)

Course Code	Course Title / Name	Course Outcomes
CS310PC	Discrete Mathematics	<p>At the end of this course, each student should be able to:</p> <p>CO1: Ability to understand and construct precise mathematical proofs.</p> <p>CO2: Ability to use logic and set theory to formulate precise statements.</p> <p>CO3: Ability to analyze and solve counting problems on finite and discrete structures.</p> <p>CO4: Ability to describe and manipulate sequences.</p> <p>CO5: Ability to apply graph theory in solving Computing problems</p>
CS302PC	Data Structures	<p>At the end of this course, each student should be able to:</p> <p>CO1: Ability to select the data structures that efficiently model the information in a problem.</p> <p>CO2: Ability to assess efficiency trade-offs among different data structure implementations or combinations.</p> <p>CO3: Implement and know the application of algorithms for sorting and pattern matching.</p> <p>CO4: Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees.</p>

MA313BS	Mathematical and Statistical Foundations	<p>At the end of this course, each student should be able to:</p> <p>CO1: Apply the concepts of probability and distributions to some case studies</p> <p>CO2: Correlate the material of one unit to the material in other units</p> <p>CO3: Resolve the potential misconceptions and hazards in each topic of study.</p>
CS304PC	Computer Organization and Architecture	<p>At the end of this course, each student should be able to:</p> <p>CO1: Understand the basics of instruction sets and their impact on processor design.</p> <p>CO2: Demonstrate an understanding of the design of the functional units of a digital computer system.</p> <p>CO3: Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.</p> <p>CO4: Design a pipeline for consistent execution of instructions with minimum hazards.</p> <p>CO5: Recognize and manipulate representations of numbers stored in digital computers.</p>
CS311PC	Python Programming	<p>At the end of this course, each student should be able to:</p> <p>CO1: Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.</p> <p>CO2: Demonstrate proficiency in handling Strings and File Systems.</p> <p>CO3: Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.</p> <p>CO4: Interpret the concepts of Object-Oriented Programming as used in Python.</p> <p>CO5: Implement exemplary applications related to Network Programming, Web Services and databases in python.</p>

SM306MS	Business Economics & Financial Analysis	<p>At the end of this course, each student should be able to:</p> <p>The students will understand the various Forms of Business and the impact of economic variables on the Business. The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt. The Students can study the firm's financial position by analysing the Financial Statements of a Company.</p>
CS307PC	Data Structures Lab	<p>At the end of this course, each student should be able to:</p> <p>CO1: Ability to develop C programs for computing and real-life applications using basic elements like control statements, arrays, functions, pointers and strings, and data structures like stacks, queues and linked lists.</p> <p>CO2: Ability to Implement searching and sorting Algorithms.</p>
CS312PC	Python Programming Lab	<p>At the end of this course, each student should be able to:</p> <p>CO1: Student should be able to understand the basic concepts scripting and the contributions of scripting language</p> <p>CO2: Ability to explore python especially the object-oriented concepts, and the built in objects of Python.</p> <p>CO3: Ability to create practical and contemporary applications such as TCP/IP network programming, Web applications, discrete event simulations</p>

*MC309	Gender Sensitization Lab	<p>At the end of this course, each student should be able to:</p> <p>CO1: Students will have developed a better understanding of important issues related to gender in contemporary India.</p> <p>CO2: Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.</p> <p>CO3: Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.</p> <p>CO4: Students will acquire insight into the gendered division of labour and its relation to politics and economics.</p> <p>CO5: Men and women students and professionals will be better equipped to work and live together as equals.</p> <p>CO6: Students will develop a sense of appreciation of women in all walks of life.</p> <p>CO7: Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.</p>
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B.Tech. II Year II Sem Syllabus(AI&ML)

Course Code	Course Title / Name	Course Outcomes
CS416PC	Formal Languages And Automata Theory	<p>At the end of this course, each student should be able to:</p> <p>CO1: Able to understand the concept of abstract machines and their power to recognize the languages.</p> <p>CO2: Able to employ finite state machines for modeling and solving computing problems.</p> <p>CO3: Able to design context free grammars for formal languages.</p> <p>CO4: Able to distinguish between decidability and undecidability.</p> <p>CO5: Able to gain proficiency with mathematical tools and formal methods.</p>
CS417PC	Software Engineering	<p>At the end of this course, each student should be able to:</p> <p>CO1: Ability to translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD).</p> <p>CO2: Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.</p> <p>CO3: Will have experience and/or awareness of testing problems and will be able to develop a simple testing report</p>
CS403PC	Operating Systems	<p>At the end of this course, each student should be able to:</p> <p>CO1: Will be able to control access to a computer and the files that may be shared.</p> <p>CO2: Demonstrate the knowledge of the components of computer and their respective roles in computing.</p> <p>CO3: Ability to recognize and resolve user problems with standard operating environments.</p> <p>CO4: Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.</p>

CS404PC	Database Management Systems	<p>At the end of this course, each student should be able to:</p> <p>CO1: Gain knowledge of fundamentals of DBMS, database design and normal forms</p> <p>CO2: Master the basics of SQL for retrieval and management of data.</p> <p>CO3: Be acquainted with the basics of transaction processing and concurrency control.</p> <p>CO4: Familiarity with database storage structures and access techniques</p>
CS412PC	Object Oriented Programming Using Java	<p>At the end of this course, each student should be able to:</p> <p>CO1: Able to solve real world problems using OOP techniques.</p> <p>CO2: Able to understand the use of abstract classes.</p> <p>CO3: Able to solve problems using java collection framework and I/o classes.</p> <p>CO4: Able to develop multithreaded applications with synchronization.</p> <p>CO5: Able to develop applets for web applications.</p> <p>CO6: Able to design GUI based applications.</p>
CS406PC	Operating Systems Lab	<p>At the end of this course, each student should be able to:</p> <p>CO1: Simulate and implement operating system concepts such as scheduling, deadlock management, file management and memory management.</p> <p>CO2: Able to implement C programs using Unix system calls.</p>
CS407PC	Database Management Systems Lab	<p>At the end of this course, each student should be able to:</p> <p>CO1: Design database schema for a given application and apply normalization</p> <p>CO2: Acquire skills in using SQL commands for data definition and data manipulation.</p> <p>CO3: Develop solutions for database applications using procedures, cursors and triggers</p>
CS408PC	Java Programming Lab	<p>At the end of this course, each student should be able to:</p> <p>CO1: Able to write programs for solving real world problems using java collection framework.</p> <p>CO2: Able to write programs using abstract classes.</p> <p>CO3: Able to write multithreaded programs.</p> <p>CO4: Able to write GUI programs using swing controls in Java.</p>

<p>*MC409</p>	<p>Constitution of India</p>	<p>At the end of this course, each student should be able to:</p> <p>CO1 : Able to understand historical background of the constitutional making and its importance for building a democratic India, the structure of Indian government, the structure of state government, the local Administration.</p> <p>CO2: Able to apply the knowledge on directive principle of state policy, the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy.</p> <p>CO3: Able to analyze the History, features of Indian constitution, the role Governor and Chief Minister, role of state election commission, the decentralization of power between central, state and local self-government.</p> <p>CO4: Able to evaluate Preamble, Fundamental Rights and Duties, Zilla Panchayat, block level organization, various commissions of viz SC/ST/OBC and women.</p>
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