SIR C.R.REDDY COLLEGE OF ENGINEERING
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DEPARTMENT OF INFORMATION TECHNOLOGY

COURSE	CO CODE	COURSE OUTCOME DESCRIPTION
English	**C111.1**	Apply the four languages learning skills-listening, speaking, reading, writing (LSRW) for professional success
	C111.2	Employ knowledge of grammatical structures and vocabulary in speech and writing
	C111.3	Apply effective communication skills to enhance professional possibilities
	C111.4	Develop acceptable personality traits suitable for chosen profession
Mathematics-I	**C112.1**	Apply the partial differentiation techniques in physical problem
	C112.2	Apply the ordinary differential equation of first order and concerned applications
	C112.3	Apply higher order differential equations and concerned applications
	C112.4	Applying different types of tests to evaluating convergence of infinite series
Mathematics-II	**C113.1**	Understand a basic concept in Matrix theory to test the consistency of linear system of equations
	C113.2	Understand and apply the techniques of Matrix to reduce a given Quadratic form to Canonical form
	C113.3	Apply Laplace transforms functions for solving ordinary differential equations
	C113.4	Apply special functions to evaluate improper integrals
Engineering Chemistry	**C114.1**	Select the methods used for purification of water for domestic and industrial purposes
	C114.2	Identify the advantages and limitations of plastics, building materials and their use in day to day life
	C114.3	Select the suitable methods of corrosion control
	C114.4	Identify the fuels which are commonly used and their economics, advantages and limitations
	C114.5	Obtain the knowledge of semiconductors, super conductors and liquid crystals
Computer Programming and Numerical Methods	**C115.1**	Students will be able to identify appropriate C language constructs to solve problems
	C115.2	Understand the concepts of homogeneous data types to solve different problems
	C115.3	Apply the concepts of function modules, its usage and memory allocation using pointers

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Computer Programming and Numerical Methods	**C115.4**	Understand the concepts of heterogeneous data types and file handling feature in C
	C115.5	Solve system of linear algebraic equations and apply Newton's forward & backward interpolation for equal intervals, Langranges's formulae for unequal intervals
	C115.6	Describe the concept of numerical integration and numerical solutions of differential equations
History of Science and Technology	**C116.1**	Able to understand about the scientific history of India, a particular period's of Indian cultural habitats and the how to improvements of science and tech
	C116.2	Able to understand about policy resolution statements of India, and CSIR activities
	C116.3	Able to understand the applications Bio-technology & its applications like DNA finger printing, cloning, Tissue culture
	C116.4	Able to understand about the Indian Defence research and their importance and ocean development and biological resources, , Research institutions, Indian satellites, launch vehicle technology, types of satellites, technology transfer and fore casting etc.,
Chemistry Lab	**C117.1**	Obtain the knowledge of acid-base titrations to determine the strength of acid and base solutions
	C117.2	Gain the knowledge of Redox titrations to determine the concentration of samples such as Ores and oxalic acid using different indicators
	C117.3	Obtain the knowledge of complexometry titrations to determine the hardness of given water sample by EDTA method
	C117.4	Gain the knowledge of commonly used instrument pH meter to determine the strength of given acid solution
Computer Programming and Numerical Methods Lab	**C118.1**	Students will have a fundamental idea about computer programming concept
	C118.2	Students will have a fundamental idea to prepare algorithm and flowchart to solve simple engineering problems
	C118.3	Students will have a fundamental idea to solve simple engineering programs using structures and files
	C118.4	Students will have a fundamental idea about sources of errors in numerical methods
	C118.5	Students will have a fundamental idea to carry out interpolation using Lagrange technique and numerical integration
	C118.6	Students will have a fundamental idea to solve partial differential equations
Mathematics-III	**C121.1**	Apply the concept of lines, planes, spheres and the students are through in defining and evaluating geometric figure
	C121.2	Solve double and triple integrals to find areas and volumes
	C121.3	Apply special functions to evaluate improper integrals

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Mathematics-III	**C121.4**	Compute Fourier series for different function and also half range series certain types of functions
Applied Physics	**C122.1**	Know the laws of Thermodynamics, conversion mechanism and efficiency of heat energy to work and their importance in Engineering
	C122.2	Learn the Electric & Magnetic fields and their relation, time varying electromagnetic fields and their energy transportation
	C122.3	Explain the concepts of interference, diffraction and Polarization undergo analysis of optical effects and contribute to engineering applications
	C122.4	Understand the Lasers & its propagation through Optical fibers and importance of Ultrasonic waves and able to apply these in different applications in engineering
	C122.5	Understand the importance of Superconductors Nano materials in various Engineering applications and also learn the concepts of Quantum mechanics to explain the electrical behavior of the materials at atomic level
Probability, Statistics and Queuing Theory	**C123.1**	Ability to solve various problems regarding probability and conditional probability
	C123.2	Ability to solve random variables Examine , analyze and compare probability distributions
	C123.3	Ability to Prepare null and alternative hypothesis and test its validity based on random sample
	C123.4	Ability to solve various types of regression problems and various queuing models
Engineering Graphics	**C124.1**	Draw basic components of engineering drawing viz scales, curves etc
	C124.2	Produce projections, make sectional drawings and developments as per National and International standards
	C124.3	Produce solid machine components using various drawing techniques viz Isometric
Professional Ethics and Moral Values	**C125.1**	Understand the values in education and real life
	C125.2	Understand the values in respective professions and analyze the ethical role of engineers
	C125.3	Understand the concept of harmony in life and moral responsibility of engineers
	C125.4	Understand environmental ethics and apply in real life
Physics Lab	**C126.1**	Apply the knowledge of different phenomena of light like interference, diffraction and handle various optical measuring instruments
	C126.2	Verify the laws of thermo dynamics, electro magnetism and stretched string
	C126.3	Draw the relevance between theoretical knowledge and the means to imply it in a practical manner by performing various relative experiments
	C126.4	Apply the relevant knowledge to practically check the performance of the same in the lab

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Workshop	**C127.1**	Apply wood working knowledge in making simple wood joints
	C127.2	Apply the development of surfaces concept in producing simple sheet metal works
	C127.3	Prepare simple fitting joints with the use of proper fitting tools
English Lab	**C128.1**	Recognize the sounds of English with the help of audio visual aids
	C128.2	Build confidence and overcome inhibitions while speaking in English
	C128.3	Demonstrate acquired language skills in performing the designated activity
Data Structures	**C211.1**	Able to understand the concepts of linear & nonlinear Data Structures.
	C211.2	Able to apply the concepts of linear & nonlinear Data Structures
	C211.3	Able to analyze the time complexities of various Data Structures
	C211.4	Able to evaluate the linear and nonlinear data structures in a given application
Elements of Electronics Engineering	**C212.1**	Define and acquire knowledge on semiconductor physics
	C212.2	Illustrate the structure, creation of electric field and working of PN Junction Semiconductor Diodes
	C212.3	Describe the various modes of operation of transistors (BJT), FETs, MOSFETs
	C212.4	Develop the capability to analyze simple electronic circuits using diodes, transistors and FETs
Discrete Mathematical structures	**C213.1**	Students will be able to Understand the fundamental concepts of DMS
	C213.2	Students will be able to Apply various algorithms and problems on growth of the functions, mathematical inductions, counting techniques in DMS
	C213.3	Students will be able to Evaluate various theorems on sets, relations, functions, and graphs
	C213.4	Students will be able to Create various Graphs and Turing Machines
Object oriented Programming	**C214.1**	Students Will be able to understand fundamental concepts of object oriented programming
	C214.2	Students Will be able to apply how object oriented concepts implemented in c++
	C214.3	Students Will be able to analyze how object oriented concepts implemented in programming
	C214.4	Students Will be able to create programs by using templates, exception handling and object oriented concepts.
Systems Programming	**C215.1**	Able to understand the concept of system programming basics in assembly language, operating system and fundamentals of system softwares
	C215.2	Able to apply the concept of system software in developing different system components like assemblers, loaders, macros
	C215.3	Able to analyze the design constructs of assemblers, loaders, macros

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Digital Logic Design	**C216.1**	Able to understand Binary Systems, number system, Boolean Functions, Logic Gates, Combinational Circuits, Sequential Circuits and memories
	C216.2	Able to apply number systems, Boolean functions and logic gates for the design logic circuits
	C216.3	Able to analyze different logic circuits combinational and sequential circuits for designing logic circuits
	C216.4	Able to design different logic ,combinational and sequential circuits for storing and calculating different operations like arithmetic, logical and relational etc
Data structures Lab	**C217.1**	Student will understand the various linear and nonlinear data structures
	C217.2	Student will be able apply the various data structures in different applications
	C217.3	Student will be able to analyze the difference between linear and nonlinear data structures
	C217.4	Student will be able to evaluate the various application using data structures
Object oriented Programming Lab	**C218.1**	Students will be able to understand different object oriented programming concepts
	C218.2	Students will be able to apply various object oriented programming concepts to several problems
	C218.3	Students will be able to evaluate the various applications using object oriented programming
	C218.4	Students will be able to design and develop applications in C++
Operating Systems	**C221.1**	Understands OS evolution, its structure and all the services provided by it
	C221.2	Apply the process scheduling, policies ,mechanisms, process synchronization, inter process communication, dead locks for processes , paging and segmentation techniques in memory management
	C221.3	Analyze various CPU scheduling, disk scheduling, deadlocks, non-contiguous memory allocation algorithms
	C221.4	Evaluate process scheduling, replacement algorithms files system & implementation issues, disk scheduling, UNIX/ LINUX / Windows OS platforms and other process subsystem related concepts
Computer Organization	**C222.1**	Able to Understand the various concepts of Register transfer language, control unit, central Processing unit, vector processing, memory and I/O devices
	C222.2	Able to Apply the various components of central processing unit, control unit, memory and I/O devices for organizes the computer
	C222.3	Able to Analyze the various concepts of Register transfer language, control unit, central Processing unit, vector processing, memory and I/O devices
Micro Processors	**C223.1**	Students will be able to Understand the basic architectures of 8085 and 8086 Microprocessors
	C223.2	Students will have ability to write ALP programs using instruction sets
	C223.3	Students will be able to analyze the various interfacing concepts and micro controllers
Data Communications	**C224.1**	Students will be able to understand the basic concepts like protocol, networking, transmission media, Signals, data and various Types of Modems and Multiplexers for effective data communication

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Data Communications	**C224.2**	Students will be able to Apply various data communication Techniques to solve different errors
	C224.3	Students will be able to Analyze various data communication hardware Processors
Internet Concepts and Java Programming	**C225.1**	Able to Remember the concepts of Object Oriented Programming and Programming fundamentals
	C225.2	Able to Understand the basics like HTML, OOP concepts, Java Programming and Networking with Java API
	C225.3	Able to Apply the concepts of HTML, OOP and Java Programming
Operation Research	**C226.1**	Solve LPP problems using various methods
	C226.2	Solve Transportation, Assignment problems using several methods and travelling salesman problems, sequencing problem
	C226.3	Understand the PERT and CPM charts
	C226.4	Analyze the replacement problems, Game theory problems and inventory management with real time application
Environmental Studies	**C227.1**	Ability to acquire knowledge about the importance of environment & availability of resources
	C227.2	Understand different environmental challenges induced due to anthropogenic activities as well as nature
	C227.3	Able to identify the solutions to the environmental problems for the sake of healthy life by Protecting our natural resources
	C227.4	Create awareness on the social issues, environmental protection acts
	C227.5	Able to understand the environmental impact of developmental activities
Internet Concepts and Java Programming Lab	**C228.1**	Able to Understand the basics like HTML, OOP concepts, Java Programming and Networking with Java API
	C228.2	Able to Apply the concepts of HTML to create static and dynamic web pages
	C228.3	Able to Apply the concepts of OOP using Java
	C228.4	Able to Analyze the concepts of HTML, OOP and Java Programming
Digital Electronics and Micro Processors Lab	**C229.1**	Student will be able to understand the logic gates half adders, full adders, flip flop to design a Circuit
	C229.2	Student will be able to develop the skill of writing microprocessor programming
	C229.3	Student will be analyze the interfacing of microprocessor
Computer Networks	**C311.1**	Student will be able to Understand the basic and advanced concepts of computer network like layered architecture, internetworking devices and Adhoc networks etc
	C311.2	Student will be able to Apply various architectures/protocols/techniques needed to solve complex problems with given requirements
	C311.3	Student will be able to Analyze the various architectures/protocols/Techniques needed to design a computer network with given requirements
Web Technologies	**C313.1**	Students able to understand different web technologies like HTML,CSS, JAVASCRIPT, XML, SERVLET, PHP and MySql
	C313.2	Students able to apply different web technologies like HTML,CSS, JAVASCRIPT, XML, SERVLET, PHP

COURSE	CO CODE	COURSE OUTCOME DESCRIPTION
Web Technology	**C313.3**	Students able to develop web applications using HTML,CSS, JAVASCRIPT, XML, SERVLET, PHP and MySql
Formal Languages and Automata Theory	**C314.1**	Able to Understand the fundamental concepts of Automata and their Languages
	C314.2	Able to Apply various Automata from the given Language Classes
	C314.3	Able to Analyze Automata for different language classes
	C314.4	Able to Design grammars and automata for different language classes
Database Management Systems	**C315.1**	Students will be able to Understand the basic concepts of Data Base, Relational Model, Transaction Management, Concurrency Control, and Crash Recovery
	C315.2	Students will be able to Apply ER Model for designing Conceptual Data Base and Relational Model for designing Logical Data Base
	C315.3	Students will be able to Analyze the concepts of Relational Algebra ,Schema Refinement and Normalization.
	C315.4	Students will be able to Design Data Base applications using SQL Queries
Computer Graphics and Multimedia	**C316.1**	Understand the basic concepts of Computer graphics like algorithmic concepts, attributes, 2D and 3D transformations and comprehension of viewing and also multimedia concepts like multimedia system design, file handling and hypermedia
	C316.2	Implement various graphing drawing algorithms to generate objects and apply 2D and 3D transformations and clipping algorithms and apply compression and decompression techniques on image and files
	C316.3	Able to analyze the various display technologies, projection methods compression techniques and file formats
	C316.4	Able to develop an interactive multimedia presentation by using multimedia devices and identify theoretical and practical aspects in designing
Database Management Systems Lab	**C318.1**	Student will be able to understand the commercial RDBMS environment
	C318.2	Student will be able to learn how to run SQL commands for data definition and manipulation
	C318.3	Student will be able to analyze the database design steps on various case studies
Web Technologies Lab	**C319.1**	Students able to understand different web technologies like HTML,CSS, JAVASCRIPT, XML, SERVLET, PHP and MySql
	C319.2	Students able to apply different web technologies like HTML,CSS, JAVASCRIPT, XML, SERVLET, PHP and MySql
	C319.3	Students able to analyze different web technologies like HTML,CSS, JAVASCRIPT, XML, SERVLET, PHP and MySql
	C319.4	Students able to develop web applications using HTML,CSS, JAVASCRIPT, XML, SERVLET, PHP and MySql
Data Warehousing and Data Mining	**C321.1**	Understand functionalities of various Data Mining and Data Warehousing Concepts
	C321.2	Apply various Data mining functionalities and statistical methods to extract useful information from raw data
	C321.3	Analyze different methodologies and techniques used in Data Mining and Data Warehousing to discover interesting patterns from different kinds of data

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Object Oriented Software Engineering	**C322.1**	Ability to define the problem and perform the requirement engineering
	C322.2	Ability to draw UML diagrams for the requirements gathered
	C322.3	Ability to describe the software design techniques, architectures and managing the software process
	C322.4	Ability to Discuss various testing strategies and Test whether all requirements specified have been achieved or not
Design and Analysis of Algorithms	**C324.1**	Able to Understand various algorithms, data structures, NP Class problems and able to justify the correctness of algorithms using inductive proofs and invariants
	C324.2	Able to Apply various techniques like divide and conquer, transform and conquer, dynamic programming, greedy technique backtracking to solve different problems
	C324.3	Able to Analyze the efficiency of space and time complexity theory
	C324.4	Able to Design various algorithms for problems and complexity classes of P,NP and NP- complete, back tracking etc
E-Commerce	**C325.1**	Able to Understand the fundamental concepts of Electronic commerce environment and modes
	C325.2	Able to Identify the approaches and authenticate methods for safe E-Commerce
	C325.3	Able to Apply secure E-mail technologies for E-Commerce
	C325.4	Able to Use the key aspects of Internet Resources for Commerce, internet Access
Compiler Design	**C326.1**	Able to understand finite automata and phases of compiler
	C326.2	Able to apply automata theory on lexical analyzer
	C326.3	Able to analyze syntax and semantic error by using parsing techniques and syntax directed translations schemes
	C326.4	Able to implement various parsing, conversion, optimization and code generation algorithms for the design of a compiler
Cryptography and Network Security	**C327.1**	Student will be able to Understand the fundamental principles of cryptography and its applications on the network security domain
	C327.2	Student will be able to Apply various cryptographic techniques for secure (confidential) communication of two parties over an insecure (public) channel; verification of the authenticity of the source of a message
	C327.3	Student will be able to Analyze various approaches to Encryption techniques, strengths of Traffic Confidentiality, Message Authentication Codes
Software Engineering Mini Project Lab	**C328.1**	Able to draw UML diagrams using IBM Rational Rose
	C328.2	Able to perform forward engineering and reverse engineering by utilizing a modern tool
	C328.3	Implement a Mini-Project by following the software engineering practices as a team

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Computer Graphics and Multimedia Lab	**C329.1**	Understand various computer Graphics functions and how to use them in program and understands the usage of tools in Photoshop and macromedia flash player
	C329.2	Apply various algorithms for generating the basic output primitives by using the graphics functions
	C329.3	Analyze the differences while generating and 2D graphics and 3D graphics application programs
	C329.4	Able to evaluate graphic design projects with animations using computer graphics software
Embedded Systems	**C411.1**	Student will be able to understand the basics of Embedded Systems , development tools ,debugging techniques and Internet of Things
	C411.2	Student will be able to apply the programming basics of 8051 micro controller
	C411.3	Ability to analyze the concepts of Embedded systems, related to RTOS, Inter Task Communication methods and design issues
	C411.4	Ability to evaluate small IOT applications with embedded devices in real time
Cloud Computing	**C412.1**	Student will be able to understand fundamental and emerging concepts of cloud computing
	C412.2	Student will be able to apply cloud computing concepts in designing the third party cloud with private space
	C412.3	Student will be able to analyze various cloud computing services and recommendations according to applications used
Artificial Intelligence	**C413.1**	Understands AI problem characteristics, state space approach for solving AI problem, production system framework
	C413.2	Learn several optimal search strategies and the use of heuristics
	C413.3	Learn relational, inferential, inheritable and procedural knowledge and the corresponding knowledge representation approaches
	C413.4	Apply AI problems solving approaches to natural language processing, planning and expert system
Principles of Economics and Management	**C414.1**	Understand the links between production costs and the economic models of supply
	C414.2	Represent supply, in graphical form, including the upward slope of the supply curve and what Shifts the supply curve
	C414.3	Understand how different degrees of competition in a market effect pricing and output
	C414.4	Apply economic reasoning to individual and firm behavior
Big Data Analytics	**C416.1**	Understand the basic concepts of big data and adopt the advanced concepts of big data like map reduces HDFS and Graphs by utilizing modern tools like hadoop, spark, pig and hive
	C416.2	Apply Map Reduce Programming and adopt the advanced map reduce programming techniques on big data by utilizing a modern tool
	C416.3	Analyze the Big data concepts like HDFS and Map reduce by utilizing modern tools like hadoop with an understanding of the limitations

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Knowledge Engineering Lab	**C417.1**	Students will able to identify the state of art of the Knowledge engineering tools like R, Weka, CLIPS and PROLOG
	C417.2	Apply several data analytics operations, data mining techniques ,forward or backward chaining by using R,WEKA ,CLIPS/PROLOG respectively as individual
	C417.3	Analyze the Knowledge brought out by the experiments as an individual by using any analytical tool
Network Programming Lab	**C418.1**	Student will understand protocols used in NP
	C418.2	Student will be able apply the various NP protocols to different applications.
	C418.3	Student will be able to Analyze applications in NP
	C418.4	Student will be able to evaluate the various applications using NP protocols
Internet of Things Lab	**C419.1**	Student will understand protocols used in IOT
	C419.2	Student will be able apply the concepts of IOT to different applications
	C419.3	Student will be able to design and develop applications in IOT
	C419.4	Student will be able to evaluate the data from IOT applications
Project Lab	**C421.1**	Able to understand software engineering, process models to solve complex problems
	C421.2	Able to gather and document the requirements of the real world problems
	C421.3	Able to design architecture of the application and develop the data store layout by utilizing modern tools
	C421.4	Able to develop solutions using programming languages.
	C421.5	Develop the team work and leadership skills with Professional and ethical values