

An ISO 9001:2015 Certified Institute, Approved by AICTE, Affiliated to JNTU Kakinada, AP Phone: 0866-2844444, Email: <u>vijayatechfw@gmail.com</u> Website: <u>www.vitw.edu.in</u> College Code: NP, Enikepadu, Vijayawada-521108

Department of Computer Science and Engineering

List of Course Outcomes

Batch: 2020 (R20)

Year & Sem	Subject Code	Course Code	Course Name	At the end of the course, the student will be able to
I-I	R201102	C101	English	 CO1:Ask and answer general questions on familiar topics and introduce oneself/others CO2:Recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs CO3:To help and improve speaking skills through participation in activities such as role plays, discussions and structured talks /oral presentations CO4:Discuss specific topics in pairs or in groups for Functional English CO5:Understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information CO6:Form sentences using proper grammatical structures and correct word forms
				CO1:Utilize mean value theorems to real life problems (L3) CO2:Solve the differential equations



	D2 01101	DC1101		of first order and their applications
I-I	R201101	BS1101	Mathematics - I	SCO3:olve the differential equations of second and higher order and applications.
				CO4:Solve the differential equations related to various engineering fields(L3).
				CO5:Familiarize with functions of several variables which is useful in optimization(L3)
				CO6: Apply double integration techniques in evaluating areas bounded by region and triple integral techniques over volume.
				CO1:Analyze the different types of composite plastic materials and interpret the mechanism of conduction in conducting polymers.
				CO2:Utilize the theory of construction of electrodes, batteries and fuel cells in redesigning new engineering products and categorize the reasons for corrosion and study methods to control corrosion
		DELLOC		CO3:Summarize the preparation of semiconductors; analyze the applications of liquid crystals and superconductors.
I-I		BS1106	Applied Chemistry	CO4:Synthesize Nanomaterials for modern advances of engineering technology.
				CO5:Analyze the principles of different analytical instruments and their applications, Design models for energy by different natural sources.



			CO6:Obtain the knowledge of computational chemistry and molecular machines.
I-I	ES1112	Fundamentals of Computer Science	 CO1: Illustrate the concept of input and output devices of Computers and how it works and recognize the basic terminology used in computer programming. CO2: Recognize the Computer networks, types of networks and topologies. CO3: Summarize the concepts of Operating Systems and Databases. CO4: Recite the Advanced Computer Technologies like Distributed Computing & Wireless Networks.
I-I	ES1103	Engineering Drawing	CO1: The student will learn how to visualize 2D & 3D objects.
			CO1:Develop the use of matrix algebra techniques that is needed by engineers for practical applications and solve system of linear algebraic equations by Gauss elimination method. CO2:Find the inverse and powers of matrices by Cayley Hamilton theorem. CO3:Evaluate the approximate roots of polynomial and transcendental equations by different algorithms(L5)
I-II	BS1202	Mathematics – II	CO4:Solve system of linear algebraic equations using Gauss Jacobi ,Gauss seidel (L3)
			CO5:Apply Newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals (L3)
			CO6:Apply different algorithms for approximating the solution of Ordinary differential Equations with initial conditions to its analytical



				computations(L3)
				CO1:Interpret the physical meaning of different operators such as gradient, curl and divergence and Estimate the work done against a field, circulation and flux using vector calculus (L5)
				CO2:Apply the Laplace transform for solving differential equations (L3)
				CO3:Find or compute the Fourier series of periodic signals (L3)
I-II		BS1203	Mathematics – III	CO4:Apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic waveforms (L3)
				CO5: Identify solution methods for partial differential equations that model physical processes (L3)
				CO6: Classify and Solve the different types of partial differential equations.
				CO1: Realize the need of coherent sources, engineering applications of interference, differences between interference and diffraction, the concept of polarization in the design of various optical instruments.
I-II]	BS1204	Applied Physics	CO2:Enable to understand the concepts of LASER light sources, types of lasers, Engineering applications of lasers, Working principle of optical fibers, classification of optical fibers.
				CO3: Interpret the dual nature of matter, significance of wave function.
				CO4: Elucidate the classical and quantum free electron theories, K-P model, classification of materials, effective mass of electron.



			 CO5:Explain the dielectric constant and polarization, various types of polarization, Lorentz field and Clausius –Mosotti relation in dielectrics, classification of magnetic materials. CO6: Provide vivid comprehension on the classification of energy bands of semiconductors, Hall effect, Meissner effect, BCS theory & Josephson effect in superconductors.
I-II	ES1201	Programming for Problem Solving using C	CO1: To write algorithms and to draw flowcharts for solving problemsCO2:Toconvertflowcharts/algorithms to C Programs, compile and debug programs · To use different operators, data types and write programs that use two-way/ multi-way selection · To select the best loop construct for a given problemCO3:TodesignCO3:Todesignprograms toanalyzethedifferent opinter applications · Todecompose a problemproblemintofunctionsundular reusable code · Toapply FileI/Ooperations
I-II	ES1213	Digital Logic Design	 CO1: An ability to define different number systems, binary addition and subtraction, 2's complement representation and operations with this representation. CO2: An ability to understand the different switching algebra theorems and apply them for logic functions. CO3: An ability to define the Karnaugh map for a few variables and perform an algorithmic reduction of logic functions. CO4: Students will be able to design various logic gates starting from simple ordinary gates to complex programmable logic devices & arrays.



				CO5: Students will be able to design various sequential circuits starting from flip-flop to registers and counters.
				CO1:Interpret the physical meaning of different operators such as gradient, curl and divergence and Estimate the work done against a field, circulation and flux using vector calculus (L5)
				CO2:Apply the Laplace transform for solving differential equations (L3)
				CO3:Find or compute the Fourier series of periodic signals (L3)
II-I	R2021011	C201	Mathematics III	CO4:Apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic waveforms (L3)
				CO5: Identify solution methods for partial differential equations that model physical processes (L3)
				CO6: Classify and Solve the different types of partial differential equations.
				CO1:Classify object oriented programming and procedural programming
				CO2:Apply C++ features such as composition of objects, operator overloads, dynamic memory allocation, inheritance and polymorphism, file I/O, exception handling
II-I	R2021051	C202	Object Oriented Programming through C++	CO3:Build C++ classes using appropriate constructors and Destructors CO4:Build C++ classes using
				appropriate encapsulation and design principles CO5:Apply object oriented or non-
				object oriented techniques to solve bigger computing problems CO6:Build C++ classes using



				appropriate constructors and
II-I	R2021052	C203	Operating Systems	DestructorsCO1:Describe various generations of Operating System and functions of Operating SystemCO2:Describe the concept of program, process and thread and analyze various CPU Scheduling Algorithms and compare their performanceCO3:Solve Inter Process Communication problems using Mathematical Equations by various methodsCO4:Compare various Thrashing TechniquesCO5:Compare various Memory Management Schemes especially paging and Segmentation in Operating System and apply various Page Replacement TechniquesCO6:Outline File Systems in Operating System like UNIX/Linux and Windows
II-I	R2021053	C204	Software Engineering	CO1:Ability to transform an Object- Oriented Design into high quality, executable code CO2:Get familiar with Various process models CO3:Skills to design, implement, and execute test cases at the Unit and Integration level CO4:Get Familiar with various models CO5:Get Familiar with various and Debugging CO6:Compare conventional and agile software methods
II-I	R2021054	C205	Mathematical Foundations Of Computer Science	Software methodsCO1:Comprehend mathematical Principles and logicCO2:Communicate effectively mathematical ideas/results verbally/in writingCO3:Apply the Knowledge of Number Theory in the areas of such



				cryptography
				CO4:Demonstrate knowledge of mathematical modelling and proficiency in using mathematical software
				CO5:Demonstrate skills in solving mathematical problems
				CO6:Manipulate and analyze data numerically and graphically using appropriate software
				CO1:Classify the concepts of data science and its importance (L4)
	и и воособл	022051 C212	Probability And Statistics	CO2:Interpret the association of characteristics and through correlation and regression tools (L4)
II-II				CO3:Make use of the concepts of probability and their applications (L3)
	112022031			CO4:Apply discrete and continuous probability distributions (L3)
				CO5:Infer the statistical inferential methods based on small and large sampling tests (L4)
				CO6:Design the components of a classical hypothesis test (L6)
				CO1:Describe a relational database and object-oriented database CO2:Create, maintain and manipulate
				a relational database using SQL CO3:Describe ER model and
				normalization for database design
II-II	R2022052	C213	Database Management Systems	CO4:Describe about SQL in Detail
			Management Systems	CO5:Examine issues in data storage and query processing and can
				formulate appropriate solutions
				CO6:Outline the role and issues in
				management of data such as efficiency,
				privacy, security, ethical responsibility,
II-II	R2022053	C214	Formal Languages	and strategic advantage CO1:Classify machines by their power
11-11	K2022033	0214	ronnai Languages	COLCIASSITY machines by their power



			And Automata Theory	to recognize languages.
				CO2:Summarize language classes &
				grammars relationship among them
				with the help of Chomsky hierarchy
				CO3:Employ finite state machines to
				solve problems in computing
				CO4:Discuss about Parse trees
				CO5:Illustrate deterministic and non-
				deterministic machines
				CO6:Quote the hierarchy of problems
				arising in the computer science
				CO1:Able to realize the concept of
				Object Oriented Programming & Java
				Programming Constructs
				CO2:Able to describe the basic
				concepts of Java such as operators,
				classes, objects, inheritance, packages,
				Enumeration and various keywords
II-II	R2022054	C215	Java Programming	CO3:Apply the concept of exception
				handling and Input/ Output operations
				CO4:Mention various types of arrays
				CO5:Able to design the applications of
				Java & Java applet
				CO6:Able to Analyze & Design the
				concept of Event Handling and
				Abstract Window Toolkit
				CO1:The Learner is equipped with the
				knowledge of estimating the Demand
				and demand elasticity for a product
				CO2:The knowledge of understanding
				of the Input-Output-Cost relationships
				and estimation of the least cost
				combination of inputs
				CO3:The pupil is also ready to
			Managerial	understand the nature of different
			Economics And	markets and Price Output
II-II	R2022055	C216	Financial	determination under various market
				conditions and also to have the
			Accountancy	knowledge of different Business Units
				CO4:Discuss about various phases of business cycle
				CO5: The Learner is able to prepare
				Financial Statements and the usage of
				various Accounting tools for Analysis
				CO6: The Learner can able to evaluate
				various investment project proposals



				with the help of capital budgeting techniques for decision making UNIT I Introduction to Managerial Economics and demand Analysis: Definition of Managerial Economy
III-I	R2031051	C301	Computer Networks	 CO1:Demonstrate different network models for networking links OSI, TCP/IP, B-ISDN, N-BISDN and get knowledge about various communication techniques, methods and protocol standards. CO2:Discuss different transmission media and different switching networks. CO3:Analyze data link layer services, functions and protocols like HDLC and PPP. CO4:ALOHA, Carrier sense multiple access (CSMA), CSMA with Collision Detection, CSMA with Collision. CO5:Compare and Classify medium access control protocols like ALOHA, CSMA, CSMA/CD, CSMA/CA, Polling, Token passing, FDMA, TDMA, CDMA protocols CO6:Determine application layer services and client server paradigms like WWW, HTTP, FTP, e- mail and SNMP etc.
III-I	R2031052	C302	Design and Analysis of Algorithms	 CO1:Analyze the performance of a given algorithm, denote its time complexity using the asymptotic notation for recursive and non-recursive algorithms CO2:List and describe various algorithmic approaches and Solve problems using divide and conquer &greedy Method CO3:Synthesize efficient algorithms dynamic programming approaches to solve in common engineering design situations. CO4:The general method, multistage graphs, All pairs-shortest paths, optimal Binary search trees



				CO5:Organize important algorithmic design paradigms and methods of analysis: backtracking, branch and bound algorithmic approaches CO6:Demonstrate NP- Completeness theory ,lower bound theory and String Matching
III-I	R2031053	C303	Data Warehousing and Data Mining	WatchingCO1:Illustrate the importance of DataWarehousing, Data Mining and itsfunctionalities and Design schema forreal time data warehousingapplications.CO2: Demonstrate on various DataPre-processing Techniques viz. datacleaning, data integration, datatransformation and data reduction andProcess raw data to make it suitablefor various data mining algorithms.CO3: Choose appropriateclassification technique to performclassification, model building andevaluation.CO4:General Approach to solving aclassification problem, Decision TreeInduction: Attribute SelectionMeasures, Tree PruningCO5:Make use of association rulemining techniques viz. Apriori and FPGrowth algorithms and analyze onfrequent item sets generation.CO6:Identify and apply variousclustering algorithm (with open sourcetools), interpret, evaluate and reportthe result.
III-I	R203105A		Artificial Intelligence	CO1:Understand the fundamental concepts in Artificial Intelligence CO2:Analyze the applications of search strategies and problem reductions CO3:Apply the mathematical logic concepts. CO4:propositional calculus, proportional logic, natural deduction system, axiomatic system, CO5:Develop the Knowledge



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			representations in Artificial
			Intelligence.
			CO6:Explain the Fuzzy logic systems.
			CO1:Use number systems and
			complements
			CO2:Identifiying importance of
			canonical forms
			CO3:Minimize functions using any
			type of minimizing algorithms
			CO4:Multipluxers and
III-I	R203104Q	Digital Logic Design	demultiplexures
			CO5:Analyse the design procedures of
			combinational and sequencial Circuits
			CO6:Design the FSM using
			algarithemic state machine charts and
			perform simple projects with few flip-
			flops
			$\frac{1}{1}$
			CO1:Explain the fundamental usage of
			the concept Machine Learning system
			CO2:Demonstrate on various
			regression Technique
			CO3:Analyze the Ensemble Learning
			Methods
			CO4:Supervised Learning, Distance
III-II		Machine Learning	based Methods, Nearest Neighbours,
111-11	R2032051	Machine Leanning	Decision Trees, Naive Bayes
			CO5:Illustrate the Clustering
			Techniques and Dimensionality
			Reduction Models in Machine
			Learning.
			CO6:Discuss the Neural Network
			Models and Fundamentals concepts of
			Deep Learning
			CO1:Demonstrate phases in the design
			of compiler
			CO2:Organize Syntax Analysis, Top
			Down and LL(1) grammars
			CO3:Design Bottom Up Parsing and
III-II	R2032052	Compiler Design	Construction of LR parsers
			CO4: Intermediate Code Generation,
			Syntax Trees, Backpatching,
			Intermediate Code for Procedures.
			CO5:Analyze synthesized, inherited
			attributes and syntax directed
			translation schemes



			CO6:Determine algorithms to generate
			code for a target machine
III-II	R2032053	Cryptography and Network Security	code for a target machineCO1:Explain different security threatsand countermeasures and foundationcourse of cryptography mathematics.CO2:Classify the basic principles ofsymmetric key algorithms andoperations of some symmetric keyalgorithms and asymmetric keyalgorithms and asymmetric keycryptographyCO3:Revise the basic principles ofPublic key algorithms and Workingoperations of some Asymmetric keyalgorithms such as RSA, ECC andsome moreCO4:Symmetric Encryption, ModernSymmetric Key Ciphers, DataEncryption StandardCO5:Design applications of hashalgorithms, digital signatures and keymanagement techniquesCO6:Determine the knowledge ofApplication layer, Transport layer andNetwork layer security Protocols such
III-II	R203205B	Big Data Analytics	as PGP, S/MIME, SSL,TSL, and IPsec CO1:Illustrate big data challenges in different domains including social media, transportation, finance and medicine CO2:Use various techniques for mining data stream CO3:Design and develop Hadoop CO4:Design of HDFS, Hadoop Streaming, Task execution, Map Reduce Types CO5:Identify the characteristics of datasets and compare the trivial data and big data for various applications CO6:Explore the various search
III-II	R203204Q	Data Communications	methods and visualization techniquesCO1:Know the categories andfunctions of various datacommunication networksCO2:Design and Analyse various errordetection techniquesCO3:discuss about connection less



IV-I	PE	Cloud Computing	protocolsCO4:Demonistrate the mechanism of routing the data in network layerCO5:Domain Name SystemCO6:Know the significance of various flow control and condition control mechanismCO1: Illustrate the key dimensions of the challenge of Cloud ComputingCO2:Classify the Levels of Virtualization and mechanism of tools.CO3:Analyze Cloud infrastructure including Google Cloud and Amazon Cloud.CO4:Create Combinatorial Auctions for cloud resource and design scheduling algorithms for computing cloudCO5:Policies and Mechanisms for Resource Management, Applications of Control Theory to Task Scheduling on a CloudCO6:Assess control storage systems and cloud security, the risks involved its impact and develop cloud application
IV-I	PE	Deep Learning Techniques	 CO1: Demonstrate the fundamental concepts learning techniques of Artificial Intelligence, Machine Learning and Deep Learning. CO2: Discuss the Neural Network training, various random models. CO3: Explain the Techniques of Keras, Tensor Flow, Theano and CNTK CO4: Classify the Concepts of CNN and RNN CO5: Able to understand Recurrent Neural Networks: Introduction to RNN, RNN Code, learn how to use PyTorch Tensors: Deep Learning with PyTorch, CNN in PyTorch CO6: Implement Interactive Applications of Deep Learning.
IV-I	PE	Wireless Network	CO1: Explain the Threats in networks



		Security	and provide Authentication to real time problems.
			 CO2: Identify and investigate in-depth both early and contemporary threats to wireless networks security CO3: Ability to analyze and determine for any organization the database security requirements and appropriate solutions CO4: Able to understand Cellular Digital Packet Data (CDPD), CDPD Architecture, CDPD Security. CO5: Determined IP Security Issues
			and solve real time problems. CO6: Build wireless Development Strategies in real time issues
IV-I	OE-III	Environmental Management	 CO1:Plan and design the water and wastewater systems CO2: Identify the source of emissions and select proper control systems CO3: Design & estimation of water supply system for a city CO4:Learn about atmosphere, structure and composition of atmosphere, natural greenhouse effect, atmospheric pollution and its causes like smog, acid rain. CO5: To get knowledge about various environmental aspects CO6: Selection of suitable treatment flow for raw water treatments
IV-I	OE-IV	Soft Computing Techniques	 CO1: Develop intelligent systems leveraging the paradigm of soft computing techniques. CO2: Implement, evaluate and compare solutions by various soft computing approaches for finding the optimal solutions. CO3: Recognize the feasibility of applying a soft computing methodology for a particular problem CO4: Able to learn basic concept of Genetic algorithm and detail algorithmic steps, Adjustment of free



			 parameters, Solution of typical control problems using genetic algorithm CO5: Design the methodology to solve optimization problems using fuzzy logic, genetic algorithms and neural networks. CO6: Design hybrid system to revise the principles of soft computing in various application
			CO1: students are expected to become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life.CO2: Able to handle problems with mort include a solutions.
IV-I	HS	Universal Human Values 2: Understanding Harmony	 sustainable solutions, while keeping human relationships and human nature in mind. CO3: They would have better critical ability. They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society). CO4: It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction. CO5: This is only an introductory foundational input. It would be desirable to follow it up by a) faculty-
			 student or mentor-mentee programs throughout their time with the institution CO6: This is only an introductory foundational input. It would be desirable to follow it up by Higher level courses on human values in every aspect of living. E.g. as a professional.

