RAMIREDDY SUBBARAMI REDDY ENGINEERING COLLEGE

(Approved by AICTE, Affiliated to JNTUA. An ISO 9001: 2015 Certified Institution)

NH-16, Kadanuthala, Bogole Mandal, Kavali- 524 142, S.P.S.R. Nellore, Andhra Pradesh.)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
COURSE OUTCOMES
REGULATION – R19

Sem: I – I

S.No	Course Code	Course Name	Category	L	T	P	Credits
01	19A54101	Algebra and Calculus	BS	3	1	0	4
02	19A51102T	Chemistry	BS	3	0	0	3
03	19A05101T	Problem Solving & Programming	ES	3	1	0	4
04	19A03102	Engineering Graphics Lab	ES	1	0	4	3
05	19A03101	Engineering Workshop	LC	0	0	2	1
06	19A51102P	Chemistry Lab	BS	0	0	3	1.5
07	19A05101P	Problem Solving & Programming Lab	ES	0	0	3	1.5
						Total	18

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
I – I	19A54101	Algebra and Calculus	4101.1	Develop the use of matrix algebra techniques that is needed by engineers for practical applications. (BTL6)
			4101.2	Utilize mean value theorems to real life problems. (BTL3)
			4101.3	Develop functions of several variables which is useful in optimization. (BTL6)
			4101.4	Create 2- dimensional coordinate systems. (BTL2)
			4101.5	Analyse the utilization of special functions such as Beta and Gamma Functions. (BTL4)
I – I	19A51102T	Chemistry	1102T.1	Discuss the MOT, Apply Schrodinger wave equation to H. (BTL6)
			1102T.2	Demonstrate the application of Fullerene, CNT and Nanoparticles. (BTL2)
			1102T.3	Distinguish between pH metry, Potentiometry (BTL4)
			1102T.4	Discuss about solid, liquid, gaseous fuels (BTL6)
			1102T.5	Understand the principles of analytical instruments (BTL2)
I – I	19A05101T	Problem Solving & Programming	5101T.1	Discuss the fundamentals of computers and Introduction to Programming, Algorithms and Flowcharts. (BTL6)
			5101T.2	Understand computer problem solving and Fundamental algorithms. (BTL2)
			5101T.3	Interpret Types, Operators, and Expressions, Input and output, Control Flow, Functions and Program Structure. (BTL5)
			5101T.4	Analyse the Factoring methods, Pointers and arrays. (BTl4)
			5101T.5	Design and implement Sorting and Searching programs. (BTL6)
I – I	19A03102	Engineering Graphics Lab	3102.1	Understand the conventions and the method of engineering drawing. (BTL2)
			3102.2	Identify visualization skills so that they can apply this skill in developing new products. (BTL3)
			3102.3	Improve their technical communication skill in the form of communicative drawings. (BTL6)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
			3102.4	Improve computers skills as a drafting tool. (BTL6)
			3102.5	Construct isometric and orthographic drawings using CAD packages. (BTL3)
I – I	19A03101	Engineering Workshop	3101.1	Apply wood working skills in real world applications. (BTL3)
			3101.2	Build different parts with metal sheets in real world applications. (L3)
			3101.3	Apply fitting operations in various applications. (BTL3)
			3101.4	Apply different types of basic electric circuit connections. (BTL3)
			3101.5	Demonstrate soldering and brazing. (BTL2)
I – I	19A51102P	Chemistry Lab	1102P.1	Determine the cell constant and conduct of the solutions. (BTL5)
			1102P.2	Estimate the ferrous iron and Strength of an acid in battery. (BTL6)
			1102P.3	Design the advanced materials and analyse the properties. (BTL6)
			1102P.4	Analyse the IR and NMR spectroscopy. (BTL4)
			1102P.5	Analyse the separation method of HPLC and TLC (BTL4)
I – I	19A05101P	Problem Solving & Programming Lab	5101P.1	Identify and setup program development environment. (BTL3)
			5101P.2	Design the algorithms using C programming language constructs. (BTL6)
			5101P.3	Create programs that perform conditional, selection statements and Implement Programs with arrays and functions, strings. (BTL6)
			5101P.4	Design the programs with pointers, structures. (BTL6)
			5101P.5	Develop sorting and linked list programs. (BTL3)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Sem: I – II

S.No	Course Code	Course Name	Category	Hours per Week			Credits
				L	T	P	
01	19A02201T	Basic Electrical and Electronics Engineering	ES	3	0	0	3
02	19A54202 P	Probability and Statistics	BS	3	1	0	4
03	19A56101T	Applied Physics	BS	3	0	0	3
04	19A05201T	Data Structures	ES	3	0	0	3
05	19A52101T	Communicative English - I	HS	2	0	0	2
06	19A05202	Computer Science and Engineering Workshop	LC	0	0	2	1
07	19A52101P	Communicative English - I Lab	HS	0	0	2	1
08	19A02201P	Basic Electrical & Electronics Engineering Lab	ES	0	0	3	1.5
09	19A56101P	Applied Physics Lab	BS	0	0	3	1.5
10	19A05201P	Data Structures Lab	ES	0	0	3	1.5
						Total	**21.5**

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
I – II	19A02201T	Basic Electrical and Electronics Engineering	2201T.1	Solve simple electrical circuits with DC and AC excitation. (BTL3)
			2201T.2	Explain the construction, operation of DC Motors, AC motors, Transformers and Induction Motors. (BTL2)
			2201T.3	Identify the use of diodes and transistors in simple, typical circuit applications. (BTL3)
			2201T.4	Analyse various combinational circuits such as adders, multiplexers and decoders. (BTL4)
			2201T.5	Identify basic elements of a communication system. (BTL3)
I – II	19A54202 P	Probability and Statistics	4202P.1	Classify the concepts of data science and its applications (BTL4).

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
			4202P.2	Identify the se of the concepts of probability and their applications (BTL3).
			4202P.3	Interpret the properties of normal distribution and its applications (BTL5).
			4202P.4	Apply the concept of hypothesis testing for large samples (BTL3)
			4202P.5	Apply the concept of testing hypothesis for small samples to draw the inferences (BTL3).
I – II	19A56101T	Applied Physics	6101T.1	Analyse the wave properties of light and the interaction of energy with the matter. (BTL4)
			6101T.2	Analyse electromagnetic wave propagation in different guided media. (BTL4)
			6101T.3	Illustrate the electromagnetic wave propagation and its power in different media. (BTL2)
			6101T.4	Illustrate conductivity of semiconductors. (BTL2)
			6101T.5	Distinguish between normal conductor and superconductor and the application of nanomaterials. (BTL4)
I – II	19A05201T	Data Structures	5201T.1	Apply the concept of arrays with asymptotic notations in building of different sorting technique. (BTL3)
			5201T.2	Analyse stacks, queues and linked list using dynamic memory allocation. (BTL4)
			5201T.3	Develop algorithms for trees and graphs. (BTL6)
			5201T.4	Apply various graph traversal methods to applications & design a hashing technique. (BTL3)
			5201T.5	Organize data in the form of Files & Apply sorting on large amount of data. (BTL6)
I – II	19A52101T	Communicative English - I	2101T.1	Identify the need for understanding context, topic and specific information from social and transactional dialogues spoken by native speakers of English language. (BTL3)
			2101T.2	Apply rules of grammar for flawless writing and speaking with good vocabulary. (BTL3)
			2101T.3	List discourse markers to speak clearly on a specific topic/occasion in various discussions. (BTL1)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
			2101T.4	Compare the texts after listening or reading and summarize them effectively. (BTL2)
			2101T.5	Infer a table/chart/graph by writing a paragraph coherently. (BTL2)
I – II	19A05202	Computer Science and Engineering Workshop	5202.1	Analyse the various internal parts of computer and its peripherals. (BTL4)
			5202.2	Understand the Assembling and disassembling of PC. (BTL2)
			5202.3	Demonstrate the installation steps of OS and features. (BTL2)
			5202.4	Categorize the various Microsoft tools. (BTL4)
			5202.5	Discuss the concepts of Networking and IoT. (BTL6)
I – II	19A52101P	Communicative English - I Lab	2101P.1	Assess their proficiency by listening to audio and video materials to develop their listening, speaking, reading and writing skills. (BTL5)
			2101P.2	Develop pronunciation, accent, stress, rhythm and all other aspects of the phonetics of a language for speaking and listening comprehension. (BTL-3)
			2101P.3	Understand the nuances of English language with a focus on removing the influence of the mother tongue while conversing. (BTL2)
			2101P.4	Develop their communication skills and overcome the fear of public speaking by participating in GDs and role plays thereby make themselves employable. (BTL3)
			2101P.5	Evaluate and demonstrate acceptable etiquette required in social and professional contexts. (BTL5)
I – II	19A02201P	Basic Electrical & Electronics Engineering Lab	2201P.1	Understand Kirchoff"s Laws & Superposition theorems. (BTL2)
			2201P.2	Analyse various characteristics on DC machines by conducting suitable tests. (BTL3)
			2201P.3	Analyze the application of diode as rectifiers, clippers and clampers and other circuits. (BTL4)
			2201P.4	Design the amplifier circuits from the given specifications. (BTL6)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
			2201P.5	Design simple electronic circuits and verify its functioning. (BTL6)
I – II	19A56101P	Applied Physics Lab	6101P.1	Demonstrate optical instruments (BTL2)
			6101P.2	Analyse magnetic intensity. (BTL4)
			6101P.3	Determine mag. s uscep., hall coeff. (BTL5)
			6101P.4	Evaluate the band gap, NA, AA. (BTL5)
			6101P.5	Evaluate dielectric constant, B-H curve. (BTL5)
I – II	19A05201P	Data Structures Lab	5201P.1	Select the data structure appropriate for solving the problem. (BTL3)
			5201P.2	Design and implement searching and sorting algorithms. (BTL6)
			5201P.3	Design new data types. (BTL6)
			5201P.4	Illustrate the working of stack and queue. (BTl2)
			5201P.5	Interpret the data in the form of files. (BTl5)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Sem: II – I

S.No	Course Code	Course Name	Category	Hours per Week			Credits
				L	T	P	
01	19A54303	Mathematical Foundations of Computer Science	BS	3	0	0	3
02	19A05301	Digital Logic Design	PC	3	0	0	3
03	19A99304	Design Thinking	ES	2	0	0	2
04	19A05302T	Database Management Systems	PC	3	0	0	3
05	19A05303T	Object Oriented Programming Through Java	PC	3	0	0	3
06	19A05304T	Python Programming	PC	2	1	0	3
07	19A52301	Universal Human Values	HS	2	0	0	2
08	19A05302P	Database Management Systems Lab	PC	0	0	3	1.5
09	19A05303P	Object Oriented Programming Through Java Lab	PCC	0	0	3	1.5
10	19A05304T	Python Programming Lab	PC	0	0	3	1.5
11	19A99301	Environmental Science	MC	3	0	0	0
						Total	**23.5**

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
II – I	19A54303	Mathematical Foundations of Computer Science	4303.1	Evaluate basic logic statements using truth tables and the properties of logic (BTL5).
			4303.2	Compute Maximal Compatibility Blocks (BTL3).
			4303.3	Examine the relation between permutation and combination (BTL4).
			4303.4	Find the generating functions for a sequence (BTL1).
			4303.5	Identify Euler Graphs, Hamilton Graph and Chromatic Number of a graph (BTL2).
II – I	19A05301	Digital Logic Design	5301.1	Analyse the number systems and codes. (BTL4)
			5301.2	Decide the Boolean expressions using Minimization methods. (BTL5)
			5301.3	Design the sequential and combinational circuits. (BTL6)
			5301.4	Apply state reduction methods to solve sequential circuits. (BTL3)
			5301.5	Explain various types of memories. (BTL2)
II – I	19A99304	Design Thinking	9304.1	Understand product design process, innovative ideas on product development process. (BTL2)
			9304.2	Examine design thinking methodologies, process and tools on design thinking principles. (BTL4)
			9304.3	Adapt on idea generation techniques, innovation is a new idea to develop the new products. (BTL6)
			9304.4	Influence business process models and agile s/w development process. (BTL5)
			9304.5	Discuss the role of design thinking Principles in services design. (BTL6)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
II – I	19A05302T	Database Management Systems	5302T.1	Understand the basic concepts for database management system applications. (BTL2)
			5302T.2	Illustrate the basic SQL. (BTL2)
			5302T.3	Discus Entity model and Normalization. (BTL6)
			5302T.4	Analysis of performance tuning. (BTL4)
			5302T.5	Discus about storage structure of DB. (BTL6)
II – I	19A05303T	Object Oriented Programming Through Java	5303T.1	Understand the syntax, semantics; object-oriented features, type conversions and casting, types of string handling functions of java programming language. (BTL2)
			5303T.2	Interpret the types of inheritance, differentiating system packages and user defined packages, demonstration of interfaces to implement multiple inheritances. (BTL5)
			5303T.3	Understand the concepts of exception, how to handle them and how to create user defined exception and knowing difference between files and streams. (BTL2)
			5303T.4	Identify multithreading, importance of collections and using generic data structures from framework. (BTL3)
			5303T.5	Design the GUIs using applets and swing controls and they understand the Java Database Connectivity Architecture. (BTL6)
II – I	19A05304T	Python Programming	5304T.1	List the basic constructs of Python and solve the problems by applying modularity principle. (BTL1)
			5304T.2	Apply the conditional and principle of recursion execution of the program. (BTL3)
			5304T.3	Make use of the data structure list and Design programs for manipulating strings. (BTL3)
			5304T.4	Make use of data structure dictionaries, Organize data in the form of files and object orientation concepts. (BTL3)
			5304T.5	Plan programs using object orientation approach. Illustrate the principle of inheritance (BTL6)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
II – I	19A52301	Universal Human Values	2301.1	Understand how to become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind. (BTL2)
			2301.2	Identify the things with better critical ability. (BTL3)
			2301.3	Develop skills to become sensitive to their commitment towards what they have understood. (BTL3)
			2301.4	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. (BTL3)
			2301.5	Evaluate the skills to become more aware of themselves, and their surroundings like family, society, nature and etc. (BTL5)
II – I	19A05302P	Database Management Systems Lab	5302P.1	Analyse overview SQL commands. (BTL4)
			5302P.2	List out various constraints, aggregate functions. (BTL1)
			5302P.3	List out all joins and subqueries. (BTL1)
			5302P.4	Discuss the PL/SQL Programming. (BTL6)
			5302P.5	Understand the procedures, functions and triggers. (BTL2)
II – I	19A05303P	Object Oriented Programming Through Java Lab	5303P.1	Identify the java programming environment. (BTL3)
			5303P.2	Develop efficient programs using multithreading. (BTL3) .
			5303P.3	Design reliable programs using java exception handling features. (BTL6)
			5303P.4	Extend the programming functionality supported by java. (BTL2)
			5303P.5	Select appropriate programming construct to solve a problem. (BTL6)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
II – I	19A05304T	Python Programming Lab	5304T.1	Design solutions to mathematical problems. (BTl6)
			5304T.2	Organize the data for solving the problem. (BTL3)
			5304T.3	Develop Python programs for numerical and text-based problems. (BTL6)
			5304T.4	Select appropriate programming construct for solving the problem. (BTL6)
			5304T.5	Illustrate object-oriented concepts. (BTL2)
II – I	19A99301	Environmental Science	9301.1	Understand the various natural resources. (BTL2)
			9301.2	Describe about the Biodiversity and Ecosystem. (BTL2)
			9301.3	Discuss about the pollution aspects. (BTL3)
			9301.4	Understand the social issues related to environment and their protection acts. (BTL2)
			9301.5	Demonstrate about population explosion and welfare programme. (BTL2)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Sem: II – II

S.No	Course Code	Course Name	Category	Hours per Week			Credits
				L	T	P	
01	19A54401	Number Theory and Applications	BS	3	0	0	3
02	19A05401	Computer Organization	PC	3	0	0	3
03	19A05402T	Design and Analysis of Algorithms	PC	2	0	0	3
04	19A52401	Entrepreneurship	HS	3	0	0	3
05	19A05403T	Operating Systems	PC	3	0	0	3
06	19A05404T	Software Engineering	PC	2	1	0	3
07	19A05403P	Operating Systems Lab	PC	2	0	0	1.5
08	19A05404P	Software Engineering Lab	PC	0	0	3	1.5
09	19A99302	Biology for Engineers	MC	0	0	3	0
						Total	**21**

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
II - II	19A54401	Number Theory and Applications	4401.1	Understand basics of number theory concepts (BTL2)
			4401.2	Carrying out or using a procedure through executing or implementing for Chinese remainder theorem and its applications. (BTL3)
			4401.3	Apply the concept of congruence to various applications. (BTL3)
			4401.4	Identify and recalling relevant knowledge (BTL3)
			4401.5	Analyse the terminology of cryptology. (BTL4)
II - II	19A05401	Computer Organization	5401.1	Understand basic structure of a computer and machine instructions and programs. (BTL2)
			5401.2	Identify the arithmetic operations on signed numbers and Illustrate the ALU operations and analyse basic processing unit. (BTL3)
			5401.3	Identify various types of memories and apply effective memory management strategies. (BTL3)
			5401.4	Analyse the interrupt handling mechanisms of various processors and examine the basics of I/O data transfer synchronization and I/O data transfer methods. (BTL4)
			5401.5	Understand the use of pipelining and multiple functional units, and describe the interconnection networks for multiprocessors. (BTL2)
II - II	19A05402T	Design and Analysis of Algorithms	5402T.1	Define the performance of algorithms. Interpret Divide and Conquer Strategy to design searching and sorting techniques. (BTL1)
			5402T.2	Apply Greedy and Dynamic programming techniques to analyse and design real time applications. (BTL3)
			5402T.3	Illustrate the graph traversals and tree traversals to solve the problems. Develop the Strategies of Backtracking technique to solve the complex problems. (BTL2)
			5402T.4	Examine the Branch-and-Bound and Lower bound strategies to resolve searching and sorting techniques in trees. (BTL4)
			5402T.5	Analyse computational problems of Algorithms. Differentiate deterministic and non-deterministic algorithms. (BTL4)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
II - II	19A52401	Entrepreneurship	2401.1	Understand the concept of Entrepreneurship & know about the mind-set, career of an entrepreneur & entrepreneurial ecology. (BTL2)
			2401.2	Demonstrate social & ethical entrepreneurship & know about franchise & it's structure. (BTL2)
			2401.3	Identify opportunity & the creative pursuit of innovative ideas & able to understand about entrepreneurial mind-set in organizations. (BTL3)
			2401.4	Analyse the assessment of entrepreneurial opportunities & be able to develop marketing plan. (BTL4)
			2401.5	Assess the knowledge about legal & regulatory challenges & identify legal structures for entrepreneurial ventures. (BTL5)
II - II	19A05403T	Operating Systems	5403T.1	Analyse the Basic Concepts of Operating Systems, types of Computing Environments, Several Open-Source Operating Systems and System Services to Users, Processes and other systems (BTL 4)
			5403T.2	Understand the importance, features of a process and methods of communication between processes, CPU utilization through Multiprogramming and Multithreaded Programming (BTL2)
			5403T.3	Illustrate the various Memory Techniques for allocating memory to processes and benefits of virtual Memory Systems (BTL2)
			5403T.4	Analyse File Systems and its interface in various operating systems and different disk scheduling algorithms, investigate methods for deadlocks (BTL 4)
			5403T.5	Acquiring knowledge about various countermeasures to security attacks and schemes available for achieving system protection (BTL5)
II - II	19A05404T	Software Engineering	5404T.1	Identify the basic issues in commercial software development. (BTL3)
			5404T.2	Develop SRS document for sample problems using IEEE 830 format. (BTL6)
			5404T.3	Apply the structured, object-oriented analysis and design (SA/SD) technique. (BTL3)
			5404T.4	Design test cases for black box and white box testing. (BTL6)
			5404T.5	Apply quality management concepts at the application level. (BTL3)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
II - II	19A05403P	Operating Systems Lab	5403P.1	Understand CPU Scheduling Algorithms (BTL2)
			5403P.2	Understand concepts of Process Synchronization (BTL2)
			5403P.3	Acquire knowledge on different types of Memory Techniques (BTL3)
			5403P.4	Acquire knowledge on deadlock Management Techniques (BTL3)
			5403P.5	Analyse the concepts of File Allocation Strategies and Organization Techniques (BTL4)
II - II	19A05404P	Software Engineering Lab	5404P.1	Understand the phases of software projects and practice the activities of each phase. (BTL2)
			5404P.2	Develop Software Requirement Specification Document, Design Documents and Testing Phase related documents. (BTL3)
			5404P.3	Study and usage of any Design phase CASE tool
			5404P.4	Analyse the Design of software using any Design phase CASE tools. (BTL4)
			5404P.5	Develop test cases for unit testing and integration testing. Develop test cases for various white box and black box testing techniques. (BTL6)
II - II	19A99302	Biology for Engineers	9302.1	Understand the difference between lower organisms (prokaryotes) from higher organisms. (BTL2)
			9302.2	Interpret the relationship between the structure and function of nucleic acids. (BTL5)
			9302.3	Understand the mechanism and process of important human functions. (BTL2)
			9302.4	Explain about gene structure and replication in prokaryotes and Eukaryotes. (BTL2)
			9302.5	Identify application of biological Principles in different technologies for the production of medicines and pharmaceutical molecules through transgenic microbes, plants and animals. (BTL3)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Sem: III – I

S.No	Course Code	Course Name	Category	Hours per Week			Credits
				L	T	P	
01	19A05501	Formal Languages and Automata Theory	PC	3	0	0	3
02	19A05502T	Artificial Intelligence	PC	3	0	0	3
03	19A05503T	Object Oriented Analysis Design & Testing	PC	2	0	0	2
04	19A05504T	Computer Networks	PCC	3	0	0	3
05	19A05505a	Professional Elective – I Data Warehousing and Data Mining	PE	3	0	0	3
06	19A51506a	Open Elective – I Technical Communication and Presentation Skills	OE	3	0	0	3
07	19A05502P	Artificial Intelligence Laboratory	PCC	0	0	3	1.5
08	19A05504P	Computer Networks Laboratory	PCC	0	0	3	1.5
09	19A05503P	Object Oriented Analysis Design & Testing Lab	PCC	0	0	2	1.0
10	19A05507	Socially Relevant Project	PR	-	-	-	0.5
11	19A99501	Mandatory Course: Constitution of India	MC	3	0	0	0
		Total					21.5

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
III – I	19A05501	Formal Languages and Automata Theory	5501.1	Explain formal machines, languages and computations (BTL2)
			5501.2	Design finite state machines for acceptance of strings (BTL6)
			5501.3	Develop context free grammars for formal languages (BTL3)
			5501.4	Build pushdown automata for context free grammars (BTL3)
			5501.5	Apply Turing machine for solving problems (BTL3)
III – I	19A05502T	Artificial Intelligence	5502T.1	Apply searching techniques for solving a problem (BTL3)
			5502T.2	Design Intelligent Agents (BTL6)
			5502T.3	Develop Natural Language Interface for Machines (BTL5)
			5502T.4	Design mini robots (BTL6)
			5502T.5	Summarize past, present and future of Artificial Intelligence (BTL2)
III – I	19A05503T	Object Oriented Analysis Design & Testing	5503T.1	Recognize basic issues of object-orientation. (BTL1)
			5503T.2	Develop modelling of the user's view using use case diagrams. (BTL5)
			5503T.3	Identify the basic issues in reusable design. (BTL2)
			5503T.4	Develop sequence diagram for any given use case. (BTL5)
			5503T.5	Select appropriate tool to carry out testing. (BTL1)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
III – I	19A05504T	Computer Networks	5504T.1	Identify the software and hardware components of a computer network (BTL3)
			5504T.2	Develop new routing, and congestion control algorithms (BTL3)
			5504T.3	Assess critically the existing routing protocols (BTL5)
			5504T.4	Explain the functionality of each layer of a computer network (BTL2)
			5504T.5	Choose the appropriate transport protocol based on the application requirements (BTL3)
III – I	19A05505a	Data Warehousing and Data Mining	5505a.1	Design a Data warehouse system and perform business analysis with OLAP tools (BTL6)
			5505a.2	Design a Data warehouse system and perform business analysis with OLAP tools (BTL6)
			5505a.3	Apply frequent pattern and association rule mining techniques for data analysis (BTL3)
			5505a.4	Design appropriate classification and clustering techniques for data analysis (BTL6)
			5505a.5	Infer knowledge from raw data (BTL4)
III – I	19A51506a	Technical Communication and Presentation Skills	2506a.1	Understand the importance of effective technical communication (BTL2)
			2506a.2	Apply the knowledge of basic skills to become good orators (BTL3)
			2506a.3	Analyse non-verbal language suitable to different situations in professional life (BTL4)
			2506a.4	Evaluate different kinds of methods used for effective presentations (BTL5)
			2506a.5	Create trust among people and develop employability skills (BTL5)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
III – I	19A05502P	Artificial Intelligence Laboratory	5502P.1	Implement search algorithms (BTL3)
			5502P.2	Solve Artificial intelligence problems (BTL3)
			5502P.3	Design chatbot and virtual assistant (BTL6)
III – I	19A05504P	Computer Networks Laboratory	5504P.1	Design scripts for Wired network simulation (BTL6)
			5504P.2	Design scripts of static and mobile wireless networks simulation (BTL6)
			5504P.3	Analyse the data traffic using tools (BTL4)
			5504P.4	Analyse the data traffic using tools (BTL4)
			5504P.5	Construct a wired and wireless networks using the real hardware (BTL3)
III – I	19A05503P	Object Oriented Analysis Design & Testing Lab	5503P.1	Design use case, sequence and collaboration diagrams. (BTL6)
			5503P.2	Develop the different models to document an Object-oriented design. (BTL6)
			5503P.3	Demonstrate class level and system integration testing. (BTL2)
III – I	19A99501	Mandatory Course: Constitution of India	9501.1	Understand historical background of the constitution making and its importance for building a democratic India (BTL 2).
			9501.2	Understand the functioning of three wings of the government i.e., executive, legislative and judiciary. (BTL 2)
			9501.3	Understand the value of the fundamental rights and duties for becoming good citizen of India. (BTL 2)
			9501.4	Analyse the decentralization of power between central, state and local self- government (BTL 4)
			9501.5	Apply the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy. (BTL 3)

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Sem: III – II

S.No	Course Code	Course Name	Category	Hours per Week			Credits
				L	T	P	
01	19A05601	Cryptography & Network Security	PC	2	1	0	3
02	19A05602T	Big Data Analytics	PC	3	0	0	3
03	19A52601T	English Communication	PC	3	0	0	2
04	19A05603a	Professional Elective – II (MOOCS) Compiler Design	PE	3	0	0	3
05	19A52604a	Open Elective – II Soft Skills	OE	3	0	0	3
06	19A52602a	Humanities Elective – I Entrepreneurship & Incubation	PCC	3	0	0	3
07	19A05602P	Big Data Analytics Laboratory	PCC	0	0	3	1.5
08	19A52601P	English Communication Lab	HS	0	0	3	1.5
09	19A05605	Socially Relevant Project	PR	-	-	-	0.5
10	19A99501	Mandatory Course: Research Methodology	MC	3	0	0	0
11	19A05606	Comprehensive Online Examination	-	-	-	-	0
						Total	**21.5**

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
III – II	19A05601	Cryptography & Network Security	5601.1	Solve real-world problems using OOP techniques (BTL3)
			5601.2	Apply code reusability through inheritance, packages and interfaces (BTL3)
			5601.3	Solve problems using java collection framework and I/O classes (BTL3)
			5601.4	Develop applications by using parallel streams for better performance (BTL5)
			5601.5	Develop applets for web applications (BTL5)
III – II	19A05602T	Big Data Analytics	5602T.1	Explain the concepts and challenges of big data (BTL2)
			5602T.2	Determine why existing technologies are inadequate to analyse the large data. (BTL5)
			5602T.3	Outline the operations viz. Collect, manage, store, query, and analyse various forms of big data. (BTL2)
			5602T.4	Apply large-scale analytic tools to solve some of the open big data problems. (BTL3)
			5602T.5	Analyse the impact of big data for business decisions and strategies. (BTL4) & Design different big data applications. (BTL6)
III – II	19A52601T	English Communication	2601T.1	Understand the purpose of rhythm and rhyme making the presentation lively and attractive. (BTL2)
			2601T.2	Apply the knowledge of structure and style in a presentation, identify the audience and make note of key points. (BTL3)
			2601T.3	Evaluate reading/Listening texts and to write summaries based on global comprehension of these texts. (BTL5)
			2601T.4	List thoughts and ideas with acceptable accuracy and fluency. (BTL1)
			2601T.5	Create a coherent paragraph interpreting figure/graph/chart/table (BTL6)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
III – II	19A05603a	Compiler Design	5603a.1	Classify the various phases of a compiler (BTL4)
			5603a.2	Identify the tokens and verify the code (BTL3)
			5603a.3	Design code generator (BTL6)
			5603a.4	Apply code optimization techniques (BTL3)
			5603a.5	Design a compiler for a small programming language (BTL6)
III – II	19A52604a	Soft Skills	2604a.1	Understand the importance of soft skills (BTL2)
			2604a.2	Develop creative thinking and decision-making skills (BTL6)
			2604a.3	Understand the importance of interpersonal skills (BTL2)
			2604a.4	Apply verbal skills personal and professional life (BTL3)
			2604a.5	Apply various techniques to use para language (BTL3)
III – II	19A52602a	Entrepreneurship & Incubation	2602a.1	Understand the concept of Entrepreneurship and develop an entrepreneurial mindset (BTL2)
			2602a.2	Identify the sources of business ideas, evaluate the feasibility and design a business plan. (BTL3)
			2602a.3	Evaluate various sources of finance and analyse the role of institutional finance in the development of MSME's. (BTL5)
			2602a.4	Understand the importance of women entrepreneurship and know about government support. (BTL2)
			2602a.5	Understand the importance of business incubation and able to design own business incubation. (BTL2)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
III – II	19A05602P	Big Data Analytics Laboratory	5602P.1	Demonstrate configure Hadoop and perform File Management Tasks (BTL2)
			5602P.2	Apply Map Reduce programs to real time issues like word count, weather dataset and sales of a company (BTL3)
			5602P.3	Analyse huge data set using Hadoop distributed file systems and Map Reduce (BTL4)
			5602P.4	Apply different data processing tools like Pig, Hive and Spark. (BTL3)
III – II	19A52601P	English Communication Lab	2601P.1	Remember and understand the different aspects of the English language proficiency with emphasis on LSRW skills (BTL1)
			2601P.2	Apply communication skills through various language learning activities (BTL3)
			2601P.3	Analyse the English speech sounds, stress, rhythm, intonation and syllable division for better listening and speaking comprehension. (BTL4)
			2601P.4	Evaluate and exhibit acceptable etiquette essential in social and professional settings. (BTL5)
			2601P.5	Create awareness on mother tongue influence and neutralize it in order to improve fluency in spoken English. (BTL6)
III – II	19A99501	Research Methodology	5605.1	Explain various types of research (BTL2)
			5605.2	Understand various techniques in measurement and scaling (BTL2)
			5605.3	Compare and contrast correlation and regression (BTL4)
			5605.4	Analyse various statistical inference tests (BTL4)
			5605.5	Understand how to write a research paper along with ethics (BTL2)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Sem: IV – I

S.No	Course Code	Course Name	Category	L	T	P	Credits
				Hours per Week			
01	19A05701T	Internet of Things	PC	2	1	0	3
02	19A05702T	Software Testing	PC	2	1	0	3
03	19A05703a	Cloud Computing	PC	3	0	0	3
04	19A01704b	Basics of civil Engineering	OE	3	0	0	3
05	19A52701b	Management Science	HS	3	0	0	3
06	19A05702P	Software Testing Lab	PC	0	0	3	1.5
07	19A05701P	Internet of Things Lab	PC	0	0	3	1.5
08	19A05705	Industrial Training/Skill Development / Research Project	PR	-	-	-	2
						Total	**20**

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
IV – I	19A05701T	Internet of Things	5701T.1	Discuss The fundamental concepts of IoT and physical computing (BTL6)
			5701T.2	Develop simple applications using Raspberry Pi (BTL3)
			5701T.3	Distinguish which protocol can be used for a specific application (BTL4)
			5701T.4	Analyse Plan the business model and predict the market value (BTL4)
			5701T.5	Identify manufacturing techniques and Ethics of the IoT (BTL3)
IV – I	19A05702T	Software Testing	5702T.1	Understand the purpose of Testing and Classify different types of Bugs. (BTL2)
			5702T.2	Demonstrate the Transaction Flow Testing and Dataflow testing. (BTL2)
			5702T.3	Apply testing in various domains. (BTL3)
			5702T.4	Analyse the paths in testing and Design testing for checking the logic. (BTL4)
			5702T.5	Design algorithms for node reduction and Use state graphs for testing. (BTL6)
IV – I	19A05703a	Cloud Computing	5703a.1	Discuss the procedure for Cloud deployment. (BTL6)
			5703a.2	Distinguish different cloud service models and deployment models. (BTL4)
			5703a.3	Discuss the different cloud services. (BTL6)
			5703a.4	Design applications for an organization which use cloud environment. (BTL 6)
			5703a.5	Design cloud applications using Python. (BTL6)
IV – I	19A01704b	Basics of civil Engineering	1704b.1	Identify the traditional building materials that are used in building construction. (BTL3)
			1704b.2	Design the buildings based on principles of planning. (BTL6)
			1704b.3	Distinguish the sources of dampness and its ill effects on buildings and its prevention. (BTL4)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
			1704b.4	Understand the cost-effective construction in mass housing schemes. (BTL2)
			1704b.5	Identify the importance of surveying in planning of the buildings. (BTL3)
IV – I	19A52701b	Management Science	2701b.1	Understand the concepts & principles of management and know the designs of organizational structures. (BTL2)
			2701b.2	Apply the knowledge of Work-study principles & Quality Control techniques. (BTL3)
			2701b.3	Analyse the concepts of HRM in Recruitment, Selection and Training & Development (BTL4)
			2701b.4	Evaluate PERT/CPM Techniques in project management& and Basic knowledge about Strategy formulation and implementation in enterprises (BTL6)
			2701b.5	Understand the modern concepts in management like SCM, BPO, Six Sigma and TQM (BTL2)
IV – I	19A05702P	Software Testing Lab	5702P.1	Demonstrate the basic testing procedures. (BTL2)
			5702P.2	Evaluate the test cases and test suites. (BTL6)
			5702P.3	Understand the use of the Selenium and Bugzilla tools to perform testing. (BTL2)
			5702P.4	Design and test simple programs. (BTL6)
			5702P.5	Demonstrate bug tracking. (BTL2)
IV – I	19A05701P	Internet of Things Lab	5701P.1	Distinguish the sensors and actuators for an IoT application. (BTL4)
			5701P.2	Identify protocols for a specific IoT application. (BTL 3)
			5701P.3	Discuss the cloud platform and APIs for IoT application. (BTL6)
			5701P.4	Design with embedded boards for creating IoT prototypes. (BTL6)
			5701P.5	Analyse a solution for a given IoT application. (BTL4)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
IV – I	19A05705	Industrial Training/Skill Development / Research Project	5705.1	To Identify the applicability of modern software tools and technology. (BTL4).
			5705.2	Describe use of advanced tools and techniques encountered during industrial training and visit. (BTL 2)
			5705.3	Discuss awareness about general workplace behaviour and build interpersonal and team skills. (BTL6)
			5705.4	Analyse industrial personnel and follow engineering practices and discipline prescribed in industry. (BTL4)
			5705.5	Design professional work reports and presentations. (BTL6)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Sem: IV – II

S.No	Course Code	Course Name	Category	Hours per Week			Credits
				L	T	P	
01	19A05801c	Adhoc & Sensor Networks	PE	3	0	0	3
02	19A01802b	Global Warming and climate changes	OE	3	0	0	
03	19A05803	Project	PR	-	-	-	7
						Total	13

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
IV – II	19A05801c	Adhoc & Sensor Networks	5801c.1	Identify the design issues for Adhoc and sensor networks. (BTL3)
			5801c.2	Analyse the use of TCP in Wireless networks. (BTL4)
			5801c.3	Discuss the need for new MAC Protocols for Adhoc networks. (BTL6)
			5801c.4	Distinguish the performance of Protocols in Adhoc and sensor networks. (BTL4)
			5801c.5	Design new Protocols for Adhoc and Sensor network Develop applets for web applications. (BTL6)
IV – II	19A01802b	Global Warming and climate changes	1802b.1	identity the importance of Ozone and effect of greenhouse gases and know the effect of global warming. (BTL3)
			1802b.2	Discuss about the layers of atmosphere and their characteristics. (BTL6)
			1802b.3	understand about the causes of climate change and its effects on various sectors. (BTL2)
			1802b.4	Distinguish about the causes of climate change and carbon credits, effect of change in temperature and climate on India. (BTL4)
			1802b.5	Analyse the clean technology and use of renewable energy, mitigation technologies and their practices. (BTL4)
IV – II	19A05803	Project	5803.1	To Prepare abstract for given project by identifying the requirements and prospective solution. (BTL3)
			5803.2	To Develop latest information related to the project from various sources to analyse the project. (BTL6)
			5803.3	To Choose the materials for the project as per specifications and efficient test for developing the project. (BTL3)
			5803.4	To Illustrate effective team work after efficient testing, elaborate the completed task and compile the project. (BTL4)
			5803.5	To Prepare a good report of the project as per the guidelines and present to the panel of experts. (BTL3)