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
REGULATIONS – R15

Sem: I – I

S.No	Course Code	Course Name	Hours per Week			Credits
			L	T	P/Drg	
01	15A52101	Functional English	3	1	0	3
02	15A54101	Mathematics – I	3	1	0	3
03	15A05101	Computer Programming	3	1	0	3
04	15A56101	Engineering Physics	3	1	0	3
05	15A03101	Engineering Drawing	0	0	6	3
06	15A52102	English Language Communication Skills Lab	0	0	4	2
07	15A56102	Engineering Physics Lab	0	0	4	2
08	15A05102	Computer Programming Lab	0	0	4	2
		Total	12	4	18	21

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
I – I	15A52101	Functional English	2101.1	Acquire good listening skills to participate effectively in group discussions, debates, and interviews and writing skills for effective technical report writing. (BTL-2)
			2102.1	Develop oral communication skills in English to speak fluently in various academic and social situations. (BTL-3)
			2103.1	Identify deviant use of English both in spoken and written forms, and improve awareness of its in science and technology. (BTL-2)
			2104.1	Understand the importance of reading for life, and career and thereby develop an interest for it. (BTL-2)
			2105.1	Demonstrate fundamental skills required for critical thinking. (BTL-2)
I – I	15A54101	Mathematics – I	4101.1	Solve the First, Second and Higher order D.Es and Applications of First Order D.E (BTL3)
			4101.2	Attain the knowledge of Applications of L.D.Es like Mechanical & Electrical Oscillatory circuits and deflection of beams (BTL2)
			4101.3	Familiarize with functions of several variables which is useful in Optimizations. (BTL6)
			4101.4	Determine important tools of calculus in Higher Dimensions (Multiple Integrals) (BTL5)
			4101.5	Become familiar with the applications of vector calculus to Engineering Problems. (BTL6)
I – I	15A05101	Computer Programming	5101.1	Analyse overview of computer programming (BTL4)
			5101.2	Understand various statements in C and discuss the arrays, stings, functions (BTL2)
			5101.3	Illustrate pointers and understanding the scope of functions. (BTL2)
			5101.4	Develop the command line arguments and structures (BTL 3)
			5101.5	Understand the file handling functions and pre-processor directives. (BTL2)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
I – I	15A56101	Engineering Physics	6101.1	Analyze different realms of physics and their applications in both scientific and technological systems are achieved through the study of physical optics, lasers and fibre optics. (BTL2)
			6101.2	Analyze important properties of crystals like the presence of long-range order and periodicity, structure determination using X-ray diffraction are focused along with defects in crystals and ultrasonic non-destructive techniques. (BTL4)
			6101.3	Illustrate discrepancies between the classical estimates and laboratory observations of physical properties exhibited by materials would be lifted through the understanding of quantum picture of subatomic world. (BTL4)
			6101.4	Illustrate the properties and device applications of semiconducting and magnetic materials are illustrated (BTL4)
			6101.5	Design the importance of superconducting materials and nonmaterial along with their engineering applications are well elucidated. (BTL6)
I – I	15A03101	Engineering Drawing	3101.1	Design and drawing 2D and 3D diagrams of various objects. (BTL6)
			3101.2	Understand the conventions of Drawing, which is an Universal Language of Engineers. (BTL2)
			3101.3	Construct drafting projections of points, planes and solids. (BTL3)
			3101.4	Demonstrate the Principles of isometric projection. (BTL2)
			3101.5	Illustrate the projection of solids and development of solids. (BTL2)
I – I	15A52102	English Language Communication Skills Lab	2102.1	Understand Pronounce words correctly using speech sounds, word stress, intonation and rhythm. (BTL 2)
			2102.2	Acquire proficiency in spoken English. (BTL 2)
			2102.3	Apply English language skills effectively for interviews, group discussions, public speaking and debates with sheer confidence. (BTL 3)
			2102.4	Develop their employability skills. (BTL 3)
			2102.5	Identify techniques for writing a speech on an occasion and furthermore, give reviews on a book orally or in written form. (BTL 3)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
I – I	15A56102	Engineering Physics Lab	6102.1	Application of interferece and diffraction (BTL3)
			6102.2	Determination of NA, AA, Energy gap (BTL5)
			6102.3	Calculations using laser (BTL3)
			6102.4	Evaluation of dispersive power (BTL5)
			6102.5	Analysing variation of magnetic field (BTL4)
I – I	15A05102	Computer Programming Lab	5102.1	Understand and trace the execution of programs written in C language and Write the C code for a given algorithm. (BTL2)
			5102.2	Construct programs that perform conditional, selection statements. (BTL3)
			5102.3	Design Programs with arrays and functions, strings (BTL6)
			5102.4	Design the programs with pointers, structures. (BTL6)
			5102.5	Apply file operations to create several programs. (BTL3)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Sem: I – II

S.No	Course Code	Course Name	Hours per Week			Credits
			L	T	P	
01	15A52201	English for Professional Communication	3	1	0	3
02	15A54201	Mathematics – II	3	1	0	3
03	15A05201	Data Structures	3	1	0	3
04	15A51101	Engineering Chemistry	3	1	0	3
05	15A01101	Environmental Studies	3	1	0	3
06	15A05202	Data Structures Lab	0	0	4	2
07	15A51102	Engineering Chemistry Lab	0	0	4	2
08	15A99201	Engineering & IT Workshop	0	0	4	2
		Total	15	5	12	21

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
I – II	15A52201	English for Professional Communication	2201.1	Identify effectively in debates on modern corporatism and listen, and speak well in English in group discussions. (BTL 3)
			2201.2	Remember the alternative sources of energy by listening, summarizing and rewriting reports. (BTL 1)
			2201.3	Develop report writing skills. (BTL 3)
			2201.4	Interpret charts and tables. (BTL 2)
			2201.5	Demonstrate effectively in interviews by developing required competence thereby enhancing improving job prospects. (BTL 2)
I – II	15A54201	Mathematics – II	4201.1	Understand the usage of Laplace Transforms. (BTL2)
			4201.2	Evaluate the Fourier Series expansion of periodic functions. (BTL5)
			4201.3	Understand the usage of Fourier Transforms. (BTL2)
			4201.4	Formulate/Solve/Classify the solutions of P.D. Equations and also find the solutions of 1-Dimensional Wave equations and Heat equations. (BTL6)
			4201.5	Understand the usage of Z-Transforms. (BTL2)
I – II	15A05201	Data Structures	5201.1	Illustrate the concept of arrays with asymptotic notations in building linear and non-linear data structures. (BTL2)
			5201.2	Analyze stacks, queues and linked list using dynamic memory allocation. (BTL4)
			5201.3	Construct algorithms for trees and graphs. (BTL3)
			5201.4	Compare and implement different sorting techniques. (BTL4)
			5201.5	Construct different searching techniques and hashing methods. (BTL3)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
I – II	15A51101	Engineering Chemistry	1101.1	Differentiate between hard and soft water. (BTL3)
			1101.2	Discuss BUNA-S and BUNA-N Elastomers. (BTL2)
			1101.3	Understand the electrochemical sources of energy. (BTL3)
			1101.4	Discuss about solid, liquid, gaseous fuels (BTL2)
			1101.5	Understand the principles of lubricants and CNTs (BTL2)
I – II	15A01101	Environmental Studies	1101.1	Understand the various natural resources (BTL2)
			1101.2	Describe about the Biodiversity and Ecosystem (BTL2)
			1101.3	Discuss about the pollution aspects (BTL3)
			1101.4	To know about the social issues related to environment and their protection acts (BTL1)
			1101.5	Describe about the population explosion and welfare programme (BTL2)
I – II	15A05202	Data Structures Lab	5202.1	Determine the time and space efficiency for the given algorithms. (BTL4)
			5202.2	Apply operations like searching, insertion, deletion, and traversing mechanism etc. on various data structures. (BTL3)
			5202.3	Construct the specified problem by using appropriate concept in data structures. (BTL3)
			5202.4	Analyse the practical knowledge of data structures in real time problems. (BTL4)
			5202.5	Develop programs using trees and graphs terminology. (BTL3)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
I – II	15A51102	Engineering Chemistry Lab	1102.1	Determine the calorific value of fuel and viscosity of the oils. (BTL3)
			1102.2	Estimate the ferrous iron and copper iodometry. (BTL2)
			1102.3	Estimate the hardness of water and copper by EDTA method. (BTL3)
			1102.4	Measure the manganese in steel and iron in cement. (BTL3)
			1102.5	Illustrate the concentration values of different solutions by conductometry. (BTL2)
I – II	15A99201	Engineering & IT Workshop	9201.1	Understand Disassemble and Assemble a Personal Computer and prepare the computer ready to use. (BTL2)
			9201.2	Design the Documents using Word processors. (BTL6)
			9201.3	Design Slide presentations using the presentation tool. (BTL6)
			9201.4	Demonstrate the Interconnect of two or more computers for information sharing and install single or dual operating systems on computer. (BTL2)
			9201.5	Illustrate the Access from Internet and Browse it to obtain the required information. (BTL2)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Sem: II – I

S.No	Course Code	Course Name	Hours per Week			Credits
			L	T	P	
01	15A54301	Mathematics III	3	1	0	3
02	15A05301	Database Management Systems	3	1	0	3
03	15A05302	Discrete Mathematics	3	1	0	3
04	15A99301	Basic Electrical and Electronics Engineering	3	1	0	3
05	15A04306	Digital Logic Design	3	1	0	3
06	15A52301	Managerial Economics and Financial Analysis	3	1	0	3
07	15A05303	Database Management Systems Laboratory	0	0	4	2
08	15A99302	Basic Electrical and Electronics Laboratory	0	0	4	2
		Total	18	6	8	22

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
II – I	15A54301	Mathematics III	4301.1	Develop the use of matrix algebra techniques i.e needed by engineers for practical applications (BTL6)
			4301.2	Apply Numerical methods to solve Algebraic and Transcendental equations. (BTL3)
			4301.3	Derive Interpolating polynomials using Interpolation formulae. (BTL4)
			4301.4	Solve Integral equations using Trapezoidal Rule, Simpson's 1/3 and 3/8 rules. (BTL3)
			4301.5	Solve Differential & Integral Equations numerically. (BTL3)
II – I	15A05301	Database Management Systems	5301.1	Understand the basic concepts for database management system applications. (BTL2)
			5301.2	Illustrate the Entity relationship model. (BTL2)
			5301.3	Discuss relational algebra and basic SQL concepts. (BTL2)
			5301.4	Design and analyse the concepts of Normalization. (BTL6)
			5301.5	Discus about index and storage. (BTL2)
II – I	15A05302	Discrete Mathematics	5302.1	Describe logical sentences in terms of predicates, quantifiers, and logical connectives (BTL1).
			5302.2	Evaluate Boolean functions and simplify expression using the properties of Boolean algebra (BTL5).
			5302.3	Infer Homomorphism and Isomorphism (BTL4).
			5302.4	Identify Euler Graphs, Hamilton Graph and Chromatic Number of a graph (BTL2).
			5302.5	Find the generating functions for a sequence (BTL1)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
II – I	15A99301	Basic Electrical and Electronics Engineering	9301.1	Determine the O.C. and S.C. parameters of two-port network Experimentally. (BTL4)
			9301.2	Apply OC & SC Tests on Single-Phase Transformer and Predetermine the Efficiency and Regulation at any given load and Power Factor. (BTL3)
			9301.3	Obtain the characteristics of devices like PN junction diode, Zener diode. (BTL2)
			9301.4	Obtain the characteristics of devices like BJT in CE, CB&CC configurations, JFET, MOSFET. (BTL2)
			9301.5	Analyse RC & LC Oscillators and design summing, differential differentiator & integrator using IC741. (BTL4)
II – I	15A04306	Digital Logic Design	4306.1	Understand the basic postulates of Boolean algebra and the methods for simplifying Boolean expressions (BTL2)
			4306.2	Analyse to use the concepts to solve the problems related to logic circuits (BTL4)
			4306.3	Illustrate the concepts and study the procedures for the analysis and design of combinational circuits (BTL2)
			4306.4	Illustrate the concepts and study the procedures for the analysis and design of sequential circuits. (BTL2)
			4306.5	Analyse the concepts of programmable logic devices. (BTL4)
II – I	15A52301	Managerial Economics and Financial Analysis	2301.1	Get the basic inputs of Managerial Economics and demand concept and able to estimate the future demand of a product. (BTL2)
			2301.2	Explain the concepts of cost and production and can calculate the breakeven point. (BTL2)
			2301.3	Learn how to take effective decisions under various market situations and also about different forms of business organizations. (BTL2)
			2301.4	Get the inputs of accounting concepts and analyse the financial statements. (BTL4)
			2301.5	Know how to take an effective investment decision. (BTL2)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
II – I	15A05303	Database Management Systems Laboratory	5303.1	Analyze overview SQL commands. (BTL4)
			5303.2	List out various constraints, aggregate functions. (BTL1)
			5303.3	List out all joins and sub queries. (BTL1)
			5303.4	Discuss the PL/SQL programming. (BTL2)
			5303.5	Understand the procedures, functions and triggers. (BTL2)
II – I	15A99302	Basic Electrical and Electronics Laboratory	9302.1	Practical implementation of the fundamental electrical theorems and modelling of simple electrical systems (BTL1)
			9302.1	Study the open circuit characteristics of dc shunt generator (BTL1)
			9302.1	Learn performance characteristics dc shunt motor (BTL1)
			9302.1	Study the open circuit and short circuit test on single phase transformer (BTL2)
			9302.1	Analyze performance and efficiency of dc shunt machine (BTL3)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Sem: II – II

S.No	Course Code	Course Name	Hours per Week			Credits
			L	T	P	
01	15A54401	Probability and Statistics	3	1	0	3
02	15A05401	Software Engineering	3	1	0	3
03	15A05402	Computer Organization	3	1	0	3
04	15A04407	Microprocessors & Interfacing	3	1	0	3
05	15A05403	Object Oriented Programming using Java	3	1	0	3
06	15A05404	Formal Languages and Automata Theory	3	1	0	3
07	15A04408	Microprocessors & Interfacing Laboratory	0	0	4	2
08	15A05405	Java Programming Laboratory	0	0	4	2
09	15A05406	Comprehensive Online Examination-1	0	0	0	1
		Total	18	6	8	23

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
II – II	15A54401	Probability and Statistics	4401.1	Apply the concepts of probability and their applications (BTL3)
			4401.2	Design the statistical inferential method based on large sample tests (BTL6)
			4401.3	Design Infer the statistical inferential method based on small sample tests (BTL6)
			4401.4	Apply control charts to know the quality of a manufactured product (BTL3)
			4401.5	Distinguish queueing models to make decisions about various queues (BTL4)
II – II	15A05401	Software Engineering	5401.1	Understand the basic knowledge of the analysis and design of complex systems.(BTL2)
			5401.2	Develop, maintain and evaluate large scale software systems. (BTL6)
			5401.3	Apply software engineering concepts to code and test the software. (BTL3)
			5401.4	Understand and develop a software project from requirement gathering to implementation. (BTL2)
			5401.5	Develop and conduct appropriate experimentation, analyse and interpret data and use engineering judgement to draw conclusions. (BTL6)
II – II	15A05402	Computer Organization	5402.1	Identify the basic functional units, illustrate various addressing modes for accessing register and memory operands. Describe the instruction sequencing and various types of instructions (BTL1)
			5402.2	Understand arithmetic operations on signed numbers, the operations performed on floating point numbers and distinguish between hardwired and micro programmed control units. (BTL2)
			5402.3	Understand various types of memories, and also apply effective memory management strategies. (BTL2)
			5402.4	Analyze the interrupt handling mechanisms of various processors and also describe various techniques for I/O data transfer methods. (BTL4)
			5402.5	Examine the use of pipelining and multiple functional units in the design of high-performance processor and describe the interconnection networks for multiprocessors. (BTL4)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
II – II	15A04407	Microprocessors & Interfacing	4407.1	Understand the architecture and, memory organization of microcontroller 8051. (BTL2)
			4407.2	Apply the programming assembly level language in microprocessors. (BTL3)
			4407.3	Identify the different ways of interfacing memory and I/O with microprocessors. (BTL3)
			4407.4	Analyse the interfacing concept of different programmable interfacing modules with microprocessors and controllers for real time applications. (BTL4)
			4407.5	Understand the architecture and, memory organization of microcontroller 8051. (BTL2)
II – II	15A05403	Object Oriented Programming using Java	5403.1	Understand the concepts of operators, control statements and introducing classes. (BTL2)
			5403.2	Identify the concept of exception, how to handle them and how to create user defined exception. (BTL3)
			5403.3	Understand the concepts of multithreading, importance of collections and using generic data structures from framework. (BTL2)
			5403.4	Design the GUIs using applets and create user friendly interface. (BTL6)
			5403.5	Develop various programs using object-oriented approach and implement them using java. (BTL6)
II – II	15A05404	Formal Languages and Automata Theory	5404.1	Understand the basic concepts for problem solving in computer science and analyse the finite automata. (BTL2)
			5404.2	Illustrate the regular languages and design finite automata. (BTL2)
			5404.3	Apply context free language to solve various problems (BTL3)
			5404.4	Design and analysis push down automata. (BTL2)
			5404.5	Analysis and design truing machine undesirability (BTL 4)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
II – II	15A04408	Microprocessors & Interfacing Laboratory	4408.1	Develop 8086 Microprocessor Programs using MASM. (BTL6)
			4408.2	Develop 8086 Assembly Language programs. (BTL6)
			4408.3	Understand programmable peripheral devices and their Interfacing. (BTL2)
			4408.4	Develop 8051 assembly Language programs. (BTL6)
			4408.5	Understand the concepts of Interfacing using 8051 Trainer kit. (BTL2)
II – II	15A05405	Java Programming Laboratory	5405.1	Design programs which work in all environments. (BTL6)
			5405.2	Develop efficient programs using inheritance, method overloading and method overriding. (BTL6)
			5405.3	Design reliable programs using java exception handling features. (BTL6)
			5405.4	Solve problems using object-oriented approach and design solutions which are robust. (BTL6)
			5405.5	Create user friendly interfaces. (BTL6)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Sem: III – I

S.No	Course Code	Course Name	Hours per Week			Credits
			L	T	P	
01	15A05501	Operating Systems	3	1	0	3
02	15A05502	Computer Networks	3	1	0	3
03	15A05503	Object Oriented Analysis and Design	3	1	0	3
04	15A05504	Principles of Programming Languages	3	1	0	3
05	15A05505	Software Testing	3	1	0	3
06	15A05506	MOOCS-I Introduction to Big Data	3	1	0	3
07	15A05509	Object Oriented Analysis and Design & Software Testing Laboratory	0	0	4	2
08	15A05510	Operating Systems Laboratory	0	0	4	2
09	15A99501	Social Values & Ethics (Audit Course)	2	0	2	0
		Total	20	6	10	22

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
III – I	15A05501	Operating Systems	5501.1	Analyze the Basic Concepts of Operating Systems, types of Computing Environments, Several Open-Source Operating Systems and System Services to Users, Processes and other systems (BTL4)
			5501.2	Understand the importance, features of a process and methods of communication between processes, CPU utilization through Multiprogramming and Multithreaded Programming (BTL2)
			5501.3	Learn the various Memory Techniques for allocating memory to processes and benefits of Virtual Memory Systems (BTL2)
			5501.4	Analyze File Systems and its interface in various operating systems and different disk scheduling algorithms, understand the methods for deadlocks (BTL4)
			5501.5	Acquiring knowledge about various countermeasures to security attacks and schemes available for achieving system protection (BTL5)
III – I	15A05502	Computer Networks	5502.1	Analyze the basic concepts of computer networks and OSI and TCP/IP layers and discussed physical layer. (BTL4)
			5502.2	Discuss Data ink Layer functionalities and protocols. (BTL6)
			5502.3	Design Network Layer functionalities and protocols. (BTL6)
			5502.4	Illustrate the Transport Layer functionalities and protocols. (BTL2)
			5502.5	Understand various services of The Application Layer. (BTL2)
III – I	15A05503	Object Oriented Analysis and Design	5503.1	Develop the solutions to the complex problems using object-oriented approach. (BTL6)
			5503.2	Understand the concepts of classes and objects. (BTL2)
			5503.3	Design various UML diagrams. (BTL6)
			5503.4	Understand the concept of Structural Modelling. (BTL2)
			5503.5	Analyze the concept of Behavioral Modelling. (BTL4)
III – I	15A05504	Principles of Programming Languages	5504.1	Determine Software development process, syntax and semantics are in developing of software and programs. (BTL5)
			5504.2	Construct the programming for Structuring the data. (BTL3)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
			5504.3	Understand the concepts of computation and structuring the program. (BTL2)
			5504.4	Develop software projects using Object-Oriented languages.
			5504.5	Design software projects and implement the Making of logic, functional programming and rules of programming in software projects.
III – I	15A05505	Software Testing	5505.1	Apply the basic concepts, Flow Graphs and Path Testing techniques to test the projects. (BTL3)
			5505.2	Analyze transaction flow and data flow testing techniques and its strategies for testing the transactions and data flow in the projects. (BTL4)
			5505.3	Analyze the types of domains in domain testing and using that in testing domains in the project. (BTL4)
			5505.4	Determine different paths and path expressions to simplify testing. (BTL5)
			5505.5	Analyze state graphs, transition testing and graph matrices to solve testing problems. (BTL4)
III – I	15A05506	Introduction to Big Data	5506.1	Understand the concepts of Distributed programming using JAVA. (BTL 2)
			5506.2	Understand the concepts of Hadoop file system Hadoop Architecture, Internals of Hadoop File Systems. (BTL 2)
			5506.3	Analyze Big Data using different tools. (BTL 4)
			5506.4	Develop Big data solutions using Hadoop environment. (BTL 6)
			5506.5	Design the Case studies of Big Data analytics using Map-Reduce programming. (BTL 6)
III – I	15A05509	Object Oriented Analysis and Design & Software Testing Laboratory	5509.1	Understand the notations for representing various UML diagrams. (BTL 2)
			5509.2	Analyze and design the solutions by constructing UML diagrams for various applications. (BTL 4)
			5509.3	Design Manual Test cases for Software Project. (BTL 6)
			5509.4	Analyze the realistic problem for different category of software. (BTL 4)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
			5509.5	Evaluate automation testing tools to test the code. (BTL 5)
III – I	15A05510	Operating Systems Laboratory	5510.1	Understand and design CPU Scheduling Algorithms. (BTL2)
			5510.2	Design and implement File allocation strategies and file organization techniques. (BTL 6)
			5510.3	Design programs using process synchronization concepts.
			5510.4	Analyze the concepts of File Allocation Strategies and Organization Techniques. (BTL 4)
			5510.5	Design various programs using deadlock Management Techniques. (BTL 6)

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Sem: III – II

S.No	Course Code	Course Name	Hours per Week			Credits
			L	T	P	
01	15A05601	Compiler Design	3	1	0	3
02	15A05602	Data Warehousing & Mining	3	1	0	3
03	15A05603	Design Patterns	3	1	0	3
04	15A05604	Design and Analysis of Algorithms	3	1	0	3
05	15A05605	Web and Internet Technologies	3	1	0	3
06	15A05606	CBCC-I Artificial Intelligence	3	1	0	3
07	15A05609	Web and Internet Technologies Laboratory	0	0	4	2
08	15A05610	Data Warehousing & Mining Laboratory	0	0	4	2
09	15A52602	Advanced English Language Communication Skills (AELCS) Laboratory) (Audit Course)	0	0	2	0
10	15A05611	Comprehensive Online Examination-II	0	0	0	1
		Total	18	6	10	23

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
III – II	15A05601	Compiler Design	5601.1	Analyse the various phases of a compiler and illustrate the lexical analysis. (BTL4)
			5601.2	Design the syntax analysis phase with different parsing techniques. (BTL6)
			5601.3	Understand the syntax directed translation and intermediate code generation. (BTL2)
			5601.4	Illustrate Symbol Table and Runtime Environment. (BTL2)
			5601.5	Design programs using Code Generation and Code Optimization techniques. (BTL6)
III – II	15A05602	Data Warehousing & Mining	5602.1	Understand fundamentals of data mining functionalities for particular database of applications. (BTL2)
			5602.2	Examine Data warehouse and OLAP technology for data mining. (BTL4)
			5602.3	Determine Mining Frequent Patterns, Associations and Correlations in mining data. (BTL5)
			5602.4	Analyze the Cluster analysis in Data mining. (BTL4)
			5602.5	Illustrate Mining streams, time series and sequence in Data mining. (BTL2)
III – II	15A05603	Design Patterns	5603.1	Understand of design and design patterns, Listing contents of catalog of design patterns. (BTL2)
			5603.2	Apply lexis design, command class and sub classes for creational Design Pattern's. (BTL3)
			5603.3	Identify the context and importance of structural Design Pattern's. (BTL3)
			5603.4	Analyze the application of a pattern and outlines the importance of behavioural patterns. (BTL4)
			5603.5	Illustrate the state, strategy in behavioural patterns and identify the need of template method and visitor Pattern. (BTL2)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
III – II	15A05604	Design and Analysis of Algorithms	5604.1	Understand the performance of algorithms. Interpret Divide and Conquer Strategy to design searching and sorting techniques. (BTL2)
			5604.2	Apply Greedy and Dynamic programming techniques to analyse and design real time applications. (BTL3)
			5604.3	Illustrate the graph traversals and tree traversals to solve the problems. Develop the Strategies of Backtracking technique to solve the complex problems.
			5604.4	Examine the Branch-and-Bound and Lower bound strategies to resolve searching and sorting techniques in trees. (BTL4)
			5604.5	Analyze computational problems of Algorithms. Differentiate deterministic and non-deterministic algorithms. (BTL 4)
III – II	15A05605	Web and Internet Technologies	5605.1	Understand and design the web pages using HTML5 and CSS. (BTL2)
			5605.2	Examine the dynamic webpages using servlets and JSP , and Understand the Concepts of Database Connectivity. (BTL4)
			5605.3	Design and Build Dynamic websites using server-side PHP programming and Database Connectivity. (BTL6)
			5605.4	Understand the Concepts of XML documents and schemas. (BTL2)
			5605.5	Illustrate the web applications using AJAX. (BTL2)
III – II	15A05606	Artificial Intelligence	5606.1	Apply a search algorithm for a problem and estimate its time and space complexities. (BTL3)
			5606.2	Apply AI techniques to solve problems of game playing. (BTL3)
			5606.3	Design planning about state-space search, partial order, graphs. (BTL6)
			5606.4	Analyze probabilistic reasoning, Bayesian networks, temporal models and hidden markov models. (BTL4)
			5606.5	Apply machine learning and natural language processing. (BTL3)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
III – II	15A05609	Web and Internet Technologies Laboratory	5609.1	Design the interactive web pages using HTML and CSS. (BTL6)
			5609.2	Illustrate client-side scripting using JavaScript and DHTML. (BTL2)
			5609.3	Design Server-side programming with Java Servlets, JSP and PHP. (BTL6)
			5609.4	Understand the concepts of Extended Markup Language (XML). (BTL2)
III – II	15A05610	Data Warehousing & Mining Laboratory	5610.1	Develop Data Warehouse and Explore WEKA. (BTL6)
			5610.2	Demonstrate performing association rule mining on data sets and perform data pre-processing tasks. (BTL2)
			5610.3	Design and implement classification, clustering and regression on data sets. (BTL6)
			5610.4	Develop data mining algorithms. (BTL6)
III – II	15A52602	Advanced English Language Communication Skills Laboratory (Audit course)	2602.1	Develop a wide range of vocabulary to Speak English effectively, and respond appropriately in different socio-cultural and professional contexts. (BBTL3)
			2602.2	Apply unique qualities of professional writing style such as sentence conciseness, readability, clarity, accuracy, avoiding wordiness or ambiguity, previewing, objectivity, summarizing, coherence and transitional devices. (BTL-3)
			2602.3	Demonstrate presentations successfully devising and applying various techniques. (BTL-2)
			2602.4	Identify areas of evaluation in GDs as part of the selection procedure, and prepare accordingly and moreover, understand the strategies of the interviewers to facilitate better responses during the Placement interviews. (BTL-3)
			2602.5	Acquire personality traits as self-confidence, positive attitude, emotional intelligence, social grace, flexibility, time management, problem solving, decision making, friendliness and effective communication skills. (BTL2)

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Sem: IV – I

S.No	Course Code	Course Name	Hours per Week			Credits
			L	T	P	
01	15A52601	Management Science	3	1	-	3
02	15A05701	Grid & Cloud Computing	3	1	-	3
03	15A05702	Information Security	3	1	-	3
04	15A05703	Mobile Application Development	3	1	-	3
05	15A05704	CBCC – II Software Architecture	3	1	-	3
06	15A05707	CBCC – III Software Project Management	3	1	-	3
07	15A05710	Grid & Cloud Computing Laboratory	-	-	4	2
08	15A05711	Mobile Application Development Laboratory	-	-	4	2
		Total	18	06	08	22

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
IV – I	15A52601	Management Science	2601.1	Understand the concepts & principles of management and know the designs of organizational structures. (BTL2)
			2601.2	Apply the knowledge of Work-study principles & Quality Control techniques. (BTL3)
			2601.3	Analyze the concepts of HRM in Recruitment, Selection and Training & Development (BTL4)
			2601.4	Evaluate PERT/CPM Techniques in project management& and Basic knowledge about Strategy formulation and implementation in enterprises (BTL6)
			2601.5	Understand the modern concepts in management like SCM, BPO, Six Sigma and TQM (BTL2)
IV – I	15A05701	Grid & Cloud Computing	5701.1	Understand the traditional computing Architecture and recent technologies how to apply grid computing technologies to solve large scale scientific problems. (BTL2)
			5701.2	Elaborate the open standard services for grid architecture and able to demonstrate grid service models and functionality requirements of service architecture and service infrastructure. (BTL5)
			5701.3	Apply the concept of virtualization and understand the importance of virtualization in distributed computing and how this has enabled the development of cloud computing. (BTL3)
			5701.4	Analyze the performance of cloud computing and utilize the grid and cloud Toolkit to program on it. (BTL4)
			5701.5	Understand the concept of cloud and grid security learn the concept of cloud infrastructure model able to apply the security model in grid and cloud environment (BTL2)
IV – I	15A05702	Information Security	5702.1	Understanding computer security concepts, classical encryption techniques and modern block ciphers. (BTL2)
			5702.2	Applying number theory and design various kinds of public key cryptography algorithms. (BTL3)
			5702.3	Design various cryptographic hash functions and message authentication codes. (BTL5)
			5702.4	Analyze key management and distribution algorithms and user authentication techniques. (BTL4)
			5702.5	Understanding the various security issues in transport layer, network layer and system security. (BTL2)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
IV – I	15A05703	Mobile Application Development	5703.1	Analyze and design the applications using Android sdk (BTL4)
			5703.2	Design and develop user interface for the Android platform and make use of Basic widgets of Android applications. (BTL5)
			5703.3	Design Building blocks and utilizes the media resources for the development of Android Application. (BTL5)
			5703.4	Apply DDMS tool to Debug the application and understand the concepts of Dialogs and Fragments (BTL3)
			5703.5	Analyze and design the applications with data sharing, sending and intercepting SMS. (BTL4)
IV – I	15A05704	Software Architecture	5704.1	Understand the basic concepts of software architecture and software architecture Business cycle. (BTL2)
			5704.2	Understand the various architectural styles with case studies (BTL2)
			5704.3	Define various quality attributes of software architecture and explain the techniques to achieve them (BTL1)
			5704.4	Understand the concepts of various architectural patterns and some design patterns (BTL2)
			5704.5	Acquire solid foundation in the field of designing and documenting Software architecture. (BTL3)
IV – I	15A05707	Software Project Management	5707.1	Identify the key activities in managing a software project (BTL2)
			5707.2	Compare different process models (BTL4)
			5707.3	Understand requirement specifications and analysis modelling (BTL2)
			5707.4	Apply systematic procedure for software design and deployment (BTL3)
			5707.5	Compare and contrast the various testing and maintenance (BTL6)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
IV – I	15A05710	Grid & Cloud Computing Laboratory	5710.1	Design and implement applications on the Grid, Make use of the Grid Toolkit. (BTL5)
			5710.2	Design and implement new cloud applications on Cloud. (BTL5)
			5710.3	Make use of the Cloud Toolkit and Grid Toolkit. (BTL6)
IV – I	15A05711	Mobile Application Development Laboratory	5711.1	Analyze and design the basic application using android sdk.(BTL4)
			5711.2	Design and develop user interface for the Android platform and make use of Basic widgets of Android application. (BTL5)
			5711.3	Design Building blocks and utilizes the Media Resources for the development of Android Application. (BTL5)
			5711.4	Analyze and design the application with Menus and Action bars. (BTL4)

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Sem: IV – II

S.No	Course Code	Course Name	Hours per Week			Credits
			L	T	P	
01	15A05802	MOOCS – II Mobile Computing	3	1	-	3
02	15A05806	MOOCS – III Cyber Security	3	1	-	3
03	15A05807	Comprehensive Viva-Voce	-	-	4	2
04	15A05808	Technical Seminar	-	-	4	2
05	15A05809	Project Work	-	-	24	12
		Total	06	02	32	22

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
IV – II	15A05802	Mobile Computing	5802.1	Able to know about the types of WLANs, the components of a typical WLAN and the services offered by a WLAN. (BTL1)
			5802.2	Summarize the protocols used at the MAC layer and scheduling mechanisms. (BTL2)
			5802.3	Examine the routing mechanisms and transport layer and network security solutions in ad hoc wireless networks. (BTL4)
			5802.4	Evaluate the energy management schemes and Quality of service solution in ad hoc networks. (BTL6)
			5802.5	Acquire skills to design and implement a basic mobile ad hoc or wireless sensor network via simulations. (BTL3)
IV – II	15A05806	Cyber Security	5806.1	Analyze the cyber-crimes in mobile and wireless devices (BTL4)
			5806.2	Understanding the various tools and methods using in cybercrime. (BTL2)
			5806.3	Understanding the computer forensic and OSI layers. (BTL2)
			5806.4	Illustrate various forensic handheld devices and tool kits. (BTL3)
			5806.5	Apply the current structure of cyber security roles across the enterprise, including the roles and responsibilities of the relevant organization. (BTL3)
IV – II	15A05807	Comprehensive Viva-Voce	5807.1	To Prepare Oral Presentation skills by answering questions in precise and concise manner. (BTL6)
			5807.2	To Develop confidence and inter-personal skills. (BTL6)
			5807.3	To Explain the answer very clearly for all the courses. (BTL4)
			5807.4	To Discuss the clear explanation about the course structure. (BTL2)
			5807.5	To Examine the Personal development skills so that to enhance knowledge. (BTL4)

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YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
IV – II	15A05808	Technical Seminar	5808.1	To Develop comprehensive report based on literature survey/Topics related to different subjects in the semester (BTL6)
			5808.2	To Identify the applicability of modern software tools and technology. (BTL4)
			5805.3	To Demonstrate the Answer for queries which is posed by the listeners (BTL2)
			5808.4	To Asses himself for to improve presentation skills (BTL5)
			5808.5	To Evaluate the skills which is required for the topic (BTL5)
IV – II	15A05809	Project Work	5809.1	To Prepare abstract for given project by identifying the requirements and prospective solution. (BTL3)
			5809.2	To Develop latest information related to the project from various sources to analyse the project. (BTL6)
			5809.3	To Choose the materials for the project as per specifications and efficient test for developing the project. (BTL3)
			5809.4	To Illustrate effective team work after efficient testing, elaborate the completed task and compile the project. (BTL4)
			5809.5	To Prepare a good report of the project as per the guidelines and present to the panel of experts. (BTL3)