ANURAG ENGINEERING COLLEGE

An Autonomous Institution
(Affiliated to JNTUH-Hyderabad,Approved by AICTE-New Delhi)
ANANTHAGIRI (V) (M), SURYAPET (D), TELANGANA-508206

CSE

S.No	Course Code	Course Name	Description of the course Outcomes
1	CS103ES	PROGRAMMING FOR PROBLEM SOLVING	1. Design algorithms, flowcharts and programs involving decision and iteration structures. 2. Analyze the concepts of arrays, strings and structures for real world problems. 3. Apply various file handling techniques for better data management. 4. Apply the concept code reusability using Functions. 5. Implement various searching and sorting Techniques.
2	EE104ES	BASIC ELECTRICAL ENGINEERING	1. Understand the importance of DC circuits and analyze theorems. 2. Understand the concept of AC circuits and resonance. 3. Concept of principle of operation of transformer and efficiency of single phase transformer.

			4. Analyze the performance of DC machines and Induction motors. 5. Demonstrate the importance of electrical installation and the concept of power, power factor and its improvement.
3	EG105BS	COMPUTER AIDED ENGINEERING GRAPHICS	1. Apply computer aided drafting tools to create 2D and 3D objects 2. Sketch conics and different types of solids 3. Appreciate the need of Sectional views of solids and Development of surfaces of solids. 4. Read and interpret engineering drawings 5. Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting
4	CS106ES	ELEMENTS OF COMPUTER SCIENCE & ENGINEERING	1. Know the working principles of functional units of a basic Computer 2. Understand program development, the use of data structures and algorithms in problem solving. 3. Know the need and types of operating system, database systems. 4. Understand the significance of networks, internet, WWW and cyber security. 5. Understand Autonomous systems, the application of artificial

			intelligence.
5	CH107BS	ENGINEERING CHEMISTRY LABORATORY	1. Determination of rate of corrosion of mild steel in various conditions. 2. To perform methods such as conductometry, potentiometry and pH metry in order to find out the concentrations or equivalence points of acids and bases. 3. To prepare polymers like Thiokol rubber and Bakelite. 4. Estimation of Saponification value, Viscosity and surface tension of lubricant oils. 5. Estimation of hardness of water, Chloride content of water sample.
6	CS108ES	PROGRAMMING FOR PROBLEM SOLVING LABORATORY	1. Apply fundamental programming concepts and Exercise control statements to solve simple problems. 2. Represent and manipulate data with arrays and strings 3. Modularize the code with functions so that they can be reused. 4. Develop applications using user defined data types 5. Implement various searching and sorting techniques
7	EE108ES	BASIC ELECTRICAL ENGINEERING LABORATORY	1. Apply the various procedures and techniques for the experiments.

			2. Verify the various electrical laws and theorems with DC Excitation. 3. Determine the losses, efficiency and regulation of single phase transformer. 4. Obtain the performance of induction motors. 5. Evaluate the speed of DC shunt motor.
8	HS110MC	CONSTITUTION OF INDIA	1. Knowledge of historical perspective and salient features of Indian constitution 2. Aware of the fundamental rights of Indian citizens. 3. Know the directive principles and fundamental duties of government and citizens 4. Knowledge of the Quasi-federal and parliamentary structure of Indian constitution 5. Knowledge of the constitution amendment powers and Emergency Provisions of Indian constitution.
9	MA201BS	ORDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS	1. Methods of solving the differential equations of first order 2. Methods of solving the second and higher order differential equations. 3. Evaluation of multiple integrals

			4. The basic properties of vector valued functions and derivatives 5. Line, surface and volume integrals and vector integral theorems.
10	AP202BS	APPLIED PHYSICS	1. Understand various optical phenomena of light 2. Apply basic the principles of quantum mechanics to classify solids based on band theory. 3. Identify the role of semiconductor devices in science and engineering Applications. 4. Understand the features and applications of Nanomaterial's in various fields. 5. Understand various aspects of Lasers and Optical fiber and their applications in diverse fields.
11	ME203ES	ENGINEERING WORKSHOP	1. Study and practice on machine tools and their operations 2. Practice on manufacturing of components using workshop trades including pluming, fitting, carpentry, and foundry, house wiring and welding. 3. Identify and apply suitable tools for different trades of engineering processes including drilling, material removing, measuring, and chiseling. 4. Build right attitude, team working, precision and safety at work place.

			5. Apply basic electrical engineering knowledge and various manufacturing processes.
12	EN204HS	ENGLISH FOR SKILL ENHANCEMENT	1. Understand the importance of vocabulary and sentence structures. 2. Choose appropriate vocabulary and sentence structures for oral and written communication. 3. Demonstrate understanding of the rules of functional grammar. 4. Develop comprehension skills from known and unknown passages through effective reading strategies. 5. Construct paragraphs, letters, essays, abstracts, précis and reports in various contexts thereby improving proficiency in writing modules of English.
13	EC205ES	ELECTRONIC DEVICES AND CIRCUITS	1. Analyze the PN Junction diode operation and its characteristics 2. Know the applications of Diode such as clippers and clampers. 3. Analyze the characteristics of BJT. 4. Analyze the characteristics of FET. 5. Understand the concept of special purpose devices.
14	AP206BS	APPLIED PHYSICS LABORATORY	1. KnowthedeterminationofthePlanck'sconstantusingPhotoelectric effect 2. Appreciate quantum physics in semiconductor devices and opto

			electronics. 3. Gain the knowledge of various semiconductor devices like .PN junction diode, Zener diode, BJT, LED, solar Cell 4. Understand the properties and principles of laser and optical fiber. 5. Carried out data analysis.
15	CS207ES	PYTHON PROGRAMMING LABORATORY	1. Able to develop programs using control statements. 2. Able to code programs using modular approach. 3. Read and write data from/to files in Python Programs 4. To write GUI program to create window wizard using various buttons. 5. Implement digital systems using python and to install and use various libraries.
16	EN208HS	ENGLISH LANGUAGE AND COMMUNICATION SKILLS LABORATORY	1. Reproduce speech sounds and improve language 2. Develop accent and pronunciation in various situations 3. Understand variants in pronunciation by differentiating between British and American accents 4. Identify the diverse purposes of listening and speaking 5. Exhibit critical thinking, problem-solving and decision-making

			skills through Group Discussions and Interviews.
17	CS209ES	IT WORKSHOP	1. Perform Hardware troubleshooting 2. Understand Hardware components and inter dependencies 3. Safeguard computer systems from viruses/worms 4. Document/ Presentation preparation 5. Perform calculations using spreadsheets
18	ES210MC	ENVIRONMENTAL SCIENCE	1. The multidisciplinary nature of environment, essence of environment, 2. About the natural resources utilization and their conservation 3. The importance of Biodiversity and its Conservation 4. About the causes and effects of environmental pollution and its management as well as environmental issues 5. About the environmental wastes management rules, regulations and EIA for the protection of environment and to achieve sustainable development
19	PS301BS	PROBABILITY AND STATISTICS	1. Basic concepts of probability and Understand Chance causes and random variable that describes randomness or an uncertainty in certain realistic situation. It can be of either discrete or continuous type.

			2. Concepts like mean variance, co-variance of random variables expectation, discrete distributions. 3. The Normal random variable for the continuous case predominantly describes important probability distributions, the types of sampling and Sampling distribution. 4. Estimations of statistical parameters and Testing of hypothesis of few unknown statistical parameters. 5. Understand the stochastic process and Markov chains.
20	DE302ES	DIGITAL ELECTRONICS	1. Understand the working of logic families and logic gates. 2. Design and implement Combinational and Sequential logic circuits. 3. Design and implement Combinational logic circuits. 4. Design and implement Sequential logic circuits. 5. Analyze different types of semiconductor memories.
21	CS303PC	DATA STRUCTURES	1. Analyze the representation of various static, dynamic and, hierarchical data structures and Design and implement the mechanism of linear data structures. 2. Outline the concepts of hashing, collision and its resolution methods using hash function. 3. Design and Implementation of various advanced concepts of

			binary trees. 4. Implement various algorithms on graph data structures and implementation of various sorting techniques. 5. Design and implementation of Pattern Matching algorithms to find patterns within a bigger set of data or text.
22	CS304PC	COMPUTER ORGANIZATION AND ARCHITECTURE	1. Understand the basics of instruction sets and their impact on processor design. 2. Demonstrate an understanding of the design of the functional units of a digital computer system. 3. Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory. 4. Design a pipeline for consistent execution of instructions with minimum hazards. 5. Recognize and manipulate representations of numbers stored in digital computers
23	CS305PC	OBJECT ORIENTED PROGRAMMING THROUGH JAVA	1. Understand the basic object-oriented programming concepts and apply them in problem solving. 2. Illustrate inheritance and package concepts for reusing the program. 3. Demonstrate developing of exception handling and multitasking

			programs using multiple threading concept. 4. Able to write programs of graphical user interface using AWT. 5. Able to write Applet based programs and swing applications.
24	CS306PC	DATA STRUCTURES LABORATORY	1. Ability to develop C programs for computing and real-life applications using basic elements like control statements, functions, pointers and structures and various linked lists. 2. Ability to develop data structures like stacks and queues using arrays and pointers. 3. Ability to implements the sorting methods like Quick sort, Heap sort and Merge sort. 4. Ability to implement various trees and tree traversal techniques in recursive and non-recursive manner. 5. Gain knowledge on implementing the graph traversal techniques and Pattern matching algorithms like Boyer- Moore, Knuth-Morris-Pratt
25	CS307PC	OBJECT ORIENTED PROGRAMMING THROUGH JAVA LABORATORY	1. Able to write programs for solving real world problems using the java collection framework. 2. Able to write programs using abstract classes. 3. Able to write multithreaded programs. 4. Able to write programs for solving real world problems using the

			java collection framework. 5. Able to write GUI programs using swing controls in Java.
26	HS309MC	GENDER SENSITIZATION	1. Students will have developed a better understanding of important issues related to gender in contemporary India. 2. Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film. 3. Students will attain a finer grasp of how gender discrimination works in our society and how to counter it. 4. Students will acquire insight into the gendered division of labor and its relation to politics and economy. 5. Men and women students and professionals will be better equipped to work and live together as equals
27	CS308PC	DATA VISUALIZATION - R PROGRAMMING/ POWER BI	1. Understand How to import data into Tableau. 2. Understand Tableau concepts of Dimensions and Measures. 3. Develop Programs and understand how to map Visual Layouts and Graphical Properties. 4. Create a Dashboard that links multiple visualizations.

			5. Use graphical user interfaces to create Frames for providing solutions to real world Problems.
28	MB401HS	BUSINESS ECONOMICS AND FINANCIAL ANALYSIS	1. The students will understand the various Forms of Business and the impact of economic variables on the Business. 2. The students will understand the concept in Demand and supply. 3. The student will learn the various concepts in Production, Cost and Pricing strategies. 4. The student will gain the knowledge on financial position by analyzing the financial statements of a company. 5. The students can able to understand financial position by analyzing the Financial rations of the company
29	CS402PC	DISCRETE MATHEMATICS	1. Understand and construct Inference Theory and Normal Forms 2. Apply set theory and Relations to formulate Discrete Structures 3. Analyze and solve Posets and Algebraic Problems using Groups 4. Apply Permutations and Combinations to Solve the Discrete Problems 5. Apply graph theory in solving computing problems
30	AM306PC/CS403PC	OPERATING SYSTEMS	1. Will be able to control access to a computer and the files that may be shared

			2. Demonstrate the knowledge of the components of computers and their respective roles in computing. 3. Ability to recognize and resolve user problems with standard operating environments. 4. Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively. 5. Identify storage management and protection
31	CS404PC	DATABASE MANAGEMENT SYSTEMS	1. Gain knowledge of fundamentals of DBMS and ER Model. 2. Able to apply the knowledge of relational model and normalization. 3. Apply the basics of SQL for retrieval and management of data. 4. Be acquainted with the basics of transaction processing and concurrency control. 5. Gain knowledge on database storage structures and access techniques.
32	AM305PC/CS405PC	SOFTWARE ENGINEERING	1. Able to understand the software engineering principles, practices and process models 2. Able to elicit, analyze and specify software requirements from the

			project stakeholders 3. Able to analyze and translate the specifications into software designs and model the designs 4. Able to apply different test strategies to perform testing and metrics to assess the software 5. Able to identify and manage software risks and maintain the quality of the software
33	AM307PC/CS406PC	OPERATING SYSTEMS LABORATORY	1. Simulate and implement operating system concepts such as scheduling, 2. Able to implement C programs using Unix system calls 3. Implement the dead lock avoidance using banker's algorithm 4. Implement the producer and consumer problem and Page Replacement algorithms 5. Exercise interprocess communication.
34	CS407PC	DATABASE MANAGEMENT SYSTEMS LABORATORY	1. Develop ER data model and Relational data model for a database. 2. Design database schema for a given application and apply normalization. 3. Apply SQL commands for data definition and data manipulation. 4. Apply the basics of SQL for retrieval and management of data.

			5. Develop solutions for database applications using procedures, cursors and triggers.
35	HS411MC	INTELLECTUAL PROPERTY RIGHTS	1. Understand the fundamentals of intellectual properties and its agencies. 2. Know the trade mark registration process and its rights. 3. Understand the fundamentals of copy rights and patent law. 4. Know the trade secret determination and protection. 5. Know the recent developments in protection of intellectual property rights
36	AM310PC/CS409PC	NODE JS/ REACT JS / DJANGO	1. Build a custom website with HTML, CSS, and Bootstrap and little JavaScript. 2. Demonstrate Advanced features of JavaScript and learn about JDBC 3. Develop Server – side implementation using Java technologies 4. Develop the server – side implementation using Node JS. 5. Design a Single Page Application using React.
37	CS501PC	DESIGN AND ANALYSIS OF ALGORITHMS	1. Acquire the knowledge of algorithm analysis and its notations that are applied on the problems solved by divide and conquer paradigm

			2. Apply the major graph algorithms for model engineering problems and knowledge of the greedy paradigm 3. Apply the dynamic programming paradigm and recite algorithms that employ dynamic programming paradigm 4. Apply the concept of back tracking, branch and bound paradigm for real time problems 5. Analyse the complexity of problems and differentiate that in term of P and NP Problems.
38	CS502PC	COMPUTER NETWORKS	1. Analyze TCP/IP and OSI models and various protocols and various error handling mechanisms. 2. Use of various devices in connecting different types of LANs. 3. Analyze different routing protocols and IP Addresses. 4. Discuss the various services offered by transport layer. 5. Describes the working of various networked applications such as DNS, Mail, WWW and HTTP.
39	CS503PC	DEVOPS	1. Understand the various components of DevOps environment. 2. Identify Software development models and architectures of DevOps 3. Understand the concepts of project management

			4. Use different integration tools. 5. Select an appropriate testing tool and deployment model for project.
40	CS5011PC	QUANTUM COMPUTING (Professional Elective – I)	1. Understand basics of quantum computing 2. Understand physical implementation of Qubit 3. Understand Quantum algorithms and their implementation 4. Understand The Impact of Quantum Computing on Cryptography
41	EC512PE	ADVANCED COMPUTER ARCHITECTURE (Professional Elective – I)	1. Computational models and Computer Architectures. 2. Concepts of parallel computer models. 3. Scalable Architectures, Pipelining, Superscalar processors
42	CS513PE	SCRIPTING LANGUAGES (Professional Elective – I)	1. Understand how to Comprehend the differences between Ruby, Ruby on Rails and RubyTk and Designing CGI scripts using Ruby and Web. 2. Able to Understand and Extend the Ruby and Embedding a Ruby Interpreter. 3. Ability to create and run scripts using PERL and able to translate from Perl/Tk to Ruby.

			4. Ability to create Internet ware applications by Advanced Perl. 5. Acquire programming skills in TCL, Tk and Perl-Tk.
43	EC514PE	IMAGE PROCESSING (Professional Elective – I)	1. Demonstrate the knowledge of the basic concepts of two-dimensional signal acquisition, sampling, and quantization. 2. Demonstrate the knowledge of filtering techniques. 3. Demonstrate the knowledge of 2D transformation techniques. 4. Demonstrate the knowledge of image enhancement, segmentation, restoration and compression techniques.
44	CS515PE	PRINCIPLES OF PROGRAMMING LANGUAGES	1. Acquire the skills for expressing syntax and semantics in formal notation 2. Identify and apply a suitable programming paradigm for a given computing application 3. Gain knowledge of the features of various programming languages and their comparison
45	CS521PE	COMPUTER GRAPHICS (Professional Elective – II)	1. Understand the applications and primitives of Computer Graphics system. 2. Perform 2D transformations on graphical objects. 3. Understand 3D object representations. 4. Perform 3D transformations on graphical objects.

			5. Design computer based animation systems.
46	EC522PE	EMBEDDED SYSTEMS (Professional Elective – II)	1. Understand the selection procedure of processors in the embedded domain 2. Analyze processor and memory architectures. 3. Understand the working of communication devices and protocols. 4. Design the procedure of embedded firm ware. 5. Visualize the role of real time operating systems in embedded systems
47	CS523PE	INFORMATION RETRIEVAL SYSTEMS (Professional Elective – II)	1. Know the basics of information retrieval & database systems and their capabilities. 2. Understand different data structures and indexing algorithms. 3. Understand automatic indexing and clustering techniques. 4. Analyse search procedures and visualization technologies. 5. Comprehend text and multimedia retrieval systems
48	CS524PE	DISTRIBUTED DATABASES (Professional Elective – II)	1. Understand the concepts of distributed databases and their architecture & design. 2. Cognize query processing and optimization algorithms.

			3. Realize transaction management and concurrency control mechanisms. 4. Analyse failures in DDBS systems and parallel architectures 5. Infer the notions of object database systems
49	CS525PE	NATURAL LANGUAGE PROCESSING (Professional Elective – II)	1. Understand the natural language word and document structures. 2. Analyse syntax processing and parsing algorithms. 3. Comprehend sematic parsing techniques. 4. Understand structure of representation systems. 5. Analyse multilingual cross lingual models.
50	CS504PC	COMPUTER NETWORKS LAB	1. Implement data link layer farming methods 2. Analyze error detection and error correction codes. 3. Implement and analyze routing and congestion issues in network design. 4. Implement Encoding and Decoding techniques used in presentation layer 5. To be able to work with different network tools
51	CS505PC	DEVOPS LAB	1. Understand the need of DevOps tools 2. Understand the environment for a software application

			development 3. Apply different project management concepts. 4. Understand integration and development tools 5. Use Selenium tool for automated testing of application
52	AE506HS	ADVANCED ENGLISH COMMUNICATION SKILLS LAB	
53	CS507PC	UI DESIGN-FLUTTER	1. Knowledge on installation of various softwares. 2. Understanding of various Widgets 3. Application of Animation to Apps 4. Implements Flutter Widgets and Layouts 5. Responsive UI Design and with Navigation in Flutter
54		INTELLECTUAL PROPERTY RIGHTS	1. Distinguish and Explain various forms of IPRs. 2. Identify criteria to fit one's own intellectual work in particular form of IPRs. 3. Apply statutory provisions to protect particular form of IPRs. 4. Appraise new developments in IPR laws at national and international level
55	CS601PC	MACHINE LEARNING	1. Distinguish between, supervised, unsupervised and

			semi-supervised learning 2. Understand algorithms for building classifiers applied on datasets of non-linearly separable classes 3. Understand the principles of evolutionary computing algorithms 4. Design an ensembler to increase the classification accuracy 5. Understand the Reinforcement Learning methods.
56	CS602PC	FORMAL LANGUAGES AND AUTOMATA THEORY	1. Gain proficiency in classifying machines by their power in recognizing languages. 2. Learn to employ finite state machines for modelling and solving computing problems. 3. Design context free grammars for formal languages. 4. Master in context-free languages, push-down automata. 5. Distinguish between decidability and undecidability.
57	CS603PC	ARTIFICIAL INTELLIGENCE	1. Distinguish between, supervised, unsupervised and semi-supervised learning 2. Understand algorithms for building classifiers applied on datasets of non-linearly separable classes 3. Understand the principles of evolutionary computing algorithms 4. Design an ensembler to increase the classification accuracy 5. Understand the Reinforcement Learning methods.

58	CS631PE	FULL STACK DEVELOPMENT (Professional Elective – III)	1. Understand Full stack components for developing web application. 2. Apply packages of NodeJS to work with Data, Files, Http Requests and Responses. 3. Use MongoDB data base for storing and processing huge data and connects with NodeJS application. 4. Design faster and effective single page applications using Express and Angular. 5. Create interactive user interfaces with react components.
59	EC632PE	INTERNET OF THINGS (Professional Elective – III)	
60	CS633PE	DATA ANALYTICS (Professional Elective – III)	
61	CS634PE	MOBILE APPLICATION DEVELOPMENT (Professional Elective–III)	1. Understand the working of Android OS Practically. 2. Develop Android user interfaces 3. Develop, deploy and maintain the Android Applications. 4. Deploy software to mobile devices 5. Debug programs running on mobile devices
62	CS635PE	SOFTWARE TESTING METHODOLOGIES (Professional Elective – III)	1. Understand purpose of testing and path testing 2. Understand strategies in data flow testing and domain testing

			3. Develop logic-based test strategies 4. Understand graph matrices and its applications 5. Implement test cases using any testing automation tool
63		DATA STRUCTURES (Open Elective – I)	1. Analyze the representation of various static, dynamic and, hierarchical data structures. 2. Design and implement the mechanism of stacks, general tree data structures with their applications. 3. Implement various algorithms on graph data structures, including finding the minimum spanning tree, shortest path with real time applications, etc., 4. Implementation of various advance concepts of binary trees and graphs with real time applications. 5. Outline the concepts of hashing, collision and its resolution methods using hashfunction
64		DATABASE MANAGEMENT SYSTEMS (Open Elective – I)	1. Gain knowledge of fundamentals of DBMS, database design and normal forms 2. Master the basics of SQL for retrieval and management of data. 3. Be acquainted with the basics of transaction processing and concurrency control. 4. Familiarity with database storage structures and access

			techniques
65	CS604PC	MACHINE LEARNING LAB	1. Understand modern notions in predictive data analysis. 2. Select data, model selection, model complexity and identify the trends. 3. Understand a range of machine learning algorithms along with their strengths and weaknesses. 4. Build predictive models from data and analyse their performance. 5. Understand the Performance Analysis of Classification Algorithms.
66	CS605PC	ARTIFICIAL INTELLIGENCE LAB	1. Apply basic principles of AI in solutions that require problem solving, knowledge representation, and learning. 2. Apply artificial intelligence and its characteristics into its application areas. 3. Formulate real-world problems as state space problems, optimization problems or constraint satisfaction problems. 4. Apply appropriate algorithms and AI techniques to solve complex problems. 5. Design an expert system by using appropriate tools and

			techniques.
67	CS641PC	FULL STACK DEVELOPMENT LAB (Professional Elective – III)	1. Design flexible and responsive Web applications using Node JS, React, Express and Angular. 2. Perform CRUD operations with MongoDB on huge amount of data. 3. Develop real time applications using react components. 4. Use various full stack modules to handle http requests and responses. 5. Implement web based application using effective database access.
68	EC624PC	INTERNET OF THINGS LAB (PROFESSIONAL ELECTIVE – III)	1. Ability to introduce the concept of M2M (machine to machine) with necessary protocols and get awareness in implementation of distance sensor 2. Get the skill to program using python scripting language which is used in many IoT devices
69	CS643PC	DATA ANALYTICS LAB	1. Understand linear regression and logistic regression 2. Understand the functionality of different classifiers 3. Implement visualization techniques using different graphs 4. Apply descriptive and predictive analytics for different types of data

			5. Design various classification techniques.
70	CS644PC	MOBILE APPLICATION DEVELOPMENT LAB (Professional Elective – III)	1. Develop Applications in an android environment. 2. Develop user interface applications. 3. Develop URL related applications. 4. Develop text related applications 5. Develop database related applications
71	CS645PC	SOFTWARE TESTING METHODOLOGIES LAB (Professional Elective – III)	1. Design and develop the best test strategies in accordance with the development model. 2. Design and develop GUI, Bitmap and database checkpoints 3. Develop database checkpoints for different checks 4. Perform batch testing with and without parameter passing 5. Perform Silent mode test execution without any interruption
72	CS606PW	INDUSTRIAL ORIENTED MINI PROJECT/ INTERNSHIP/ SKILL DEVELOPMENT COURSE (Big data-Spark)	1. Develop MapReduce Programs to analyze large dataset Using Hadoop and Spark 2. Write Hive queries to analyze large dataset Outline the Spark Ecosystem and its components 3. Perform the filter, count, distinct, map, flatMap RDD Operations in Spark. 4. Build Queries using Spark SQL 5. Apply Spark joins on Sample Data Sets

			6. Make use of sqoop to import and export data from hadoop to database and vice-versa
73		ENVIRONMENTAL SCIENCE	1. Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development.