SNDT Women's University

Usha Mittal Institute of Technology

Name of Programme: Information Technology (IT)

Program Outcomes

1. Produce knowledgeable and skilled human resources which are employable in IT sector.
2. Impart knowledge required for planning, designing and building complex Application Software Systems as well as provide support to automated systems or application.
3. Produce entrepreneurs who can develop customized solutions for small to large Enterprises.
4. To develop academically competent and professionally motivated personnel, equipped with objective, critical thinking, right moral and ethical values that compassionately foster the scientific temper with a sense of social responsibility.
5. To develop students to become globally competent.
6. To inculcate Entrepreneurial skills among students

Program Specific Outcomes

The Information Technology Programme will prepare its graduates to achieve:

1. The understanding to apply knowledge of computing and technological advances appropriate to the programme.
2. Skills to analyze a problem, and identify and define the logical modeling of solutions.
3. An ability to design, implements and evaluate a computer-based system, process, component, or programme to meet stakeholder needs.
4. The knack to function effectively in teams to accomplish a common goal.
5. A sense of professional, ethical, legal, security and social issues and responsibilities.
6. Effectiveness in communicating with a wide range of audiences.
7. An ability to analyze the local and global impact of business solutions on individuals, organizations, and society.
8. An identification of the need to engage in continuing professional development.

Course Outcomes

IT Semester-I

Course Code	Course Name	Course Outcomes
Basic Science course (BSC101)	Applied Science (Physics and Chemistry)	1. Learn about electric and magnetic fields. 2. Learn about scaler and vector fields. 3. Maxwell's equations that define basic laws of electromagnetism. 4. Propagation of electromagnetic waves through free space(Vacuum or Non conducting media). 5. Analyse atomic and molecular structure in terms of wavefunctions, charge densities and energy level diagrams. 6. Obtain quantitative information about energy levels through molecular spectroscopic methods such as electronic,

		vibrational, rotational and nuclear magnetic resonance (NMR) spectroscopy. 7. Rationalise periodic properties such as ionization potential, electronegativity, oxidation states and electronegativity
Basic Science course (BSC103)	Mathematics–I	The students will learn: 1. To apply differential calculus to notions of curvature and to improper integrals. Apart from some other applications they will have a basic understanding of Beta and Gamma functions. 2. The fallouts of Rolle's Theorem that is fundamental to application of analysis to Engineering problems. 3. The tool of power series and Fourier series for learning advanced Engineering Mathematics. 4. To deal with functions of several variables that are essential in most branches of Engineering. 5. The essential tool of matrices and linear algebra in a comprehensive manner
Engineering Science Courses (ESC101)	Basic Electrical Engineering	1. To understand and analyze basic electric and magnetic circuits 2. To study the working principles of electrical machines 3. To introduce the components of low voltage electrical installations
Engineering Science Courses (ESC102)	Engineering Graphics & Design	1. To prepare you to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability 2. To prepare you to communicate effectively 3. To prepare you to use the techniques, skills, and modern engineering tools necessary for engineering practice
	Applied Science Lab	The physics and chemistry laboratory course will consist of experiments illustrating the principles of physics and chemistry relevant to the study of science and engineering. The students will learn to: 1. Analyze & generate experimental skills 2. Learn and apply basic techniques used in chemistry laboratory for preparation, purification and identification. 3. Employ the basic techniques used in chemistry laboratory for analyses such as chromatography, spectroscopy, volumetric titrations, conductometry. 4. Learn safety rules in the practice of laboratory investigations.

	Basic Electrical Engineering Lab	Get an exposure to common electrical components and their ratings. 1. Make electrical connections by wires of appropriate ratings. 2. Understand the usage of common electrical measuring instruments. 3. Understand the basic characteristics of transformers and electrical machines. Get an exposure to the working of power electronic converters.
	Engineering Graphics Design	Students prepare for actual work situations through practical training in a new state-of-the-art computer designed CAD laboratory using engineering software
	Induction Program	

IT Semester-II

Course Code	Course Name	Course Outcomes
Basic Science course (BSC102)	Applied Science (Physics and Cheistry)	1. Imparted knowledge about simple harmonic oscillations, mechanical and electric oscillators. 2. Learn about different kinds of damping in harmonic oscillators. Learn about non dispersive transverse and longitudinal waves in one dimension,acoustic waves and sound waves. 3. Know about interference and diffraction phenomena. They will also learn about Michelson Interferrometer (also learn why the result was negative. Learn about why they found no significant difference between the speed of light in the direction of movement through the presumed aether, and the speed at right angles. 4. Understand how Young's double slit experiment and diffraction grating work. 5. Interaction of radiation with matter, Einstein coefficients , working of different types of Lasers and their application in science, engineering and medicine. 6. Rationalise bulk properties and processes using thermodynamic considerations. 7. Understand the energies existing in a bulk macroscopic system. List major chemical reactions that are used in the synthesis of molecules. 8. Rationalize the terms and concepts involved in Stereochemistry like symmetry operations, chirality, isomerism etc.

Basic Science course (BSC104)	Mathematics-II	1. The mathematical tools needed in evaluating multiple integrals and their usage. 2. The effective mathematical tools for the solutions of differential equations that model physical processes. 3. The tools of differentiation and integration of functions of a complex variable that are used in various techniques dealing engineering problems.
Engineering Science Courses (ESC103)	Programming for Problem Solving	1. To formulate simple algorithms for arithmetic and logical problems. 2. To translate the algorithms to programs (in C language). 3. To test and execute the programs and correct syntax and logical errors. 4. To implement conditional branching, iteration and recursion. 5. To decompose a problem into functions and synthesize a complete program using divide and conquer approach. 6. To use arrays, pointers and structures to formulate algorithms and programs. 7. To apply programming to solve matrix addition and multiplication problems and searching and sorting problems. 8. To apply programming to solve simple numerical method problems, namely rot finding of function, differentiation of function and simple integration.
Engineering Science Courses (ESC104)	Workshop/ Manufacturing Practices	Upon completion of this course, the students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials.
Humanities and Social Sciences including Management courses HSM (101)	English	After completing this course, students will 1. Acquire basic proficiency in English grammar and vocabulary 2. Develop good writing skills 3. Demonstrate skills requires for presentations 4. Acquire skills to participate in interview
	Applied Science Lab	The students will learn to: 1. Estimate rate constants of reactions from concentration of reactants/products as a function of time 2. Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc 3. Synthesize a small drug molecule and analyse a salt sample

	Programming for Problem Solving Lab	1. To formulate the algorithms for simple problems 2. To translate given algorithms to a working and correct program 3. To be able to correct syntax errors as reported by the compilers 4. To be able to identify and correct logical errors encountered at run time 5. To be able to write iterative as well as recursive programs 6. To be able to represent data in arrays, strings and structures and manipulate them through a program 7. To be able to declare pointers of different types and use them in defining self referential structures. 8. To be able to create, read and write to and from simple text files.
	Workshop /Manufacturing Practices Lab English Practical	1. Upon completion of this laboratory course, students will be able to fabricate components with their own hands. 2. They will also get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes. 3. By assembling different components, they will be able to produce small devices of their interest
	English Practical	The student will acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.
	Environmental Sciences	After completing this course, students will be able to 1. Apply the basic knowledge of environmental protection, sustainable development and improvement. 2. Categorize and scrutinize impact of human development on natural resources. Provide the student with an understanding of radioactive waste. 3. Interpret the impact of environmental problems on socio economic growth and human health. 4. Apply various strategies, technological improvement, and methods for sustainable management of environmental systems and for the remediation of degraded environment. 5. Apply different Science and Technology (S&T) based sustainability solutions and limitations as well as to identify impact of human population on the natural environment and human health.
IT Semester-III		
Course Code	**Course Name**	**Course Outcomes**

Engineering Science Course ESC 301 323411	Analog Electronic Circuits	1. Understand the characteristics of transistors 2. Design and analyse various rectifier and amplifier circuits. 3. Design sinusoidal and non-sinusoidal oscillators. 4. Understand the functioning of OP-AMP and design OP-AMP based circuits
Professional Core Courses PCC-CS 301 343411	Data structure & Algorithms	1. . For a given algorithm student will be able to analyze the algorithms to determine the time and space complexity and justify the correctness. 2. For a given Search problem (Linear Search, Binary Search & hashing) students will be able to implement it. 3. For a given problem of Stacks, Queues and linked list students will be able to implement it and analyze the same to determine the time and computation complexity. 4. Compare and contrast the benefits of dynamic and static data structures implementations. 5. Students will be able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in terms of Space and Time complexity. 6. Students will be able to implement Graph search and traversal algorithms and determine the time and computation complexity.
Professional Core Courses ESC 302 343412	Digital Electronics	1) Able to understand the basics concepts and techniques used in digital electronics. 2) Understand and examine the structure of various number systems and its application in digital design. 3) The ability to understand, analyze and design various combinational and sequential circuits. 4) Ability to identify basic requirements for a design application and propose a cost effective solution. 5) Able to understand Memory Units and recognizes the properties of memory units.
Professional Core Courses PCC-CS302 343413	IT Workshop (Sci Lab/Octave/ MATLAB)	1)Understand the fundamental concepts of Matlab/Octave. 2)Understand the syntax and semantics of Matlab/Octave. 3) Understand the fundamental abstractions in procedural programming - variables/values/types, assignment, control flow (conditionals/loops/error handling) 4) Understand the Octave specific compound data types -vectors, matrices, cell arrays and the basic linear algebra underlying them (linear maps, matrix multiplication, factorization)

Basic Science course BSC 301 313411	Mathematics-III (Probability and Statistics)	1. The ideas of probability and random variables and various discrete and continuous probability distributions and their properties. 2. The basic ideas of statistics including measures of central tendency, correlation and regression.
323421	AnalogElectronic Circuits Lab	1. Implement and analyse various configurations amplifier circuits 2.Implement and analyse various sinusoidal and non-sinusoidal oscillators
343421	Data structure & Algorithms Lab	Design and implement algorithms to solve problems. 2. Choose efficient data structures (Linear & Non-Linear) and apply them to solve problems. 3. Design & implement different searching & sorting algorithms using appropriate data structures. 4. Analyze the efficiency of programs based on time complexity. 5. Prove the correctness of a program using loop invariants, pre-conditions and post-conditions in programs.
343422	Digital Electronics Lab	1) Learn the basics of gates. 2) Construct basic combinational circuits and verify their functionalities. 3) Apply the design procedures to design basic sequential circuits. 4) Learn about counters. 5) Learn about Shift registers. 6) To understand the basic digital circuits and to verify their operation.
343423	IT Workshop (Sci Lab/MATLAB) Lab	1) Able to understand the fundamental concepts of Scientific Programming using Matlab/Octave. 2) Understand the syntax and semantics of Matlab/Octave. 3) Understand the fundamental abstractions in procedural programming - variables/values/types, assignment, control flow (conditionals/loops/error handling) 4) Understand the Octave specific compound data types -vectors, matrices, cell arrays and the basic linear algebra underlying them (linear maps, matrix multiplication, factorization) 5) Able to carry out simple numerical computations and analyses using Octave. 6) Able to design simple algorithms to solve problems and write a simple program in Octave to solve scientific and mathematical problems
IT Semester-IV		

Course Code	Course Name	Course Outcomes
Professional Core Courses PCC- CS401 443411	Discrete Mathematics	Mathematical reasoning: Students are expected to use mathematical reasoning in order to read, comprehend, and construct mathematical arguments. Students will learn basic concepts of mathematical logic and proof. 2. Combinatorial analysis: Students will count or enumerate objects and perform combinatorial analysis. 3. Discrete structures: Students will learn the basic concepts of sets, permutations, relations, poset, graphs, trees. 4. Algebraic structures: Students will learn the concepts of algebraic structures and its properties like homomorphism, isomorphism. 5. Groups, Rings: Students are expected to learn different algebraic structures like semigroups, groups, monoid, rings, field, boolean algebra.
Engineering Science Course PCC-CS 402 423411	Computer Organization & Architecture	. How Computer Systems work & the basic principles 2. Instruction Level Architecture and Instruction Execution 3. The current state of art in memory system design 4. How I//O devices are accessed and its principles 5. Concepts of advanced pipelining techniques
Professional Core Courses PCC- CS403 443412	Operating Systems	1. To learn and understand the fundamentals of Operating Systems.Create processes and threads. 2. Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time. 3. For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time. 4. Design and implement a file management system. 5. For a given I/O devices and OS (specify) develop the I/O management functions in OS as part of a uniform device abstraction by performing operations for synchronization between CPU and I/O controllers.

Professional Core Courses PCC- CS404 443413	Design & Analysis of Algorithms	1.For a given algorithms analyze worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms. 2. Describe the greedy paradigm and explain when an algorithmic design situation calls for it. For a given problem develop the greedy algorithms. 3. Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Synthesize divide-and-conquer algorithms. Derive and solve recurrence relation. 4. Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. For a given problems of dynamic-programming and develop the dynamic programming algorithms, and analyze it to determine its computational complexity. 5. For a given model engineering problem model it using graph and write the corresponding algorithm to solve the problems
Humanities & Social Sciences including Management courses HSMC 401 433411	Management 1 (Organizational Behaviour/ Finance & Accounting)	1. Understand fundamental principles of Accounting 2. Identify the main financial statements and their purposes. 3. Complete a Project/ Written Assignment that integrates career orientation and or professional development skills. 4. Develop the ability to use accounting information to solve a variety of business problems 5. The course will help understand and learn the accounting documents, system and procedure.
Mandatory Courses MC 483451	Constitution of India	After completing this course, students will be able to 1. Understand the constitutional framework and state and central policies 2. Display awareness of fundamental right and duties of a citizen 3. Demonstrate awareness about engineering ethics and responsibilities of an engineer 4. Display awareness about human rights in India
423421	Computer Organization & Architecture Lab	Components of CPU: Students are expected to identify and assemble CPU 2. Number Representation and Conversion: Students are expected to write programs to convert numbers from binary and hexadecimal number systems. 3.MIPs Assembly Language: Students are expected to write the basic programs of MIPs Assembly Language using Vlab 4. Adder: Students are expected to build and do the binary addition using half adder and full adder in VLAB

		5. Memory and CPU Design: Students are expected to design memory module, ALU and CPU using VLAB
443422	Operating Systems Lab	Study of Kernel and their types. 2. Implementing Scheduling algorithms like FCFS,SJF,RR,Priority based scheduling algorithm. 3. Implementing memory management algorithm like First fit,Best fit,Worst fit 4. Study of Various case studies of operating System like UNIX, LINUX,Windows series etc.
443423	Design & Analysis of Algorithms Lab	1. Design and implement recursive algorithms to solve problems of recursive nature. 2. Understand the problem, identify appropriate algorithm design strategy that suits it and then solve the problem using that strategy. 3. Analyse the algorithm after implementing it by using recurrence relation or Masters theorem for reducing functions or by dividing functions. 4. Design & implement searching & sorting algorithms by using appropriate algorithm design strategies and analyse them.

IT Semester-V

Course Code	Course Name	Course Outcomes
5131	Artificial Intelligence	Students will be able to 1. know the difficulties arise to define "Artificial Intelligence" 2. to understand the types and areas of AI 3. to understand the applicability, strength and weaknesses of the basic knowledge representation 4. to develop intelligent systems by assembling solutions to concrete computational problems 5. to understand role of knowledge representation, problem solving and learning in intelligent-system engineering
5132	Machine Learning	On completion of the course students will be expected to: 1. Have a good understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc. 2. Have an understanding of the strengths and weaknesses of many popular machine learning approaches
5101	Communication skill	After Completing this course, students will be able to 1. Design Technical documents with precision of language, vocabulary and style

		2. Recognize attributes of a suitable candidate for a job by participating in resume writing, group discussions and interviews 3. Deliver formal presentations 4. Demonstrate Knowledge of Professional Ethics and Behaviour
5163	Discrete Time Signal Processing	1. Understand the concepts of discrete-time Fourier transform and fast Fourier transform. 2. Apply the knowledge of design of IIR digital filters to meet arbitrary specifications. 3 . Apply the knowledge of design of FIR digital filters to meet arbitrary specifications. 4. Analyze the effect of hardware limitations on performance of digital filters. 5. Apply the knowledge of DSP processors for various applications
5161	MicroProcessor and Microcontroller	1.Basic understanding of 8085 and 8086 microprocessors architectures and its functionalities 2: Design and develop 8086 Microprocessor based systems for real time applications using low level language like ALP CO 3 Interface external peripherals and I/O devices and program the 8086 microprocessor 4. To write Interrupt service Routine(ISR) to handle interrupts in 8086 microprocessor. 5. To transmit data serially in Multi-processor applications 6.Basic understanding of 8051 microcontrollers architectures and its functionalities. 7.Design and develop microcontroller based systems for real time applications using low level language like
5162	Object Oriented Methodology and Design	1. Use an object-oriented method for analysis and design 2. Analyse information systems in real-world settings and to conduct methods such as interviews and observations. 3. Apply variety of approaches and perspectives of systems development, and to evaluate other Information System development methods and techniques. 4. Know techniques aimed to achieve the objective and expected results of a systems development process 5. Apply the concepts of architectural design for deploying the code for software.

5261	Micro processor and micro contrller (lab)	1 Basic understanding of 8085 and 8086 microprocessors architectures and its functionalities 2Design and develop Microprocessor based systems for real time applications using low level language like ALP 3Interface external peripherals and I/O devices and program the 8086 microprocessor.
5231	computational intelligent lab	student will be able to 1. Implement the different AI algorithms 2. To implement machine learning algorithms. 3. To use tools for machine learning 4. to use tools for AI.
5262	Discrete Time Signal Processing	1 Basic understanding of 8085 and 8086 microprocessors architectures and its functionalities 2Design and develop Microprocessor based systems for real time applications using low level language like ALP 3Interface external peripherals and I/O devices and program the 8086 microprocessor.
5232	Object Oriented Methodology and Design (lab)	**1.** Understand the difference between writing programs for the software and doing analysis and design. **2.** Problem formulation and decomposition (analysis) and solution building (design) will be covered. **3.** Apply the object-oriented approach to analysing and designing systems and software solutions. Employ the Unified modelling Language notations to create effective and efficient system designs. **4.** Demonstrate the Conceptual model of UML and SDLC.

IT Semester-VI

Course Code	**Course Name**	**Course Outcomes**
6161	Image Processing	1. Understand basic concepts of digital Image processing, sampling, quantization 2. Calculate various transforms of an image 3. Enhance the image in spatial and frequency domain using point processing, histogram specification, various filtering techniques 4. Compress images by lossy and lossless techniques and compare their performance

		5. Segment images and perform morphological operations on images and understand representation and description 6. Understand current trends in applications of image processing
6133	DIP	The Students will be able to understand 1. Various aspects of distributed paradigms. 2. Apply the synchronization for distributed applications 3. Learn about the most effective Distributed Information Processing systems, and gain practice implementing them
6162	Software Engineering	Students will be able to 1. gain broad understanding of the discipline of software engineering and its application to the development and management of software systems. 2. Knowledge of basic SW engineering methods and practices, and their appropriate applications 3. understand the role of software process model such as waterfall, evolutionary models. 4. understand implementation issues . 5. understand approaches to verification and validation.
6134	Environmental Science	1. Apply the basic knowledge of environmental protection, sustainable development and improvement. 2. Categorize and scrutinize impact of human development on natural resources. Provide the student with an understanding of radioactive waste. 3. Interpret the impact of environmental problems on socio economic growth and human health. 4. Apply various strategies, technological improvement, and methods for sustainable management of environmental systems and for the remediation of degraded environment. 5. Apply different Science and Technology (S&T) based sustainability solutions and limitations as well as to identify impact of human population on the natural environment and human health.
6131	Web Technology	1. To provide basic knowledge of HTML and web technology 2. To Introduction of web design issues and design effective navigation 3. Able to understand style sheet ,javascript events and all features of web design 4. To provide knowledge ofXML and PHPwith programming 5. To understand python and advances web app task with flask database
6132	Data Communication Network	1. Understand the architectural principles of computer networking and compare different approaches to organising networks. 2. Understand good network design: simplicity, scalability, performance, and the end-to-end principle. 3. Understand how the Internet works today. 4. Judge the effectiveness of existing or similar network protocols. 5. Be conversant with primitives of network application programming.

6231	Web technology lab	1. Design and implement dynamic websites with good aesthetic sense of designing and latest technical know-how. 2. Create web pages using HTML and Cascading Styles sheets. 3. Analyze a web page and identify its elements and attributes. 4. Create dynamic web pages using JavaScript. 5. Build web applications using PHP. 6. Create XML documents and XML Schema. 7. Understand, analyze and apply the role of languages like HTML, CSS, XML, JavaScript, PHP and protocols in the workings of the web and web applications 8. Have a Good grounding of Web Application Terminologies like JSON, jQuery, Angular Js, Node.js.
6232	Data Communication and Network (lab)	To master the terminology and concepts of the OSI reference model and the TCP-IP reference model. To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks, To be familiar with wireless networking concepts, To be familiar with contemporary issues in networking technologies, To be familiar with network tools and network programming
6261	Image Processing (lab)	1. Implement the sampling, quantization techniques 2. Implementation of different point processing, and filtering techniques. 3. Implementation of histogram equalization, transforms, compression, segmentation and morphological techniques
6339	Semester Project	1. Students understand how to identify the project to be developed by doing a survey. 2. students are able to implement software project using suitable tools 3. students are able to do the analysis, design and modeling for project 4. Students learn to present and demonstrate their project work
IT Semester-VII		

Course Code	Course Name	Course Outcomes
7513	Mobile Computing	1. To study the concept of Mobile radio propagation, cellular system design. 2. To understand mobile technologies like GSM and CDMA. 3. To know evolution of 2G, 3G and 3 G in detail.
7532	Cyber Security and Forensic	After successful completion of this course, Students are able to 1. To Analyse the different security measures required for networks 2. Differentiate among different types of security attacks. 3. Identify the process in taking digital evidence. 4. Describe how to conduct an investigation using methods of memory, operating system, network and email forensics. 5. Assess the different forensics tools. 6. Describe the concept of ethical hacking.
7532	Data Mining	After successful completion of this course, student will be able to 1. Identify the key processes of data mining, data warehousing and knowledge discovery processes. 2. Organize and Prepare the data needed for data mining using pre preprocessing techniques. 3. Understand the basic principles and algorithms used in practical data mining and their strengths and weaknesses. 4. Implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on large data sets.
7561	Advanced databases	1. Extended relationship model: Students are expected to understand the notion of EER model.Students are able to develop EER models for given problem statements. 2. OODB and ORDB: Students will learn data storage methods usable for object-oriented program systems, including pure object database systems and object-relational mappers, its advantages and disadvantages. 3. Distributed Database and XML: Students are expected to find the need of distributed databases. Students will be able to learn its types, query optimization, concurrency control protocols, web based databases. 4. Active and Deductive Database: Students will learn models and methods of organization of deductive databases using Prolog.Students will be able to write triggers. 5. Spatial Databases: Students will learn GIS and Spatial database models. Students will be able to identify design issues and spatial query language. Students will learn representation of spatial data, spatial data types, operators and indexing.
7631	Mobile Computing Lab	1. Design and Implement various mobile applications using emulators. 2. Deploy applications to hand-held devices

7632	Cyber Security and Forensic Lab	Students will be able 1. to understand various areas of cyber security and forensics 2. to learn Recuva tool for file recovery 3. Encase forensics tool 4. to Implementation of Rabitt Virus
7633	Data Mining Lab	Students will be able to: 1. Identify sources of Data for mining and perform data exploration 2. Organize and prepare the data needed for data mining algorithms in terms of attributes and class inputs, training, validating, and testing files. 3. Implement the appropriate data mining methods like classification, clustering or association mining on large data sets using open source tools like WEKA 4. Implement various data mining algorithms from scratch using languages like C, C++, Java etc.
7661	Advanced databases Lab	1. PostgreSQL: Students are expected to create and use ADT abstract data types, user defined data types. 2. Inheritance and Partition: Students are expected to use inheritance commands, cascade dependency. 3. Triggers: Students are expected to develop and use triggers using Pg/Sql. 4. Spatial Database: Students are expected to use spatial data types and operators in PostgreSQL. 5. XML database: Students are expected to use XML types and commands in XML.
7931	Project (Stage-I)	1. Students are able to discover or identify the idea for project development. 2. students are able to find innovative projects for development by studying the literature on the same topic. 3. Students learned to define the scope of the project. 4. Students learned to 5. students learned to prepare the analytical and design model of the project. 6. Students define the objective and the problem statement for their project.
7731	Geographical Information Systems (Elective-I)	1. Students should be able to understand what is a Geographical Information System. 2. Students should be able to do GIS Data Processing, Analysis and Visualization. 3. to understand and learn the concepts of Terrain Mapping, Geocoding. 4. where and how it is used. 5. understand and apply it to real time applications.
7762	Data Science and Business Analytics (Elective-I)	Students are able to 1. To use mathematics,statistics,computer science to evaluate data and to extract valuable information for use in strategic decision making, product development, trend analysis and forecasting. 2. To apply quantitative modeling techniques and data analysis techniques to the solution of real world business problems, communicate findings, and effectively present results using data visualization techniques 3. to use the suitable algorithms for data analytics. 4. to use the appropriate data normalization technique.

7831	Geographical Information Systems Lab (Elective-I)	Students should be able 1. to access Geographical Information of different locations. 2. to do GIS Data Processing, Analysis and Visualization. 6. to implement the concepts of Terrain Mapping, Geocoding. 7. to use it in real time application. 8. to do the image processing of geographical data.
7862	Data Science and Business Analytics Lab (Elective-I)	Students are able to 1. To use different techniques of data visualization. 2. To use various statistical models for data analysis. 3. To do Big data analytics of data in various formats. 4. Learn how to preprocess the data. 5. How to extract the useful information from the large data.

IT Semester-VIII

Course Code	Course Name	Course Outcomes
8561	Cloud Computing	After successful completion of this course, student will be able to 1. Define Cloud Computing and memorize the different Cloud service and deployment models 2. Describe the importance of virtualization along with their technologies. 3. Apply the fundamental concepts in datacenters to understand the tradeoffs in power, efficiency and cost. 4. Use and Examine different cloud computing services 5. Analyze the components of open stack & Google Cloud platform 6. Describe the key components of Amazon web Service , Google App Engine 7. Design & develop backup strategies for cloud data based on features.
8661	Cloud Computing Lab	Students will able to: 1. Implement Virtualization using different types of Hypervisors 2. Study and implement Collaboration with different Software As Services 3. Describe steps to perform on demand Application delivery using Ulteo . 4. Examine the installation and configuration of Open stack cloud 5. Analyze and understand the functioning of different google services . 6. Implementation of Platform as a Service using Google App Engine 7. Design & Synthesize Storage as a service using its own Cloud.
8931	Project (Stage II)	7. Students are able to develop the software project. 8. students are able to write project reports or software documentation. 9. students are able to perform the testing of the project. 10. students are able to do the interfacing among different modules, hardware devices and users. 11. students are able to write the technical paper for the project. 12. students learned to do the plagiarism check of their paper.

8932	Project (Stage III)	1. students are able to develop the complete software +hardware project. 2. students can do the proper analysis of their project. 3. students learned to demonstrate the project. 4. students learned to participate and demonstrate their work in technical competitions or conferences or journals. 5. students learned to do the plagiarism check of their project.
8761	Software Project management (Elective-II)	Students should be able to 1. Select the proper project, softwares, hardwares for their projects. 2. Do the planning of time cost, resources etc. 3. Check quality of software 4. Do Project Management, scheduling, testing
8762	Big Data Analytics (Elective II)	1. To provide an overview of an exciting growing field of big data analytics. 2. To introduce the tools required to manage and analyze big data like Hadoop,NoSQL,MapReduce. 3. To enable students to have skills that will help them to solve complex real world problems for decision support. 4. To enable students to understand the concept of distributed processing of Big Data for real time applications. 5. Students are able to manage stream data using the suitable technology.
8861	Software Project management Lab (Elective-II)	Student will be able to 1. Assist the Project officer in developing a project plan, scheduling activities, tracking progress, preparing status reports and managing changes. 2. Perform the duties of a project analyst trainee in a corporate Project Management office. 3. Plan and manage a small project as project manager. 4. Design SRS of any system
8862	Big Data Analytics Lab (Elective II Lab)	1. Students are able to do visualization of data using R tools. 2. Students are able to install Big data analytics tools like Hadoop. 3. Students are able to work on different formats of data using suitable tools like MangoDB. 4. Students are able to install Cloudera in VM.