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# DR. C.V. RAMAN UNIVERSITY

// Chhattisgarh, Bilaspur AN AISECT GROUP UNIVERSITY

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**POs, PSOs and COs**

**FACULTY OF  
INFORMATION  
TECHNOLOGY**



Add: Kargi Road, Kota, Bilaspur (C.G.)  
Ph. 07753-253801, E-Mail: info@cvru.ac.in

# **FACULTY OF INFORMATION TECHNOLOGY**

## **DIPLOMA IN COMPUTER PROGRAMME CODE –03DIP001**

### **PROGRAMME OBJECTIVE**

The objective of the programme is to develop high computer skills to the students. This program provides initial knowledge of computer that will support the learners to improve their skills in the field of information technology. The target is to provide overall knowledge of computer which includes both software and hardware. The learners also have the knowledge of both theoretical and practical aspect of computer.

### **PROGRAMME SPECIFIC OUTCOME**

The specific outcome of the programme is to achieve the well computer literates' and educated learners who will be able to become a member of the growth of information technology industries. The aim of DCA programme is to produce next generation person with the knowledge and skills to get prizing careers into the world of information technology.

### **PROGRAMME OUTCOME**

- This program opens the opportunity for learners that come from any stream to learn a skill-based subject.
- Learners can get initial knowledge of computer and can improve their skills. The students are also motivated for doing computer graduation proramme like DCA.
- They can also work as computer operator or program developer in government or private sectors.
- This program provides competitive environment for the learners which enable to stand and complete themselves.

**Course Code: 2TDCA-101**

**Course Name: FUNDAMENTALS OF COMPUTERS & INFORMATION TECHNOLOGY**

### **Course Objective**

- To understand the basic knowledge of computer.
- To understand the assembly-level programming.
- To understand the input output devices, storage media, memory.
- To understand the concept of Networking devices

### **Course Outcomes**

After study this student will be able to know about terms and concepts of Fundamentals of Computers & Information Technology (hardware, software, networking, security, Internet/ Web, and applications).

**Course Code: 2TDCA-102**

**Course Name: OPERATING SYSTEMS (DOS, WINDOWS, LINUX)**

**Course Objective**

- To develop the understanding of Operating System.
- To understand the Operating System Process Concepts, process state & process control
- To understand the Features of Windows
- To understand the Communication and Single User and Multiuser Operating System
- To understand the Disk Scheduling, Disk Management

**Course Outcomes**

- After Study, the Student will be able to know about functioning of Operating System. To make students able to learn different types of operating systems along with concept of file systems and CPU scheduling algorithms used in operating system.
- To provide knowledge of memory management and deadlock handling algorithms. At the end of the course, students will be able to implement various algorithms required for management, scheduling, allocation and communication used in operating system

**Course Code: 2TDCA-103**

**Course Name: COMPUTER IN OFFICE–I (MS WORD & MS EXCEL)**

**Course Objective**

- To understand the basic knowledge of MS Windows.
- To understand the Office Packages.
- To understand the MS Excel.
- To understand the formulas writing in MS Excel

**Course Outcomes**

- After studying this student will be able to know about terms and concepts of Microsoft suite completely. (like MS-Word, Power-point-Excel and Outlook express)

**Course Code: 2TDCA-104**

**Course Name: COMPUTERS IN OFFICE–II (MS POWERPOINT, MS ACCESS & MS OUTLOOK)**

**Course Objective**

- To understand the basic knowledge of MS Windows.
- To understand the Office Packages.
- To understand the MS Access.
- To understand the MS Outlook Express.

**Course Outcomes**

- After studying this student will be able to know about terms and concepts of Microsoft suite completely (like MS-Excel, MS-Access and Outlook express)

**Course Code: 2TDCA-105****Course Name: COMMUNICATION SKILLS & PERSONALITY DEVELOPMENT****Course Objective**

- To understand how to communicate effectively and appropriately in real-life situation.
- To use English effectively for study purpose across the curriculum.
- To develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking, Writing

**Course Outcomes**

- After study this student will be able to know about how to become active readers, what are the writing skills and process. Learn about oral communication skills.

**Course Code: 2TDCA-201****Course Name: INTRODUCTION TO INTERNET & WEB TECHNOLOGY****Course Objective**

- To understand concept of Internet
- To understand the web technology terminologies.
- To develop and integrate the use of current trends on internet technology
- To understand firewall and HTML programming

**Course Outcomes**

- After study, the student will be able to know about Internet, Internet connectivity and services of internet, internet security management and firewalls.

**Course Code: 2TDCA-202****Course Name: INTRODUCTION TO FINANCIAL ACCOUNTING WITH TALLY****Course Objective**

- To understand the concept of Financial Accounting
- To understand the knowledge about Tally.
- To develop and integrate the use of Accounting
- To understand Cheque Printing, Multi Account Printing etc.

**Course Outcomes**

- After study, the student will be able to know about Accounting, Company, Company Features, Features of Company Accounting, Interest Calculation Transaction and Cheque Printing, Multi Account Printing

**Course Code: 2TDCA-203**

**Course Name: PROGRAMMING IN C**

**Course Objective**

- To understand the basic knowledge of programming concepts.
- To understand the C language & its concepts.

**Course Outcomes**

- Develop conditional and iterative statements to write C programs
- Exercise user defined functions to solve real time problems
- Exercise files concept to show input and output of files in C
- Illustrate the flowchart and design an algorithm for a given problem and to develop IC programs using operators

**Course Code: 2TDCA-204**

**Course Name: DBMS WITH MS ACCESS**

**Course Objective**

- To understand the concept of Data Base Management

**Course Outcomes**

- After study this student will be able to know about programs based upon data base with access concepts, squery commands

# **BACHELOR OF COMPUTER APPLICATION (BCA) PROGRAMME CODE -03UGR001**

## **PROGRAMME OBJECTIVE**

The objective of the programme is to develop high computer skills to the students. This program provides the chance to gain overall knowledge of computer which includes both software and hardware. This program also develops the knowledge of programming and networking skills to the learners. The learners also have the knowledge of both theoretical and practical aspect of computer.

## **PROGRAMME OUTCOME**

- This program opens the opportunity for learners that come from any stream to learn a skill-based subject.
- Learners can go for their master's degree in computer application or computer science.
- They can also work as computer operator or program developer in government or private sectors.
- This program provides competitive environment for the learners which enable to stand and complete themselves.

## **PROGRAMME SPECIFIC OUTCOME**

The specific outcome of the programme is to achieve the well computer literates' and educated learners who will be able to become a member of the growth of information technology industries. The aim of BCA programme is to produce next generation person with the knowledge and skills to get prizing careers into the world of information technology.

**Course Code: 3MBFE101**

**Course Name: FUNDAMENTALS OF ENTREPRENEURSHIP**

### **Course Objective**

- Understanding basic concepts of entrepreneurship and key steps in the elaboration of business ideas, Developing personal creativity and entrepreneurial initiative.

### **Course Outcome**

- Understanding basic concepts in the area of entrepreneurship, understanding the stages of the entrepreneurial process, adopting of the key steps in the elaboration of business ideas, Developing personal creativity and entrepreneurial initiative.

**Course Code: 3IBCA101**

**Course Name: FUNDAMENTALS OF COMPUTERS & INFORMATION TECHNOLOGY**

**Course Objective**

- To understand the basic knowledge of computer
- To understand the assembly-level programming
- To understand the input output devices, storage media, memory.
- To understand the concept of MIS, Networking devices.

**Course Outcome**

- After study this student will be able to know about terms and concepts of Fundamentals of Computers & Information Technology (hardware, software, networking, security, Internet/Web, and applications).

**Course Code: 3IBCA102**

**Course Name: WINDOWS & MS OFFICE (WORD, POWER POINT, EXCEL, OUTLOOK EXPRESS)**

**Course Objective**

- To understand the basic knowledge of MS Windows.
- To understand the Office Packages.
- To understand the MS Excel.
- To understand the MS PowerPoint & Outlook Express.

**Course Outcome**

- After studying this student will be able to know about terms and concepts of Microsoft suite completely. (like MS-word, power-point excel sheets, outlook express)

**Course Code: 3IBCA103**

**Course Name: PROGRAMMING IN C**

**Course Objective**

- To understand the basic knowledge of programming concepts.
- To understand the C language & its concepts.

**Course Outcome**

- Illustrate the flowchart and design an algorithm for a given problem and to develop IC programs using operators
- Develop conditional and iterative statements to write C programs
- Exercise user defined functions to solve real time problems
- Exercise files concept to show input and output of files in C

**Course Code: 3IBDM101**

**Course Name: DISCRETE MATHEMATICS**

### **Course Objective**

This course introduces the applications of discrete mathematics in the field of computer science.

- It covers sets, logic, proving techniques, combinatory, functions, relations, Graph theory and algebraic structures.
- These basic concepts of sets, logic functions and graph theory are applied to Boolean algebra and logic networks while the advanced concepts of functions and algebraic structures are applied to finite state machines and coding theory.

### **Course Outcome**

- After study this student will be able to know about some fundamental mathematical concepts and terminology, how to use and analyze recursive definitions, how to count some different types of discrete structures, techniques for constructing mathematical proofs, illustrated by discrete mathematics examples.

**Course Code: 3HBHL101**

**Course Name: हिन्दी भाषा और संरचना – 1**

### **हिन्दी आधार/पाठ्यक्रम– पाठ्यक्रम के उद्देश्य**

- विद्यार्थियों में राष्ट्र प्रेम की भावना का विकास करना।
- हिन्दी के समृद्ध साहित्य को नयी पीढ़ी तक पहुँचाना।
- पत्र-लेखन, सार लेखन, भाव पल्लवन एवं साक्षात्कार के कौशल का विकास करना।
- डायरी, संस्मरण, लेखन, पारिभाषिक, शब्दावली, तत्सम, तद्भव, देशज, विदेशी शब्दों इत्यादि के ज्ञान का परिमार्जन करना।

### **अपेक्षित परिणाम**

- विद्यार्थी भारत भूमि से प्रेम व स्नेह के भावों को बढ़ा सकेंगे।
- विद्यार्थियों की हिन्दी की शब्द संपदा में वृद्धि होगी।
- पत्र-लेखन, सार लेखन, भाव पल्लवन साक्षात्कार के कौशल का विकास होगा।
- डायरी एवं संस्मरण लेखन विद्या का परिमार्जन होगा।
- हिन्दी के समृद्ध साहित्य कोष से लाभान्वित होंगे।

**Course Code: 3IBEC 201**

**Course Name: DIGITAL COMPUTER ORGANIZATION**

**Course Objective**

- To study the basic organization and architecture of digital computers (CPU, memory, I/O, software).
- Discussions will include digital logic and microprogramming.
- Understanding and utilization of digital computers.

**Course Outcome**

- An ability to perform computer arithmetic operations.
- An ability to understand control unit operations.
- An ability to design memory organization that uses banks for different word size operations.
- An ability to understand the concept of cache mapping techniques.
- An ability to understand the concept of I/O organization.
- An ability to conceptualize instruction level parallelism.

**Course Code: 3IBCA201**

**Course Name: OBJECT ORIENTED PROGRAMMING WITH C++**

**Course Objective**

Student will be able

- To understand the basic knowledge of opps with C++ language.
- To understand the Structure & classes concepts, data member.
- To understand the Array, Pointers operations.
- To understand the Function overloading & Operator Overloading.
- To understand the Inheritance & C++I/O system.

**Course Outcome**

- After Study This Student Will Be Able To Know About And Concepts of OOPs with C++ Language, Classes. Student will be able to create Arrays Its uses, Uses of function overloading, inheritance & C++I/O system.

**Course Code: 3IBCA202**

**Course Name: OPERATING SYSTEMS**

**Course Objective**

- To develop the understanding of functioning of Operating System.
- To understand the Process Concepts, process state & process control
- To understand the Critical Section Problem
- To understand the Contiguous Allocating, Paging
- To understand the Disk Scheduling, Disk Management

### **Course Outcomes**

- After study this student will be able to know about the functioning of Operating System. To make students able to learn different types of operating systems along with concept of file systems and CPU scheduling algorithms used in operating system. To provide students knowledge of memory management and deadlock handling algorithms. At the end of the course, students will be able to implement various algorithms required for management, scheduling, allocation and communication used in operating system.

**Course Code: 3IBCA203**

**Course Name: INTERNET PROGRAMMING (HTML, DHTML & JAVASCRIPT)**

### **Course Objective**

- To understand the general concepts pertaining to the Internet and World Wide Web.
- To have a good working knowledge of HTML, CSS and JavaScript and the principles of Website Design.
- To know different Web Designing Tools, how web hosting and publishing done
- To understand JavaScript, Electronic Commerce, Electronic Payment System and Electronic Security

### **Course Outcomes**

- After study this student will be able to know about programs based upon Html and html concepts, create animation & events based upon java script concepts, and connect an application with database.

**Course Code: SCIT 201**

**Course Name: DATA ENTRY OPERATIONS**

### **Course Objective**

- To understand the basic knowledge of computer
- To understand the assembly-level programming
- To understand the input output devices, storage media, and memory

### **Course Outcome**

- After studying this student will be able to know about terms and concepts of Microsoft suite completely. (like MS-word, power-point-excel sheets, outlook express)

**Course Code: 3HBEL402**

**Course Name: ENGLISH LANGUAGE AND SCIENTIFIC TEMPER**

### **Course Objective**

- To Study the basic language skills (speaking, listening, reading, and writing) and

grammar.

- Comprehensive study of different kinds of letters and applications.
- To study the different kinds of prose and poetry.

### **Course Outcome**

- Student will be able to understand correct use of grammar and language skills.
- Student will be familiar with different prose and poetry.
- Student should be able to write analytically in a variety of formats, including essays, report writing and application.

**Course Code: 3IBCA301**

**Course Name: DATA BASE MANAGEMENT SYSTEM (SQL/MS ACCESS)**

### **Course Objective**

- To understand the basic knowledge of DBMS Concepts.
- To understand the Database Design.
- To understand the RELATIONAL DATA MODEL.
- To understand the RELATIONAL DATABASE DESIGN.
- To understand the Indexing & Hashing-Basic Concepts & Recovery System.

### **Course Outcome**

- After study this student will be able to know about and concepts & fundamentals of DBMS, Concept of keys, RELATIONAL DATA MODEL & design. Student will also able to create table and implement commands.

**Course Code: 3IBCA302**

**Course Name: DATA STRUCTURE**

### **Course Objective**

Data structures play a central role in modern computer science. Data structures are essential building blocks in obtaining efficient algorithms.

- The objective of the course is to teach students how to design, write, and analyze the performance of programs that handle structured data and perform more complex tasks, typical of larger software projects.
- Students should acquire skills in using generic principles for data representation & manipulation with a view for efficiency, maintainability, and code reuse.
- Another goal of the course is to teach advance data structures concepts, which allow one to store collections of data with fast updates and queries.

### **Course Outcome**

- After study this student will be able to know about the concepts of Data Structure Using C++ Language, List & Its Operations Concept of Tree, and Algorithm & Graphs Design. Students will also know about the sorting and searching.

**Course Code: 3IBCA303**

**Course Name: COMPUTER COMMUNICATION & NETWORKS**

**Course Objective**

- To understand the fundamental concepts of computer networking.
- To understand the basic taxonomy and terminology of the computer networking area.
- To understand the advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
- To understand the various transition method.

**Course Outcome**

After study this student will be able to know about

- Independently understand basic computer network technology.
- Understand and explain Data Communications System and its components.
- Identify the different types of network topologies and protocols.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.

**Course Code: 3IBCA304**

**Course Name: PROGRAMMING WITH JAVA**

**Course Objective**

- To introduce and understand students to programming concepts and techniques using the Java language and programming environment, class, objects, also learn about lifetime, scope and the initialization mechanism of variables and improve the ability general problem-solving abilities in programming. Be able to use the Java SDK environment to create, debug and run simple Java program.

**Course Outcome**

Students will complete software projects comprised of an object-oriented design, implementation, and test plan.

- Designs will demonstrate the use of good object-oriented design principles including encapsulation and information hiding.
- The implementation will demonstrate the use of a variety of basic control structures including selection and repetition; classes and objects in a tiered architecture (user interface, controller, and application logic layers); primitive and reference data types including composition; basic AWT components; file-based I/O; and one-dimensional arrays.
- Test plans will include test cases demonstrating both black box and glass box testing strategies.

**Course Code: SCIT 301**

**Course Name: MULTIMEDIA**

**Course Objective**

- To learn and understand technical aspect of Multimedia Systems.
- To understand the standards available for different audio, video and text applications.
- To Design and develop various Multimedia Systems applicable in real time.
- To learn various multimedia authoring systems.
- To understand various networking aspects used for multimedia applications.
- To develop multimedia application and analyze the performance of the same

**Course Outcome**

- Create an ad that uses animation, draw a hierarchy of information (flow chart) to show an interactive site, import graphics and textures created on other applications into a multimedia software program, create a movie using simple animation, create an effective interactive site for use on the internet, create sound file, put a QuickTime movie into an interactive piece

**Course Code: 3HBEL501**

**Course Name: INTRODUCTION TO SOFT SKILL & TEAM BUILDING**

**Course Objective**

By the end of the soft skills training program, the students should be able to:

- Develop effective communication skills (spoken and written).
- Develop effective presentation skills.
- Conduct effective business correspondence and prepare business reports which produce results.
- Become self-confident individuals by mastering inter-personal skills, team management skills, and leadership skills.
- Develop all-round personalities with a mature outlook to function effectively in different circumstances.
- Develop broad career plans, evaluate the employment market, identify the organizations to get good placement, match the job requirements and skill sets.
- Take part effectively in various selection procedures adopted by the recruiters.

**Course Outcome**

- The teaching methods in the soft skills training include lectures, projects, role plays, quizzes, and various other participatory sessions. The emphasis will be on learning by doing.
- Since the method of training is experiential and highly interactive, the students imbibe the skills and attributes in a gradual and subtle way over the duration of the program. The students will not only learn the skills and attributes but also internalize them over a period of time.

- Internalization ensures that the skills and attributes become part of the students' nature. Subtle changes are bound to occur in their behavior and outlook, and these will make them more self-assured and confident. Moreover, the behavior changes will be gradual and natural and will not appear artificial or put on. Thus, the changes in them will be genuine and positive.
- The Soft Skills training program is a credit course and the evaluation of the students takes place on a continuous basis. Active participation in activities, interest displayed by the students in acquiring the necessary attributes and skills and the commitment shown by them to improve in terms of attitudes are the main criteria for evaluation.

**Course Code: 3IBCA401**

**Course Name: LINUX OPERATING SYSTEM —OPERATIONS & MANAGEMENT**

**Course Objective**

- To introduce the internals of Linux Operating System.
- To develop, debug and implement Shell Programme.
- To understand System administration.
- To understand configuration of Proxy Server
- To Installation, configuration and managing a simple LAN within an organization using Linux.

**Course Outcome**

- After study this student will be able to know about basic features, different flavors of Linux. Advantages, installing. Student will know about processes in Linux, shell programming & gnome graphical interfaces. Identify and use UNIX/Linux utilities to create and manage simple file processing operations, organize directory structures with appropriate security, and develop shell scripts to perform more complex tasks.

**Course Code: 3IBCA402**

**Course Name: RDBMS WITH ORACLE**

**Course Objective**

- To Identify the advantages of the database approach over the file-based data storage system
- To understand the architecture of a DBMS and functions of the database system components
- To understand the features of distributed and object- oriented databases
- To understand the various operations of PL\SQL

**Course Outcome**

- After study this student will be able to know about the core database administration tasks and tools. Restore databases from backups, Import and export data. Monitor SQL Server.

- To understand the concept of Transaction and Query processing

**Course Code: 3IBCA403**

**Course Name: PROGRAMMING WITH VISUAL BASIC .NET**

### **Course Objective**

The aim of the course is for the student to gain knowledge in the basic concepts of object-oriented programming and build skills to develop modern software programs using the language Visual Basic. The course is also suitable for students with prior programming experience who wish to strengthen their knowledge in the area of object-oriented design and programming with Windows.

- Analyze program requirements
- Design/develop programs with GUI interfaces
- Code programs and develop interface using Visual Basic .Net
- Perform tests, resolve defects and revise existing code

### **Course Outcomes**

After the completion of the course, students are expected to:

- Have gained a good understanding of the basic concepts of object orientation
- Have a good understanding of the visual basic language structure and language syntax
- Have developed the ability to design and develop interactive applications using the object-oriented principals, encapsulation, inheritance and to some extents polymorphism
- Be able to effectively develop applications with full functionality and a graphical user interface using the language visual basic
- Have the capability of analyzing and finding suitable and effective solutions to windows based applications using classes and objects.

**Course Code: 3IBCA404**

**Course Name: NETWORK & WEB SECURITY**

### **Course Objective**

- To understand basics of Cryptography and Network Security.
- To be able to secure a message over insecure channel by various means.
- To learn about how to maintain the Confidentiality, Integrity and Availability of a data.
- To understand various protocols for network security to protect against the threats in the networks

### **Course Outcome**

After successful completion of the course, the learners would be able to

- Provide security of the data over the network.
- Do research in the emerging areas of cryptography and network security.

- Implement various networking protocols.
- Protect any network from the threats in the world.

**Course Code: 3HBHP401**

**Course Name: HUMAN VALUES & ETHICS**

**Course Objectives**

- To help students understand the basic guidelines, content and process of Human value and value crisis in contemporary Indian Society
- To help students understand the meaning of happiness and prosperity for a human being
- To help students reflect critically on gender violence.
- To facilitate the students to understand harmony at all the levels of human living, and live accordingly.

**Course Outcome**

On completion of this course, the students will be able to:

- Understand the significance of value inputs in a classroom and start applying them in their life and profession
- Understand the value of harmonious relationship based on trust and respecting their life and profession.
- Students will develop a sense of appreciation of women in all walks of life.
- Understand the role of a human being in ensuring harmony in society and nature.

**Course Code: 3IBCA501A**

**Course Name: WEB PROGRAMMING WITH ASP.NET AND C#**

**Course Objective**

- To understand networking and the World Wide Web.
- Building multi-tier enterprise applications.
- .NET framework.
- .NET Interoperation services.
- Client side programming: HTTP, CGI, Cookies, JavaScript, HTML, XML.
- Server side programming: Web Forms, ASP.NET Web Services, ADO.NET Data Access
- Client/Server Programming, 3-tier architecture.
- ASP.NET Web services and web service security.
- Simple Object Access Protocol (SOAP) and Web Services.

**Course Outcome**

After successfully completing these course students shall be able:

- Successful students will able to design web applications using ASP.NET

- Successful students will be able to use ASP.NET controls in web applications.
- Successful students will be able to debug and deploy ASP.NET web applications

**Course Code: 3IBCA501 B**

**Course Name: COMPUTER GRAPHICS**

**Course Objective**

- To introduce the use of the components of a graphics system and become familiar with building approach of graphics system components and algorithms related with them.
- To learn the basic principles of 3- dimensional computer graphics.
- Provide an understanding of how to scan convert the basic geometrical primitives, how to transform the shapes to fit them as per the picture definition.
- Provide an understanding of mapping from a world coordinates to device coordinates, clipping, and projections.
- To be able to discuss the application of computer graphics concepts in the development of computer games, information, visualization, and business applications.
- To comprehend and analyze the fundamentals of animation, virtual reality, underlying technologies, principles, and applications.

**Course Outcomes**

- To list the basic concepts used in computer graphics.
- To implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.
- To describe the importance of viewing and projections.
- To implement various line generation, clipping, curve generation algorithms.

**Course Code: 3IBCA502A**

**Course Name: MANAGEMENT INFORMATION SYSTEM**

**Course Objective**

- To understand why information systems are so important today for business and management
- To understand the role of the major types of information systems in a business environment and their relationship to each other.
- To understand the impact of the Internet and Internet technology on business electronic commerce and electronic business.
- To understand the major management challenges to building and using information systems and learn how to find appropriate solutions to those challenges.

**Course Outcome**

After study this student will be able to know about

- The basic concepts and technologies used in the field of management information systems.
- Have the knowledge of the different types of management information systems.
- Develop an understanding of how various information systems work together to accomplish the information objectives of an organization.

**Course Code: 3IBCA502B**

**Course Name: COMPILER DESIGN**

**Course Objective**

- The Objectives of this course is to explore the principles, algorithms, and data structures involved in the design and construction of compilers. Topics include context-free grammars, lexical analysis, parsing techniques, symbol tables, error recovery, code generation, and code optimization.

**Course Outcome**

- After completion of this course each student will implement a compiler for a small programming language.

**Course Code: 3IBCA503**

**Course Name: DATA WAREHOUSING & MINING**

**Course Objective**

- To understand the scope and necessity of Data Mining & Warehousing for the society.
- To understand the designing of Data Warehousing so that it can be able to solve the root problems.
- To understand various tools of Data Mining and their techniques to solve the real time problems.
- To develop ability to design various algorithms based on data mining tools.

**Course Outcome**

After study this student will be able to know about the

- Process raw data to make it suitable for various data mining algorithms.
- Discover and measure interesting patterns from different kinds of databases.
- Apply the techniques of clustering, classification, association finding, feature selection and visualization to real world data.

**Course Code: 3IBCA504**

**Course Name: MULTIMEDIA SYSTEMS**

**Course Objective**

- To learn the multimedia communication standards and compression techniques.
- To provide the foundation knowledge of multimedia computing, e.g. media

characteristics, compression standards, multimedia representation, data formats, multimedia technology development.

- To provide programming training in multimedia computing, multimedia system design and implementations. To learn the Multimedia communication across the networks.

### **Course Outcome**

- To understand about various latest interactive multimedia devices, the basic concept about images and image formats.
- To understand about data compression techniques, image compression techniques like JPEG, video compression techniques like MPEG, and the basic concepts about animation.
- To develop an interactive multimedia presentation by using multimedia devices and identify theoretical and practical aspects in designing multimedia applications surrounding the emergence of multimedia technology.

**Course Code: SCIT 501**

**Course Name: WEB DESIGNING WITH HTML**

### **Course Objective**

The student will be able to

- Define the principle of Web page design
- Define the basics in web design
- Visualize the basic concept of HTML.
- Recognize the elements of HTML.
- Introduce basics concept of CSS.
- Develop the concept of web publishing

### **Course Outcome**

- Create local HTML pages and move them to a remote web server.
- Design and develop basic web pages using HTML and CSS.
- Use graphics in Web pages.
- Use tables in Web pages.
- Link pages so that they create a Web site.
- Design and develop web pages using CSS styles, internal and/or external style sheets.
- Design and develop web pages using CSS for layout.

**Course Code: 3IBCA601**

**Course Name: PHP, MYSQL**

### **Course Objective**

- To understand to develop web application using open source technologies
- To understand PHP scripting language and deploying application on Apache Web

Server

- To understand Apache Web Server configuration
- To understand MySQL database deployment for web applications Syllabus.

### **Course Outcome**

- After study this student will be able to understand the concept of Web Application Design and implementation. They will be able to identify the reason and importance of web application development and design.

**Course Code: 3IBCA602**

**Course Name: INFORMATION TECHNOLOGY TRENDS**

### **Course Objective**

- To understand the principles and vocabulary of Information Technology.
- To understand the mathematical principles underlying multimedia information technologies.
- To understand the questions about the social, economic, and political contexts in which IT exists
- To understand the cutting-edge technologies and trends such as those in the areas of wireless multimedia, computer security, digital audio, and high-performance computing.

### **Course Outcome**

After study this student will be able to know the

- Familiarity with the foundations of basic information technologies.
- The social, political and economic implications of IT.
- Understand the difference between analog and digital technologies.
- Understand how audio and images are digitized.

**Course Code: 3IBCA603**

**Course Name: EMBEDDED SYSTEMS**

### **Course Objective**

- Students have knowledge about the basic functions of embedded systems.
- Students have knowledge about the basic structure of embedded systems
- Students have knowledge about the basic concepts of embedded systems
- Students have knowledge about the applications of embedded systems

### **Course Outcome**

After completion of course students will be able to understand -

- 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.

**Course Code: 3IBCA604**

**Course Name: SOFTWARE ENGINEERING**

### **Course Objective**

This course introduces the concepts and methods required for the construction of large software intensive systems.

- It aims to develop a broad understanding of the discipline of software engineering
- It seeks to complement this with a detailed knowledge of techniques for the analysis and design of complex software intensive systems.
- It aims to set these techniques in an appropriate engineering and management context.
- It provides a brief account of associated professional and legal issues.

### **Course Outcomes**

- Carry out an evaluation and selection of projects against strategic, technical and economic criteria and use a variety of cost benefit evaluation techniques for choosing among competing project proposals. Approach project planning in an organized step by step manner and select an appropriate process model produce an activity plan for a project.
- Identify project risks, monitor and track project deadlines and produce a workplan and resource schedule. Plan the evaluation of a proposal or a product and manage people in software environments. Understand the importance of teamwork and quality management in software project management. Apply these project management tools and techniques in a diversity of fields such as new product and process development, construction, information technology, health care, and applied research.

**POST GRADUATE DIPLOMA IN COMPUTER  
APPLICATION (PGDCA – GENERAL)  
PROGRAMME CODE –03PGD001**

**PROGRAMME OBJECTIVE**

The objective of the programme is to develop computer skills to the students. This programme aimed towards building prospective career in the field of computer application. The programme is designed with the objective to provide knowledge and skills in the various aspects of computer application and core programming.

**PROGRAMME SPECIFIC OUTCOME**

The specific outcome of the programme is to achieve the well computer literates' and educated learners who will be able to become a member of the growth of information technology industries. Any learner can do so many things with the respect of their career in the field of computer science. The knowledge of computer also helps to qualify competitive exams to make their career in post like computer operator

**PROGRAMME OUTCOME**

- This program opens the opportunity for learners that come from any stream to learn a skill based subject. Learners can get initial knowledge of computer and can improve their skills.
- They can also work as computer operator or program developer in government or private sectors.
- This program provides competitive environment for the learners which enable to stand and complete themselves.
- The learners can also be able to prepare applications using computer language,

**Course Code: 4TPDC-101**

**Course Name: FUNDAMENTALS OF COMPUTERS & INFORMATION TECHNOLOGY**

**Course Objective**

Student will be able

- To understand the basic knowledge of computer
- To understand the assembly-level programming
- To understand the input output devices, storage media, memory.
- To understand the concept of Networking devices.

**Course Outcomes**

- After study this student will be able to know about terms and concepts of Fundamentals of Computers & Information Technology (hardware, software, networking, security, Internet/Web, and applications).

**Course Code: 4TPDC-102**

**Course Name: WINDOWS & MS OFFICE**

**Course Objective**

Student will be able

- To understand the basic knowledge of MS Windows.
- To understand the Office Packages.
- To understand the MS Excel.
- To understand the MS PowerPoint & Outlook Express.

**Course Outcomes**

- After studying this student will be able to know about terms and concepts of Microsoft suite completely (like MS-Word, Power-Point-Excel Sheets, Excel Chart)

**Course Code: 4TPDC-103**

**Course Name: DBMS WITH MS ACCESS**

**Course Objective**

Student will be able

- To understand the concept of Data Base Management.
- To understand the knowledge of Data base design.
- To develop the skills in MS Access programming.
- To understand the concept of Multi data files.

**Course Outcome**

- After study this student will be able to know about the core database administration tasks and tools. Restore databases from backups, Import and export data. Monitor SQL Server.

**Course Code: 4TPDC-104**

**Course Name: COMPUTER NETWORK & INTERNET**

**Course Objective**

Student will be able

- To understand the fundamental concepts of computer networking.
- To understand the basic taxonomy and terminology of the computer networking area.
- To understand the advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
- To understand the various transition method.

**Course Outcomes**

After study this student will be able to know about

- Independently understand basic computer network technology.

- Understand and explain Data Communications System and its components.
- Identify the different types of network topologies and protocols.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.

**Course Code: 4TPDC-105**

**Course Name: COMMUNICATION SKILLS & PERSONALITY DEVELOPMENT**

### **Course Objective**

Student will be able

- To Understand how to communicate effectively and appropriately in real-life situation.
- To use English effectively for study purpose across the curriculum.
- To develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking, Writing.

### **Course Outcomes**

- After study this student will be able to know about how to become active readers, what are the writing skills and process. What are the oral communication skills

**Course Code: 4TPDC-201**

**Course Name: OBJECTS ORIENTED PROGRAMMING WITH C++**

### **Course Objective**

Student will be able

- To understand the basic knowledge of opps with C++ language.
- To understand the Structure & classes concepts, data member.
- To understand the Array, Pointers operations.
- To understand the Function overloading & Operator Overloading.
- To understand the Inheritance & C++I/O system.

### **Course Outcome**

- After Study This Student Will Be Able to Know About And Concepts of OOPs with C++ Language, Classes. Student will be able to create Arrays Its uses, Uses of function overloading, inheritance & C++I/O system.

**Course Code: 4TPDC-202**

**Course Name: RDBMS AND SQL**

### **Course Objective**

Student will be able

- To understand the basic knowledge of DBMS Concepts.
- To understand the Database Design.

- To understand the RELATIONAL DATA MODEL.
- To understand the RELATIONAL DATABASE DESIGN.
- To understand the Indexing & Hashing-Basic Concepts & Recovery System.

### **Course Outcomes**

After study this student will be able to know about and concepts & Fundamentals of DBMS, Concept of keys, RELATIONAL DATA MODEL & design.

**Course Code: 4TPDC-203**

**Course Name: COMPUTERISED ACCOUNTING WITH TALLY**

### **Course Objective**

Student will be able

- To understand the concept of Financial Accounting
- To understand the knowledge about Tally.
- To develop and integrate the use of Accounting
- To understand Cheque Printing, Multi Account Printing etc.

### **Course Outcomes**

- After study, the student will be able to know about Accounting, Company, Company Features, Features of Company Accounting, Interest Calculation Transaction and Cheque Printing, Multi Account Printing

**Course Code: 4TPDC-204**

**Course Name: INTRODUCTION TO INTERNET & WEB TECHNOLOGY**

### **Course Objective**

- To understand the basic knowledge of computer
- To understand the assembly-level programming
- To understand the input output devices, storage media, memory
- To understand the concept of MIS, Networking devices

### **Course Outcome**

- After study this student will be able to know about programs based upon HTML and DHTML concepts, create animation & events based upon java script concepts, connect an application with database

**Course Code: 4TPDC 205**

**Course Name: PROGRAMMING WITH VB.NET**

### **Course Objective**

- The aim of the course is for the student to aim knowledge in the basic concepts of object-oriented programming and build skills to develop modern software programs

using the language Visual Basic. The course is also suitable for students with prior programming experience who wish to strengthen their knowledge in the area of object-oriented design and programming with Windows.

- Analyze program requirements
- Design/develop programs with GUI interfaces
- Code programs and develop interface using Visual Basic .Net
- Perform tests, resolve defects and revise existing code

### **Course Outcomes**

After the completion of the course, students are expected to:

- have gained a good understanding of the basic concepts of object orientation
- have a good understanding of the Visual Basic language structure and language syntax
- have developed the ability to design and develop interactive applications using the object-oriented principals, encapsulation, inheritance and to some extents polymorphism
- be able to effectively develop applications with full functionality and a graphical user interface using the language Visual Basic
- have the capability of analysing and finding suitable and effective solutions to Windows based applications using classes and objects

**POST GRADUATE DIPLOMA IN COMPUTER  
APPLICATION (PGDCA – PROFESSIONAL)  
PROGRAMME CODE –03PGD002**

**PROGRAMME OBJECTIVE**

The objective of the programme is to develop computer skills to the students. This programme aimed towards building prospective career in the field of computer application. The programme is designed with the objective to provide knowledge and skills in the various aspects of computer application and core programming.

**PROGRAMME SPECIFIC OUTCOME**

The specific outcome of the programme is to achieve the well computer literates' and educated learners who will be able to become a member of the growth of information technology industries. Any learner can do so many things with the respect of their career in the field of computer science. The knowledge of computer also helps to qualify competitive exams to make their career in post like computer operator

**PROGRAMME OUTCOME**

This program opens the opportunity for learners that come from any stream to learn a skill based subject. Learners can get initial knowledge of computer and can improve their skills. They can also work as computer operator or program developer in government or private sectors. This program provides competitive environment for the learners which enable to stand and complete themselves. The learners can also be able to prepare applications using computer language,

**Course Code: 4TPDC101**

**Course Name: FUNDAMENTALS OF COMPUTERS**

**Course Objective**

Student will be able

- Making the students understand and learn the basics of computer how it computes, to make familiar with the part and function of computer, its types , how to use computer, its characteristics, its usage, limitations and benefits etc.

**Course Outcomes**

- An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
- An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
- An ability to analyze the local and global impact of computing on individuals, organizations, and society.

**Course Code: 4TPDC102**

**Course Name: PC Package**

**Course Objective**

Student will be able

- To understand the basic knowledge of MS Windows.
- To understand the Office Packages.
- To understand the MS Excel.
- To understand the MS PowerPoint.

**Course Outcomes**

- Demonstrate the basic mechanics of creating Word documents, presentation and excel calculation for office use.
- Demonstrate introductory formatting techniques and presentation styles.
- Demonstrate working knowledge of producing a mail merge.
- Demonstrate the basic mechanics and navigation of an Excel spreadsheet.

**Course Code: 4TPDC103**

**Course Name: DBMS WITH MS ACCESS**

**Course Objective**

Student will be able

- To understand the concept of Data Base Management.
- To understand the knowledge of Data base design.
- To develop the skills in MS Access programming.
- To understand the concept of Multi data files.

**Course Outcome**

- After study this student will be able to know about the core database administration tasks and tools. Restore databases from backups, Import and export data. Monitor SQL Server.

**Course Code: 4TPDC104**

**Course Name: COMPUTER NETWORK & INTERNET**

**Course Objective**

Student will be able

- To understand the fundamental concepts of computer networking.
- To understand the basic taxonomy and terminology of the computer networking area.
- To understand the advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
- To understand the various transition method.

### **Course Outcomes**

After study this student will be able to know about

- Independently understand basic computer network technology.
- Understand and explain Data Communications System and its components.
- Identify the different types of network topologies and protocols.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.

**Course Code: 4TPDC105**

**Course Name: FINANCIAL ACCOUNTING AND MANAGEMENT CONTROL**

### **Course Objective**

Student will be able

- The objectives of the Course is to give exposure to the students, about fundamental accounting principles, techniques and their application in the business decision making process.
- The objective is to provide education about Tally software that is used for financial accounting.

### **Course Outcomes**

By the end of this course, students should be able to:

- State the use and users of accounting information.
- Explain and apply accounting concepts, principles and applications.
- Record basic accounting transactions and prepare annual financial statements.

**Course Code: 4TPDC201**

**Course Name: OPERATING SYSTEM**

### **Course Objective**

Student will be able

- To understand the basic knowledge of opps with C++ language.
- To understand the Structure & classes concepts, data member.
- To understand the Array, Pointers operations.
- To understand the Function overloading & Operator Overloading.
- To understand the Inheritance & C++I/O system.

### **Course Outcomes**

- Analyze the structure of OS and basic architectural components involved in OS design.
- Analyze and design the applications to run in parallel either using process or thread models of different OS.

- Analyze the various device and resource management techniques for timesharing and distributed systems.
- Understand the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system.
- Conceptualize the components involved in designing a contemporary OS.

**Course Code: 4TPDC202**

**Course Name: INTRODUCTION TO PAGE MAKER**

**Course Objective**

Student will be able

- The main objective of the Course is to enable learners to create and edit publications. The PageMaker course enables students to gain various skills required to design any publication.

**Course Outcomes**

- After completing this course students are able to design and layout their own publication or printing projects. They also have different skills to work in Print and Publication Industry.

**Course Code: 4TPDC203**

**Course Name: INTRODUCTION TO COREL DRAW AND ADOBE PHOTOSHOP**

**Course Objective**

Student will be able

- This course is intended to provide basic drawing skills to the learners using CorelDraw & Adobe Photoshop application programs so that they will be able to create logos, photos, graphics, designs, etc.

**Course Outcomes**

After completion of this course by the students, he/she would be able to:

- Design Artwork for print and publication.
- Design template for web.

**Course Code: 4TPDC204**

**Course Name: Computer accounting (Tally, Busy, Saral)**

**Course Objective**

- The objectives of the Course is to give exposure to the students, about fundamental accounting principles, techniques and their application in the business decision making process.

**Course Outcome**

- After learning this Course student will understand the fundamental principles and techniques of financial accounting so as to use these concepts for effective business decisions.
- Student learns about accounting software tally and their features.

**Course Code: 4TPDC205****Course Name: INTRODUCTION TO INTERNET & WEB TECHNOLOGY****Course Objective**

- To understand the basic knowledge of computer
- To understand the assembly-level programming
- To understand the input output devices, storage media, memory
- To understand the concept of MIS, Networking devices

**Course Outcome**

- After study this student will be able to know about programs based upon HTML and DHTML concepts, create animation & events based upon java script concepts, connect an application with database

## **MASTER OF SCIENCE (M. Sc – IT)**

### **PROGRAMME CODE –03PGR001**

#### **PROGRAM OBJECTIVE**

The objective of the Program is to develop skilled manpower in the various areas of information technology like:

- To prepare graduates who will be successful professionals in industry, government, academia, research, entrepreneurial pursuit and consulting firms. Students will demonstrate ability to conduct a research or applied Computer Science project, requiring writing and presentation skills which exemplify scholarly style in computer science.
- To prepare graduates who will contribute to society as broadly educated, expressive, ethical and responsible citizens with proven expertise
- To prepare graduates who will achieve peer-recognition; as an individual or in a team; through demonstration of good analytical, design and implementation skills
- To prepare graduates who will thrive to pursue life-long learning to fulfill their goals. Students will demonstrate a breadth of knowledge in computer science, as exemplified in the areas of systems, theory and software development.

#### **PROGRAM OUTCOME**

- An ability to use current techniques, skills, and tools necessary for computing practices.
- An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;
- An ability to apply design and development principles in the construction of software systems of varying complexity.

#### **PROGRAM SPECIFIC OUTCOMES**

The objectives are that, upon completion, the students will have developed:

- The ability to gather, organise and critically evaluate information needed to formulate and solve problems;
- The ability to apply acquired knowledge effectively and efficiently to all work in the relevant areas of Engineering;
- Skills in qualitative and quantitative oral and written communications designed to present essential scientific and technical concepts;
- Abilities in observation, measurement and the design and conduct of experiments through practical experience in the laboratory;
- The ability to display initiative and innovation, demonstrated in a major item of individual work;

- The ability to work collaboratively with others through the development of team skills;
- The ability to apply advanced techniques to problems at the frontiers of knowledge;
- A range of professional and management skills;
- A deep knowledge and advanced understanding in specialist areas;
- An awareness of research methodology.

**Course Code: 6IMIT101**

**Course Name: FUNDAMENTALS OF COMPUTERS & MS OFFICE**

### **Course Objective**

Student will be able

- To understand the basic knowledge of computer
- To understand the Number System
- To understand the Computer Virus and Internet
- To understand the concept of Storage devices.
- To understand about software as well as hardware.
- To understand the basic knowledge of MS Windows.
- To understand the Office Packages.
- To understand the MS Excel.

### **Course Outcomes**

- An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
- An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
- An ability to analyze the local and global impact of computing on individuals, organizations, and society.
- Demonstrate the basic mechanics of creating Word documents, presentation and excel calculation for office use.

**Course Code: 6IMIT102**

**Course Name: PROGRAMMING METHODOLOGY & PROGRAMMING IN C**

### **Course Objective**

Student will be able

- To understand the basic knowledge of programming concepts.
- To understand the C language & its concepts.
- To understand the basic concept of programming and develop the programming skills.

### **Course Outcome**

- After learning this paper, the student would be able to understand the concept of

programming language, all about C language, its features, uses and working principles.

**Course Code: 6IMIT103**

**Course Name: COMPUTER NETWORKS & INTERNET**

### **Course Objective**

Student will be able

- To understand the fundamental concepts of computer networking.
- To understand the basic taxonomy and terminology of the computer networking area.
- To understand the advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
- To understand the various transition method.

### **Course Outcome**

After study this student will be able to know about

- Independently understand basic computer network technology.
- Understand and explain Data Communications System and its components.
- Identify the different types of network topologies and protocols.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.

**Course Code: 6IMIT104**

**Course Name: DIGITAL ELECTRONICS & LOGIC DESIGN**

### **Course Objective**

Student will be able

- To understand the overview of the principles, operation and application of the analog building blocks like diodes, BJT, FET etc for performing various functions.
- To understand the overview of amplifiers, feedback amplifiers and oscillators.
- To understand the knowledge on existing on future analog circuits, Registers, Circuits

### **Course Outcome**

After study this student will be able to know about

- Knowledge in the field of solid state materials.
- To analyze the structure of different types of semiconductor crystal structures.
- Know the intrinsic property of semiconductor materials.
- Idea about the equilibrium and non equilibrium states of semiconductors.
- The complete internal structure of PN junction including different.

**Course Code: 6IMIT201**

**Course Name: OBJECTS ORIENTED PROGRAMMING WITH C++**

### **Course Objective**

Student will be able

- To understand the basic knowledge of opps with C++ language.
- To understand the concept of data abstraction and encapsulation.
- To learn how inheritance and virtual functions implement dynamic binding with polymorphism.
- To understand the Structure & classes concepts, data member.
- To understand the Array, Pointers operations.
- To understand the Function overloading & Operator Overloading.
- To understand the Inheritance & C++I/O system.

### **Course Outcome**

- After Study This Student Will Be Able To Know About And Concepts of OOPs with C++ Language, Classes. Student will be able to create Arrays Its uses, Uses of function overloading, inheritance & C++I/O system.

**Course Code: 6IMIT202**

**Course Name: DBMS & SQL**

### **Course Objective**

Student will be able

- To understand the basic knowledge of DBMS Concepts.
- To understand the Database Design.
- To understand the RELATIONAL DATA MODEL.
- To understand the RELATIONAL DATABASE DESIGN.
- To understand the Indexing & Hashing-Basic Concepts & Recovery System.

### **Course Outcome**

- After study this student will be able to know about and concepts & fundamentals of DBMS, Concept of keys, RELATIONAL DATA MODEL& design. Student will also able to create table and implement commands.

**Course Code: 6IMIT203**

**Course Name: DATA STRUCTURE**

### **Course Objective**

Student will be able

- To understand the basic knowledge of data structure.
- To understand the Abstract data type concepts.
- To understand the Linked List & its Basic operations.
- To understand the Basic Terminology of TREES.
- To understand the Analysis of algorithm & Introduction to graphs.

### **Course Outcome**

- After study this student will be able to know about the concepts of Data Structure Using C++ Language, List & Its Operations Concept Of Tree, Algorithm & Graphs Design.

**Course Code: 6IMIT204**

**Course Name: OPERATING SYSTEMS**

### **Course Objective**

Student will be able

- To develop the understanding of functioning of Operating System.
- To understand the Process Concepts, process state & process control
- To understand the Critical Section Problem
- To understand the Contiguous Allocating, Paging
- To understand the Disk Scheduling, Disk Management

### **Course Outcome**

- After Study this student will be able to know about functioning of Operating System. To make students able to learn different types of operating systems along with concept of file systems and CPU scheduling algorithms used in operating system.
- To provide students knowledge of memory management and deadlock handling algorithms. At the end of the course, students will be able to implement various algorithms required for management, scheduling, allocation and communication used in operating system.

**Course Code: SCMIT 201**

**Course Name: WEB DEVELOPMENT**

### **Course Objective**

- To understand to develop web application using open source technologies
- To understand XML scripting language and deploying application on Apache Web Server
- To understand Web Server configuration
- To understand MySQL database deployment for web applications.

### **Course Outcome**

- After study this student will be able to understand the concept of Web Application Design and implementation. They will be able to identify the reason and importance of web application development and design.

**Course Code: 6IMIT301**

**Course Name: PROGRAMMING WITH VB.NET**

### **Course Objective**

Student will be able-

- The aim of the course is for the student to gain knowledge in the basic concepts of object-oriented programming and build skills to develop modern software programs using the language Visual Basic. The course is also suitable for students with prior programming experience who wish to strengthen their knowledge in the area of object-oriented design and programming with Windows.
- Analyze program requirements
- Design/develop programs with GUI interfaces
- Code programs and develop interface using Visual Basic .Net 5. Perform tests, resolve defects and revise existing code.

### **Course Outcome**

After the completion of the course, students are expected to:

- Have gained a good understanding of the basic concepts of object orientation
- Have a good understanding of the visual basic language structure and language syntax
- Have developed the ability to design and develop interactive applications using the object-oriented principals, encapsulation, inheritance and to some extent polymorphism
- Be able to effectively develop applications with full functionality and a graphical user interface using the language visual basic
- Have the capability of analysing and finding suitable and effective solutions to windows based applications using classes and objects

**Course Code: 6IMIT302**

**Course Name: JAVA PROGRAMMING**

### **Course Objective**

Student will be able

- To understanding the JAVA environment.
- To understand the basic concept of oops with java techniques.
- To understand the Classes and its parts of programming
- To understand the Applets and other concept of java.

### **Course Outcome**

- Students will complete software projects comprised of an object-oriented design, implementation, and test plan.
- Designs will demonstrate the use of good object-oriented design principles including encapsulation and information hiding.
- The implementation will demonstrate the use of a variety of basic control structures including selection and repetition; classes and objects in a tiered architecture (user interface, controller, and application logic layers); primitive and reference data types including composition; basic AWT components; file-based I/O; and one-dimensional arrays.

- Test plans will include test cases demonstrating both black box and glass box testing strategies.

**Course Code: 6IMIT303(A)**

**Course Name: A. SOFTWARE ENGINEERING**

### **Course Objective**

Student will be able-

- To understanding the concepts and methods required for the construction of large software intensive systems.
- To develop a broad understanding of the discipline of software engineering.
- To understanding the detailed knowledge of techniques for the analysis and design of complex software intensive systems.
- To understanding the techniques in an appropriate engineering and management context.
- To understanding the brief account of associated professional and legal issues.

### **Course Outcome**

After study this student will be able to

- Carry out an evaluation and selection of projects against strategic, technical and economic criteria and use a variety of cost benefit evaluation techniques for choosing among competing project proposals. Approach project planning in an organized step by step manner and select an appropriate process model produce an activity plan for a project.
- Identify project risks, monitor and track project deadlines and produce a work plan and resource schedule.
- Plan the evaluation of a proposal or a product and manage people in software environments. Understand the importance of teamwork and quality management in software project management. Apply these project management tools and techniques in a diversity of fields such as new product and process development, construction, information technology, healthcare, and applied research.

**Course Code: 6IMIT303(B)**

**Course Name: B. COMPUTER ARCHITECTURE**

### **Course Objective**

Student will be able

- To understand the lower level abstraction of a computer system including digital logic, instruction set and assembly language programming.
- To understand data representation, logic gates, simplification of logical expressions, design and analysis of simple combinational circuit such as decoders and multiplexers.
- To understand the working of flip-flops and registers, design and analysis of simple synchronous sequential circuit, random-access and read-only memories, instruction

set architecture and programming in assembly language.

### **Course Outcomes**

- An ability to perform computer arithmetic operations.
- An ability to understand control unit operations.
- An ability to design memory organization that uses banks for different word size operations.
- An ability to understand the concept of cache mapping techniques.
- An ability to understand the concept of I/O organization.
- An ability to conceptualize instruction level parallelism.

**Course Code: 6IMIT304(A)**

**Course Name: A. COMPILER DESIGN**

### **Course Objective**

Student will be able-

- To introduce the major concept areas of language translation and compiler design.
- To enrich the knowledge in various phases of compiler and its use, code optimization techniques, machine code generation, and use of symbol table.
- To extend the knowledge of parser by parsing LL parser and LR parser.
- To provide practical programming skills necessary for constructing a compiler.

### **Course Outcome**

- To apply the knowledge of lex tool & yacc tool to develop a scanner & parser.
- To design & conduct experiments for Intermediate Code Generation in compiler.
- To design & implement a software system for backend of the compiler.
- To deal with different translators.
- To develop program to solve complex problems in compiler.
- To learn the new code optimization techniques to improve the performance of a program in terms of speed & space.
- To acquire the knowledge of modern compiler & its features.
- To learn & use the new tools and technologies used for designing a compiler.

**Course Code: 6IMIT304(B)**

**Course Name: B. ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM**

### **Course Objective**

Student will be able-

- To understanding the importance of AI and puzzle problem.
- To understanding the Search Techniques.
- To understanding the Symbolic and Statistical Reasoning.
- To understanding the frames and Structural Knowledge Representation.

- To understanding the expert system life cycle.

### **Course Outcome**

- After study this student will be able to know about the AI with search algorithm and expert system with life cycle.

**Course Code: 6IMIT304(C)**

**Course Name: C. DATA WAREHOUSING & MINING**

### **Course Objective**

Students will be able

- To understand the scope and necessity of Data Mining & Warehousing for the society.
- To understand the designing of Data Warehousing so that it can be able to solve the root problems.
- To understand various tools of Data Mining and their techniques to solve the real time problems.
- To develop ability to design various algorithms based on data mining tools.

### **Course Outcome**

After study this student will be able to know about the

- Process raw data to make it suitable for various data mining algorithms.
- Discover and measure interesting patterns from different kinds of databases.
- Apply the techniques of clustering, classification, association finding, feature selection and visualization to real world data.

**Course Code: SCMIT 301**

**Course Name: LINUX**

### **Course Objective**

Student will be able

- To introduce the internals of Linux Operating System.
- To develop, debug and implement Shell program.
- To understand System administration.
- To understand configuration of Proxy Server
- To Installation, configuration and managing a simple LAN within an organization using Linux.

### **Course Outcome**

- After Study This Student Will Be Able To Know About Basic Features, Different flavors of Linux. Advantages, Installing. Student will know about Processes in Linux, Shell programming & Gnome graphical interfaces.

**Course Code: 6IMIT401**

**Course Name: SOFT COMPUTING**

### **Course Objective**

Students will be able

- Fundamental concepts used in Soft computing. The concepts of Fuzzy logic (FL) will be covered first, followed by Artificial Neural Networks (ANNs) and optimization techniques using Genetic Algorithm (GA). Applications of Soft Computing techniques to solve a number of real life problems will be covered to have hands on practices. In summary, this course will provide exposure to theory as well as practical systems and software used in soft computing.

### **Course Outcome**

- Fuzzy logic and its applications
- Artificial neural networks and its applications.
- Solving single-objective optimization problems using GAs.
- Solving multi-objective optimization problems using Evolutionary algorithms (MOEAs).
- Applications of Soft computing to solve problems in varieties of application domains.

**Course Code: 6IMIT402**

**Course Name: ADVANCED JAVA PROGRAMMING**

### **Course Objective**

Student will be able

- To understanding the JAVA environment.
- To understand the Applets and applications.
- To understand the Java packaging
- To understand the Socket Programming
- To understand the AWT.

### **Course Outcome**

- Students will complete software projects comprised of an object-oriented design, implementation, and test plan.
- Designs will demonstrate the use of good object-oriented design principles including encapsulation and information hiding.
- The implementation will demonstrate the use of a variety of basic control structures including selection and repetition; classes and objects in a tiered architecture (user interface, controller, and application logic layers); primitive and reference data types including composition; basic AWT components; file based I/O; and one-dimensional arrays.

- Test plans will include test cases demonstrating both black box and glass box testing strategies.

**Course Code: 6IMMAT401**

**Course Name: NUMERICAL METHODS**

**Course Objective:**

Student will be able

- The aim is to teach the student various topics in Numerical Analysis such as solutions of nonlinear equations in one variable, interpolation and approximation, numerical differentiation and integration, direct methods for solving linear systems, numerical solution of ordinary differential equations.

**Course Outcome**

- Knowledge and Understanding: Students are able to understand the nature and operations of Numerical Analysis, demonstrate familiarity with theories and concepts used in Numerical Analysis and identify the steps required to carry out a piece of research on a topic in Numerical Analysis, derivation of the Numerical Methods, studying their convergence rate and performance, applicability of the methods on different test examples.
- Intellectual Skills: By the end of the course the student is expected to solve real-life and Engineering applications reflecting the student ability to:
  - Recognize and apply appropriate theories, principles and concepts relevant to Numerical Analysis.
  - Critically assess and evaluate the literature within the field of Numerical Analysis.
  - Analyze and interpret information from a variety of sources relevant to Numerical Analysis.
- Practical Skills: By the end of the course student will have the ability to compare the computational methods for advantages and drawback, choose the suitable computational method among several existing methods, implement the computational methods using any of existing programming languages, test such methods and compare between them, identify the suitable computational technique for a specific type of problems and develop the computational method that is suitable for the underlying problem.
- Transferable Skills: Within the lectures the student is able to transfer ideas and experience Numerical Analysis Techniques, work effectively both in a team and independently, apply the best computational methods to solve real-life and Engineering applications via computational packages such as MATLAB or Mathematica and develop his ability to self appraise and reflect on practice relevant to Numerical Analysis.

## **MASTER OF SCIENCE (M. Sc – CS)**

### **PROGRAMME CODE –03PGR002**

#### **PROGRAMME OBJECTIVE**

The objective is to provide computer education added to core and advance subject of computer science with innovative learning facilities to the learners of rural and tribal backgrounds. We provide innovative computer knowledge to the learners which enhance the personality and help to develop professionals in the field of CS. This program also develops the knowledge of programming and networking skills to the learners. The learners also have the knowledge of both theoretical and practical aspect of computer.

#### **PROGRAMME SPECIFIC OUTCOME**

The specific outcome of the programme is to provide knowledge of different programming languages, this helps to develop software professional and also achieve the well computer literates' and educated learners who will be able to become a member of the growth of information technology industries.

#### **PROGRAMME OUTCOME**

- This programme gives the opportunity to work in computer science industry for development of software and software testing.
- It also able to learners for finding various jobs like database administrators, software professionals, system analyst in government as well as in private sectors.
- This programme provides competitive environment for the learners which enable to stand and compete themselves.
- This programme provides specialization in the field of research like data mining, soft computing, software engineering, advance network etc.

**Course Code: 6IMMA101**

**Course Name: DISCRETE MATHEMATIC STRUCTURE**

#### **Course Objective**

Student will be able

- To understand the Use mathematically corrects terminology and notation.
- To construct correct direct and indirect proofs.
- To use division into cases in a proof.
- To apply logical reasoning to solve a variety of problems.

#### **Course Outcome**

- After study this student will be able to know about some fundamental mathematical concepts and terminology, how to use and analyse recursive definitions, how to count

some different types of discrete structures, techniques for constructing mathematical proofs, illustrated by discrete mathematics examples.

**Course Code: 6IMCS101**

**Course Name: PROGRAMMING IN C**

**Course Objective**

Student will be able

- To understand the basic knowledge of programming concepts.
- To understand the C language & its concepts.
- To understand the basic concept of programming and develop the programming skills.

**Course Outcome**

- After study this student will be able to know about the concepts of C Programming. Student will also know about how to design program.

**Course Code: 6IMCS102**

**Course Name: COMPUTER ORGANIZATION & ARCHITECTURE**

**Course Objective**

Student will be able

- To introduce basics of digital logic circuits design and Computer Organization.
- To understand the Input-Output Organizations.
- To understand the Memory Organization.

**Course Outcome**

- After study this student will be able to know about digital logic circuits design and Computer Organization. Students will also able to understand about the logic gates and different types of adders and subtractors.

**Course Code: 6IMCS103**

**Course Name: FUNDAMENTALS OF COMPUTERS & MS OFFICE**

**Course Objective**

Student will be able

- To understand the basic knowledge of computer
- To understand the Number System
- To understand the Computer Virus and Internet
- To understand the concept of Storage devices.
- To understand about software as well as hardware.
- To understand the basic knowledge of MS Windows.
- To understand the Office Packages.
- To understand the MS Excel.
- To understand the MS PowerPoint.

### **Course Outcomes**

- An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
- An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
- An ability to analyze the local and global impact of computing on individuals, organizations, and society.
- Demonstrate the basic mechanics of creating Word documents, presentation and excel calculation for office use.

**Course Code: 6IMCS201**

**Course Name: DATA STRUCTURES & ALGORITHMS**

### **Course Objective**

Student will be able

- To understand the basic knowledge of data structure.
- To understand the Abstract data type concepts.
- To understand the Linked List & its Basic operations.
- To understand the Basic Terminology of TREES.
- To understand the Analysis of algorithm & Introduction to graphs.

### **Course Outcome**

- After study this student will be able to know about the concepts of Data Structure Using C++ Language, List & Its Operations Concept Of Tree, Algorithm & Graphs Design. Students will also know about the sorting and searching.

**Course Code: 6IMCS202**

**Course Name: OPERATING SYSTEM**

### **Course Objective**

Student will be able

- To develop the understanding of functioning of Operating System.
- To understand the Process Concepts, process state & process control.
- To understand the Critical Section Problem.
- To understand the Contiguous Allocating, Paging.
- To understand the Disk Scheduling, Disk Management.

### **Course Outcome**

- After Study This Student Will Be Able To Know About functioning of Operating System. To make students able to learn different types of operating systems along with concept of file systems and CPU scheduling algorithms used in operating

system.

- To provide students knowledge of memory management and deadlock handling algorithms.
- At the end of the course, students will be able to implement various algorithms required for management, scheduling, allocation and communication used in operating system.

**Course Code: 6IMCS203**

**Course Name: DBMS & SQL**

### **Course Objective**

Student will be able

- To understand the basic knowledge of DBMS Concepts.
- To understand the Database Design.
- To understand the RELATIONAL DATA MODEL.
- To understand the RELATIONAL DATABASE DESIGN.
- To understand the Indexing & Hashing-Basic Concepts & Recovery System.

### **Course Outcome**

- After study this student will be able to know about and concepts & fundamentals of DBMS, Concept of keys, RELATIONAL DATA MODEL & design. Student will also able to create table and implement commands.

**Course Code: 6IMCS204**

**Course Name: OBJECTS ORIENTED PROGRAMMING WITH C++**

### **Course Objective**

Student will be able

- To understand the basic knowledge of opps with C++ language.
- To understand the concept of data abstraction and encapsulation.
- To learn how inheritance and virtual functions implement dynamic binding with polymorphism.
- To understand the Structure & classes concepts, data member.
- To understand the Array, Pointers operations.
- To understand the Function overloading & Operator Overloading.
- To understand the Inheritance & C++I/O system.

### **Course Outcome**

- After Study This Student Will Be Able to Know About And Concepts of OOPs with C++ Language, Classes. Student will be able to create Arrays Its uses, Uses of function overloading, inheritance & C++I/O system.

**Course Code: SCMIT 201**

**Course Name: WEB DEVELOPMENT**

**Course Objective**

- To understand to develop web application using open source technologies.
- To understand XML scripting language and deploying application on Apache Web Server.
- To understand Web Server configuration.
- To understand MySQL database deployment for web applications.

**Course Outcome**

- After study this student will be able to understand the concept of Web Application Design and implementation. They will be able to identify the reason and importance of web application development and design.

**Course Code: 6IMCS301**

**Course Name: PROGRAMMING IN PYTHON**

**Course Objective**

Student will be able-

- Upon successfully completing this course, students will be able to “do something useful with Python”.
- Identify/characterize/define a problem
- Design a program to solve the problem
- Create executable code
- Read most Python code
- Write basic unit tests

**Course Outcome**

Upon completion of the course, students will be able to:

- Write, test, and debug simple Python programs.
- Implement Python programs with conditionals and loops.
- Develop Python programs step-wise by defining functions and calling them.
- Use Python lists, tuples, dictionaries for representing compound data.
- Read and write data from/to files in Python.

**Course Code: 6IMCS302A**

**Course Name: A. COMPUTER NETWORKS WITH WINDOWS NT**

**Course Objective**

Student will be able

- To understand the fundamental concepts of computer networking.
- To understand the basic taxonomy and terminology of the computer networking area.
- To understand the advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
- To understand the various transition method.

### **Course Outcome**

After study this student will be able to know about

- Independently understand basic computer network technology.
- Understand and explain Data Communications System and its components.
- Identify the different types of network topologies and protocols.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.

**Course Code: 6IMCS302B**

**Course Name: B. ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM**

### **Course Objective**

Student will be able-

- To understanding the importance of AI and puzzle problem.
- To understanding the Search Techniques.
- To understanding the Symbolic and Statistical Reasoning.
- To understanding the frames and Structural Knowledge Representation.
- To understanding the expert system life cycle.

### **Course Outcome**

- After study this student will be able to know about the AI with search algorithm and expert system with life cycle.

**Course Code: 6IMCS302C**

**Course Name: C. RESEARCH METHODOLOGY**

### **Course Objective**

- The students will be able to understand the principles of research and enable students to link the research process with theories of their specialist areas.

### **Course Outcome**

- After completing this course the students should be able to understand the principles of research and enable students to link the research process with theories of their specialist area.

**Course Code: 6IMCS303A**

**Course Name: A. SOFTWARE ENGG.**

### **Course Objective**

Student will be able-

- To understanding the concepts and methods required for the construction of large software intensive systems.
- To develop a broad understanding of the discipline of software engineering.
- To understanding the detailed knowledge of techniques for the analysis and design of complex software intensive systems.
- To understanding the techniques in an appropriate engineering and management context.
- To understanding the brief account of associated professional and legal issues.

### **Course Outcome**

- Carry out an evaluation and selection of projects against strategic, technical and economic criteria and use a variety of cost benefit evaluation techniques for choosing among competing project proposals. Approach project planning in an organized step by step manner and select an appropriate process model produce an activity plan for a project.
- Identify project risks, monitor and track project deadlines and produce a work plan and resource schedule.
- Plan the evaluation of a proposal or a product and manage people in software environments. Understand the importance of teamwork and quality management in software project management. Apply these project management tools and techniques in a diversity of fields such as new product and process development, construction, information technology, health care, and applied research.

**Course Code: 6IMCS303B**

**Course Name: B. MULTIMEDIA TOOLS & APPLICATION**

### **Course Objective**

Student will be able-

- To understand the multimedia communication standards and compression techniques.
- To understand the foundation knowledge of multimedia computing, e.g. media characteristics, compression standards, multimedia representation, data formats, multimedia technology development.
- To understand the programming training in multimedia computing, multimedia system design and implementations. To learn the Multimedia communication across the networks.

**Course Outcome**

After study this student will be able to

- To understand about various latest interactive multimedia devices, the basic concepts about images and image formats.
- To understand about data compression techniques, image compression techniques like JPEG, video compression techniques like MPEG, and the basic concepts about animation.
- To develop an interactive multimedia presentation by using multimedia devices and identify theoretical and practical aspects in designing multimedia applications surrounding the emergence of multimedia technology.

**Course Code: 6IMCS303C**

**Course Name: C. DATA WAREHOUSING & MINING**

**Course Objective**

Students will be able

- To understand the scope and necessity of Data Mining & Warehousing for the society.
- To understand the designing of Data Warehousing so that it can be able to solve the root problems.
- To understand various tools of Data Mining and their techniques to solve the real time problems.
- To develop ability to design various algorithms based on data mining tools.

**Course Outcome**

After study this student will be able to know about the

- Process raw data to make it suitable for various data mining algorithms.
- Discover and measure interesting patterns from different kinds of databases.
- Apply the techniques of clustering, classification, association finding, feature selection and visualization to real world data.

**Course Code: 6IMCS304**

**Course Name: JAVA PROGRAMMING**

**Course Objective**

Student will be able

- To understand the general concepts pertaining to the Internet and World Wide Web.
- To have a good working knowledge of HTML, CSS and JavaScript and the principles of website design.
- To know different Web Designing Tools, how web hosting and publishing done
- To understand JavaScript, Electronic Commerce, Electronic Payment System and electronic security.

- To understanding the JAVA environment.
- To understand the basic concept of oops with java techniques.
- To understand the Classes and its parts of programming
- To understand the Applets and other concept of java.

### **Course Outcome**

- Students will complete software projects comprised of an object-oriented design, implementation, and test plan.
- Designs will demonstrate the use of good object-oriented design principles including encapsulation and information hiding.
- The implementation will demonstrate the use of a variety of basic control structures including selection and repetition; classes and objects in a tiered architecture (user interface, controller, and application logic layers); primitive and reference data types including composition; basic AWT components; file based I/O; and one-dimensional arrays.
- Test plans will include test cases demonstrating both black box and glass box testing strategies.

**Course Code: SCMIT 301**

**Course Name: LINUX**

### **Course Objective**

Student will be able

- To introduce the internals of Linux Operating System.
- To develop, debug and implement Shell program.
- To understand System administration.
- To understand configuration of Proxy Server.
- To Installation, configuration and managing a simple LAN within an organization using Linux.

### **Course Outcome**

After Study This Student Will Be Able to Know About Basic Features, Different flavors of Linux. Advantages, Installing. Student will know about Processes in Linux, Shell programming & Gnome graphical interfaces.

**Course Code: 6IMCS402**

**Course Name: COMPILER DESIGN**

### **Course Objective**

Student will be able

- To understand the general concepts pertaining to the Compiler Design.
- To have a good working knowledge of Parsers.

**Course Outcome**

After Study This Student Will Be Able To Know About Basic Features, and concept of compiler designing and working.

**Course Code: : 6IMCS403**

**Course Name: ASP.NET & C#**

**Course Objective**

Student will be able-

- To understand the basic concepts of object-oriented programming and build skills to develop modern software programs using the language Visual Basic. The course is also suitable for students with prior programming experience who wish to strengthen their knowledge in the area of object-oriented design and programming with Windows.
- To understand the analyze program requirements
- To understand the design/develop programs with GUI interfaces
- To understand the code programs and develop interface using Visual Basic .Net
- To understand the perform tests, resolve defects and revise existing code.

**Course Outcome**

After the completion of the course, students are expected to:

- To design web applications using ASP .NET .
- Successful students will be able to use ASP.NET controls in web applications.
- Successful students will be able to debug and deploy ASP.NET web applications.
- Successful students will be able to create database driven ASP.NET web applications and web services.

**Course Code: 6IMCS404**

**Course Name: SOFT COMPUTING**

**Course Objective**

Students will be able-

- Fundamental concepts used in Soft computing. The concepts of Fuzzy logic (FL) will be covered first, followed by Artificial Neural Networks (ANNs) and optimization techniques using Genetic Algorithm (GA). Applications of Soft Computing techniques to solve a number of real life problems will be covered to have hands on practices. In summary, this course will provide exposure to theory as well as practical systems and software used in soft computing.

**Course Outcome**

- Fuzzy logic and its applications.
- Artificial neural networks and its applications.
- Solving single-objective optimization problems using GAs.
- Solving multi-objective optimization problems using Evolutionary algorithms

(MOEAs).

- Applications of Soft computing to solve problems in varieties of application domains.

## **DOCTOR OF PHILOSOPHY (Ph. D – CS)**

### **PROGRAMME CODE – PH.D001**

#### **PROGRAMME OBJECTIVE**

The structure of the Ph. D. (CS) course is designed to produce post graduates as well as M. Phil. with rigorous research and analytical skills, who are exceptionally well-equipped to go onto post doctoral research , or employment in industry and the public service. The Ph. D. (CS) course provides:

- Skills to enable the student to critically examine the background literature relevant to their specific research area.
- An environment that encourages the student's originality and creativity in their research.
- A period of sustained in-depth study of a specific topic.
- Publishing the results of their research in high-profile scientific journals, through constructive feedback of written work and oral presentations.

#### **PROGRAMME SPECIFIC OUTCOME**

- This programme is able to demonstrate originality in the application of knowledge, together with a practical understanding of how research and enquiry are used to create and interpret knowledge in their field.
- This programme is an achievement and a significant for students piece of research.
- This programme is able to act autonomously in the planning and implementation of research.
- This programme have gained oral presentation and scientific writing skills.

#### **PROGRAMME OUTCOME**

- This programme have a thorough knowledge of the literature and a comprehensive understanding of scientific methods and techniques applicable to their own research.
- This programme develops the ability to critically evaluate current research and research techniques and methodologies.
- This programme opens the opportunity for the post graduation students in respective stream to start research work in the interesting area which will be helpful for society.
- This programme creates self-direction and originality in tackling and solving problems

**Course Code: 5020112801**

**Course Name: Research Methodology**

#### **Course Objective**

- Objective of the course to enable Ph. D. scholar to understand the methods of research & different computer application in research and apply the knowledge

and skills in conducting research work.

### **Course Outcome**

- After learning this scholar will be able to understand the concept and process of research and will be able to carry out their research work effectively considering the ethics of research for usefulness of society.

**Course Code: 5020152801**

**Course Name: Advanced Computer Technology and Trends**

### **Course Objective**

- The objective of imparting quality and creative research with an in-depth understanding and integrated knowledge of advanced applicable theory in the field of computer science. It also provides the knowledge of new methodology and tools to develop the innovative models which will be beneficial for academic, industries and society.

### **Course Outcome**

After course study a researcher

- Can be able to communicate complex and advanced theories and results to different audiences
- Can be able to handle complex academic issues and to challenge established knowledge and practice in the specialization.
- Can be able to evaluate method and analysis tools for research development

**Course Code: 5020152802**

**Course Name: Data Warehousing and Knowledge Discovery**

### **Course Objective**

- To introduce the concept of data Mining as an important tool for enterprise data management and as a cutting edge technology for building competitive advantage
- To enable students to effectively identify sources of data and process it for data mining.
- To make students well versed in all data mining algorithms, methods of evaluation.
- To impart knowledge of tools used for data mining.

### **Course Outcome**

- Demonstrate an understanding of the importance of data mining and the principles of business intelligence
- Organize and Prepare the data needed for data mining using preprocessing techniques
- Perform exploratory analysis of the data to be used for mining.

- Implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on large data sets.
- Define and apply metrics to measure the performance of various data mining algorithms.
- Apply BI to solve practical problems : Analyze the problem domain, use the data collected in enterprise apply the appropriate data mining technique, interpret and visualize the results.

**Course Code: 5020152803**

**Course Name: Artificial Intelligent and Machine Learning**

### **Course Objective**

- Understanding the basic concept of AI and machine learning
- Understand the concepts of concept of Artificial Neural Network.
- Study about various supervised and unsupervised learning for classification and pattern reorganization.
- Understanding the concept of different feature selection and feature optimization techniques.

### **Course Outcome**

On completion of the course students will be expected to:

- Understanding of the fundamental issues and challenges of *AI and machine learning*: like their applications , problem solving methods and complexity.
- Understanding the concept artificial neural network and its application in different areas
- Understanding of the strengths and weaknesses of many popular supervised and approaches with different feature selection and feature optimization techniques.

**Course Code: 5020152804**

**Course Name: Network Security**

### **Course Objective**

- This course will cover a wide range of topics to prepare you for the network security issues. The goal of this course is to teach how to encrypt a message using any particular encryption method. This course also covers the private and public key cryptography to encrypt and decrypt the message. It also provides IP and web security protocol for authentication of users.

### **Course Outcome**

After competition of this course students are able:

- To understand how to achieve the security issues to protect the information from unauthorized person.
- To understand the concept of working of different types of keys.
- To understand the concept of IP and security protocols.

- To understand the concept of firewall, IDS and malicious software.

**Course Code: 5020152805**

**Course Name: Parallel Processing**

**Course Objective**

- The course is intended for knowledge and skills necessary for successful start of professional activity in the domain of parallel programming. A distinctive feature of the course is its integrity. The course provides necessary theoretical knowledge in the domain of parallel calculations. The course can be used as an introduction to parallel processing, pipelining and vector processing, functions of multiprocessors and knowledge of parallel algorithms on array processors.

**Course Outcome**

The course will acquire the following knowledge for students:

- Understanding parallel algorithms implementation for solution of standard problems of computational mathematics (matrix calculations, sorting, graph processing, optimization).
- Analysis and decomposition of calculations into parts, that allows concurrent processing.
- Understanding the functionality of multiprocessor architecture.

**Course Code: 5020112802**

**Course Name: Research and Publication Ethics**

**Course Objective**

- The objective of the course is to enable the Ph.D. scholar to understand about the publication ethics and publication misconduct and to create the awareness.

**Course Outcome**

- After learning this Course scholars will be able to understand the concepts and process of research and aware about the publication ethics and publication misconduct.

# **DOCTOR OF PHILOSOPHY (Ph. D – IT)**

## **PROGRAMME CODE – PH.D001**

### **PROGRAMME OBJECTIVE**

The structure of the Ph. D. (IT) course is designed to produce post graduates as well as M. Phil. with rigorous research and analytical skills, who are exceptionally well-equipped to go onto post doctoral research , or employment in industry and the public service. The Ph. D. (IT) course provides:

- Skills to enable the student to critically examine the background literature relevant to their specific research area.
- An environment that encourages the student's originality and creativity in their research.
- A period of sustained in-depth study of a specific topic.
- Publishing the results of their research in high-profile scientific journals, through constructive feedback of written work and oral presentations.

### **PROGRAMME SPECIFIC OUTCOME**

- This programme is able to demonstrate originality in the application of knowledge, together with a practical understanding of how research and enquiry are used to create and interpret knowledge in their field.
- This programme is an achievement and a significant for students piece of research.
- This programme is able to act autonomously in the planning and implementation of research.
- This programme have gained oral presentation and scientific writing skills.

### **PROGRAMME OUTCOME**

- This programme has a thorough knowledge of the literature and a comprehensive understanding of scientific methods and techniques applicable to their own research.
- This programme develops the ability to critically evaluate current research and research techniques and methodologies.
- This programme opens the opportunity for the post graduation students in respective stream to start research work in the interesting area which will be helpful for society.
- This programme creates self-direction and originality in tackling and solving problems.

**Course Code: 5010112601**

**Course Name: Research Methodology**

### **Course Objective**

- Objective of the course to enable Ph. D. scholar to understand the methods of research & different computer application in research and apply the knowledge and skills in conducting research work.

### **Course Outcome**

- After learning this scholar will be able to understand the concept and process of research and will be able to carry out their research work effectively considering the ethics of research for usefulness of society.

**Course Code: 5010152801**

**Course Name: Recent Trends in Information Technology**

### **Course Objective**

- The objective of imparting quality and creative research with an in-depth understanding and integrated knowledge of advanced applicable theory in the field of information technology. It also provides the knowledge of new methodology and tools to develop the innovative models which will be beneficial for academic, industries and society.

### **Course Outcome**

After course study a researcher

- Can be able to communicate complex and advanced theories and results to different audiences
- Can be able to handle complex academic issues and to challenge established knowledge and practice in the specialization.
- Can be able to evaluate method and analysis tools for research development

**Course Code: 5010152802**

**Course Name: Soft Computing**

### **Course Objective**

This course covers the basics of soft computing, fuzzy logic and neural networks have covered. This course also covers the solving optimization problem. The objective of this course is:

- To present the fuzzy logic and its application in various fields.
- To present the mathematical, statistical and computational challenges of building neural networks.
- To study the concept of classification and feature selection techniques for classification and reduce the features of data to achieve better performance of classification techniques.
- To study the solving optimization problem like genetic algorithm.

### **Course Outcome**

Upon completion of the course, the students will be able:-

- To understand basics of soft computing.
- To understand the concept of fuzzy and fuzzy logic system.
- To understand the concept of neural network and its applications.

- Analyze solving optimization problem and its application.

**Course Code: 5010152803**

**Course Name: Data Warehousing and Mining**

**Course Objective**

- To introduce the concept of data Mining as an important tool for enterprise data management and as a cutting edge technology for building competitive advantage
- To enable students to effectively identify sources of data and process it for data mining.
- To make students well versed in all data mining algorithms, methods of evaluation
- To impart knowledge of tools used for data mining.

**Course Outcome**

- Demonstrate an understanding of the importance of data mining and the principles of business intelligence
- Organize and Prepare the data needed for data mining using preprocessing techniques
- Perform exploratory analysis of the data to be used for mining.
- Implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on large data sets.
- Define and apply metrics to measure the performance of various data mining algorithms.
- Apply BI to solve practical problems: Analyze the problem domain, use the data collected in enterprise apply the appropriate data mining technique, interpret and visualize the results.

**Course Code: 5010152804**

**Course Name: Machine Learning**

**Course Objective**

- Understanding the basic concept of machine learning
- Understand the concepts of concept of Artificial Neural Network.
- Study about various supervised and unsupervised learning for classification and pattern reorganization.
- Understanding the concept of different feature selection and feature optimization techniques.

**Course Outcome**

On completion of the course students will be expected to:

- Understanding of the fundamental issues and challenges *machine learning*: like their applications in different domain.
- Understanding the concept artificial neural network and its application in different areas
- Understanding of the strengths and weaknesses of many popular supervised and approaches with different feature selection and feature optimization techniques

**Course Code: 5010152805**

**Course Name: Software Engineering**

**Course Objective**

- This course introduces the concepts and methods required for the construction of large software intensive systems. It aims to develop a broad understanding of the discipline of software engineering.
- It seeks to complement this with a detailed knowledge of techniques for the analysis and design of complex software intensive systems. It aims to set these techniques in an appropriate engineering and management context.
- It provides a brief account of associated professional and legal issues.

**Course Outcome**

- How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment
- An ability to work in one or more significant application domains
- Work as an individual and as part of a multidisciplinary team to develop and deliver quality software
- Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle
- Demonstrate an ability to use the techniques and tools necessary for engineering practice.

**Course Code: 5010112801**

**Course Name: Research and Publication Ethics**

**Course Objective**

- The objective of the course is to enable the Ph.D. scholar to understand about the publication ethics and publication misconduct and to create the awareness.

**Course Outcome**

- After learning this Course scholars will be able to understand the concepts and process of research and aware about the publication ethics and publication misconduct.