

Course Outcomes (COs):

1 st Year (Part – I)		
Hon's Paper – I	Group – A	<ul style="list-style-type: none"> To understand the applications of computers in present era. To understand the concept of evaluation and history of computers. To learn the functional units and classify types of computers and their use. To understand the concepts of various types of input and output devices working process of computer. To understand the software classifications. To understand the types of system software and their uses. To understand how the operating system works and their types. To classify various types applications software and their classifications. To understand communication systems
	Group – B	<ul style="list-style-type: none"> To understand communication among various units of CPU take place To understand various types of registers used CPU and its role. To understand Fetch, Decode, and Execute Cycles (instruction cycle) To understand Direct Memory Access (DMA) controller. To understand CISC and RISC architecture and the difference between them. To learn architecture of 8085 and 8088 microprocessor. To learn various internal and external commands of MS – DOS operating system.
	Group – C	<ul style="list-style-type: none"> To develop a basic understanding of many areas of information technology and how they are used To understand logic development To understand the basic structure of a program including sequence, decisions and looping To understand how to design a program to solve a simple program To introduce the basics of several programming language and understand the commonality and differences in languages To understand what a programmer does and what writing a program means To learn creation of flow chart, writing algorithms, and pseudo codes To learn programming with QBasic Programming Language user for beginners.
	Group – D	<ul style="list-style-type: none"> Computer lab work for executing various types of MS – DOS commands with their options / switches / parameters. Computer lab work for creating and executing various programs of QBasic taught in class.
Hon's Paper – II	Group – A	<ul style="list-style-type: none"> Identify and describe the Services Provided by Operating Systems. Understand and Solve Problems Involving Process Control, Mutual Exclusion, Synchronization and Deadlock. Implement Processor Scheduling, Synchronization and Disk Allocation Algorithms for a Given Scenario. Apply Various Approaches of Memory Management Techniques. Analysis Various Operating System Approaches in Unix / Linux and Windows.
	Group – B	<ul style="list-style-type: none"> Operational knowledge of Windows operating system and various types of administration settings Working knowledge of word processing software using MS Word Working knowledge of electronic data processing software using MS Excel Working knowledge of presentation software using MS Power Point Conceptual knowledge of Database management system.
	Group – C	<ul style="list-style-type: none"> Database creating, add, updating, editing, appending, sorting, deleting, filtering and other various operations with records handling in FoxPro. Handling multiple database files together in FoxPro. Reports & labels designing In FoxPro. Programming with FoxPro. Data Input Screen Layout Designing.
	Group – D	<ul style="list-style-type: none"> Implementation of Linux / Unix command in computer lab. MS – Windows operations and settings. Ms – Word implementations with various menu commands Ms – Excel implementations with various menu commands Ms – Power Point implementations with various menu commands FoxPro Database Handling, Programming, etc.

Subsidiary	Paper – I	<ul style="list-style-type: none"> • The maximum portion of the Syllabus is useful for higher studies in Computer Science. • Set Theory, Algebra, Real Analysis, Matrix Theory, etc are taught and used in the field. • It's helpful for Research works in Computer Science and Engineering. • Trigonometry and Analytical Geometry are useful in Computer Graphics.
	Paper – II	<ul style="list-style-type: none"> • To be able to read and comprehend English. • To acquire an interest in reading English. • To develop an aesthetic sense of appreciation • To develop a strong sense of moral values. • To develop an appreciation of Nature.
	Paper – III	<ul style="list-style-type: none"> • अपने पाठ्यक्रम में विद्यार्थी भक्ति काल के महान कवियों की कविताएं पढ़ेंगे हैं जो उनके व्यक्तित्व में नैतिकता, चरित्र तनमाण, त्रिरितनणया शक्ति और उच्च संस्कारों को स्थापित करने हैं। • भविष्य में जीवित में आने वाली उहापोह की स्थिति में इसे सही तनणाय ले पाएंगे। • उनके द्वारा पढ़ी गई कविताएं मन में कोमल भावनाओं और संवेदनशीलता का विकास करिगी। • जो उन्हें हस्त, ओडोडफोड शत्रुता जैसे विकारों से दूर रखेगी। • पाठ्यक्रम में पढ़े जाने वाले व्याकरण के विषय उन्हें शुद्ध भाषा का ज्ञान कराएंगे हैं और प्रभाषित भाषण का प्रशिक्षण दे रहे हैं। • भविष्य में ककसी भी प्रकार के साक्षात्कार या मौखिक पिरीक्षा में जनसंपर्क के माध्यम के रूप में विद्यार्थियों के पास भाषा का मजबूत साधन होगा।

2 nd Year (Part – II)		
Hon's Paper – III	Group – A	<ul style="list-style-type: none"> • Demonstrate the Basic Concepts of Networking, Networking Principles, Routing Algorithms, IP Addressing, and Working of Networking Devices. • Demonstrate the Significance, Purpose, and application of Networking Protocols and Standards. • Describe, compare, and contrast LAN, WAN, MAN, Intranet, Internet, AM, FM, PM, and Various Switching Techniques. • Explain the working of Layers and apply the various protocols of the OSI & TCP/IP model. • Analyze the Requirements for a Given Organizational Structure and Select the Most Appropriate Networking Architecture and Technologies. • Design the Network Diagram and Solve the Networking Problems of the Organizations with Consideration of Human and Environment. • Install and Configure Networking Devices.
	Group – B	<ul style="list-style-type: none"> • Apply the principles of number system, binary codes and Boolean algebra to minimize logic expressions • Develop K-maps to minimize and optimize logic functions up to 5 variables • Acquire knowledge about various logic gates and logic families and analyze basic circuits of these families. • Design various combinational and sequential circuits such as encoders, decoders and counters using multiplexers, and flip - flops • Describe and compare various memory systems, shift registers and analog to digital and digital to analog conversion circuits

Group – C	<ul style="list-style-type: none">• Illustrate basic concepts of Computer and C programming.• Design the solution for the given problems and develop the same using C programming language.• Apply the concepts of looping, branching, and decision-making statements for a given problem.• Demonstrate the ability to write C programs using pointers, structures, unions and arrays.• Develop modular applications using C programming language.
Group – D	<ul style="list-style-type: none">• Writing and executing various programs of C language in computer lab.

Hon's Paper – IV	Group – A	<ul style="list-style-type: none"> • Understand and Explain Basic Data Structures Such as, Linked Lists, Stacks and Queues, Tree and Graph. • Select and Apply Appropriate Data Structures to define the particular Problem statement. • Implement Operations Like Searching / Sorting, Insertion, and Deletion, Traversing on Various Data Structures. • Determine and Analyze the Complexity of Given Algorithms.
	Group – B	<ul style="list-style-type: none"> • Illustrate the basic concepts of internet and its evolution • To understand various terms used in the world of internet • To know about various types of internet connections and ISP • To understand various types of software used by internet • To know various types of applications of internet • To know about data over internet • To know about various computer languages used by internet
	Group – C	<ul style="list-style-type: none"> • To understand basic concepts of Engineering design. • Demonstrate basic concepts of the AutoCAD software • Apply basic concepts to develop construction (drawing) techniques • Ability to manipulate drawings through editing and plotting techniques • Understand geometric construction • Produce template drawings • Produce 2D Orthographic Projections • Understand and demonstrate dimensioning concepts and techniques • Understand Section and Auxiliary Views • Become familiar with the use of Blocks, Design Center, and Tool Palettes • Become familiar with Solid Modelling concepts and techniques.
	Group – D	<ul style="list-style-type: none"> • Practical implementation of algorithms used in data structure study • Accessing internet, creating email, video chat, internet telephony, newsgroup, writing blogs, etc. • Creating various types engineering design in 2-D & 3-D form and generating raster image using AutoCAD.
Subsidiary	Paper – IV	<ul style="list-style-type: none"> • Calculus and Differential Equations must be known to everyone who is related with Science and Applied fields. • Vector Analysis and Vector Calculus is useful in Computer Graphics. • Statics and Dynamics are the applications and are very interesting to study and are useful for technical students.
	Paper – V	<ul style="list-style-type: none"> • Ability to comprehend English and use it efficiently • Critical ability to appreciate culture and thoughts down the ages • To develop student's character and emotional maturity • To develop a confidence in students to stand at par with others • To acquire linguistic communicative skills
	Paper – VI	<ul style="list-style-type: none"> • हहदं ढी भाषा भााििि की संस्कृति औि पिंिपिा को समझने का मुख्ढु सधन है। विदुुयार्थुया ढों के शलए तनधारािि पाठुुयकुरम में "यशोधुिा" नधामक कावुुय विशुिि प्रशसदुध गौुिम बुदुध के जीुुिन से उनके संघषा औि िपसुया से अिगि किाने के सार्थुु-सार्थुु यशोधुिा के रूढुप में प्राचीन भाािििीय नाििी के आदशा रूढुप को हमाििे समुुमुख प्रसुिुि कतििा है। सार्थुु ही मरुैरुथलीशणिण गुुपुिि जैसे कवि के अदुुभुिि कावुुय कौशल का परिचय देिा है। • विदुुयार्थुया ढों के शलए हहदं ढी पढुुना ज्यादध जरुुिी है। लगधुाििािि िकननीकी विषयुुों को पढुुिे हुुए उनका सोच वुिहधुािि औि प्रिुकृ िि मशीनी हो सकिी हैुुं। पाठुुयकुरम से इिििि सधुाहहतुुय जैसे विषय में उनकी रुचुु कम होिी जा िही है, जीुुिन की आपधुाधुापी, नौकिी की रचुिा में प्रधुाढुुः युुििाओं का मन नीुुिस औि अिसधुाद ग्रसुिि हो जाििा है। ऐसुुे में भाषा औि सधुाहहतुुय एक ओि उनके मन को सिस संििेदनशील बनाििे हैुुं दसुु िी ओि उनमें समाज औि िधुापर के प्रति दधुातयतुुि बोध जगधुाििे हैुुं। • विदुुयार्थुया ढों के शलए पाठुुयकुरम में 6 तनबंधुुों का एक संकलन तनधुाारिि है।

	<p>कजसमे०ं जी०िन, दै०तनक व्मिह०ाि, विज्ञ०ान, इत०िह०ास, पु०िाि०ित्ि औि संसुकृ० त्ि से संब०र्धि प्रशसदुध लेखकों के विसिििि आलेख हैं। यह पुस्ििक यदुिा िगा मे०ं भािििीय संसुकृ० ति के प्रति गौििि का भािि जगाने के सार्थ सार्थ उनके सामान्य ज्ञान को समदुध धकिने िाली है।</p>
--	--

		<ul style="list-style-type: none"> आज नेटिा हो या अशभनेटिा, शशक्षक पत्रकांि या िकील - सब की सफलिटा का मूल मंत्र है उनकी भाषा औि संप्रेषण शक्ति। दकु नया भि में संपीकं ग क्कल का बोलबाला है, जो विज्ञान गखणि कंप्यूटि की बजाए भाषा औि साहहत्य से विकशसि होिी है। एक साधाणि पद से लेकि उच्च प्रशासतनक सेटिाके शलए साधातकांि में भाषा एक मजबूि साधन है।
--	--	---

3 rd Year (Part – III)		
Hon's Paper – V	Group – A	<ul style="list-style-type: none"> Students list the visual programming concepts. Explain basic concepts and definitions. Express constants and arithmetic operations. Distinguish variable and data types. Students code visual programs by using Visual Basic work environment. Distinguish and compose events and methods. Recognize and arrange control structures. Design a complete program using visual programming concepts. Students prepare various projects by helping visual programming. Different types of Connectivity with database software applications. Prepare project in visual programming. Manage and analyse prepared project with programs. Interpret and report obtaining results.
	Group – B	<ul style="list-style-type: none"> Describe the fundamental elements of relational database management systems Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL. Design ER-models to represent simple database application scenarios Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data. Improve the database design by normalization. Familiar with basic database storage structures and access techniques: file and page organizations, indexing methods.
	Group – C	<ul style="list-style-type: none"> Database Design will be able to apply normalization rules to database design. Database Design will be able to create E-R (Entity Relationship) and UML (Unified Modeling Language) diagrams for a given database scenario. Database Management - Oracle Lecture will be able to create queries to retrieve data from multiple tables using Oracle functions, views, and scripts. Database Management - Oracle Lecture will be able to use decision making statements, loops, and cursors in order to create a business application. Students will understand exception handling and know how to take the actions when exceptions are raised. Students will be able to understand subqueries. In ACTs introduction to Oracle PL/SQL programming training, attendees write stored procedures, functions, packages, and triggers, and implement complex business rules with oracle.
	Group – D	<ul style="list-style-type: none"> Computer Practical Laboratory works of Group – A & Group – B.
Hon's Paper – VI	Group – A	<ul style="list-style-type: none"> Explain Concepts and Advantages of Object-Oriented Programming. Apply and implement the concepts of the Object-Oriented paradigms to analyze, design and develop the solutions of real-world problems using the principles of information Hiding Localization and Modularity. Design, Development and maintain the small applications, system utility for societal and academic problems using reusability concepts in team spirit. Demonstrate the Advanced Features of C++ Specifically Stream I/O, Templates and Operator Overloading and overriding.
	Group – B	<ul style="list-style-type: none"> Explain and Apply the Object-Oriented Concepts for Solving Real Problem. Use the Java SDK Environment to Create, Debug and Run Simple Java Programs.

		<ul style="list-style-type: none"> • Apply Java Technology to Develop the Small Applications, Utilities, and Web Applications. • Apply Events Management and Layout Managers Using AWT, Swing, JDBC and Servlet for Developing the Software for Various Problems.
	Group – C	<ul style="list-style-type: none"> • Demonstrate Artificial Intelligence Techniques, Various Types of Production Systems, and Characteristics of Production Systems. • Design and implement Neural Networks using layers, various activation functions and Various Algorithms to solve real life problems. • Analyze fuzzy nature problem and Design, implement and test the Fuzzy Inference Systems for vague nature real life problem. • Explain Genetic Algorithms theory, Design and validate the Genetic Algorithms based systems for search space driven problems.
	Group – D	<ul style="list-style-type: none"> • Computer Practical Laboratory works of Group – A, Group – B, and Group – C.
Practical	Paper – VII	<ul style="list-style-type: none"> • Computer Practical Examination Hon’s Paper – V & Hon’s Paper – VI.
Project	Paper – VIII	<ul style="list-style-type: none"> • Students will be required to pursue a project work for an organization of their choice with the permission of the HOD. This work generally involves collecting data, solving and implementing a problem for the organization, developing computer programs using the knowledge acquired in the theory and laboratory courses. They will have to submit a report of the work done by them. Finally, a demonstration of the work with the help of a presentation has to be done.
Subsidiary	Paper – VII	<ul style="list-style-type: none"> • Current events of national and international importance • History of India and Indian National Movement • Indian and World Geography • Indian Polity and Governance • Evaluation and History of Bihar, polity and governance • Economic and Social Development • General issues on Environmental ecology, Bio-diversity and Climate Change (<i>Covers only general awareness of the issues, no subject specialization required</i>) • General Science • Comprehension • Interpersonal skills including communication skills • Logical reasoning and analytical ability • Decision making and problem-solving • General mental ability such as Basic numeracy, Numbers and their relations, Orders of magnitude, etc. and Data interpretation

