



Nalbari College, Nalbari

Teaching Plan for the Session: 2022-23

Name of the Teacher: Dhruba Jyoti Mishra

Department: Computer Science

Paper Name: Computer Graphics

Semester: VI

Paper Code: ITB-HC-6026

Learning Objectives:

1. Know the basics of computer.
2. Learn number systems and their use.
3. Learn about operating systems.
4. Know about internet, computer networks, computer security.

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|-------------------|--|-------------------------------|--|--|----------------------------|
| 1 | Introduction: computer graphics and its applications. | Reference books, e-books etc, | Blackboard and PPT is used for lecture | Home assignment, Test etc | Class Test, Quiz |
| 2 | Input Devices : Keyboard, Mouse, Trackball & Space ball, Joystick | | | | |

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| 3 | Input Devices : Data Glove, Digitizers, Image Scanners, Touch panels, Light Pens systems. | Online Education Websites. | Methods | | |
| 4 | Refresh CRT, Raster scan display and Random scan display technique | | | | |
| 5 | color display techniques Beam penetration method and Shadow mask method | | | | |
| 6 | Direct view storage tubes, emissive & non-emissive flat panel displays Plasma panels, | | | | |
| 7 | Thin film electrostatic displays, LED and LCD monitor, | | | | |
| 8 | Three-dimensional viewing devices and Virtual Reality systems | | | | |
| 9 | Display processor: Raster scan systems, Random scan systems | | | | |
| 10 | line drawing algorithms DDA algorithm and Bresenham's Line Algorithm | | | | |
| 11 | Mid point Algorithm for Circle and Ellipse Generation, Curve generation | | | | |
| 12 | Area filling algorithms scan line polygon fill, Non zero winding number rule | | | | |
| 13 | Scanline curve | | | | |

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| | filling, Boundaryfill algorithm | | | | |
| 14 | Flood fill algorithm | | | | |
| 15 | Character generation techniques, generation of bitmap and outlined font | | | | |
| 16 | 2D Geometric Transformations: Basic transformations translation, rotation and Scaling | | | | |
| 17 | matrix representations and Homogeneous coordinate representations | | | | |
| 18 | Composite transformations among translation, rotation and scaling, General Pivot point rotation | | | | |
| 19 | General fixed-point scaling, General scaling directions | | | | |
| 20 | Other transformations reflection and shear | | | | |
| 21 | Transformation between coordinate Systems, Definition of Affine transformations | | | | |
| 22 | 2D viewing: definition, viewing transformation pipeline | | | | |
| 23 | window to viewport coordinate transformation. | | | | |
| 24 | 2D Clipping: Concept and Algorithm: point clipping, line clipping | | | | |
| 25 | Cohen Sutherland | | | | |

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| | Algorithm | | | |
| 26 | Area clipping, text clipping, polygon clipping | | | |
| 27 | Interactive picture construction techniques: Basic positioning methods | | | |
| 28 | constraints, grids, gravity fields, rubberband methods, dragging, painting &rawing | | | |
| 29 | 3D concepts: Display methods Parallel projection, perspective projection | | | |
| 30 | 3D geometric transformations: Transformation, Translation, Rotation and Scaling around Axes | | | |
| 31 | 3D Viewing Projections – Parallel and Perspective | | | |
| 32 | Visible surface detection: Definition, Algorithms for visible surface detection – Depth buffer method | | | |
| 33 | Abuffer method | | | |
| 34 | Raycasting method | | | |
| 35 | Curved surfaces, WireframeMethods | | | |
| 36 | Illumination and Surface rendering: definition and importance | | | |
| 37 | light sources, Basic | | | |

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| | illumination models Ambient light | | | | |
| 38 | Diffuse reflection, Specular reflector and Phong model | | | | |
| 39 | combined diffuse and specular reflections for multiple light sources | | | | |
| 40 | Warn model, Intensity Attenuation | | | | |
| 41 | Color considerations, Transparency, Shadows | | | | |



Signature of the Teacher



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Nalbari College, Nalbari

Teaching Plan for the Session: 2022-23

Name of the Teacher: DHRUBA JYOTI MISHRA

Department: COMPUTER SCIENCE

Paper Name: OFFICE AUTOMATION

Semester: I

Paper Code: ITB-HG-1026

Learning Objectives:

1. To perform documentation
2. To perform presentation skills
3. To perform accounting operations

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|--------------------------|---|-------------------------------|--|--|--|
| 1 | Introduction to Word Processing , Features | Reference books, e-books etc. | PPT is used for mathematical Computation and illustrations using lecture Methods | Practical , Home assignments, Seminar presentations etc. | Class Test, Solving critical Problems etc. |
| 2 | Learning document window, Creating , Saving & Closing a document, Opening an Existing document , Editing a Document | | | | |
| 3 | Formatting Features (Paragraph Formats, Aligning | | | | |

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| | text & paragraph, Border and Shading, Header & Footers, Bullet & Numbering) | | | | |
| 4 | Inserting & Editing a Table , Inserting Picture | | | | |
| 5 | Checking & Spelling Correction, Page Setup , Print Preview , Printing a document | | | | |
| 6 | Mail Merge , Document Template & Wizards | | | | |
| 7 | Introduction to Spreadsheet, creating, saving and editing a workbook | | | | |
| 8 | Inserting, deleting Worksheets, Opening & Moving around in existing worksheets | | | | |
| 9 | working with Formula & Cell referencing, Functions, working with ranges - creating, editing and selecting ranges | | | | |
| 10 | Format Feature: AutoFormat Feature, Changing alignment, Character styles, Date Format, Border & Colors etc. | | | | |

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| | Previewing & Printing a worksheet | | | | |
| 11 | Creating Charts & Graphs. Database in worksheet, macro, linking and embedding | | | | |
| 12 | Creating & saving presentations , Opening an existing Presentation | | | | |
| 13 | Working in different views, Working with slides, Adding and Formatting Text, Formatting Paragraphs | | | | |
| 14 | Checking Spelling and correcting typing mistakes , Adding clip art and other pictures | | | | |
| 15 | Inserting Animation, Designing slide shows, Running and controlling slide show, Printing Presentation. | | | | |
| 16 | Portable Document Format: storing, creation, conversion. | | | | |
| 17 | Local language pack in Office Packages: installation and use | | | | |
| 18 | Document design using any | | | | |

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| | DTP package, Graphics design and manipulation using any currently available package | | | |
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Teaching Plan for the Session: 2022-23

Name of the Teacher: DHRUBA JYOTI MISHRA

Department: COMPUTER SCIENCE

Paper Name: DIGITAL LOGIC FUNDAMENTALS

Semester: II

Paper Code: ITB-HC-2026

Learning Objectives:

1. Have a thorough understanding of the fundamental concepts and techniques used in digital electronics.
2. To understand and examine the structure of various number systems and its application in digital design.
3. The ability to understand, analyze and design various combinational and sequential circuits.
4. Ability to identify basic requirements for a design application and propose a cost effective solution.
5. The ability to identify and prevent various hazards and timing problems in a digital design.
6. To develop skill to build, and troubleshoot digital circuits.

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|--------------------------|--|-------------------------------|--|--|-----------------------------------|
| 1 | Axiomatic definition of Boolean algebra, Rules (postulates and basic | Reference books, e-books etc. | PPT is used for mathematical Computation | Practical , Home assignments, Seminar presentations etc. | Class Test, Solving critical |

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| | theorems) of Boolean algebra | | and | | Problems etc. |
| 2 | dual and complement of Boolean expression, Canonical form and Standard form | | illustrations using lecture Methods | | |
| 3 | Sum of product and product of sum form, Conversion between Boolean expression and truth table | | | | |
| 4 | Karnaugh map method (upto four variable kmap), Don't care condition | | | | |
| 5 | Quine Mc Cluskey method, Different types of gates, Implementation of logic expression with logic gates | | | | |
| 6 | Adder: half adder, full adder | | | | |
| 7 | Subtractors: half subtractor and full subtractor | | | | |
| 8 | Magnitude comparator, Decoder, Encoder, Application examples of decoder and encoder | | | | |
| 9 | Multiplexer, Demultiplexer, Application examples of multiplexer and Demultiplexer | | | | |
| 10 | Simple RS flip-flop or latch | | | | |

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| 11 | Clocked RS flip-flop, D flip-flop | | | |
| 12 | JK flip-flop, T flip-flop | | | |
| 13 | Analysis of Clocked Sequential circuits, State Reduction and Assignment | | | |
| 14 | Flip –Flop Excitation tables, Design Procedure for sequential circuits. | | | |
| 15 | Ripple counters: Binary Ripple Counter | | | |
| 16 | BCD Ripple Counter, and Synchronous Counters | | | |
| 17 | Binary Counter, Binary Up and down Counter, BCD Counter | | | |
| 18 | Counter design using state diagram, state table and state equation. | | | |
| 19 | Registers: Shift registers | | | |
| 20 | serial in serial out, serial in parallel out | | | |
| 21 | parallel in serial out, parallel in parallel out | | | |
| 22 | Registers with parallel Load | | | |
| 23 | Bidirectional shift register with | | | |

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| | parallel load. | | | |
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Teaching Plan for the Session: 2022-23

Name of the Teacher: DHRUBA JYOTI MISHRA

Department: Computer Science

Semester: III

Paper Name: COMPUTER ORGANIZATION AND ARCHITECTURE

Paper Code: ITB-HC-3016

Learning Objectives:

This Paper is intended to teach the basics involved in data representation and digital logic circuits used in the computer system. This includes the general concepts in digital logic design, including logic elements, and their use in combinational and sequential logic circuit design. This will also expose students to the basic architecture of processing, memory and i/o organization in a computer system.

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|-------------------|--|-------------------------------|--|--|--|
| 1 | Functional units of a computer, basic instructions | Reference books, e-books etc. | PPT is used for mathematical Computation and illustrations | Practical , Home assignments, Seminar presentations etc. | Class Test, Solving critical Problems etc. |
| 2 | interconnection of functional units | | | | |

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| 3 | bus structure | | using lecture Methods | | |
| 4 | memory locations, memory addresses, memory operations | | | | |
| 5 | instruction and instruction sequencing (straight Line sequencing and branching) | | | | |
| 6 | addressing modes | | | | |
| 7 | introduction to assembly language, stack, subroutine, I/O instructions | | | | |
| 8 | Introduction, inter register transfer | | | | |
| 9 | arithmetic microoperation, logic microoperation, | | | | |
| 10 | shift microoperation, Conditional control statements, | | | | |
| 11 | fixed point binary data, instruction code | | | | |
| 12 | design of a simple computer | | | | |

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| 13 | Processor organization, design of arithmetic and logic unit | | | |
| 14 | status register, design of accumulator | | | |
| 15 | Hardware control, microprogrammed control block diagram | | | |
| 16 | symbolic microprogram, microprogrammed CPU organization | | | |
| 17 | Program controlled I/O | | | |
| 18 | Interrupts: enabling and disabling interrupts, handling interrupts from multiple sources | | | |
| 19 | DMA, structure and working of hard disk | | | |
| 20 | CDROM, printer, Semiconductor memory | | | |
| 21 | SRAM, DRAM, ROM, speed size and cost, Cache memory | | | |
| 22 | ,Mapping functions | | | |
| 23 | Semiconductor memory: RAM, RAM Family | | | |



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Teaching Plan for the Session: 2022-23

Name of the Teacher: DHRUBA JYOTI MISHRA

Department: COMPUTER SCIENCE

Paper Name: Data Communication and Computer Networks

Semester: IV

Paper Code: ITB-HC-4036

Learning Objectives:

1. Describe various communications networks and their main components.
2. Identify the advantages and disadvantages of a network.
3. Define the terminology associated with computer networks.
4. Identify the components associated with computer networks.
5. Develop a networking plan for yourself or a client.

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|-------------------|---|-------------------------------|------------------------------|--|------------------------------|
| 1 | Data communications: components, Network criteria, physical structures, network models, categories of networks, | Reference books, e-books etc. | PPT is used for mathematical | Practical , Home assignments, Seminar presentations etc. | Class Test, Solving critical |

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| | interconnection of networks, inter network Protocols and standards: | | Computation and illustrations using lecture Methods | | Problems etc. |
| 2 | protocols-standards-standards organizations- internet standards Network models: Layered tasks, OSI model, layers in the OSI model, TCP/IP protocol suite. | | | | |
| 3 | Digital to digital conversion: Line coding, line coding schemes, block coding - analog to digital conversion, PCM, transmission modes: serial transmission, parallel transmission, | | | | |
| 4 | Analog Transmission: Digital to analog conversion: FSK-ASK-PSK, Analog to Analog conversion: Amplitude modulation, Frequency modulation, | | | | |
| 5 | phase modulation, Multiplexing: Frequency division multiplexing, Time division multiplexing, | | | | |
| 6 | Transmission Media Guided media: Twisted pair cable, coaxial cable, fiber optic cable Unguided media: radio waves – microwaves-infrared. | | | | |
| 7 | Error correction and detection: Introduction, block coding, linear block code, cyclic codes checksum, Data link Control: | | | | |

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| | protocols, simplest protocol, stop and wait protocol, | | | | |
| 8 | stop and wait automatic repeat request, go back n automatic repeat request, selective repeat, automatic repeat request, piggybacking, | | | | |
| 9 | Multiple Access: Random access, Aloha, CSMA, CSMA/CD, CSMA/CA Controlled access: reservation, polling, | | | | |
| 10 | token passing, Channelization:FDMA,TDMA,CDMA . | | | | |
| 11 | Wired LANs: Ethernet: IEEE standards, standard Ethernet- fast Ethernet, Wireless LANS: IEEE 802.11 architecture, MAC sublayer addressing mechanism, physical layer-Bluetooth | | | | |
| 12 | architecture Bluetooth layers-radio layer- baseband layer-L2CAP-other upper layers. | | | | |
| 13 | Network Layer: IPV4 addresses, IPV6 Addresses, Internet Protocol: IPv4 &IPv6 Address mapping protocols: ARP – RARP. | | | | |
| 14 | Routing protocols: Unicast routing protocols: distance vector routing, | | | | |

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| | Link State routing, Multicast Routing protocols (Any two) Transport Layer | | | |
| 15 | Process to process delivery, UDP/TCP, Congestion control and QOS: Data traffic, congestion, congestion control, quality of service techniques to improve quality of service. | | | |
| 16 | DNS: Name space, domain name space, distribution of name space, Electronic mail Architecture, FILE transfer: FTP WWW and HTTP | | | |
| 17 | Architecture, web documents, HTTP, Network Security: Introduction, definitions, two categories, symmetric key cryptography | | | |
| 18 | traditional ciphers, asymmetric key cryptography | | | |



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Nalbari College, Nalbari

Teaching Plan for the Session: 2022-23

Name of the Teacher: DHRUBA JYOTI MISHRA

Department: COMPUTER SCIENCE

Paper Name: PROGRAMMING IN PYTHON

Semester: III

Paper Code: ITB-SE-3024

Learning Objectives:

After completion of the paper the students will be able to-

1. Define identifiers, keywords, operators and expressions.
2. Use different operators, expressions and variables available in python.
3. Build complex expressions using operators.
4. Determine the data type of value.
5. Build basic programs using fundamental programming constructs like variables, conditional logic, looping, and functions
6. Work with user input to create fun and interactive programs
7. Create simple games with images, animations, and audio using our custom beginner-friendly programming library, Wizardlib.

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|-------------------|--|-------------------------------|--|--|------------------------------|
| 1 | Concept of problem solving, Problem definition | Reference books, e-books etc. | PPT is used for mathematical Computation | Practical , Home assignments, Seminar presentations etc. | Class Test, Solving critical |
| 2 | Program design, Debugging | | | | |

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| 3 | Types of errors in programming | | and illustrations using lecture Methods | | Problems etc. | | | |
| 4 | Documentation | | | | | | | |
| 5 | Flowcharting | | | | | | | |
| 6 | decision table, algorithms | | | | | | | |
| 7 | Structured programming concepts | | | | | | | |
| 8 | Programming methodologies viz. top-down | | | | | | | |
| 9 | bottom-up programming | | | | | | | |
| 10 | Structure of a Python Program | | | | | | | |
| 11 | Elements of Python | | | | | | | |
| 12 | Python Interpreter, Using Python as calculator | | | | | | | |
| 13 | Python shell, Indentation Atoms, Identifiers and keywords | | | | | | | |
| 14 | Literals, Strings, Operators: Arithmetic operator, Relational operator | | | | | | | |
| 15 | Logical or Boolean operator, Assignment | | | | | | | |
| 16 | Operator, Ternary operator, Bit wise operator, Increment or Decrement operator | | | | | | | |

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| 17 | Input and Output Statements, Control statements | | | | |
| 18 | Branching, Looping, Conditional Statement, Exit function | | | | |
| 19 | Difference between break, continue and pass | | | | |
| 20 | Defining Functions, default arguments, Errors and Exceptions | | | | |
| 21 | Conditional execution, Alternative execution | | | | |
| 22 | Nested conditionals, the return statement | | | | |
| 23 | Recursion, Stack diagrams for recursive functions | | | | |
| 24 | Multiple assignment, the while statement | | | | |
| 25 | Tables, Two-dimensional tables | | | | |
| 26 | String as a compound data type, Length | | | | |
| 27 | Traversal and the for loop, String slices, String comparison | | | | |

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| 28 | A find function, Looping and counting | | |
| 29 | List values, Accessing elements, List length, List membership | | |
| 30 | Lists and for loops, List operations | | |
| 31 | List deletion. Cloning lists, Nested lists | | |
| 32 | Introduction to Classes | | |
| 33 | Objects and Methods | | |
| 34 | Standard Libraries | | |
| 35 | Arrays | | |
| 36 | list | | |
| 37 | set | | |
| 38 | stacks | | |
| 39 | Queues. | | |
| 40 | Linear and Binary Search | | |
| 41 | Bubble sort | | |
| 42 | Selection sort | | |
| 43 | Insertion sort | | |



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Nalbari College, Nalbari

Teaching Plan for the Session: 2022-23

Name of the Teacher: Ankur Baishya

Department: Computer Science

Paper Name: E-Commerce Technologies

Semester: V

Paper Code: ITB-HD-5016

Learning Objectives:

1. Student can have basic idea about E-commerce, business model.
2. How to register a domain name and web advertising
3. Security measures in online technologies
4. Electronic data exchange program
5. Internet marketing

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|--------------------------|---|--|--|---|-----------------------------------|
| 1 | What is E-Commerce (Introduction AndDefinition), Main activities E-Commerce | Reference books, e-books etc, Online Education | Blackboard and PPT is used for lecture Methods | Home assignment, Test etc | Class Test, Quiz |

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| 2 | Goals of E-Commerce, Technical Components of E-Commerce | Websites. | | | |
| 3 | Functions of E-Commerce | | | | |
| 4 | Advantages and disadvantages of E-Commerce, Scope of E-Commerce | | | | |
| 5 | Electronic Commerce Applications, Electronic Commerce and Electronic | | | | |
| 6 | Business models (C2B,C2C, B2B, B2C,B2G,G2B,G2C) | | | | |
| 7 | Evolution of Internet, Domain Names and Internet Organization (.edu, .com, .mil, .gov, .net etc.) | | | | |
| 8 | Types of Network | | | | |
| 9 | Internet Service Provider, World Wide Web, | | | | |

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| | Internet & Extranet, Role of Internet in B2B Application | | | | |
| 10 | building own website, Cost, Time, Reach | | | | |
| 11 | Registering a Domain Name | | | | |
| 12 | Web promotion, Target email, Banner, Exchange, Shopping Bots | | | | |
| 13 | Secure Transaction, Computer Monitoring, Privacy on Internet | | | | |
| 14 | Corporate Email privacy, Computer Crime(Laws, Types of Crimes) | | | | |
| 15 | Threats, Attack on Computer System, Software Packages for privacy, | | | | |
| 16 | Hacking, Computer Virus(How it spreads, Virus problem, virus protection, Encryption | | | | |

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| | and Decryption | | | | |
| 17 | Secret key Cryptography, DES, Public Key Encryption | | | | |
| 18 | RSA, Authorization and Authentication | | | | |
| 19 | Firewall, Digital Signature(How it Works) | | | | |
| 20 | Concepts of EDI and Limitation, Applications of EDI, Disadvantages of EDI | | | | |
| 21 | Electronic Payment System: Introduction, Types of Electronic Payment System, Payment Types | | | | |
| 22 | Value Exchange System, Credit Card System,Electronic Fund Transfer, Paperless bill, Modern Payment Cash, Electronic Cash | | | | |
| 23 | Planning Electronic Commerce initiates, | | | | |

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| | Linking objectives to business strategies | | | | |
| 24 | Measuring cost objectives, Comparing benefits to Costs | | | | |
| 25 | Strategies for developing electronic commerce web sites | | | | |
| 26 | The PROS and CONS of online shopping, The cons of onlineshopping | | | | |
| 27 | Justify an Internet business, Internet marketing techniques | | | | |
| 28 | The E-cycle of Internetmarketing, Personalization e-commerce. | | | | |

Ankur

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Nalbari College, Nalbari

Teaching Plan for the Session: 2022-2023

Name of the Teacher: ANKUR BAISHYA

Department: COMPUTER SCIENCE

Paper Name: COMPUTER FUNDAMENTALS AND PROGRAMMING

Semester: I

Paper ITB-HC-1016

Learning Objectives:

- Be familiar with fundamental programming concepts and methodology (variables, assignments, conditions, branches, loops, functions, recursions, structures).
- Be familiar with and appreciate good programming practice, and apply it to follow-up courses.
- Be able to apply problem-solving knowledge and skills to write small, well-documented, effective C programs.
- Be able to appreciate the use of simple data structure such as array, know their limitations to pave way for more complex data structures in the next course.
- Know the responsibilities of an ethical programmer.

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|--------------------------|---|-------------------------------|---|---|-----------------------------------|
| 1 | Importance of C, sample C program, C program structure, executing C program.system | Reference books, e-books etc. | Blackboard, Lab and PPT is used for illustrations and lecture Methods | Practical , Home assignment etc. | Class test, presentation |
| 2 | Variables, Data Types | | | | |
| 3 | Constants: integer constant, real constant, character constant, string constant | | | | |
| 4 | Character set, C tokens, keywords and identifiers | | | | |
| 5 | variables declaration, Assigning values to variables---Assignment statement, | | | | |
| 6 | declaring a variable as constant, as volatile. | | | | |
| 7 | Operators and Expression: Categories of operator- Arithmetic, Relational, logical, assignment, increment, decrement, conditional, bitwise and special operators | | | | |
| 8 | arithmetic expressions, | | | | |

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| | precedence and associativity of operators | | | | |
| 9 | type conversions, mathematical functions Managing Input and Output Operators: Reading and writing a character, formatted input, formatted output. | | | | |
| 10 | <i>if</i> statement, <i>if.....else</i> statement, nested <i>if....else</i> statement, <i>switch....case</i> statement, | | | | |
| 11 | <i>goto</i> statement. Decision Making and Looping: Definition of loop, categories of loops, <i>for</i> loop <i>while</i> loop, <i>do-while</i> loop, <i>break</i> statement, <i>continue</i> statement | | | | |
| 12 | Declaration and accessing of one & two-dimensional arrays | | | | |
| 13 | initializing two-dimensional arrays, multidimensional arrays. | | | | |
| 14 | The form of C functions, | | | | |

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| | Return values and types, return statement | | | | |
| 15 | calling a function, categories of functions, Nested functions, Recursion, | | | | |
| 16 | functions with arrays, call by value, call by reference, storage classes, Macro substitution, file inclusion. | | | | |
| 17 | Defining, giving values to members, initialization and comparison of structure variables | | | | |
| 18 | array of structure, array within structure, structure within structure, structures and functions, unions. | | | | |
| 19 | Definition of pointer, declaring and initializing pointers, accessing a variable through address and through pointer, pointer expressions | | | | |
| 20 | pointer increments and | | | | |

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| | scale factor, pointers and arrays, pointers and functions, pointers and structures. | | | | |
| 21 | Opening, closing and I/O operations on files, random access to files, command line arguments. | | | | |



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Nalbari College, Nalbari

Teaching Plan for the Session: 2022-23

Name of the Teacher: ANKUR BAISHYA

Department: COMPUTER SCIENCE

Paper Name: SOFTWARE ENGINEERING

Semester: IV

Paper Code: ITB-HC-4026

Learning Objectives:

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

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|-------------------|--|--------------------|------------------------------|--|----------------------------|
| 1 | Software Processes & Characteristics, Software | Reference | Blackboard, | Practical , Home | Class Test. |

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| | life cycle, Models - Waterfall, Prototype, Evolutionary and Spiral Models. | books, e-books etc. | PPT is used for mathematical Computation and illustrations using lecture Methods | assignments, Seminar presentations etc. | |
| 2 | Requirement engineering, requirement, elicitation techniques like FAST, QFD, | | | | |
| 3 | requirements analysis using DFD, Data dictionaries | | | | |
| 4 | Requirements documentation | | | | |
| 5 | Nature of SRS, Characteristics & organization of SRS. | | | | |
| 6 | Size Estimation like lines of Code & Function Count | | | | |
| 7 | Cost Estimation Models, COCOMO, | | | | |
| 8 | Risk Management. | | | | |
| 9 | Data design, Architectural design, Interface design, | | | | |
| 10 | Function Oriented Design, Object Oriented | | | | |

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| | Design | | | | |
| 11 | Cohesion & Coupling, Classification of Cohesiveness & Coupling, | | | | |
| 12 | Software Metrics: different types of project metrics. | | | | |
| 13 | Testing Process, Design of Test Cases, Types of Testing | | | | |
| 14 | Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing. | | | | |
| 15 | Software Maintenance: Management of Maintenance, Maintenance Process, | | | | |
| 16 | Reverse Engineering, Software Re-engineering, | | | | |
| 17 | Configuration Management, Documentation. Software quality Assurance. | | | | |

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| 18 | CASE tools--- Analysis tools, design tools, SQA tools, software testing tools. | | | |
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Nalbari College, Nalbari

Teaching Plan for the Session: 2022-23

Name of the Teacher: ANKUR BAISHYA

Department: COMPUTER SCIENCE

Paper Name: DATABASE MANAGEMENT SYSTEM

Semester: III

Paper Code: ITB-HC-3036

Learning Objectives:

1. Describe the fundamental elements of relational database management systems
2. Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
3. Design ER-models to represent simple database application scenarios
4. Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data.
5. Improve the database design by normalization.

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|-------------------|--|-------------------------------|--|--|----------------------------|
| 1 | Record storage and primary file organization: memory hierarchies and storage devices, Storage of | Reference books, e-books etc. | Blackboard, PPT is used for mathematical | Practical , Home assignments, Seminar presentations etc. | Class Test. |

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|---|---|--|---|--|--|
| | Databases, | | Computation and illustrations using lecture Methods | | |
| 2 | Placing file records on disks: Records and its Types, Files, Fixed length records and variable length records, | | | | |
| 3 | Record Blocking, allocating file blocks on disks, operation on files | | | | |
| 4 | Issues in Physical Design: Concept of indexes | | | | |
| 5 | Definition of Database, Traditional File Approach vs. DBMS approach, Characteristics of the Data Base Approach, | | | | |
| 6 | DBMS user, Role of a DBA, Advantage of using DBMS, DBMS architecture, | | | | |
| 7 | Data independence, ANSI/SPARC 3 level architecture. | | | | |
| 8 | Fundamental integrity rules: entity integrity, referential integrity, Relational algebra (Select , | | | | |

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| | Project, Cross ,Product , theta join, equi join, natural join, outer join), | | | | |
| 9 | Set Operation, ANSI SQL – 92 Standard : DDL, DML, SQL constructs(Select .. From... Where... Group by Having... Order by....) | | | | |
| 10 | Insert, Delete, Update, View, Definition and use, nested quires, | | | | |
| 11 | Constraints considers(NOT NULL , UNIQUE, Check Primary key, Foreign key) | | | | |
| 12 | Conceptual model, logical model, physical model, ER model as a tool for conceptual designentities, attributes and relationships | | | | |
| 13 | weak and strong entities, conversion of ER model into relational schema. DFD, Normalization: informal design guidelines for relational schemas (overview level), | | | | |

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| 14 | functional dependencies, different types of keys, Normal forms (first, second, third, BCNF), | | | |
| 15 | Functional dependency diagram and design of relational database from it. Database connectivity using JDBC. | | | |

Ankur

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Teaching Plan for the Session: 2022-23

Name of the Teacher: ANKUR BAISHYA

Department: COMPUTER SCIENCE

Semester: IV

Paper Name: INFORMATION SECURITY AND CYBER LAWS

Paper Code: ITB-HG-4026

Learning Objectives:

- 1) Analyze and evaluate the cyber security needs of an organization.
- 2) Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation.
- 3) Measure the performance and troubleshoot cyber security systems.
- 4) Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools.
- 5) Comprehend and execute risk management processes, risk treatment methods, and key risk and performance indicators

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|-------------------|---|-------------------------------|--|--|----------------------------|
| 1 | Computer network as a threat, hardware vulnerability, | Reference books, e-books etc. | Blackboard, PPT is used for mathematical | Practical , Home assignments, Seminar presentations etc. | Class Test. |

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| 2 | software vulnerability, importance of data security | | Computation and illustrations using lecture Methods | | |
| 3 | Overview of digital crime, criminology of computer crime | | | | |
| 4 | Tools of the attacker, information and cyber warfare, scanning and spoofing, password cracking, malicious software, session hijacking | | | | |
| 5 | Risk analysis, process, key principles of conventional computer security, security policies, authentication, data protection, access control, | | | | |
| 6 | internal vs external threat, security assurance, passwords, authentication and access control, computer forensics and incident response | | | | |
| 7 | Important terms, Threat, Flaw, Vulnerability, Exploit, Attack, Ciphers, | | | | |

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| | Codes, Substitution Cipher (Caeser), Transposition Cipher (Rail-Fence), | | | | |
| 8 | Public key cryptography (Definitions only), Private key cryptography (Definition and Example), Cyber forensics, Steganography | | | | |
| 9 | Firewalls, logging and intrusion detection systems, Windows and windows XP / NT security | | | | |
| 10 | Unix/Linux security, ethics of hacking and cracking | | | | |
| 11 | <p>Cyber laws to be covered as per IT 2008 (10 Lectures)</p> <ul style="list-style-type: none"> • Chapter 1: Definitions • Chapter 2: Digital Signature and Electronic Signature • [Section 43] Penalty and Compensation for damage to computer, computer □□[Section 65] Tampering with Computer Source | | | | |

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| | | | | |
| 12. | <ul style="list-style-type: none">• [Section 66 A] Punishment for sending offensive messages through communication service etc.• [Section 66 B] Punishments for dishonestly receiving stolen computer resource or communication device• [Section 66C] Punishment for identity theft• [Section 66D] Punishment for cheating by personating by using computer resource | | | |
| 13. | <ul style="list-style-type: none">• [Section 66E] Punishment for violation of privacy• [Section 66F] Punishment for cyber terrorism• [Section 67] Punishment for publishing or transmitting obscene material in electronic form• [Section 67A] Punishment for publishing or transmitting of material containing sexually explicit act, etc. in electronic | | | |

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| form[Section 67B] Punishment for publishing or transmitting of material depicting children in sexually explicit act, etc. in electronic form • [Section 72] Breach of confidentiality and privacy | | | | |
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Nalbari College, Nalbari

Teaching Plan for the Session: 2022-23

Name of the Teacher: Ankur Baishya

Department: Computer Science

Paper Name: Data Mining and Warehousing

Semester: VI

Paper Code: ITB-HE-6026

Learning Objectives:

1. Be familiar with mathematical foundations of data mining tools.
2. Understand and implement classical models and algorithms in data warehouses and data mining
3. Characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering.
4. Develop skill in selecting the appropriate data mining algorithm for solving practical problems.

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|-------------------|---|--------------------------|--------------------------------|--|----------------------------|
| 1 | Overview and concepts: Need for Data | Reference books, e-books | Blackboard and PPT is used for | Home assignment, Test etc | Class Test, Quiz |

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| | Warehousing | etc, Online Education Websites. | lecture Methods | | |
| 2 | Basic elements of Data Warehousing | | | | |
| 3 | differences between Database Systems and Data Warehouse | | | | |
| 4 | Planning and Requirements: Project planning and management | | | | |
| 5 | Collecting the requirements | | | | |
| 6 | Architecture and Infrastructure: Data Warehouse Architecture and its components | | | | |
| 7 | Infrastructure and metadata | | | | |
| 8 | Data Design and Data Representation: Principles of dimensional modeling | | | | |
| 9 | advanced topics data extraction | | | | |
| 10 | transformation and | | | | |

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| | loading, data quality | | | | |
| 11 | Information Access and Delivery: Matching information to classes of users | | | | |
| 12 | OLAP in Data Warehouse, Data warehousing and the web. | | | | |
| 13 | Implementation and Maintenance: Physical design process, Data Warehouse deployment, growth and maintenance. | | | | |
| 14 | Basics of data mining, Different definitions of Data Mining and related concepts, Data mining process Data preparation | | | | |
| 15 | data cleaning and data visualization. KDD process | | | | |
| 16 | Data mining techniques: Clustering, Association | | | | |

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| | rules and Decision trees | | | | |
| 17 | Partitional versus Hierarchical Clustering, types of data in clustering | | | | |
| 18 | Clustering methods – kmeans, kmedoids | | | | |
| 19 | PAM, CLARA, CLARANS | | | | |
| 20 | Hierarchical clustering methods – BIRCH, CURE | | | | |
| 21 | Density based clustering methods DBSCAN | | | | |
| 22 | Mining association rules, frequent sets and border sets | | | | |
| 23 | Apriori algorithm | | | | |
| 24 | PincerSearch algorithm | | | | |
| 25 | Border algorithm | | | | |
| 26 | Generalized association rule | | | | |
| 27 | quantitative association rule | | | | |
| 28 | association rule with item constraint | | | | |
| 29 | decision tree generation | | | | |

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|----|---|--|--|--|--|
| | algorithms – CART, ID3 | | | | |
| 30 | Web Content Mining, Web Structure | | | | |
| 31 | Web Usage mining | | | | |
| 32 | spatial mining | | | | |
| 33 | Temporal mining – Temporal association rules | | | | |
| 34 | sequence mining and GSP algorithm, discovery of frequent episodes | | | | |



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Nalbari College, Nalbari

Teaching Plan for the Session: 2022-23

Name of the Teacher: HiraKjyoti Barman

Department: Computer Science

Paper Name: Compiler Design

Semester: V

Paper Code: ITB-HC-5016

Learning Objectives:

1. Comprehend the role and structure of a compiler, including its major phases: lexical analysis, syntax analysis, semantic analysis, optimization, and code generation.
2. Learn how to design a lexical analyzer.
3. Understand regular expressions, finite automata.
4. Understand context-free grammars and parse trees.
5. Comprehend semantic analysis and the role of a semantic analyzer in checking for semantic errors.

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|-------------------|--|--------------------------|--|--|----------------------------|
| 1 | What is a compiler? Phases of compiler. | Reference books, e-books | Blackboard and PPT is used for lecture Methods | Home assignment, Test etc | Class Test, Quiz |
| 2 | Overview of working of a compiler | etc, Online Education | | | |

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| 3 | linker,loader | Websites. | | | |
| 4 | NFA | | | | |
| 5 | NFA Examples | | | | |
| 6 | DFA | | | | |
| 7 | DFA Examples | | | | |
| 8 | conversion from NFA to DFA | | | | |
| 9 | conversion from NFA to DFA examples | | | | |
| 10 | Regular expression | | | | |
| 11 | Regular expression to NFA Conversion | | | | |
| 12 | Minimization of DFA | | | | |
| 13 | Structuer of Lexical analyzer | | | | |
| 14 | use of finite autometa to write lexical analyser | | | | |
| 15 | Grammar representation | | | | |
| 16 | Derivation and parse tree | | | | |
| 17 | Ambiguity and possible elimination | | | | |
| 18 | Top down parsing, Bottom up parsing | | | | |
| 19 | Recursive descent and predictive top down parsing | | | | |
| 20 | Elimination of Left recursion | | | | |
| 21 | Operator precedence parsing | | | | |

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| 22 | LR parsing:SLR | | | | |
| 23 | LR parsing LALR | | | | |
| 24 | Error detection and recovery | | | | |
| 25 | Parser table construction | | | | |
| 26 | Symbol table contents, implementation | | | | |
| 27 | Type checking. Syntax directed translation | | | | |
| 28 | Forms of intermediate codes. Abstract Syntax Trees | | | | |
| 29 | Directed Acyclic Graph | | | | |
| 30 | Three address Code | | | | |
| 31 | Intermediate code generation for different language constructs, Boolean Expressions | | | | |
| 32 | if, if else | | | | |
| 33 | while, case or switch | | | | |
| 34 | Target code generation issues | | | | |
| 35 | register allocation, Runtime storagemanagement | | | | |
| 36 | DAG, basic blocks | | | | |
| 37 | Common subexpression elimination, variable propogation | | | | |
| 38 | code motion, strength reduction | | | | |
| 39 | elimination of dead code, loop optimisation | | | | |

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Nalbari College, Nalbari

Teaching Plan for the Session: 2022-23

Name of the Teacher: Dhruba Jyoti Mishra

Department: Computer Science

Paper Name: **R Programming**

Semester: IV

Paper Code: ITB-SE-4034

Learning Objectives:

1. Efficiently manipulate, clean, and preprocess data using R's data structures (vectors, data frames, lists) and functions from packages like dplyr.
2. Perform a wide range of statistical tests, build and interpret models (regression, ANOVA), and implement machine learning algorithms.
3. Create and customize visualizations to effectively communicate data insights using **ggplot2** and interactive tools like **shiny** and **plotly**.

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & | Experiential/Participating Learning Used | Mode of Assessment for |
|-------------------|----------------|--------------------|--------------------|--|------------------------|
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| | | | ICT Tools | | CIE |
|----|------------------------------------|--|--|---------------------------|------------------|
| 1 | Overview and History of R | Reference books, e-books etc, Online Education Websites. | Blackboard and PPT is used for lecture Methods | Home assignment, Test etc | Class Test, Quiz |
| 2 | R Data Types and Objects | | | | |
| 3 | Subsetting, Vectorized, Operations | | | | |
| 4 | Reading and Writing Data. | | | | |
| 5 | Control Structures, Functions | | | | |
| 6 | lapply, tapply, split | | | | |
| 7 | mapply, apply, | | | | |
| 8 | Scoping Rules | | | | |
| 9 | Coding Standards. | | | | |
| 10 | Loop functions | | | | |
| 11 | Debugging Tools | | | | |
| 12 | Simulation | | | | |
| 13 | R Profiler. | | | | |



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Nalbari College, Nalbari

Teaching Plan for the Session: 2022-23

Name of the Teacher: HIRAKJYOTI BARMAN

Department: Computer Science

Semester: III

Paper Name: OPERATING SYSTEM

Paper Code: ITB-HC-3026

Learning Objectives:

1. Know the basic components of operating system.
2. Comprehend how an operating system virtualizes CPU and memory.
3. Discuss various swapping and scheduling policies.
4. Learn about different deadlock situations.
5. Visualize different file system workings with Operating Systems.

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & | Experiential/Participating Learning Used | Mode of Assessment for |
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| | | | ICT Tools | | CIE |
|---|--|--|--|------------------------------|------------------|
| 1 | Basics of Operating Systems | Reference books, e-books etc, Online Education Websites. | Blackboard and PPT is used for lecture Methods | Home assignment, Seminar etc | Class Test, Quiz |
| 2 | Generations of OSs | | | | |
| 3 | Types of Oss: Mainframe, Batch, Multiprocessor, Distributed, Multitasking, Real Time, Parallel and Time Sharing. | | | | |
| 4 | Process: Process States, Creation, Termination, Context Switching | | | | |
| 5 | Thread: Concepts, Design issues of thread, Types of thread, Benefits of threads. Basic Concepts of Multiprogramming. | | | | |
| 6 | Basic Concept of Inter-Process Communication, Race Condition, Critical Section, Mutual Exclusion, Semaphore, Mutex | | | | |
| 7 | Disabling Interrupts, | | | | |

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| | Test Set Lock | | | | |
| 8 | Peterson's Solution using semaphore | | | | |
| 9 | Different IPC Problems | | | | |
| 10 | Basic Concepts of scheduling, Pre-emptive and Non Pre Emptive scheduling | | | | |
| 11 | Scheduling Criteria, CPU Utilization, Throughput, Turnaround Time, Waiting Time, Response Time | | | | |
| 12 | Scheduling Algorithms, FCFS, SJF, RR, Priority Scheduling | | | | |
| 13 | Goals of scheduling algorithm | | | | |
| 14 | Deadlock definition, Characteristics, | | | | |
| 15 | Deadlock prevention | | | | |
| 16 | Deadlock detection and recovery | | | | |
| 17 | Deadlock avoidance using banker's algorithm | | | | |
| 18 | Memory management, | | | | |

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|----|---|--|--|--|--|
| | swapping, virtual memory, Logical vs Physical address space | | | | |
| 19 | Paging, segmentation, page fault, page table, demand paging, TLB | | | | |
| 20 | Page replacement algorithm, LRU, Optimal, NRU, FIFO, Second Chance, Clock, NFU, Working Set | | | | |
| 21 | File System, Types, attributes, operations, Acces methods | | | | |
| 22 | Directory in Unix, Relative path and absolute path, Disk layout, Disk block allocation | | | | |



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Nalbari College, Nalbari

Teaching Plan for the Session: 2022-23

Name of the Teacher: HIRAKJYOTI BARMAN

Department: Computer Science

Paper Name: SYSTEM ADMINISTRATION USING LINUX

Semester: VI

Paper Code: ITB-HC-6016

Learning Objectives:

1. Understand the architecture of a Linux system

2. Install and maintain a Linux workstation, including X11 and setup it up as a network client
3. Work at the Linux command line, including common GNU and Unix commands
4. Handle files and access permissions as well as system security

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|--------------------------|--|-------------------------------|--|--|--|
| 1 | Introduction to System Administration, Role and power of System Administrator, Basic Features of the Linux operating system, A brief Overview of the most popular Linux Distributions - Red Hat Enterprise Linux (RHEL), Ubuntu, Debian, | Reference books, e-books etc. | PPT is used for mathematical Computation and illustrations using lecture Methods | Practical , Home assignments, Seminar presentations etc. | Class Test, Solving critical Problems etc. |
| 2 | Fedora, SUSE), Installation Requirements, Partitioning the Hard drive in Linux, Installing the Linux system, Installing and Configuring software in linux, Linux kernel and device drivers | | | | |
| 3 | System Startup and | | | | |

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| | Shutdown. Standard I/O, Standard error, Redirection and Piping | | | | |
| 4 | Basics of Linux file system - File system types (ext3, ext4, xfs, jfs, ReiserFS, iso9660 etc.), three basic types of files (ordinary or regular, special or device and directory), | | | | |
| 5 | I-nodes and file attributes, Absolute and Relative path names. File system Mounting and Unmounting, Organization of the file tree, Standard directories and their contents. | | | | |
| 6 | Files and Directory handling Commands - ls, cd, cp, mv, rm, mkdir, rmdir, Commands for Creating and Viewing ordinary files - cat, more, pg | | | | |
| 7 | Filter Commands - wc, head, tail, cut, tr, grep (with regular expressions), | | | | |

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| | Setting user and group ownership of files and Access permissions – chmod, chown, chgrp commands | | | | |
| 8 | Study of different Linux Shells (sh, bash, csh, zsh), Environment variables, Shell script basics (examples of some simple shell programming). | | | | |
| 9 | Basic commands for starting and stopping processes, Basic process attributes and their role in Access control, Examining the list of running processes on the system and understand the data presented there, Background process, | | | | |
| 10 | Job control, Cron tab file format, Backup and Restore procedure, Submit a print job, check the status of a print job, cancel a print job | | | | |
| 11 | Configuring the Print Queue, Selecting | | | | |

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| | the Print Driver, Editing the Printer configuration. | | | |
| 12 | Understanding the „root,, account, Becoming a Superuser (su), A limited su (sudo) Managing user accounts - Adding a new user, Modifying and Removing User accounts | | | |
| 13 | Changing Password, System monitoring and logging, Monitoring memory usage, disk space usage and I/Oactivity. | | | |
| 14 | The rules governing IP address classes and netmasks, Network Address, Netmask and Gateway, configuring Interface with ifconfig, ping, netstat, | | | |
| 15 | traceroute, telnet. Understanding the significance of the /etc/services file and well known port numbers, Basics of | | | |

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| | configuring | | | |
| 16 | NFS, NIS, DNS, FTP, Squid Proxy, DHCP server, iptables and firewall, Basic Network Security Issues | | | |



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Nalbari College, Nalbari

Teaching Plan for the Session: 2022-23

Name of the Teacher: HIRAKJYOTI BARMAN

Department: Computer Science

Paper Name: MICROPROCESSOR

Semester: VI

Paper Code: ITB-HE-6016

Learning Objectives:

1. To introduce students with the architecture and operation of typical microprocessors and microcontrollers.
2. To familiarize the students with the programming and interfacing of microprocessors and microcontrollers.
3. To provide strong foundation for designing real world applications using microprocessors and microcontrollers

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|--------------------------|--|-------------------------------|--|--|--|
| 1 | User Programmable registers, PC, SP, accumulator, flags, data bus, address bus, control bus, instruction word size | Reference books, e-books etc. | PPT is used for mathematical Computation and illustrations using lecture Methods | Practical , Home assignments, Seminar presentations etc. | Class Test, Solving critical Problems etc. |
| 2 | opcode format, data format, memory addressing | | | | |
| 3 | I/O addressing, address decoding for memory and I/O. | | | | |
| 4 | Pinout of 8085A | | | | |

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| | microprocessor, multiplexed address/data bus, | | | | |
| 5 | control and status signal, demultiplexing of control signals, other signals, bus timings, | | | | |
| 6 | fetch decode and execute cycle, timing diagram for opcode fetch memory read and memory write, | | | | |
| 7 | interfacing memory and I/O. | | | | |
| 8 | Complete instruction set in detail, programming examples, logic operation, | | | | |
| 9 | counters and time delays, stack and subroutine, processing arrays, bit manipulation. | | | | |
| 10 | In and OUT instruction, decoding addresses, Interfacing LED | | | | |
| 11 | relay, seven segment display, switch, keyboard | | | | |

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| 12 | Vectored interrupts, interrupt priorities, general purpose programmable peripheral devices, 8255A control and status registers | | | |
| 13 | programming 8255A, introduction to 8279, 8254 and 8237 (block diagrams and basic functions). | | | |



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Nalbari College, Nalbari

Teaching Plan for the Session: 2022-23

Name of the Teacher: Pranjali Dutta

Department: Computer Science

Paper Name: **Multimedia and Applications**

Semester: III

Paper Code: **ITB-HG-3016**

Learning Objectives:

1. One can learn about the fundamental concepts of multimedia.
2. Gain proficiency in using multimedia development tools and software for creating, editing and integrating multimedia elements.
3. Understand the principles of multimedia project management, including planning, design, implementation and evaluation.

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|-------------------|---|--|--|--|----------------------------|
| 1 | Introduction to multimedia | Reference books, e-books etc, Online Education Websites. | Blackboard and PPT is used for lecture Methods | Home assignment, Test etc | Class Test, Quiz |
| 2 | components | | | | |
| 3 | uses of multimedia, multimedia applications | | | | |
| 4 | virtual reality | | | | |

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| 5 | Fonts & Faces | | | | |
| 6 | Using Text in Multimedia | | | | |
| 7 | Font Editing | | | | |
| 8 | Font Design Tools | | | | |
| 9 | Hypermedia | | | | |
| 10 | Hypertext | | | | |
| 11 | Still Images – bitmaps | | | | |
| 12 | vector drawing | | | | |
| 13 | 3D drawing & rendering | | | | |
| 14 | naturallight & colors | | | | |
| 15 | Computerized colors | | | | |
| 16 | color palettes | | | | |
| 17 | image file formats | | | | |
| 18 | Digital Audio, MIDI Audio | | | | |
| 19 | MIDI vs Digital Audio | | | | |
| 20 | Audio File Formats | | | | |
| 21 | How video works | | | | |
| 22 | analog video | | | | |
| 23 | digital video | | | | |
| 24 | video file formats | | | | |
| 25 | video shooting and editing | | | | |
| 26 | Principle of animations | | | | |
| 27 | animation techniques | | | | |
| 28 | animation file formats | | | | |

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| 29 | www and HTML | | | | |
| 30 | multimedia on the web | | | | |
| 31 | web servers | | | | |
| 32 | web browsers | | | | |
| 33 | web page makers | | | | |
| 34 | Site builders | | | | |
| 35 | Stages of a multimedia project | | | | |
| 36 | Requirements to make good multimedia | | | | |
| 37 | Multimedia Hardware | | | | |
| 38 | Macintosh and Windows production Platforms | | | | |
| 39 | Hardware peripherals | | | | |
| 40 | Connections | | | | |
| 41 | Memory and storage Devices | | | | |
| 42 | Multimedia software | | | | |
| 43 | Authoring tools | | | | |



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Nalbari College, Nalbari

Teaching Plan for the Session: 2022-23

Name of the Teacher: PRANJAL DUTTA

Department: COMPUTER SCIENCE

Paper Name: DATA STRUCTURE AND ALGORITHM

Semester: II

Paper Code: ITB-HC-2016

Learning Objectives:

1. To provide the knowledge of basic data structures and their implementations.
2. To understand importance of data structures in context of writing efficient programs.
3. To develop skills to apply appropriate data structures in problem solving.

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|--------------------------|--|-------------------------------|---|---|---|
| 1 | Concept of Data Types, elementary structure, words and their interpretations, packed words | Reference books, e-books etc. | Blackboard, Lab and PPT is used for illustrations and lecture Methods | Practical , Home assignment, seminar etc. | Laboratory work for practice , Quizzes, class tests |
| 2 | Types, memory representation, address translation functions for one & two dimensional | | | | |

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| | arrays, different examples | | | | |
| 3 | Singly and doubly linked list, circular and non circular | | | | |
| 4 | list manipulation with pointers, example involving insertion and deletion of elements and their comparative studies with implementations using array structure | | | | |
| 5 | Stacks and Queues definitions, representation using array and linked list structure | | | | |
| 6 | Application of stack and queues in simulation | | | | |
| 7 | Postfix conversion and evolution of arithmetic expressions | | | | |
| 8 | Binary Trees definition, quantitative properties, memory representation | | | | |
| 9 | Trees traversal | | | | |

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| | algorithms (recursive and non-recursive) | | | | |
| 10 | Threaded trees, BFS and DFS | | | | |
| 11 | Sorting and Searching : Linear and binary search algorithms, performance and complexity | | | | |
| 12 | Binary search trees (construction, insertion, deletion and search) Concept of optimal binary search trees. | | | | |
| 13 | Terminology, performance evaluation, sorting algorithms (non recursive, recursive description, Complexity, advantages and disadvantage, implementation) | | | | |
| 14 | Creating & saving Presentations , Opening an existing Presentation, Working in different views, | | | | |

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| 15 | Bubble sort, insertion sort, selection sort | | | | |
| 16 | Heap sort, quick sort, merge sort | | | | |
| 17 | Radix sort, External Sorting | | | | |
| 18 | Analysis of Algorithm: Time and Space complexity of algorithms, average case and worst case analysis, asymptotic notation as a measure of algorithm complexity, O and notations. | | | | |
| 19 | Analysis of sorting algorithms- Selection sort, Bubble sort, Insertion sort, Heap sort, Quick sort and analysis of searching algorithms – linear search and binary search. | | | | |



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Teaching Plan for the Session: 2022-23

Name of the Teacher: PRANJAL DUTTA

Department: Computer Science

Semester: IV

Paper Name: WEB TECHNOLOGY

Paper Code: ITB-HC-5026

Learning Objectives:

1. Students are able to develop a dynamic webpage by the use of java script and Students will be able to connect a java program to a DBMS and perform insert.
2. Students will be able to write a well formed / valid XML document.
3. DHTML. Students will be able to write a server side java application called Servlet to catch
4. update and delete operations on DBMS table. Students will be able to write a server side java application called JSP to catch form

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|-------------------|--|-------------------------------|--|--|--|
| 1 | A brief history of TCP/IP and the Internet, Internet services-email, telnet, ftp | Reference books, e-books etc. | PPT is used for mathematical Computation and illustrations using lecture Methods | Practical , Home assignments, Seminar presentations etc. | Class Test, Solving critical Problems etc. |
| 2 | Web browser helper applications, Introduction to web servers and their architecture, Review of some popular web servers like | | | | |

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| | Apache, | | | | |
| 3 | Nginx, Litespeed, Tomcat etc. | | | | |
| 4 | Firewall, proxy server, overview of intranet security, web server security, username/password authentication, | | | | |
| 5 | COM, DCOM, CORBA, JDBC, ODBC- CGI, ASP and PHP, Dynamic page creation and advantages | | | | |
| 6 | Basic HTML, HTML tags, creating list in HTML, hyperlinks, multimedia, HTML forms, tables in HTML, frames in HTML | | | | |
| 7 | image maps, style sheets in HTML. DHTML, XML- Introduction, syntax, DTD | | | | |
| 8 | Client side Scripting languages | | | | |
| 9 | Creating interactive documents using JavaScript | | | | |



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Teaching Plan for the Session: 2022-23

Name of the Teacher: PRANJAL DUTTA

Department: Computer Science

Paper Name: PROGRAMMING IN JAVA

Semester: IV

Paper Code: ITB-HC-4016

Learning Objective:

1. Codes basic programs in Java programming language.
2. Prints to the screen in Java language.
3. Makes relational operations in Java.
4. Constructs loops in Java.
5. Defines arrays in Java and uses them.
6. Uses objects and classes.
7. Declares objects and classes.
8. Distinguishes classes and objects.

| Sl. No of Lecture | Topic/Subtopic | Learning Resources | Mode of Teaching & ICT Tools | Experiential/Participating Learning Used | Mode of Assessment for CIE |
|-------------------|---|--------------------|------------------------------|--|----------------------------|
| 1 | Basic features, Java virtual machine concepts | Reference | PPT is used for | Practical , Home | Class Test, |

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| | Creation of JAVA | books, e-books | mathematical | assignments, Seminar | Solving critical |
| 2 | executing a java program using command line arguments, The primitive data types and Variables | etc. | Computation and illustrations using lecture | presentations etc. | Problems etc. |
| 3 | Java Key words, integer and floating point data type, character and Boolean types, declaring and initialization variables, Type conversion and casting | | Methods | | |
| 4 | Java operators - Arithmetic operators, Bitwise operators, Relational operators, Boolean logical operators, Assignment operator, Conditional operator | | | | |
| 5 | if and switch statements, iteration statements, jump statements | | | | |
| 6 | Class fundamentals, Objects, Constructors | | | | |
| 7 | this keyword, finalize () method, Overloading methods, garbage collection | | | | |
| 8 | Returning objects, introducing access control, understanding static | | | | |
| 9 | introducing final, introducing nested and inner classes, String | | | | |

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| | operations, Character Extraction, Comparing, Searching & Modifying the strings | | | | |
| 10 | Data conversion using valueOf(), StringBuffer | | | | |
| 11 | Inheritance basics, using super, creating a multilevel hierarchy | | | | |
| 12 | method overriding, dynamic method dispatch, using abstract classes | | | | |
| 13 | using final with inheritance Packages and interfaces Packages, access protection, importing packages | | | | |
| 14 | interfaces Multithread programming, The JAVA thread model, creating a thread, creating a multiple thread | | | | |
| 15 | Using is Alive() and join (), Inter thread communication, suspending, resuming and stopping threads, using multithreading | | | | |
| 16 | Exception handling fundamentals, exception types, uncaught exceptions, using try and catch, multiple catch clauses | | | | |
| 17 | nested try statements, throw, throws, finally, Java's built-in Exceptions | | | | |
| 18 | Input/output: Java I/O classes and interfaces, file, the stream classes, byte | | | | |

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| | streams, character streams | | | | |
| 19 | Console class. Applet class: Applet basics, applet architecture, simple applet skeleton, applet displaying methods | | | | |
| 20 | Event handling: Two event handling mechanisms, delegation event model, event classes, source of events, event listener interface | | | | |



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