CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)

Semester-III	**Branch: Computer Science Engineering (Cyber Security)**
Subject:Discrete Mathematics	**Code: 3022C01AT014**
Maximum/Minimum-Passing Marks: 100/35 **Teacher Assessment Marks: 20** **Class Test Marks: 20**	**Periods/week:**
Class Tests: 2 (Mandatory)	**Assignments: 2 (Minimum)**
Duration (ESE): 3 hours	**Total Credits: 3**

L	T	P	Ass. Hours	Teaching Hrs/Sem
02	01	-	15	45

Course Objectives	Course Outcomes
1. To introduce a number of discrete mathematical structures found to be serving as tools in the development of theoretical computer science. 2. The course focuses on how discrete structures actually helped computer engineers to solve problems that occurred in the development of programming languages. 3. The course highlights the importance of discrete structures towards simulation of a problem in computer science engineering.	After completion of this course students will be – 1. Able to apply mathematical logic and Boolean algebra in switching circuits & logic circuits. 2. Familiar with set theory, relation and functions. 3. Familiar with algebraic structures, graph theory and combinatorics. 4. Able to solve problems in various fields in computer science, specially networking

UNIT-I MATHEMATICAL LOGIC & BOOLEAN ALGEBRA:

Basic concept of mathematical logic, Statements, Connectives, Conditional and biconditional statements, Logical equivalence, Logical implication & quantifiers, Basic concept of Boolean Algebra, Properties of Boolean Algebra, Boolean functions, Disjunctive & conjunctive normal forms of Boolean functions, Applications of Boolean Algebra in switching circuits & logic circuits.

UNIT-II SET THEORY, RELATIONS, FUNCTIONS:

Cartesian Product and properties, Relations, Properties of relation in a set, Equivalence relation, Composition of relations, Partial order & Total order relations, Lattices & Hasse diagram, Introduction to function, Inverse, Identity, Injective, Surjective & Bijective functions, Composition of functions and some special functions.

UNIT-III ALGEBRAIC STRUCTURES:

Groups, Subgroups, Cosets, Lagrange's theorem, Homomorphism, Isomorphism, Automorphism, Codes & group codes.

UNIT-IV GRAPH THEORY:

Introduction to graph theory, Types of graphs, Walks, Paths & Circuits, Eulerian and Hamiltonian graphs, Matrix Representation of graphs, Shortest path problems-Dijkstra Algorithm, Basic concept of tree: spanning Tree, minimum spanning tree- Kruskal's and Prim's Algorithm.

UNIT-V COMBINATORICS:

Permutation and combination, pigeon-hole principle, Mathematical Induction, Principle of Inclusion and Exclusion, Generating function, Recurrence relation.

Text Books:

S. No.	Title	Authors	Edition	Publisher
1)	Elements of Discrete Mathematics	C.L. Liu	3rd Edition	Tata McGraw-Hill, publications.
2)	Elements of Discrete Mathematics-A Computer Oriented Approach	C.L. Liu, D P Mohapatra	4th Edition	Tata McGraw-Hill, publications.
3)	Discrete Mathematical Structures,	Bernard Kolman, Robert C. Busby and Sharon Cutler Ross	6th Edition 2009	PHI Learning Pvt. Ltd.
4)	A Text Book of Discrete Mathematics	Sapan Kumar Sarkar	10th Edition, 2025	S. Chand and Company Ltd.
5)	विवेक्त गणित, हिन्दी (Discrete Mathematics)	Dr. H. K. Pathak	Edition 2023-24	Shiksha Sahitya Prakashan

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1)	Graph theory with applications to engineering and computer science	Narsingh Deo	Indian Reprint 2014	Prentice Hall of India
2)	Discrete mathematics for computer scientists and mathematicians	J.L. Mott, A. Kandel and T.P. Baker	2nd Edition	Pearson

3)	Discrete Mathematical Structures with applications to computer science	J.P. Tremblay and R. Manohar	39th Reprint 2011	Tata McGraw-Hill
4)	Discrete Mathematics and Its Applications	Kenneth H. Rosen	6th Edition 2007	Tata McGraw-Hill
5)	Discrete Mathematical Structure	Dr. H. K. Pathak	1st Edition 2009-10	Shiksha Sahitya Prakashan
6)	Discrete Structure	Dr. D. C. Agrawal	5th Edition 2023-24	Shree Sai Prakashan

E- resources/ Web Sources: NPTEL You Tube Channel

1. SWAYAM Portal: Online Lectures on Engineering Mathematics.(https://onlinecourses swayam2.ac.in/cec20_ma02/preview).

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)

<table>
<tr><td>Semester-III</td><td colspan="5">Branch: Computer Science Engineering (Cyber Security)</td></tr>
<tr><td>Subject: Operating System</td><td colspan="5">Code: 3022C02BT022</td></tr>
<tr><td rowspan="3">Maximum/Minimum-Passing Marks: 100/35
Teacher Assessment Marks: 20
Class Test Marks: 20</td><td colspan="5">Periods/week:</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>Ass. Hours</td><td>Teaching Hrs/Sem</td></tr>
<tr><td>02</td><td>01</td><td></td><td>15</td><td>45</td></tr>
<tr><td>Class Tests: 2 (Mandatory)</td><td colspan="5">Assignments: 2 (Minimum)</td></tr>
<tr><td>Duration (ESE): 3 hours</td><td colspan="5">Total Credits: 3</td></tr>
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Course Objective

1. Understand the fundamental role of an operating system in managing hardware and software resources for efficient data processing.
2. Analyze process management concepts, including concurrency, scheduling, deadlocks, and synchronization mechanisms.
3. Explore memory management techniques, such as paging, segmentation, and virtual memory.
4. Examine file system structures, disk organization, and secondary storage management.
5. Gain knowledge of system calls, process communication, and security mechanisms in modern operating systems.

UNIT I: Introduction **(09 Hrs)**

Introduction to operating systems – Objectives , functions of an operating system, Components of an operating system, The evolution of operating system, **Operating system types :** Batch system, Interactive System, Time sharing system, Embedded Operating System and real time systems, Protection.

UNIT II: Process Management **(09 Hrs)**

Definition, Process State, Process state transitions, Process control block. Operations on Processes: Suspend and Resume, Interrupt Processing. Mutual Exclusion, the Producer / Consumer problem, the critical section problem, Semaphores, Classical problems in concurrency, inter process communication. CPU scheduling: concepts, performance criteria, and scheduling Algorithms. Algorithm evaluation. **Dead Locks:** System model, Deadlock characterization. Prevention, Avoidance and Detection, Recovery from deadlock, combined approach.

UNIT III: Memory Management **(09 Hrs)**

Multiprogramming with fixed partition, Multiprogramming with variable partitions, Paging, Segmentation, paged - segmentation, virtual Memory concepts, Demand paging, performance, page Replacement algorithms, Allocation of frames, Thrashing, cache memory organization.

(09 Hrs)

UNIT IV: I/O Management

I/O device and the organization of the I/O function, I/O Buffering, Direct Memory access(DMA), File system: File Concepts – File organization and Access mechanism, File Directories, File sharing, Implementation issues. Disk Scheduling algorithms.

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UNIT V: Case Study Unix/Linux System **(09 Hrs)**

Architecture and Features of Unix O/S, Unix file system and its layout (Boot block, Super block, Inode Block, Data block), concept of Inode. Unix Commands – PATH, who, date, cat, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, more, pipe operator, redirection operator, Filters, nl, uniq, grep, cmp, chmod, tr, writing and executing Basic of Shell Script.

Course Outcomes:

1. Understand the role of the operating system in executing data-processing tasks on a computer.
2. Learn how the OS manages resource complexity during concurrent process execution, and analyze resource bottlenecks caused by concurrency, deadlocks, and synchronization mechanisms.
3. Explain the functioning of operating system components in memory management, including virtual memory techniques.
4. Describe disk organization, file system structure, and the secondary storage management functions of the OS.
5. Explore various system calls and the concept of inodes.

Text Books:

1. **"Operating System Concepts"** – Abraham Silberschatz, Peter B. Galvin, Greg Gagne
2. **"Modern Operating Systems"** – Andrew S. Tanenbaum, Herbert Bos
3. **"Operating Systems: Internals and Design Principles"** – William Stallings
4. **"Operating System: A Design-Oriented Approach"** – Charles Crowley

Reference Books:

1. **"Operating Systems: Principles and Practice"** – Thomas Anderson, Michael Dahlin
2. **"Operating Systems: Three Easy Pieces"** – Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau (Free online)
3. **"Linux Kernel Development"** – Robert Love

हिंदी पुस्तक:

1. **'ऑपरेटिंग सिस्टम फंडामेंटल्स (हिंदी)'** लेखक: डॉ. अजय तिवारी प्रकाशक: यूनिवर्सिटी बुक्स वर्ष: 2023 ISBN: 9788181981196 यह पुस्तक ऑपरेटिंग सिस्टम के मूलभूत सिद्धांतों को हिंदी में विस्तृत रूप से समझाती है।

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)

Semester- III	Branch: Computer Science Engineering (Cyber Security)				
Subject: Digital Electronics & Logic Design	Code: 3022C03BT022				
Maximum/Minimum-Passing Marks: 100/35 Teacher Assessment Marks: 20 Class Test Marks: 20	Periods/week:				
	L	T	P	Ass. Hours	Teaching Hrs/Sem
	02	01	-	15	45
Class Tests: 2 (Mandatory)	Assignments: 2 (Minimum)				
Duration (ESE): 3 hours	Total Credits: 3				

Course Objectives:

1. Understand the fundamental concepts of number systems, Boolean algebra, and logic gates.
2. Analyze and design combinational circuits such as adders, multiplexers, decoders, and encoders.
3. Explore sequential circuits, including flip-flops, registers, and counters, and their applications.
4. Study the design and implementation of memory units and programmable logic devices (PLDs).
5. Develop skills in designing and analyzing digital systems using hardware description languages (HDL) and simulation tools.

UNIT I: Digital Fundamentals **(9 Hrs)**

laws of Boolean algebra, Boolean functions, Minterm and maxterm, Prime implicants, Representation in SOP and POS forms, Minimization of logic expressions by Karnaugh Map and algebraic method, Realization of switching functions using gates, Number representation and Computer Arithmetic (fixed and floating point).

UNIT II: Combinational Circuits **(9 Hrs)**

Adder and Subtractor (half-full adder & subtractor), Parallel Adder, Carry look ahead adder and Parity Generator, Encoder, Decoder, Multiplexer, Demultiplexer, Comparator, Code Converters.

UNIT III: Sequential Circuits(Flip-Flops, Latches & Registers) **(9 Hrs)**

Latches, Flip-Flops, SR, JK, Master slave JK, D, T, characteristic Tables, Excitation tables, Conversion of flip -flops, Registers (SISO, SIPO, PIPO, PISO).

UNIT IV: Sequential Circuits (Counters and Finite state Machine) **(9 Hrs)**

Basic concept of Synchronous and Asynchronous counters, Up/Down Counters, Ring counter, Johnson counter, Design of Modulo-N Counter.

UNIT V: Digital Logic Families and Memory **(9 Hrs)**

MOS Logic: CMOS Logic, Dynamic MOS Logic, Comparison among various logic families. Memories: ROM and RAM, Programmable Devices **:** PLA, PAL and FPGA.

Course Outcomes:

1. Apply knowledge of number systems, Boolean algebra, and logic gates to simplify and design digital circuits.
2. Design and implement combinational circuits such as multiplexers, decoders, and arithmetic circuits.
3. Develop and analyze sequential circuits, including flip-flops, counters, and shift registers.
4. Understand and utilize memory elements, programmable logic devices (PLDs), and their applications in digital systems.
5. Use simulation tools and hardware description languages (HDL) to design and verify digital logic circuits.

Text Books:

1. **"Digital Design" –** M. Morris Mano, Michael D. Ciletti
2. **"Fundamentals of Digital Circuits" –** A. Anand Kumar

Reference Books:

1. **"Modern Digital Electronics" –** R. P. Jain
2. **"Digital Principles and Applications" –** Donald P. Leach, Albert Paul Malvino
3. **"Digital Electronics: Principles and Integrated Circuits" –** Anil K. Maini

हिंदी पुस्तक:

1. **'अंकीय इलेक्ट्रोनिक्स'** प्रकाशक: अखिल भारतीय तकनीकी शिक्षा परिषद (AICTE) यह पुस्तक डिजिटल इलेक्ट्रॉनिक्स के मूलभूत सिद्धांतों को हिंदी में विस्तृत रूप से प्रस्तुत करती है

2. **'Experiments in Digital Electronics'** लेखक: एन.एस. पंवार और कुलदीप कुमार यह पुस्तक सरल भाषा में छोटे-छोटे प्रयोगों के माध्यम से डिजिटल इलेक्ट्रॉनिक्स की अवधारणाओं को समझाती है, विशेष रूप से बी.टेक, डिप्लोमा, और एम.एससी. भौतिकी के छात्रों के लिए उपयोगी है।

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)

Semester-III	**Branch: Computer Science Engineering (Cyber Security)**
Subject: Object Oriented Programming Using C++	**Code: 3022C04CT022**
Maximum/Minimum-Passing Marks: 100/35 **Teacher Assessment Marks: 20** **Class Test Marks: 20**	**Periods/week:**

L	T	P	Ass. Hours	Teaching Hrs/Sem
02	01	-	15	45

Class Tests: 2 (Mandatory)	**Assignments: 2 (Minimum)**
Duration (ESE): 3 hours	**Total Credits: 3**

Course Objectives:

1. Understand Object-Oriented Programming (OOP) Concepts
2. Develop and Implement Classes & Objects
3. Apply Inheritance and Polymorphism
4. Utilize File Handling and Exception Handling
5. Design Real-World Applications Using OOP in C++

Unit - I Principles of Object Oriented Programming 1.1 Procedure Oriented Programming (POP) verses Object Oriented Programming (OOP) 1.2 Features of Object Oriented Programming, Examples of Object Oriented languages, Applications of OOP 1.3 Data types, Type compatibility, Declaration of variable, Dynamic initialization of variable, Reference variable, Type casting 1.4 Special Operators in C++: Scope resolution operator, Memory management operators, Manipulators 1.5 Structure of C++ program, Basic Input /Output operators and functions in C++, Simple C++ Program 1.6 Class & Object: Introduction, Specifying a class, Access specifiers, Defining member functions: Inside class and Outside class, Creating objects, Memory allocations for objects **(15 Hrs)**

Unit - II Functions and Constructors 2.1 Inline function, Static data members, Static member function, Friend function: Using two different classes , Using non-member function 2.2 Array of Objects, Object as function arguments 2.3 Concepts of Constructors, Types of constructors 2.4 Constructor overloading and Constructors with default arguments 2.5 Destructors **(7 Hrs)**

Unit - III Extending classes using Inheritance 3.1 Introduction to Inheritance, Defining a derived class, Visibility modes and effects 3.2 Types of Inheritance : Single, Multilevel, Multiple, Hierarchical, Hybrid 3.3 Virtual base class, Abstract class, Constructor in derived class **(6 Hrs)**

Unit - IV Pointers and Polymorphism in C++ 4.1 Concept of Pointer: Pointer declaration, Pointer operator, Address operator, Pointer arithmetic 4.2 Pointer to Object: Pointer to object, 'this' pointer, Pointer to derived class 4.3 Introduction of Polymorphism, Types of polymorphism 4.4 Compile time Polymorphism: Function overloading, Revision of constructor overloading, Operator overloading: Rules for operator overloading, Overloading of unary and binary operators 4.5 Run time polymorphism: Virtual function, Rules for virtual function, Pure virtual function **(10 Hrs)**

Unit - V File operations 5.1 C++ stream classes, Classes for file stream operations 5.2 Detection of end of file, File modes 5.3 Opening files: Using constructors and open(), Closing files, Reading from and writing to files, Formatted Input/output functions in file 5.4 Types of file: Random access, Sequential access **(7 Hrs)**

Course Outcomes:

1. Demonstrate a Strong Understanding of OOP Principles
2. Develop C++ Programs Using Classes and Objects
3. Implement Advanced OOP Features
4. Work with File Handling and Exception Handling
5. Build Real-World Applications Using C++

Text Books:

1. **"Object-Oriented Programming with C++" – E. Balagurusamy**
2. **"The C++ Programming Language" – Bjarne Stroustrup**

Reference Books:

1. **"C++ Standard Library: A Tutorial and Reference" – Nicolai M. Josuttis**
2. **"Programming: Principles and Practice Using C++" – Bjarne Stroustrup**
3. **"Object-Oriented Programming in C++" – Robert Lafore**

हिंदी पुस्तक:

1. **Object Oriented Programming With C++ (2nd Hindi Edition)" – प्रखर प्रकाशन**

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)

Semester-III	**Branch: Computer Science Engineering (Cyber Security)**				
Subject: Web Development	**Code: 3022C05CT022**				
Maximum/Minimum-Passing Marks: 100/35 **Teacher Assessment Marks: 20** **Class Test Marks: 20**	**Periods/week:**				
	L	**T**	**P**	**Ass. Hours**	**Teaching Hrs/Sem**
	02	**01**	**-**	**15**	**45**
Class Tests: 2 (Mandatory)	**Assignments: 2 (Minimum)**				
Duration (ESE): 3 hours	**Total Credits: 3**				

Course Objectives:

1. Gain an understanding of various Internet technologies and their applications.
2. Learn the architecture and implementation of Java-based web services.
3. Develop web applications using modern development frameworks.
4. Understand how to integrate databases, APIs, and other back-end services
5. Learn to deploy web applications effectively and implement security best practices to protect against common vulnerabilities

UNIT I: Introduction to WWW: Overview of the Internet, Web, and HTTP Protocol, Evolution of Web Technologies (Web 1.0, Web 2.0, Web 3.0), Web Architecture: Client-Server Model, DNS, URL. Web Design: Web site design principles, planning the site and navigation, Introduction to Web Client (Browsers), e-mail client, ftp Client and Search Engines. Hosting What is server, choices, setting up UNIX and Linux web servers, Logging users, dynamic IP **(10 Hrs)**

UNIT II: HTML5 Common Tags and CSS: Structure of HTML document, HTML Elements, Attributes, Headings, Paragraphs , List, Forms, Tables, Multimedia Elements, Semantics HTML, Introduction to CSS,CSS Selectors, Properties, Box Model, Inline, Internal, External CSS, Responsive Design, Basic Tags, Tables,Forms.HTML5 Tags, HTML Graphics, HTML media, HTML Graphics, HTML APIs. CSS – Background, Borders, margin, Box model. Styling text, fonts, list, links, and tables. CSS overflow, float, inline blocks, pseudo classes, pseudoelements.CSS border images, rounded corners **(13 Hrs)**

UNIT III: Client-Side Scripting (JavaScript)**:** Introduction to Java Script, Java Script language-declaring variables, Scope of variables, Functions, Event Handlers, on click, on submit etc. Document Object Model, Form Validation. **(7 Hrs)**

UNIT IV: Server-Side Scripting: Introduction to Server-Side Scripting, Overview of PHP. Variables and control statements, Function and Arrays, Form Handling (GET and POST), Session and Cookies, File Handling Basics. **(06 Hrs)**

UNIT V: Database Integration and Web Security: Introduction to databases, Sql basics, Connecting to web applications to database (e.g. PHP with MYSQL), Authentication and Authorization, Common Web Vulnerabilities (SQL Injection, XSS, CSRF), Basic security practices, Data Validation and Sanitization **(09 Hrs)**

Course Outcomes:

1. Design and develop a basic website using HTML and CSS for structure and styling.
2. Create dynamic web pages with form validation using JavaScript and implement various event-handling techniques.
3. Develop server-side functionality by writing programs in PHP.
4. Build simple web pages using PHP and represent structured data in XML format.
5. Design and implement interactive and user-friendly web applications.

Text Books:

1. Jeffrey C and Jackson, Web Technologies A Computer Science Perspective, Pearson
2. Deitel and Deitel and Nieto, Internet and World Wide Web - How to Program, Prentice Hall, 5th Edition, 2011.
3. Angular 6 for Enterprise-Ready Web Applications, Doguhan Uluca, 1st edition, Packt Publishing
4. *Learning Web Design* by Jennifer Robbins

Reference Books:

1. Stephen Wynkoop and John Burke “Running a Perfect Website”, QUE, 2nd Edition,1999.
2. Chris Bates, Web Programming – Building Intranet Applications, 3rd Edition, Wiley Publications, 2009.

हिंदी पुस्तक:

1. **"HTML, CSS, और JavaScript द्वारा वेब विकास"** – लेखक: अमित वर्मा
2. **"वेब डिज़ाइन और पब्लिशिंग" – लेखक: बी.पी.बी पब्लिकेशन**

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)

<table>
<tr><td>Semester- III</td><td colspan="5">Branch: Computer Science Engineering (Cyber Security)</td></tr>
<tr><td>Subject: Life Concept by Bhagwat Gita</td><td colspan="5">Code: 3000C06ET046</td></tr>
<tr><td rowspan="4">Maximum/Minimum-Passing marks:100/35
Teacher Assessment Marks: 20
Class Test Marks: 20</td><td colspan="5">Periods/week:</td></tr>
<tr><td>L</td><td>T</td><td>P</td><td>Ass. Hours</td><td>Teaching Hrs/Sem</td></tr>
<tr><td>02</td><td>0</td><td>-</td><td>15</td><td>30</td></tr>
<tr><td colspan="5"></td></tr>
<tr><td>Class Tests: 2 (Mandatory)</td><td colspan="5">Assignments: 2 (Minimum)</td></tr>
<tr><td>Duration (ESE): 3 hours</td><td colspan="5">TotalCredits: 2</td></tr>
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Course Objectives:

1. To learn the scientific aspects of the Bhagavad Gita.
2. To explore how the timeless wisdom of the Gita can be integrated into modern life to foster holistic well-being.
3. To discover practical methods from the Gita to manage and reduce stress, anxiety, and overwhelm in personal and professional life.
4. To gain insights from the Gita on building meaningful and harmonious relationships, enhancing effective communication, and critical thinking.
5. To develop mindfulness and meditation practices based on Gita teachings to enhance self-awareness, inner peace, and bhakti for achieving the ultimate goal of life.

Course Outcome:

1. Student understands the basic concepts of Bhagwd-Gita and its need for students.
2. They have been introduced to some concepts of Science of SOULS
3. They have been introduced to some concepts Supreme Lord (Ishwara).
4. They have been introduced to concepts of Yoga – Dhyana, Karma, Jnana, Bhakti

UNIT-I: BASIC CONCEPTS OF BHAGWAD GITA: (8 Hours)

Introduction to Bhagavad Gita, How to learn Bhagavad-Gita, Five topics in the Bhagavad Gita: Isvara, Jiva, Kala, Karma and Prakriti.

Dilemma in the material world: Arjuna's dilemmas and doubts; perplexities of life in this world: birth, death, disease and old age, three-fold miseries; material relationships: temporary, cause misery; the only solution: spiritual, relationship.

Absolute necessity of spiritual relationship with a bonafide spiritual master/teacher; qualifications of a spiritual master; check and balance through Guru, sadhu and sastra, Qualifications of a disciple/student

UNIT-II: SCIENCE OF SOUL (JIVA): (6 Hours)

What is soul? Proof of existence of soul, its nature and individuality; the doctrine of life comes from life; activities in knowledge of science of soul. Cause of suffering in this world; constitutional position of living entity.

UNIT-III: SUPREME LORD (ISHWARA): (8 Hours)

Knowing Krishna, the Supreme personality of Godhead; Krishna as the source of both material and spiritual energies, and the supreme controller; understanding the position of God, His expansions and living entities. Lord's descent: His love, purpose and mission; Paramatma: our ever well-wishing best friend. Inconceivable nature of the Supreme Personality of Godhead, His qualities and pastimes; cultivating spiritual relationship: the only way to understand Him. Is God personal or impersonal? Three aspects of the Absolute Truth; path of personalism vs. path of impersonalism. Demigod worship: universal administration; demigods and their relationship with Krishna; right way to approach demigods

UNIT-IV: YOGA (CONNECTING WITH SUPREME LORD): (8 Hours)

What is yoga? Types of yoga – Dhyana, Karma, Jnana, Bhakti; limitation of asthanga yoga in kali yuga; gradual and direct method - bhakti yoga; pure devotional service; the topmost yoga system. Different platforms of worship: fear, desire, duty,

Karm Yoga (कर्म योग) : Why bad things happen to good people? Law of karma: good karma, bad karma and akarma; how to become free from karma and reincarnation; karma yoga and its importance; contemporary relevance of karma yoga; sakama and nishkama karma yoga

Jnana Yoga (ज्ञान योग): Relation between Karma Yoga and Jñāna yoga, Distinction between Jnana and Vijñāna. Criteria of True Knowledge (Buddhi Yoga & JñānaYoga),

Bhakti Yoga भक्ति योग : Four kinds of devotees, Characteristics of Ideal Bhakti- Saraṇāgati & Prapattikrupa (grace); Relation between Bhakti Yoga & Jñāna Yoga

Text Books:

1. Srimad Bhagavad Gita: The ultimate manual of life (1st ed.) Das, M., & Das, T. K. (n.d.) CHOICE (Centre for Heritage of Indian Culture and Education).
2. Introduction to Bhagavad Gita by A.C.Bhaktivedanta Swami Prabhupada.
3. Srimad Bhagavad Gita As It Is. Mumbai: Bhaktivedanta Book Trust, 2009.
4. The Bhagavad Gita. Gorakhpur: Gita Press, 2007.
5. Krishna consciousness - The Topmost Yoga System by A.C.Bhaktivedanta Swami Prabhupada.

Reference Books:

1. Prabhupada, His Divine Grace A.C. Bhaktivedanta. Isopanishad. Mumbai: Bhaktivedanta, Book Trust, 2002.
2. Dasa, Bhurijana. Surrender Unto Me. Vrindavan: Vrindavan Institute of Higher Education, 1997.

3. Prabhupada, His Divine Grace A.C. Bhaktivedanta. The Science of Self-Realization. Mumbai: Bhaktivedanta Book Trust, 2002.

E- Recourses

1. https://youtu.be/bedsn7xIn0w?si=VW5iQdLgDu5UDhA6
2. https://anubooks.com/uploads/session_pdf/16623612876.pdf
3. https://ijcrt.org/papers/IJCRT2101218.pdf
4. https://youtu.be/HHIv6qJlRjI?si=MML5aslZRwUvE1Rl
5. https://en.wikipedia.org/wiki/Jnana-Vijnana_Yoga
6. https://en.wikipedia.org/wiki/Bhakti_yoga

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)

Semester-III	Branch: Computer Science Engineering (Cyber Security)				
Subject: Operating System Lab	Code: 3131C01BL022				
Maximum Marks: 40 Teacher Assessment Marks: 20 Duration (ESE): 3 hours Total Credits: 1	Periods/week:				
	L	T	P	Ass. Hours	Teaching Hrs/Sem
	-	-	2	15	30

Course Objectives:

1. Understand Fundamental Operating System Concepts
2. Implement Process Scheduling and Synchronization
3. Apply Memory Management Techniques
4. Simulate File Systems and Disk Scheduling Algorithms
5. Develop Shell Scripts for System Administration

List of Experiments: (Each student is required to perform a minimum of 15 experiments.)

1. **Basic Linux Commands**

- Introduction to shell
- File & directory operations
- Process-related commands
- Permission commands (chmod, chown, umask)

2. **Shell Scripting Basics**

- Writing simple shell scripts
- Loops, conditions, functions
- Automating tasks like backup, file copy, logs, etc.

Simulation of algorithms - Write programs (C/C++/Python) to simulate:

3. **Simulate the following CPU scheduling algorithms.**

a. FCFS b) SJF c) Round Robin d) Priority.

4. Simulate producer-consumer problem using Semaphores
5. Simulate the concept of Dining-philosophers problem.
6. Simulate MVT and MFT.
7. Simulate the following contiguous memory allocation Techniques

a) Worst fit b) Best fit c) First fit.

8. Simulate all page replacement algorithms

a)FIFO b) LRU c) OPTIMAL

9. Simulate all File Organization Techniques

a) Single level directory b) Two level directory

10. Simulate all file allocation strategies

a) Sequential b) Indexed c) Linked.
11. Simulate Bankers Algorithm for Dead Lock Avoidance.
12. Simulate Bankers Algorithm for Dead Lock Prevention.
13. Simulate disk scheduling algorithms.
a) FCFS b) SCAN c) C-SCAN
14. Create processes using system call.
15. Implementation of system calls.

Course Outcomes:

1. Understand and Implement Operating System Concepts
2. Simulate Process Scheduling and Synchronization
3. Apply Memory Management Techniques
4. Work with File Systems and Disk Scheduling
5. Develop and Execute Shell Scripts for System Automation

Text Books:

1. **"Operating System Concepts" –** Abraham Silberschatz, Peter B. Galvin, Greg Gagne
2. **"Modern Operating Systems" –** Andrew S. Tanenbaum, Herbert Bos
3. **"Operating Systems: Internals and Design Principles" –** William Stallings
4. **"Operating System: A Design-Oriented Approach" –** Charles Crowley

Reference Books:

1. **"Operating Systems: Principles and Practice" –** Thomas Anderson, Michael Dahlin
2. **"Operating Systems: Three Easy Pieces" –** Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau (Free online)
3. **"Linux Kernel Development" –** Robert Love

हिंदी पुस्तक:

1. **'ऑपरेटिंग सिस्टम फंडामेंटल्स (हिंदी)'** लेखक: डॉ. अजय तिवारी प्रकाशक: यूनिवर्सिटी बुक्स वर्ष: 2023 ISBN: 9788181981196 यह पुस्तक ऑपरेटिंग सिस्टम के मूलभूत सिद्धांतों को हिंदी में विस्तृत रूप से समझाती है।

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)

Semester-III	Branch: Computer Science Engineering (Cyber Security)
Subject: Object Oriented Programming in C++ Lab	Code: 3131C02BL022
Maximum Marks: 40 Teacher Assessment Marks: 20 Duration (ESE): 3 hours Total Credits: 1	Periods/week:

L	T	P	Ass. Hours	Teaching Hrs/Sem
-	-	2	15	30

Course Objectives:

1. To strengthen problem solving ability by using the characteristics of an object-oriented approach.
2. To design applications using object oriented features
3. To handle Exceptions in programs.
4. To teach the student to implement object oriented concepts

List of Experiments: (Each student is required to perform a minimum of 10 experiments.)

1. Basic C++ Programs
2. Write a C++ program to find the sum of individual digits of a positive integer. b) Write a C++ program to generate the first n terms of the sequence.
3. Write a C++ program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
4. Write a C++ program to find both the largest and smallest number in a list of integers.
5. Write a C++ program to sort a list of numbers in ascending order.
6. Write a Program to illustrate New and Delete Keywords for dynamic memory allocation
7. Write a program Illustrating Class Declarations, Definition, and Accessing Class Members.
8. Program to illustrate default constructor, parameterized constructor and copy constructors
9. Write a Program to Demonstrate the i)Operator Overloading.ii) Function Overloading.
10. Write a Program to Demonstrate Friend Function and Friend Class.
11. Write a Program to Access Members of a STUDENT Class Using Pointer to Object Members.
12. Write a Program to Generate Fibonacci Series use Constructor to Initialize the Data Members.
13. Write a C++ program to implement the matrix ADT using a class. The operations supported by this ADT are: a) Reading a matrix. b) Addition of matrices. c) Printing a matrix. d) Subtraction of matrices. e) Multiplication of matrices
14. Write C++ programs that illustrate how the following forms of inheritance are supported: a)Single inheritance b)Multiple inheritance c)Multi level inheritance d)Hierarchical inheritance
15. Write a C++ program that illustrates the order of execution of constructors and destructors when new class is derived from more than one base class.
16. Write a Program to Invoking Derived Class Member Through Base Class Pointer.
17. Write a Template Based Program to Sort the Given List of Elements.

18. Write a C++ program that uses function templates to find the largest and smallest number in a list of integers and to sort a list of numbers in ascending order.

Course Outcome:

1. Understand the features of C++ supporting object oriented programming
2. Understand the relative merits of C++ as an object oriented programming language
3. Understand how to produce object-oriented software using C++
4. Understand how to apply the major object-oriented concepts to implement object oriented programs in C++, encapsulation, inheritance and polymorphism
5. Understand advanced features of C++ specifically stream I/O, templates and operator overloading

Text Books:

1. E. Balagurusamy, Object Oriented Programming with C++, Tata McGraw Hill.
2. Lafore R., Object Oriented Programming in C++, Waite Group.
3. Bjarne Stroustrup, The C++ Programming Language, Addison Wesley.

Reference Books:

1. R. S. Salaria, Mastering Object-Oriented Programming with C++, Salaria Publishing House.
2. Herbert Schildt, C++: The Complete Reference, McGraw-Hill Education (Osborne/McGraw-Hill).

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)

Semester-III	Branch: Computer Science Engineering (Cyber Security)
Subject: Web Development Lab	Code: 3131C03CL022
Maximum Marks: 40 Teacher Assessment Marks: 20 Duration (ESE): 3 hours Total Credits: 1	Periods/week:

L	T	P	Ass. Hours	Teaching Hrs/Sem
-	-	2	15	30

Course Objectives:

1. Effectively utilize various front-end and back-end development tools.
2. Acquire the ability to comprehend and independently create functional applications.
3. Demonstrate proficiency in designing and developing engaging websites.
4. Build web-based applications using appropriate client-side and server-side programming techniques.
5. Implement robust web-based applications with efficient and optimized database integration.

List of Experiments: (Each student is required to perform a minimum of 15 experiments.)

1. Create a basic HTML page with headings, paragraphs, lists, text formatting, fonts, and links.
2. Design a webpage using tables and include multimedia elements like audio, video, and iframe.
3. Structure a webpage using semantic HTML5 tags.
4. Create forms with HTML5 validation attributes.
5. Apply CSS using inline, internal, and external methods in one page.
6. Use CSS selectors (class, id, pseudo-classes) for styling.
7. Create a responsive webpage using media queries.
8. Design layouts using float, inline-block, and flexbox.
9. Apply advanced CSS features like rounded corners and border images.
10. Write JavaScript programs using variables, data types, and operators.
11. Implement control structures like if-else and loops in JavaScript.
12. Create and use functions in JavaScript.
13. Handle events like onclick, onsubmit, and onmouseover.
14. Create interactive pages using alert, prompt, and confirm.
15. Perform DOM manipulation to change content and styles dynamically.
16. Implement form validation using JavaScript (basic and advanced).
17. Build a dynamic calculator using JavaScript.
18. Create an image gallery or slideshow using JavaScript.
19. Setup PHP environment and write basic PHP scripts.
20. Implement control statements, loops, arrays, and functions in PHP.
21. Create forms and handle data using GET and POST methods in PHP.
22. Perform file handling operations in PHP.
23. Install MySQL and perform SQL operations.

24. Connect PHP with MySQL and perform database operations.
25. Develop a login system using sessions and cookies and build a mini Student Management System.
    a.

Course Outcomes:

1. Utilize a variety of front-end and back-end development tools effectively.
2. Develop the capability to understand, design, and build applications independently.
3. Demonstrate the ability to design and develop professional-quality websites.
4. Create web-based applications by implementing suitable client-side and server-side programming.
5. Develop and deploy web-based applications with efficient database integration.

Text Books:

S.No	Title	Author(s)	Publisher
1	Web Programming with HTML5, CSS, and JavaScript	John Dean	Jones & Bartlett Learning
2	Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML and AJAX	Kogent Learning Solutions Inc.	Dreamtech Press
3	Web Technology	Uttam K. Roy	Oxford University Press India
4	PHP and MySQL Web Development	Luke Welling, Laura Thomson	Addison-Wesley

Reference Books:

S.No	Title	Author(s)	Publisher

1	Learning PHP, MySQL & JavaScript	Robin Nixon	O'Reilly
2	Web Enabled Commercial Application Development Using HTML, JavaScript, DHTML and PHP	Ivan Bayross	BPB Publications
3	PHP and MySQL Web Development	Luke Welling, Laura Thomson	Addison-Wesley
4	Learning Web Design	Jennifer Niederst Robbins	O'Reilly

Online Resources:

1. **Coursera (Web Design for Everybody) –** https://www.coursera.org/specializations/web-design
2. **Udemy (Web Development Bootcamp) –** https://www.udemy.com/course/the-web-developer-bootcamp/

हिंदी पुस्तक:

1. **वेब डेवलपमेंट (HTML, CSS, JavaScript, PHP) लेखक:सुरेश चंद्रा, विवरण**: इस पुस्तक में वेब डेवलपमेंट के सभी पहलुओं को समझाया गया है, जिससे पाठक फुल स्टैक डेवलपमेंट में दक्ष हो सकते हैं।
2. **PHP और MySQL वेब डेवलपमेंट लेखक**: **अमित अग्रवाल, विवरण**: इस पुस्तक में PHP प्रोग्रामिंग, डेटाबेस कनेक्टिविटी और CRUD ऑपरेशन्स को हिंदी में विस्तार से समझाया गया है।

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)

Semester-III	Branch: Computer Science Engineering (Cyber Security)
Subject: Idea Innovation Lab	Code: 3131C04FL022
Teacher Assessment Marks: 40 Total Credits: 1	Periods/week:

L	T	P	Ass. Hours	Teaching Hrs/Sem
-	-	2	15	30

Course Objectives:

1. To understand the complete 3D printing process and the effect of key parameters on print quality, strength, and accuracy.
2. To design and analyze fundamental digital logic circuits using logic gates and ICs to understand the operation of combinational and sequential systems.
3. To develop Arduino-based programs for interfacing sensors and controlling devices to understand basic embedded system applications and automation.
4. To apply design thinking principles to identify real-world problems, develop innovative solutions, create prototypes, and present them as a startup concept.
5. To foster creativity, problem-solving, and entrepreneurial skills by designing user-centric solutions and validating them through prototyping and presentation.

At least 15 Experiments are to be performed by each student from 1 to 20..
Exp. 21 is compulsory.

Experiments using 3D Printer:

1. 3D Model Creation and Printing

   Create a simple object using Tinkercad or Fusion 360 and print it using an FDM printer.

   Objective: To understand the complete workflow from digital design to physical object.

2. Study of STL File and Slicing Process

   Convert a 3D model into STL format, slice it using Cura, and observe layer preview before printing.

   Objective: To study how software converts a model into printable layers.

3. Effect of Layer Height on Printed Output

   Print the same model at different layer heights such as 0.1 mm, 0.2 mm, and 0.3 mm.

   Objective: To compare surface finish, printing time, and dimensional accuracy.

4. Effect of Infill Density on Part Strength

Print samples with different infill percentages such as 20%, 50%, and 80%, then compare their strength manually or by simple load testing.

Objective: To examine how internal structure affects mechanical behavior.

5. G-code Study and Printer Movement Experiment

   Observe the generated G-code for a simple object and identify commands related to movement, temperature, and extrusion.

   Objective: To understand how software instructions control the printer physically.

Experiments using Digital Trainer Kit:

6. To design NAND and NOR gates as a universal logic.
7. To design and prove Demorgan'sTheorem.
8. To design Half and Full adder circuits using logic gates.
9. To design Half and full subtractor circuits using logic gates
10. To design the binary parallel adder.
11. To design 4-bit magnitude comparator circuits.
12. To design the 7-segment decoder.
13. To design 16: 1 Multiplexer using 4:1 Multiplexer.
14. To design various types of flip flops using logic gates and ICs.
15. To design Up-Down counter.

Experiments using Arduino:

16. Arduino Program for LED blink and LED fade – in and fade -out.
17. Arduino Program to light up the LED on two button presses and make the LED low on single button press.
18. Arduino Programming to measure and display the temperature of surroundings using an LM35 temperature sensor and display the readings on the LCD display.
19. Arduino Programming to control the state of a bulb using LDR and Relay with Arduino.
20. Arduino Programming to measure the humidity and temperature of the surroundings using a Humidity sensor with Arduino and then print the value on an LCD display.

21 Experiments / Case Study

i. Identify real world problems such as Smart cities, agriculture , health care and Education.

ii. Apply design thinking processes like empathy and understanding user needs, defining the problem, ideation techniques, prototype thinking, testing and feedback.

iii. Create basic prototypes using suitable technologies.

iv. Demonstrate the Functional prototype of the problem.

v. Presentation of the Startup pitch.

Course Outcomes:

After successful completion of the course, students will be able to:

1. To design, prepare, and fabricate 3D printed models while optimizing print parameters for quality and efficiency.
2. To design and implement combinational and sequential digital circuits using logic gates and ICs.
3. To develop and execute Arduino programs for sensor interfacing and real-time control applications.
4. To apply design thinking methodology to analyze real-world problems and develop innovative prototype solutions.
5. To demonstrate creativity, teamwork, and entrepreneurial skills through prototype development and effective presentation of ideas.

Text Books:

S.No	Title	Author(s)	Publisher
1	Internet of Things : A Hands-On Approach	Arsheep Bahga, Vijay Madisetti	University press
2	Mastering 3D Printing: A Guide to Modeling Printing and Prototyping 2nd edn	Joan Horvath, Rich Cameron	Springer India
3	Digital Electronics – A Comprehensive Lab Manual	Cherry Bhargava	BS Publications

Reference Books:

S.No	Title	Author(s)	Publisher

1	Arduino: Getting Started With Arduino and Basic Programming With Projects (Advanced Methods to Learn Arduino Programming)	Ernest Leclerc	Zoe Lawson
2	Practical IoT Handbook: Programming IoT by implementing hands-on projects with Arduino, Python, and Raspberry Pi	Rodrigo J.Hernandez	BPB Publications

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)

Semester- III	Branch: Computer Science Engineering (Cyber Security)				
Subject: Personality Development	Code: 3000C07DT076				
Teacher Assessment Marks: 40 Total Credits: Non Credit Course	Periods/week:				
	L	T	P	Ass. Hours	Teaching Hrs/Sem
	1	-	2	15	45

Course Objectives: This course aims to develop self-awareness, self-management, communication, interpersonal, and professional skills in students to enhance their personality and prepare them for career and workplace readiness.

Course Contents:

Unit I: **Personality & Self-Awareness –** Concept and determinants of personality, Self-awareness and SWOT analysis, Attitude and confidence building.

Unit II: **Self-Management–** Stress management techniques, Time management and goal setting, Body language.

Unit III**: Interpersonal Skills –** Interpersonal transactions and Transactional Analysis (TA) basics; Conflict – Types and resolution, Digital communication etiquette: email writing, netiquette, and professional social media presence.

Unit IV: **Teamwork –** Group dynamics and team building, Leadership skills, Collaboration and coordination, Problem-solving in teams.

Unit V: **Professional Skills –** Public speaking and presentation skills: overcoming stage fear, structuring a talk, use of visuals; Workplace etiquette: professional appearance, meeting conduct, and workplace relationship.

Course Outcomes:

CO No.	Course Outcome	Bloom's Level
CO1	Identify personality traits and perform self-assessment analysis.	Remember (L1) / Understand (L2)
CO2	Apply self-management techniques for personal and career goals.	Apply (L3)
CO3	Demonstrate effective interpersonal skills in various contexts.	Apply (L3)
CO4	Analyze group dynamics and exhibit teamwork abilities.	Analyze (L4)

CO5	Develop professional competencies and workplace etiquettes.	Create (L6)

Text Books:

S.No.	Title	Authors	Edition	Publisher
1	Personality Development and Soft Skills	Barun K. Mitra	-	Oxford University Press
2	Communication Skills and Personality Development	J.R. Kadam et al.	-	Scientific Publishers

Reference Books:

S.No.	Title	Authors	Edition	Publisher
1	Communication Skills and Personality Development	M. Jegadeesan et al.	-	-
3	How to Win Friends and Influence People	Dale Carnegie	-	-