GURU KASHI UNIVERSITY

Bachelor of Computer Applications

(Digital Marketing)

2023-24

Department of Computer Applications

GRADUATE OUTCOMES OF THE PROGRAMME

This program aims to develop graduates with a comprehensive understanding of digital marketing strategies and computer applications, equipping them to navigate the evolving landscape of technology-driven marketing while demonstrating critical thinking, analytical skills, and ethical decision-making.

PROGRAMME LEARNING OUTCOMES After completing the programme, the learner will be able to:

1. Demonstrate proficiency in fundamental computer concepts and programming languages such as C, C++, Java, and Python, enabling them to develop software applications and solve computational problems effectively.

2. Apply digital marketing strategies and techniques, including search engine optimization (SEO), social media marketing, email marketing, and web analytics, to create engaging marketing campaigns and effectively reach target audiences.

3. Utilize database management systems and data structures to organize and retrieve information, ensuring efficient data management and storage.

4. Design and develop user-friendly websites and digital content using technologies like HTML, CSS, JavaScript, and WordPress, while incorporating principles of search engine optimization (SEO) and user experience (UX) design.

5. Analyze and interpret complex digital marketing data, making data-driven decisions to optimize marketing strategies and enhance campaign performance.

6. Implement social media marketing and mobile marketing strategies, utilizing various platforms and techniques to reach and engage with users on different digital channels.

Programme Structure

Course Code	Course Title	Type of Course	L	T	P	Credits
Semester I							
BCD101	Computer Fundamentals	Core	4	0	0	4
BCD102	Programming using C	Core	4	0	0	4
BCD103	Fundamentals of Digital Marketing	Skill Based	3	0	2	4
BCD104	Communication Skills	Compulsory Foundation	2	0	2	3
BCD105	Programming using C Lab	Technical skill	0	0	4	2
BCD199	XXX	MOOC	-	-	-	2
Disciplinary Elective- I (Any one of the following)							
BCD106	Computer System Architecture	Disciplinary Elective-I	3	0	0	3
BCD107	Digital Electronics					
Total			**16**	**0**	**8**	**22**

Semester II						
Course Code	**Course Title**	**Course Type**				
			L	**T**	**P**	**Credits**
BCD201	Operating Systems	Core	4	0	0	4
BCD202	Programming using C++	Core	4	0	0	4
BCD203	Search Engine Optimization	Skill Based	2	0	4	4
BCD204	Online Reputation Management	Skill Based	2	0	0	2
BCD205	Operating Systems Lab	Technical skill	0	0	4	2
BCD206	Programming using C++ Lab	Technical skill	0	0	4	2
BCD207	Environmental Studies	Compulsory Foundation	1	0	0	1
BCD208	Introduction to Human Resource Management	Skill Based	2	0	0	2
Disciplinary Elective- II (Any one of the following)						
BCD209	E-Commerce	Discipline Elective- II	3	0	0	3
BCD210	Information System Design and Implementation					
Total			**16**	**0**	**16**	**24**

Semester III						
Course Code	**Course Title**	**Course Type**	**L**	**T**	**P**	**Credits**
BCD301	Database Management Systems	Core	4	0	0	4
BCD302	Data Structures	Core	4	0	0	4
BCD303	Social Media Marketing	Skill Based	2	0	2	3
BCD304	Database Management Systems Lab	Technical skill	0	0	4	2
BCD305	Data Structures Lab	Technical skill	0	0	4	2
BCD399	XXX	MOOC	-	-	-	2
Disciplinary Elective- III (Any one of the following)						
BCD306	Programming using PHP	Discipline Elective- III	3	0	0	3
BCD307	Application Development using VB.NET					
Open Elective Course						
XXX		OEC	2	0	0	2
Total			**15**	**0**	**10**	**22**
Open Elective Courses (For other Departments)						
BCD308	Digital Marketing	OEC	2	0	0	2

Semester IV						
Course Code	**Course Title**	**Course Type**	**L**	**T**	**P**	**Credits**
BCD401	Programming using Java	Core	4	0	0	4
BCD402	Discrete Mathematics	Core	4	0	0	4
BCD403	Web Analytics	Skill Based	2	0	4	4
BCD404	Advanced Social Media Marketing	Skill Based	2	0	2	3
BCD405	Programming using Java Lab	Technical skill	0	0	4	2
Disciplinary Elective- IV (Any one of the following)						
BCD406	Big Data	Disciplinary Elective-IV	3	0	0	3
BCD407	Data Warehouse and Mining					
Value Added Course						
BCD408	Basics of Latex	VAC	2	0	0	2
Total			**17**	**0**	**10**	**22**

Semester V						
Course Code	**Course Title**	**Course Type**	**L**	**T**	**P**	**Credits**
BCD501	Artificial Intelligence	Core	4	0	0	4
BCD502	Computer Networks	Core	4	0	0	4
BCD503	Email Marketing	Skill Based	1	0	4	3
BCD504	Mobile Marketing	Skill Based	1	0	4	3
BCD505	Artificial Intelligence Lab	Technical skill	0	0	2	1
BCD506	Internship Training* (6 weeks)	Internship	-	-	-	6
BCD599	XXX	MOOC	-	-	-	2
Disciplinary Elective-V (Any one of the following)						
BCD507	Computer Graphics	Disciplinary Elective-V	3	0	0	3
BCD508	Parallel Processing					
Total			**13**	**0**	**10**	**26**

Note: * 6 Month Training After Fourth Semester during summer vacation

Semester VI							
Course Code	**Course Title**	**Course Type**					
			L	**T**	**P**	**Credits**	
BCD601	Software Engineering	Core	4	0	0	4	
BCD602	Programming using Python	Core	4	0	0	4	
BCD603	Affiliate Marketing	Skill Based	2	0	2	3	
BCD604	Programming using Python Lab	Technical skill	0	0	4	2	
BCD605	Major Project	Technical skill	0	0	4	2	
BCD606	Service Learning	Skill Based	0	0	4	2	
Disciplinary Elective-VI(Any one of the following)							
BCD607	Introduction to Cloud Computing	Discipline Elective-VI	3	0	0	3	
BCD608	Analysis & Design of Algorithms						
Total			**13**	**0**	**14**	**20**	
Grand Total			**90**	**0**	**68**	**136**	

Evaluation Criteria for Theory Courses

A.   Continuous Assessment: [25 Marks]

CA1: Surprise test (Two best out of three) (10 Marks)

    CA2: Assignment(s) (10 Marks)

    CA3: Term Paper/Quiz/Presentation (5 Marks)

B.   Attendance(5 marks)

C.   Mid Semester Test:[30 Marks]

D.   End-Term Exam:[40 Marks]

SEMESTER-I

Course Title: Computer Fundamentals	L	T	P	Credits
Course Code: BCD101	4	0	0	4

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Classify binary, hexadecimal and octal number systems and their arithmetic operations.
2. Analyze the concept of computer devices and recognition of the basic terms used in computer programming.
3. Demonstrate the functions of computer programming languages.
4. Utilize the Internet Web resources.

Course Content

UNIT I   **14 hours**

Computer Fundamentals: Block diagram of a computer, characteristics of computers and generations of computers.

Number System: Bit, byte, binary, decimal, hexadecimal, and octal systems, conversion from one system to the other, representation of characters, integers and fractions.

Binary Arithmetic: Addition, subtraction and multiplication.

Computer Codes: weighted and non-weighted code, BCD, EBCDIC, ASCII, Unicode.

UNIT II   **16 hours**

Input Devices: Keyboard, Mouse, Joy tick, Track Ball, Touch Screen, Light Pen, Digitizer, Scanners, Speech Recognition Devices, Optical Recognition devices – OMR, OBR, OCR

Output Devices: Monitors, Printer and its Types.

Memories: Units of Memory, Main Memories - RAM, ROM and Secondary Storage Devices - Hard Disk, Compact Disk, DVD.

UNIT III   **14 hours**

Computer languages: Machine language, assembly language, higher level language, 4GL. Introduction to Compiler, Interpreter, Assembler, Assembling, System Software, Application Software.

MS Word: Introduction, Creating & Editing Word Document. Saving Document, Working with Text: Selecting, Formatting, Aligning, Finding Replacing Text, Bullets & Numbering, Header & Footer, Working with Tables, Properties Using spell checker, Grammar, Auto Correct Feature, Graphics: Inserting Pictures, Clip art, Drawing Objects, Setting page size and margins; Printing documents, Mail-Merge.

UNIT IV   **16 hours**

MS-Excel: Environment, Creating, Opening & Saving Workbook, Range of Cells, Formatting Cells, Functions: Mathematical, Logical, Date Time, Auto

Sum, Formulas. Graphs: Charts. Types & Chart Toolbar, Printing: Page Layout, Header and Footer Tab.

MS PowerPoint: Environment, Creating and Editing presentation, Auto content wizard using built-in templates, Types of Views: Normal, Outline, Slide, Slide Sorter, Slide Show, Creating, customized templates; formatting presentations, AutoShapes, adding multimedia contents, printing slides

Internet: Basic Internet terms: Web Page, Website, Home page, Browser, URL, Hypertext, Web Server, Applications: WWW, e-mail, Instant Messaging, Videoconferencing.

Transaction Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning**.**

Suggested Readings

- *Sinha P.K. and Sinha P. (2002). Foundations of Computing, First Edition, BPB.*
- *SandersD.H. (1988). Computers Today, Fourth Edition, McGraw Hill.*
- *Rajaraman V. (1996).Fundamentals of Computers,Second Edition, Prentice Hall of India, New Delhi.*
- *Jain Satish (1999). Information Technology, Paperback Edition, BPB.*

Web Sources

- *https://byjus.com/govt-exams/computer-fundamentals/*
- *https://www.chtips.com/computer-fundamentals/what-is-computer-fundamentals/*
- *https://www.tutorialspoint.com/computer_fundamentals/index.htm*

	L	**T**	**P**	**Credits**

Course Title: Programming using C
Course Code: BCD102

L	**T**	**P**	**Credits**
4	0	0	4

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Develop confidence for self-education and ability for life-long learning needed for Computer language.
2. Apply logics in Programming to buildup project.
3. Examine the concept of algorithms and apply in programming.
4. Analyses, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage.

Course Content
UNIT I   **14 hours**

Basics of 'C' Language: History, Structure of a C program, Data types, Constants and variables, Operators and Expressions, I/O functions: Formatted & Unformatted Input/Output

Control constructs: If, If-else, nested if-else, else-if ladder, switch, goto, for, while, do... while, jumps in loops: break and continue.

UNIT II   **16 hours**

Preprocessor: #define, #include, #undef, #conditional compilation directives (#if, #else, #elif, #endif, #ifdef and #ifndef), Storage classes, Header files (stdio.h, ctype.h, string.h, math.h, stdlib.h, time.h); Type casting, Type conversion, Scope Rules: Local and Global variables

Functions: library functions, user defined functions, scope rule of functions, Parameter passing: call by value and call by reference, calling functions with Arrays, Recursion: Basic concepts, Design examples (Tower of Hanoi)

UNIT III   **14 hours**

Arrays: Creating and using One dimensional and two dimensional arrays
Strings: Introduction to strings, declaring and initializing string variables, reading and writing strings, string handling functions

Pointers: & and * operators, Declaring and initializing pointers, Pointer expression, Pointer assignments, Pointer arithmetic. The dynamic memory allocation functions – malloc and calloc, Pointer vs Arrays, Passing Array to functions, Arrays of pointers, and Functions with variable number of arguments.
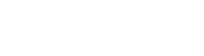
UNIT IV   **14 hours**

Structures: Basics of Structures, Declaring a structure, Referencing structure elements, Array of structures, passing structures to functions. Unions: Declaration, Uses; Enumerated data types.

File Handling: Introduction, creating a data file, opening and closing a data file, file Pointers, file accessing functions (fopen, fclose, putc, getc, fprint); argc and argv; File opening modes: Text mode, Binary mode.

Suggested Reading :

- *Balaguruswamy, Programming with C Language, Tata McGraw Hill, New Delhi*
- *Schaum Series, Programming in C, McGraw Hills Publishers, New York.*
- *Salaria, R. S., Application Programming in C, Khanna Book Publishing. New Delhi.*
- *Yashavant P. Kanetkar, Let us C, BPB Publications, New Delhi.*
- *Salaria, R.S. , Test Your Skills in C, Salaria Publications, New Delhi.*
- *Byron S. Gottfried, Programming in C, McGraw Hills Publishers, New York.*
- *M.T. Somashekara, Programming in C, Prentice Hall of India.*

Course Title: Fundamentals of Digital Marketing	**L**	**T**	**P**	**Credits**
Course Code: BCD103	**3**	**0**	**2**	**4**

Total Hours: 75

Learning Outcomes

After completion of this course, the learner will be able to:

1. Understand the key concepts and trends associated with Digital Marketing
2. Acquire the skill of leading tools and techniques used in the customer-facing aspects of Digital Marketing
3. Demonstrate cognitive knowledge of the skills required in conducting online research and research on online markets, as well as in identifying, assessing and selecting digital market opportunities.
4. Analyze cross-cultural and ethical issues in globalized digital markets.

Course Content

UNIT I   **15 Hours**

Fundamentals of Digital marketing & Its Significance, Traditional marketing Vs Digital Marketing, Evolution of Digital Marketing, Digital Marketing Landscape, Key Drivers.

Digital Consumer & Communities, Gen Y & Netizen's expectation & influence wrt Digital Marketing

UNIT II   **14 Hours**

The Digital users in India, Digital marketing Strategy- Consumer Decision journey,

POEM Framework, Segmenting & Customizing messages, Digital advertising Market in India, Skills in Digital Marketing, Digital marketing Plan.

UNIT III   **16 Hours**

Display advertising, Buying Models, different type of ad tools, Display advertising terminology, types of display ads, different ad formats,

Placement techniques, important ad terminology, Programmatic Digital Advertising

UNIT IV   **15 Hours**

Terminology used in Digital Marketing, PPC and online marketing through social media, Social Media Marketing,

SEO techniques, Keyword advertising, Google web-master and analytics overview, Affiliate Marketing, Email Marketing, Mobile Marketing.

Transaction Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Gupta, S., & Davin, J. (2020). Digital marketing. McGraw Hill Education (India) Private Limited.*
- *Foroudi, P., Gupta, S., Nazarian, A., & Duda, M. (2017). Digital technology and marketing management capability: achieving growth in SMEs. Qualitative Market Research: An International Journal.*
- *Kingsnorth, S. (2022). Digital marketing strategy: an integrated approach to online marketing. Kogan Page Publishers.*
- *Parkin, G. (2016). Digital marketing: Strategies for online success. Fox Chapel Publishing.*

List of Practical

- Create a comparative analysis of a company's traditional marketing campaign and its digital marketing campaign.
- Identifying and Analyzing Key Digital Marketing Drivers
- Practical Assignment - Understanding Gen Y & Netizen's Expectations & Influence in Digital Marketing
- Implementing the POEM Framework in Digital Marketing
- Practical Assignment: Segmenting Audiences and Customizing Marketing Messages
- Practical Exercise: Display Advertising - Terminology, Types and Formats
- Implementing and Analyzing a Social Media PPC Campaign

Course Title: Communication Skills	L	T	P	Credits
Course Code: BCD104	2	0	2	3

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Take a course overview of prerequisites to Business Communication and awareness of appropriate communication strategies.
2. Formulate an outline for effective Organizational Communication.
3. Summarize the information, ideas, concepts and opinions from a variety of sources.
4. Attain the competence in oral, written, and visual communication.

Course Content

UNIT I   **4 hours**

English Language: Sentence, Sentence Formation, Parts of speech, Tenses, Active passive voice, Direct/Indirect speech, Vocabulary.

Business Communication: Definition, Types, Medias, Objectives, Modals, Process and Barriers to communication in an organization & ways to handle and improve barriers of business communication.

UNIT II   **4 hours**

Oral Communication: Verbal communication and its types, Non- Verbal Communication and its types.

Listening Skills: Types of listening and Traits of a good listener, Note taking, barriers to listening & remedies to improve listening barriers, Cambridge Tests of listening.

UNIT III   **3 hours**

Reading Skills: Newspaper / Magazine/ Article Reading from English Newspaper, Cambridge Readings.

UNIT IV   **4 hours**

Writing Skills: Essay Writing, Letter writing: Formal, informal and Job – application, Resume writing.

Presentation Skills: Presentation Purpose in Business world, how to Prepare PPT, Tips for the required body language while delivering the presentation in front of a third party.

Transaction Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Kumar, S., &Lata, P. (2011). Communication skills. Oxford University Press.*
- *Training, M. T. D. (2012). Effective communication skills. Bookboon.*

- *Hargie, O. (Ed.). (1986). The handbook of communication skills (p. 37). London: Croom Helm.*
  Web Sources
- *https://haiilo.com/blog/top-5-communication-skills-and-how-to-improve-them/*
  https://corporatefinanceinstitute.com/resources/management/communication/
- *https://www.thebalancemoney.com/communication-skills-list-2063779*
- *https://www.skillsyouneed.com/ips/communication-skills.html*

Course Title: Programming using C Lab	L	T	P	Credits
Course Code: BCD105	0	0	4	2

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Identify the difference between the top-down and bottom-up approach.
2. Develop a given program using the basic elements like control statements.
3. Understand the syntax and semantic error to debug the programming code.
4. Implement the Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.

Course Content

1. Write a program to display your name.
2. Write another program to print a message with an inputted name.
3. Write a program to add two numbers.
4. Write a program to find the square of a given number
5. Write a program to calculate the average of three real numbers.
6. Write a program to find ascii value of a character
7. Write a program to find the size of int, float, double and char
8. Write a program to compute quotient and remainder
9. Write a program to accept the values of two variables.
10. Write a program using various unformatted input functions
11. Write a program to find area of rectangle and print the result using unformatted output functions
12. Write a program to find the larger of two numbers.
13. Write a program to find greater of three numbers using nested if.
14. Write a program to find whether the given number is even or odd.
15. Write a program to generate multiplication table using for loop
16. Write a program to generate multiplication table using while loop
17. Write a program to make a simple calculator using switch...case
18. Write a program to find whether the given number is a prime number.
19. Write a program using function to find the largest of three numbers
20. Write a program using a function to print the first 20 numbers and its squares.
21. Write a program to find the factorial of a given number.
22. Write a program to print the sum of two matrices
23. Write a program to find the length of a string
24. Write a program to copy string using strcpy()
25. Write a program to compare a string
26. Write a program to reverse a string

27.   Write a program to reverse a string
28.   Write a program to multiply two numbers using pointers.
29.   Write a program to display address of variable using pointers
30.   Write a program to show the memory occupied by structure and union.
31.   Write a program to create student i-card using a structure
32.   Write a program to read data from a file from a file
33.   Write a program to save employee details in a file using file handling

Course Title: Computer System Architecture
Course Code: BCD106

L	T	P	Credits
3	0	0	3

Total Hours: 45

Learning Outcomes

After completion of this course, the learner will be able to:

1. Knowledge about the architecture of the central processing unit.
2. Attain the knowledge of memory hierarchy.
3. Use the appropriate tools to design, verify and test the architecture of microprocessors.
4. Know about the concepts of Memory mapping and Cache memory.

Course Content

UNIT I   14 hours

Computer System Organisation: CPU Organisation, Instruction Execution (instruction cycle, types of instructions), RISC v/s CISC, Design Principles for Modern Computers, Instruction level parallelism. Processor level parallelism.

Primary memory: Memory addresses, Byte Ordering, Error-correcting codes, Cache memory. Secondary memory: Memory hierarchy, SCSI disk, RAID.

UNIT II   16 hours

Instruction Set Architecture: Instruction formats, Expanding opcodes, types of addressing modes, data transfer and manipulation instructions, Program control(status-bit conditions, conditional branch instructions, program interrupt, types of interrupt).

UNIT III   14 hours

Register Transfer Language: Register Transfer, Bus and memory transfer, Arithmetic micro operations, Logic micro-operations, Shift micro-operations, Arithmetic logic shift unit, Micro-programmed control, control word, control memory (concepts only) .

UNIT IV   16 hours

Input-output Organisation- I/O interfaces (I/O bus and interface modules, I/O versus memory bus, isolated versus memory-mapped I/O). Asynchronous Data transfer (strobe control, handshaking), modes of transfer (programmed I/O, interrupt-initiated I/O, software considerations), direct memory access.

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Mano, M. M. (1993). Computer system architecture. Prentice-Hall, Inc.*
- *Balch, M. (2003). Complete digital design: a comprehensive guide to digital electronics and computer system architecture. McGraw-Hill Education.*
- *Parhami, B. (2005). Computer architecture. Oxford University Press, New York, NY, USA.*

Web Sources

- *https://www.studytonight.com/computer-architecture/input-output-organisation*
- *https://www.javatpoint.com/computer-organization-and-architecture-tutorial*
- *https://429151971640327878.weebly.com/blog/13-computer-system-architecture*
- *https://www.geeksforgeeks.org/microarchitecture-and-instruction-set-architecture/*

	L	**T**	**P**	**Credits**
Course Title: Digital Electronics				
Course Code: BCD107	**3**	**0**	**0**	**3**

Total Hours: 45

Learning Outcomes

After completion of this course, the learner will be able to:

1. Classify the fundamental concepts and techniques used in digital electronics.
2. Apply the principles of number system, binary codes and Boolean algebra to minimize logic expressions.
3. Identify the basic requirements for designing an application.
4. Analyze the various hazards in a digital design.

Course Content

UNIT I **15 hours**

Fundamental Concepts: Introduction to Analog and Digital Systems, Digital Signals, Basic Digital Circuits: AND, OR, NOT, NAND, NOR, XOR and XNOR gates. Boolean algebra Theorems, Characteristics of Digital IC. Number Systems: Positional and Non-positional number systems, Binary, Decimal, Octal and Hexadecimal, Base conversions, Binary arithmetic: Addition and Subtraction, 1"s complement, 2"s complement, subtraction using 1"s complement and 2"s complement.

UNIT II **15 hours**

Combinational Logic Design: SOP and POS Representation of Logic functions, K-Map representation and simplification up to 4 variable expressions, don't care condition.
Multiplexers: 4X1, 8X1 and 16X1. De-multiplexers: 1 to 4, 1 to 8 and 1 to 16. BCD to Decimal decoder, Decimal to BCD encoder. Parity generator and Parity checker. Design of Half adder and Full adder

UNIT III **15 hours**

Flip-Flops: Introduction, Latch, Clocked S-R Flip Flop, Preset and Clear signals, D-Flip Flop, J-K Flip Flop, The race-around condition, Master Slave J-K Flip Flop, D-Flip-Flop, Excitation Tables of Flip Flops. Edge-Triggered Flip Flops.

UNIT IV **15 hours**

A/D and D/A Converters: Introduction, Digital to Analog Converters: Weighted-Register D/A converter, R-2R Ladder D/A converter.
Analog to Digital Converters: Quantization and encoding, Parallel-comparator A/D converter, Counting A/D converter.

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration,

Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Jain, R. P. (2003). Modern digital electronics. Tata McGraw-Hill Education.*
- *Maini, A. K. (2007). Digital electronics: principles, devices and applications. John Wiley & Sons.*
- *Pedroni, V. A. (2008). Digital electronics and design with VHDL. Morgan Kaufmann.*
- *Balch, M. (2003). Complete digital design: a comprehensive guide to digital electronics and computer system architecture. McGraw-Hill Education.*

Web Sources

- *https://www.javatpoint.com/digital-electronics*
- *https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials/*
- *https://www.tutorialspoint.com/digital_circuits/index.htm*
- *https://byjus.com/physics/digital-electronics/*

Semester-II

Course Title: Operating Systems	L	T	P	Credits
Course Code: BCD201	4	0	0	4

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:
1. Describe the fundamental concepts of Operating Systems.
2. Solve the various types of Scheduling Algorithms for better utilization of external memory.
3. Attain the knowledge about deadlock detection algorithms.
4. Demonstrate the components and aspects of concurrency management.

Course Content

UNIT I 14 hours

Fundamentals of Operating system: Introduction to Operating system, Functions of an operating system. Operating system as a resource manager. Structure of operating system (Role of kernel and Shell). Views of the operating system. Evolution and types of operating systems.

Process & Thread Management: Program vs. Process; PCB, State transition diagram, Scheduling Queues, Types of schedulers, Concept of Thread, Benefits, Types of threads, Process synchronization.

CPU Scheduling: Need of CPU scheduling, CPU I/O Burst Cycle, Preemptive vs. Non-pre-emptive scheduling, Different scheduling criteria, scheduling algorithms (FCSC, SJF, Round-Robin, Multilevel Queue).

UNIT II 16 hours

Memory Management: Introduction, address binding, relocation, loading, linking, memory sharing and protection; Paging and segmentation; Virtual memory: basic concepts of demand paging, page replacement algorithms.

UNIT III 14 hours

I/O Device Management: I/O devices and controllers, device drivers; disk storage.

File Management: Basic concepts, file operations, access methods, directory structures and management, remote file systems; file protection.

UNIT IV 16 hours

Advanced Operating systems: Introduction to Distributed Operating system, Characteristics, architecture, Issues, Communication & Synchronization; Introduction Multiprocessor Operating system, Architecture, Structure, Synchronization & Scheduling; Introduction to Real-Time Operating System, Characteristics, Structure & Scheduling. Case study of Linux operating system.

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- Tanenbaum, A. (2009). *Modern operating systems*. Pearson Education, Inc.,.
- Coffman, E. G., & Denning, P. J. (1973). *Operating systems theory* (Vol. 973). Englewood Cliffs, NJ: prentice-Hall.
- Madnick, S. E., & Donovan, J. J. (1974). *Operating systems* (Vol. 197, No. 4). New York: McGraw-Hill.
- Deitel, H. M. (1990). *An introduction to operating systems*. Addison-Wesley Longman Publishing Co., Inc..

Web Sources

- *https://www.guru99.com/operating-system-tutorial.html)*
- *https://www.tutorialspoint.com/operating_system/os_overview.htm)*
- *https://www.javatpoint.com/operating-systemand Functions - javatpoint*
- *https://www.howtogeek.com/361572/what-is-an-operating-system/ (howtogeek.com)*

Course Title: Programming using C++	L	T	P	Credits
Course Code: BCD202	4	0	0	4

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Discuss about the programming techniques to solve problems in the C++ programming language.
2. Attain the conceptual knowledge of array and string.
3. Describe the constructor and class member function.
4. Analyze the inheritance with the understanding of early binding and late binding.

Course Content

UNIT I   14 hours

Introduction to Object Oriented Programming Concepts: Object, Class, Encapsulation, Data hiding, Inheritance and Polymorphism; analysis and design of system using object oriented approach.

C++ Basics: Token, keywords, Identifiers, Basic data types, user defined and derived data types, symbolic constants, declaration of variables, dynamic initialization of variables, reference variables, operators in C++, I/O streams, Control structures.

Classes and Objects: Specifying a class, defining data members and member functions, private and public member functions, member function definition inside/outside the class declaration, scope resolution operator, nesting of member functions, creating and declaring objects, accessing class data members, accessing member functions, static data members and member functions.

UNIT II   14 hours

Constructors and destructors: Introduction, default constructors, parameterized constructors, multiple constructors in a class, copy constructors, dynamic constructors; Destructors: Definition and use.

Functions in C++: Function prototyping, pass by value, pass by reference, In line functions, default arguments, const arguments, function overloading, Friend functions, Objects as function arguments, friendly functions, returning objects

Arrays and Strings: creating and manipulating arrays with in a class, arrays of objects, Creating and manipulating String Objects, Accessing Characters in strings.

UNIT III   14 hours

Extending Classes using Inheritance: Introduction, base class, derived class, defining derived classes, visibility modes: private, public, protected; single inheritance: privately derived, publicly derived; making a protected

member inheritable, access control to private and protected members by member functions of a derived class, multilevel inheritance, virtual base classes, abstract classes, nesting of classes.

Pointers, Virtual Functions and polymorphism: virtual and pure virtual functions, Function overloading, operator overloading.

UNIT IV   **14 hours**

Console I/O Operations: C++ Stream Classes, Unformatted I/O functions-put(), get(), getline(), write(), Formatting with ios class functions and flags, Manipulators.

Files and Streams: Text and binary streams, The stream class hierarchy, Processing files, declaring files, opening files using open() function or constructor function, closing files, String I/O, Sequential and random Access, File updation.

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Balagurusamy, E., Balagurusamy, E., &Balagurusamy, E. (2001). Object oriented programming with C++. Tata McGraw-Hill Publishing Company.*
- *Pohl, I. (1993). Object-oriented programming using C++. Benjamin-Cummings Publishing Co., Inc..*
- *Dewhurst, S. C., & Stark, K. T. (1989). Programming in C++. Prentice-Hall, Inc..*
- *Lafore, R. (1997). Object-oriented programming in C++. Pearson Education.*

Web Search

- *https://www.w3schools.com/cpp/cpp_intro.asp#:~:text=C%2B%2B%20is%20an%20object%2Doriented,fun%20and%20easy%20to%20learn!*
- *https://www.geeksforgeeks.org/c-plus-plus/*
- *https://www.programiz.com/cpp-programming*
- *https://www.javatpoint.com/cpp-tutorial*

Course Title: Search Engine Optimization	L	T	P	Credits
Course Code: BCD203	2	0	4	4

Total Hours: 90

Learning Outcomes

After completion of this course, the learner will be able to:

1. Identify how to optimize on-page elements including titles, meta descriptions, page headings and body copy.
2. Create a content marketing strategy to support SEO and link acquisition.
3. Understand the skills needed to attempt Google Ads Certifications
4. Apply Google Analytics and other metrics and tools to monitor progress in achieving search engine marketing goals.

Course Content

UNIT I 8 Hours

Search Engine Periodic Table, Search Engine Heat Map, Search Engine on Page SEO factors.

Internet Business Promoter (IBP) SEO software installation.

Testing Pages for ON PAGE SEO factors using SEO analysis tools i.e. IBP SEO software. Traffic Travis SEO Analysis, On-Page Factors, Originality & Fresh Content, Writing for Humans, SEO Analysis, Images Optimization.

Types of Google Ads campaigns. Understanding various types of Google Ads campaigns, Ads Account Limits.

UNIT II 7 Hours

IP Address Exclusion, Guideline of Google ads, what is CTR, Impression, CPC.

The elements of a search ad, Targeting options, bidding and ranking for search ads, Tracking, Use the Google Ads Editor to Manage Your Ads and Keywords.

UNIT III 8 Hours

Introduction, what is pay –per click? Key terms and concepts, advertising in search, difference between search and display campaign, recent update in ads, account structure in ads

The Benefits of PPC in the Purchase Phase Set Up the Search and Content Networks, Keyword Research, Trademarks and Keywords.

UNIT IV 7 Hours

Search Engine Marketing (SEM, Creating the Ad Groups, Naming the Ad Groups, Writing the Ads Competitors' Bids, The Quality Score, The Ad Rank Score, Manual Bid Management, Automated Bid Management, Creating reports for Google Ads

Transaction Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration,

Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Das, S. (2021). Search engine optimization and marketing: A recipe for success in digital marketing. CRC press.*
- *Zilincan, J. (2015, September). Search engine optimization. In CBU International Conference Proceedings (Vol. 3, pp. 506-510).*
- *Shahzad, A., Jacob, D. W., Nawi, N. M., Mahdin, H., & Saputri, M. E. (2020). The new trend for search engine optimization, tools and techniques. Indonesian Journal of Electrical Engineering and Computer Science, 18(3), 1568-1583.*

List of Practical

- Analyzing the Search Engine Periodic Table: Students will explore the various elements of the search engine periodic table and write a detailed report on how each element contributes to effective SEO.
- Creating a Search Engine Heat Map: Using an eye-tracking tool, create a heatmap of a popular search engine's results page. Analyze and present the findings.
- On-Page SEO Factors Assessment: Choose a website and assess its on-page SEO factors using the IBP SEO software.
- Installation and Use of IBP SEO Software: Install the Internet Business Promoter (IBP) SEO software and create a detailed report on its features and functionality.
- Comparative Analysis of Google Ads Campaigns: Create a comparative analysis of different types of Google Ads campaigns and their effectiveness for different businesses.
- Practical Assignment - Understanding Google Ads Account Limits: Identify the limitations of Google Ads accounts and write a report on how these limits could impact a business's digital marketing strategy.
- IP Address Exclusion Exercise: Demonstrate how to exclude specific IP addresses in Google Ads and explain the benefits of this practice.
- Understanding CTR, Impressions, CPC: Analyze an existing Google Ads campaign, focusing on click-through rate (CTR), impressions, and cost-per-click (CPC). Suggest improvements based on your analysis.
- Designing a Search Ad: Design a search ad for a fictitious product or service, focusing on effective copywriting and keyword use.
- Practical Exercise - Using Google Ads Editor: Use the Google Ads Editor to manage ads and keywords for a mock campaign. Discuss the advantages of using this tool.
- Understanding Pay-Per-Click (PPC): Create a presentation explaining PPC, its benefits, and key concepts related to PPC advertising.
- Keyword Research Exercise: Use a keyword research tool to identify a list of keywords for a hypothetical business. Justify your choices.

- Creating an Ad Group: Plan and create an ad group for a hypothetical business, justifying your choices for ad group name, keywords, and ads.
- Exploring Bid Management: Compare and contrast manual and automated bid management in Google Ads. Create a presentation discussing the advantages and disadvantages of each.
- Creating Reports for Google Ads: Use Google Ads to create a performance report for a hypothetical campaign. Analyze and present the findings.

Course Title: Online Reputation Management	L	T	P	Credits
Course Code: BCD204	2	0	0	2

Total Hours: 30

Learning Outcomes

After completion of this course, the learner will be able to:

1. Understand the basic concepts of online reputation management.
2. Acquire the skill to monitoring online reputation step by step guide to overcome negative online reputation
3. Identify ways to embrace online negativity/criticism
4. Identify the types of reputational risk that exist online and the difference between an issue and a crisis

Course Content

UNIT I   8 Hours

Online reputation and reputation management: and Difference between reputation marketing & management, Discover assets that help in reputation management, Learn about various brand sentiments

Corporate reputation in the digital age.

Reputation and participatory culture.

UNIT II   7 Hours

1. Protecting a Reputation: when it goes wrong, crisis response.

UNIT III   8 Hours

Online reputation management and reputation marketing tools: Social Media Analytics tools, publishing tools for multiple social platforms, customers' sentiments.

Towards best practice reputation management.

UNIT IV   7 Hours

How online has changed the media cycle.

Managing reputation online

Transaction Mode

Inquiry based learning, Group discussion, Active participation, Case Analysis, Mentee Meter, Brainstorming, Demonstration, Project based learning, Team Teaching

Suggested Readings

- *Proserpio, D., & Zervas, G. (2017). Online reputation management: Estimating the impact of management responses on consumer reviews. Marketing Science,*
- *Dolle, R. (2014). Online reputation management (Bachelor's thesis, University of Twente).*

- *Robertson, C. B. (2016). Online reputation management in attorney regulation. Geo. J. Legal Ethics, 29, 97.*

	L	**T**	**P**	**Credits**

Course Title: Operating System Lab

Course Code: BCD205

L	**T**	**P**	**Credits**
0	0	4	2

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:
1. Get expertise on the Unix OS platform.
2. Develop and debug C programs created on UNIX platforms.
3. Install the standard libraries of the Operating System.
4. Classify Shell Programming in Linux.

Course Content
1. Write down the Steps to Install Linux Operating System.
2. Write down the Steps to Install XP Operating System.
3. Write and explain the File Related commands.
4. Write and explain the Directory Related commands.
5. Write and explain the Process and status information commands.
6. Write and explain the Text related commands.
7. Write and explain the command to set the File Permissions.
8. Write a shell Program for Numerical Calculations in Linux.
9. Write a shell program to create a table in Linux.
10. Write a shell program to identify Even and Odd Number in Linux.

Course Title: Programming using C++ Lab
Course Code: BCD206

L	T	P	Credits
0	0	4	2

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Classify the object oriented concepts and their implementation.
2. Use the concepts of array and string using C++.
3. Design a program to resolve the real time problems in C++.
4. Grasp the concept of implementing the constructors with classes.

Course Content

1. Write a program to print

1

12

123

1234

123452

2. Write a program to find whether the number is even, odd.

3. Write a program to find greatest out of three number.

4. Write a program to find whether the number is palindrome or not.

5. Write a program to print prime number Series.

6. Write a program to find the reverse of number.

7. Write a program to find factorial of number.

8. Write a program to implement switch case in C++.

9. Write a program to implement for loop, while loop and do-while loop in C++.

10. Write a program to enter record of 50 students.

11. Write a program to implement call by value.

12. Write a program to show call by reference in C++.

13. Write a program to create structure in C++.

14. Write a program to find the area of circle, rectangle and polygon by using structure.

15. Write a program to create classes in C++.

16. Write a program that uses a class where the member functions are defined inside a class.

17. Write a program to demonstrate the use of static data members.

18. Write a program to demonstrate the use of keyword const data members.

19. Write a program using constructors in C++.

20. Write a program using destructors in C++.

21. Write a program using multiple constructors in C++.

22. Write a program using the Copy constructor in C++.

23. Write a program to demonstrate the single inheritance.

24. Write a program to demonstrate the multilevel inheritance.

25. Write a program to demonstrate the multiple inheritances.

26. Write a program showing hierarchical inheritance in C++.

27. Write a program to implement function overloading.

28. Write a program to demonstrate the overloading of binary arithmetic operators.

29. Write a program showing operator overloading in C++.

30. Write a program to demonstrate the use of function template.

31. Write a program to demonstrate the use of class template.

32. Write a program showing Exception handling in C++.

33. Write a program to read and write data from a file in C++.

34. Write a program to demonstrate the reading and writing of mixed types of data.

35. Write a program to demonstrate the reading and writing of object

	L	T	P	Credits

Course Title: Environmental Studies
Course Code: BCD207

L	T	P	Credits
1	0	0	1

Total Hours: 15

Learning Outcomes

After completion of this course, the learner will be able to:
1. Acquire the basic knowledge of Environment study.
2. Attain the information about the ecosystem and its functioning.
3. Discuss the role of individuals in prevention of pollution.
4. Elaborate the role of information technology in the environment and human health.

Course Content

UNIT I   4 hours

The Multidisciplinary nature of environmental studies Definition, scope and importance, Need for public awareness.

Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems.

Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining, dams and their effects on forests and tribal people.

Water resources: Use and over-Utilization of surface and ground water, floods, drought, conflicts and water, dams-benefits and problems.

Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.

Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

UNIT II   3 hours

E-Concept of an ecosystem: Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids.

Biodiversity and its conservation: Introduction – Definition: genetic, species and ecosystem diversity, Bio-geographical classification of India, Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values, Biodiversity at global, National and local levels, India as a mega-diversity nation.

UNIT III   4 hours

Environmental Pollution Definition: Causes, effects and control measures of: a. Air pollution b. Water pollution c. Soil pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards, ill-effects of fireworks, Solid waste

Management: Causes, effects and control measures of urban and industrial wastes, Role of an individual in prevention of pollution, Disaster management: floods, earthquake, cyclone and landslides.

UNIT IV   **4 hours**

Social Issues and the Environment: From Unsustainable to Sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management, Resettlement and rehabilitation of people; its problems and concerns, Environmental ethics: Issues and possible solutions, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Wasteland reclamation, Consumerism and waste products, Environment Protection Act, Air (Presentation and Control of Pollution) Act, Water (Prevention and control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation.

Human Population and the Environment: Population growth, variation among nations, Population explosion – Family Welfare Programme, Environment and human health, Human Rights, Value Education, HIV / AIDS, Women and Child Welfare

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Agarwal K.C. (2001). Environment Biology, Nidi Publ. Ltd. Bikaner.*
- *Jadhav H & Bhosale (1995). Environment Protection and Laws, Himalaya Pub House, Delhi.*
- *Rao M.N. & Datta A.K. (1987). Waste Water, Treatment Oxford & IBH Publ. Co. Pvt. Ltd.*
  Web Sources
- *https://leverageedu.com/blog/multidisciplinary-nature-of-environmental-studies/*
- *https://study.com/learn/lesson/web-presence-overview-importance.html*

Course Title: Introduction to Human Resource Management	L	T	P	Credits
Course Code: BCA23207	2	0	0	2

Course Content   **Total Hours: 30**

Learning Outcomes

After completion of this course, the learner will be able to:

1. Understand the significance of HRM, distinguish it from Personnel Management (PM), and identify HR challenges.
2. Apply HRM principles to practical situations such as recruitment, selection, and induction.
3. Analyze performance appraisal methods and training programs.
4. Evaluate the effectiveness of HR policies like promotion and transfer. Develop HR strategies and procedures.

Course Content

UNIT I   **8 hours**

Introduction to HRM: Definition and Concept of HRM and Personnel Management, Difference between PM and HRM, Importance of HRM, Activities and Functions of HRM, Challenges before HRM, HRD, HRP, Concept of Recruitment –Sources of Recruitment.

UNIT II   **9 hours**

Performance Appraisal, Training and Development: Meaning and Definition-Need- Objective –Importance of Training, Training Method – Evaluation of Training Program, Concept and Objective Performance Appraisal-Process of Performance Appraisal Method –Uses and Limitation of Performance Appraisal, Promotion and Demotion Policy, Transfer Policy.

UNIT III   **6 hours**

Method of Wage Payment – Employee Remuneration Factors Determining the Level of Remuneration-Profit Sharing –Fringe Benefit

Nature of E-HRM, E-HR Activity, E-Recruitment, E-Selection, E-Learning, E-Compensation.

UNIT IV   **7 hours**

Grievance and Discipline: Meaning, Definition and Nature of Grievance Procedure-Grievance Machinery.

Definition of Discipline-Aim and Objective of Discipline. Principle of Discipline.

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- Fundamentals of Human Resource Management by David A. DeCenzo, Stephen P. Robbins, and Susan L. Verhulst.
- Effective Human Resource Management: A Global Analysis by Edward Lawler, John Boudreau, and Susan Albers Mohrman.
- Human Resource Management: Gaining a Competitive Advantage by Raymond Noe, John Hollenbeck, Barry Gerhart, and Patrick Wright

Web Sources
- https://www.shrm.org/
- https://onlinelibrary.wiley.com/journal/17488583

Course Title: E-Commerce	L	T	P	Credits
Course Code: BCD209	3	0	0	3

Total Hours: 45

Learning Outcomes

After completion of this course, the learner will be able to:

1. Discuss about the basic concepts and technologies used in the field of E-Commerce and Governance.
2. Gain knowledge about the different types of Electronic Payment Systems.
3. Knowledge about the ethical, social and security issues of online transactions.
4. Describe the Internet trading relationships including Business to Consumer, Business-to Business, Intra-organizational

Course Content

UNIT I   **12 hours**

Introduction to e-commerce: History of e-commerce, e-business models B2B, B2C, C2C, C2B, legal; environment of e-commerce, ethical issues, electronic data interchange, value chain and supply chain, advantages and disadvantages of e-commerce.

Electronic Payment Systems: Credit cards, debit cards, smart cards, e-credit accounts, e-money, Marketing on the web, marketing strategies, advertising on the web, customer service and support, introduction to m-commerce, case study: e-commerce in passenger air transport.

UNIT II   **10 hours**

E-Government, theoretical background of e-governance, issues in e-governance applications, evolution of e-governance, its scope and content, benefits and reasons for the introduction of e-governance, e-governance models- broadcasting, critical flow, comparative analysis, mobilization and lobbying, interactive services / G2C2G.

UNIT III   **11 hours**

E-readiness, e-government readiness, E- Framework, step & issues, application of data warehousing and data mining in e-government, Case studies: NICNET-role of nationwide networking in e-governance, e-seva.

UNIT IV   **12 hours**

E-Government systems security: Challenges and approach to e-government security, security concern in e-commerce, security for server computers, communication channel security, security for client computers.

Transaction Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Winn, J. K., & Wright, B. (2000). The law of electronic commerce. Wolters Kluwer.*
- *United States. White House Office. (1997). A framework for global electronic commerce. White House.*
- *Andrea, G. (Ed.). (2002). Development Centre Studies Electronic Commerce for Development. OECD Publishing.*

Web Sources

- *https://simplycoding.in/e-commerce-and-e-governance-notes/*
- *https://study.com/academy/lesson/what-is-e-government-commerce-definition-examples.html*
- *https://www.geeksforgeeks.org/e-governance/*
- *https://web.archive.org/web/20160103054145/http://www.isoc.org/inet96/proceedings/g7/g7_3.htm*

Course Title: Information System Design & Implementation	L	T	P	Credits
Course Code: BCD210	3	0	0	3

Total Hours: 45

Learning Outcomes

After completion of this course, the learner will be able to:

1. Learn about the various aspects of Information Systems to be developed their analysis and design.
2. Aware about prerequisite of software development and associated paradigms.
3. Analyze and design information systems using database.
4. Analyze and document user requirements for information systems.

Course Content

UNIT I   12 hours

Systems Concepts and Information Systems Environment: Definition and characteristics of a system. Elements of a system Environment: Boundaries and interface. Types of systems: Physical or Abstract Systems, Open and Closed System, Man - made information systems.

The System Development Life Cycle: Introduction to various phases-Recognition of Need, Feasibility Study, Analysis, Design, Implementation, Post– Implementation and Maintenance.

The Role of System Analyst: Skills of a System Analyst, various roles of the Analyst.

UNIT II   11 hours

System Planning and the Initial Investigation: Bases for planning in system analysis, Initial investigation, determining the users information requirements, Problem definition and Project Initiation, Background Analysis, Fact Finding, Fact Analysis, Determination of Feasibility.

Information Gathering: Introduction, Information Gathering tools: Review of Literature, Procedures and forms. On -site observation. Interviews and questionnaires.

Tools of Structured Analysis: Various tools of structured analysis: Data flow diagram (DFD), Data Dictionary, Decision tree and structured English, Decision table, Pros and cons

of each tool.

UNIT III   11 hours

Feasibility Study: System Performance-statement of Constraints, Identification of Specific System Objectives, description of Outputs. Feasibility Study – Feasibility considerations, Steps in feasibility analysis. Feasibility Report.

System Design: The Process of Design-Logical and Physical Design, Design methodologies: Structured design, Functional Decomposition.

System Testing and Quality Assurance: Testing, System testing, Quality assurance and its goals in its system life cycle, Levels of quality assurance, Trends in testing.

UNIT IV **11 hours**

Implementation and Software Maintenance: Introduction, Conversion-Activity network for Conversion, File Conversion, User Training: Elements of user Training Post implementation review. Software Maintenance - Primary activities of a Maintenance Procedure, Reducing Maintenance Costs.

Hardware and Software Selection: Types of Software, Procedure for Hardware/Software selection: Major phases in selection, Evaluation and Validation, Vendor Selection, Post – Installation Review. Software selection- Criteria for Software Selection, the evaluation process.

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *E.M. Awad: Systems Analysis and Design,Galgotia Publications(P)Ltd.*
- *Hardgrave Bill C. ,Siau Keng, Chiang Roger H.L., Systems Analysis and Design : Techniques, Methodologies, Approaches and Architectures 1st Edition, M.E. Sharpe Publications.*

Web Sources

- *https://egyankosh.ac.in/bitstream/123456789/25561/1/Unit-2.pdf*
- *https://www.tutorialspoint.com/system_analysis_and_design/system_analysis_and_design_overview.htm*
- *https://www.gpp7.org.in/wp-content/uploads/sites/22/2020/04/file_5e95e008f2daf.pdf*

Semester-III

Course Title: Database Management System	L	T	P	Credits
Course Code: BCD301	4	0	0	4

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:
1. Identify the difference about database systems from the file systems by enumerating their features.
2. Acknowledge the role of the database administrator.
3. Retain the knowledge about physical and logical database designs.
4. Apply an Entity-Relationship diagram to Relational Schema.

Course Content

UNIT I   **14 hours**

Introduction of DBMS: Data Modeling for a Database, Three level Architecture of DBMS, Components of a DBMS.

Introduction to Data Models: Hierarchical, Network and Relational Model, Comparison of Network, Hierarchical and Relational Model, Entity Relationship Model.

UNIT II   **16 hours**

Relational Database: Relational Algebra and Calculus, SQL Fundamentals, DDL, DML, DCL, PL/SQL Concepts, Cursors, Stored Procedures, Stored Functions, Database Triggers.

UNIT III   **14 hours**

Introduction to Normalization: First, Second, Third Normal Forms, Dependency Preservation, Boyce-Codd Normal Form, Multi-valued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form, Domain-key normal form (DKNF).

UNIT IV   **16 hours**

Database Recovery: Concurrency Management, Database Security, Integrity and Control. Structure of a Distributed Database, Design of Distributed Databases.

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Ramakrishnan, R., Gehrke, J., &Gehrke, J. (2003). Database management systems (Vol. 3). New York: McGraw-Hill.KorthF. Henry. Database System Concepts, McGraw Hill.*
- *Lu, G. (1999). Multimedia database management systems. Boston: Artech House.*

- *Date, C. J. (1975). An introduction to database systems. Pearson Education India.*
  Web Sources
- *https://www.geeksforgeeks.org/introduction-of-dbms-database-management-system-set-1/*
- *https://www.javatpoint.com/dbms-tutorial*
- *https://www.techopedia.com/definition/24361/database-management-systems-dbms*

Course Title: Data Structure	L	T	P	Credits
Course Code: BCD302	4	0	0	4

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Apply appropriate constructs of Programming language, coding standards for application development
2. Select appropriate data structures for problem solving and programming
3. Identify appropriate searching and/or sorting techniques for wide range of problems and data types.
4. Differentiate between various types of data structures.

Course Content

UNIT I   **14 hours**

Introduction to Data Structures: Algorithms and Flowcharts, Basics Analysis on Algorithm, Complexity of Algorithm, Introduction and Definition of Data Structure, Classification of Data, Arrays, Various types of Data Structure, Static and Dynamic Memory Allocation, Function, Recursion.

Arrays, Pointers and Strings: Introduction to Arrays, Definition, One Dimensional Array and Multi-Dimensional Arrays, Pointer, Pointer to Structure, various Programs for Array and Pointer. Strings. Introduction to Strings, Definition, Library Functions of Strings.

UNIT II   **16 hours**

Stacks and Queue: Introduction to Stack, Definition, Stack Implementation, Operations of Stack, Applications of Stack and Multiple Stacks. Implementation of Multiple Stack Queues, Introduction to Queue, Definition, Queue Implementation, Operations of Queue, Circular Queue, De-queue and Priority Queue.

UNIT III   **14 hours**

Linked Lists and Trees: Introduction, Representation and Operations of Linked Lists, Singly Linked List, Doubly Linked List, Circular Linked List, and Circular Doubly Linked List.

Trees: Introduction to Tree, Tree Terminology Binary Tree, Binary Search Tree, Strictly Binary Tree, Complete Binary Tree, Tree Traversal, Threaded Binary Tree, AVL Tree B Tree, B+ Tree.

UNIT IV   **16 hours**

Graphs, Searching, Sorting and Hashing Graphs**:** Introduction, Representation to Graphs, Graph Traversals Shortest Path Algorithms.

Searching and Sorting**:** Searching, Types of Searching, Sorting, Types of sorting like quick sort, bubble sort, merge sort, selection sort.

Hashing**:** Hash Function, Types of Hash Functions, Collision, Collision Resolution Technique (CRT), Perfect Hashing

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Hubbard, J. R. (2007). [Introduction to] Schaum's Outline of Data Structures with Java. McGraw-Hill.*
- *Horowitz, E., &Sahni, S. (1976). Fundamentals of data structures (Vol. 1982). Potomac, MD: Computer science press.*
- *Wirth, N. (1985). Algorithms & data structures. Prentice-Hall, Inc..*
- *Tarjan, R. E. (1983). Data structures and network algorithms. Society for Industrial and Applied Mathematics.*
  Web Search
- *https://www.geeksforgeeks.org/data-structures/*
- *https://www.javatpoint.com/data-structure-tutorial*
- *https://www.programiz.com/dsa/data-structure-types*
- *https://www.techtarget.com/searchdatamanagement/definition/data-structure*

Course Title: Social Media Marketing	L	T	P	Credits
Course Code: BCD303	2	0	2	3

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Identify the major social media marketing portals that can be used to promote a company, brand, product, service or person.
2. Evaluate a company's current situation, isolate social media issues and provide solutions by identifying appropriate social media marketing portals to influence consumers and improve the company's reputation.
3. Create a social media marketing plan and track progress in achieving goals with a variety of measurement tools, services, and metrics.
4. Create effective social media marketing strategies for various types of industries and businesses.

Course Content

UNIT I   11 Hours

Social Media Marketing (SMM): Introduction, Key terms and concepts, Social media channels & Social networks.

Facebook Marketing, Content creation, Location and social media, Rules of engagement, Creating Business Page

UNIT II   10 Hours

Advantages and challenges, Facebook Marketing Strategies for Fan Page, Introduction to Fan Page Marketing Strategies.

All Connections, Invite Potential Followers, Distributer Pages Class Demo and Practical Session for Your Content, Competitions: Rules & Steps

UNIT III   12 Hours

Facebook Inner Marketing Strategies structure, Psychology of Facebook Ads & Promotions: Targeted Customers. Facebook Retargeting, Introduction to Retargeting Class Demo and Practical Session

Create Pixel, Pixel Installation, Pixel Status & Checker, And Pixel Custom Audience. Lookalike & Custom Audience, Conversion Ad & Custom Conversion, Start Retargeting.

UNIT IV   12 Hours

Instagram Marketing Introduction Instagram Marketing Overview, Basics of Instagram, Advantages of Using Instagram

Linkedin Marketing Introduction to Linkedin, business needs importance role of linkedin in business

Transaction Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching,

Collaborative Learning

Suggested Readings

- *Evans, D., Bratton, S., & McKee, J. (2021). Social media marketing. AG Printing & Publishing.*
- *Tuten, T. L., & Solomon, M. R. (2017). Social media marketing. Sage.*
- *Dwivedi, Y. K., Kapoor, K. K., & Chen, H. (2015). Social media marketing and advertising. The Marketing Review.*

List of Practical

- Understanding Social Media Channels: Research various social media channels and networks, and prepare a report detailing their unique features, user demographics, and ideal use cases for marketing.
- Creating a Facebook Business Page: Practical exercise to create a Facebook Business Page for a fictitious company, focusing on setting up all necessary information and initial content.
- Facebook Content Creation: Create a week's worth of content (posts, stories, etc.) for a fictitious Facebook Business Page, ensuring it is engaging and appropriate for the platform.
- Rules of Engagement on Social Media: Create a list of 'rules of engagement' for social media interactions on a business page, explaining why each is important.
- Analyzing Facebook Marketing Strategies: Analyze the Facebook marketing strategies of three different businesses and write a report discussing their effectiveness and areas of improvement.
- Inviting Potential Followers: Develop a strategy to invite potential followers to a fictitious Facebook Fan Page and discuss the expected impact of this strategy.
- Practical Session on Distributing Pages: Implement a strategy to distribute your content across various social media platforms, and report on the process and challenges encountered.
- Running a Facebook Competition: Plan and execute a hypothetical Facebook competition for a fictitious business, including establishing the rules and steps for participation.
- Facebook Retargeting Exercise: Create a presentation explaining the concept of Facebook retargeting, including a practical demonstration using a hypothetical business.
- Setting up Facebook Pixel: Install and set up Facebook Pixel for a fictitious website. Discuss the process and the benefits of using Facebook Pixel.
- Using Facebook Custom Audiences: Create a custom audience in Facebook Ads Manager for a hypothetical marketing campaign and discuss the expected impact of this strategy.

- Instagram Marketing Basics: Create an Instagram profile for a fictitious business and draft a week's worth of posts, taking into account best practices for marketing on Instagram.
- Exploring LinkedIn for Business: Create a LinkedIn profile for a fictitious business, ensuring all information is complete and professional. Analyze and report on the advantages of LinkedIn for businesses.
- LinkedIn Content Creation: Develop a content strategy for a fictitious business on LinkedIn, and create a week's worth of posts, taking into account best practices for marketing on LinkedIn.
- Using LinkedIn for Networking: Demonstrate how to use LinkedIn to network with other professionals and businesses. Create a networking strategy for a fictitious business and discuss its potential benefits.

Course Title: Database Management Systems Lab
Course Code: BCD304

L	T	P	Credits
0	0	4	2

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Solve the query of the database using SQL DML / DDL commands.
2. Apply the basic concepts of Database Systems and Applications.
3. Design a commercial relational database system (Oracle, My SQL) by writing SQL using the system.
4. Analyze and Select storage and recovery techniques of database systems.

Course Content

1.   Introduction to DBMS & SQL.
2.   To implement Various DDL comments.
3.   Implement the DML commands.
4.   Study of Various types of data Constraints and implementation.
5.   Study of all types of operators.
6.   Implement the concept of Set Operators.
7.   Explore select clauses -order by, having etc.
8.   Implement the concept of Inbuilt Function.
9.   Implement the concept of Joins,
10. Implement the concept of views.
11. Implement the concept of Indexes

Course Title: Data Structures Lab	L	T	P	Credits
Course Code: BCD305	0	0	4	2

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Identify the time and space complexity of the data structures.
2. Summarize the searching and sorting techniques.
3. Implement the stack, queue and linked list operation.
4. Use Searching methods to search data using binary search trees and splay trees and graphs.

Course Content

1. Write a program to insert an element into an array
2. Write a program to delete an element from an array.
3. Write a program to implement linear search algorithm
4. Write a program to implement binary search algorithm
5. Write a program to implement a bubble sort algorithm.
6. Write a program to implement a selection sort algorithm.
7. Write a program to implement PUSH operation in stacks.
8. Write a program to implement POP operation in stacks.
9. Write a program to implement Queues.
10. Write a program to insert an element in the beginning of the link list.
11. Write a program to insert an element in the middle of the link list.
12. Write a program to insert an element in the end of the link list.
13. Write a program to delete an element from the beginning of the link list.
14. Write a program to delete an element from the end of the link list.
15. Write a program for implementation of a graph.
16. Write a program for implementation of binary search tree.

Course Title: Minor Project

Course Code: BCD305

L	T	P	Credits
0	0	2	1

Total Hours:30

Course Description:

The Minor Project course in BCA provides students with the opportunity to apply their knowledge and skills acquired during their program to a practical project. The course allows students to work on a smaller-scale project under the guidance of faculty members to gain practical experience in software development, problem-solving, and project management.

	L	T	P	Credits
Course Title: Programming using PHP	**3**	**0**	**0**	**3**

Course Code: BCD306

Total Hours: 45

Learning Outcomes

After completion of this course, the learner will be able to:

1. Implement the PHP basics i.e. web server, Text editor (Sublines, Dreamweaver.
2. Demonstrate about the concept of operators, Conditional and loops.
3. Develop the functional PHP script in web pages.
4. Introduce the creation of static webpage using HTML.

Course Content

UNIT I   12 hours

Introduction to PHP:PHP introduction, inventions and versions, important tools and software requirements (like Web Server, Database, Editors etc.), PHP with other, technologies, scope of PHP, Basic Syntax, PHP variables and constants, Types of data in PHP, Expressions, scopes of a variable (local, global), PHP Operators: Arithmetic, Assignment, Relational, Logical operators, Bitwise, ternary and MOD operator, PHP operator Precedence and associativity.

UNIT II   11 hours

Handling HTML form with PHP: Capturing Form Data, GET and POST form Methods Dealing with multi value fields, redirecting a form after submission.

PHP conditional events and Loops: PHP IF Else conditional statements (Nested IF and Else), Switch case, while, For and Do While Loop, Goto, Break, and Continue and exit.

UNIT III   10 hours

PHP Functions: Function, Need of Function, declaration and calling of a function, PHP Function with arguments, Default Arguments in Function, Function argument with call by value, call by reference, Scope of Function Global and Local.

UNIT IV   12 hours

String Manipulation and Regular Expression: Creating and accessing String, Searching & Replacing String, Formatting, joining and splitting String, String Related Library functions, Use and advantage of regular expression over inbuilt function, Use of preg_match(), preg_replace(), preg_split() functions in regular expression.

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Lerdorf, R., Tatroe, K., Kaehms, B., &McGredy, R. (2002). Programming Php. " O'Reilly Media, Inc.".*
- *Lerdorf, R., Tatroe, K., &MacIntyre, P. (2006). Programming Php. " O'Reilly Media, Inc.".*
- *Tatroe, K., &MacIntyre, P. (2020). Programming PHP: Creating dynamic web pages. O'Reilly Media.*

Web Sources

- *https://www.w3schools.com/php/*
- *https://www.tutorialspoint.com/php/php_introduction.html*
- *https://www.javatpoint.com/php-tutorial*

Course Title: Application Development using VB.NET	L	T	P	Credits
Course Code: BCD307	3	0	0	3

Total Hours: 45

Learning Outcomes

After completion of this course, the learner will be able to:

1. Demonstrate proficiency in using variables, data types, and control flow structures in VB.NET.
2. Apply event handling techniques to respond to user actions and input
3. Connect to databases and retrieve data using VB.NET.
4. Implement data manipulation operations, such as inserting, updating, and deleting records.

Course Content

UNIT I   14 hours

Overview of the Visual Studio .NET IDE: Introduction to .NET Framework and the Common Language Runtime, Introduction to Visual tudio.NET IDE: Menu Bar and Tool Bar, Solution Explorer, Toolbox, Using different controls of Toolbox and their commonly used properties and methods: TextBox, Label, Check Box, Radio Button, Button, Frame, List Box, Combo Box, Picture, Image, Shape, Drive, File, directory related controls, Introduction to Menus

UNIT II   16 hours

Basics of VB.Net: Constants, Variables, data types, assignment operator, Operators: Arithmetic, Relational and logical operators, Assignment operators, Control structures: If, if/then/else selection structures, Select case Multiple-selection structure, While, do while, do until, For/Next repetition structure.

Procedures: Introduction, sub Procedures, function procedures, event procedures, commonly used Form events, msgBox function, InputBox function.

Arrays and Strings: declaring and allocating Arrays, Using Strings and String functions: len, right, left, ucase, lcase, ltrim, trim;

Control Arrays: Introduction, creating and using Control Arrays

UNIT III   14 hours

Writing ASP .NET applications and Deploying ASP .NET Applications: Introduction to ASP.NET, Difference between ASP and ASP.NET, Understanding Web Forms, Using

Validation Controls: RequiredFieldValidator, RangeValidator, CompareValidator, RegularExpressionValidator, CustomValidator, ValidationSummary; , Managing State in ASP.NET Web Applications using Session object, Cookie and Query String ,Creating ASP.NET application,

Deploying ASP.NET Applications with Windows Installer, Introduction to Web Services.

UNIT IV   **16 hours**

Accessing Data with ADO.NET: Understanding ADO.net, ADO.NET Object model: Connected model and Disconnected model, architecture, components, Understanding

Provider classes, using Data Reader to read data from database, Data Adapter and Data sets, Using DataAdapter for Data Navigation and Data Manipulation, connecting to and querying a data source, using Data Grid view control with ADO.NET data sources.

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Dave Grundgeiger, Programming Visual Basic .NET, O'Reilly Publisher.*
- *Michael McMillan, Object Oriented programming using Visual Basic.Net, Cambridge University Press.*
- *Cameron Wakefield Henk-Evert Sonder Wei Meng Lee, VB.NET Developer's Guide, Global Knowledge, Syngress Publishing.*
- *Evangelos Petroutsos, Mastering Visual Basic .NET, SYBEX Publishing*
- *Deitel, Visual Basic.NET How to Program, Pearson Education*
- *Lowell Mauer, Teach Yourself more Visual Basic.net in 21 days, SAMS*
   Web Sources
- *https://www.javatpoint.com/vb-net*
- *https://www.tutorialspoint.com/vb.net/index.html*
- *https://www.geeksforgeeks.org/introduction-to-net-framework/*

Course Title: Digital Marketing
Course Code: BCD308

L	T	P	Credits
2	0	0	2

Total Hours: 30

Learning Outcomes

After completion of this course, the learner will be able to:

1. Understand the digital marketing concepts and its usefulness in business.
2. Examine digital marketing strategy and successfully executing it.
3. Apply Search Engine Optimization techniques (SEO) technique and Search Engine Marketing (SEM) to maximize reach and enhance engagement of users.
4. Analysis the web using analytics tools and gaining insights to various tools for Social Media Marketing.

Course Content

UNIT I   11 hours

Digital Marketing Basics: Digital Marketing meaning and its importance, Traditional vs Digital Marketing, Benefits of Digital Marketing, Internet Marketing basics, Digital Marketing channels, Types of Business models, Digital Marketing strategies (P.O.E.M framework), Inbound and Outbound marketing, Digital Transformation model, 4Cs of Digital Marketing.

UNIT II   12 hours

Social Media Marketing – Introduction, Social Media marketing strategies, Overview of Social media platforms – Instagram, Snapchat, Facebook, Mobile, Twitter, Content Planning and Strategy, Influential marketing, Content marketing, Digital Marketing campaign.

UNIT III   11 hours

Search Engine Optimization – Introduction to SEO, On-Page and Off-Page Optimization, Role of Keywords in SEO, Organic vs Non-Organic SEO, Blogging as marketing strategy, Types of Blogs.

Search Engine Marketing – Introduction to Paid marketing, Google Adwords, Types of campaigns and Campaign creation.

UNIT IV   11 hour

Tools for SMM and Marketing communication – Overview of Buffer, Hootsuite, Canva, Trello and Hot jar.

Web Analytics: Meaning, Purpose and process, Types, Tools for analytics – Google analytics, Audience analytics, Acquisition analytics, Behavior analytics, Conversion analytics.

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Rajan Gupta, Supriya Madan, "Digital Marketing", BPB Publication, Ist Edition, 2022*
- *Seema Gupta, "Digital Marketing", McGraw Hill, 2nd Edition, 2018.*
- *Puneet Singh Bhatia, "Fundamentals of Digital Marketing", Pearson, 2nd Edition, 2020.*

Web Sources

- *https://josephscollege.ac.in/lms/Uploads/pdf/material/DigitalMarketing_Notes.pdf*
- *https://www.digitalmarketer.com/digital-marketing/assets/pdf/ultimate-guide-to-digital-marketing.pdf*

Semester-IV

Course Title: Programming using Java	L	T	P	Credits
Course Code: BCD401	4	0	0	4

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Solve the computational problems using basic statements like if-else, control structures, array, and strings.
2. Knowledge about the user requirements for software functionality in Java programming language.
3. Apply basic principles of creating Java applications with Applet programming.
4. Develop a given program using the basic elements like Control and Conditional statements.

Course Content

UNIT I   14 hours

Introduction to Java: Introduction to java , Java History, Java Features; How Java Differs from C and C++; Comments in java, Java Program Structure, Implementing a Java Program, Java Virtual Machine, Command Line Arguments, Programming Style, Java and Internet, Java and World Wide Web, Web Browsers, Hardware and Software Requirements; Java Support Systems, Java Environment. Java Tokens; Java Statements

UNIT II   16 hours

Constants, Variables and Data Types: Introduction; Constants, Variables, Data Types, Introduction to Operators, Expressions, Operator Precedence. Decision Making, Branching and Looping: Decision making and branching Statements, Looping Statements, Labeled loops, Jumping Statements.

UNIT III   14 hours

Classes, Objects and Methods: Introduction, Defining a Class, Data member, member function, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods, Arrays, Strings, Vectors: Arrays, Jagged Arrays, Strings, String functions: Vectors, Wrapper Classes, Inheritance: Extending a Class, Overriding Methods, Final Variables and Methods, Final Classes, Finalizer Methods, Abstract Methods and Classes, Visibility Control.

UNIT IV   16 hours

Interfaces: Introduction, Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interface Variables, Implementing Multiple Inheritance using Interfaces.

Packages: Introduction; System Packages, Using System Packages, Naming Conventions, Creating Packages, Accessing a Package, Using a Package, Adding a Class to a Package, Hiding Classes.

Managing Errors and Exceptions: Introduction; Types of Errors; Exceptions, Exception Handling using Try, Catch and Finally block: Throwing Our Own Exceptions, Using Exceptions for Debugging.

Applet Programming: Introduction; How Applets Differ from Applications; Applet Life Cycle; Creating an Executable Applet

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Li, Y. (2022). Computer Software Java Programming Optimization Design. In International Conference on Frontier Computing (pp. 1086-1092). Springer, Singapore.*
- *Liang, Y. D. (2003). Introduction to Java programming. Pearson Education India.*
- *Liang, Y. D. (2018). Introduction to Java programming and data structures. Pearson Education.*
- *Kavka, C. (2003, October). Introduction to JAVA. In Second Workshop on Distributed Laboratory Instrumentation Systems, ICTP, Trieste, Italy.*

Web Sources

- *https://www.javatpoint.com/java-tutorial*
- *https://www.geeksforgeeks.org/introduction-to-java/*
- *https://www.geeksforgeeks.org/interfaces-in-java/*
- *https://www.geeksforgeeks.org/classes-objects-java/*

Course Title: Discrete Mathematics	L	T	P	Credits
Course Code: BCD402	4	0	0	4

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Implement the Logical and Algebraic operations.

2. Demonstrate the basic principles of relation in a set.

3. Solve the various methods of Recurrence relations.

4. Perform operations on sets, functions, relations, and sequences.

Course Content

UNIT I   14 hours

Set Theory: Introduction ,Sets and Elements, Subsets ,Venn Diagrams, Set Operations ,Algebra of Sets, Duality , Finite Sets, Counting Principle ,Classes of Sets, Power Sets, Partitions ,Mathematical Induction.

Relations: Introduction , Product Sets , Relations ,Pictorial Representations of Relations ,Composition of Relations ,Types of Relations ,Closure Properties , Equivalence Relations ,Partial Ordering Relations

Functions: Introduction, Functions, One-to-One, Onto, and Invertible Functions, Mathematical Functions, Exponential and Logarithmic Functions.

UNIT II   16 hours

Combinations: Rule of products, permutations, combinations.

Algebra of Logic: Propositions and logic operations, truth tables and propositions generated by set, equivalence and implication laws of logic, mathematical system, and propositions over a universe, mathematical induction, quantifiers.

UNIT III   14 hours

Recursion and recurrence: The many faces of recursion, recurrence, relations, and some common recurrence relations, generating functions.

UNIT IV   16 hours

Graph Theory: Introduction, Data Structures ,Graphs and Multigraphs, Subgraphs, Isomorphic and Homeomorphic Graphs ,Paths, Connectivity, Traversable and Eulerian Graphs, Labeled and Weighted Graphs, Complete, Regular, and Bipartite Graphs, Planar Graphs , Graph Colorings ,Representing Graphs in Computer Memory and Graph Algorithms. Directed Graphs, Sequential Representation of Directed Graphs, Warshall's Algorithm, Shortest Paths

Trees: Introduction, Binary Trees, Complete and Extended Binary Trees, Representing Binary Trees in Memory, Traversing Binary Trees, Binary Search Trees

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Epp, S. S. (2010). Discrete mathematics with applications. Cengage learning.*
- *Biggs, N. L. (2002). Discrete mathematics. Oxford University Press*
- *Ross, K. A., & Wright, C. R. (1985). Discrete Mathematics.Prentice-Hall,Inc.*

Web Sources

- *https://www.javatpoint.com/discrete-mathematics-tutorial h*
- *https://www.geeksforgeeks.org/discrete-mathematics-tutorial/*
- *https://www.tutorialspoint.com/discrete_mathematics/index.htm*

	L	T	P	Credits

Course Title: Web Analytics

Course Code: BCD403

L	T	P	Credits
2	0	4	4

Total Hours: 90

Learning Outcomes

After completion of this course, the learner will be able to:

1. Understand the role of web analytics within the digital marketing landscape
2. Recognize how to effectively use insights to support website design decisions, campaign optimization, search analytics, etc
3. Understand analytical methods to transform social media data into marketing insights
4. Identify, define and interpret commonly used web metrics and KPIs

Course Content

UNIT I   14 Hours

Introduction, Basic Analytics, Analytics and AWStats, AWStats Dashboard, Summary, Days and Hours, Countries, Visits Duration,
Pages-URL, Operating Systems and Browsers, key Words and Key Phrases

UNIT II   16 Hours

Analytics Settings, Website Profiles, Adding a Profile, Checking Status, Editing a Profile, Deleting Profile, Access Management
Adding a User, Setting User, Permissions, Deleting a User

UNIT III   17 Hours

Web Metrics: Common metrics: Hits, Page views, Visits, Unique visitors, unique page views, Bounce, Bounce rate, Page/visit, Average time on site, new visits

Optimization (e-commerce, non e-commerce sites): Improving bounce rates, Optimizing adwords campaigns; Real time report, Audience report, Traffic source report, Custom campaigns, Content report,

UNIT IV   13 Hours

Google analytics, Introduction to KPI, characteristics, Need for KPI, Perspective of KPI, Uses of KPI.

Internet & TCP/IP, Client / Server Computing, HTTP (HyperText Transfer Protocol), Server Log Files & Cookies, Web Bugs

Transaction Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Clifton, B. (2010). Advanced web Metrics mit Google Analytics: Praxis-Handbuch. MITP-Verlags GmbH & Co. KG.*
- *Kaushik, A. (2009). Web analytics 2.0: The art of online accountability and science of customer centricity. John Wiley & Sons.*
- *Sterne, J. (2003). Web metrics: Proven methods for measuring web site success. John Wiley & Sons.*

List of Practical

- Introduction to Basic Analytics: Create a presentation on basic web analytics, including an explanation of key terms and their significance.
- Navigating AWStats Dashboard: Use the AWStats platform to analyze a website's traffic and performance. Write a report discussing the findings.
- Understanding AWStats Metrics: Choose several metrics tracked by AWStats, such as Visits Duration, Pages-URL, and Key Words, and prepare a presentation explaining each one.
- Creating Website Profiles: Using an analytics platform, create profiles for a fictitious website and report on the process.
- Managing User Access: Demonstrate how to add, set permissions for, and delete users in an analytics platform. Discuss the potential implications of each action.
- Understanding Common Web Metrics: Write a detailed report explaining common web metrics like Hits, Page Views, Unique Visitors, Bounce Rate, and Average Time on Site.
- Improving Bounce Rates: Analyze the bounce rates of a real or fictitious website and create a strategy to improve these rates.
- Optimizing Adwords Campaigns: Run a mock AdWords campaign for a fictitious business. Use analytics to optimize the campaign and report on the changes made and their effects.
- Analyzing Google Analytics Reports: Use Google Analytics to generate and analyze real-time, audience, traffic source, and content reports for a fictitious website.
- Introduction to KPIs: Create a presentation explaining what Key Performance Indicators (KPIs) are, their characteristics, their importance, and how they're used in web analytics.
- Exploring Internet Protocols: Write a report on TCP/IP and HTTP, explaining how they work and their role in web analytics.
- Understanding Server Log Files: Investigate the information that server log files provide and create a presentation on how this information can be used in web analytics.
- Working with Cookies: Conduct a practical exercise on how cookies are used to track website visitors and generate user data.

- Identifying Web Bugs: Identify the use of web bugs (also known as pixel tags) on several websites. Write a report on how they're used for tracking and analytics purposes.
- Creating Custom Campaigns: Using Google Analytics, create a custom campaign for a fictitious business. Analyze the results and make recommendations for improvements.

Course Title: Advance Social Media Marketing	**L**	**T**	**P**	**Credits**
Course Code: BCD404	**2**	**0**	**2**	**3**

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Identify the major social media marketing portals that can be used to promote a company, brand, product, service or person.
2. Develop creative strategies to build brands through the use of social media.
3. Design engaging social content using emerging tools and technologies.
4. Create effective social media marketing strategies for various types of industries and businesses.

Course Content

UNIT I   **11 Hours**

Linkedin Marketing -Paid Advertising, Targeting, New Audience Targeting, Bid Strategy, Campaign Manager, Sponsored Groups and Display Ads. Measure the Impact and Optimize, Unlock the Power of Linkedin's Partner Program and Reporting

UNIT II   **10 Hours**

Twitter Marketing - The Followers, Components of Twitter, Considerations to Follow Others on Twitter & Image & Video Posts; Twitter Marketing - Sharing Images on Twitter, Tagging People in Twitter, Twitter Video Posts, Sharing Videos on Twitter & Recording a Video on Twitter

UNIT III   **12 Hours**

Twitter Marketing - Twitter Marketing - Account and Profile, Creating a Twitter Account, Tips on Selecting a Username, Twitter Account Profile & Twitter Account Profile Elements Twitter Marketing Twitter Marketing Twitter Marketing - The Followers, Components of Twitter, Considerations to Follow Others on Twitter & Image & Video Posts; Twitter Marketing - Sharing Images on Twitter, Tagging People in Twitter, Twitter Video Posts, Sharing Videos on Twitter & Recording a Video on Twitter

UNIT IV   **12 Hours**

Twitter Marketing-Hashtags, Considerations of Using Hashtags in Twitter, Types of Twitter Hashtags & Twitter Marketing Retweets.
Twitter Marketing-Useful Features, URL Shorteners In Twitter, Posting Links in a Tweet & Implementing Twitter Cards /Presentation
YouTube Marketing In introduction, Creating an Account and The YouTube Advantage; YouTube Marketing Create Creative Video, Creating a Channel, Channel Description Box and Setup Channel Background;

YouTube Marketing Channel Branding, Thumbnails, Create Video Playlists & Video Sharing Sharing Unlisted and Private Videos,

Transaction Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Evans, D., Bratton, S., & McKee, J. (2021). Social media marketing. AG Printing & Publishing.*
- *Tuten, T. L., & Solomon, M. R. (2017). Social media marketing. Sage.*
- *Dwivedi, Y. K., Kapoor, K. K., & Chen, H. (2015). Social media marketing and advertising. The Marketing Review.*

List of Practical

- Linkedin Paid Advertising: Set up a mock paid advertising campaign on LinkedIn, detailing each step including targeting, bid strategy, and campaign management.
- Measuring Impact on LinkedIn: After running a mock LinkedIn campaign, analyze the results and prepare a report outlining the impacts and potential optimizations.
- Utilizing LinkedIn's Partner Program: Research LinkedIn's Partner Program and create a presentation explaining its benefits and how to use it.
- Gaining Followers on Twitter: Develop a strategy to increase followers on a hypothetical Twitter account, and discuss the potential impacts of this increase.
- Creating a Twitter Account: Create a Twitter account for a fictitious business, taking into account tips for selecting a username and creating a compelling profile.
- Sharing Images and Videos on Twitter: Share images and videos on a mock Twitter account and discuss how these types of content can be used in a marketing strategy.
- Twitter Hashtag Usage: Create a Twitter post for a fictitious business that uses hashtags effectively. Analyze the potential reach and impact of the post.
- Implementing Twitter Cards: Set up and implement Twitter Cards for a fictitious website. Write a report on the process and benefits.
- Creating a YouTube Account: Set up a YouTube account for a fictitious business, ensuring all necessary information is filled out and optimized for search.
- Creating a YouTube Channel: Develop a YouTube channel for a fictitious business, focusing on channel description, branding, and setup.

- Creating YouTube Video Playlists: Create a playlist of relevant videos for a fictitious YouTube channel. Discuss the benefits of using playlists as a part of YouTube marketing strategy.
- YouTube Video Sharing: Demonstrate how to share unlisted and private videos on YouTube, discussing the use cases for each.
- Using Twitter's URL Shorteners: Create a report discussing the importance and use of URL shorteners in Twitter marketing.
- Creating YouTube Thumbnails: Create thumbnails for hypothetical YouTube videos, discussing why each thumbnail is effective and how it could help increase views.
- Tagging People on Twitter: Demonstrate the process of tagging people in Twitter posts and discuss how this can be utilized to increase reach and engagement.

Course Title: Programming using Java Lab	L	T	P	Credits
Course Code: BCD405	0	0	4	2

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:
1. Discuss about the concepts of object-oriented programming.
2. Analysis the performance of Exception handling and multi-threading.
3. Implementing and Debugging the Java programs.
4. Develop an Applet code using Java Programming.

Course Content

1. Introduction to JAVA, Class, Object, Package, Applet.
2. Write a Java program which does the creation of Class and object.
3. Usage of import statement and package declaration in java programs.
4. Declaring variables of various data types and their effect by changing the access modifiers like private, public, protected, default.
5. Write a program which makes use of Comparison Operators.
6. Write programs which make use of Arithmetic Operators.
7. Write a program which makes use of Logical Operators.
8. Write a program which makes use of control Statement like if, while, do while.
9. Write Java programs, which make use of Statements like Try, catch, finally.
10. Write a Java program, which make use of control Statement like Try, catch, finally, throw, and throws.
11. Write code snippets which make usage of Method Overloading, Using super, this, super (), this () in Java Programs.
12. Write code snippets which make usage of method Overriding.
13. Write code snippets which make Applet.
14. Write code snippets which make usage of recursion.
15. Write code snippets which make usage of Thread.
16. Write code snippets which make usage of Thread Synchronization.
17. Write code snippets which make usage of String Methods.
18. Write code snippets which make usage of Swing Package.

	L	**T**	**P**	**Credits**
Course Title: Big Data				
Course Code: BCD406	**3**	**0**	**0**	**3**

Course Title: Big Data
Course Code: BCD406

Total Hours: 45

Learning Outcomes

After completion of this course, the learner will be able to:

1. Discuss the building blocks of Big Data.
2. Articulate the programming aspects of cloud computing (map Reduce etc.).
3. Knowledge about the recent research trends related to Hadoop File System, Map Reduce and Google File System etc.
4. Study different types Case studies on the current research and applications of the Hadoop and big data in industry

Course Content

UNIT I   **14 hours**

Introduction to Big Data: Introduction to Big Data Platform – Challenges of Conventional Systems - Intelligent data analysis – Nature of Data - Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error

UNIT II   **09 hours**

Mining Data Streams: Introduction To Streams Concepts – Stream Data Model and Architecture - Stream Computing - Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window – Decaying Window - Real time Analytics Platform (RTAP) Applications –- Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

UNIT III   **10 hours**

Hadoop Environment: History of Hadoop- The Hadoop Distributed File System – Components of Hadoop- Analyzing the Data with Hadoop- Scaling Out- Hadoop Streaming- Design of HDFS-Hadoop filesystems-Java interfaces to HDFS- Basics-Developing a Map Reduce Application-How Map Reduce Works-Anatomy of a Map Reduce Job run-Failures-Job Scheduling-Shuffle and Sort – Task execution - Map Reduce Types and Formats- Map Reduce Features - Setting up a Hadoop Cluster - Cluster specification - Cluster Setup and Installation – Hadoop Configuration-Security in Hadoop

UNIT IV   **12 hours**

Data Analysis Systems and Visualization: Link Analysis – Page Rank - Efficient Computation of Page Rank- Topic-Sensitive Page Rank – Link Spam- Recommendation Systems- A Model for Recommendation Systems-Content-Based   Recommendations   -   Collaborative   Filtering-

Dimensionality Reduction- Visualizations - Visual data analysis techniques-interaction techniques- Systems and applications.

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Chris Eaton, (2012). Dirk derooset al., Understanding Big data, McGraw Hill.*
- *Tom White, (2012). HADOOP: The definitive Guide, O Reilly.*
- *Hurwitz, J., Nugent, A., Halper, F., & Kaufman, M. (2013). Big data for dummies (Vol. 336). Hoboken, NJ: John Wiley & Sons.*

Web Sources

- *https://www.javatpoint.com/what-is-big-data*
- *https://www.guru99.com/what-is-big-data.html*
- *https://www.geeksforgeeks.org/what-is-big-data/*
- *https://cloud.google.com/learn/what-is-big-data*

	L	T	P	Credits
Course Title: Data Warehouse and Mining	3	0	0	3
Course Code: BCD 407				

Total Hours: 45

Learning Outcomes

After completion of this course, the learner will be able to:

1. Identify the scope and necessity of Data Mining & Warehousing for the society.
2. Describe the designing of Data Warehousing so that it can be able to solve the root problems.
3. Use normalization techniques to redundancy and incomplete data from the dataset.
4. Develop a data mining application for data analysis using various tools.

Course Content

UNIT I   **10 hours**

Introduction: What is Data Mining, Data Mining Functionalities, Classification of Data Mining Systems, and Major Issues in Data Mining. Data Preprocessing: Needs Preprocessing, Descriptive Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy Generation.

UNIT II   **12 hours**

Data Warehouse and OLAP Technology: Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture and Implementation, from Data Warehousing to Data Mining. Frequent Patterns, Associations Rules: Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Mining various kinds of Association Rules.

UNIT III   **11 hours**

Classification and Prediction: Introduction, Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, and Rule based Classification, Classification by Back Propagation, Support Vector Machines, Prediction, Accuracy and Error Measures.

UNIT IV   **12 hours**

Cluster Analysis: Introduction, Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, and Grid Based Methods; Model Based Clustering Methods, Outlier Analysis.

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Dunham Margaret H, Sridhar S. (2008). Data mining: Introductory and Advanced Topics, Pearson Education.*
- *HumphiresH.D.(2009).Data Warehousing: Architecture and Implementation Pearson Education.*
- *Anahory.(2008). Data Warehousing in the Real World. Pearson Education.*

Web Sources

- *https://www.javatpoint.com/data-mining-cluster-vs-data-warehousing*
- *https://www.ibm.com/topics/data-warehouse*
- *https://www.geeksforgeeks.org/difference-between-data-warehousing-and-data-mining/*
- *https://www.investopedia.com/terms/d/data-warehousing.asp*

Course Title: Basics of LaTeX	L	T	P	Credits
Course Code: BCD408	2	0	0	2

Total Hours: 30

Learning Outcomes:

After completion of this course, the learner will be able to:
1. Gain a basic knowledge of LaTex.
2. Learn to add images and mathematical equations.
3. Use various packages of LaTex.
4. Apply LaTex tools to design reports and books.

Unit-I   **8 Hours**

Installation of the software LaTeX, Understanding LaTeX compilation and LaTeX editors, Basic syntax, Writing mathematical equations, Matrices, Tables, Inclusion of graphics into LaTeX file..

Unit-2   **8 Hours**

Page configurations: Title, Abstract, Keywords, Chapter, Sections and Subsections, References and their citations, Labeling of equations, Table of contents, List of figures, List of tables, Page numbering, Generating index.

Unit-3   **6 Hours**

Packages: amsmath, amssymb, amsthm, amsfonts, hyperrefer, graphic, color, xypic, latexsym, natbib, setspace, multicol, suBCDption, url, verbatim, tikz, and geometry. Classes: Article, Report, Book, Letter, Slides, Beamer.

Unit-4   **8 Hours**

Applications to: Writing reports, books, articles/ research papers, thesis, and official letters. Making simple and modern resumes, figures, question papers, and presentations.

Suggested Readings
- *L. Lamport. LATEX: A Document Preparation System, User's Guide and Reference Manual. 2nd Edition, Addison Wesley, New York, 1994.*
- *F. Griffiths and D. J. Higham, Learning LaTex, 2nd Edition, Philadelphia, Pennsylvania, SIAM, 1997.*

Web Sources
- *https://www.overleaf.com*
- *https://www.sharelatex.com/*

Semester-V

Course Title: Artificial Intelligence	L	T	P	Credits
Course Code: BCD501	4	0	0	4

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:
1. Identify problems that are amenable to solution by specific AI methods
2. Represent knowledge in Prolog and write code for drawing inferences.
3. Identify appropriate AI technique for the problem at hand
4. Compare strengths and weaknesses of different artificial Intelligence techniques.

Course Content

UNIT I   15 hours

Introduction: Introduction to artificial intelligence, background and applications, Turing test, rational agents, intelligent agents, structure, behavior and environment of intelligent agents.

UNIT II   15 hours

Knowledge Representation: Propositional logic, first order predicate logic, resolution principle,

unification, semantic nets, conceptual dependencies, frames, scripts, production rules, conceptual

graphs.

UNIT III   15 hours

Problem Solving and Searching Techniques: Problem characteristics, production systems, control strategies, breadth first search, depth first search, hill climbing and its variations, heuristics search techniques: best first search, A* algorithm, constraint satisfaction problem, means-end analysis.

Ethics in AI, Fairness in AI, Legal perspective

UNIT IV   15 hours

Game Playing: introduction to game playing, min-max and alpha-beta pruning algorithms.

Prolog Programming: Introduction to Programming in Logic (PROLOG), Lists, Operators, basic Input and Output.

Transactional modes

Project based learning, Team Teaching, Flipped teaching, Open talk, Collaborative Teaching, Case Analysis, Panel Discussions, Group Discussions.

Suggested Readings

- *Winston, P. H. (1992). Artificial intelligence. Addison-Wesley Longman Publishing Co., Inc..Winston, P. H. (1984). Artificial intelligence. Addison-Wesley Longman Publishing Co., Inc..*
- *Boden, M. A. (Ed.). (1996). Artificial intelligence. Elsevier.*

- *Hunt, E. B. (2014). Artificial intelligence. Academic Press.*

Web Sources

- *https://www.vssut.ac.in/lecture_notes/lecture1428643004.pdf*
- *https://mrcet.com/downloads/digital_notes/IT/(R17A1204)%20Artificial%20Intelligence.pdf*
- *https://www.cet.edu.in/noticefiles/271_AI%20Lect%20Notes.pdf*

	L	T	P	Credits
Course Title: Computer Networks	**4**	**0**	**0**	**4**
Course Code: BCD502				

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Get knowledge about the layers of the OSI model and TCP/IP.
2. Compare and identify various network topologies.
3. Identify the types of application process protocols.
4. Discuss the various data link layers and network protocols.

Course Content

UNIT I   14 hours

Data communications concepts: Digital and analog parallel and serial synchronous and asynchronous, simplex, half duplex, full duplex, multiplexing.

Communication channels: Wired transmissions: Telephone lines, leased lines, switch line, coaxial cables, base band, and broadband, optical fiber transmission.

UNIT II   16 hours

Wireless transmission: Microwave transmission, infrared transmission, laser transmission, radio transmission, and satellite transmission, Communication switching techniques; Circuit switching, message switching, packet switching.

UNIT III   14 hours

Network reference models: Network topologies, OSI references model, TCP/IP reference model, comparison of OSI and TCP reference model. Data link layer design issue: Services provided to the network layer, framing, error control, flow control, HDLC, SDLC, data link layer in the internet (SLIP, PPP).

UNIT IV   16 hours

MAC sub layer: CSMA/CD, IEEE standards, FDM, TDM, CDMA.

The Network Layer: Design Issues,

Routing Algorithms: Optimality principled, shortest path routing, Concept of Internet Working.

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Tanenbaum, A. S. (2002). Computer networks. Pearson Education India.*
- *Peterson, L. L., & Davie, B. S. (2007). Computer networks: a systems approach. Elsevier.*

- *Kiesler, S. (1986). The hidden messages in computer networks (pp. 46-47). Harvard Business Review Case Services.*

Web Sources

- *https://www.geeksforgeeks.org/data-communication-definition-components-types-channels/*

- *https://www.studytonight.com/computer-networks/reference-models-in-computer-networks*

- *https://www.bing.com/ck/a?!&&p=2b949258678ed6ceJmltdHM9MTY4MzUwNDAwMCZpZ3VpZD0yYzYwNzgyMS05YmI2LTY0ZDItMDJmNi02OGJmOWEyZDY1NjkmaW5zaWQ9NTIxMQ&ptn=3&hsh=3&fclid=2c607821-9bb6-64d2-02f6-68bf9a2d6569&psq=cOMPUTER+nETWORKS&u=a1aHR0cHM6Ly93d3cuamF2YXRwb2ludC5jb20vY29tcHV0ZXItbmV0d29yay10dXRvcmlhbA&ntb=1*

Course Title: Email Marketing	L	T	P	Credits
Course Code: BCD503	1	0	4	3

Total Hours: 75

Learning Outcomes

After completion of this course, the learner will be able to:

1. Understand customer lifecycle marketing in relation to email marketing
2. Understand the current CRM, email marketing, and marketing automation platforms
3. Evaluate email marketing performance metrics and recommend improvements to email marketing strategy and action plans based on evaluation outcomes
4. Apply techniques to minimize unsubscribe and maintain a healthy subscriber base

Course Content

UNIT I   17 Hours

Email Marketing: introduction to email marketing, Key term and concepts, Email Software and tools.

Email strategy and planning advantage and challenges, solving the spam problem, rich media e- mail

UNIT II   15 Hours

Email marketing, process, tools of the trade (Mailchimp, Groupmail and Interspire Email marketer etc.)

Mailchimp campaign setup, email list building, double option in email list building and strategy making

Email marketing: Email campaign planning, objective setting, Email campaign budgeting

Campaign design: targeting, offer, timing, creative, campaign, integration, Measurement & Testing

UNIT III   15 Hours

Various types of email samples for different purposes e.g. Class Demo and Practical Session Onboarding Emails, Subscriber Emails, Promotional Emails, Transactional Emails and Behavioral Emails

Various types of email samples, Welcome Emails, Personal Welcome Emails, Getting Started Emails, Free Trial Ending Emails, Activation Emails, Nudge Emails, Complete Your Profile Emails, Upsell Emails

UNIT IV   13 Hours

GroupMail configuration marketing configuration email Class Demo and Practical Session software installation, SMTP and setting up mail campaign marketing software installation,

INTERSPIRE email Class Demo and Practical Session configuration, SMTP

configuration and setting up mail campaign

Web Forms Lead Importing, Integrating Landing Page Forms, Campaign Reports and Insights; Segmentation Strategy,

Auto-Responder Series, Triggering Auto -Responder Emails, Auto Responder follow-up sequence setup.—

Transaction Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Frost, R. D., & Strauss, J. (2018). E-marketing. Routledge.*
- *Jenkins, S. (2008). The truth about email marketing. FT Press.*
- *Chaffey, D. (2007). Total E-mail Marketing: maximizing your results from integrated e-marketing. Routledge.*

List of Practical

- *Introduction to Email Marketing: Prepare a presentation explaining the basics of email marketing, its key terms, concepts, and the tools used in it.*
- *Spam Problem Solving: Analyze a series of emails and identify which elements could potentially mark them as spam. Develop strategies to solve these issues.*
- *Email Marketing Tool Exploration: Familiarize yourself with email marketing tools like MailChimp, GroupMail, and Interspire Email Marketer. Write a comparison report outlining the advantages and disadvantages of each.*
- *MailChimp Campaign Setup: Create a mock email campaign in MailChimp, outlining each step from setup to deployment.*
- *Email List Building: Develop a strategy for building an email list for a fictitious company, focusing on double opt-in procedures.*
- *Campaign Budgeting: Given a budget, plan a hypothetical email campaign that stays within those financial constraints.*
- *Designing an Email Campaign: Design a mock email campaign for a fictitious business, considering targeting, timing, and creative elements.*
- *Creating Various Types of Emails: Draft samples of different types of emails, such as Onboarding Emails, Promotional Emails, and Transactional Emails.*
- *Welcome Emails: Draft a series of welcome emails for new subscribers of a fictitious company's email list. Analyze the impact of personalized welcome emails.*
- *GroupMail Configuration: Configure a GroupMail account for a mock company. Discuss the process and any challenges encountered.*
- *Interspire Email Configuration: Configure an Interspire Email account for a mock company. Discuss the process and any challenges encountered.*
- *Integrating Landing Page Forms: Create a mock landing page and demonstrate how to integrate its form with an email marketing tool.*

- *Campaign Reporting: After running a mock email campaign, analyze the campaign report and create a presentation on the results.*
- *Segmentation Strategy: Develop a segmentation strategy for a hypothetical email list. Discuss how this strategy can improve the effectiveness of email campaigns.*
- *Auto-Responder Setup: Set up an auto-responder series for a fictitious company. Discuss the benefits and potential uses of auto-responders in email marketing.*

Course Title: Mobile Marketing	L	T	P	Credits
Course Code: BCD504	1	0	4	03

Total Hours: 75

Learning Outcomes

After completion of this course, the learner will be able to:

1. Understand the fundamental principles and concepts of mobile marketing.
2. Understand the significance and scope of Mobile Marketing
3. Identify various methods for locating mobile users
4. Analyze the key policies, guidelines, and/or organizations in the mobile marketing industry.

Course Content

UNIT I   **17 Hours**

Mobile marketing: Introduction, concepts, the role of mobile in personal communication, mobile messaging channels, location and mobile.

Understanding Mobile Devices, Core Product and Service Offerings

Careers in Mobile Marketing Mobile Marketing Opportunities

UNIT II   **15 Hours**

Mobile Advertising and Search: Mobile Advertising Mobile Marketing and Search Programmatic Ad Buying.

Mobile marketing technology & reach anywhere anytime access and advertisements.

UNIT III   **15 Hours**

Marketing strategy, mobile marketing police, SMS campaigns, benefits of SMS campaign.

Mobile Marketing and social media Mobile and Social Media Content Marketing for Mobile Facebook Advertising for Mobile.

UNIT IV   **13 Hours**

Mobile website marketing, M-commerce.

Mobile Rules and Regulations Mobile Marketing Rules and Regulations Mobile Campaign Compliance, Location and Mobile Marketing Location - Based Services.

Transaction Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Hua, H. (2019). Mobile marketing management: Case studies from successful practices. CRC Press.*
- *Mittal, S., & Kumar, V. (2020). A framework for ethical mobile marketing. International Journal of Technoethics (IJT)*
- *Rowles, D. (2017). Mobile marketing: how mobile technology is revolutionizing marketing, communications and advertising. Kogan Page Publishers.*
- *Michael, A., & Salter, B. (2006). Mobile marketing. Routledge.*

List of Practical

- Understanding Mobile Devices: Analyze various mobile devices and their usage, identifying how their characteristics could influence a mobile marketing strategy.
- Exploring Careers in Mobile Marketing: Research and prepare a report on potential career paths in mobile marketing, highlighting the necessary skills and qualifications.
- Exploring Mobile Advertising: Set up a mock mobile advertising campaign. Write a report detailing each step and the reasoning behind the choices made.
- Programmatic Ad Buying: Research and explain the concept of programmatic ad buying in the context of mobile marketing.
- Understanding Mobile Marketing Technology: Explore the technologies involved in mobile marketing. Prepare a presentation explaining each technology and its role in mobile marketing.
- Developing a Mobile Marketing Strategy: Develop a mobile marketing strategy for a hypothetical business. Discuss the benefits and potential challenges.
- Setting Up SMS Campaigns: Set up a mock SMS campaign for a hypothetical company. Discuss the benefits and drawbacks of SMS campaigns.
- Exploring Mobile and Social Media: Research and explain how mobile marketing can be integrated with social media marketing.
- Facebook Advertising for Mobile: Set up a mock Facebook mobile advertising campaign. Write a report detailing the process and results.
- Understanding Mobile Website Marketing: Analyze a mobile website and identify ways it could be optimized for mobile marketing.
- Exploring M-Commerce: Research the concept of M-Commerce. Write a report explaining how it works and its potential impact on mobile marketing.
- Learning Mobile Marketing Rules and Regulations: Research and

summarize the main rules and regulations that govern mobile marketing.

- Exploring Location-Based Services: Research and discuss various location-based services and how they can be utilized in a mobile marketing strategy.
- Mobile Campaign Compliance: Analyze a mobile marketing campaign to check for compliance with rules and regulations.
- Understanding the Impact of Location on Mobile Marketing: Discuss the role of location in mobile marketing, and how location-based targeting can influence a mobile marketing strategy.

Course Title: Artificial Intelligence Lab	L	T	P	Credits
Course Code: BCD505	0	0	2	1

Total Hours: 30

Learning Outcomes

After completion of this course, the learner will be able to:

1. Demonstrate proficiency in programming logic and problem-solving by successfully implementing various Prolog programs, such as calculating the sum of two numbers and finding the maximum of two numbers.
2. Understand recursive programming techniques through the implementation of Prolog programs, including factorial calculation and generating Fibonacci series.
3. Apply mathematical concepts in programming by successfully implementing Prolog programs, such as calculating the greatest common divisor (GCD) of two numbers and raising a number to a given power.
4. Develop proficiency in working with lists and manipulating them using Prolog predicates, as demonstrated in programs such as checking membership of an element in a list and appending lists together.

Course Content

1. Write a prolog program to calculate the sum of two numbers.
2. Write a Prolog program to implement max(X, Y, M) so that M is the maximum of two numbers X and Y.
3. Write a program in PROLOG to implement factorial (N, F) where F represents the factorial of a number N.
4. Write a program in PROLOG to implement generate_fib(N,T) where T represents the Nth term of the fibonacci series.
5. Write a Prolog program to implement GCD of two numbers.
6. Write a Prolog program to implement power (Num,Pow, Ans) : where Num is raised to the power Pow to get Ans.
7. Prolog program to implement multi (N1, N2, R) : where N1 and N2 denotes the numbers to be multiplied and R represents the result.
8. Write a Prolog program to implement memb(X, L): to check whether X is a member of L or not.
9. Write a Prolog program to implement conc (L1, L2, L3) where L2 is the list to be appended with L1 to get the resulted list L3.
10. Write a Prolog program to implement reverse (L, R) where List L is original and List R is reversed list.
11. Write a program in PROLOG to implement palindrome (L) which checks whether a list L is a palindrome or not.
12. Write a Prolog program to implement sumlist(L, S) so that S is the sum of a given list L.

13.   Write a Prolog program to implement two predicates evenlength(List) and odd length(List) so that they are true if their argument is a list of even or odd length respectively.

14.   Write a Prolog program to implement nth_element (N, L, X) where N is the desired position, L is a list and X represents the Nth element of L.

15.   Write a Prolog program to implement maxlist(L, M) so that M is the maximum number in the list.

16.   Write a prolog program to implement insert_nth (I, N, L, R) that inserts an item I into the Nth position of list L to generate a list R.

17.   Write a Prolog program to implement delete_nth (N, L, R) that removes the element on Nth position from a list L to generate a list R.

18.   Write a program in PROLOG to implement merge (L1, L2, L3) where L1 is first ordered list and L2 is second ordered list and L3 represents the merged list.

Course Title: Internship Training

Course Code: BCD506

L	T	P	Credits
0	0	0	6

Course Description:

The Internship Training program in BCA provides students with a hands-on learning experience by working in real-world industry settings. It aims to bridge the gap between academic knowledge and practical application, allowing students to gain valuable industry exposure, apply their skills, and develop a deeper understanding of their chosen field.

Course Title: Computer Graphics	L	T	P	Credits
Course Code: BCD507	3	0	0	3

Total Hours: 45

Learning Outcomes

After completion of this course, the learner will be able to:

1. Describe Standard raster and vector scan devices as well as Graphical Input and output devices.
2. Implement algorithms for drawing basic primitives such as line circle and ellipse.
3. Implement algorithms for line clipping and polygon clipping and filing.
4. Implement a 3D object representation scheme and carry out 2D and 3D Transformation, 3D projections.

Course Content

UNIT I   **12 hours**

Introduction: Introduction to Graphics systems, Basic elements of Computer graphics, Applications of computer graphics.

Overview of Graphics Systems: Video Display Devices, Cathode Ray Tube, CRT monitors, Flat panel displays: Plasma Panel display, Thin-film electroluminescent displays, LED, Liquid Crystal Displays (LCD), Raster Scan Systems, Random Scan Systems. Graphics Monitors and Workstations, Input Devices, Hard-copy devices, Graphics Software.

UNIT II   **11 hours**

Drawing and clipping primitives: Raster scan line, circle and ellipse drawing algorithms, Polygon filling, line clipping and polygon clipping algorithms. Filled area primitives, character generation, Antialiasing.

UNIT III   **11 hours**

Transformation and Viewing: 2D and 3D Geometric Transformations, 2D and 3D Viewing Transformations (Projections- Parallel and Perspective), Vanishing points.

UNIT IV   **11 hours**

Geometric Modeling: Polygon Mesh Representation, Cubic Polynomial curves (Hermite and Bezier). Visible Surface determination and Surface Rendering: Z-buffer algorithm, List-priority algorithm and area subdivision algorithm for visible surface determination. Illumination and shading models, RGB color model and Basics of Computer Animation.

Transactional modes

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning**.**

Suggested Readings

- *Hearn, D., Baker, M. P., & Baker, M. P. (2004). Computer graphics with OpenGL (Vol. 3). Upper Saddle River, NJ:: Pearson Prentice Hall.*

- *Foley, J. D., Van Dam, A., Feiner, S. K., Hughes, J. F., & Phillips, R. L. (1994). Introduction to computer graphics (Vol. 55). Reading: Addison-Wesley.*
- *Shirley, P., Ashikhmin, M., &Marschner, S. (2009). Fundamentals of computer graphics. AK Peters/CRC Press.*
- *Foley, J. D., Van, F. D., Van Dam, A., Feiner, S. K., Hughes, J. F., & Hughes, J. (1996). Computer graphics: principles and practice (Vol. 12110). Addison-Wesley Professional.*

Web Sources

- *https://www.javatpoint.com/computer-graphics-tutorial*
- *https://www.geeksforgeeks.org/introduction-to-computer-graphics/*
- *https://www.coursera.org/articles/computer-graphics*

Course Title: Parallel Processing	L	T	P	Credits
Course Code: BCD508	3	0	0	3

Total Hours: 45

Learning Outcomes

After completion of this course, the learner will be able to:

1. Analysis the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction and deployment.
2. Apply the techniques of SIMD and MIMD for parallel processing.
3. Perform the various testing techniques in project.
4. Prepare the Documentation of Software Requirement Analysis (SRS).

Course Content

UNIT I   12 hours

Introduction: Definition of PP, Feature of PP, Advantages and disadvantages of PP, Synchronous - vector/array, SIMD, MIMD.

Hardware taxonomy: Flynn's classifications, Handler's classifications.

UNIT II   11 hours

Abstract parallel computational models: Combinational circuits, Sorting network, PRAM models,

Performance Metrics: Laws governing performance measurements. Matrices - speedups, efficiency, communication overheads.

UNIT III   11 hours

Parallel Processors: Taxonomy and topology - shared memory multiprocessors, distributed memory networks.

Parallel Programming: Shared memory programming, distributed memory programming, object oriented programming, functional programming.

UNIT IV   11 hours

Scheduling and Parallelization: Scheduling parallel programs. Parallelization of sequential programs. Parallel programming support environments.

Suggested Readings

- *M. J. Quinn. Parallel Computing: Theory and Practice , McGraw Hill, New York, 1994.*
- *T. G. Lewis and H. El-Rewini. Introduction to Parallel Computing , Prentice Hall, New Jersey, 1992.*
- *T. G. Lewis. Parallel Programming: A Machine-Independent Approach , IEEE Computer Society Press, Los Alamitos, 1994.*

Web Sources

- *https://www.javatpoint.com/parallel-processing*
- *https://www.geeksforgeeks.org/what-is-parallel-processing/*
- *https://www.sciencedirect.com/topics/computer-science/parallel-processing*

Semester-VI

Course Title: Software Engineering	L	T	P	Credits
Course Code: BCD601	4	0	0	4

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Figure out the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction and deployment.
2. Gain knowledge about Cost estimation model and Software Process Model.
3. Perform the various testing techniques.
4. Prepare the Documentation software process planning.

Course Content

UNIT I   **14 hours**

Software: Characteristics, Components, Applications

Software Process Models: Waterfall, Spiral, Prototyping, Fourth Generation Techniques, Concepts of Project Management, Role of Metrics & Measurements.

UNIT II   **16 hours**

S/W Project Planning: Objectives, Decomposition techniques: S/W Sizing, Problem based estimation, Process based estimation

Cost Estimation Models: COCOMO Model, the S/W Equation.

UNIT III   **14 hours**

System Analysis: Principles of Structured Analysis, Requirement analysis, DFD, Entity Relationship diagram, Data dictionary.

S/W Design: Objectives, Principles, Concepts, Design methodologies: Data design, Architectural design, procedural design, Object oriented concepts

UNIT IV   **16 hours**

Testing fundamentals: Objectives, principles, testability, Test cases: White box & Black box testing.

Testing strategies: verification & validation, unit test, integration testing, validation testing, system testing

Transactional Mode

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Pressman S Roger (1992). Software Engineering, A Practitioner's Approach, Third Edition,McGraw Hill.*
- *Fairley E.R. (1985). Software Engineering Concepts, McGraw Hill.*

- *Jalota Pankaj (1992).An Integrated Approach to Software Engineering,Narosa Publishing House.*

Web Sources

- *https://www.simplilearn.com/tutorials/devops-*
- *https://www.geeksforgeeks.org/software-engineering-software-characteristics/*
- *https://www.bing.com/ck/a?!&&p=69e83b0e8aeb7214JmltdHM9MTY4MzUwNDAwMCZpZ3VpZD0yYzYwNzgyMS05YmI2LTY0ZDItMDJmNi02OGJmOWEyZDY1NjkmaW5zaWQ9NTI3Ng&ptn=3&hsh=3&fclid=2c607821-9bb6-64d2-02f6-68bf9a2d6569&psq=software+engineering&u=a1aHR0cHM6Ly93d3cuZ2Vla3Nmb3JnZWVrcy5vcmcvc29mdHdhcmUtZW5naW5lZXJpbmcv&ntb=1*

Course Title: Programming using Python	L	T	P	Credits
Course Code: BCD602	4	0	0	4

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Understand the variables, expressions and statements.
2. Apply conditional and looping constructs.
3. Design and import functions in python programming.
4. Learn the basics of Strings and Dictionaries.

Course Content

UNIT I   **16 hours**

Introduction to Python Getting Started: Introduction to Python- an interpreted high level language, interactive mode and script mode.

Variables, Expressions and Statements: Values, Variables and keywords; Operators and Operands in Python: (Arithmetic, relational and logical operators), operator precedence, Expressions and Statements (Assignment statement); Taking input (using raw_input() and input()) and displaying output(print statement);Putting Comments.

UNIT II   **14 hours**

Conditional constructs and looping: if else statement While, For (range function), break, continue, else, pass, Nested loops, use of compound expression in conditional constructs and looping

Functions: Importing Modules (entire module or selected objects), invoking built in functions, functions from math module, using random () and randint() functions of random module to generate random numbers, composition.

Defining functions, invoking functions, passing parameters, scope of variables, void functions and functions returning values, flow of execution.

UNIT III   **14 hours**

Strings: Creating, initializing and accessing the elements; String operators: +, *, in, not in, range slice [n:m]; Comparing strings using relational operators; String functions & methods: len, capitalize, find, isalnum, isalpha, isdigit, lower, islower, isupper, upper, lstrip, rstrip, isspace, istitile, partition, replace, join, split, count, decode, encode, swapcase, Pattern Matching.

Lists: Concept of mutable lists, creating, initializing and accessing the elements, traversing, appending, updating and deleting elements; List operations (joining, list slices); List functions & methods: len, insert, append, extend, sort, remove, reverse, pop

Dictionaries: Concept of key-value pair, creating, initializing and accessing the elements in a dictionary, traversing, appending, updating and deleting

elements. Dictionary functions & Methods: cmp, len, clear(), get(), has_key(), items(), keys(), update(), values().

UNIT IV   **16 hours**

Tuples: Immutable concept, creating, initializing and accessing the elements in a tuple; Tuple functions:cmp(), len(), max(), min(), tuple()

Input and Output: Output Formatting, Reading and Writing Files

Errors and Exceptions: Syntax Errors, Exceptions, Handling Exceptions, Raising Exceptions, User-defined Exceptions, Defining Clean-up Actions, Predefined Clean-up Actions.

Transactional modes

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- Guttag, J. V. (2013). *Introduction to computation and programming using Python.* Mit Press.
- Guttag, J. V. (2016). *Introduction to computation and programming using Python: With application to understanding data.* MIT Press.
- Langtangen, H. P., Langtangen, H. P. (2011). *A primer on scientific programming with Python* (Vol. 1). Berlin/Heidelberg: Springer.

Web Sources

- https://www.toppr.com/guides/computer-science/programming-withpython/tuples/immutabletuples/#:~:text=These%20tuples%20are%20an%20ordered,can%20call%20them%20immutable%20tuples.
- https://www.w3schools.com/python/gloss_python_join_lists.asp
- https://www.w3schools.com/python/
- https://www.geeksforgeeks.org/python-programming-language/

Course Title: Affiliate Marketing	**L**	**T**	**P**	**Credits**
Course Code: BCD603	**2**	**0**	**2**	**3**

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:
1. Understand the fundamentals of affiliate marketing.
2. Identify the key stakeholders involved in affiliate marketing.
3. Evaluate and select affiliate programs based on commission rate, products relevance, and affiliate support.
4. Create and set up a professional and user-friendly affiliate website.

Course Content

UNIT I   8 Hours

Introductions to Affiliate Marketing: Overview of Affiliate Marketing, Basics of Affiliate Marketing.

Role in Internet Marketing, Preparing to Begin Affiliate Marketing

UNIT II   7 Hours

Affiliate Marketing and the Major Players

Types of Affiliate Sites That Work Best for Monetization, Integrating Affiliate Marketing into Your Marketing Mix,

Adding Paid Sponsoring Placement, AdSense and Links, Determining Costs and Creating a Business Plan, Tracking Tools, Obtaining and Placing Tracking Code

UNIT III   8 Hours

Video, Blogs, Email and Social Media to Broadcast, Methods for Delivering a Variety of Content

Understanding Search: SEO/SEM and Their Role in Affiliate Marketing,

UNIT IV   7 Hours

Creating Content for Your Affiliate Marketing Site.

An Introduction to Drop Shipping, Payment Gateway and Order Processing Understanding Drop shipping.

Setting up and account with Payment gateway, KYC for Payment Gateways and other required documents.

Transaction Mode

Flipped teaching**,** Demonstration, Visualization, Group discussion, Active participation, Mentee Meter

Suggested Readings

- *Flynn, P. (2016). Affiliate Marketing: How to Make Money Online and Build Your Own $100,000+ Affiliate Marketing Online Business. Createspace Independent Publishing Platform.*
- *Gardiner, S. (2020). Affiliate Marketing: The Beginner's Step by Step*

Guide to Making Money Online With Affiliate Marketing. Independently published.

- *Nisson, A. (2019). Affiliate Marketing: The Complete Guide Step by Step to How to Create Your First Passive Income Stream With Marketing, Social Media, Blogging and SEO. Independently published.*

List of Practical

- Affiliate Marketing Overview: Write a report on the basics of affiliate marketing and its role in internet marketing.
- Identifying Major Players in Affiliate Marketing: Research and create a presentation on the major players in the affiliate marketing industry.
- Types of Affiliate Sites: Analyze different types of affiliate websites and discuss their effectiveness in monetization.
- Integrating Affiliate Marketing into Your Marketing Mix: For a hypothetical company, develop a plan to integrate affiliate marketing into the existing marketing strategy.
- Implementing Tracking Tools: Setup and demonstrate how to use various tracking tools for affiliate marketing. Document each step in the process.
- Using Video, Blogs, Email and Social Media: Plan and implement a content strategy for affiliate marketing using various platforms such as video, blogs, email, and social media.
- Understanding SEO/SEM in Affiliate Marketing: Create a guide explaining the role of SEO and SEM in affiliate marketing and how they contribute to its success.
- Creating Content for Affiliate Marketing Site: Design and develop mock content for an affiliate marketing website, considering SEO best practices.
- Exploring Drop Shipping: Research and create a presentation on the concept of drop shipping and how it can be used in an affiliate marketing context.
- Setting Up Payment Gateway: Set up a mock account with a payment gateway and document the steps involved.
- Understanding KYC for Payment Gateways: Research and create a presentation on the Know Your Customer (KYC) process for payment gateways.
- Adding Paid Sponsoring Placement: Demonstrate how to add paid sponsoring placements in an affiliate site. Write a report detailing each step.
- Developing a Business Plan for Affiliate Marketing: Create a business plan for a hypothetical affiliate marketing business, detailing costs and potential revenue streams.
- Methods for Delivering a Variety of Content: Develop a strategy for delivering a variety of content (text, video, images, etc.) on an affiliate

marketing site.

- Obtaining and Placing Tracking Code: Demonstrate how to obtain and place tracking code on an affiliate site. Document each step in the process.

Course Title: Programming using Python Lab	L	T	P	Credits
Course Code: BCD604	0	0	4	2

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Learn the concept of debugging the Python Programs.
2. Implement Conditionals and Loops for Python Programs.
3. Use functions and represent Compound data using Lists.
4. Implement the basic conditional and looping constructs.

Course Content

Program 1: hello world

Program 2: add numbers and concatenate strings

Program 3: input from user

Program 4: loops

Program 5: if-else - conditional checking

Program 6: functions

Program 7: math library

Program 8: strings

Program 9: exceptional handling

Program 10: random numbers/string

Program 11: demo of data structure - list

Program 12: demo of data structure - dictionary

Program 13: demo of data structure – tuple

Program 14: command line argument

	L	T	P	Credits
	0	0	4	2

Course Title: Major Project

Course Code: BCD605

Total Hours: 60

Learning Outcomes

After completion of this course, the learner will be able to:

1. Update oneself with all the latest changes in the technological world.
2. Become master in one's specialized technology.
3. Communicate efficiently.
4. Analyze and understand the environment of the organization.
5. Develop to cognizance of the importance of management principles

Course Content

1.   Starting of Major Project (Feasibility Study, Requirement Analysis, Design)

2.   **Note: The marks distribution for the practical will be as under**

a.   Viva Voce 10 marks

b.   System development 30

Course Title: Service Learning	L	T	P	Credits
Course Code: BCD605	0	0	4	2

Total Hours: 60

Course Content

This course aims to engage students in meaningful service-learning activities that foster community linking. Students will actively participate in community-based projects, collaborate with community members and organizations, and reflect on the impact of their service activities. Through this experiential learning approach, students will develop a deep Analyzing of community needs, build relationships with diverse stakeholders, and contribute to community development.

In this course, students are expected to have a presence in the community throughout the semester and reflect on their experiences regularly. In these reflections, they use course content as a basis for their analysis and Analyzing of the key theoretical, methodological and applied issues at hand.

Transaction Mode

Problem solving learning, blended learning, Cooperative learning, Inquiry based learning, Visualization, Group discussion, experiential learning, Active participation

Suggest Reading

- *"Service-Learning in Higher Education: Concepts and Practices" by Barbara Jacoby.*
- *"Learning Through Serving: A Student Guidebook for Service-Learning and Civic Engagement Across Academic Disciplines and Cultural Communities" by Christine M. Cress, Peter J. Collier, and Vicki L. Reitenauer.*
- *"Reflection: Turning Experience into Learning" by David Boud, Rosemary Keogh, and David Walker.*
"The Community Engagement Professional in Higher Education: A Competency Model for an Emerging Field" by Lina D. Dostilio.

Course Title: Introduction to Cloud Computing
Course Code: BCD607

L	T	P	Credits
3	0	0	3

Total Hours: 45

Learning Outcomes

After completion of this course, the learner will be able to:
1. Gain insight about basic technology behind the Cloud.
2. Comprehend the Cloud computing applications.
3. Learn the models and services of cloud technology.
4. Accessing the cloud and system testing.

Course Content

UNIT I   **12 hours**

Introduction to Cloud Computing, History and Evolution of Cloud Computing, Types of clouds, Private Public and hybrid clouds, Cloud Computing architecture, Cloud computing infrastructure, Merits of Cloud computing.

UNIT II   **10 hours**

Cloud computing delivery models and services (IaaS, PaaS, SaaS), obstacles for cloud technology, Cloud vulnerabilities, Cloud challenges, Practical applications of cloud computing.

UNIT III   **10 hours**

Web-based business services, Delivering Business Processes from the Cloud: Business process examples, Broad Approaches to Migrating into the Cloud, The Seven-Step Model of Migration into a Cloud, Efficient Steps for migrating to cloud,

UNIT IV   **13 hours**

Assessing the Cloud: software Evaluation, System Testing, Seasonal or peak loading, Cost cutting and cost-benefit analysis, selecting the right scalable application, Considerations for selecting cloud solution.

Transactional modes

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Aggarwal, R. S. (2000). A Modern Approach to Verbal & Non Verbal Reasoning. S. Chand.*
- *Carter, P. (2007). IQ and aptitude tests. Kogan Page Publishers.*
  Web Sources
- *https://www.tutorialspoint.com/cloud_computing/cloud_computing_introduction.htm*
- *https://www.youtube.com/watch?v=Q9zvgcOrTtw*
- *https://www.forbes.com/sites/forbestechcouncil/2020/06/05/what-is-cloud-computing-a-beginners-guide/?sh=40daa0ed77d7*

- *https://www.ibm.com/cloud/learn/cloud-computing-basics*
- *https://azure.microsoft.com/en-us/overview/what-is-cloud-computing/*

				L	T	P	Credits

Course Title: Analysis & Design of Algorithms

Course Code: BCD608

L	T	P	Credits
3	0	0	3

Total Hours: 45

Learning Outcomes

After completion of this course, the learner will be able to:

1. Analyze the performance of algorithms and choose appropriate algorithm design techniques for solving problems.
2. Compare between different data structures. Pick an appropriate data structure for a design situation.
3. Clear up troubles the usage of set of rules design methods including the grasping approach, divide and Conquer, dynamic programming, backtracking and department and certain.
4. Recognize the variations among tractable and intractable problems.

Course Content

UNIT I 12 hours

Introduction To Analysis of Algorithm: Algorithm, analysis, Characteristics of an Algorithm, time complexity and space complexity, Well Known Asymptotic Functions & Notations, Big O-notation, Omega notation and theta notation, Sets and disjoint set, union and find algorithms, Heaps. Sorting in linear time.

UNIT II 10 hours

Divide and Conquer: General Strategy, Exponentiation, Strassen's matrix multiplication. Convex hull, closest pair finding. Divide and conquer binary search, heap sort, and quick sort and merge sort, finding the median.

Greedy Method: General Strategy, Formalization of Greedy Technique, Knapsack problem, Job sequencing with Deadlines, Optimal merge patterns, Minimal Spanning Trees Prim's and Kruskal Algorithm and Dijkstra's algorithm.

UNIT III 10 hours

Dynamic Programming: General Strategy, The Principle of Optimality, Multistage graphs, OBST, 0/1 Knapsack, Traveling Salesperson Problem, Make change Problem. Flow Shop Scheduling, Chained Matrix Multiplication.

UNIT IV 13 hours

Backtracking And Branch And Bound: Backtracking: General Strategy, 8 Queens problem, Graph Coloring, Hamiltonian Cycles, 0/1 Knapsack, sum of subset.

Branch and Bound: General Strategy, 0/1 Knapsack, Traveling Salesperson Problem , resource allocation problem.

Transactional modes

Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings

- *Horowitz/Sahni.Fundamentals of Computer Algorithms, Galgotia Publication. 2006.*
- *Sanjay Dasgupta, Chirostos Papadimitriou, Umesh Vazirani. Algorithms, Tata Mcgraw Hill, 2006.*
- *Bressard. Fundamentals of Algorithms, PHI.*
- *Thomas H Cormen and Charles E Leiserson, Introduction to Algorithms, PHI.*
- *Aho and J.D. Ullman, Design and Analysis of Algorithms, Addison Wesley.*

Web Sources

- *https://vssut.ac.in/lecture_notes/lecture1428551222.pdf*
- *https://mrcet.com/downloads/digital_notes/IT/Design%20and%20 Analysis%20Algorithms.pdf*