Faculty of Information Technology

Second Semester, 2022-2023
Course Handouts

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The ICFAI University, Raipur

Faculty of Information Technology

Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
MCA121	Data Structure and Algorithm	3	2	4

Instructor-in-charge: Mr. ASHISH KUMBHARE

Learning Outcomes:

This course introduces the core principles and techniques for Data structures. Students will gain experience in how to keep a data in an ordered fashion in the computer. Students can improve their programming skills using Data Structures Concepts. After successful completion of the course student will be able to

1. Explore basic data structures such as stacks and queues.
2. Introduce a variety of data structures such as Linked list, Trees, search trees, Graphs
3. Introduce sorting and searching algorithms.

Textbook(s) T1	Fundamentals of Data Structures by Ellis Horowitz & Sartaj Sahni, Computer Science press.
Reference Book(s) R1	Data Structures using C by A. K. Sharma, Pearson Education
R2	Data structures and Algorithm Analysis in C, 2nd edition, M.A.Weiss, Pearson.
R3	Data structures and Program Design in C, 2nd edition, R.Kruse, C.L.Tondo and B.Leung,Pearson
NPTEL Link	https://nptel.ac.in/courses/106/102/106102064/
SWAYAM Link	https://onlinecourses.swayam2.ac.in/cec19_cs04/preview

Lecture-wise-plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference(Ch./Sec./Page Nos.ofTextBook)
1-3	To learn Introduction of Data structure and its types	Introduction of Data structure, Data types: primitive, non-primitive data types, Linear and nonlinear data structure.	T1 CH-1 1.1, 1.3, 1.4
4-6	To learn application of array and various searching techniques	Array concept (one dimension, two dimension), Linear and Binary Search Algorithms,	T1 CH-2 2.4
6-7	To learn various sorting techniques	Sorting Algorithms: Bubble Sort, Insertion Sort, Selection Sort	T1 CH-7 7.1, 7.2
8-10	To learn various sorting techniques using Divide and Conquer strategy.	Quick Sort, Merge Sort & Radix sort	T1 CH-7 7.3, 7.4, 7.5

11	To learn introduction to linear data structure stack.	Stack concept	T1 CH-3 3.1
12-13	To learn various stack operations.	Operations PUSH, POP, TRAVERSE, Isfull, Isempty.	T1 CH-3 3.1, 3.2
14-17	To learn Applications of stack	Infix, Prefix, Postfix representation, Conversion using stack	T1 CH-3 3.3
18-19	To learn introduction to linear data structure Queue and its types.	Introduction, and Types of Queues, Priority Queue, Circular queue, Double Ended Queue,	T1 CH-3 3.1
20	To learn various Queue operations.	Operations (INSERT, DELETE, TRAVERSE)	T1 CH-3 3.1, 3.2
21-22	To learn introduction to linear data structure Linked list and its types.	Linked List, Singly and Doubly Linear link lists, Singly and doubly circular linked list	T1 CH-4 4.1
23-24	To learn various linked List operations	Operations on linked lists insert, delete, Applications of linked lists.	T1 CH-4 4.8,4.9
25-26	To learn introduction to Nonlinear data structure Tree and its types.	Definition of trees and their types, Binary trees, Properties of Binary trees,.	T1 CH-5 5.1, 5.2
27-30	To learn various operations and traversal technique.	Insertion, deletion, Searching and traversal algorithm, Preorder, post order, in-order traversal) , BFS, DFS	T1 CH-5 5.3, 5.4, 5.5
31-32	To learn various applications of tree	Binary Search Trees, Implementations, AVL Trees, B tree,	T1 CH-5 5.6, 5.7
33	To learn introduction to Nonlinear data structure Graph and its types.	Definition of Graph and their types	T1 CH-6 6.1
34-35	To learn various applications of Graph	Adjacency and incident (matrix & linked list) representation of graphs, Weighted Graphs,	T1 CH-6 6.2
36-38	To learn various operations and traversal technique.	Shortest path Algorithm, Spanning tree, Minimum Spanning tree,	T1 CH-6 6.3, 6.4
39-42	To learn various operations and traversal technique.	Kreskas and prims algorithms.	T1 CH-6 6.3, 6.4

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec. No.)	Remarks
Test 1	60 Minutes	16	31.01.2023	1-12	CB
Test 2	60 Minutes	17	01.03.2023	13-24	CB
Test 3	60 Minutes	17	03.04.2023	25-42	OB
LAB	Through out	10	**	**	CB
Comprehensive Exam	3 Hours	40	03.05.2023	1-42	CB

** To be announced in the class

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must..

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Mr. ASHISH KUMBHARE
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information technology

Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
MCA122	**Computer Network**	**3**	**0**	**3**

Instructor-in-charge: Mr.NAVEEN KUMAR VAISHNAV

Learning Outcomes:

After successful completion of the course student will be able to:

Data communication and networking are changing the way we live and do the things today. They rely on computer networks and internetworks. This course focuses on networking fundamentals, standards and various underlying protocols to make the network connected for text, audio, video and a conglomerate of them. The security aspect of network is also emphasized. As a result, the technology advances make it possible to communicate faster and offer more services thru IEEE standards and TCI/IP and other protocols.

Textbook(s) T1	Data Communication and Computer Networking, B. A. Forouzan , TMH , 2006
Reference book(s) R1	Computer Networks, A. S. Tanen baum, Pearson Education / Prentice Hall of India,4th Edition, 2004.
R2	Data Communications, Computer Networks and Open Systems, Halsall Fred, Addition-Wesley, 4th Edition, 2004.
R3	An Engineering Approach to Computer Networks, S. Kesha, Pearson Education, (2004)

Lecture-wise plan:

Lecture No.	Learning Objective	Topics to be covered	(Ch./Sec./Text Book)
1-3	To Understand network concept	OSI MODEL, TCP/IP and other networks models, Arpanet	T1: 1.1,T1: 3.1,3.2,3.3: T:2.3
4-6	To understand the network topologies	Network Topologies, Internet WAN, LAN, MAN	T1:1.2.1.3 T1: 7.1,7.2,7.3
7-10	To understand the concept of ISDN and physical layer	Physical Layer: Transmission media copper, Twisted pair wireless, Switching, asynchronous communications;	T1:1.2.1.3,1.4 T1: 7.1,7.2,7.3
11-13	To know the concept of ATM & detection methods	error detection and correction CRC,	T1: 10.1,10.2,10.3
14-15	To understand the different flow control techniques	Elementary Protocol-stop and wait, sliding window	T1: 10.4,10.5
16-17	To know the concept protocols	Ethernet, Data link layer	T1:11.1.11.2

18-19	To understand MAPs	Multiple Access Protocols, Link Layer Addressing – ARP	T1:12.1,12.2,12.3
20-21	To know the concept network components	Hubs, Bridges, Switches	T1:12.1,12.2,12.3
22-24	Different types of multiple access control protocols	Medium Access sub layer: ALOHA MAC addresses, Carrier sense multiple accesses.	T1:12.1,12.2,12.3
25-28	To understand IEEE 802.x concepts	IEEE 802.X Standard Ethernet wireless LANS Bridges	T1:15.1,15.2
29	To know the network service models	Forwarding and Routing, Network Service Models	T1: 18.5
30	To know IP concepts	Virtual Circuit, Mobile IP Protocol	T1:18.1,18.2,18.3,18.4
31-33	To understand the different IPv4, IPv6	IP Datagram Networks, Router – Internet, IPv4 and IPv6 Link State Routing, Distance Vector Routing	T1:18.1,18.2,18.3,18.4
34-35	To understand the network layers	Transport Layer Services, Multiplexing and Demultiplexing, UDP	T1:18.1,18.2,18.3,18.4
36-37	To understand data transfer techniques	Reliable Data Transfer – Go Back-N Selective Repeat. Connection-Oriented Transport:	T1: 17.1,17.2,17.3
38-40	To understand Network Security	Cryptography, Public and Private Key, Algorithms	T1: 24.1,24.2,24.3

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Component	Duration	Weightage	Date	Syllabus (Lecture No)	Remarks
Test 1	60 Minutes	16	31.01.2023	1-18	CB
Test 2	60 Minutes	17	01.03.2023	19- 28	CB
Test 3	60 Minutes	17	03.04.2023	29-40	OB
Quiz	1 Hours	10	**	**	CB
Comprehensive Exam	3 Hours	40	03.05.2023	1- 40	CB

** To be announced in the class OB* = Open Book CB= Closed Book

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Mr. NAVEEN KUMAR VAISHNAV
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology
Second Semester, 2022–2023

Course Handout

Course No	Course Title	L	P	U
MCA123	Web Technology	3	2	4

Instructor in charge: Mr. NAVEEN KUMAR VAISHNAV

Scope & Objective of the Course:

After successful completion of the course student will be able to:

1. Understand the basics involved in publishing content on the World Wide Web. This includes the 'language of the Web – HTML, the fundamentals of how the Internet and the Web function, a basic understanding of graphic production with a specific stress on creating graphics for the Web.
2. Understand a general grounding introduction to more advanced topics such as programming and scripting.
3. Expose to the basic tools and applications used in Web publishing.

Textbook T1	Deitel, Deitel, Goldberg, "Internet & World Wide Web How to Program", Third Edition, Pearson Education, 2006.
Reference books R1	Achyut Godbole, Atul Kahate "Web Technologies: TCP/IP, Web/Java Programming, and Cloud Computing", Third Edition, McGraw Hill Education.
R2	Raj Kamal, "Internet and Web Technologies", Tata McGraw-Hill. 4.
NPTEL	https://nptel.ac.in/courses/106/105/106105084/
SWAYAM	https://onlinecourses.swayam2.ac.in/nou20_cs05/preview

Lecture	Learning Objective	Topics to be covered	Reference (chapters)
1-4	Internet Concept:	Fundamental of Web, History of Web, Web development overview, Domain Name System (DNS)	T1: 1.5-1.6
5-8	Functionality of Internet	DHCP and SMTP and other servers ,Internet service provider (ISP), Concept of IP Address,	T1: 1.8, 2.1
9-12	Protocols and Components of internet	Internet Protocol, TCP/IP Architecture, Web Browser and Web Server.	T1: 2.1, 2.7
13-18	HTML and DHTML:-	HTML Tag, Rules of HTML, Text Formatting and Style, List, Adding Graphics to Html Document,	T1: 4.1- 4.9
19-23	Tables	Tables and Layout , Linking Documents, Forms, Project in HTML	T1: 4.10 - 4.11
24-28	DHTML & CSS	Introduction to DHTML, CSS, Class and DIV, External Style Sheet.	T1: 5.1 - 5.8

29-33	Java Script	JavaScript(JS) in Web Page, Advantage of Java Script ,JS object model and hierarchy ,Handling event ,Operators and syntax of JS	T1: 6.1 – 6.5
34-36	Java Script Functions	JS Function, Client side JS Vs. Server side JS, JS security,	T1: 9.1 – 9.11
37-38	XML	Introduction to XML	T1: 14.1
39-40	XML in Action	XML Namespace, DTD	T1: 14.4

Practical list:

S.No	Name of the Experiments
1	HTML page to print Hello World.
2	Web page illustrating text formatting tags available in HTML. (i.e. <h1>, <b>, <u>, <i> etc).
3	Web page to illustrate types of lists in HTML.
4	HTML page which displays 3 images at LEFT, RIGHT and CENTER respectively.
5	HTML Code for Table
6	CSS Colors for background colors, font colors
7	Student registration form using <form> tag
8	Web page using CSS Inline style.
9	Web page using CSS Internal style.
10	Web page using CSS External style.
11	Design Resume Using HTML Code.
12	Java Script Program to check maximum number out of three numbers.
13	Java Script Program to print 1 to 100 using while loop.
14	Java Script Program to calculate percentage and Division of student.
15	Create CD Catalogue Table in XML and display it using XSL Style Sheet.

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Component	Duration	Weightage	Date	Syllabus (Lecture No)	Remarks
Test 1	60 Minutes	16	01.02.2023	1-18	CB
Test 2	60 Minutes	17	02.03.2023	19- 28	CB
Test 3	60 Minutes	17	04.04.2023	29-40	OB
Lab	2 Hours	10	**	**	CB
Comprehensive Exam	3 Hours	40	06.05.2023	1- 40	CB

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Mr. NAVEEN KUMAR VAISHNAV

Date: 15-01-2023 **Instructor-in-charge**

The ICFAI University, Raipur

Faculty of Information Technology
Second Semester, 2022–2023

Course Handout

Course No	Course Title	L	P	U
MCA124	Software Engineering	3	0	3

Instructor in charge: Ms.SHRUTI BHENDALE

Scope & Objective of the Course:

- Students will learn to apply fundamental software engineering concepts, design, analysis and testing methodologies while incorporating the software engineering quality metrics to produce high quality correct software in a scheduled amount of time.
- Students will learn object-oriented methodologies for proving programs are correct and methods of testing programs to demonstrate correctness.
- Students will learn to use the Unified Modeling Language (UML) programming to achieve course goals.

Text Book(s)T1	Software Engineering: A Practitioner's approach, Pressman R.S, MGHISE, 6th Edition, 2005.
Reference book(s)R1	Object Oriented Technology , Tsang, THM, 2006.
R2	Larmen C, Aplying UML and Patterns: An Introduction to Object Oriented analysis and Design and the Unified process, Pearson Education 2nd Edition, 2004.
R3	Pankaj Jalote, An Integrated approach to Software Engineering, Narosa Publishing House, 3rd Edition, 2004.

Lecture Nos.	Learning Objective	Topics to be covered	Reference
1-2	Key concepts, software characteristics	Introduction, Software Product	Chapter 1 (T1)
3-4	Generic framework activities, agility	Software Process, Activities	Chapter 2 (T1)
5-7	Life Cycle of Software	SDLC	Chapter 3 (T1)
8-9	Various Models	Waterfall, Iterative Waterfall	Chapter 4 (T1)
10-12	Various Models and comparison	RAD, Prototype, Spiral	Chapter 5 (T1)
13-15	Requirement Elicitation, analysis and Specification	Requirements Engineering	Chapter 7 (T1)
16-18	Diagrammatic forms, provides viewof one or more model elements	Analysis Modeling, Data Modeling, SRS	Chapter 8 (T1& R1)
19-21	Design is the place where software quality is established	Design Engineering	Chapter 9 (T1& R1)
22-25	The preliminary blue print from which software is constructed	Architectural Engineering	Chapter 10(T1 & R1)
26-28	Design guide lines for avoiding errors as procedural design evolves	Component level Design	Chapter 11(T1 & R1)

29-31	User scenarios will be created and screen layouts will be developed	User Interface Design	Chapter 12(T1 & R1)
32-34	Different strategies for testing software.	Testing Strategies	Chapter 13 (T1)
35-37	Software Maintenance	Characteristics of Software management, types of maintenance,Reverse Engineering	Chapter 14(T1)
38-40	Quality Assurance	Quality Assurance & Control	Chapter 15(T1)

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Component	Duration	Weightage	Date	Syllabus (Lecture No)	Remarks
Test 1	60 Minutes	16	01.02.2023	1-9	CB
Test 2	60 Minutes	17	02.03.2023	10- 25	CB
Test 3	60 Minutes	17	04.04.2023	26-40	OB*
Quizzes/Assignment	30 Minutes	10	**	**	CB
Comprehensive Exam	3 Hours	40	06.05.2023	1- 40	CB

** To be announced in the class OB* = Open Book CB= Closed Book

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General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc

Ms.SHRUTI BHENDALE
Instructor-in-charge

Date:15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology
Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
MCA125	**Artificial Intelligence**	3	0	3

Instructor-in-charge: Dr.RAMESH KUMAR YADAV

Learning Outcomes:

1. Introduce the basic principles of AI towards problem solving, inference, perception, knowledge representationand learning.
2. Investigate applications of AI techniques in intelligent agents, expert systems, artificial neural Networks andother machine learning models.
3. Experiment with a machine learning model for simulation and analysis.
4. Explore the current scope, potential, limitations, and implications of intelligent systems.
5. To have a basic proficiency in a traditional AI language including an ability to write simple to intermediateprograms and an ability to understand code written in that language.

Textbook (s) T1	Artificial Intelligence by Elaine Rich and Kevin Knight, Tata MeGraw Hill.
Reference book (s) R1	Principles of Artificial Intelligence by Nils J.Nilsson, Narosa Publishing house.

Lecture Nos.	Learning objectives	Topics to be covered	Reference (Ch./Sec./ Page Nos. of Text Book)
1-3	Overview & Search Techniques:	Introduction to AI, Problem Solving, State space search,	15-32
4-5	Overview & Search Techniques:	Blind search: Depth first search, Breadth first search,	48-60
6	Overview & Search Techniques:	Informed search: Heuristic function, Hill climbing search.	71-77
7-9	Overview & Search Techniques:	Best first search, A* & AO* Search.	81-87
10	Overview & Search Techniques:	Constraint satisfaction, Game tree	88- 95
11-12	Overview & Search Techniques:	Evaluation function, Mini-Max search, Alpha-beta pruning, Games of chance.	135-148
13-15	How to do Knowledge Representation	Introduction to KR, Knowledge agent, Predicate logic	155-159
16-17	How to do Knowledge Representation	WFF, Inference rule & theorem proving forward chaining, backward chaining, resolution	160-190

18	How to do Knowledge Representation	Propositional knowledge, Boolean circuit agents.	200-221
19-20	How to do Knowledge Representation	Rule Based Systems, Forward reasoning	230-241
21-22	How to do Knowledge Representation	Conflict resolution, backward reasoning: Use of Back tracking, Structured KR	317-329
23-24	How to do Knowledge Representation	Semantic Net - slots, inheritance, Frames- exceptions and defaults attached predicates	330-354
25-26	How to do Knowledge Representation	Conceptual Dependency formalism and other knowledge representations.	360-371
27	How to Handling uncertainty & Learning:	Source of uncertainty, Probabilistic inference	373-375
28-29	How to Handling uncertainty & Learning:	Bayes' theorem, Limitation of naïve Bayesian system, Bayesian Belief Network (BBN)	380-386
30	How to Handling uncertainty & Learning	Inference with BBN, Dumpster-Shafer Theory	389-405
31-32	How to Handling uncertainty & Learning	Fuzzy Logic, Fuzzy function, Fuzzy measure, Non monotonic reasoning:	410-419
33-34	How to Handling uncertainty & Learning	Dependency directed backtracking, Truth maintenance systems.	420-434
35-36	How to Handling uncertainty & Learning	Learning: Concept of learning, Learning model, learning decision tree, Paradigms of machine learning,	435-447
37-40	How to Handling uncertainty & Learning	Supervised & Unsupervised learning, Example of learning, Learning by induction, Learning using Neural Networks.	448-460

Evaluation Scheme:
Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	17	31.01.2023	1-12	CB
Test 2	60 Minutes	17	01.03.2023	13- 28	CB
Test 3	60 Minutes	16	03.04.2023	29- 40	OB
Quizzes (2)	20 Minutes each	10	**	**	CB
Comprehensive Exam	3 Hours	40	08.05.2023	1- 40	CB

** To be announced in the class

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Dr. RAMESH KUMAR YADAV
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology
Second Semester, 2022 – 2023
Course Handout

Course No	Course Title	L	P	U
EGL121	**English Language Skils**	3	2	3

Instructor-in-charge: Dr.SHUBHRA TIWARI

Scope & Objective of the course
This Course aims at familiar sing learner with English Language Sound System, to make their circulation nationally and internationally intelligible. It enhances comprehensive knowledge of vocabulary n term of articulation and meaning. It trains the learner in all four skills of language namely listening, speaking riding and writing. The content of the course and exercise aim at making the learner gain language proficiency and improves communication skills**.**

Textbook(s) T1	English Language skills-II, Dr.K.ARUNA ICFAI University Press 2008
Work Book W1	Words are hour Friends-Ii.Dr.K.ARUNA ICFAI University Press 2008
Reference Book(s)	Oxord Advanced Learner's Dictionary Reading Skills' Cambridge university Press
R2	Grellet, Francoise 1981 "Developing Reading Skills' Cambridge University
R3	Littlewoods., W,1992 "Teaching Oral Communication' A Methodological Framework, Oxford Blackwell

Lecture-wise-plan

Lecture Nos	Learning Objective	Topics to be covered	Reference
1	• To know accent of the word, • To know how accent of the word changes meaning • To know how accent changes function of the word	**Word-Accent**	**Ch1pg1**
2	• To Know the techniques of connected speech, • To aware of the	**Sentence accent**	**Ch:2 19 pg12**
3-4	• T Know various techniques to improve one's own pronunciation • To overcome specific speech problems because of mother lounge influence. • To acquire intelligible articulation	**Effective Speech**	**Ch3-35**
5-6	• To improve Vocabulary	**Vocabulary Annexure-A**	**Words are your Friends**

7,8,9	• To develop the organization of one's own arguments • To acquire clarity of expression • To develop argument and logical reasoning	**Debate**	**Ch:4**
10-11	• To improve Vocabulary	**Vocabulary Annexure-A**	**Words are your Friends lessons 4,5,6 P 231-237**
12-14	• To aware the difference of various Speech activities such as: Conversation, Debate and Group Discussion. • To acquire the effective speaking skill to participate in GD • To know the skill of group participation • To overcome barriers to GD	**Group Discussion**	**Ch:5-65 P-49**
15-17	• To know the skill of writing paragraph. • To know the skill of developing Sentences and paragraphs • To know how to write various types of paragraphs	**Writing Paragraph**	**Ch:6-82 Pg66**
18-19	• To acquire the skill of developing Vocabulary	**Vocabulary**	**Words are your friends EXaercises:7,8,9 Review-3,Pg:238-240**
20-21	• To acquire the skill of paraphrasing • To leach the skill of note-making	**Paraphrase writing and note-making**	**Ch:7 PP88-92 Ch:8 Pg 93-102**
22-24	• To know principles of writing précis • To learn to use steps for writing précis • To acquire the skill of abridging sentences • To know the techniques of summarization	**Précis writing, Summary Writing**	**Ch:9 Pg 105-117, Ch:10 Pg:117-121**
25-26	• To acquire proficiency in using suitable words in the context	**Vocabulary**	**Words are your Friends Exercises: 10,11,12 Review-4 Annexure C and D Pg.241-256**
27-28	• To know features of Sales Letter • To know the structure of sales Letter • To know how to write Sales Letter	**Sales Letter**	**Ch:14 Pg.143-150**
29	• To know how to write Circular Letters	**Circulator**	**Ch:15 Pg 151-155**

30-31	• To develop the skill of using suitable words in the context	**Vocabulary**	**Words are your friends Excercises:13,14,15**
32-33	• To understand the confusions of spellings in English • To acquire the skill of writing correct spellings	**Learning Spellings**	**Ch:16-172,Pg:156**
34-36	• To understand end-punctuation marks • To understand internal punctuation • To understand word punctuation • To know how to use correct punctuation marks	**Punctuation**	**Ch:17-202, pG173**
37-39	• To know reasons for Common Errors • To overcome Common Errors • To develop the skill of using suitable words in the context	**Common Errors, Vocabulary**	**Ch:18, Pg 203-226,Words are your Friends Exercises: 16,17,18,6 Review**
40	• To be able to identify Confusions in words. •	**Annexure : D and E**	**Annexure Pg 243-257**

Classroom Practical:

S.No	Name of the Practical
1	**Debate, Group Discussion & Presentation**
2	**Preparation and presentation on subject based and current topic**
3	**Writing practice for formal communication**

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	16	31.01.2023	1-12	CB
Test 2	60 Minutes	17	01.03.2023	13- 28	CB
Test 3	60 Minutes	17	03.04.2023	29- 40	OB
Lab	Throughout the Semester	10	**	**	CB
Comprehensive Exam	3 Hours	40	01.05.2023	1- 40	CB

** To be announced in the class

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Dr.SHUBHRA TIWARI
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Science and Technology

Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
MGT122	**Fundamentals of Finance and Accounting**	**3**	**0**	**3**

Instructor-in-charge: Mr .JITENDRA KUMAR SINGH

Learning Outcomes:

After successful completion of the course student will be able to

1. Explain the accounting information system and demonstrate how it is used to record and report common business transactions.
2. Describe the conceptual framework for financial reporting.
3. Know and apply Accounting and Finance theory
4. Explain and apply international accounting standards
5. Critically evaluate financial statement information
6. Evaluate and compare different investments.

Text books T1 T2	Financial Accounting, S.M.Shukla, Shahitya Bhawan Publication Financial Management, S.P Gupta, Shahitya Bhawan Publicatio
Reference books R1	Financial Accounting, Mukherjee & Hanif, McGraw-Hill Education (India) Pvt Limited, 2003
R2	Financial Accounting, Grewal, Shukla, S. Chand (Sultan Chand Publications), Delhi
Swayam Link	https://onlinecourses.swayam2.ac.in/

Lecture-wise Plan

Lecture Nos	Learning Objective	Topics to be covered	Reference
1	Accounting Principles	International Accounting Standards (only outlines); Accounting principles; Accounting Standards in India	T1:1.1
2-5	Accounting transactions	Accounting Cycle; Journal; Rules of debit and credit; Compound journal entry.	T1:1.2-1.5
6-8	Accounting transactions	Opening entry; Relationships between Journal and Ledger;	T1:1.6-1.7
9-10	Accounting transactions	Rules regarding posting; Trial balance; Subdivisions of a journa	T1:1.9; 2.3-2.4
11-13	Capital and Revenue	Classification of income; Classification of	

		expenditure; Classification of receipt.	T1:2.1,2.5-2.9
13-15	Capital and Revenue	Accounting concepts of income; Accounting concepts and income measurement, Expired costs and income measurement	T1:3.1-3.3, 3.5-3.8
16-23	Final Accounts;	Manufacturing account; Trading account; Profit and loss account; Balance Sheet	T1:4.1-4.6
24-29	Final Accounts;	Adjustment entries, Rectification of errors, Classification of errors; Location of errors; Suspense accounts; Effects on profit.	T1:4.7 -4.11
30 -32	Depreciation Provisions and Reserves**:**	Concept of depreciation; Causes of depreciation; Depreciation, depletion, amortization.	T1:5.1-5.4
33-35	Depreciation accounting	Methods of recording depreciation; Methods for providing depreciation; Depreciation of different assets; Depreciation of replacement cost;	T1:5.5-5.8
36- 37	Depreciation accounting	Depreciation accounting as per accounting standard; Depreciation accounting; Provisions and reserves	T1:6.1-6.5
38	SPECIAL ACCOUNTING AREAS: Hire Purchase and instalment system	Meaning of hire purchase contract, legal provision	T1:7.1-7.2,7.5
39-40	Hire Purchase and instalment system	Accounting regarding hire- purchase contract.	T1:7.6-7.7

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	16	01.02.2023	1-12	CB
Test 2	60 Minutes	17	02.03.2023	13- 28	CB
Test 3	60 Minutes	17	04.04.2023	29- 42	OB
Lab	Throughout the Semester	10	**	**	CB
Comprehensive Exam	3 Hours	40	06.05.2023	1- 42	CB

** To be announced in the class

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Mr.JITENDRA SINGH
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information and Technology

Second Semester, 2022–2023

Course Handout

Course No	Course Title	L	P	U
MATH123	Mathematics II	3	0	3

Instructor-in-charge: Ms.YOGITA CHANDRAKAR

Scope & Objective of the course:

The Course is designed to provide basic concepts of Theory of equations and an introduction to the theory of functions of a complex variable.

Textbook(s)T1	Higher Engineering Mathematics, B.S. Grewal, J.S.Grewal, J.K.Dhanoa, Khanna Publishers, 44th Edition, 2017
Reference book(s) R1	Complex Variables and Applications, J. W. Brown, R. V. Churchill, Mc Graw-Hill, 7th Ed , 2003.
R2	Complex analysis for Mathematics & Engineering, John H. Mathews & Russel W. Howell, Jones & Bartlett Publishers, 2001.

Lecture-wise plan:

Lecture No.	Learning Objective	Topics to be covered	Reference (Ch/Sec/Pg Nos of Text Book)
1-4	To understand algebraic and geometric properties of complex numbers	Complex Numbers, argand Plane, Demoivre's theorem, Roots of complex number	639-642,647-650,651-653 (T1)
5-7	To learn the concept of a function of a complex variable and the properties of complex function	Complex Functions ,Exponential function of a complex variable, circular functions, Hyperbolic functions,	656-661(T1)
8-10		Real and Imaginary parts of circular and hyperbolic functions, Logarithmic function of a complex variable, Summation of series 'C+iS' method	662-669
11-13	Calculus of Complex functions	Limit of a complex function ,derivative of f(z), C-R equations	672-674
14-17	To learn the concept of Riemann Sphere, C-R equations and harmonic	Analytic functions, Harmonic functions, Orthogonal system, Milne-Thomson's Method	674-684

18-21	To learn the concepts of integrals and anti-derivatives of complex valued functions of a single variable	Complex integrations, (line integrals), Cauchy theorem, Cauchy Integral Formula(Without proof)	694-700
22-24	To understand the form of Taylor's and Laurent series for an analytic function of a complex variable	Taylor's and Laurent series, Zero's of analytic function	704-710
25-28	Develop the skill to find the residues, poles and zeros of analytic functions	Residues, Residue theorem, Poles of analytic Functions	710-715
29-31	Evaluation of certain types of definite and improper integrals using the theory of residues	Application of residues, Evaluation of real definite integrals	716-722
32-33	To learn theory of equations	General properties, Intermediate value property, Descartes's rule of signs, Relation between roots and coefficients	1-5
34-36	Develop the skill to find various kind of roots	Transformation of equations, Reciprocal equations	5-8
37-41	Solution of Cubic and Bi-quadratic equations	Cardon's method, Ferrari's method	9-15

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	16	03.02.2023	01-10	CB
Test 2	60 Minutes	17	04.03.2023	11-21	CB
Test 3	60 Minutes	17	06.04.2023	22- 33	OB
Quizzes (2)	20 minutes	10	**	**	CB
Comprehensive Exam	3 Hours	40	12.05.2023	01-41	CB

** To be announced in the class

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Ms.YOGITA CHANDRAKAR
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology

Second Semester, 2022–2023

Course Handout

Course No	Course Title	L	P	U
CA124	Computer Organization	3	0	3

Instructor-in-charge: Mrs.NISHA THAKUR

Learning Outcome –

1. After successful completion of the course student will be able to:
2. To understand basic concepts and implementation of Computer Organization.
3. To understand about Number Systems, logic gates, Boolean algebra and Advanced Concepts.
4. To understand about Combinational & Sequential Circuits and its working architecture.

Textbook T1	Computer Fundamental, Pradeep K. Sinha Sixth Edition BPB Publication.
Reference book(s) R1	Computer Architecture & Organization by Moriss Manno, 3rd edition, Print ice Hall of India Pvt Ltd.
R2	Digital Computer electronics: An Introduction to microcomputers by Albert Malvino and Jerald Brown, Tata Mcgraw Hill.
NPTEL	http://www.nptelvideos.in/2012/11/computer-organization.html

Lecture-wise plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)
1-2	Introduction to Computer Organization	Computer system concepts, Computer architecture	T1 : Chap 1, Chap 2
3-6	Concept of Data	Concept of data & data Storage, Types of programming languages	T1 : Chap 12
5-9	Computer Number Systems	Decimal numbers, binary numbers, Octal, Hexadecimal	T1 : Chap 3
10-12	Binary arithmetic & Conversion	binary arithmetic, 1's and 2's complements, inter-conversion of number system	T1 : Chap 5
13-17	Digital codes	Binary coded decimal(BCD), Gray code, Excess-3 code, Format of ASCII code.	T1 : Chap 4
20-25	Logic Gates	Positive and negative logics, NOT gate, OR gate, AND gate, NAND gate, NOR gate, EX-OR andEX-NOR gates	T1 : Chap 6
26-28	Circuit diagram and Universal Gates	Truth table, Circuit diagram, universal property of NAND and NOR gates.	T1 : Chap 6

29-32	Boolean Algebra	Boolean operation, logic expressing, rules and laws of Boolean algebra,	T1 : Chap 6
32-36	Simplification & K-Map	Demorgan's theorems, simplification of Boolean expression using Boolean algebra techniques, Karnaugh map techniques	R1 : 1.4
37 - 40	Combinational & Sequential Circuits	Half adder, Full adder, Multiplexer, Flip-Flops, Registers, Shift registers, counters	R1 : 1.5-1.7

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	16	31.01.2023	1-10	CB
Test 2	60 Minutes	17	01.03.2023	11- 24	CB
Test 3	60 Minutes	17	03.04.2023	25- 42	OB
Assignments	Continuous	10	**	**	CB
Comprehensive Exam	3 Hours	40	03.05.2023	1- 40	CB

** To be announced in the class OB* = Open Book Exam CB = Closed Book Exam

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Mrs.NISHA THAKUR
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology

Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
CA125	**Web Technologies**	**3**	**2**	**4**

Instructor in charge: Mr. NAVEEN KUMAR VAISHNAV

Scope & Objective of the Course:

After successful completion of the course student will be able to:

4. Understand the basics involved in publishing content on the World Wide Web. This includes the 'language of the Web – HTML, the fundamentals of how the Internet and the Web function, a basic understanding of graphic production with a specific stress on creating graphics for the Web.
5. Understand a general grounding introduction to more advanced topics such as programming and scripting.
6. Expose to the basic tools and applications used in Web publishing.

Textbook T1	Deitel, Deitel, Goldberg, "Internet & World Wide Web How to Program", Third Edition, Pearson Education, 2006.
Reference books R1	Achyut Godbole, Atul Kahate "Web Technologies: TCP/IP, Web/Java Programming, and Cloud Computing", Third Edition, McGraw Hill Education.
R2	Raj Kamal, "Internet and Web Technologies", Tata McGraw-Hill. 4.
NPTEL	https://nptel.ac.in/courses/106/105/106105084/
SWAYAM	https://onlinecourses.swayam2.ac.in/nou20_cs05/preview

Lecture wise plan:

Lecture	Learning Objective	Topics to be covered	Reference (chapters)
1-4	Internet Concept:	Fundamental of Web, History of Web, Web development overview, Domain Name System (DNS)	T1: 1.5-1.6
5-8	Functionality of Internet	DHCP and SMTP and other servers ,Internet service provider (ISP), Concept of IP Address,	T1: 1.8, 2.1
9-12	Protocols and Components of internet	Internet Protocol, TCP/IP Architecture, Web Browser and Web Server.	T1: 2.1, 2.7
13-18	HTML and DHTML:-	HTML Tag, Rules of HTML, Text Formatting and Style, List, Adding Graphics to Html Document,	T1: 4.1- 4.9
19-23	Tables	Tables and Layout , Linking Documents, Forms, Project in HTML	T1: 4.10 - 4.11
24-28	DHTML & CSS	Introduction to DHTML, CSS, Class and DIV, External Style Sheet.	T1: 5.1 - 5.8
29-33	Java Script	JavaScript(JS) in Web Page, Advantage of Java Script ,JS object model and hierarchy ,Handling event ,Operators and syntax of JS	T1: 6.1 – 6.5

34-36	Java Script Functions	JS Function, Client side JS Vs. Server side JS, JS security,	T1: 9.1 – 9.11
37-38	XML	Introduction to XML	T1: 14.1
39-40	XML in Action	XML Namespace, DTD	T1: 14.4

Practical list:

S.No	Name of the Experiments
1	HTML page to print Hello World.
2	Web page illustrating text formatting tags available in HTML. (i.e. <h1>, <b>, <u>, <i> etc).
3	Web page to illustrate types of lists in HTML.
4	HTML page which displays 3 images at LEFT, RIGHT and CENTER respectively.
5	HTML Code for Table
6	CSS Colors for background colors, font colors
7	Student registration form using <form> tag
8	Web page using CSS Inline style.
9	Web page using CSS Internal style.
10	Web page using CSS External style.
11	Design Resume Using HTML Code.
12	Java Script Program to check maximum number out of three numbers.
13	Java Script Program to print 1 to 100 using while loop.
14	Java Script Program to calculate percentage and Division of student.
15	Create CD Catalogue Table in XML and display it using XSL Style Sheet.

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Component	Duration	Weightage	Date	Syllabus (Lecture No)	Remarks
Test 1	60 Minutes	16	01.02.2023	1-18	CB
Test 2	60 Minutes	17	02.03.2023	19- 28	CB
Test 3	60 Minutes	17	04.04.2023	29-40	OB*
Lab	2 Hours	10	**	**	CB
Comprehensive Exam	3 Hours	40	05.05.2023	1- 40	CB

** To be announced in the class OB* = Open Book CB= Closed Book

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc

Mr. NAVEEN KUMAR VAISHNAV
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Institute Technology

Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
TA126	**Computer Programming-II**	**3**	**2**	**3**

Instructor-in-charge: Dr. RAVI KIRAN

Learning Outcomes:
This course is offered as a technical art subject to engineering students. It focuses on training the students rigorously in the skills of a structured programming language, particularly in C and application of such language in problem solving.

Text Book T1	"Programming with ANSI C", E. Balaguruswamy, TMH 4th edition, 2004.
Reference book(s) R1	"Programming with C", Gottfried, Schaum -TMH, 2nd Edition, 2002.
R2	"A Book on C", Al Kelly & Ira Pohl, Pearsons, 4th Edition, 2001..
R3	"The C Programming Language", Kernighan & Ritchie, 2nd Edition PHI, 2002.

Lecture-wise plan:

Lecture No.	Learning Objective	Topics to be covered	(Ch./Sec./Text Book)
1	Overview of C	History, Sample program, basic structure of C, executing a C program	T1 Ch.1
2-3	Constants, Variables and Data types	Constants, variables, data types, storage classes, declarations, assigning values, etc	T1 Ch.2
4-5	Operators and Expressions	Arithmetic, relational, logical, assignment, increment and decrement bitwise, conditional operators, expressions, operator precedence, type conversions, etc.	T1 Ch.3
6	Input, output operations	Reading, writing characters, formatted i/o, etc	T1. Ch.4
7	Decision making & branching	If statement, if - else, nested if, switch statement, etc	T1 Ch.5
8	Decision making & looping	While loop, do loop, for loop etc	T1 Ch.6
9-10	Arrays	One-dimensional, two-dimensional, multi-dimensional arrays, initialization, etc	T1 Ch.7
11-12	Character arrays & strings	Declaring, initializing, reading, writing strings. Arithmetic operations on characters and string operations, etc	T1 Ch.8
13-15	Low level Programming	Bitwise Operations, Bit fields	R1 Ch.13
16-17	Understanding Functions	Definition of function, function calls, return values	T1 Ch.9
18-20	User Defined Functions	Types of functions, passing arguments, nesting, recursion, passing arrays	T1 Ch.9
21-23	Understanding Structures	Defining structure, accessing structure members, structure initialization, operations on	T1 Ch.10

		individual members, arrays of structures	
24	Structures & Unions	Unions, Structures Vs Unions	T1 Ch.10
25	Dynamic Memory Allocation	Introduction, Dynamic Memory Allocation, Malloc, Calloc, Realloc	T1. Ch.13(13.1-13.6)
26-27	Understanding Pointers	Introduction, accessing address of a variable, declaring pointers, initialization	T1. Ch.11 (11.1-11.5)
28-29	Programming with Pointers	Accessing a variable through pointer, pointer expressions, pointer increments and scale factor	T1. Ch.11 (11.6-11.9)
30-31	Pointers & Arrays	Pointers & Arrays, Pointers & Strings, Array of Pointers	T1. Ch.11 (11.10-11.12)
32-33	Pointers & Functions	Pointers as function arguments, functions returning pointers, pointers & structures	T1. Ch.11 (11.13-11.16)
34-36	File Management	Opening a files, closing a file, I/O operations, Random Access to File, Command line arguments	T1. Ch.12
37-42	Data Structures using C	Implementation of linear linked lists, stacks, queues and binary trees	R2 Ch.10 T1. Ch.13

Evaluation Scheme:
Student evaluation is based on the series of Assessment Tests and Tests conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage (%)	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	16	06.02.2023	1-10	CB
Test 2	60 Minutes	17	28.02.2023	11- 20	CB
Test 3	60 Minutes	17	08.04.2023	21- 30	OB
Quizzes (2)	20 Minutes each	10	**	**	CB
Comprehensive Exam	3 Hours	40	19.05.2023	1- 42	CB

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Dr. RAVI KIRAN
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology
Second Semester, 2022–2023

Course Handout

Course No	Course Title	L	P	U
CA302	Software Engineering	3	0	3

Instructor in charge: Ms.SHRUTI BHENDALE

Scope & Objective of the Course:

- Students will learn to apply fundamental software engineering concepts, design, analysis and testing methodologies while incorporating the software engineering quality metrics to produce high quality correct software in a scheduled amount of time.
- Students will learn object-oriented methodologies for proving programs are correct and methods of testing programs to demonstrate correctness.
- Students will learn to use the Unified Modeling Language (UML) programming to achieve course goals.

Text Book(s)T1	Software Engineering: A Practitioner's approach, Pressman R.S, MGHISE, 6th Edition, 2005.
Reference book(s)R1	Object Oriented Technology , Tsang, THM, 2006.
R2	Larmen C, Aplying UML and Patterns: An Introduction to Object Oriented analysis and Design and the Unified process, Pearson Education 2nd Edition, 2004.
R3	Pankaj Jalote, An Integrated approach to Software Engineering, Narosa Publishing House, 3rd Edition, 2004.

LectureNos.	Learning Objective	Topics to be covered	Reference
1-2	Key concepts, software characteristics	Introduction, Software Product	Chapter 1 (T1)
3-4	Generic framework activities, agility	Software Process, Activities	Chapter 2 (T1)
5-7	Life Cycle of Software	SDLC	Chapter 3 (T1)
8-9	Various Models	Waterfall, Iterative Waterfall	Chapter 4 (T1)
10-12	Various Models and comparison	RAD, Prototype, Spiral	Chapter 5 (T1)
13-15	Requirement Elicitation, analysis and Specification	Requirements Engineering	Chapter 7 (T1)
16-18	Diagrammatic forms, provides viewof one or more model elements	Analysis Modeling, Data Modeling, SRS	Chapter 8 (T1& R1)
19-21	Design is the place where software quality is established	Design Engineering	Chapter 9 (T1& R1)
22-25	The preliminary blue print from which software is constructed	Architectural Engineering	Chapter 10(T1 & R1)
26-28	Design guide lines for avoiding errors as procedural design evolves	Component level Design	Chapter 11(T1 & R1)

29-31	User scenarios will be created and screen layouts will be developed	User Interface Design	Chapter 12(T1 & R1)
32-34	Different strategies for testing software.	Testing Strategies	Chapter 13 (T1)
35-37	Software Maintenance	Characteristics of Software management, types of maintenance,Reverse Engineering	Chapter 14(T1)
38-40	Quality Assurance	Quality Assurance & Control	Chapter 15(T1)

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Component	Duration	Weightage	Date	Syllabus (Lecture No)	Remarks
Test 1	60 Minutes	16	01.02.2023	1-9	CB
Test 2	60 Minutes	17	02.03.2023	10- 25	CB
Test 3	60 Minutes	17	04.04.2023	26-40	OB*
Quizzes/Assignment	30 Minutes	10	**	**	CB
Comprehensive Exam	3 Hours	40	06.05.2023	1- 40	CB

** To be announced in the class OB* = Open Book CB= Closed Book

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc

Ms.SHRUTI BHENDALE
Instructor-in-charge

Date:15-01-2023

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2022 – 2023
Course Handout

Course No	Course Title	L	P	U
MATH303	**Operations Research**	**3**	**0**	**3**

Instructor-in-charge: Mr.HEMANT KUMAR DEWANGAN

Learning Outcomes:

After successful completion of the course student will be able to:

1. Identify and develop operational research models from the verbal description of the real system.
2. Understand the mathematical tools that are needed to solve optimization problems.
3. Use mathematical software to solve the proposed models.
4. Develop a report that describes the model and the solving technique, analyze the results and propose recommendations in language understandable to the decision-making processes in Management Engineering.
5. Learn the concepts, models, tools and techniques, to manage operations in manufacturing and service organizations.

Textbook(s) T1	Sharma, S.D., "Operations Research", Kedar Nath Ram Nath & Co. (15th Edition), 2010.
Reference book(s) R1	Taha, H.A., "Operations Research – An Introduction", Prentice Hall, (7th Edition), 2002.
R2	Hillier, F.S., Lieberman, G.J. , Nag, B., Basu, P., "Introduction to Operations Research", McGraw Hill (10th Edition), 2017.
R3	Operations Management, FedUni
R4	Ravindran, A. , Phillips, D. T and Solberg, J. J. , "Operations Research: Principles and Practice", John Willey and Sons, 2nd Edition, 2009.
R5	Operations Management, Lee J Krajweski and Larry P.Ritzman/ Person Education Delhi 6th edition
R6	Operations Management, Russel &Taylor, 4th Edition
SwayamLink	https://onlinecourses.swayam2.ac.in/cec20_ma10/preview

Lecture-wise Plan:

Lecture No.	Learning objectives	Topics to be covered	Refer to Chapter,See (Book)
1	Linear Programming Problem	Mathematical Formulation of LPP	T1, Unit-2, ch-3, pg.3-26
2		Graphical Method for Solving LPP	T1, Unit-2, ch-3, pg.26-53
3		Simplex Method for Solving LPP and Big-M Method	T1, Unit-2, ch-5, pg.67-95
4		Some Special Cases in LPP	T1, Unit-2, ch-5,

			pg.95-125
5		Duality, and Solving LPP using Duality in Simplex Method	T1, Unit-2, ch-7,
6	Transportation	Mathematical Formulation of LPP	T1, Unit-2, ch-11, pg.262-267
7		Initial BFS of Transportation Problem	T1, Unit-2, ch-11, pg.269-278
8		Optimality Test by Stepping Stone Method and, and	T1, Unit-2, ch-11, pg.278-351
9		MODI Method	T1, Unit-2, ch-11, pg.278-351
10		Some Special Cases of Transportation Problem	T1, Unit-2, ch-11, pg.278-351
11	Assignment	Initial BFS of Assignment Problem	T1, Unit-2, ch-12, pg.352-353
12		Johnson's job of sequencing rules	T1, Unit-2, ch-12, pg.353-403
13		Solution by Hungarian Method, and Travelling Salesman Problem	T1, Unit-2, ch-12, pg.353-403
14	Game Theory	Basic Concept and Terminologies	T1, Unit-4, ch-19, pg.3-5
15		Two-person Zero-sum Game, and Game with Pure and Mixed Strategies	T1, Unit-4, ch-19, pg.20-61
16		Dominance Principle, Arithmetic Method, and Graphical Method for Solving (2× n) Game	T1, Unit-4, ch-19, pg.20-61
17		Graphical Method for Solving (m×2) Game and Solution of Game by Simplex Method	T1, Unit-4, ch-19, pg.20-61
18	Job Sequencing	Basic Terminologies and Assumptions of Job Sequencing	T1, Unit-4, ch-24, pg.299-300
19		Processing of n Jobs through 2 and 3 Machines	T1, Unit-4, ch-24, pg.300-315
20		Processing n Jobs through m Machines, and Processing 2 Jobs through m Machines - Graphical	T1, Unit-4, ch-24, pg.300-315
21	Inventory Theory	Economic Order Quantity and EOQ Models without Shortage	T1, Unit-4, ch-20, pg.62-71
22		EOQ models with Shortage and EPQ Models with/without Shortages	T1, Unit-4, ch-20, pg.72-100
23		Newsboy Problem and Probabilistic Inventory Model with Instantaneous Demand and No Set up Cost	T1, Unit-4, ch-21, pg.143-172
24		Probabilistic Inventory Model with Uniform Demand and No Set up Cost, and Buffer Stock in Probabilistic Inventory Model	T1, Unit-4, ch-21, pg.143-172
25		Problems regarding different models	T1, Unit-4, ch-21, pg.173-175
26	Queuing Theory	Basic Characteristics of Queuing System and Probability Distribution of Arrivals	T1, Unit-4, ch-23, pg.215-229
27		Probability Distribution of Departures and Model I (M|M|1):(∞|FCFS)	T1, Unit-4, ch-23, pg.230-231
28		Model I. (General): (M|M|1): (∞|FCFS), and Model II. (M|M|1): (N|FCFS)	T1, Unit-4, ch-23, pg.232-257
29		Model III - (M|M|s): (∞|FCFS), and Model IV -	T1, Unit-4, ch-23,

		(M|Ek|1): (∞|FCFS)	pg.258-268
30	Network Analysis	Networking Modeling	T1, Unit-4, ch-25, pg.316-322
31		Critical Path Method (CPM)	T1, Unit-4, ch-25, pg.323-349
32		Program Evaluation & Retention Technique (PERT)	T1, Unit-4, ch-25, pg.349-382
33		Project Crashing	T1, Unit-4, ch-25, pg.349-382
34		LP and Dual LP Solutions to Network Problem	T1, Unit-4, ch-25, pg.349-382
35	Dynamic Programming	Basic Concept and Terminology, and Dynamic Programming Models I and II	T1, Unit-5, ch-33, pg.72-77
36		DP Model III, Solution of Discrete DP Problem and Solution of LPP by DP	T1, Unit-5, ch-33, pg.82
37-38	Supply Chain Management	Introduction, Business Drivers in Supply Chain performance	R3, ch-16, pg.217-232
39-40	Just-In-Time (JIT) Manufacturing System	Introduction, The Concept of the JIT System	R3, ch-18, pg.253-261

Evaluation Scheme:

Student evaluation is based on the series of Tests and Lab Tests conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	17	23.02.2022	1-13	CB
Test 2	50 Minutes	17	24.03.2022	14- 25	CB
Test 3	50 Minutes	16	28.04.2022	26- 40	OB
Quiz 1	10 Minutes	5	**	1-20	CB
Quiz 2	10 Minutes	5	**	21-40	CB
Comprehensive Exam	3 Hours	40	16.05.2022	1- 40	CB

Make-up Policy: Make –up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Mr.HEMANT KUMAR DEWANGAN

Date-15-01-2023 **Instructor-in-charge**

The ICFAI University, Raipur

Faculty of Information Technology
Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
CA401	**Computer Graphics**	**3**	**0**	**3**

Instructor-in-charge: Mr. ASHISH KUMBHARE

Learning Objective:

1. After successful completion of the course student will be able to:
2. Understand the concepts of computer graphics through theoretical, algorithmic and advanced modeling aspects along with, applications in 3D graphics and visualization in 3D.
3. To apply the concepts and techniques to various problem domain and visualization of data- sets and processes.

Textbook(s) TI	Computer Graphics, James D. Foley, A. Van Dam, S.K. Ferrier, and J.F. Hughes,Principles and Practice, 2nd Edition in C, Addition-Wesley , 1996.
Reference book(s) R1	Mathematical Elements of Computer Graphics, Rogers B. McGraw Hill, 1989.
R2	Computer Graphics, D. Hearn and M.P. Baker, PHI, 1994.
R3	Introduction to Computer Graphics, N Krishnamurthy, 1st Edition, TMH, 2002.

Lecture-wise plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./ PageNos.of Text Book)
01-03	What, Why & Where aboutGraphics,	Overview of graphics systems — What, Why & Where about Graphics, Hardware & Software, Input & Output Technology,	Ch l Ch 4.4
04-08	Fast Algorithms for Drawing 2D objects Line	Raster Graphics Algorithms for Drawing 2D objects: Line	Ch 3.1—3.4
09-10	Fast Algorithms for Drawing 2D objects Circle.	Raster Graphics Algorithms for Drawing 2D objects: Circle	Ch 3.1—3.4
11-13	Manipulation of objects	Introduction to 2D & 3D Geometry, Scaling, Translation,Rotation, Shear, Reflection, Projection and Composite Transformations	Ch5.1-5.3 Ch5.5-5.7
14-17	Mapping of 2d from world toscreen	Viewing & Clipping in 2D (Cohen's and Parametric Line Methods)	Ch 5.4 Ch 3.11

18-22	Mapping of 3d from world toscreen	Viewing & Clipping in3D (Perspective & Parallel projection, Clipping against a Canonical View Volume, Clipping in HomogeneousCoordinates, and Mapping into A Viewport	Ch 6
23-27	Drawing Smooth Curves &Surfaces	Hermit, Bezier, Continuities, B-spline Curves, Parametric Bi Cubic Surfaces, Quadric Surfaces	Ch 11.2.1-11.2.4 Ch 11.3- 11.4
28-31	Representation of Solid objects	Solid Modeling (Representations, Operations, Geometry, and Interface)	Ch 12
32-35	Detection of hidden portions	Visible Surface Detection (Need & Algorithms, Ray Tracing) and Hidden Line elimination	Ch 15.1-15.4
36-42	How to shade surfaces and solids	Rendering (Models, Physics, Shading Polygons & Surface, & Shadows) Animation (Languages, Techniques,Control, Basic Rules & Problems)	Ch 16.1-16.4

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec. No.)	Remarks
Test 1	60 Minutes	16	02.02.2023	1-12	CB
Test 2	60 Minutes	17	03.03.2023	13- 24	CB
Test 3	60 Minutes	17	05.04.2023	25- 42	OB
LAB	Through out	10	**	**	CB
Comprehensive Exam	3 Hours	40	08.05.2023	1- 42	CB

** To be announced in the class

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.
General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Mr. ASHISH KUMBHARE
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology

Second Semester, 2022 – 2023

Course Handout

Course No	Course Title:	L	P	U
SS263	Soft Skills	3	0	3

Instructor-in-charge: Ms. EKTA DEWANGAN

Learning Outcomes:

After successful completion of the course student will be able to

1. Understand the concept, importance and types of soft skills.
2. Learn the usage of effective soft skills and draw benefit from it.
3. Develop listening, writing and speaking skills.
4. Personality development and attributes of success.
5. Prepare students for interviews, group discussions and make them ready for corporate life.

R1	Professional Communication by Aruna Koneru (Tata McGraw Hill)
R2	You can win by Shiv Khera (Bloomsbury)

Lecture-wise Plan

Lecture Nos	Learning Objective	Topics to be covered	Reference
1,2	Learning basic concepts & definitions	Introduction to soft skills, Basics of Communication	PC-Unit1-chapter1
3,4	Develop effective speaking skills	Speaking skills - Theory & Concept, Practical (Extempore)	PC-Unit4-chapter26
5,6	Develop effective listening skills	Listening - Concept & Techniques, Practical Orientation	PC-Unit4-chapter22
7,8	Develop effective writing skills	Language Fluency, abstract and summary	PC-Unit3-chapter17
9,10	Importance and build Positive attitude	Attitude - Concept & Techniques, Positive attitude	YCW-chapter1,2
11,12	Motivation	Motivation-importance, process, benefits	YCW-chapter6
13,14,15	Personality development	Grooming, development, positive personality	YCW-chapter10

16,17,18	Attributes of success	Adaptability, habits-develop and maintain	YCW-chapter3,4
19,20,21	Written official comma	Office circulars & notices, Report writing	PC-Unit2-chap10, Unit3-chap13
22,23	General awareness-methods to develop	General Awareness - Building & Importance	NA
24,25,26	Build effective presentation skills	Presentation Skills - Concept, Techniques, Class activity	PC-Unit4-chapter26
27,28	Personal Interview	Professional Self-introduction, Specific Skills for PI	Practical
29,30	Effective interview skills	Mock Interviews & GD	Practical
31,32	Profile writing and explaining	Role of CV in Selection, Defending & Validating CV	PC-Unit4-chapter24
33,34	Internships-learning and expectations	Sectorial Interest, Company Updates, Achievements, Learning's	Practical
35,36	Prepare for interviews and GD	Mock Interviews & GD	Practical
37,38	Self-awareness	Self-Evaluation, Career Expectations, Goal Setting & Initiatives	YCW-chapter4
39,40	Corporate overview	Corporate Expectations, Demand-Supply Dynamics	Current state

Classroom Practical

S.No	Name of the Practical
1	Professional Self-introduction, Specific Skills for PI
2	Presentation and pitch delivery
2	Mock Interviews & GD
3	Sectorial Interest, Company Updates, Achievements and Internship Learning's

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Component	Duration	Weightage	Date	Syllabus (Lecture No)	Remarks
Test 1	60 Minutes	16	31.01.2023	1-18	CB
Test 2	60 Minutes	17	01.03.2023	19- 28	CB
Test 3	60 Minutes	17	03.04.2023	29-40	OB
Quiz	1 Hours	10	**	**	CB
Comprehensive Exam	3 Hours	40	01.05.2023	1- 40	CB

** To be announced in the class OB* = Open Book CB= Closed Book

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Ms.EKTA DEWANGAN
Date:15-01-2023 **Instructor-in-charge**

The ICFAI University, Raipur

Faculty of Information Technology

Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
CA242	**Web Technologies**	**3**	**2**	**4**

Instructor in charge: Mr. NAVEEN KUMAR VAISHNAV

Scope & Objective of the Course:

After successful completion of the course student will be able to:

7. Understand the basics involved in publishing content on the World Wide Web. This includes the 'language of the Web – HTML, the fundamentals of how the Internet and the Web function, a basic understanding of graphic production with a specific stress on creating graphics for the Web.
8. Understand a general grounding introduction to more advanced topics such as programming and scripting.
9. Expose to the basic tools and applications used in Web publishing.

Textbook T1	Deitel, Deitel, Goldberg, "Internet & World Wide Web How to Program", Third Edition, Pearson Education, 2006.
Reference books R1	Achyut Godbole, Atul Kahate "Web Technologies: TCP/IP, Web/Java Programming, and Cloud Computing", Third Edition, McGraw Hill Education.
R2	Raj Kamal, "Internet and Web Technologies", Tata McGraw-Hill. 4.
NPTEL	https://nptel.ac.in/courses/106/105/106105084/
SWAYAM	https://onlinecourses.swayam2.ac.in/nou20_cs05/preview

Lecture wise plan:

Lecture	Learning Objective	Topics to be covered	Reference (chapters)
1-4	Internet Concept:	Fundamental of Web, History of Web, Web development overview, Domain Name System (DNS)	T1: 1.5-1.6
5-8	Functionality of Internet	DHCP and SMTP and other servers ,Internet service provider (ISP), Concept of IP Address,	T1: 1.8, 2.1
9-12	Protocols and Components of internet	Internet Protocol, TCP/IP Architecture, Web Browser and Web Server.	T1: 2.1, 2.7
13-18	HTML and DHTML:-	HTML Tag, Rules of HTML, Text Formatting and Style, List, Adding Graphics to Html Document,	T1: 4.1- 4.9
19-23	Tables	Tables and Layout , Linking Documents, Forms, Project in HTML	T1: 4.10 - 4.11
24-28	DHTML & CSS	Introduction to DHTML, CSS, Class and DIV, External Style Sheet.	T1: 5.1 - 5.8
29-33	Java Script	JavaScript(JS) in Web Page, Advantage of Java Script ,JS object model and hierarchy ,Handling	T1: 6.1 – 6.5

34-36	Java Script Functions	JS Function, Client side JS Vs. Server side JS, JS security,	T1: 9.1 – 9.11
37-38	XML	Introduction to XML	T1: 14.1
39-40	XML in Action	XML Namespace, DTD	T1: 14.4

Practical list:

S.No	Name of the Experiments
1	HTML page to print Hello World.
2	Web page illustrating text formatting tags available in HTML. (i.e. <h1>, <b>, <u>, <i> etc).
3	Web page to illustrate types of lists in HTML.
4	HTML page which displays 3 images at LEFT, RIGHT and CENTER respectively.
5	HTML Code for Table
6	CSS Colors for background colors, font colors
7	Student registration form using <form> tag
8	Web page using CSS Inline style.
9	Web page using CSS Internal style.
10	Web page using CSS External style.
11	Design Resume Using HTML Code.
12	Java Script Program to check maximum number out of three numbers.
13	Java Script Program to print 1 to 100 using while loop.
14	Java Script Program to calculate percentage and Division of student.
15	Create CD Catalogue Table in XML and display it using XSL Style Sheet.

Evaluation Scheme:
Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Component	Duration	Weightage	Date	Syllabus (Lecture No)	Remarks
Test 1	60 Minutes	16	01.02.2023	1-18	CB
Test 2	60 Minutes	17	02.03.2023	19- 28	CB
Test 3	60 Minutes	17	04.04.2023	29-40	OB*
Lab	2 Hours	10	**	**	CB
Comprehensive Exam	3 Hours	40	05.05.2023	1- 40	CB

** To be announced in the class OB* = Open Book CB= Closed Book

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Mr.NAVEEN KUMAR VAISHNAV
Instrucor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology

Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
CA303	**Java Programming**	**2**	**2**	**3**

Instructor-in-charge: Dr. PALAK KESHWANI

Scope & Objective of the course:

The course exposes the concepts of object-oriented programming. It also covers the fundamental programming aspects of Java. It includes a 'practical' content as well as weightage for the same in evaluation.

Textbook(s) T1	An Introduction to Object-Oriented Programming with Java, C Thomas Wu, TMH, 2006.
Reference book(s) R1	The Complete Reference Java J2SE, Herbert Schildt, 5th Edition, TMH, 2005
R2	Programming with Java: A Primer, E Balagurusamy, 2nd Edition, TMH, 2006.
R3	Core Java 2: Volume I - Fundamentals, Cay S. Horstmann, Gary Cornel, 7th Edition, Pearson Education, 2004.

Lecture-wise plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./ Page Nos.of Text Book)
1	Introduction to OOPs	Classes, Objects, Messages, Methods, Data values, Inheritance, software engineering life cycle	Chapter1 of T1
2 - 3	Getting Started with Java	First Java program, program components, Edit-Compile-Run cycle	Chapter2 of T1
4 - 5	Handling Numerical Data	Variables, Expressions, Constants, Math class	Chapter3 of T1
6 - 8	Defining your own class	Defining & using a class, arguments & parameters, Passing objects to a method, Constructors, Information hiding	Chapter4 of T1
9 - 10	Concept of Constructors	Returning an Object from a Method, Overloaded Methods & Constructors, Class variables and Methods	Chapter7 of T1
11 - 14	Exceptions and Assertions	Catching exceptions, Propagating exceptions, Assertions	Chapter 8 of T1
15 - 18	Multithreading	Java thread model, creating a thread, synchronization.	Chapter 11 of R1

19 - 20	Characters and Strings	Characters, Strings, Pattern Matching & Regular Expression, Comparing Strings	Chapter 9 of T1
21-24	Arrays	Basics, Arrays of objects, Passing Arrays to Methods	Chapter 10 of T1
25-28	Sorting & Searching	Searching, Sorting, Heapsort	Chapter 11 of T1
29-30	File I/O	Low-level File I/O, High-level File I/O, Object I/O	Chapter 12 of T1
31-35	Inheritance and Polymorphism	Classes with Inheritance, Polymorphism, Inheritance & Member Accessibility, Inheritance & Constructors	Chapter 13 of T1
36-40	Event Driven Programming, Applet Programming	Delegation-based event model, AWT classes, applet programming	Chapter 14 of T1 & Chapter 14 of R2

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	16	02.02.2023	1-10	CB
Test 2	60 Minutes	17	03.03.2023	11- 20	CB
Test 3	60 Minutes	17	05.04.2023	21- 30	OB
Quizzes (2)	50 Minutes each	10	**	**	CB
Comprehensive Exam	3 Hours	40	10.05.2023	1- 40	CB

** To be announced in the class

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Dr.PALAK KESHWANI
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology
Second Semester, 2022 – 2023
Course Handout

Course No	Course Title	L	P	U
CA417	**Artificial Intelligence**	3	0	3

Instructor-in-charge: Dr.RAMESH KUMAR YADAV

Learning Outcomes:

1. Introduce the basic principles of AI towards problem solving, inference, perception, knowledge representationand learning.
2. Investigate applications of AI techniques in intelligent agents, expert systems, artificial neural Networks andother machine learning models.
3. Experiment with a machine learning model for simulation and analysis.
4. Explore the current scope, potential, limitations, and implications of intelligent systems.
5. To have a basic proficiency in a traditional AI language includes an ability to write simple to intermediateprograms and an ability to understand code written in that language.

Textbook (s) **T1**	Artificial Intelligence by Elaine Rich and Kevin Knight, Tata MeGraw Hill.
Reference book (s) **R1**	Principles of Artificial Intelligence by Nils J.Nilsson, Narosa Publishing house.

Lecture Nos.	Learning objectives	Topics to be covered	Reference (Ch./Sec./ Page Nos. of Text Book)
1-3	Overview & Search Techniques:	Introduction to AI, Problem Solving, State space search,	15-32
4-5	Overview & Search Techniques:	Blind search: Depth first search, Breadth first search,	48-60
6	Overview & Search Techniques:	Informed search: Heuristic function, Hill climbing search.	71-77
7-9	Overview & Search Techniques:	B est first search, A* & AO* Search.	81-87
10	Overview & Search Techniques:	Constraint satisfaction, Game tree	88- 95
11-12	Overview & Search Techniques:	Evaluation function, Mini-Max search, Alpha-beta pruning, Games of chance.	135-148
13-15	How to do Knowledge Representation	Introduction to KR, Knowledge agent, Predicate logic	155-159
16-17	How to do Knowledge Representation	WFF, Inference rule & theorem proving forward chaining, backward chaining, resolution	160-190
18	How to do Knowledge Representation	Propositional knowledge, Boolean circuit agents.	200-221

19-20	How to do Knowledge Representation	Rule Based Systems, Forward reasoning	230-241
21-22	How to do Knowledge Representation	Conflict resolution, backward reasoning: Use of Back tracking, Structured KR	317-329
23-24	How to do Knowledge Representation	Semantic Net - slots, inheritance, Frames-exceptions and defaults attached predicates	330-354
25-26	How to do Knowledge Representation	Conceptual Dependency formalism and other knowledge representations.	360-371
27	How to Handling uncertainty & Learning:	Source of uncertainty, Probabilistic inference	373-375
28-29	How to Handling uncertainty & Learning:	Bayes' theorem, Limitation of naïve Bayesian system, Bayesian Belief Network (BBN)	380-386
30	How to Handling uncertainty & Learning	Inference with BBN, Dempster-Shafer Theory	389-405
31-32	How to Handling uncertainty & Learning	Fuzzy Logic, Fuzzy function, Fuzzy measure, Non monotonic reasoning:	410-419
33-34	How to Handling uncertainty & Learning	Dependency directed backtracking, Truth maintenance systems.	420-434
35-36	How to Handling uncertainty & Learning	Learning: Concept of learning, Learning model, learning decision tree, Paradigms of machine learning,	435-447
37-40	How to Handling uncertainty & Learning	Supervised & Unsupervised learning, Example of learning, Learning by induction, Learning using Neural Networks.	448-460

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	17	31.01.2023	1-12	CB
Test 2	60 Minutes	17	01.03.2023	13- 28	CB
Test 3	60 Minutes	16	03.04.2023	29- 40	OB
Quizzes (2)	20 Minutes each	10	**	**	CB
Comprehensive Exam	3 Hours	40	08.05.2023	1- 40	CB

** To be announced in the class

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc

Dr.RAMESH KUMAR YADAV
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology

Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
CA402	**E-Commerce**	3	0	3

Instructor-in-charge: Ms.SNEHA THAKUR

Learning Outcomes:

1. Understand the basic concepts of E-commerce
2. Demonstrate an retailing in E-commerce by using the effectiveness of market research
3. Describe Internet trading relationships including Business to Consumer, Business-to-Business, Intra organizational

Text Book T1	E-commerce Concepts, Models, Strategies, C.S.V. Murthy,
Reference Book(s) R1	E- Commerce An Indian Perspective, P.T. Joseph, S.J.
Reference Book(s) R2	Indian Banking in Electronic Era, SS Kaptan & NS Choubey

Lecture-wise plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Chapter/Sec./Page Nos. of Text/Ref. Books)
1	To understand the basics of E commerce	**Unit – I:** Introduction to E-Commerce	T1 Ch1- Page 3-7
2-3	To understand the Meaning of E commerce	E – Commerce: Meaning, definition,	T1 Ch2- Page 8-39
4-5	To understand the features and scope of E commerce	Features, Scope	T1 Ch2- Page 8-39
6-7	To understand the merits and demerits of E commerce	Advantages and Disadvantages of E commerce	T1 Ch2- Page 8-39
8-9	To understand the various business models of E commerce.	**Unit – II:** Business Modesl: B2B, B2C, C2C, C2B, B2G.	T1 Ch3- Page 40-97
10-11	To understand the meaning and risks in E payments.	E-payment systems: Meaning, Risks,	T1 Ch21-625-664
12	To understand the designing of secured E payments system.	Designing Electronic Payment systems	T1 Ch21- Page 625-664

13-14	To understand the various types of E payments system.	**TYPES OF E-PAYMENT SYSTEMS:** Credit card, Debit card, Smart card, E-Money, Internet, Mobile payments	T1 Ch21- Page 625-664
15-16	To understand the various types of E payments system.	Financial Service Kiosks, Television Set-Top Boxes and Satellite Receiver, Biometric Payments, Person-to-Person, Micro Payment System.	T1 Ch21- Page 625-664
17-18	To understand the digital token based system of E payments.	DIGITAL TOKEN BASED PAYMENT SYSTEM: Types, Issues and benefits.	T1 Ch21-625-664
19-20	To understand the security issues in E commerce.	**Unit III:** E-Security: Concept of E-Security, Commune E-Commerce pitfalls,	T1 Ch22- Page 665-705
21	To understand the E security tools.	E-Security tools,	T1 Ch22- Page 665-705
22	To understand the fundamentals of computer security.	Fundamentals of computer security,	T1 Ch22- Page 665-705
23	To understand Measures to ensure security.	Measures to ensure security,	T1 Ch22- Page 665-705
24	To understand Stages in E-Security design	Stages in E-Security design,	T1 Ch22- Page 665-705
25-26	To understand Types of risks, Measures to protect.	Types of risks, Measures to protect.	T1 Ch22- Page 665-705
27-28	To understand the basics of M Commerce	Mobile Commerce: Meaning and definition, Characteristics,	R1 Ch10- Page 412-420
29-31	To understand the application, merits and demerits of M Commerce	Applications of m-commerce, Advantages of m-commerce, Disadvantages of m-commerce,	R1 Ch10- Page 412-420
32	To understand the challenges of M Commerce	Challenges Faced by E-Commerce in India.	R1 Ch10- Page 412-420
33-36	To understand the basics of E banking	**Unit-IV:** E: Banking: Meaning of E-banking, Functions of E-banking, Description of Services, Importance of E-Banking , Advantages of E-banking, Traditional V/S E-Banking.	R1 Ch6- Page 297-303
37-40	To understand the basics of E Trading	E-Trading: Meaning of E-Trading, Importance and advantages of E-Trading.	R1 Ch6- Page 297-303

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	16	01.02.2023	1-7	CB
Test 2	60 Minutes	17	02.03.2023	8-18	CB
Test 3	60 Minutes	17	04.04.2023	19-32	OB*
Quiz (1)Assignment(1)	20 Minutes each	10	**	**	CB
Comprehensive Exam	3 Hours	40	05.05.2023	1-40	CB

** To be announced in the class OB* = Open Book Exam CB = Closed Book Exam

Make-up Policy:
Make –up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the competent authority is required..

General:
It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc. The student is required to refer the books and journals in the library and attend all presentation sessions and submit assignments to enhance the subject knowledge.

Ms.SNEHA THAKUR

Date: 15-01-2023 **Instructor-in-charge**

The ICFAI University, Raipur

Faculty of Information Technology

Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
CA321	**ASP.Net Technology**	**2**	**2**	**3**

Instructor-in-charge: Dr. RAMESH KUMAR YADAV

Learning Outcomes:

1. The learning objectives of this course are to:
2. Gain a thorough understanding of the philosophy and architecture of Web applications using ASP.NET
3. Acquire a working knowledge of Web application development using Web Forms and Visual Studio 2008
4. Optimize an ASP.NET Web application using configuration, security, and caching
5. Access databases using ADO.NET and LINQ
6. More recent ASP .NET features
7. Implement rich client applications using ASP.NET AJAX
8. Customize Web applications through the use of HTTP handlers and modules

Text Book T1	C# 6.0 and the .NET 4.6 Framework by Andrew Troelsen and Philip Japikse
Text Book T2	Programming Entity Framework by Julia Lerman
Reference Book(s) R1	Pro ASP.Net MVC 5 (Expert‘s Voice in ASP.Net)by Adam Freeman

Lecture wise plan

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)
1-5	To understand the basics of .NET	**Introduction to ASP.NET** From ASP to ASP.NETWeb Forms Web Services ASP.NET Features	T l Ch-l1.4,1.5, T2,Ch1.6,1.9
6-10	To learn the concepts of webform architecture	**Web Forms Architecture** Page Class Web Forms Life Cycle Web Forms Event Model	T2 Ch-2 2.1,2.4,2.7,2.9
16-20	To learn the concepts of HTTPClass	**ASP.NET and HTTP** Request/Response ProgrammingHttp Request Class HTTP Collections Http Response Class	T1 Ch-33.1,3.7 T2 Ch3 5.6,3.8

21-23	To learn the concepts of webapplication	**Web Applications Using Visual Studio** Using Visual Web Developer Visual Studio Forms DesignerUsing Components Shadow Copying Using the Global.ajax FileData Binding	T1 Ch-44.7, 4.4 T2 Ch44.8,4.10
24-25	To understand concept of sessionstate	**State Management and Web Applications**Session State Application State Multithreading Issues, Cookies	T1 Ch-55.5,5.9
26-30	To understand concept of servercontrols	**Server Controls** HTML Server Controls Web Forms Server ControlsRich Controls Validation ControlsUser Controls	T2 Ch-55.3,5.7
31-40	To learn the concepts of cachingand its uses	**Caching in ASP.NET** What Is Caching PageLevel Caching Page Fragment Caching	T1 Ch-5,Ch6 5.7, 6.4,7.2 T2 Ch6 6.9,7.4,7.9

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	17	31.01.2023	1-12	CB
Test 2	60 Minutes	17	01.03.2023	13- 28	CB
Test 3	60 Minutes	16	03.04.2023	29- 40	OB
Practical/Quizzes (2)	20 Minutes each	10	**	**	CB
Comprehensive Exam	3 Hours	40	05.05.2023	1- 40	CB

** To be announced in the class

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.
General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc

Dr.RAMESH KUMAR YADAV
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology

First Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
CA423	**Theory of Computation**	**3**	**0**	**3**

Instructor-in-charge: Dr.PALAK KEHSWANI

Learning Outcomes:

The learning objectives of this course are to:

1. Introduce students to the mathematical foundations of computation including automata theory; the theory of formal languages and grammars; the notions of algorithm, decidability, complexity, and computability.
2. Enhance/develop students' ability to understand and conduct mathematical proofs for computation and algorithms.

Text Book T1	Introduction to Automata Theory Languages, and Computation, by J.E.Hopcroft, R.Motwani & J.D.Ullman (3rd Edition) – Pearson Education
T2	Theory of Computer Science (Automata Language & Computations), by K.L.Mishra& N. Chandrashekhar, PHI
Reference Book(s) R1	Sipser, M. (2006). *Introduction to the Theory of Computation* (2nd ed.). Boston, MA: Thompson Course Technology.

Lecture wise plan

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)
1-5	To understand the basics of Automata	Introduction to Automata(Introduction and motivation, infinite sets, proofs, Closures, Alphabets, languages, and representations)	T l Ch-l 1.4,1.5,1.6,1.9
6-10	To learn the concept of Finite Automata	Finite Automata (Deterministic finite automata, Non-deterministic finite automata, Closure properties and equivalences, Regularity)	T2 Ch-2 2.1,2.2,2.3,2.9
11-15	To learn the concepts of Regular-Expression & DFA	Regular Expressions and Languages,	T1 Ch-3 3.2,3.4 T2 Ch3 3.6,3.8
16-20	To learn the concepts of Regular-Languages	Properties of Regular Languages	T1 Ch-4, 4.5, 4.6 T2 Ch4, 4.8,4.10
21-25	To understand concept of CFG	Context-Free Grammars and Languages	T1 Ch-5 5.7,5.8

26-30	To understand concept of CFG	Applications of Context-Free Grammars	T2 Ch-5 5.4,5.8
31-40	To learn the concepts of PDA and its uses, NP concept	Pushdown Automata Languages of PDA Deterministic Pushdown Automata Properties of Context-Free Languages The complexity class P, The complexity class NP	T1 Ch-5,Ch6 5.9, 6.4,7.1 T2 Ch6 6.8,7.4,7.9

Evaluation Scheme:
Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	16	01.02.2023	01-10	CB
Test 2	60 Minutes	17	02.03.2023	11-20	CB
Test 3	60 Minutes	17	04.04.2023	21- 30	OB
Quizzes	20 Minutes	10	**	**	CB
Comprehensive Exam	3 Hours	40	06.05.2023	01-40	CB

** To be announced in the class

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Dr.PALAK KESHWANI
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology
Second Semester, 2022–2023

Course Handout

Course No	Course Title	L	P	U
CA428	**Digital Marketing**	**3**	**0**	**3**

Instructor-in-charge: Mr. ASHISH KUMBHARE

Learning Outcomes:
After successful completion of the course student will be able to

1. Discuss the opportunities and risks of integrated digital marketing
2. outline an approach to developing a digital marketing plan
3. explain the key digital marketing activities needed for competitive success
4. translate some of the key marketing and business models that will help to shape their digital marketing strategy

Text Books **T1** **T2**	Digital Marketing by Seema Gupta, Third Edition, Tata McGraw Hill publication. Digital Marketing by Dr. Saroj Kumar, Thakur publication Pvt. Ltd.
Reference Book(s) R1	Fundamental of Digital Marketing by Dr. Moloy Ghoshal & Dr. Karishma Gulati Trehan

Lecture wise plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)R1
1-2	To learn about Digital Marketing Fundamentals	Introduction to Digital Marketing. Traditional Vs. Digital Marketing,	T1 CH-1 1.1,1.2,1.3
3-4	To learn about Digital Marketing Fundamentals	Technology behind Digital Marketing, Characteristics of Digital Marketing,	T1 CH-1 1.5,1.6,1.7
5-7	To learn about Digital Marketing Fundamentals	Digital Marketing Strategy, Understanding Digital Consumer**.**	T1 CH-2 2.1, 2.2, 2.3, 2.4
8-10	To learn about online advertising	Introduction, Objective, Where to Advertise, Online AdFormat, Search Engine Ad,	T1 CH-4 4.1, 4.2, 4.3, 4.4, 4.5
11-12	To learn about online advertising	Network Advertising, Affiliate Programs, Landing Pages	T1 CH-4 4.8,4.9,4.10,4.11
13	To know about Email marketing	Introduction, Types of Email,	T1 CH-5 5.1, 5.2,5.4
14-15	To know about Email	Email Marketing Campaign Process, Email	T1 CH-5

	marketing	marketing Tools,	5.5, 5.6, 5.7, 5.8
16-18	To know about Email marketing	Advantages and Disadvantages, Opt-in Email Advertising, Email tracking	T1 CH-55.9,5.10, 5.11
19-21	To know about Social media marketing	What is Social Media Marketing, Seven Myths of SMM,	T1 CH-8 8.1,8.2,8.3,8.4
22-24	To know about Social media marketing	Characteristics of Successful Social Media Marketer, Social Media Marketing plan,	T1 CH-8 8.6,8.7,8.8,8.9
25-27	To know about Social media marketing tools	Social Media marketing Tools, Publishing Blogs, Podcast and Webinars	T1 CH-99.3,9.4,9.5,9.6
28-31	To know about Social media monitoring	Social Media Monitoring, Social Media: Facebook, Twitter.	T1 CH-9 9.8,9.9,9.10,9.11 ,9.12
32-34	To learn about Search Engine Optimization	Understanding SEO, Search Engine Optimization Process – Goals,	T1 CH-11 11.1,11.2,11.3
35-36	To learn about Search Engine Optimization techniques	On-Page Optimization, Off-Page Optimization and Analyze,	T1 CH-11 11.5,11.6,11.7
37-42	To learn about Search Engine Optimization tools	Search Engine Result Process (SERP), SEO Tools.	T1 CH-11 11.9,11.10,11.12

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec. No.)	Remarks
Test 1	60 Minutes	16	02.02.2023	1-12	CB
Test 2	60 Minutes	17	01.03.2023	13- 26	CB
Test 3	60 Minutes	17	03.04.2023	27- 42	OB
Lab	Through out	10	**	**	CB
Comprehensive Exam	3 Hours	40	08.05.2023	1- 42	CB

** To be announced in the class

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Mr.ASHISH KUMBHARE
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Institute Technology

Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
ES201	**Environmental Science**	**3**	**0**	**3**

Instructor-in-charge: Ms.YUKTI DEWANGAN

Learning Outcomes:

- Master core concepts and methods from ecological and physical sciences and their application in environmental problem solving.
- To describe the challenges of maintaining Soil quality and solid waste Management
- Understand the transnational character of environmental problems and ways of addressing them, including interactions across local to global scales.
- Apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.
- Understanding of earth processes, evaluating alternative energy systems, pollution control and mitigation, natural resource management, and the effects of global warming and climate change.

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Textbook (s) **T1**	Principles of Environmental Science and Engineering, P. VenugopalaRao PHI Learning private limited, Publication)
T2	A Textbook of Environmental Chemistry and Pollution Control by S.S. Dara (S. Chand and Company)
Reference book (s) **R1**	Masters, G.M. Introduction to Environment Engineering and Science (Prentice Hall of India)
R2	Environmental Chemistry by A.K. Dey (Eastern Ltd.).
R3	Environmental Chemistry by B.K. Sharma (Krishna Prakashan).

Lecture Nos.	Learning objectives	Topics to be covered	Reference (Ch./Sec./ Page Nos.of Text Book)
1-3	Observe and describe habitats within ecosystems	Definition, Characteristics of Ecosystem: Structure of Ecosystem	T1:40-44
4-6		Function of ecosystem, Food chain, Food web, Trophic level, Energy flow, ecological pyramids.	T1: 46-54
7-9		Types of ecosystems: Aquatic ecosystems Terrestrial ecosystems	T1:59-71
10-11	To describe the challenges of maintaining Soil quality	Land Pollution, Lithosphere, pollutants	T2 110-120
12-14		Pollutants & their origin and effect, collection of solid waste Solid waste management, recycling and reuse of solid waste and their disposal techniques (open dumping, sanitary land filling, thermal, composting).	T2: 132-147
15-18			
19 -21	To describe the challenges of maintaining surface and ground water quality.	Aquatic Environment, water pollutants, Eutrophication	R2: 201-220
22-25		Chemical Speciation, monitoring techniques and methodology	R2: 12.11.1 - 12.11.12
26-27		Determination of temporary and permanent hardness of water	T1: 251-252
28-30		Waste water treatment	T1: 153-162
31- 33	To understand the sources of air pollution and describe the types of air pollutants.	Introduction- definition-classification of air pollutants- air quality standards.	T1: 125-131
34-37		Sources, Analysis, Effects and control measures for Sox, NOx, PM and CO	R2:146-172
38-40		Secondary [photochemical smog, acid rain, ozone, PAN (Peroxy Acetyl Nitrate)], Green-house effect, ozone depletion, atmospheric stability and temperature inversion,	T2 27-45

Evaluation Scheme:

Student evaluation is based on the series of Tests and Lab Tests conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	16	31.01.2023	1-12	CB
Test 2	60 Minutes	17	01.03.2023	13- 28	CB
Test 3	60 Minutes	17	03.04.2023	29- 40	OB
Quizzes (2)	20 Minutes each	10	**	**	CB
Comprehensive Exam	3 Hours	40	01.05.2023	1- 40	CB

** To be announced in the class

Make-up Policy: Make –up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Ms.YUKTI DEWANGAN
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology
Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
PGDCA121	Database Using My SQL	3	2	4

Instructor-in-charge: Mr. NAVEEN KUMAR VAISHNAV

Scope & Objective of the Course:

After successful completion of the course student will be able to:

1. To understand basic concepts and implementation issues of Database System.
2. To Learn ER-Modeling, Data models, Normalization and Functional dependencies, Relational Algebra, Implementation and Advanced Concepts.
3. To learn the hands-on database operations in SQL interface.

Textbook T1	Database System Concepts, Silberschatz A, Korth HF, and SudarshanS,TMH,2002
Reference book(s) R1	Database Management Systems, Ramakrishna R.& Gehrke J, 3rd Edition, Mc-GrawHill,2002
R2	Database Systems-The Complete book, HectorG Molina, Jeffrey D.Ullmanand Jennifer Widom, Pearson Education, 2002
NPTEL	https://nptel.ac.in/courses/106/105/106105175/
SWAYAM	https://onlinecourses.swayam2.ac.in/cec19_cs05/preview

Lecture wise plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page No.s of Text/Ref. Books)
1-2	Introduction to Database Systems	Course overview, Overview of modern DBMS	T1: 1.1-1.13
3-5	About Database	Data Views, Data Dictionary, DB Administrator	T1: 2.1-2.13
6-7	Data modeling	Basic elements of ER model, Database Design through ER-model	T1: 7.1-7.10
8-9	Understanding Relational model	Relation as a mathematical model, ER to Relational model	T1: 2.1- 2.6
10-16	Introduction to SQL constructs	SELECT…FROM, WHERE… GROUP BY… HAVING… ORDERBY…	T1: 3.1-3.9
17-25	Understanding additional SQL structures	INSERT, DELETE, UPDATE, VIEW definition and use, Temporary tables, Nested queries	T1: 4.1-4.5
26-30	Database design through Functional Dependencies & Normalization	Functional dependencies, Normal Forms: 1NF,2NF, 3NF, BCNF, Multi-valued dependencies:4NF,5NF	T1: 8.1-8.9

31-35	Formal Query Languages	Relational algebra operators, Relational algebra queries	T1: 61.-6.4
36-40	Integrity constraints	Integrity constraints: Not null, unique, check, primary key, foreign key, references, Triggers.	T1: 4.4-4.5

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Component	Duration	Weightage (%)	Date	Syllabus (Lecture No)	Remarks
Test 1	60 Minutes	16	31.01.2023	1-9	CB
Test 2	60 Minutes	17	01.03.2023	10- 25	CB
Test 3	60 Minutes	17	03.04.2023	26-40	OB
Lab	2 Hour	10	**	**	CB
Comprehensive Exams	3 Hours	40	01.05.2023	1- 40	CB

** To be announced in the class OB* = Open Book CB = Closed Book

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Mr.NAVEEN KUMAR VAISHNAV
Instructo-in-charge

Date:15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology

Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
PGDCA122	**Computer in Office – II**	**3**	**2**	**4**

Instructor-in-charge- Dr.PALAK KESHWANI

Learning Outcome –

- To use MS word application in office work such as creating professional-quality documents; store, organize and analyze information and create dynamic documentation with images, tables and much more, digitally and effectively.
- To understand basic Google Applications and build on skills beyond the traditional introduction of computer concepts and incorporates emerging technologies using Google Applications.

Textbook(s)T1	Microsoft Office 2007 Bible - John Walkenbach, Herb Tyson, Faithe Wempen, cary N.Prague, Michael R.groh, Peter G. Aitken, and Lisa a. Bucki -Wiley India pvt. ltd.
T2	Google Apps Made Easy: Learn to work in the cloud (Computers Made Easy Book 7), James Bernstein, Kindle Edition
Reference Book(s)R1	Fundamentals of computers - V.Rajaraman - Prentice- Hall of india
R2	A Conceptual Guide to OpenOffice.org 3 - R. Gabriel Gurley- create Space Independent Publishing Platform, 2008

Lecture-wise plan

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./ Page Nos. of Text Book)
1-2	MS word basics	Typing the text, Alignment of text , Editing Text: Cut, Copy, Paste, Select All, Clear, Find & Replace	T1 CH-13 13.1,13.2
3-5	Text formatting and saving file	New, Open, Close, Save, Save As, Formatting Text Font Size, Font Style, Font Color, Use the Bold, Italic, and Underline, Change the Text Case, Line spacing, Paragraph spacing, Shading text and paragraph, Working with Tabs and Indents	T1 CH-13 13.3,13.4
6-8	Working with objects	Shapes, Clipart and Picture, Word Art, Smart Art, Columns and Orderings - To Add Columns to a Document, Change the Order of Objects, Page Number, Date & Time, Inserting Text boxes,	T1 CH-13 13.5

		Inserting Word art, Inserting symbols, Inserting Chart	
9-10	Working with Bullets, numbered lists and Header/ Footer	Inserting custom Header and Footer, Inserting objects in the header and footer, Add section break to a document, Multilevel numbering and Bulleting, Creating List, Customizing List style, Page bordering, Page background	T1 CH-14 14.1,14.2
11-15	Working with Tables, its styles and contents	Working with Tables, Table Formatting, Table Styles, Alignment option, Merge and split option, Using Build- in Styles, Modifying Styles, Creating Styles, Creating a list style, Table of contents and references, Adding internal references , Adding a Footnote , Adding Endnote	T1 CH-14 14.4, 14.5
16-20	Merging Documents	Typing new address list, Importing address list from Excel file, Write and insert field , Merging with outlook contact, Preview Result , Merging to envelopes, Merging to label, Setting rules for merges, Finish & Merge options	T1 CH-14 14.3
21-22	Proofing the documents	Check Spelling As You Type, Mark Grammar Errors As You Type, Setting AutoCorrect Options	T1 CH-16 16.1,16.2
23-25	Management of Emails	Introduction to E-mail, Email addressing, Inbox, outbox, spam and other functionalities of mailbox, Creating, viewing, sending, replying of Email message, Forwarding, sorting and searching of emails, Saving mails, Sending attachments	T2 CH-3 3.1, 3.2, 3.3, 3.4
26-28	Working with Google Calendar	Introduction to google calendar, scheduling an event	T2 CH-5 5.1, 5.2, 5.3
29-30	Working with Google Drive	Introduction to google drive, uploading and accessing files/folder, adding restrictions	T2 CH-6 6.1, 6.2, 6.3, 6.4, 6.5
31-35	Working with Google Forms	Introduction to google forms, creating a form, sharing form, creating quiz, manage response.	T2 CH-7 7.1, 7.2, 7.3, 7.4, 7.5, 7.6
36-40	Working with Google doc, sheet and slide	Create document in google doc, sheet in google sheet, presentation in google slide.	T2 CH-9,CH-10, CH-11

Evaluation Scheme:
Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	16	31.01.2023	01-10	CB
Test 2	60 Minutes	17	01.03.2023	11-20	CB
Test 3	60 Minutes	17	03.04.2023	21- 30	OB
Quizzes	50 Minutes	10	**	**	CB
Comprehensive Exam	3 Hours	40	03.05.2023	01-40	CB

** To be announced in the class

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc

Dr.PALAK KESHWANI
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology
Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
PGDCA123	**Object Oriented Programming**	**3**	**2**	**4**

Instructor-in-charge: Mr. ASHISH KUMBHARE

Learning Outcomes:

After successful completion of the course student will be able to

1. Isolate and fix common errors in C++ programs
2. Manipulate various C/C++ Data types, such as arrays, strings, and pointers
3. Use memory appropriately, including proper allocation/de allocation procedures
4. Apply object-oriented approaches to software problems in C++
5. Understand and use the basic programming constructs of C/C++
6. Write small-scale C++ programs using the above skills

TextBook T1,T2	E. Balagurusamy – Object Oriented Programming with C++, Fifth edition, Tata McGraw Education Hill, 2011. Ashok N. Kamthane, Object oriented Programming with ANSI & Turbo C++, First Edition, Pearson India
Reference Book(s) R1	Herbert Schildt , The complete reference C++Fourth Edition Tata McGraw-Hill

Lecture wise plan

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)R1
1	To learn the OOPs fundamentals	What is OOPs? Procedure Oriented Programming vs. Object Oriented Programming.	255
2-4	To learn the OOP's principles	Abstraction Encapsulation, Polymorphism and Inheritance	257-260
5-7	To learn about Classes and Objects	Objects and Instances Class Members	289
8-9	To know about Language Constructs	Programming basics, data type, loops and decisions, Control statements	70-88
10-13	To Learn about Class Member functions and Objects	Classes and Member functions Constructors and destructors	289-324
14-16	To learn about Strings Objects	Creation and Manipulation of Strings String I/O	683-693
17-19	To define and use operators for user defined types	Operator Overloading and multiple overloading with type conversion	384-414
20-23	To learn about Inheritance	Class Single and Multiple Inheritance,	417-425

24-25	To learn about Inheritance	Member Specifiers Derived classes	426-430
26-29	To learn about Polymorphism and need and importance of Virtual Functions	Virtual Function, function call binding, late binding	444-447
30-34	To learn about Polymorphism and need and importance of Virtual Functions	Friend and static function, this operator	332,310-315,297-302
35-36	To learn about handling the file Object	Mechanism, try, throw and catch	494
37-42	To learn about handling the file Object	Catching all Exceptions, Multiple catches	495

Object Oriented Programming Lab:

S.No	List of Practical
1.	Write a C++ program to demonstrate conditional statements.
2.	Write a C++ program to demonstrate looping statements.
3.	Write a C++ program to demonstrate Class and Object.
4.	Write a C++ program to demonstrate constructor.
5.	Write a C++ program to demonstrate Friend function.
6.	Write a C++ program to demonstrate function overloading.
7.	Write a C++ program to demonstrate Operator overloading.
8.	Write a C++ program to demonstrate Single and Multiple Inheritance.
9.	Write a C++ program to demonstrate Multilevel and Hierarchical Inheritance.
10.	Write a C++ program to demonstrate Exception Handling.

Evaluation Scheme:
Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec. No.)	Remarks
Test 1	60 Minutes	16	01.02.2023	1-12	CB
Test 2	60 Minutes	17	02.03.2023	13- 26	CB
Test 3	60 Minutes	17	04.04.2023	27- 42	OB
Lab	Through out	10	**	**	CB
Comprehensive Exam	3 Hours	40	05.05.2023	1- 42	CB

** To be announced in the class

Make-up Policy: Make up will be given only under genuine circumstances for Tests Only. However prior and proper intimation to the concerned instructor is must.

General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Mr.ASHISH KUMBHARE
Instructor-in-charge

Date:15-01-2023

The ICFAI University, Raipur

Faculty of Science and Technology

Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
PGDCA124	**Fundamentals of Finance and Accounting**	**3**	**0**	**3**

Instructor-in-charge: Mr .JITENDRA KUMAR SINGH

Learning Outcomes:

After successful completion of the course student will be able to

1. Explain the accounting information system and demonstrate how it is used to record and report common business transactions. Describe the conceptual framework for financial reporting.
2. Know and apply Accounting and Finance theory
3. Explain and apply international accounting standards
4. Critically evaluate financial statement information
5. Evaluate and compare different investments.

Text books T1 T2	Financial Accounting, S.M.Shukla, Shahitya Bhawan Publication Financial Management, S.P Gupta, Shahitya Bhawan Publicatio
Reference books R1	Financial Accounting, Mukherjee & Hanif, McGraw-Hill Education (India) Pvt Limited, 2003
R2	Financial Accounting, Grewal, Shukla, S. Chand (Sultan Chand Publications), Delhi
Swayam Link	https://onlinecourses.swayam2.ac.in/

Lecture-wise Plan

Lecture Nos	Learning Objective	Topics to be covered	Reference
1	Accounting Principles	International Accounting Standards (only outlines); Accounting principles; Accounting Standards in India	T1:1.1
2-5	Accounting transactions	Accounting Cycle; Journal; Rules of debit and credit; Compound journal entry.	T1:1.2-1.5
6-8	Accounting transactions	Opening entry; Relationships between Journal and Ledger;	T1:1.6-1.7
9-10	Accounting transactions	Rules regarding posting; Trial balance; Subdivisions of a journa	T1:1.9; 2.3-2.4
11-13	Capital and Revenue	Classification of income; Classification of expenditure; Classification of receipt.	T1:2.1,2.5-2.9
13-15	Capital and Revenue	Accounting concepts of income; Accounting concepts and income	T1:3.1-3.3,

		measurement, Expired costs and income measurement	3.5-3.8
16-23	Final Accounts;	Manufacturing account; Trading account; Profit and loss account; Balance Sheet	T1:4.1-4.6
24-29	Final Accounts;	Adjustment entries, Rectification of errors, Classification of errors; Location of errors; Suspense accounts; Effects on profit.	T1:4.7 -4.11
30 -32	Depreciation Provisions and Reserves**:**	Concept of depreciation; Causes of depreciation; Depreciation, depletion, amortization.	T1:5.1-5.4
33-35	Depreciation accounting	Methods of recording depreciation; Methods for providing depreciation; Depreciation of different assets; Depreciation of replacement cost;	T1:5.5-5.8
36- 37	Depreciation accounting	Depreciation accounting as per accounting standard; Depreciation accounting; Provisions and reserves	T1:6.1-6.5
38	SPECIAL ACCOUNTING AREAS: Hire Purchase and instalment system	Meaning of hire purchase contract, legal provision	T1:7.1-7.2,7.5
39-40	Hire Purchase and instalment system	Accounting regarding hire- purchase contract.	T1:7.6-7.7

Evaluation Scheme:

Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	16	01.02.2023	1-12	CB
Test 2	60 Minutes	17	02.03.2023	13- 28	CB
Test 3	60 Minutes	17	04.04.2023	29- 42	OB
Lab	Throughout the Semester	10	**	**	CB
Comprehensive Exam	3 Hours	40	06.05.2023	1- 42	CB

** To be announced in the class

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Mr.JITENDRA SINGH
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology

Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
DCA121	Database Using MS Access	3	2	4

Instructor in charge: Mr. NAVEEN KUMAR VAISHNAV

Scope & Objective of the Course:

After successful completion of the course student will be able to:

1. To understand basic concepts and implementation issues of Database System.
2. To learn ER modeling, Data models, Normalization and Functional dependencies, Relational Algebra, Implementation and Advanced Concepts.
3. To learn the hands-on database operations in SQL interface.

Textbook T1	Database System Concepts, Silberschatz A, Korth HF, and SudarshanS,TMH,2002
Reference book(s) R1	Database Management Systems, Ramakrishna R.& Gehrke J, 3rd Edition, Mc-GrawHill,2002
R2	Database Systems-The Complete book, HectorG Molina, Jeffrey D.Ullmanand Jennifer Widom, Pearson Education, 2002
NPTEL	https://nptel.ac.in/courses/106/105/106105175/
SWAYAM	https://onlinecourses.swayam2.ac.in/cec19_cs05/preview

Lecture wise plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page No.s of Text/Ref. Books)
1-2	Introduction to Database Systems	Course overview, Overview of modern DBMS	T1: 1.1-1.13
3-5	About Database	Data Views, Data Dictionary, DB Administrator	T1: 2.1-2.13
6-7	Data modeling	Basic elements of ER model, Database Design through ER-model	T1: 7.1-7.10
8-9	Understanding Relational model	Relation as a mathematical model, ER to Relational model	T1: 2.1- 2.6
10-16	Introduction to SQL constructs	SELECT…FROM, WHERE… GROUP BY… HAVING… ORDERBY…	T1: 3.1-3.9

17-25	Understanding additional SQL structures	INSERT, DELETE, UPDATE, VIEW definition and use, Temporary tables, Nested queries	T1: 4.1-4.5
26-30	Database design through Functional Dependencies & Normalization	Functional dependencies, Normal Forms: 1NF,2NF, 3NF, BCNF, Multi-valued dependencies:4NF,5NF	T1: 8.1-8.9
31-35	Formal Query Languages	Relational algebra operators, Relational algebra queries	T1: 61.-6.4
36-40	Integrity constraints	Integrity constraints: Not null, unique, check, primary key, foreign key, references, Triggers.	T1: 4.4-4.5

Evaluation Scheme:

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Component	Duration	Weightage (%)	Date	Syllabus (Lecture No)	Remarks
Test 1	60 Minutes	16	31.01.2023	1-9	CB
Test 2	60 Minutes	17	01.03.2023	10- 25	CB
Test 3	60 Minutes	17	03.04.2023	26-40	OB*
Lab	2 Hour	10	**	**	CB
Comprehensive Exams	3 Hours	40	01.05.2023	1- 40	CB

** To be announced in the class OB* = Open Book CB = Closed Book

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General: It shall be the responsibility of individual students to attend all sessions, to take prescribed Assessment Tests, Tests and Comprehensive Examinations, etc.

Mr. NAVEEN KUMAR VAISHNAV

Date: 15-01-2023 **Instructor-in-charge**

The ICFAI University, Raipur

Faculty of Institute Technology
Second Semester, 2022 – 2023

Course Handout

Course No	Course Title	L	P	U
DCA122	**Hardware Basic & Introduction to Computers**	**3**	**2**	**4**

Instructor-in-charge: Dr.RAMESH KUMAR YADAV

Learning Outcomes:

The learning objectives of this course are to:

The Course in Hardware and Networking helps students become industry ready for careers in Hardware and Networking immediately post completion of the course.

Text Book T1	Comdex Hardware and Networking Course Kit (English, Paperback, Gupta Vikas)
Text Book T2	Computer Networking With Internet Protocols and Technology by STALLINGS (Author)
Reference Book(s) R1	PC Hardware: The Complete Reference by Craig Zacker (Author), John Rourke (Author)

Lecture wise plan

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)
1-5	To understand the basics of computer	Computer Fundamentals o Introduction to Computers o Types of Computers o Introduction to Input Output Devices o Introduction to Storage Devices o Principals of Data Communication	T l Ch-l 1.4,1.5, T2,Ch1.6,1.9
6-10	To learn the concept of basic installations	Assembling and Installation o Hardware Configuration o Introduction to basic components of a typical PC o Assembling a PC o Formatting, Installing Operating System and other system software	T1 Ch-2 2.1,2.4,2.7,2.9
16-20	To learn the basic knowledge of Troubleshooting	Troubleshooting o Basic Trouble shooting during the assembling o Basic troubleshooting of PC	T1 Ch-3 3.1,3.7 T2 Ch3 5.6,3.8
21-23	To learn the concepts of Networking Fundamentals	Networking Fundamentals o Introduction to various types of cables and connectors used in networking o Introduction to networking and networking concepts,	T1 Ch-4 4.7, 4.4 T2 Ch4 4.8,4.10

		networking topology and protocols	
24-25	To understand concept of Basic network devices	Basic network devices introduction: Repeaters, Hubs, Switches, Bridges, Routers o WAN o Hubs vs. Switches	T2 Ch-5 5.5,5.9
26-30	Tounderstand concept of server controls	Network Installation and Configuration o Structured Cabling o LAN Practical's o IP Addressing and IP Classes o TCP/IP Concepts and configuration of IP Address	T2 Ch-5 5.3,5.7
31-40	To learn the concepts of Security	Introduction to Security policy Strategies for secure network. Types of attacks, Viruses and Types of viruses.	R1 Ch-5,Ch6 5.7, 6.4,7.2 T2 Ch6 6.9,7.4,7.9

Evaluation Scheme:
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Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	17	01.02.2023	1-12	CB
Test 2	60 Minutes	17	02.03.2023	13- 28	CB
Test 3	60 Minutes	16	04.04.2023	29- 42	OB
Quizzes (2)	20 Minutes each	10	**	**	CB
Comprehensive Exam	3 Hours	40	05.05.2023	1- 40	CB

** To be announced in the class

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Dr.RAMESH KUMAR YADAV
Instructor-in-charge

Date: 15-01-2023

The ICFAI University, Raipur

Faculty of Information Technology
Second Semester, 2022 – 2023
Course Handout

Course No.	Course Title	L	P	U
DCA123	**Computer in Office – II**	**3**	**2**	**4**

Instructor-in-charge: Dr.PALAK KESHWANI

Learning Outcome –

- To use MS word application in office work such as creating professional-quality documents; store, organize and analyze information and create dynamic documentation with images, tables and much more, digitally and effectively.
- To understand basic Google Applications and build on skills beyond the traditional introduction of computer concepts and incorporates emerging technologies using Google Applications.

Textbook(s) T1	Microsoft Office 2007 Bible - John Walkenbach, Herb Tyson, Faithe Wempen, cary N.Prague, Michael R.groh, Peter G. Aitken, and Lisa a. Bucki -Wiley India pt. ltd.
T2	Google Apps Made Easy: Learn to work in the cloud (Computers Made Easy Book 7), James Bernstein, Kindle Edition
Reference Book(s) R1	Fundamentals of computers - V.Rajaraman - Prentice- Hall of india
R2	A Conceptual Guide to OpenOffice.org 3 - R. Gabriel Gurley- create Space Independent Publishing Platform, 2008

Lecture-wise plan

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./ Page Nos. of Text Book)
1-2	MS word basics	Typing the text, Alignment of text , Editing Text: Cut, Copy, Paste, Select All, Clear, Find & Replace	T1 CH-13 13.1,13.2
3-5	Text formatting and saving file	New, Open, Close, Save, Save As, Formatting Text Font Size, Font Style, Font Color, Use the Bold, Italic, and Underline, Change the Text Case, Line spacing, Paragraph spacing, Shading	T1 CH-13 13.3,13.4

6-8	Working with objects	Shapes, Clipart and Picture, Word Art, Smart Art, Columns and Orderings - To Add Columns to a Document, Change the Order of Objects, Page Number, Date & Time, Inserting Text boxes, Inserting Word art, Inserting symbols, Inserting Chart	T1 CH-13 13.5
9-10	Working with Bullets, numbered lists and Header/ Footer	Inserting custom Header and Footer, Inserting objects in the header and footer, Add section break to a document, Multilevel numbering and Bulleting, Creating List, Customizing List style, Page bordering, Page background	T1 CH-14 14.1,14.2
11-15	Working with Tables, its styles and contents	Working with Tables, Table Formatting, Table Styles, Alignment option, Merge and split option, Using Build- in Styles, Modifying Styles, Creating Styles, Creating a list style, Table of contents and references, Adding internal references , Adding a Footnote , Adding Endnote	T1 CH-14 14.4, 14.5
16-20	Merging Documents	Typing new address list, Importing address list from Excel file, Write and insert field , Merging with outlook contact, Preview Result , Merging to envelopes, Merging to label, Setting rules for merges, Finish & Merge options	T1 CH-14 14.3
21-22	Proofing the documents	Check Spelling As You Type, Mark Grammar Errors As You Type, Setting AutoCorrect Options	T1 CH-16 16.1,16.2
23-25	Management of Emails	Introduction to E-mail, Email addressing, Inbox, outbox, spam and other functionalities of mailbox, Creating, viewing, sending, replying of Email message, Forwarding, sorting and searching of emails, Saving mails, Sending attachments	T2 CH-3 3.1, 3.2, 3.3, 3.4
26-28	Working with Google Calendar	Introduction to Google calendar, scheduling an event	T2 CH-5 5.1, 5.2, 5.3

29-30	Working with Google Drive	Introduction to Google drive, uploading and accessing files/folder, adding restrictions	T2 CH-6 6.1, 6.2, 6.3, 6.4, 6.5
31-35	Working with Google Forms	Introduction to Google forms, creating a form, sharing form, creating quiz, manage response.	T2 CH-7 7.1, 7.2, 7.3, 7.4, 7.5, 7.6
36-40	Working with Google doc, sheet and slide	Create document in Google doc, sheet in Google sheet, presentation in Google slide.	T2 CH-9,CH-10, CH-11

Evaluation Scheme:
Student evaluation is based on the series of Tests and Quizzes conducted during the course of semester followed by a comprehensive examination.

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	16	31.01.2023	01-10	CB
Test 2	60 Minutes	17	01.03.2023	11-20	CB
Test 3	60 Minutes	17	03.04.2023	21- 30	OB
Quizzes	50 Minutes	10	**	**	CB
Comprehensive Exam	3 Hours	40	01.05.2023	01-40	CB

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Dr.PALAK KESHWANI
Instructor-in-charge

Date: 15-01-2023