The ICFAI University, Raipur

Faculty of Science and Technology

Second Semester, 2024–2025
Course Handouts

Table of Contents

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
CAC121	**Computer Programming II**	**3**	**2**	**0**	**4**

Instructor-in-charge: Dr.NISHA THAKUR

Learning Outcome:
The learning objective of Python is to equip individuals with the ability to write clear, efficient, and scalable code for a wide range of applications. Python's simplicity and versatility enable learners to develop skills in problem-solving, algorithm design, and software development. The goal is to understand core programming concepts such as data types, control structures, functions, and object-oriented programming while leveraging Python's extensive libraries and frameworks for tasks like data analysis, web development, and automation. By mastering Python, learners gain the tools to build real-world applications, collaborate effectively in teams, and adapt to evolving technological challenges.

Text Book T1	Python Programming by Rao, K. Nageswara Shaikh Akbar, Scitech Publications (India) Pvt. Ltd.
Text Book T2	Learning Python by Lutz, Mark, 5th Edition, O'Reilly Publication.
Reference Book R1	Python Essential Reference by Beazley, David, 4th Edition, Addison-Wesley Professional.
Reference Book R2	Head First Python by Paul, Barry, 2d Edition, O'Reilly Publication.

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning	Reference (Ch./Sec. /Pg No)
1	Introduction and Syntax of Python Program:	Features of Python-Interactive, Object-oriented, Interpreted, platform-independent.	a. Group Learning and Teaching	T1: Ch-1

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning	Reference (Ch./Sec. /Pg No)
2-3	Introduction and Syntax of Python Program:	Python building blocks - Identifiers, Keywords, Indention, Variables, Comments, Python environment setup Installation and working of IDE	a. Group Learning and Teaching	T2: Ch-1
4-5	Introduction and Syntax of Python Program:	Running Simple Python scripts to display 'welcome' message,	a. Group Learning and Teaching	T1: Ch-2,
6-7	Introduction and Syntax of Python Program:	Python Data Types: Numbers, String, Tuples, Lists, Dictionary.	a. Group Learning and Teaching	T2: Ch-1
8-10	Introduction and Syntax of Python Program:	Declaration and use of data types.	c. Technology based Learning	T1: Ch-3
11-13	Python Operators and Control Flow statements	Basic Operators: Arithmetic, Comparison/ Relational, Assignment, Logical, Bitwise,	c. Technology based Learning	
14-15	Python Operators and Control Flow statements	Membership, Identity operators, Python Operator Precedence,	c. Technology based Learning	T1: Ch-4
16-18	Python Operators and Control Flow statements	Control Flow, Conditional Statements (if, if ... else, nested if)	c. Technology based Learning	T1: Ch-7, T2: Ch-2

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning	Reference (Ch./Sec. /Pg No)
19-20	Python Operators and Control Flow statements	Looping in python (while loop, for loop, nested loops), loop manipulation using continue, pass, break, else.	d. Peer teaching	T2: Ch-3
21-24	Data Structures in Python	List: Defining lists, accessing values in list, deleting values in list, updating lists, Basic List Operations, Built-in List functions.	d. Peer teaching	T1: Ch-10,
25-30	Data Structures in Python	Tuples: Accessing values in Tuples, deleting values in Tuples, and updating Tuples, Basic Tuple operations, Built in Tuple functions.	d. Peer teaching	T2: Ch-3
31-33	Python Functions and modules	Use of Python built-in functions (e.g. type/ data conversion functions, math functions etc.), User-defined functions: Function definition, Function calling, function arguments and parameter passing,	d. Peer teaching	T1: Ch-11, T2: Ch-3
34-35	Python Functions and modules	Scope of Variables: Global variable and Local Variable. Modules: Writing modules, importing modules, importing	b. Game Based Learning	T1: Ch-13, T2: Ch-4

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning	Reference (Ch./Sec. /Pg No)
		objects from modules,		
36	Python Functions and modules	Python built-in modules (e.g. Numeric and mathematical module, Functional Programming Module) Namespace and Scoping.	b. Game Based Learning	T2: Ch-5
37-38	File I/O Handling	I/O Operations: Reading keyboard input, Printing to screen,	e. Project based Learning	T1: Ch-19, T2: Ch-5
39-40	File I/O Handling	File Handling: Opening file in different modes, accessing file contents using standard library functions, Reading and writing files, closing a file, Renaming and deleting files.	e. Project based Learning	T1: Ch-23, T2: Ch-5
17-18	MAC	Multiple Access Protocols	e. Project based Learning	T1: Ch-13, T2: Ch-4
19	Design of Network Layer	Network Layer Design Issues	e. Project based Learning	T2: Ch-5

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning	Reference (Ch./Sec. /Pg No)
20-21	Types of Routing	Routing Algorithms	b. Game Based Learning	T1: Ch-19, T2: Ch-5
22-23	Removing Congestion on Network	Congestion Control Algorithms	b. Game Based Learning	T1: Ch-23, T2: Ch-5
24	Internetworking	Quality Of Service, Internetworking	d. Peer teaching	T1: Ch-23
25	Protocols of Transport Layer	The Transport Service	d. Peer teaching	T1: Ch-22, T2: Ch-6
26-27	Protocols of Transport Layer	Elements of Transport Protocols, A Simple Transport Protocol	d. Peer teaching	T1: Ch-22, T2: Ch-6
28-29	Internet Transport Protocols	The Internet Transport Protocols: UDP, The Internet Transport Protocols: TCP	c. Technology based Learning	T1: Ch-22
30-34	Services of Application Layer	DNS--Domain Name System, Electronic Mail, The World Wide Web	c. Technology based Learning	T1:Ch 25,26, 27,T2:Ch-7
35-38	Security on Networks	Cryptography, Symmetric-Key Algorithms	c. Technology based Learning	T1: Ch-29,31, T2: Ch-8

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning	Reference (Ch./Sec. /Pg No)
39-40	Algorithms	Public-Key Algorithms	c. Technology based Learning	T2: Ch-8

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	10	17-02-2025	1-10	CB
Test 2	60 Minutes	10	07-04-2025	11-20	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	**	CB
Comprehensive Exam	3 Hours	70	01-05-2025	01-40	CB

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

Date: 08/01/2025

Dr.NISHA THAKUR
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
CAC122	**Operating Systems**	**3**	**2**	**0**	**4**

Instructor-in-charge: Mr.ASHISH KUMBHARE

Learning Outcome

1. To understand the basic concepts and functions of operating systems.
2. To understand Processes and Threads
3. To analyze Scheduling algorithms.
4. To understand the concept of Deadlocks.
5. To analyze various memory management schemes.
6. To understand I/O management and File systems.

Text Book T1	Operating System Concepts , Silbverschatz, A and Galvin, P.B, 7th edition, Addison, Wesley, 1998.
Text Book T2	Operating Systems- A concept bases approach, Dhamdhere D.M., 2nd edition, TMH 2006.
Reference Book R1	Operating Systems, Stallings W, 4th edition, PHI, 2001.
Reference Book R2	The design of the Unix operating System, Bach, M.J, PHI, 1986.
Reference Book R3	Modern Operating Systems, Tanenbaum, A.S,PHI, 1996.
NPTEL	https://nptel.ac.in/courses/106/105/106105214/

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Page Nos. of Text Book)
1	To understand what is operating system and its functions	Overview	c. Technology based Learning	T1 CH-1
2		Types of OS	c. Technology based Learning	T1 CH-1

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Page Nos. of Text Book)
3		Design Approaches	c. Technology based Learning	T1 CH-1
4		System call, context switching	c. Technology based Learning	T1 CH-2
5		System design implementation	c. Technology based Learning	T1 CH-3
6	To understand the concept of process and its various states	Process overview(State, PCB)	c. Technology based Learning	T1 CH-4
7-8		Process Scheduling	c. Technology based Learning	T1 CH-4
9		Threads	c. Technology based Learning	T1 CH-5
10		Inter Process Communication (IPC)	c. Technology based Learning	T1 CH-5
11	To know what is scheduling and its importance	CPU Scheduling Overview	d. Peer teaching	T1 CH-6
12-13		Scheduling Algorithms	d. Peer teaching	T1 CH-6
14	To understand the problem of Critical Section and its solution	Critical Section Problem	c. Technology based Learning	T1 CH-7
15		Multi Process Solution	c. Technology based Learning	T1 CH-7
16		Semaphores	c. Technology based Learning	T1 CH-7
17		Classical Problems of Synchronization	c. Technology based Learning	T1 CH-7
18-20	To know what is deadlock and its handling	Deadlock Handling	c. Technology based Learning	T1 CH-8

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Page Nos. of Text Book)
21	To understand various memory management schemes and their relative advantages and disadvantages	Memory Management Overview	c. Technology based Learning	T1 CH-9
22-23		Paging	c. Technology based Learning	T1 CH-9
24		Segmentation	c. Technology based Learning	T1 CH-9
25		Segmentation with Paging	c. Technology based Learning	T1 CH-9
26		Virtual Memory	c. Technology based Learning	T1 CH-10
27		Demand Paging	c. Technology based Learning	T1 CH-10
28		Page Replacement	c. Technology based Learning	T1 CH-10
29		Page Replacement Algorithms	c. Technology based Learning	T1 CH-10
30		Thrashing	c. Technology based Learning	T1 CH-10
31	To understand the concept of files, its types, attributes and operations	File Operations	c. Technology based Learning	T1 CH-11
32		Directory Structure	c. Technology based Learning	T1 CH-11
33		File-System Structure	c. Technology based Learning	T1 CH-12
34		Allocation Methods	c. Technology based Learning	T1 CH-12
35-39		I/O Systems	c. Technology based Learning	T1 CH-12

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Page Nos. of Text Book)
40		Disk Scheduling	d. Peer teaching	T1 CH-13

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	10	17-02-2025	1-15	CB
Test 2	60 Minutes	10	07-04-2025	06-25	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	**	CB
Comprehensive Exam	3 Hours	70	05-05-2025	01-40	CB

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

Date: 03/01/2025

Mr.ASHISH KUMBHARE
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
CAC123	**Computer Architecture and Organization**	**3**	**2**	**0**	**4**

Instructor-in-charge: Mr.ASHISH KUMBHARE

Learning Outcomes:

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 and Sequential Circuits and its working architecture

Text Book T1	Computer Fundamental, Pradeep K. Sinha Sixth Edition BPB Publication.
Reference Book R1	Computer Architecture & Organization by Moriss Manno, 3rd edition, Print ice Hall of India Pvt Ltd.
Reference Book 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	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (chapter/sec. /Page Nos of Text/Ref. Books).
1-2	Introduction to Computer Organization	CPU architecture, Stack organization, Instruction format	c. Technology based Learning	T1 : CH 1, 2

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (chapter/sec. /Page Nos of Text/Ref. Books).
3-5	Addressing in Computer Organization	Address instructions, Addressing modes	d. Peer teaching	T1 : CH 12
6-9	Memory in Computer Organization	Computer memory system, Cache Memory and It's types	c. Technology based Learning	T1 : CH 3
10-12	Binary arithmetic & Conversion	inter-conversion of number system	d. Peer teaching	T1 : CH 5
13-17	Digital codes	Binary coded decimal(BCD), Gray code, Excess-3 code, Format of ASCII code.	d. Peer teaching	T1 : CH 4
20-25	Logic Gates	Positive and negative logics, NOT gate, OR gate, AND gate, NAND gate, NOR gate, EX-OR and EX- NOR gates	d. Peer teaching	T1 : CH 6
26-28	Circuit diagram and Universal Gates	Truth table, Circuit diagram, universal property of NAND and NOR gates.	d. Peer teaching	T1 : CH 6
29-32	Boolean Algebra	Boolean operation, logic expressing, rules and laws of Boolean algebra,	d. Peer teaching	T1 : CH 6

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (chapter/sec. /Page Nos of Text/Ref. Books).
32-36	Simplification & K-Map	Demorgan's theorems, simplification of Boolean expression using Boolean algebra techniques, Karnaugh map techniques	d. Peer teaching	R1 : 1.4
37-40	Combinational & Sequential Circuits	Half adder, Full adder, Multiplexer, Flip-Flops, Registers, Shift registers, counters	d. Peer teaching	R1 : 1.5-1.7

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	10	18-02-2025	1-15	CB
Test 2	60 Minutes	10	08-04-2025	16-23	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	**	CB
Comprehensive Exam	3 Hours	70	07-05-2025	1-40	CB

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

Date: 07/01/2025

Mr.ASHISH KUMBHARE
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
SCA121	**Hindi Language**	**2**	**0**	**0**	**2**

Instructor-in-charge: Dr.JAYA SINGH

Learning Objectives:

1. भाषा के प्रति रूचि उत्पन्न कराना
2. सम्प्रेषण में विकास कराना
3. भाषा को सुदृढ़ बनाना
4. शब्द्कोश में विकास कराना
5. भाषा में शुध्द्धि, अशुद्धि का ज्ञान कराना

Text Book T1	*भारतीयता के अमर स्वर मध्यप्रदेशहिंदी ग्रन्थ अकादमी ,भोपाल*
Reference Books R1	हिंदी शब्द –अर्थ- प्रयोग (डॉ.हरदेव बाहरी)अभिव्यक्ति प्रकाशन
Reference Books R2	नेट/स्लेटहिंदी भाषा
Reference Books R3	हिंदी व्याकरण , डॉ. भोला नाथ तिवारी
Website	https://www.bsakari.com , hi.m.wikipedia.org/wiki/pallavan
Website	https://www.learncbse.in, hi.m.wikipedia.org/wiki/pallavan

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning	Reference (chapter/ Sec. /Page Nos of Text/Ref. Books)
01	व्याकरण से भाषा प्रवाह सुदृढ़ होगा	संज्ञा,सर्वनाम	Group Learning and Teaching.	T1,P.1/CH-2 PG.10-11

Lecture Nos.	Learning Objective	Topics to be covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning	Reference (chapter/ Sec. /Page Nos of Text/Ref. Books)
02	मानक भाषा और अमानक भाषा का अर्थ जन सकेंगे	मानक हिंदी भाषा	Group Learning and Teaching	T1, P.2 CH-2 PG 101-136
03	भाषा शब्द शुद्धि वाक्य शुद्धि हिंदी वर्तनी संबंधी अशुद्धियाँ की जानकारी प्राप्त होगी	शुद्धि वाक्य शुद्धि हिंदी वर्तनी संबंधी अशुद्धियाँ	Game Based Learning	T1, P.2 CH-2 PG 101-136
04	पारिभाषिक शब्दावली	मुहावरे और लोकोक्तियाँ	Group Learning and Teaching	T1,P. 2/CH-3 PG No.174 ,180,210, 214
05	संस्कृत और हिंदी में आम बोलचाल के प्रयोग में अन्तर समझ सकेंगे	तत्सम और तद्भव शब्द	Peer teaching	T1,P.1 /CH-1 PG No.12-13
06	पल्लवन में व्याख्या कर सकेंगे i	पल्लवन	Group Learning and Teaching.	T1, P.2/ CH-1 PG No. 31-39
07	शब्दों के अर्थे और विपरीत अर्थ समझ सकेंगे	समानार्थी शब्द, विरुद्धार्थी शब्द	Group Learning and Teaching.	T1,P.1 /CH-1 PG No.121-129
08	विषय के निश्चित क्षेत्र में उपयोग में आने वाले शब्द	पारिभाषिक शब्दावली,	Group Learning and Teaching.	T1,P. 2/CH-3 PG No.69-78
09	पदनाम	हिंदी में पदनाम	Game Based Learning	T1,P. 2/CH-3 PG No.205-209

Lecture Nos.	Learning Objective	Topics to be covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning	Reference (chapter/ Sec. /Page Nos of Text/Ref. Books)
10	व्याकरण में रस के प्रकार और अलंकार को समझ सकेंगे	रस ,अलंकार	Group Learning and Teaching.+ Game Based Learning	T1, P.1 CH-1 PG No.1 &24
11	समास, प्रकार और उपयोग के बारे में जानेंगे	समास	Group Learning and Teaching.	T1, P.1 CH-1 PG No.1 &24
12	क्रमशः	समास	Group Learning and Teaching	T1, P.1 CH-1 PG No.1 &24
13	अपठित गद्यांश का महत्त्व समझेंगे	अपठित गद्यांश	Group Learning and Teaching.	T1, P.2/ CH-1 PG No. 211-214\
14	समश्रुत शब्द	समश्रुत शब्द	Group Learning and Teaching	T1, P.2/ CH-1 PG No. 147--158\
15	संधि और संधि के प्रकारों का ज्ञान प्राप्त होगा	संधि	Group Learning and Teaching	T1, P.1 CH-1 PG No.1 &24
	विभिन्न आवेदन पत्र एवं पत्र लिखने की समझ प्राप्त कर सकेंगे	पत्र लेखन पत्राचार (i)	Group Learning and Teaching.	T1-P.3,/CH-3 PG No. 237-242
17	विभिन्न आवेदन पत्र एवं पत्र लिखने की समझ प्राप्त कर सकेंगे	पत्र लेखन पत्राचार (II)	Group Learning and Teaching.	T1-P.3,/CH-3 PG No. 237-242
18	विशेषण,क्रिया विशेषणकी परिभाषा , प्रकार और उपयोग समझ सकेंगे	विशेषण,क्रिया विशेषण	Group Learning and Teaching.	T1-P.3,/CH-3 PG No. 249-256

Lecture Nos.	Learning Objective	Topics to be covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning	Reference (chapter/ Sec. /Page Nos of Text/Ref. Books)
19	Doubt Clearing Session	All Course Content	(Group discussion) Group Learning and Teaching.	
20	बाल मनोविज्ञान पर आधारित कहानी से मानवीय संवेग मुखरित होंगे.	ईदगाह-मुंशी प्रेमचंद	Group Learning and Teaching.	T1-P.3,/CH-3 PG No. 49-53
21	Revision	All syllabus	Group Learning and Teaching.	
22	Discussion	Problems	Group Learning and Teaching.	

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	5	18-02-2025	1-8	CB
Test 2	60 Minutes	5	08-04-2025	9-12	OB
Quiz/Assignment/Lab	Throughout the Semester	5	**	13-22	CB
Comprehensive Exam	3 Hours	35	09-05-2025	1-22	CB

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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

Date: 08/01/2025

Dr.JAYA SINGH
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
CAS121	**Soft Skills**	**2**	**0**	**0**	**2**

Instructor-in-charge: Mr.TARUN

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

Text Book T1	Soft Skills
Reference Books R1	Professional Communication by Aruna Koneru (Tata McGraw Hill)
Reference Books R2	You can win by Shiv Khera (Bloomsbury)

Lecture-Wise-Plan:

Lecture Nos	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference
1-2	Learning basic concepts & definitions	Introduction to soft skills	a. Group Learning and Teaching	T1
3-6	Develop effective communication skills	Communication Skills	a. Group Learning and Teaching	T1
7-9	Develop effective Goal Setting Skill	Goal Setting	a. Group Learning and Teaching	T1

Lecture Nos	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference
10-13	Develop Positive Attitude	Positive Attitude	a. Group Learning and Teaching	T1
14-18	Build real life conversation skills	Vocabulary Enrichment	a. Group Learning and Teaching	T1
19-20	Develop Resume Writing Skills	Resume Writing	e.Project based Learning.	T1

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	5	19-02-2025	1-6	CB
Test 2	60 Minutes	5	09-04-2025	7-13	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	**	CB
Comprehensive Exam	3 Hours	30	12-05-2025	1-20	CB

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

Date: 07/01/2025

Mr.Tarun
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
CAG121	**Mathematics II (Discrete Mathematics)**	**3**	**0**	**1**	**4**

Instructor-in-charge: Dr.ANIMESH KUMAR SHARMA

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

1. Discrete mathematics is the study of discrete sets.
2. Material usually includes Logic, Graph Theory & Boolean Algebra.
3. Mathematical Induction and method of proofs
4. Algebraic Structures and related concepts
5. Language and Grammars

Text Book T1	Discrete Mathematical Structures, Kolman, Busby & Ross : PHI, 5th Edition, 2006.
Reference Book R1	A Textbook of Discrete Mathematics, 9th Edition S.Chand Company Ltd. Dr. Swapan Kumar Sarkar, 9th Edition, 2021
Reference Book R2	Elements of Discrete Maths, C.L. Liu : Tata McGraw Hill, 2nd edition,2001.
Reference Book R3	Discrete Mathematics for Computer Science, Gary Haggard & John Schlipf, Cengage, Thomson 2006.

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec. / Page Nos.of Text Book)
1- 4	To understand mathematical structures and operations.	Basic Concept of Mathematical Logic ,Proposition or Statement logical operations or connectives, Conditional and Bi-Conditional	Peer teaching	1.2,1.3,1.5,1.6

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec. / Page Nos.of Text Book)
		Statements, Logical Equivalence. Quantifiers, Negation of Quantifiers,		
5- 7	To understand the logical representations.	Set Theory, Types of Sets, Operations on Sets, Algebraic Properties of set operations, Cartesian Product of two sets,		Ch. 2
8-11	To understand the relation and its representations.	Relation, Domain and Range, Inverse Relation, Composite relation, Relation on a Set, Identity relation, Types of Binary relation, Equivalence relation	Peer teaching	
12-16	To learn about Boolean Algebra.	Boolean Algebra , Absorption Law, De-Morgan's Law, Boolean Function Expressions, Conjunctive Normal Form, Disjunctive Normal Forms	Peer teaching	6.4, 6.5

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec. / Page Nos.of Text Book)
17-22	To learn the geometric and algebraic methods of representing objects.	Graphs, Isomorphic Graphs, Subgraphs, Operation on Graphs, Euler Paths & Circuits, Hamiltonian Paths & Circuits	Peer teaching	8.1-8.3
23-27	To learn the theoretical and Computational aspects of discrete structures of relations.	Directed Graphs, Paths in relations & directed graphs, Relations, Equivalence relation & partitions	Peer teaching	Ch. 4
28-31	To learn about the construction of trees and its flows.	Trees & their representations labeled trees	Peer teaching	7.1,7.2
32-35	To learn Special Kind of Trees and their properties	Spanning trees, Minimal Spanning Trees, Algorithms for minimal spanning tree in Graph	Peer teaching	7.4, 7.5

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec. / Page Nos.of Text Book)
36-40	To learn about Algebraic Structure	Binary operation on a set, Laws of binary operations, Algebraic structure , some definitions	Peer teaching	
41-44	To learn about Algebraic Structure	Definition of group & semi group, General Properties of Groups, Cyclic Groups	Peer teaching	9.2,9.4
45-47	To learn the construction of language compilers.	Introduction, Strings, Languages , Regular Expressions,	Peer teaching	10.1,10.3,10.4
48-50	To understand phrase structure grammars.	Grammar, type-0,type-1,type-2, type-3 grammars	Peer teaching	R1
51-54	To study finite state machines.	Finite State Machine (FSM), Problems based upon language and FSM	Peer teaching	R1

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	10	19-02-2025	1-16	CB
Test 2	60 Minutes	10	09-04-2025	17-35	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	**	CB
Comprehensive Exam	3 Hours	70	14-05-2025	1-54	CB

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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

Date: 08/01/2025

Dr.ANIMESH KUMAR SHARAMA
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
CA221	**Software Engineering**	**3**	**0**	**0**	**3**

Instructor-in-charge: Mr.NAVEEN KUMAR VAISHNAV

Scope & Objective of the Course:
After successful completion of the course, the student will be able to:

1. Understand software development life cycle models, processes, and methodologies.
2. Gain knowledge in software requirement analysis and specification.
3. Develop skills in software design approaches, including object-oriented design.
4. Learn software testing, quality assurance, and maintenance practices.
5. Acquire knowledge of software project management, planning, estimation, and scheduling.

Text Book T1	Software Engineering, Ian Sommerville, 10th Edition, Pearson Education, 2015.
Reference Book R1	Software Engineering: A Practitioner's Approach, Roger S. Pressman, 8th Edition, McGraw-Hill, 2014.
Reference Book R2	Pankaj Jalote, An Integrated approach to Software Engineering, Narosa Publishing House, 3rdEdition, 2004.
NPTEL	https://nptel.ac.in/courses/106/105/106105182/
SWAYAM	https://onlinecourses.swayam2.ac.in/cec20_cs07/preview

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning Strategies a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch/sec. /Page No.s of Text/Ref. Books)
1-3	Introduction to Software Engineering	Course overview, Importance of Software Engineering, SDLC	Peer Teaching	T1: 1.1-1.5

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning Strategies a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch/sec. /Page No.s of Text/Ref. Books)
4-7	Software Process Models	Waterfall, Iterative, Prototype, Evolutionary, Spiral Model	Group Learning	T1: 2.1-2.10
8-12	Software Requirements	Requirements Engineering, Functional/Non-Functional Requirements, SRS	Technology-based Learning	T1: 3.1-3.5
13-18	Software Design	DFD, Function Oriented vs Object Oriented Design Approach	Peer Teaching	T1: 4.1-4.9
19-23	Software Project Management	SPM, Risk identification & Assessment, COCOMO	Peer Teaching	T1: 5.1-5.9
24-30	Software Testing	Testing Techniques: Unit Testing, Integration Testing, System Testing, Regression	Technology-based Learning	T1: 6.1-6.10
31-33	Software Quality Assurance	Quality Models, Risk Management, Reliability, Maintainability	Peer Teaching	T1: 7.1-7.5
34-35	Software Maintenance & Evolution	Types of Maintenance, Software Reengineering, Reverse Engineering	Group Learning	T1: 8.1-8.6

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning Strategies a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch/sec. /Page No.s of Text/Ref. Books)
36-37	Software Project Management	Scheduling, Cost Estimation, Risk Analysis, Function Point	Peer Teaching	T1: 9.1-9.4
38-40	Emerging Topics in Software Engineering	Unified Modelling Language, Use Case Diagram, Software as a Service (SaaS)	Technology-based Learning	T1: 10.1-10.5

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	10	17-02-2025	1-20	CB
Test 2	60 Minutes	10	07-04-2025	21-40	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	01-05-2025	1- 40	CB

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Date: 07/01/2025

Mr.NAVEEN KUMAR VAISHNA
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
MATH222	**Operation Research**	**3**	**0**	**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.

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

Lecture-Wise-Plan:

Lecture No.	Learning Objectives	Topics to be covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Refer to Chapter, See (Book)
1	Linear Programming Problem	Mathematical Formulation of LPP	Peer teaching	T1, Unit-2, ch-3, pg.3-26
2		Graphical Method for Solving LPP	Peer teaching	T1, Unit-2, ch-3, pg.26-53
3		Simplex Method for Solving LPP and Big-M Method	Peer teaching	T1, Unit-2, ch-5, pg.67-95
4		Some Special Cases in LPP	Peer teaching	T1, Unit-2, ch-5, pg.95-125
5		Duality, and Solving LPP using Duality in Simplex Method	Peer teaching	T1, Unit-2, ch-7, pg.158-203
6	Transportation	Mathematical Formulation of LPP	Peer teaching	T1, Unit-2, ch-11, pg.262-267
7		Initial BFS of Transportation Problem	Peer teaching	T1, Unit-2, ch-11, pg.269-278
8		Optimality Test by Stepping Stone Method and, and	Peer teaching	T1, Unit-2, ch-11, pg.278-351
9		MODI Method	Peer teaching	T1, Unit-2, ch-11, pg.278-351
10		Some Special Cases of Transportation Problem	Peer teaching	T1, Unit-2, ch-11, pg.278-351

Lecture No.	Learning Objectives	Topics to be covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Refer to Chapter, See (Book)
11	Assignment	Initial BFS of Assignment Problem	Peer teaching	T1, Unit-2, ch-12, pg.352-353
12		Johnson's job of sequencing rules	Peer teaching	T1, Unit-2, ch-12, pg.353-403
13		Solution by Hungarian Method, and Travelling Salesman Problem	Peer teaching	T1, Unit-2, ch-12, pg.353-403
14	Game Theory	Basic Concept and Terminologies	Peer teaching	T1, Unit-4, ch-19, pg.3-5
15		Two-person Zero-sum Game, and Game with Pure and Mixed Strategies	Peer teaching	T1, Unit-4, ch-19, pg.20-61
16		Dominance Principle, Arithmetic Method, and Graphical Method for Solving (2× n) Game	Peer teaching	T1, Unit-4, ch-19, pg.20-61
17		Graphical Method for Solving (m×2) Game and Solution of Game by Simplex Method	Peer teaching	T1, Unit-4, ch-19, pg.20-61
18	Job Sequencing	Basic Terminologies and Assumptions of Job Sequencing	Peer teaching	T1, Unit-4, ch-24, pg.299-300
19		Processing of n Jobs through 2 and 3 Machines	Peer teaching	T1, Unit-4, ch-24, pg.300-315

Lecture No.	Learning Objectives	Topics to be covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Refer to Chapter, See (Book)
20		Processing n Jobs through m Machines, and Processing 2 Jobs through m Machines - Graphical	Peer teaching	T1, Unit-4, ch-24, pg.300-315
21	Inventory Theory	Economic Order Quantity and EOQ Models without Shortage	Peer teaching	T1, Unit-4, ch-20, pg.62-71
22		EOQ models with Shortage and EPQ Models with/without Shortages	Peer teaching	T1, Unit-4, ch-20, pg.72-100
23		Newsboy Problem and Probabilistic Inventory Model with Instantaneous Demand and No Set up Cost	Peer teaching	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	Peer teaching	T1, Unit-4, ch-21, pg.143-172
25		Problems regarding different models	Peer teaching	T1, Unit-4, ch-21, pg.173-175
26	Queuing Theory	Basic Characteristics of Queuing System and Probability Distribution of Arrivals	Peer teaching	T1, Unit-4, ch-23, pg.215-229

Lecture No.	Learning Objectives	Topics to be covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Refer to Chapter, See (Book)
27		Probability Distribution of Departures and Model I (M|M|1):(∞|FCFS)	Peer teaching	T1, Unit-4, ch-23, pg.230-231
28		Model I. (General): (M|M|1): (∞|FCFS), and Model II. (M|M|1): (N|FCFS)	Peer teaching	T1, Unit-4, ch-23, pg.232-257
29		Model III - (M|M|s): (∞|FCFS), and Model IV - (M|Ek|1): (∞|FCFS)	Peer teaching	T1, Unit-4, ch-23, pg.258-268
30	Network Analysis	Networking Modeling	Peer teaching	T1, Unit-4, ch-25, pg.316-322
31		Critical Path Method (CPM)	Peer teaching	T1, Unit-4, ch-25, pg.323-349
32		Program Evaluation & Retention Technique (PERT)	Peer teaching	T1, Unit-4, ch-25, pg.349-382
33		Project Crashing	Peer teaching	T1, Unit-4, ch-25, pg.349-382
34		LP and Dual LP Solutions to Network Problem	Peer teaching	T1, Unit-4, ch-25, pg.349-382
35	Dynamic Programming	Basic Concept and Terminology, and Dynamic Programming Models I and II	Peer teaching	T1, Unit-5, ch-33, pg.72-77

Lecture No.	Learning Objectives	Topics to be covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Refer to Chapter, See (Book)
36		DP Model III, Solution of Discrete DP Problem and Solution of LPP by DP	Peer teaching	T1, Unit-5, ch-33, pg.82
37-38	Supply Chain Management	Introduction, Business Drivers in Supply Chain performance	Group Learning and Teaching	R3, ch-16, pg.217-232
39-40	Just-In-Time (JIT) Manufacturing System	Introduction, The Concept of the JIT System	Group Learning and Teaching	R3, ch-18, pg.253-261

Evaluation Scheme:

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Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	60 Minutes	10	17-02-2025	1-15	CB
Test 2	60 Minutes	10	07-04-2025	16-30	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	**	CB
Comprehensive Exam	3 Hours	70	05-05-2025	1-40	CB

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Date: 08/01/2025

Mr.HEMANT KUMAR DEWANGAN
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
CA223	**Operating System**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.PALAK KESHWANI

Learning Outcome :

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

1. To understand the basic concepts and functions of operating systems.
2. To understand Process and Threads
3. To analyze Scheduling algorithms.
4. To understand the concept of Deadlocks.
5. To analyze various memory management schemes.
6. To understand I/O management and File systems.

Text Book T1	Operating System Concepts, Silberschatz, A and Galvin, P.B, 7th edition, Addison, Wesley, 1998
Text Book T2	Operating Systems- A concept bases approach, Dhamdhere D.M., 2nd edition, TMH 2006.
Reference Book R1	Operating Systems, Stallings W, 4th edition, PHI, 2001
Reference Book R2	The Design of the Unix operating System, Batch, M J, PHI, 1986
Reference Book R3	Modern Operating Systems, Tanenbaum, A.S PHI 1996
NPTEL	https://nptel.ac.in/courses/106/105/106105214/

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning Strategies a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch/sec. /Page No.s of Text/Ref. Books)
1	To understand operating system, functions and its types	Overview	a. Group Learning and Teaching	
2		Operation System objectives and functions		T1 CH-1
3		The Evolution of operating Systems		T1 CH-1
4		Batch, interactive time sharing and real time systems		T1 CH-1
5		Operating System Structure, operating system service,		T1 CH-3
6	To understand the concept of process and its various states	Process Overview (State, PCB)		T1 CH-4
7-8		Process Scheduling		T1 CH-4
9		Threads		T1 CH-4
10		Inter Process Communication (IPC)		T1 CH-5
11	To know what is scheduling and its importance	CPU Scheduling Overview	a. Group Learning and Teaching	T1 CH-6
12-13		Scheduling Overview		T1 CH-6
14	To understand the problem of	Critical Section Problem	c. Technology Based Learning	T1 CH-7

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning Strategies a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch/sec. /Page No.s of Text/Ref. Books)
15	Critical Section and its solution	Multi Process Solution		T1 CH-7
16		Semaphores		T1 CH-7
17		Classical Problems of Synchronization	c. Technology Based Learning	T1 CH-7
18-20	To know what is deadlock and its handling	Deadlock Handling	a. Group Learning and Teaching	T1 CH-8
21	To understand various memory management schemes and their relative advantages and disadvantages	Memory Management Overview	a. Group Learning and Teaching	T1 CH-9
22-23	To understand various memory management schemes and their relative advantages and disadvantages	Paging	a. Group Learning and Teaching	T1 CH-9
24		Segmentation		T1 CH-9
25		Segmentation with Paging		T1 CH-9
26		Virtual Memory		T1 CH-9
27		Demand Paging		T1 CH-10
28		Page Replacement		T1 CH-10
29		Page Replacement Algorithms		T1 CH-10

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning Strategies a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch/sec. /Page No.s of Text/Ref. Books)
30		Thrashing		T1 CH-10
31	To understand concept of files and brief introduction to distributive O.S	File Operation	a. Group Learning and Teaching	T1 CH-11
32-33		Directory and File System Structure		T1 CH-11
34-35		Allocation Methods		T1 CH-12
36-38		Disk Scheduling		T1 CH-12
39-40		Types, Features and Uses of distributive O.S		T1 CH-12

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	10	18-2-2025	1-13	CB
Test 2	60 Minutes	10	08-04-2025	14-30	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	**	CB
Comprehensive Exam	3 Hours	70	07-05-2025	1-40	CB

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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

Date: 06/01/2025

Dr.PALAK KESHWANI
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
CA224	**Java Programming**	**3**	**2**	**0**	**4**

Instructor-in-charge: Dr.PALAK KESHWANI

Objective of the course: The objective of the Java Programming course is to provide a comprehensive understanding of Java, covering core concepts, object-oriented programming principles, standard libraries, GUI development, data persistence techniques, and networked applications.

Text Book T1	The Complete Reference Java J2SE, Herbert Schildt, 5th Edition, TMH, 2005
Text Book T2	Introduction to Java Programming: Liang, Pearson Education, 7 th Edition
Reference Book R1	Programming with Java: A Primer, E Balagurusamy, 2nd Edition, TMH, 2006.

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec. /Page Nos.of Text Book)
1	Introduction to OOPs	Introduction to Java and Java programming Environment, Object Oriented Programming. Classes, objects, methods, variables, constants, expressions,	c. Technology based Learning	Chapter1 of T1

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec. /Page Nos.of Text Book)
2 - 3	Getting Started with Java	First Java program, program components, Edit-Compile-Run cycle,	c. Technology based Learning	Chapter2 of T1
4 - 5	Handling parameters	Math class, defining and using a class, arguments and parameters	c. Technology based Learning	Chapter3 of T1
6 - 10	Looping concepts	Java's Selection statements (if, switch, iteration, statement, while, do-while, for, Nested loop)	c. Technology based Learning	Chapter4 of T1
11 – 14	Constructors	Constructors, overloaded methods and constructors, static, abstract, final, this keyword,	c. Technology based Learning	Chapter6 of T1
15-17	Exception Handling	Catching exceptions, Propagating exceptions , different types of exception	c. Technology based Learning	Chapter 10 of T1
18-20	Multithreading	Java thread model, creating a thread, synchronization, Different methods of a Thread class,	c. Technology based Learning	Chapter 11 of T1

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec. /Page Nos.of Text Book)
21-24	Packages	Package basics, Creating and Importing a package	c. Technology based Learning	Chapter 9 of T1
25- 28	Strings and Arrays	Strings, Arrays, Searching, Sorting	c. Technology based Learning	Chapter 13 of T1
29-34	Inheritance and Interface	Inheritance basics, Different types of Inheritance, Method Overriding, Interface	c. Technology based Learning	Chapter 8 of T1
35-38	Applet Programming	Applet programming	c. Technology based Learning	Chapter 12 of T1
39-40	Event Driven Programming,	Delegation-based event model, AWT classes, JDBC	e. .Project based Learning	Chapter 20 of T1

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	10	18-02-2025	1-14	CB
Test 2	60 Minutes	10	08-04-2025	15-34	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	**	CB
Comprehensive Exam	3 Hours	70	09-05-2025	1-40	CB

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

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Date: 06/01/2025

Dr.PALAK KESHWANI
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
CA225	**Computer Organization and Architecture**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.PINKEY CHOUHAN

Learning Outcomes

Upon successful completion of the course, student will be:

1. Able to describe the basic hardware components of a computer system.
2. Familiar with the functional units of the processor such as the register file and
3. Familiar with the representation of data, addressing modes and instruction sets.
4. Familiar with the RISC/CISC architectures and memory organization

Text Book T1	Computer Organization & Architecture, Morris Mano,3rd Ed.,Pearson Education/Prentice Hall-New Delhi, 2004.
Text Book T2	Computer Organization, V.C.Hamacher, Z.G. Vranesic and S.G. Zaky, Mc Graw Hill, 5th Edition,2002.
Reference Book R1	Structured Computer Organization, A.S.Tanenbaum:,4th Ed., Pearson Education,/Prentice Hall New Delhi.,2004
Reference Book R2	Advanced Computer Architecture: Parallelism Scalability, Programmability, Kai Hwang, TMH, New Delhi,2002
NPTEL	https://archive.nptel.ac.in/courses/106/105/106105163/

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec. /Page Nos. of Text Book)
1-5	To understand the basic structure of a computer	Functional units, Basic operational concepts, Bus structures, Memory, register, data, instruction, program counter,	a. Group Learning and Teaching	T1: Ch8 , 241

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec. /Page Nos. of Text Book)
		Accumulator, bus architecture		
6-7	addressing modes	Different types of Addressing modes	a. Group Learning and Teaching	T1: Ch 8,260
8-12	To understand how a complete instruction executes	Instruction field, Instruction formats, Micro operations, Execution of a Complete Instruction	a. Group Learning and Teaching	T1:Ch8,255,222
13-20	To understand the control unit organization	Hardwired control, Micro programmed Control Organization, control memory, Address sequencing, design of CU	a. Group Learning and Teaching	T1:Ch7,213,214, 231
21-24		Multiplication algorithm: Booth algorithm	d. Technology based Learning	T1:Ch 10,340-346
25-28		Division Algorithm: Restoring and non-restoring	a. Group Learning and Teaching	T1:348-353
29-30		Floating point arithmetic.	a. Group Learning and Teaching	T1: 354-362
31	To understand Input Output Organization	Programmed I/O.,I/O addressing & instruction		T1:Ch 11,381

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec. /Page Nos. of Text Book)
32-34		Synchronization, RISC,CISC, pipelining, Data Manipulation Instructions, Machine Control Instruction, Data Transfer instructions in AVR microcontroller	a. Group Learning and Teaching	T1:Ch8, 241
35-	To understand Memory Organization	Basic concepts and Memory hierarchy, Arithmetic instructions in AVR microcontroller	a. Group Learning and Teaching	T1:Ch 12,445
		Semiconductor memories RAM, ROM	d. Peer teaching	T1: Ch 12,448
		Memories and interleaving, Virtual memory	a. Group Learning and Teaching	T1: Ch 9, 324 Ch 12,469
40		Cache memory and mapping, Conditional Branch Instructions in AVR Microcontroller CALL Instructions and Stack in AVR Microcontroller, Branch Instructions in AVR Microcontroller, Logical Instructions in AVR Microcontroller, Instruction Design and Format	d. Technology based Learning	T1: Ch 12,462,456

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	10	19-02-2025	1-15	CB
Test 2	60 Minutes	10	09-04-2025	16-30	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	**	CB
Comprehensive Exam	3 Hours	70	12-05-2025	1-40	CB

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

Date: 10/01/2025

Dr.PINKEY CHOUHAN
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
EGL226	**Technical Report Writing**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.SHUBHRA TIWARI

Learning Objectives:

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

1. Understand the concept, importance and types of technical written communication.
2. Learn the usage of effective technical report writing and draw benefit from it.
3. Explore skills and ability to develop career in technical writing.
4. Understanding the application of various technical reports writing.
5. Nuances, legal aspects and ethics in technical writing.

Reference Book R1	Technical Report Writing Kieran Morgan
Reference Book R2	Managing Your Documentation Projects JoAnn T Hackos
Reference Book R3	The Insider's Guide to Technical Report Writing Krista Van Laan
Reference Book R4	Technical Report Writing and Research Methodology (English, Paperback, Dr. Naushad Alam, Dr. Quadri Javeed Ahmad Peer, Dr. Banarsi Lal)
Website	Website & You-tube www.slideshare.com, many you-tube channels as per topic

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Teaching Learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch/Sec. /Page Nos. of Text/Ref. Books)
01	Understanding technical comm	Technical report Writing - Definition & Purpose	a. Group Learning and Teaching.	T1,R1, R2, R3

Lecture Nos.	Learning Objective	Topics to be covered	Teaching Learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch/Sec. /Page Nos. of Text/Ref. Books)
02	Nature of technical comm	Characteristics of Technical report writing	b. Peer teaching	T1,R1, R2, R3
03	Focused technical comm	Qualities of good technical report	a. Group Learning and Teaching	T1,R1, R2, R3
04	Rhetorical awareness	Rhetorical Awarenss in Tech Comm	Technology based learning	T1,R1, R2, R3
05	Correctness of technical comm	Legal & Ethical Communication	Technology based	T1,R1, R2, R3
06	Understand oral technical comm	Oral & Presentation	a. Group Learning and Teaching	T1,R1, R2, R3
07	Technical documents-details	Parts/ Components of Tech Documents	Group Learning and Teaching, technology based	T1,R1, R2, R3
08	Why is technical comm important?	Description & Importance of Tech Comm	a. Group Learning and Teaching	T1,R1, R2, R3
09	Detailed rules of technical comm	Implicit & Explicit Rules of Comm: Definition & Examples	b. Technology based Learning.	T1,R1, R2, R3
10	Know the types of tech documents	Types of Tech Documents	b. Technology based Learning.	T1,R1, R2, R3

Lecture Nos.	Learning Objective	Topics to be covered	Teaching Learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch/Sec. /Page Nos. of Text/Ref. Books)
11	Understand need of technical comm	Establishing Goals in Tech Writing	a. Group Learning and Teaching	T1,R1, R2, R3
12	Process orientation of technical comm	Technical Writing Process: Pre-writing, Writing and Re-writing	Group Learning and Teaching	T1,R1, R2, R3
13	Practical presentation	Project Work & Presentation	a. Group Learning and Teaching	T1,R1, R2, R3
14	Process orientation of technical comm	Technical re-writing & Editing	a. Group Learning and Teaching	T1,R1, R2, R3
15	Technical writing - user orientation	Usability Testing & Tech Writing	Game based learning	T1,R1, R2, R3
16	Usage of reusables in tech writing	Prototypes & Wireframes	Game and technology based	T1,R1, R2, R3
17	Understand types of tech reports	Formal & Informal Tech Reports	Game and technology based	T1,R1, R2, R3
18	Practical presentation	Project Work & Presentation	Game and technology based	T1,R1, R2, R3
19	Understand business reports	Business Reports & Proposals	Technology based	T1,R1, R2, R3

Lecture Nos.	Learning Objective	Topics to be covered	Teaching Learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch/Sec. /Page Nos. of Text/Ref. Books)
20	Tech writing-customer orietation	Technical Correspondence	Case based & technology based	T1,R1, R2, R3
21	Tech writing-resumes/ cover letters	types	b. Technology based Learning.	T1,R1, R2, R3
22		style	Peer and group learning	T1,R1, R2, R3
23		purpose	Game based	T1,R1, R2, R3
24			Game based	T1,R1, R2, R3
25		Writing Resumes & Cover Letters	a. Group Learning and Teaching	T1,R1, R2, R3
26		Writing Resumes & Cover Letters	Group Learning and Teaching	T1,R1, R2, R3
27	Types of tech documents	Technical Instructions,	a. Group Learning and Teaching	T1,R1, R2, R3
28		Manual Writing,	Group Learning and Teaching	T1,R1, R2, R3
29		Proposal writing	Group Learning and Teaching	T1,R1, R2, R3

Lecture Nos.	Learning Objective	Topics to be covered	Teaching Learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch/Sec. /Page Nos. of Text/Ref. Books)
30	Practical presentation	Project Work & Presentation	a. Group Learning and Teaching	T1,R1, R2, R3
31	Practical presentation	Project Work & Presentation	Technology based Learning.	T1,R1, R2, R3
32	Practical presentation	Project Work & Presentation	a. Group Learning and Teaching	T1,R1, R2, R3
33	Practical presentation	Project Work & Presentation	a. Group Learning and Teaching	T1,R1, R2, R3
34	Practical presentation	Project Work & Presentation	Peer learning	T1,R1, R2, R3
35	Practical presentation	Project Work & Presentation	b. Technology based Learning.	T1,R1, R2, R3
36	Practical presentation	Project Work & Presentation	b. Technology based Learning. Group learning	T1,R1, R2, R3
37	Practical presentation	Project Work & Presentation	b. Technology based Learning.	T1,R1, R2, R3
38	Practical presentation	Project Work & Presentation	Technology based Learning.	T1,R1, R2, R3
39	Practical presentation	Project Work & Presentation	a. Group Learning and Teaching	T1,R1, R2, R3

Lecture Nos.	Learning Objective	Topics to be covered	Teaching Learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch/Sec. /Page Nos. of Text/Ref. Books)
40	Practical presentation	Project Work & Presentation	Technology based Learning.	T1,R1, R2, R3

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	10	19-02-2025	1-10	CB
Test 2	60 Minutes	10	09-04-2025	11-24	OB
Quiz/Assignment /Lab	Throughout the Semester	10	**	25-40	CB
Comprehensive Exam	3 Hours	70	14-05-2025	1-40	CB

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

Date: 06/01/2025

Dr.SHUBHRA TIWARI
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
CA426	**Block Chain Technology**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.NISHA THAKUR

Learning Outcomes:

The Learning Objectives of this course are to:

1. Enhance/develop students' ability to understand Blockchain Technology, Ethereum, Hyperledger Fabric, Distributed Application Development(smart contracts development, API)
2. By the end of the course, students will be able to Understand how blockchain systems (mainly Bitcoin and Ethereum) work, Design, build, and deploy smart contracts and distributed applications, Integrate ideas from blockchain technology into their own projects

Text Book T1	Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press (July 19, 2016).
Text Book T2	Blockchain Explained: A Pragmatic Approach by Srihari Kapu
Reference Book R1	Mastering Blockchain by Imran Bashir

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning	Reference (ch/sec ./Page Nos of Text/Ref. Books)
1-7	Overview of Blockchain Technology	Defining Blockchain and Distributed Ledger, Blockchain Properties Decentralized, Transparent, Immutable and secure. Blockchain Applications. Types of Blockchain: Public, private, and consortium based blockchain, Why to use Blockchain, History of Blockchain.	a.Group Learning and Teaching	T l Ch-l 1.4,1.5,1.6,1.9 Notes/PDF
8-13	Introduction to computing models and P2P networking	Centralized, Decentralized and Distributed Systems, Decentralization vs distributed, P2P systems, propertied of P2P systems, P2P communication architecture. P2P network applications: File sharing, P2P network for blockchain	a.Group Learning and Teaching	T2 Ch-2 2.1,2.2,2.3,2.9 Notes/PDF

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning	Reference (ch/sec ./Page Nos of Text/Ref. Books)
14-19	Foundational Concepts Blockchain Data Structure	Cryptographic Hash Functions, Digital Signatures, Public Keys as Identities, Decentralized Identity management, Hash Pointers, Hash chain and Merkel tree.	c.Technology based Learning	T1 Ch-3 3.2,3.4 T2 Ch3 3.6,3.8 Notes/PDF
20-25	Consensus Mechanisms	Consensus Mechanisms – POW, POS and other Consensus Mechanisms - Proof of storage and so on. Transactions incentivizing and mining.	c.Technology based Learning	T1 Ch-5 5.7,5.8 Notes/PDF
26-30	Blockchain & Cryptocurrency	Cryptocurrency as the first blockchain application. Mechanics of Bitcoin, Storing and Using Bitcoins, Mining in Bitcoin, Limitations of Bitcoin and alternative cryptocurrencies.	d.Peer teaching	T1 Ch-4 4.5, 4.6 T2 Ch4 4.8,4.10 Notes/PDF

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning	Reference (ch/sec ./Page Nos of Text/Ref. Books)
31-36	Smart Contracts and Ethereum	History, Purpose and types of smart contracts, Introduction to Ethereum, bitcoin vs Ethereum stack. P2P network in Ethereum, consensus in Ethereum, Concept - Smart contracts, Developing and executing smart contracts in Ethereum. State and data structure in Ethereum. Ethereum Virtual Machine.	d.Peer teaching	T2 Ch-5 5.4,5.8 Notes/PDF
37-42	Private and Consortium based Blockchain: Hyperledger	Need for the consortium. Hyperledger stack, Multichain blockchain. Innovation in Hyperledger, distributed applications in hyperledger.	b.Game Based Learning	T1 Ch-5,Ch6 5.9, 6.4,7.1 T2 Ch6 6.8,7.4,7.9 Notes/PDF

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	10	17-02-2025	1-13	CB
Test 2	60 Minutes	10	07-04-2025	14-25	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	01-05-2025	1- 42	CB

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

Date: 07/01/2025

Dr.NISHA THAKUR
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
CA423	**Theory of Computation**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.PALAK KESHWANI

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
Text Book T2	Theory of Computer Science (Automata Language & Computations), by K.L.Mishra& N. Chandrashekhar, PHI
Reference Book 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	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (ch/sec./ Page Nos of Text/Ref. Books)
1-5	To understand the basics of Automata	Introduction to automata theory, Examples of automata machine, Finite automata as a language acceptor and	a. Group Learning and Teaching	T l Ch-3

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (ch/sec./ Page Nos of Text/Ref. Books)
		translator. Deterministic finite automata. Non deterministic finite automata,		
6-10	Conversion	Conversion of NFA to DFA Minimizing number of states of a DFA, Mealy Machine, Moore machine	a. Group Learning and Teaching	T2 Ch-3
11-15	Regular-Expression	Regular Expressions, Properties of Regular Expression. Finite automata and Regular expressions. Regular Expression to DFA conversion & vice versa.	a. Group Learning and Teaching	T1 Ch-3 T2 Ch3
16-20	Pumping Lemma for Regular grammars	Pumping lemma for regularsets.Application of pumping lemma, Regular sets and Regular grammar	a. Group Learning and Teaching	T1 Ch-5
21-25	Types of grammar	Definition and types of grammar. Chomsky hierarchy of grammar. Relation between types of grammars	a. Group Learning and Teaching	T1, Ch-4
26-28	Context free grammar	Context free grammar. Left most linear &right mostderivation trees. Ambiguity in grammar.	a. Group Learning and Teaching	T1 Ch-4 T2 Ch-4

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (ch/sec./ Page Nos of Text/Ref. Books)
29-30	Simplification of grammar	Simplification of context free grammar. Chomsky normal from.	a. Group Learning and Teaching	T1,Ch-6
31-34	Context Free Grammar	Pumping lemma from context free language. Decision algorithm for context tree language.	a. Group Learning and Teaching	T1 Ch-7
35-40	Pushdown automata	Pushdown automata, Deterministic pushdownautomata and non deterministic push down automata. Acceptance of push down automata. Push downautomata and context free language	a. Group Learning and Teaching	T1, Ch-7

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	10	17-02-2025	01-15	CB
Test 2	60 Minutes	10	07-04-2025	16-30	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	**	CB
Comprehensive Exam	3 Hours	70	05-05-2025	01-40	CB

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

Date: 09/01/2025

Dr.PALAK KESHWANI
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
CA424	**Machine Learning**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.K NAGAIAH

Scope and Objective:
This course explains machine learning techniques such as descision tree learning, Bayesian learning etc. To understand computational learning theory. To study the pattern comparison techniques

Text Book T1	Machine Learning – Tom M. Mitchell, - MGH
Reference Book R1	Machine Learning: An Algorithmic Perspective, Stephen Marshland, Taylor & Francis

Lecture-Wise-Plan

Lecture No.	**Learning Objective**	**Topics to be Covered**	**Teaching learning strategies:** **a. Group Learning and Teaching** **b. Game Based Learning** **c. Technology based Learning** **d. Peer teaching** **e. Project based Learning.**	**Reference (Ch./Sec./ Text Book)**
1-3	Introduction	Introduction - Well-posed learning problems, designing a learning system, Perspectives and issues in machine learning Concept learning and	a. Group Learning and Teaching	T1 Chapter-1

Lecture No.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Text Book)
		the general to specific ordering		
4-6	Concepts of Searching methods	introduction, a concept learning task, concept learning as search, find-S: finding a maximally specific hypothesis, version spaces and the candidate elimination algorithm, remarks on version spaces and candidate elimination, inductive bias	a. Group Learning and Teaching	T1 Chapter-1
7-9	Decision Tree Learning	Introduction, decision tree representation, appropriate problems for decision tree learning, the basic decision tree learning algorithm, hypothesis space search	c.Technology based Learning	T1 Chapter-1

Lecture No.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Text Book)
		in decision tree learning, inductive bias in decision tree learning, issues in decision tree learning		
10-12	Artificial Neural Networks-1	– Introduction, neural network representation, appropriate problems for neural network learning, perceptions, multilayer networks and the back-propagation algorithm	c.Technology based Learning	T1 Chapter-2
13-15	Artificial Neural Networks-2	Remarks on the Back-Propagation algorithm, An illustrative example: face recognition, advanced topics in artificial neural networks.	c.Technology based Learning	T1 Chapter-2

Lecture No.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Text Book)
16-17	Evaluation Hypotheses	– Motivation, estimation hypothesis accuracy, basics of sampling theory, a general approach for deriving confidence intervals, difference in error of two hypotheses, comparing learning algorithms.	a. Group Learning and Teaching	T1 Chapter-2
18-20	Bayesian learning	Introduction, Bayes theorem, Bayes theorem and concept learning, Maximum Likelihood and least squared error hypotheses, maximum likelihood hypotheses for predicting probabilities, minimum	a. Group Learning and Teaching	T1 Chapter-3

Lecture No.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Text Book)
		description length principle, Bayes optimal classifier, Gibs algorithm, Naïve Bayes classifier, an example: learning to classify text, Bayesian belief networks, the EM algorithm.		
21-23	Computational learning theory	Introduction, probably learning an approximately correct hypothesis, sample complexity for finite hypothesis space, sample complexity for infinite hypothesis spaces, the mistake bound model of learning	a. Group Learning and Teaching	T1 Chapter-3

Lecture No.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Text Book)
24-25	Instance-Based Learning-	Introduction, k-nearest neighbour algorithm, locally weighted regression, radial basis functions, case-based reasoning, remarks on lazy and eager learning.	a. Group Learning and Teaching	T1 Chapter-3
26-28	Genetic Algorithms	Motivation, Genetic algorithms, an illustrative example, hypothesis space search, genetic programming, models of evolution and learning, parallelizing genetic algorithms.	a. Group Learning and Teaching	T1 Chapter-4
29-31	Learning Sets of Rules	Introduction, sequential covering algorithms, learning rule sets:	c.Technology based Learning	T1 Chapter-4

Lecture No.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Text Book)
		summary, learning First-Order rules, learning sets of First-Order rules: FOIL, Induction as inverted deduction, inverting resolution.		
32-34	Reinforcement Learning	Introduction, the learning task, Q–learning, non-deterministic, rewards and actions, temporal difference learning, generalizing from examples, relationship to dynamic programming	a. Group Learning and Teaching	T1 Chapter-4

Lecture No.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Text Book)
35-37	Analytical Learning-1-	Introduction, learning with perfect domain theories: PROLOG-EBG, remarks on explanation-based learning, explanation-based learning of search control knowledge.	c.Technology based Learning	T1 Chapter-5
38-39	Analytical Learning-2	Using prior knowledge to alter the search objective, using prior knowledge to augment search operators	c.Technology based Learning	T1 Chapter-5
40	Combining Inductive and Analytical Learning	Motivation, inductive-analytical approaches tolearning using prior knowledge to initialize the hypothesis.	a. Group Learning and Teaching	T1 Chapter-5

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	10	18-02-2025	1-12	CB
Test 2	60 Minutes	10	09-04-2025	13-28	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	**	CB
Comprehensive Exam	3 Hours	70	07-05-2025	1-40	CB

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

Date: 07/01/2025

Dr.K NAGAIAH
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
CA425	**Data Science Using Python**	**3**	**2**	**0**	**4**

Instructor-in-charge: Dr.B RAVI KIRAN

Learning Outcomes:
Data Science Using Python is an application oriented course which forms the first half of a two semester comprehensive course on core level to be taught to all the students B.Tech. The Course Aims at:

1. Developing and understanding of the basic principles of Data Science and tis implementation in research work
2. Developing the application of concepts to problems of practical interest using Python
3. Improving the concepts and improving the problem solving skills of students

Text Book T1	Statistics (wikibooks.org)
Reference Book R1	Lecture Series from Youtube (Channel-Code basics) (YouTube links are provided)

Lecture-Wise-Plan:

Lecture Nos.	Learning objectives	Topics to be covered	Teaching Learning Strategic a. Group Learning and Teaching b. Game Based Learning c. Technology Based Learning d. Peer Teaching e. Project Based Learning	Reference (Ch./Sec./ Page Nos. of Text Book)
1-3	Learn about the Basics Statistical Methods and related information	Statistical Methods: Definition and scope of Statistics, concepts of statistical population and sample. Data:	a. Group Learning and Teaching	https://nptel.ac.in/courses/110/106/110106064/ (Module-01)

Lecture Nos.	Learning objectives	Topics to be covered	Teaching Learning Strategic a. Group Learning and Teaching b. Game Based Learning c. Technology Based Learning d. Peer Teaching e. Project Based Learning	Reference (Ch./Sec./ Page Nos. of Text Book)
		quantitative and qualitative, attributes variables		
4-5		Scales of measurement nominal, ordinal, interval and ratio. Presentation: tabular and graphical.	a. Group Learning and Teaching	13-16
6-8	Understanding the use of basic statistical techniques for preprocessing of a dataset.	Descriptive vs Inferential Statistics, Statistics for data science, Log normal distribution Math	a. Group Learning and Teaching	https://www.investopedia.com/terms/l/log-normal-distribution.asp & https://www.youtube.com/watch?v=dX5pw_sQUmc
9-12		Statistics for data science, machine learning, Median, Mean, Mode, Percentile Math	a. Group Learning and Teaching	23-32 & https://www.youtube.com/watch?v=t4LOv9h-FJM
13-15		Statistics for data science, machine learning, Normal Distribution, Z Score, t Score	a. Group Learning and Teaching	https://www.youtube.com/watch?v=okhrFgaUwio

Lecture Nos.	Learning objectives	Topics to be covered	Teaching Learning Strategic a. Group Learning and Teaching b. Game Based Learning c. Technology Based Learning d. Peer Teaching e. Project Based Learning	Reference (Ch./Sec./ Page Nos. of Text Book)
16-17		Z test and t test for interpretation of Math, Statistics for data science, machine learning	a. Group Learning and Teaching	
18-19	Understanding prediction for univariate and multivariate dataset	Introduction to Machine Learning, Linear Regression Single Variable	a. Group Learning and Teaching	https://www.youtube.com/watch?v=8jazNUpO3lQ&list=PLeo1K3hjS3uvCeTYTeyfe0-rN5r8zn9rw&index=2
20-21		Linear Regression Multiple Variables, Gradient Descent and Cost Function	a. Group Learning and Teaching	https://www.youtube.com/watch?v=J_LnPL3Qg70&list=PLeo1K3hjS3uvCeTYTeyfe0-rN5r8zn9rw&index=3 & https://www.youtube.com/watch?v=vsWrXfO3wWw&list=PLeo1K3hjS3uvCeTYTeyfe0-rN5r8zn9rw&index=4

Lecture Nos.	Learning objectives	Topics to be covered	Teaching Learning Strategic a. Group Learning and Teaching b. Game Based Learning c. Technology Based Learning d. Peer Teaching e. Project Based Learning	Reference (Ch./Sec./ Page Nos. of Text Book)
21-23		Training and Testing Data	a. Group Learning and Teaching	https://www.youtube.com/watch?v=fwY9Qv96DJY&list=PLeo1K3hjS3uvCeTYTeyfe0-rN5r8zn9rw&index=7
24-27		Logistic Regression (Binary Classification), Decision Tree	a. Group Learning and Teaching	https://www.youtube.com/watch?v=zM4VZR0px8E&list=PLeo1K3hjS3uvCeTYTeyfe0-rN5r8zn9rw&index=8 & https://www.youtube.com/watch?v=PHxYNGo8NcI&list=PLeo1K3hjS3uvCeTYTeyfe0-rN5r8zn9rw&index=10
28-33		Support Vector Machine (SVM)	a. Group Learning and Teaching	https://www.youtube.com/watch?v=FB5EdxAGxQg&list=PLeo1K3hjS3uvCeTYTeyfe0-

Lecture Nos.	Learning objectives	Topics to be covered	Teaching Learning Strategic a. Group Learning and Teaching b. Game Based Learning c. Technology Based Learning d. Peer Teaching e. Project Based Learning	Reference (Ch./Sec./ Page Nos. of Text Book)
				rN5r8zn9rw&index=11
34-35	Learning about the minimization of factors for effective predictions	Eigen Systems, Factor Analysis, Notation	a. Group Learning and Teaching	Printed Notes Contents
36-42		Principal Components Analysis (PCA) Exploratory Factor Analysis	a. Group Learning and Teaching	Printed Notes Contents
40-42	Understanding the	Hypothesis Testing, P-value, using one & two sample Z-test and one & two sample T-test	a. Group Learning and Teaching	Printed Notes Contents

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	10	19-02-2025	1-12	CB
Test 2	60 Minutes	10	09-04-2025	13-26	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	**	CB
Comprehensive Exam	3 Hours	70	12-05-2025	1-42	CB

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

Date: 08/01/2025

Dr.B RAVI KIRAN
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
CA428	**Digital Marketing**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.RAMESH KUMAR YADAV

Learning Outcomes:

After the successful completion of the course, the student shall be able to - :

1. Understand digital marketing, importance thereof, meaning of web site and levels of website, difference between blog, portal and website
2. Understand the working of SEO (Search engine optimization) on page optimization, off page optimization, and will learn to prepare reports
3. Learn about SMO (Social media optimization) like Face book, twitter, LinkedIn, Tumbir, Printerest and other social media services optimization.
4. Understand paid tools like Google ad words, display advertising techniques
5. Learn and apply hands on experience on tools useful to SEO for analysis on website traffic, keyword analysis and learn email marketing and ad designing.

Text Book T1	Ahuja Vandana Digital Marketing, Oxford University press (2016) ISBN:9780199455447 Sainy Romi, Nargundkar Rajendra Digital Marketing: cases from India, Notion Press (2018) ISBN 9781644291931, 1644291932
Reference Book R1	Stephanie Daimond, Author of Facebook Marketing for Dummies, a Wiley brand
Suggested equivalent online courses:	https://onlinecourses.swayam2.ac.in

Lecture-Wise-Plan:

Lecture Nos.	Learning objectives	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Page Nos. of Text Book)
1-10	Learn about the Basics digital marketing	Meaning of Digital Marketing, Differences from Traditional Marketing, Returns of Investments on Digital Marketing vs. Traditional Marketing, E Commerce, tools used for successful marketing, SWOT Analysis of Business for Digital Marketing, Meaning of Blogs, Websites, Portal and their differences, Visibility, Visitor, Engagement, conversion process, Retention, Performance Evaluation.	a. Group Learning and Teaching.	T1

Lecture Nos.	Learning objectives	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Page Nos. of Text Book)
11-20	Learn about the SEO	Search Engine Optimization (SEO): On page optimization techniques, off page optimization Techniques, Preparing Reports, Creating search Campaigns, Creating Display Campaigns.	b. Technology based Learning.	T2
21-30	Learn about the SMO, SEM and Traffic Analysis	Social Media Optimization (SMO): Introduction to Social Media Marketing, Advanced Facebook Marketing, Word press Blog Creation, Twitter Marketing, LinkedIn Marketing, Instagram Marketing, social media Analytical Tools.	a. Group Learning and Teaching	T1

Lecture Nos.	Learning objectives	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Page Nos. of Text Book)
31-35		Search engine Marketing: Meaning and Use of Search Engine Marketing, Tools used-Pay Per Click, Google Ad words, Display Advertising Techniques, Report Generation	a. Group Learning and Teaching	T1
36-40		Website Traffic Analysis, Affiliate Marketing and Ad Designing: Google Analytics, Online Reputation Management, Email Marketing, Affiliate Marketing, Understanding Ad Words Algorithm, Advertisement Designing	a. Group Learning and Teaching	T2

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	10	19-02-2025	1-20	CB
Test 2	60 Minutes	10	09-04-2025	21-35	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	12-05-2025	1- 40	CB

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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

Date: 08/01/2025

Dr.RAMESH KUMAR YADAV
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
MCA121	**Operating Systems**	**3**	**0**	**0**	**3**

Instructor-in-charge: Mr.ASHISH KUMBHARE

Learning Outcomes:

1. To understand the basic concepts and functions of operating systems.
2. To understand Processes and Threads
3. To analyze Scheduling algorithms.
4. To understand the concept of Deadlocks.
5. To analyze various memory management schemes.
6. To understand I/O management and File systems

Text Book T1	Operating System Conceots Silbveschatz A ad Galvin, P.B 7th Edition, Addison, Wesley, 1998
Text Book T2	Operating Systems- A concept bases approach, Dhamdhere D.M., 2nd edition, TMH 2006.
Reference Book R1	Operating Systems, Stallings W, 4th edition, PHI, 2001.
Reference Book R2	The design of the Unix operating System, Bach, M.J, PHI, 1986.
Reference Book R3	Modern Operating Systems, Tanenbaum, A.S,PHI, 1996.
NPTEL	https://nptel.ac.in/courses/106/105/106105214/

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Page Nos. of Text Book)
1	To understand what is operating system and its functions	Overview	c. Technology based Learning	T1 CH-1
2		Types of OS	c. Technology based Learning	T1 CH-1

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Page Nos. of Text Book)
3		Design Approaches	c. Technology based Learning	T1 CH-1
4		System call, context switching	c. Technology based Learning	T1 CH-2
5		System design implementation	c. Technology based Learning	T1 CH-3
6	To understand the concept of process and its various states	Process overview(State, PCB)	c. Technology based Learning	T1 CH-4
7-8		Process Scheduling	c. Technology based Learning	T1 CH-4
9		Threads	c. Technology based Learning	T1 CH-5
10		Inter Process Communication (IPC)	c. Technology based Learning	T1 CH-5
11	To know what is scheduling and its importance	CPU Scheduling Overview	d. Peer teaching	T1 CH-6
12-13		Scheduling Algorithms	d. Peer teaching	T1 CH-6
14	To understand the problem of Critical Section and its solution	Critical Section Problem	c. Technology based Learning	T1 CH-7
15		Multi Process Solution	c. Technology based Learning	T1 CH-7
16		Semaphores	c. Technology based Learning	T1 CH-7
17		Classical Problems of Synchronization	c. Technology based Learning	T1 CH-7

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Page Nos. of Text Book)
18-20	To know what is deadlock and its handling	Deadlock Handling	c. Technology based Learning	T1 CH-8
21	To understand various memory management schemes and their relative advantages and disadvantages	Memory Management Overview	c. Technology based Learning	T1 CH-9
22-23		Paging	c. Technology based Learning	T1 CH-9
24		Segmentation	c. Technology based Learning	T1 CH-9
25		Segmentation with Paging	c. Technology based Learning	T1 CH-9
26		Virtual Memory	c. Technology based Learning	T1 CH-10
27		Demand Paging	c. Technology based Learning	T1 CH-10
28		Page Replacement	c. Technology based Learning	T1 CH-10
29		Page Replacement Algorithms	c. Technology based Learning	T1 CH-10
30		Thrashing	c. Technology based Learning	T1 CH-10
31	To understand the concept of files, its types, attributes and operations	File Operations	c. Technology based Learning	T1 CH-11
32		Directory Structure	c. Technology based Learning	T1 CH-11
33		File-System Structure	c. Technology based Learning	T1 CH-12
34		Allocation Methods	c. Technology based Learning	T1 CH-12

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./ Page Nos. of Text Book)
35-39		I/O Systems	c. Technology based Learning	T1 CH-12
40		Disk Scheduling	d. Peer teaching	T1 CH-13

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	20	17-02-2025	1-15	CB
Test 2	60 Minutes	20	07-04-2025	16-25	OB
Quiz/Assignment/Lab	Throughout the Semester	20	**	**	CB
Comprehensive Exam	3 Hours	40	01-05-2025	1-40	CB

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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

Date: 07/01/2025

Mr.ASHISH KUMBHARE
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
MCA122	**Computer Network**	**3**	**0**	**0**	**3**

Instructor-in-charge: Mr.ASHISH KUMBHARE

Learning Outcomes:
Data communication and networking are changing the way we live and do the things today. They rely on computer networks and internet works. This course focuses on networking fundamentals, standards and various underlying protocols to make the network connected for text, audio, video. 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

Text Book T1	Data Communication and Computer Networking,B.A.Forouzan,TMH,2006
Text Book T2	Computer Networks, A.S.Tanenbaum, Pearson Education/Prentice Hall of India, 4th Edition, 2004.
Reference Book R1	Data Communications, Computer Networks and Open Systems, HalsallFred, Addition-Wesley, 4th Edition, 2004
Reference Book R2	An Engineering Approach to Computer Networks, S.Kesha, Pearson Education, (2004)

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec. /P gNo)
1	Introduction to Computer Networking	Introduction to Networks, ComputerNetworking	c. Technology based Learning	T1: Ch-1

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec. /P gNo)
2-3	Use of Hardware andSoftware	Uses of computer networks, network hardware, network software	c. Technology based Learning	T2: Ch-1
4-5	Introduction to OSI, TCP/IP	Introduction to Reference Models OSI,TCP/IP Layers	c. Technology based Learning	T1: Ch-2, T2: Ch-1
6	Analog and digital Transmissions	Types of Signals: Analog and digital,Analog signals, Digital signals, Transmission impairment	c. Technology based Learning	T1: Ch-3
7-8	Coding and Sampling in Transmission	Line coding, block coding, 0sampling,transmission mode	c. Technology based Learning	T1: Ch-4
9-10	Transmission in PhysicalLayer	Types of Transmission media: Guidedmedia and Unguided media	c. Technology based Learning	T1: Ch-7,T2:
11	Data Link Layer	Data Link Layer Design Issues	c. Technology based Learning	T2: Ch-3
12-13	Errors and their significance	Error Detection And Correction	c. Technology based Learning	T1: Ch-10, T2: Ch-3
14-16	Data Link Layer Protocols	Data link Control and Protocols: Elementary Data Link Protocols, Sliding Window Protocols	c. Technology based Learning	T1: Ch-11,T2: Ch-3

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec. /P gNo)
17-18	MAC	Multiple Access Protocols	c. Technology based Learning	T1: Ch-13, T2: Ch-4
19	Design of Network Layer	Network Layer Design Issues	c. Technology based Learning	T2: Ch-5
20-21	Types of Routing	Routing Algorithms	d. Peer teaching	T1: Ch-19, T2: Ch-5
22-23	Removing Congestion on Network	Congestion Control Algorithms	d. Peer teaching	T1: Ch-23, T2: Ch-5
24	Internetworking	Quality Of Service, Internetworking	c. Technology based Learning	T1: Ch-23
25	Protocols of Transport Layer	The Transport Service	c. Technology based Learning	T1: Ch-22, T2: Ch-6
26-27	Protocols of Transport Layer	Elements of Transport Protocols, A Simple Transport Protocol	c. Technology based Learning	T1: Ch-22, T2: Ch-6
28-29	Internet Transport Protocols	The Internet Transport Protocols: UDP, The Internet Transport Protocols: TCP	c. Technology based Learning	T1: Ch-22

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec. /P gNo)
30-34	Services of Application Layer	DNS--Domain Name System, Electronic Mail, The World Wide Web	c. Technology based Learning	T1:Ch-25,26, 27,T2:Ch-7
35-38	Security on Networks	Cryptography, Symmetric-Key Algorithms	d. Peer teaching	T1: Ch-29,31, T2: Ch-8
39-40	Algorithms	Public-Key Algorithms	d. Peer teaching	T2: Ch-8

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	20	17-02-2025	01-10	CB
Test 2	60 Minutes	20	07-04-2025	11-20	OB
Quiz/Assignment/Lab	Throughout the Semester	20	**	---	CB
Comprehensive Exam	3 Hours	40	05-05-2025	1-40	CB

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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

Date: 08/01/2025

Mr.ASHISH KUMBHARE
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
MCA123	**Web Technology**	**3**	**0**	**0**	**3**

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 Web Fundamentals: Learn the architecture of the web, including client-server interactions and HTTP.
2. Proficiency in HTML & CSS: Build structured web pages with HTML and style them using CSS for responsive design.
3. Dynamic Web Pages with JavaScript: Implement interactivity, form validation, and DOM manipulation using JavaScript.
4. Server-side Programming with PHP: Create dynamic websites, connect to databases, and manage sessions using PHP.
5. Build Full Web Applications: Combine front-end and back-end skills to create and deploy complete web applications.
6. Emphasize Web Standards: Focus on accessibility, SEO, web performance, and cross-browser compatibility.

Text Book T1	Deitel, Deitel, Goldberg, "Internet & World Wide Web How to Program", Third Edition, Pearson Education, 2006.
Reference Book R1	Achyut Godbole, Atul Kahate "Web Technologies: TCP/IP, Web/Java Programming, and Cloud Computing", Third Edition, McGraw Hill Education.
Reference Book 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 No	Learning Objective	Topics to be Covered	Teaching Learning Strategies a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (chapters)
1-2	Internet Concept:	Fundamental of Web, History of Web, Web development overview, Domain Name System (DNS)	Peer Teaching	T1: 1.5-1.6
3-4	Functionality of Internet	DHCP and SMTP and other servers, Internet service provider (ISP), Concept of IP Address	Peer Teaching	T1: 1.8, 2.1
5-6	Protocols and Components of internet	Internet Protocol, TCP/IP Architecture, Web Browser and Web Server.	Peer Teaching	T1: 2.1, 2.7
7-10	HTML and DHTML	HTML Tag, Rules of HTML, Text Formatting and Style, List, Image, Hyperlinks	Technology based Learning	T1: 4.1- 4.9
11-15	HTML Tables and Frames	Tables and Layout, Linking Documents, Frame, Forms, Project in HTML	Technology based Learning	T1: 4.10 - 4.11

Lecture No	Learning Objective	Topics to be Covered	Teaching Learning Strategies a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (chapters)
16-20	DHTML & CSS	Introduction to DHTML, CSS, Class and DIV, External Style Sheet.	Technology based Learning.	T1: 5.1 - 5.8
21-24	Java Script	JavaScript (JS) in Web Page, Advantage of Java Script, JS object model and hierarchy	Technology based Learning.	T1: 6.1 – 6.5
25-28	Java Script Functions	JS Function, Client-side JS Vs. Server-side JS, JS security	Technology based Learning.	T1: 9.1 – 9.11
29-33	PHP	PHP Syntax, Variables, Data Types, Strings, Constants, Operators, Control structure, Functions, Array, PHP Forms, Forms Handling	Technology based Learning.	R1: 8.1- 8.6
34-38	PHP Connectivity	Working with PHP and MySQL, Connecting to Database, Creating, Selecting, Deleting, Updating Records in a table, Inserting Multiple Data	Technology based Learning.	R1: 8.7- 8.9

Lecture No	Learning Objective	Topics to be Covered	Teaching Learning Strategies f. Group Learning and Teaching g. Game Based Learning h. Technology based Learning i. Peer teaching j. Project based Learning.	Reference (chapters)
39-40	Latest Technologies	Introduction to Code Igniter, Laravel, Word press etc.	Peer Teaching	Refer Internet & Follow Instructor in Charg

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	20	18-04-2025	1-20	CB
Test 2	60 Minutes	20	08-04-2025	21-40	OB
Quiz/Assignment/Lab	Throughout the Semester	20	**	---	CB
Comprehensive Exam	3 Hours	40	07-05-2025	1- 40	CB

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Date: 08/01/2025

Mr.NAVEEN KUMAR VAISHNAV
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
MCA124	**Software Engineering**	**3**	**2**	**0**	**4**

Instructor-in-charge: Mr.NAVEEN KUMAR VAISHNAV

Scope & Objective of the Course:

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

1. Understand software development life cycle models, processes, and methodologies.
2. Gain knowledge in software requirement analysis and specification.
3. Develop skills in software design approaches, including object-oriented design.
4. Learn software testing, quality assurance, and maintenance practices.
5. Acquire knowledge of software project management, planning, estimation, and scheduling.

Text Book T1	Software Engineering, Ian Sommerville, 10th Edition, Pearson Education, 2015.
Reference book R1	Software Engineering: A Practitioner's Approach, Roger S. Pressman, 8th Edition, McGraw-Hill, 2014.
Reference book R2	Pankaj Jalote, An Integrated approach to Software Engineering, Narosa Publishing House, 3rdEdition, 2004.
NPTEL	https://nptel.ac.in/courses/106/105/106105182/
SWAYAM	https://onlinecourses.swayam2.ac.in/cec20_cs07/preview

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (ch/sec. /Page No.s of Text/Ref. Books)
1-3	Introduction to Software Engineering	Course overview, Importance of Software	Peer Teaching	T1: 1.1-1.5

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (ch/sec. /Page No.s of Text/Ref. Books)
		Engineering, SDLC		
4-7	Software Process Models	Waterfall, Iterative, Prototype, Evolutionary, Spiral Model	Group Learning	T1: 2.1-2.10
8-12	Software Requirements	Requirements Engineering, Functional/Non-Functional Requirements, SRS	Technology-based Learning	T1: 3.1-3.5
13-18	Software Design	DFD, Function Oriented vs Object Oriented Design Approach	Peer Teaching	T1: 4.1-4.9
19-23	Software Project Management	SPM, Risk identification & Assessment, COCOMO	Peer Teaching	T1: 5.1-5.9
24-30	Software Testing	Testing Techniques: Unit Testing, Integration Testing, System Testing, Regression	Technology-based Learning	T1: 6.1-6.10
31-33	Software Quality Assurance	Quality Models, Risk Management, Reliability, Maintainability	Peer Teaching	T1: 7.1-7.5

Lecture Nos.	Learning Objective	Topics to be Covered	Teaching Learning Strategies a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (ch/sec. /Page No.s of Text/Ref. Books)
34-35	Software Maintenance & Evolution	Types of Maintenance, Software Reengineering, Reverse Engineering	Group Learning	T1: 8.1-8.6
36-37	Software Project Management	Scheduling, Cost Estimation, Risk Analysis, Function Point	Peer Teaching	T1: 9.1-9.4
38-40	Emerging Topics in Software Engineering	Unified Modelling Language, Use Case Diagram, Software as a Service (SaaS)	Technology-based Learning	T1: 10.1-10.5

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	20	17-02-2025	1-16	CB
Test 2	60 Minutes	20	07-04-2025	17-29	OB
Quiz/Assignment/Lab	Throughout the Semester	20	**	**	CB
Comprehensive Exam	3 Hours	40	01-05-2025	1-40	CB

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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

Date: 09/01/2025

Mr.NAVEEN KUMAR VAISHNAV
Instructor-in-charge

The ICFAI University, Raipur

Faculty of Science and Technology
Second Semester, 2024-2025
Course Handouts

Course Code	Course Title	L	P	T	U
MCA125	**Machine Learning**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.PINKEY CHAUHAN

Scope and Objective:
This course explains machine learning techniques such as decision tree learning, Bayesian learning etc. To understand computational learning theory. To study the pattern comparison techniques.

Text Book T1	Machine Learning – Tom M. Mitchell, - MGH
Reference Book R1	Machine Learning: An Algorithmic Perspective, Stephen Marshland, Taylor & Francis

Lecture-Wise-Plan:

Lecture No.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./Text Book)
1-3	Introduction	Introduction - Well-posed learning problems, designing a learning system, Perspectives and issues in machine learning Concept learning and	a. Group Learning and Teaching	T1 Chapter-1

Lecture No.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./Text Book)
		the general to specific ordering		
4-6	Concepts of Searching methods	introduction, a concept learning task, concept learning as search, find-S: finding a maximally specific hypothesis, version spaces and the candidate elimination algorithm, remarks on version spaces and candidate elimination, inductive bias	a. Group Learning and Teaching	T1 Chapter-1
7-9	Decision Tree Learning	Introduction, decision tree representation, appropriate problems for decision tree learning, the basic decision tree learning algorithm, hypothesis space search in decision tree learning,	c.Technology based Learning	T1 Chapter-1

Lecture No.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./Text Book)
		inductive bias in decision tree learning, issues in decision tree learning		
10-12	Artificial Neural Networks-1	– Introduction, neural network representation, appropriate problems for neural network learning, perceptions, multilayer networks and the back-propagation algorithm	c.Technology based Learning	T1 Chapter-2
13-15	Artificial Neural Networks-2	Remarks on the Back-Propagation algorithm, An illustrative example: face recognition, advanced topics in artificial neural networks.	c.Technology based Learning	T1 Chapter-2

Lecture No.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./Text Book)
16-17	Evaluation Hypotheses	– Motivation, estimation hypothesis accuracy, basics of sampling theory, a general approach for deriving confidence intervals, difference in error of two hypotheses, comparing learning algorithms.	a. Group Learning and Teaching	T1 Chapter-2
18-20	Bayesian learning	Introduction, Bayes theorem, Bayes theorem and concept learning, Maximum Likelihood and least squared error hypotheses, maximum likelihood hypotheses for predicting probabilities, minimum description	a. Group Learning and Teaching	T1 Chapter-3

Lecture No.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./Text Book)
		length principle, Bayes optimal classifier, Gibs algorithm, Naïve Bayes classifier, an example: learning to classify text, Bayesian belief networks, the EM algorithm.		
21-23	Computational learning theory	Introduction, probably learning an approximately correct hypothesis, sample complexity for finite hypothesis space, sample complexity for infinite hypothesis spaces, the mistake bound model of learning	a. Group Learning and Teaching	T1 Chapter-3

Lecture No.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./Text Book)
24-25	Instance-Based Learning-	Introduction, k-nearest neighbour algorithm, locally weighted regression, radial basis functions, case-based reasoning, remarks on lazy and eager learning.	a. Group Learning and Teaching	T1 Chapter-3
26-28	Genetic Algorithms	Motivation, Genetic algorithms, an illustrative example, hypothesis space search, genetic programming, models of evolution and learning, parallelizing genetic algorithms.	a. Group Learning and Teaching	T1 Chapter-4

Lecture No.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./Text Book)
29-31	Learning Sets of Rules	Introduction, sequential covering algorithms, learning rule sets: summary, learning First-Order rules, learning sets of First-Order rules: FOIL, Induction as inverted deduction, inverting resolution.	c.Technology based Learning	T1 Chapter-4
32-34	Reinforcement Learning	Introduction, the learning task, Q–learning, non-deterministic, rewards and actions, temporal difference learning, generalizing from examples, relationship to dynamic programming	a. Group Learning and Teaching	T1 Chapter-4

Lecture No.	Learning Objective	Topics to be Covered	Teaching learning strategies: a. Group Learning and Teaching b. Game Based Learning c. Technology based Learning d. Peer teaching e. Project based Learning.	Reference (Ch./Sec./Text Book)
35-37	Analytical Learning-1-	Introduction, learning with perfect domain theories: PROLOG-EBG, remarks on explanation-based learning, explanation-based learning of search control knowledge.	c.Technology based Learning	T1 Chapter-5
38-39	Analytical Learning-2	Using prior knowledge to alter the search objective, using prior knowledge to augment search operators	c. Technology based Learning	T1 Chapter-5
40	Combining Inductive and Analytical Learning	Motivation, inductive-analytical approaches tolearning using prior knowledge to initialize the hypothesis.	a. Group Learning and Teaching	T1 Chapter-5

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Comprehensive Exam	3 Hours	40	12-05-2025	1-40	CB

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Date: 07/01/2025

Dr.PINKEY CHAUHAN
Instructor-in-charge