The ICFAI University, Raipur

Faculty of Science and Technology

First Semester, 2024–2025
Course Handouts

Table of Contents

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CAC111	**Computer Programming**	**3**	**2**	**0**	**4**

Instructor-in-charge: Mr.ASHISH KUMBHARE

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

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

Text Book T1	The C++ Programming Language by Bjarne Stroustrup, 3rd Edition, Pearson Publication.
Text Book T2	Programming with C++ by by John Hubbard, Atul Kahate , McGraw Hill Publication
Reference Book R1	Let Us C++ by Yashwant Kanetkar, BPB publication

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)R1
1	To learn the fundamentals of Programming	Types of Languages, Evolution of Programming Language	32-35
2-4	To learn the fundamentals of C++ Programming	Structure of a 'C++' Program, 'C++' Program development life cycle, Executing and Debugging a 'C++' Program	41-46
5-7	To learn the fundamentals of C++ Programming	Keywords and Identifiers, Operators, Constants, Variables, Data Types	61-68
8-9	To learn the fundamentals of C++ Programming	Precedence of Operators, Scope and Lifetime of Variables.	70-88

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)R1
10-13	To learn the Control Structures in C++	Decision Making using if statements, Types of if …else blocks	113-129
14-16	To learn the Control Structures in C++	Switch case Block, and GOTO statements	135-149
17-19	To learn the Control Structures in C++	Concept of Loop, For loop, While loop, Do while loop Jumping in Loop break and continue statement.	153-177
20-23	To learn the Arrays in C++	Introduction of Array, One-D Array, Two-D Array	231-258
24-25	To learn the Arrays in C++	Implementing String Variables, String handling Functions	266-282
26-29	To learn the Function in C++	Concept of Function, User-defined Function, System Defined Function, Types of parameter passing in function.	304-348
30-32	To learn the Pointers in C++	Need of Pointers, Types of Pointers,	356-370
33-34	To learn the Pointers in C++	Pointer Expression, Arrays of Pointers, Pointers and Functions	372-386
35-36	To learn the Structures in C++	Need of Structure, Implementing Structure Variable	401-421
37-38	To learn the Structures in C++	Arrays of Structure, Structure within Structure	423-433

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)R1
39-42	To learn about Dynamic Memory Allocation	Concept of Dynamic Allocation, Implementing Malloc and Calloc Functions, Releasing the free space	506-515

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	09-10-2024	1-12	CB
Test 2	50 Minutes	10	20-11-2024	13-28	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	20-12-2024	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: 02/08/2024

Mr.ASHISH KUMBHARE
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CAV111	**Quantitative Aptitude and MS-Excel**	**2**	**0**	**0**	**2**

Instructor-in-charge: Mr.HEMANT KUMAR DEWANGN

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

1. Understand the basic concepts of quantitative ability.
2. Acquire satisfactory competency in use of reasoning.
3. Solve campus placements aptitude papers covering Quantitative Ability, Logical Reasoning Ability.
4. Compete in various competitive exams like CAT, CMAT, GATE, GRE, GATE, UPSC, GPSC etc.

Text Book T1	Quantitative aptitude for Competitive examination by R S Agarwal
Text Book T2	Magical Book on Quicker Maths by M. Tyra, Fifth Edition
Reference Book R1	A Modern Approach to Verbal & Non-Verbal Reasoning by R S Agarwal
Reference Book R2	Quantitative Aptitude by Competitive Examinations by Abhijit Guha 4th edition

Lecture-Wise-Plan:

Lecture No	Learning Objective	Topics to be Covered	Reference (Ch./Sec/Page Nos. of Text)
1-2	Unit– I Quantitative Ability (Basic Mathematics)	Number Systems, LCM and HCF, Decimal Fractions	T 1
3-4		Simplification, Square Roots and Cube Roots	T 1
5-6		Average, Problems on Ages, Surds & Indices	T 1
7		Percentages, Problems on Numbers	T 1

Lecture No	Learning Objective	Topics to be Covered	Reference (Ch./Sec/Page Nos. of Text)
8	Unit– II Numerical Ability	Logarithm, Permutation and Combinations, Probability	T 1
9-10		Profit and Loss	T 1
11-12		Simple and Compound Interest	T 1
13-14		Time, Speed and Distance	T 1
15-16		Time & Work, Ratio and Proportion	T 1
17-18		Area, Mixtures and Allegation	T 1
19-20	Unit- III Data Interpretation	Data Interpretation, Tables	T 1
21		Column Graphs, Bar Graphs	T 1
22		Line Charts, Pie Chart, Venn Diagrams	T 1
23	Unit- IV Logical Reasoning	Analogy, Blood Relation, Directional Sense	T 1
24		Number and Letter Series, Coding – Decoding	T 1
25		Calendars, Clocks	T 1
26		Seating Arrangement	T 1
27		Syllogism, Mathematical Operations.	T 1

Lecture No	Learning Objective	Topics to be Covered	Reference (Ch./Sec/Page Nos. of Text)
28	Unit- V MS Excel	Introduction to MS Excel, Manage workbook options and settings	NA
29		Apply Custom Data Formats and Layouts, Create Tables	NA
30		Perform Operations with Formulas and Functions, Create Charts and Objects	NA

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	5	09-10-2024	1-18	CB
Test 2	50 Minutes	5	20-11-2024	19-30	OB
Quiz/Assignment/Lab	Throughout the Semester	5	**	---	CB
Comprehensive Exam	3 Hours	35	18-12-2024	1- 30	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: 05/08/2024

Mr.HEMANT KUMAR DEWANGAN
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CAC113	**Multimedia and Technology**	**3**	**0**	**1**	**4**

Instructor-in-charge: Dr.BHARATI PATEL

Learning Outcomes:

1. Apply the knowledge of the basic fundamentals components of Multimedia
2. To apply the animatic effects for basic multimedia formats
3. Identify about compression and applying the video settings
4. Effective learning about hardware components and software tool devices
5. Functioning and creating of webpage with all the applications

Text Book(s) T1	Multimedia: Making It Work, Tay Vaughan, 7th Edition, Tata Mc-Graw Hill., 2008.
Text Book(s) T2	Multimedia Systems, John F.Koegel Buford, Pearson edition, 2003.
Reference Book(s) R1	Ranjan Parekh, Principles of Multimedia, TMH, 2006.
Reference Book(s) R2	Multimedia: Computing, Communication and applications, Ralf Steinmetz and KlaraNahrstedt, Pearson Edition, 2001.

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
1-6	Introduction To Multimedia	Introduction to making Multimedia- Multimedia Skills and training- Text: Using text in Multimedia- Computer and Text- Font Editing and Design Tools- Hypermedia and Hypertext	T1:- Chpt 1
7-13	Multimedia File Handling	Sound – Images – Animation – Video	T1:- Chpt 2

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
14-23	Digital Video And Image Compression	Evaluating a compression system – Redundancy and Visibility-Video compression techniques-Standardization of an algorithm – The JPEG image compression standard-ITU –T Standards – MPEG motion video compression standard-DVI Technology.	T1:- Chpt 3
24-34	Hardware, Software And Multimedia Authoring Tools	Multimedia Hardware: Macintosh and Windows production Platforms-Hardware Peripherals: Memory and Storage Devices, Input Devices, Output Devices, Communication Devices .Basic Software Tools	T1:- Chpt 4
35-40	Multimedia And Internet	Internetworking –connections – Internet services –Tools for WWW – Designing WWW.	T1:- Chpt 5

Evaluation Scheme:

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Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	08-10-2024	1-15	CB
Test 2	50 Minutes	10	19-11-2024	16-30	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	13-12-2024	1- 40	CB

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Date: 05/08/2024

Dr.BHARATI PATEL
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CAA111	**English Language**	**2**	**0**	**0**	**2**

Instructor-in-charge: Dr.RITU ATUL BENJAMIN

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

1. Enhance comprehension skills and enrich vocabulary through the reading of short and simple passages
2. Enhance comprehension skills and enrich vocabulary through the reading of short and simple passages
3. Enhance communication skills
4. Acquaint students with social formulae used to perform various everyday functions so that they can converse in English in simple situations

Reference Book R1	English at the Workplace. Delhi: Macmillan, 2006
Reference Book R2	Everyday English. Delhi: Pearson, 2005.
Reference Book R3	Developing Language Skills 2, Delhi: Doaba House, 1995
Reference Book R4	Effective Technical communication, Ashraf Rizvi, McGraw Hill,2005
Reference Book R5	Essentials of Business Communication, Rajendra Pal, S Chand Publication

Lecture-Wise-Plan:

Lecture Nos	Learning Objective	Topics to be covered	Reference
1-2	To Develop Reading Skills	Reading strategies	R1
3-4	To Develop Reading Skills	Reading newspaper articles	R1
5-6	Develop Recitation Skills	Reciting poems	R2

Lecture Nos	Learning Objective	Topics to be covered	Reference
7-8	Develop Narrative Skills	Reading and narrating novels	R2
9-10	Evaluating Reading Skills	Exercises based on reading	R2
11	Develop Summarizing Skills	Summarizing the text	R3
12	Develop Paraphrasing Skills	Paraphrasing the text	R4
13-14	Develop Communication Skills	Communication: Definition, forms, types	R5
15	Develop Communication Skills	Principles and barriers to communication	R5
16-20	Develop Speaking Skills	Socializing, Expression, greeting others, Introduction of self and others, Apologizing, excusing, Asking and giving information	R2

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	5	08-10-2024	1-12	CB
Test 2	50 Minutes	5	19-11-2024	13-20	OB
Quiz/Assignment/Lab	Throughout the Semester	5	**	---	CB
Comprehensive Exam	3 Hours	35	16-12-2024	1- 20	CB

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Date: 05/08/2024

Dr.RITU ATUL BENJAMIN
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CAC112	**Computer Fundamentals and MS Office**	**3**	**0**	**1**	**4**

Instructor-in-charge: Mr.NAVEEN KUMAR VAISHNAV

Scope & Objectives of the Course

Upon successful completion of this course, students will be able to:

1. Understand Basic Computer Concepts: Gain foundational knowledge of computer organization, including the core components and their functions.
2. Comprehend Number Systems and Logic Design: Grasp the fundamentals of number systems, logic gates, and Boolean algebra, and apply these concepts to solve problems.
3. Analyze Combinational & Sequential Circuits: Understand the architecture and working principles of combinational and sequential circuits, including their real-world applications.
4. Gain Proficiency in MS Office: Develop practical skills in Microsoft Office applications, enabling students to efficiently create, edit, and manage documents, spreadsheets, and presentations.

Text Book T1	Computer Fundamental, Pradeep K. Sinha, Sixth Edition BPB Publication.
Reference Book R1	Fundamentals of computers. 6th edition, V. Rajaraman, Neeharika Adabala
Reference Book R2	Digital Computer electronics: An Introduction to microcomputers by Albert Malvino and Jerald Brown, Tata Mc graw Hill.
Reference Book R3	Microsoft office 2000 Marquis
NPTEL	http://www.nptelvideos.in/2012/11/computer-organization.html
SWAYAM	https://onlinecourses.swayam2.ac.in/cec19_cs06/preview

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page No.s of Text/Ref. Books)
1-2	Introduction to Computers	Introduction to ITT, Basics concept of IT, Concept of data and information, History of computers	T1: Chap 1, Chap 2

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page No.s of Text/Ref. Books)
3-5	To understand Basic Computer Organization	Generations and classification of Computers	T1 : Chap 12
6-7	To learn about Components of Computer system	Input and Output devices, storage devices, memory hierarchy	T1: Pg 19-22
8-9	To Understand Software	Software and its need, Types of Software: System software, application software, utility software, Firm ware.	T1: Pg 180-185
10-12	To Understand Programming language	Types of operating system, Language translator, Types of Programming Languages	T1: Pg 23-35, T1: Pg 220- 250
13-16	To Understand MS Word	Overview of MS Word, Document creation, formatting, and editing, Styles, templates, and advanced formatting techniques, Mail merge.	R3: Pg 69-86
17-19	To Understand MS Excel	Overview of Excel, Data entry, formulas, and functions, Creating and customizing charts and graphs	R3: Pg 639-676
20-22	To Understand MS PowerPoint and Access	Overview of PowerPoint, Designing and formatting presentations, adding multimedia elements and animations, Overview of MS Access, Introduction to DBMS, Features of DBMS, Working with database and tables.	R3: Pg 287-312
23-25	To Understand Number System	Logic Gates and their truth tables, Number System (Binary, Decimal, Octal, Hexadecimal) and conversions	T1 : Chap 3, Chap 5
26-28	To Understand Computer Network	Communication process, Communication and system elements, Analog and digital signal, mode of communication, Technical foundation of Internet, history of Internet, Internet Service Provider (ASP), ARPANET	T1: Pg 346- 250

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page No.s of Text/Ref. Books)
29-30	To understand Web Terminologies	Communication media: Wired and Wireless. Computer Network: Types, criteria, advantages and disadvantages	T1: Pg 383- 388
31-34	To understand Web Concepts	Topology, LAN and other network related protocols, OSI reference model and TCP/IP model.	T1: Pg 392- 400
35-38	To understand Web Terminologies	Services Available on Internet; Internet Applications : E-mail, WWW and file transfer .Internet addressing , Client server computing, Domain name system (DNS)	T1: Pg 346- 250
39-42	To understand Web Services and latest trends	Search Engine, Internet Security – Fire walls, Encryptions etc., Multimedia, Artificial Intelligence, Machine learning, Cloud computing, SWAYAM, NPTEL	T1: Pg 400-405

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	07-10-2024	1-20	CB
Test 2	50 Minutes	10	18-11-2024	21-40	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	23-12-2024	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: 01/08/2024

Mr.NAVEEN KUMAR VAISHNAV
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CAG111	**Elementary Calculus**	**3**	**0**	**1**	**4**

Instructor-in-charge: Dr.ANIMESH KUMAR SHARMA

Scope and Objective of the course:
The Course is designed to provide basic concepts of Linear Algebra and an introduction to the complex number and also introduce to differentiation and integration, both are major concepts of Calculus,

Text Book T1	Linear Algebra by Kenneth Hoffman, Ray Kunze.
Text Book T2	Complex Analysis and Applications by J. W. Brown, R.V. Churchill; McGraw-Hill.
Text Book T3	Essential Calculus Skill by Chris McMullen.
Reference Book R1	Scaum's Outline of Linear Algebra by Seymour Lipschutz, Marc Lipson; McGraw Hill
Reference Book R2	Complex Analysis for Mathematics and Engineering, John H. Mathews & Russel W. Howell, Jones & Barlett Publishers,2001.

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)
1-6	Differentiation	Differential coefficient or Derivative of a function, Geometrical interpretation of the derivative of a function, Notation, Properties of derivatives, Derivatives of some important functions, Product rule, Quotient rule, Chain rule, double differentiation, Maximum and Minimum values of a function, Maxima, Minima.	Ch1,Ch2,Ch3,Ch4, Ch5/TB3
7-14	Integration	Integral of a function, Properties of Indefinite Integral, Standard formulae for Integration, Definite Integral of a function, Algebraic method to evaluate	Ch9,Ch10,Ch11,Ch12,Ch13,Ch14,Ch15/TB3

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)
		Definite Integral, Properties of Definite Integral, Rule of substitution, Geometrical Significance of a Definite Integral.	
15-25	Matrices	Introduction, Notation, Order, Equality, Types of Matrices, Zero and Identity Matrix, Transpose of a Matrix, Symmetric and Skew-Symmetric Matrices, Operation on Matrices, Addition and Multiplication and Multiplication with a scalar, Simple properties of Addition, Multiplication and scalar multiplication, On Commutativity of multiplication of matrices and the existence of non-zero matrices whose product is the zero matrix (restrict to square matrices of order 2), Invertible matrices (Here all matrices will have real entries).	Ch1/1-15/TB1
26-32	Determinants	Determinant of a square matrix (up to 3 x 3 matrices), Minors, Co-factors and applications of Determinants in finding the area of a triangle, Adjoint and Inverse of a square matrix, Consistency, Inconsistency and number of solutions of system of linear equations by examples, Solving system of linear equations in two or three variables (having unique solution) using Inverse of a matrix.	Ch2/18-35/TB1
33-40	Complex Numbers and Quadratic Equations	Introduction, Need of Complex numbers, especially $\sqrt{-1}$, to be motivated by the inability to solve some of the quadratic equations, Algebraic properties of Complex numbers, The Modulus and the conjugate of a Complex number, Argand plane, Polar representation, Quadratic Equations.	Ch1/1-14/TB2

Evaluation Scheme:

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Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	07-10-2024	1-15	CB
Test 2	50 Minutes	10	18-11-2024	16-33	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	09-12-2024	1- 40	CB

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Date: 05/08/2024

Dr.ANIMESH KUAMR SHARMA
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CA211	**Computer Network**	**3**	**0**	**1**	**4**

Instructor-in-charge: Dr.BHARATI PATEL

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

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./PgNo)
1-2	Introduction to Computer Networking	Introduction to Computer Networks and Security	T1: Ch-1
3-5	Hardware and Software	LAN, MAN, WAN, PAN, CAN, Topologies in Computer Network	T2: Ch-1, Ch-4

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./PgNo)
6-8	Introduction to OSI, TCP/IP	Introduction to Reference Models OSI,TCP/IP Layers	T1: Ch-2, T2: Ch-1
9-10	Physical layer and Transmission media	Introduction to Physical Layer: Repeaters, HUB, Bridge, Switch Routers	T1: Ch-3, Ch-7
11-13	Data Link Layer and Errors	Data Link Layer Design Issues, Error Detection And Correction	T2: Ch-3, Ch-10
14-18	Data Link Layer Protocols	Elementary Data Link Protocols, Sliding Window Protocols, MAC, ALOHA	T1: Ch-11, Ch-3, Ch-4, Ch-13
19-21	Design of Network Layer	Network Layer Design Issues, Routing algorithm: classful & classless	T2: Ch-5, Ch-19
22-24	Removing Congestion on Network	Congestion Control Algorithms, subnet, super net	T1: Ch-23, T2: Ch-5
25-27	Protocols of Transport Layer	The Transport Service, Elements of Transport Protocol	T1: Ch-22, T2: Ch-6
28-30	Internet Transport Protocols	The Internet Transport Protocols: UDP, TCP	T1: Ch-22
31-36	Application Layer Services	DNS, E-Mail, WWW	T1:Ch-25,26, 27,T2:Ch-7
37-40	Networks Security	Cryptography, Symmetric-Key & Asymmetric-key Algorithms	T1: Ch-29,31, T2: Ch-8

Evaluation Scheme:

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Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	25-09-2024	1-15	CB
Test 2	50 Minutes	10	13-11-2024	16-30	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	11-12-2024	1- 40	CB

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Date: 01/08/2024

Dr.BHARATI PATEL
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CAC212	**Database Management Systems**	**3**	**2**	**0**	**4**

Instructor-in-charge: Mr.NAVEEN KUMAR VAISHNAV

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

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

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

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page No.s of Text/Ref. Books)
1-3	Introduction to Database Systems	Course overview, Overview of modern DBMS, Database Architecture	T1: 1.1-1.13
4-8	About Database	Data Independence, Data Dictionary, Types of Keys	T1: 2.1-2.13
8-11	Data modeling	Basic elements of ER model, Attributes, Types of Relationship	T1: 7.1-7.10

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page No.s of Text/Ref. Books)
12-16	Introduction to SQL constructs	DDL & DML Commands	T1: 3.1-3.9
17-19	Types of Operators and Functions	In, Between, Like, Aggregate Functions	T1: 5.1
20-25	Understanding additional SQL structures	Insert, Delete, Update, View Definition and Use, Temporary Tables, Nested Queries	T1: 4.1-4.5
26-30	Database design through Functional Dependencies & Normalization	Functional dependencies, Normal Forms: 1NF,2NF, 3NF, BCNF, Multi-valued dependencies:4NF,5NF	T1: 8.1-8.9
31-33	Formal Query Languages	Relational algebra operators, Relational algebra queries	T1: 61.-6.4
34-35	Integrity constraints	Integrity constraints: Not null, unique, check, primary key, foreign key, references, Triggers	T1: 4.4-4.5
36-38	Understand Database connectivity	Connectivity to the database, designing and implementation	T1: 12.1-12.8
39-40	Latest Technologies	Introduction to Hadoop, Big-Data, Data warehouse	T1: 14.1-14.10

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	23-09-2024	1-16	CB
Test 2	50 Minutes	10	11-11-2024	17-29	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	04-12-2024	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: 05/08/2024

Mr.NAVEEN KUMAR VAISHNAV
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
SS215	**Soft Skills I**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.SHUBHRA TIWARI

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

1. Understand the meaning, concept, importance and types of communication.
2. Learn the usage of effective communication and work as a team.
3. Explore skills and ability to effectively participate in Group discussion and clear interview.
4. Understanding and develop interpersonal and goal setting skills.
5. Understand and develop time management skills.

Text Books T1	Soft Skills by Prashant Sharma
Reference Books R1	Books by Dale Carnegie, Geoffrey. A Dudley etc.
Reference Books R2	Business Vocabulary in Use-Bill Mascoll – Cambridge University Press
Reference Books R3	Soft Skills- K. Alex
Reference Books R4	Soft skills lab-Institution Material

Lecture-Wise-Plan:

Lecture Nos	Learning Objective	Topics to be covered	Reference
1	Understanding verbal & non-verbal comm	Verbal and Non-Verbal Communication Skills: Introduction	R1, R2, R3
2,3	Understanding different communication skills with special focus on listening.	Listening to customers, team members and managers; listening to electronic media; communication with customers.	R1, R2, R3

Lecture Nos	Learning Objective	Topics to be covered	Reference
4	Communication in group	Communication with team members and managers, referencing for verbal communication	R1, R2, R3, Practical Examples From Contemporary World
5,6,7,8,9	Career preparation CV, GD & PI	Introduction; SOP; career objective; educational qualification; achievements and interests; Introduction to GD; foundation skills in GD; Introduction to PI; foundation skills in PI.	R1, R2, R3, Sample Cvs, Sample Interviews From Corporate Industry
10,11	Executive Skills: Interpersonal skills	Definition; understanding, analysis and response to the needs, requirements and capabilities of people at different levels.	R1, R2, R3, Biographies Of Business Men & Women
12	Goal Setting Skills	Introduction; SWOT	R1, R2, R3
13		Students SWOT analysis	
14		Relevance of SWOT on goal setting	R1, R2, R3
15		Setting career goal	R1, R2, R3, Biographies of achievers
16		Action plan	R1, R2, R3
17,		Measures to achieve career goal	R1, R2, R3

Lecture Nos	Learning Objective	Topics to be covered	Reference
18,19,		Corporate role models	R1, R2, R3 Examples From Current Time.
20, 21		Three to five years career roadmap	Students' Self-Goal Setting
22,23		Competitive work environment and realization of goals;	R1, R2, R3 Examples & Case Study
24		Anticipating challenges and utilizing opportunities	R1, R2, R3 Examples & Case Study
25	Time Management Skills	Understanding the concept & planning,	R1, R2, R3
26,		Scheduling, Prioritizing;	R1, R2, R3
27,28,29		multitasking	R1, R2, R3 & Practical
30,31		Corporate Etiquette	R1, R2, R3
32		Customer interaction etiquette	R1, R2, R3 & Examples From Contemporary Time
33,34		Office Etiquette	R1, R2, R3 & ppt

Lecture Nos	Learning Objective	Topics to be covered	Reference
35,36,37,38		Meeting etiquette; telephone etiquette; presentation etiquette.	R1, R2, R3 & audio-visual
39,40	Practical presentation	Project Work & Presentation	Practical Session

Class Room Practical:

S.No	Name of the Practical
1	Group Discussion & Mock interview
2	Preparation and presentation on subject based and current topic
3	Time management-based activities
4	LSRW based activities

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	25-09-2024	1-20	CB
Test 2	50 Minutes	10	13-11-2024	21-40	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	13-12-2024	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: 08/08/2024

Dr.SHUBHRA TIWARI
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CA213	**Data Structure and Algorithm**	**3**	**0**	**0**	**3**

Instructor-in-charge: Mr.ASHISH KUMBHARE

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

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

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

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
1-3	To learn Introduction of Data structure and its types	Introduction of Data structure, Data types: primitive, non-primitive data types, Linear and non linear data structure.	T1 CH-1 1.1, 1.3, 1.4
4-6	To learn application of array and various searching techniques	Array concept (one dimension, two dimension), Linear and Binary Search Algorithms,	T1 CH-2 2.4

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
6-7	To learn various sorting techniques	Sorting Algorithms: Bubble Sort, Insertion Sort, Selection Sort	T1 CH-7 7.1, 7.2
8-10	To learn various sorting techniques using Divide and Conquer strategy.	Quick Sort, Merge Sort & Radix sort	T1 CH-7 7.3, 7.4, 7.5
11	To learn introduction to linear data structure stack.	Stack concept	T1 CH-3 3.1
12-13	To learn various stack operations.	Operations PUSH, POP, TRAVERSE, Is full, Is empty.	T1 CH-3 3.1, 3.2
14-17	To learn Applications of stack	Infix, Prefix, Postfix representation, Conversion using stack	T1 CH-3 3.3
18-19	To learn introduction to linear data structure Queue and its types.	Introduction, and Types of Queues, Priority Queue, Circular queue, Double Ended Queue,	T1 CH-3 3.1
20	To learn various Queue operations.	Operations (INSERT, DELETE, TRAVERSE)	T1 CH-3 3.1, 3.2
21-22	To learn introduction to linear data structure Linked list and its types.	Linked List, Singly and Doubly Linear link lists, Singly and doubly circular linked list	T1 CH-4 4.1
23-24	To learn various linked List operations	Operations on linked lists insert, delete, Applications of linked lists.	T1 CH-4 4.8,4.9
25-26	To learn introduction to Nonlinear data structure Tree and its types.	Definition of trees and their types, Binary trees, Properties of Binary trees,.	T1 CH-5 5.1, 5.2

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
27-30	To learn various operations and traversal technique.	Insertion, deletion, Searching and traversal algorithm, Preorder, post order, in-order traversal) , BFS, DFS	T1 CH-5 5.3, 5.4, 5.5
31-32	To learn various applications of tree	Binary Search Trees, Implementations, AVL Trees, B tree,	T1 CH-5 5.6, 5.7
33	To learn introduction to Nonlinear data structure Graph and its types.	Definition of Graph and their types	T1 CH-6 6.1
34-35	To learn various applications of Graph	Adjacency and incident (matrix & linked list) representation of graphs, Weighted Graphs,	T1 CH-6 6.2
36-38	To learn various operations and traversal technique.	Shortest path Algorithm, Spanning tree, Minimum Spanning tree,	T1 CH-6 6.3, 6.4
39-42	To learn various operations and traversal technique.	Kruskal and prims algorithms.	T1 CH-6 6.3, 6.4

Data Structure and Algorithm Lab:

S.No	List of Practical
1	Write a program that implements Search Techniques. 1. Linear Search
2	Write a program that implements Search Techniques. 1. Binary Search.
3	Write a program that implements Sorting Techniques. 1. Bubble Sort.
4	Write a program that implements Sorting Techniques. 1. Selection sort.
5	Write a program that implements Sorting Techniques. 1. Insertion Sort
6	Write a program that implements Sorting Techniques. 1. Quick sort.
7	Write a program that implements operations on STACK
8	Write a program that implements operations on QUEUE
9	Write a program that implements operations on Linked List

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	25-09-2024	1-14	CB
Test 2	50 Minutes	10	13-11-2024	15-30	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	11-12-2024	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: 02/08/2024

Mr.ASHISH KUMBHARE
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CA225	**Computer Graphics**	**3**	**2**	**0**	**4**

Instructor-in-charge: Dr.RAMESH KUMAR YADAV

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

1. Understand the concepts of computer graphics through theoretical, algorithmic and advanced modelling aspects along with, applications in 3D graphics and visualization in 3D.
2. To apply the concepts and techniques to various problem domain and visualization of data- sets and processes.

Text Book TI	Computer Graphics, James D. Foley, A. Van Dam, S.K. Ferrier, and J.F. Hughes,PrinciplesandPractice,2ndEditioninC,Addition-Wesley,1996.
Reference Book R1	Mathematical Elements of Computer Graphics, Rogers B. McGraw Hill, 1989.
Reference Book R2	Computer Graphics, D. Hearn and M.P. Baker, PHI, 1994.
Reference Book R3	IntroductiontoComputerGraphics,NKrishnamurthy,1st Edition, TMH, 2002.

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
01-02	What, Why & Where about Graphics	Overview of graphics systems— What, Why & Where about Graphics, Hardware & Software, Input & Output Technology, Mathematical complexity involved – Demonstration Through some examples.	Ch l Ch4
03-05	Algorithms for Drawing 2D objects Line, Circle & Ellipse.	Raster Graphics Algorithms for Drawing 2D objects: Line, Circle & Ellipse.	Ch3

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
06-10	Manipulation of objects	Introduction to 2D & 3D Geometry, Scaling, Translation, Rotation, Shear, Reflection, Projection and Composite Transformations	Ch5
11-13	Mappingof2D from world to screen	Viewing & Clipping in 2D (Cohen's and Parametric Line Methods)	Ch5 Ch3
14-17	Mapping of 3D from world to screen	Viewing & Clipping in 3D Perspective & Parallel projection, Clipping against a Canonical View Volume, Clipping in Homogeneous Coordinates, and Mapping in to a Viewport	Ch6
18-22	Drawing Smooth Curves & Surfaces	Hermit, Bezier, Continuities, B - spline Curves, Parametric Bi Cubic Surfaces, Quadric Surfaces	Ch11
23-27	Representation of Solid objects	Solid Modeling (Representations, Operations, Geometry, and Interface)	Ch12
28-31	Detection of hidden portions	Visible Surface Detection (Need &Algorithms, Ray Tracing) and Hidden Line elimination	Ch15
32-35	How to shade surfaces and solids	Rendering (Models, Physics, Shading Polygons & Surface, & Shadows)	Ch16
36-40	How to show graphics in motion	Animation (Languages, Techniques, Control, Basic Rules & Problems)	Ch21

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	23-09-2024	1-20	CB
Test 2	50 Minutes	10	11-11-2024	21-35	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	02-12-2024	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: 06/08/2024

Dr.RAMESH KUMAR YADAV
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CA216	**E Commerce**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.RAVI KIRAN

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

1. To provide an analytical framework to understand the emerging world of e-commerce
2. To make the learners familiar with current challenges and issues in e-commerce
3. To develop the understanding of the learners towards various business models
4. To enable to understand the Web- based Commerce and equip the learners to assess e-commerce requirements of a business
5. To develop understanding of learners relating to Legal and Regulatory Environment and Security issues of E-commerce

Text Book T1	Laudon, Kenneth C. and Carol Guercio Traver (2002) E-commerce: business, technology, society. (New Delhi : Pearson Educatin). Awad, Elias M. (2007), Electronic Commerce: From Vision to Fulfillment (NewDelhi : Pearson Education).
Reference Book R1	Kamlesh K.Bajaj and Debjani Nag, Ecommerce- the cutting edge of Business, Tata McGrawHill Publications, 2008 Kalakota et al, Frontiers of Electronic Commerce, Addison Wesley, 2004 E- Commerce Strategies, Technology and applications (David) Tata McGrawHill Introduction to E-commerce (jeffrey) Tata- Mcgrawhill E-Business and Commerce- Strategic Thinking and Practice (Brahm) biztantra
Suggested equivalent online courses:	

Lecture-Wise-Plan:

Lecture Nos.	Learning objectives	Topics to be covered	Reference (Ch./Sec./ Page Nos. of Text Book)
1-10	Introduction to Electronic Commerce –Evolution and Models	Evolution of E-Commerce- Introduction, History/ Evolution of Electronic Commerce, Roadmap of E-Commerce in India, Main	T1

Lecture Nos.	Learning objectives	Topics to be covered	Reference (Ch./Sec./ Page Nos. of Text Book)
		activities, Functions and Scope of E-Commerce. Benefits and Challenges of E-Commerce, E-Commerce Business Strategies for Marketing, Sales and Promotions. Business Models of E-Commerce-Characteristics of Business to Business(B2B), Business to Consumers (B2C), Business to Government (B2G) Business to Consumer E-Commerce process, Business to Business E-Commerce- Need and Importance, alternative models of B2B E-Commerce. E-Commerce Sales Product Life Cycle (ESLC) Model	
11-20	World Wide Web and E-enterprise	World Wide Web-Reasons for building own website, Benefits of Website, Registering a Domain Name, Role of web site in B2C E-commerce; push and pull approaches; Web site design principles. EDI and paperless trading; Pros & Cons of EDI; Related new technologies use in E-commerce. Applications of E-commerce and E-enterprise - Applications to Customer Relationship Management- Types of E-CRM, Functional Components of E-CRM. Managing the E-enterprise-Introduction, Managing the E-enterprise, Comparison between Conventional and E-organization, Organization of Business in an E-enterprise, Benefits and Limitations of E- enterprise	T2

Lecture Nos.	Learning objectives	Topics to be covered	Reference (Ch./Sec./ Page Nos. of Text Book)
21-30	E-marketing and Electronic Payment System	E-Marketing- Scope and Techniques of E-Marketing, Traditional web promotion; Web counters; Web advertisements, Role of Social media. E-Commerce Customer Strategies for Purchasing and support activities, Planning for Electronic Commerce and its initiates, The pros and cons of online shopping, Justify an Internet business. Electronic Payment System- Characteristics of E-payment system, SET Protocol for credit card payment, prepaid e- payment service, post-paid E-payment system, Types of payment systems. Operational, credit and legal risks of E-payment system, Risk management options for E-payment systems, Set standards / principles for E-payment Marketing, social media Analytical Tools.	T1
31-40	Legal and Regulatory Environment and Security issues of E-commerce	Introduction to Cyber Laws-World Scenario, Cyber-crime & Laws in India and their limitations, Hacking, Web Vandals, E-mail Abuse, Software Piracy and Patents. Taxation Issues, Protection of Cyber Consumers in India and CPA 1986, Importance of Electronic Records as Evidence. Security Issues in E-Commerce- Risk management approach to Ecommerce Security - Types and sources of threats, Protecting electronic commerce assets and intellectual property. Security Tools, Client server network security, Electronic signature, Encryption and concepts of public and private key infrastructure	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	50 Minutes	10	24-09-2024	1-20	CB
Test 2	50 Minutes	10	12-11-2024	21-40	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	06-12-2024	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: 07/08/2024

Dr.RAVI KIRAN
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CA422	**Network Security**	**3**	**0**	**0**	**3**

Instructor-in-charge: Mrs.NISHA THAKUR

Learning Outcomes:
The objective of this course is to teach the concepts of securing computer network protocols, based on the application of cryptography techniques. This course covers the underlying principles and techniques for network and communication security. The course also gives a survey of cryptographic tools and explains how they can be utilized in protocols and applications, for example how to provide secure user authentication over a public network. Students have a good understanding of how applications can communicate securely and what tools and protocols exist in order to offer different levels of security.

Text Book T1	Cryptography And Network Security – Principles and Practices, William Stallings, Prentice Hall of India, Fifth Edition, 2011
Reference Book R1	Cryptography and Network Security Atul Kahate, Tata McGrawHill, 2003.
Reference Book R2	Security in Computing Charles B. Pfleeger, Shari Lawrence Pfleeger, Third Edition, Pearson Education, 2003.
NPTEL Link	https://nptel.ac.in/courses/106/105/106105031/

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
1	To learn Introduction of Network Security	Introduction of Network Security,	T1 CH-1 1.1, 1.2
2-3	To learn Need for Security	Need for Security – Concept & Types of Attacks, Types of Services and Mechanisms	T1 CH-1 1.3, 1.4,1.5
4-5	To learn concept of encryption	Introduction to encryption, Classical encryption Techniques	T1 CH-2 2.1,2.2
6-8	To learn various encryption standards	Block ciphers standard, Data encryption standard, Advanced encryption standard	T1 CH-3 3.1,3.2

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
9-11	To learn symmetric cipher encryption DES algorithm	Symmetric ciphers- triple DES concept, DES- Modes of operation	T1 CH-3 3.4,3.5
12-13	To learn public key cryptography	Confidentiality using Symmetric Encryption, Public key cryptography	T1 CH-8 8.1,8.2
14-15	To learn public key cryptography RSA Algorithm	Concept and working of RSA	T1 CH-9 9.1,9.2
16-17	To learn Key management and distribution technique	Key management Techniques, Key Distribution Techniques	T1 CH-10 10.1,10.2
18	To learn public Key Cryptosystems	Other public Key Cryptosystems – Diffie Hellmen Inroduction	T1 CH-10 10.2
19	To learn Diffie Hellmen Algorithm	Diffie Hellmen working Concept	T1 CH-10 10.2,10.3
20-21	To learn concept of Hash Function	Cryptographic Hash functions – concept, uses, Cryptographic Hash functions –SHA	T1 CH-11 11.1,11.2
22	To learn Message authentication Codes	Introduction to Message authentication Codes (MAC),	T1 CH-11 11.3
23-26	To learn different MAC algorithm	Message authentication Codes (MAC) – HMAC, Message authentication Codes (MAC) – DAA, Hash and MAC algorithms – MD5	T1 CH-12 12.1,12.3,12.4
27	To learn concept of Digital Signature	Introduction to Digital signatures	T1 CH-13 13.1
28-29	To learn Digital Signature technique	Digital signatures – DSS, Digital signatures –DSA,	T1 CH-13 13.2,13.3
30-32	To learn Authentication principles	Application of X.509 Certificates. Authentication principles, Authentication applications- Kerberos V4 & V5	T1 CH-14 14.1,14.2
33-34	To learn Web security concept	Introduction to Web security, Working concept of Web security	T1 CH-17 17.1,17.2
35	To learn Web security	Web security - Secure Electronic Transaction	T1 CH-17 17.3

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
36-37	To learn E-Mail security	Introduction E-Mail security, Working concept of E-Mail security	T1 CH-15 15.2
38-39	To learn IP Security	Introduction to IP Security, Working concept of IP Security	T1 CH-16 16.1,16.2
40-42	To learn Application of IP Security	Application of IP Security, PGP (Pretty_Good_Privacy) Cocept	T1 CH-15 15.1

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	23-09-2024	1-11	CB
Test 2	50 Minutes	10	11-11-2024	12-26	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	02-12-2024	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: 06/08/2024

Mrs.NISHA THAKUR
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CA408	**Internets of Things**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.PINKEY CHOUHAN

Learning Outcomes

1. Upon successful completion of the course, student will be:
2. To understand the definition and significance of the Internet of Things.
3. To learn the architecture, operation, and business benefits of an IoT solution.
4. To examine the potential Security issues in IoT and explore the relationship between IoT, cloud computing, and big data.
5. Design and program IoT devices, use real IoT protocols for communication, Secure the elements of an IoT device.

Text Book T1	Pethuru Raj and Anupama C. Raman, ―The Internet of Things: Enabling Technologies, Platforms, and Use Cases", CRC Press, 2017.
Text Book T2	Raj kamal, ―Internet of Things: Architecture and design Principles‖, McGraw Hill Education, 2017.
Text Book T3	Simone Cirani, Gianluigi Ferrari, Marco Picone, Luca Veltri Internet of Things: Architectures, Protocols and Standards,‖ Wiley, 2018.
Reference Book R1	R. Buyya and A.K. Dastjerdi (eds.), ―Internet of Things: Principles and Paradigms,‖ Cambridge, MA, USA: Morgan Kaufmann (Elsevier), 2016.
Link	https://www.javatpoint.com/iot-internet-of-things

Lecture-Wise-Plan:

Lecture No.	Learning Objective	Topics to be covered	Reference (Ch./ Sec./Page Nos.)
1	To understand the introduction to The Internet of Things	Introduction to IoT and Components of IoT Ecosystem	T1: 1
2		IoT applications, Trends and Implications	T1:3
3-4		IoT issues and challenges, IoT Architectures	Notes

Lecture No.	Learning Objective	Topics to be covered	Reference (Ch./ Sec./Page Nos.)
5	To understand basic	Components of internet of things, Operating System for IoT	Notes, T2:15
6		WoT Applications for Mobile and Wearable Devices	T2:336
7-8	components and working of IoT	Industrial IoT: case study: Agriculture, Healthcare, Process Automation & monitoring etc.	T1: 28
9-10	To understand different communication protocol for IoT	Working of IoT, Communication Technologies used in IoT	T2:9,48
11-12		Infrastructure Protocols: MAC protocols for sensor network, SMAC, IEEE 802.15.4,	T2:74
13-14		Near Field Communication (NFC), RFID, ZigBee, Bluetooth Low Energy (BLE),IPv6 over LowPower Wireless Personal Area Networks (6LoWPAN),	T1: 71-78
15-16		Long Term Evolution-Advanced, Z-Wave, Components of ZWave Network,	T2: 53
17-18		Protocols for IoT Service Discovery: DNS service discovery, multicast domain name system.	T2:141
19-21	To understand different networking protocol for IoT	Constrained Application Protocol (CoAP), Message Queue Telemetry Transport (MQTT), Extensible Messaging and Presence Protocol (XMPP),	T2: 81, 97, 99
22-24		Advanced Message Queuing Protocol (AMQP), Data Distribution Service (DDS),	T1:111, 112
25-26		Service Discovery Protocols, Routing Protocol for Low Power and Lossy Networks (RPL),	T1:61, 64
27-29		Wireless sensor network architecture, data dissemination and gathering protocol.	T2: 32,63

Lecture No.	Learning Objective	Topics to be covered	Reference (Ch./ Sec./Page Nos.)
30-31	To understand how to build IoT	Introduction to Microcontrollers, Arduino and Raspberry-Pi, IoT Systems	T2: 293, 309
32-33		Logical Design using Python, IoT Physical Devices & Endpoints, IoT Device	T2:327
34-35		Programming with Arduino and different sensors.	T2:327
36-38	To Understand Platforms for IoT Applications and Analytics	Role of the cloud and fog resources in the delivery of IoT services, Splunk Software for IoT Data,	T1: 237
39		The IoT Building Blocks, Connected Devices, IoT or Sensor Data Gateway,	T1:156
40-42		Amazon Web Service IoT Platform, Azure IoT Hub, The IoT Data Virtualization Platforms, IoT Data Visualization Platform, Security and Privacy in IoT	T2:456, T1:20 T1:285 T1: 191

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	24-09-2024	1-15	CB
Test 2	50 Minutes	10	12-11-2024	15-35	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	09-12-2024	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: 05/08/2024

Dr.PINKEY CHOUHAN
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CA429	**Image Processing**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.K NAGAIAH

Scope and Objective:
This is a basic course in digital image processing and aims at providing an understanding of some of the fundamental concepts involved. It shall deal with the fundamentals of images. The various discrete transforms that are used extensively in image processing and their application to data compression are dwelt with. In addition, the course covers some basic enhancement and restoration techniques and coding. The course also briefly covers image understanding, image classification and recognition along with some neural networks.

Text Book T1	Digital Imagel Processing, Rafael C. Gonzalez & Richard E. Woods, Pearson Education Asia, Second Ed., 5th. Indian reprint 2003.
Text Book T2	Digital Imagel Processing Using MATLAB, Rafael C. Gonzalez & Richard E. Woods, Steven L. Eddins, Pearson Education Asia, Second Ed., 3rd . Indian reprint 2005.
Reference Book R1	Digital Image Processing, Anil K. Jain, PHI, 1998, Indian reprint 2003
Reference Book R2	Digital Image Processing and Analysis, Bhabatosh Chanda & Dwijesh Dutta Majumdar, PHI, 2002
Reference Book R3	Fundamentals of Electronic Image Processing, Arthur R. Weeks, PHI, 1999, Indian reprint 2003.

Lecture-Wise-Plan:

Lecture No.	Learning Objective	Topics to be covered	(Ch./Sec./Text Book)
1	Introduction	Introduction to digital image processing and systems	TB:2.2
2-3	Digital Image Fundamentals	Image Sampling and Quantization	TB: 2.3.4- 2.4.5
4-6	Image Enhancement in Frequency Domain	Fourier Transform, DFT and its properties	TB: 4.2.1-4.2.2

Lecture No.	Learning Objective	Topics to be covered	(Ch./Sec./Text Book)
7-8	Implementation	2D convolution	TB: 4.6.3-4.6.4
9	Implementation	Fast Fourier Transform	TB: 4.6.6
10	Image enhancement in spatial domain	Introduction to Image Enhancement	TB: 3.1
11-12	Basics of gray level transformations	Image enhancement-gray level transformations	TB: 3.21-3.2.4
13-14	Histograms	Image enhancement-histogram processing	TB:3.3-3.3.3
15-16	Basics of spatial filtering	Image enhancement by spatial filtering	TB: 3.5.-3.6.1 3.7.1-3.7.3
17-18	Filtering of images	Image enhancement-filtering in frequency	TB: 4.2.3-4.4.3
19	Image degradation models, noise models	Image restoration-image degradation models	I TB: 5.1-5.2.2; 5.5
20-21	Estimation of degrading function	Image restoration-removal of linear motion blur	TB: 5.6.3
22-23	Image restoration - filters	Image restoration-Inverse filtering, constrained least squares	TB: 5.7 - 5.9
24-25	Fundamentals and models of image compression	Fundamentals of image compression	TB: 8.1-8.2
26-27	Information theory for image compression	Elements of information theory for compression	TB: 8.3.1-8.3.2
28-30	Coding theorems	Fundamentals of image coding	TB: 8.3.3-8.3.4
31-33	Error-free image compression	Error-free image compression	TB: 8.4.1-8.4.4

Lecture No.	Learning Objective	Topics to be covered	(Ch./Sec./Text Book)
34-36	Lossy image compression, compression standards	Lossy image compression, compression standards	TB: 8.5.1-8.5.2 8.6.1-8.6.2
37-38	Image segmentation	Image segmentation	TB:10.1-10.1.3 10.3.1-10.3.3
39-40	Image representation	Representation	TB:11.1

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	24-09-2024	1-15	CB
Test 2	50 Minutes	10	12-11-2024	16-30	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	06-12-2024	1- 40	CB

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

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

Date: 05/08/2024

Dr.K Nagaiah
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CS321	**Dot Net Technology**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.RAMESH KUMAR YADAV

Learning Outcomes:
The learning objectives of this course are to:

1. Gain a thorough understanding of the philosophy and architecture of Web applications using VB.NET
2. Acquire a working knowledge of Web application development using Web Forms and Visual Studio 2019
3. Optimize an VB.NET Web application using configuration, security, and caching
4. Access databases using ADO.NET and LINQ
5. More recent VB..NET features
6. Implement rich client applications using C#.NET AJAX
7. Customize Web applications through the use of HTTP handlers and modules

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

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)
1-5	To understand the basics of .NET	Introduction to .NET NET Executables and the CLR , Vb.net Programming Visual Studio	T l Ch-l 1.4,1.5, T2,Ch1.6,1.9
6-10	To learn the concepts of web form architecture	Web Forms Architecture Page Class Web Forms Life Cycle Web Forms Event Model	T2 Ch-2 2.1,2.4,2.7,2.9

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)
16-20	VB.Net Overview for the Sophisticated Programmer	VB .NET First VB.Net Application Data Types Control Structures Subroutines and Functions Parameter Passing Strings Arrays Console I/O	T1 Ch-3 3.1,3.7 T2 Ch3 5.6,3.8
21-23	Object-Oriented Programming in Vb.Net	VB .NET Classes Access Control Methods and Properties Tool Box Solution Explorer	T1 Ch-4 4.7, 4.4 T2 Ch4 4.8,4.10
24-25	VB.NET Framework	Components Interfaces System.Object Collections	T1 Ch-5 5.5,5.9
26-30	Introduction to Windows Forms	Creating Windows Applications Using Visual Studio Partial Classes Buttons, Labels and Textboxes Handling Events Listbox Controls	T2 Ch-5 5.3,5.7
31-40	Using Visual Studio	MVC Concept Overview of Visual Studio Creating a Console Application ADO Debugging	 T1 Ch-5,Ch6 5.7, 6.4,7.2 T2 Ch6 6.9,7.4,7.9

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	23-06-2024	1-20	CB
Test 2	50 Minutes	10	11-11-2024	21-30	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	04-12-2024	1- 40	CB

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Date: 05/08/2024

Dr.RAMESH KUMAR YADAV
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CA414	**Software Testing and Quality Management**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.PINKEY CHOUHAN

Learning Outcomes:
The learning objectives of this course are to:
It provides a holistic view of managing software quality from the perspective of programmer to quality manager. While in Software Project Management, much of the attention is on planning, risk management, scheduling and tracking of project activities, in Software Quality Management greater emphasis is placed on planning of quality assurance activities like testing, reviews, audits and organizational Quality Management Systems (QMS) compliant with ISO 9000/CMMi models.

Text Book T1	Software Quality Engineering – Jeff Tian, Wiley India, 2015
Text Book T2	Software Testing – A Craftsman's Approach – Paul C. Jorgensen, 4th Edition, CRC Press, 2014
Reference Book R1	Software Engineering: A Practitioner's Approach – Roger S. Pressman, 7th Edition, McGraw Hill, 2010

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./P age Nos of Text/Ref. Books)
1-5	Software Quality Management – An Overview	Software Quality Management – An Overview This introductory module gives an overview of Software Quality by illustrating its role in Software Engineering.	T l Ch-l 1.4,1.5, T2,Ch1.6,1.9
6-12	Demystifying Quality Concepts	This module demystifies various terms associated with quality-QA, QC, QM, Quality Engineering-as well as the role of process frameworks, methodologies and tools	T1 Ch-2 2.1,2.4,2.7,2.9

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./P age Nos of Text/Ref. Books)
		adopted for Software Quality Engineering. Also highlights formal definitions of Quality by Standards groups of IEEE/ISO	
13-20	SQA Activities	This module highlights the difference between defect prevention and defect detection activities. Presents the big picture of SQA encompassing Quality Planning and Continuous Improvement by giving formal definition of 'defect', 'error/bug' and the role of defect measurement.	T1 Ch-3 3.1,3.7 T2 Ch3 5.6,3.8
21-26	Software Testing	This module highlights various Testing strategies-white-box and black-box testing-introducing Usage Based Testing and Coverage Based Testing. Also discussed is the issue of 'when to stop testing and start delivering'.	T2 Ch-4 4.7, 4.4 T2 Ch4 4.8,4.10
27-30	Verification and Validation	Requirement verification, Coding standards, walk through , Formal Inspection, Design validation and verification , Function test, Design metrics , correctness proof and it's requirement.	T2 Ch-4 4.7, 4.4

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./P age Nos of Text/Ref. Books)
31-36	Reviews & Inspections	"Prevention of defects is better than Testing for defects later" – is the spirit behind Reviews, Inspections and Walkthroughs. This modules highlight these important SQA activities-from formal reviews/inspections to little informal code-walkthroughs-adopted as part of most formal software development methodologies.	T1 Ch-5 5.5,5.9
37-42	Quality Management Systems	Quality Metrics and Base lining, Software Product Metrics & Defect Propagation, Quality Management Systems	T2 Ch-5 5.3,5.7

Evaluation Scheme:

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Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	25-09-2024	1-12	CB
Test 2	50 Minutes	10	13-11-2024	12-35	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	11-12-2024	1- 42	CB

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Date: 05/08/2024

Dr.PINKEY CHOUHAN
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CA311	**Artificial Intelligence**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.BHARATI PATEL

Learning Outcomes:

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

Text Book T1	Artificial Intelligence by Elaine Rich and Kevin Knight, Tata Mc Graw Hill
Reference Book R1	Principles of Atrificial Intelligence by Nils J.Nilsson, Narosa Publishing House

Lecture-Wise-Plan:

Lecture No	Learning Objectives	Topic to be Covered	Reference (Ch/Sec./Page Nos.of Text Book)
1-4	Overview and Search Techniques	Introduction to AI, Problem Solving, Sate Space Search	15-32
5-7		Blin Search: Depth First search, Breadth first search	48-60
8-10		Informed Search: Heuristic function, Hill climbing search	71-77
11-13		Best first search A* and AO* Search	81-87
14-16		Constraint satisfaction, Game tree	88-95
17-20		Game Playing: min-max algorithm, alpha beta Pruning	135-148

Lecture No	Learning Objectives	Topic to be Covered	Reference (Ch/Sec./Page Nos.of Text Book)
21-24	How to do knowledge Representation	Introduction to KR, knowledge agent, predicate logic, preposional logic	155-159
25-26		Resolution Method, Forward Chaining, Backward Chaining	160-190
27-28	How to Handling Uncertainty and Learning	Source of Uncertainty, Probabilistic	373-375
29-30		Bayes theorem, Limitation of native Bayesian system, Bayesian Belief Network (BBN)	380-386
31-34		Fuzzy Logic, Fuzzy function, Fuzzy measure, Non monotonic reasoning	410-419
35-36	How to handling uncertainty and Learning	Learning Concept of Learning, Learning model, learning decision tree, Paradigms of machine learning	435-447
37-40		Supervised and Unsupervised Larning, Example of learning, Learning by induction, Learning using Neural Networks	448-460

Evaluation Scheme:

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Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	25-09-2024	1-15	CB
Test 2	50 Minutes	10	13-11-2024	16-30	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	13-12-2024	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: 06/08/2024

Dr.BHARATI PATEL
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
MCA111	**Object Oriented Programming**	**3**	**2**	**0**	**4**

Instructor-in-charge: Mr.ASHISH KUMBHARE

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

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

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

Lecture-Wise-Plan:

Lecture No	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)R1
1	To learn the fundamentals of Programming	Types of Languages, Evolution of Programming Language	32-35
2-4	To learn the fundamentals of C++ Programming	Structure of a ‘C++’ Program, ‘C++’ Program development life cycle, Executing and Debugging a ‘C++’ Program	41-46
5-7	To learn the fundamentals of C++ Programming	Keywords and Identifiers, Operators, Constants, Variables, Data Types	61-68

Lecture No	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)R1
8-9	To learn the fundamentals of C++ Programming	Precedence of Operators, Scope and Lifetime of Variables.	70-88
10-13	To learn the Control Structures in C++	Decision Making using if statements, Types of if …else blocks	113-129
14-16	To learn the Control Structures in C++	Switch case Block, and GOTO statements	135-149
17-19	To learn the Control Structures in C++	Concept of Loop, For loop, While loop, Do while loop Jumping in Loop break and continue statement.	153-177
20-23	To learn the Arrays in C++	Introduction of Array, One-D Array, Two-D Array	231-258
24-25	To learn the Arrays in C++	Implementing String Variables, String handling Functions	266-282
26	To learn the OOPs fundamentals	What is OOPs? Procedure Oriented Programming vs. Object Oriented Programming.	255
27-28	To learn the OOP's principles	Abstraction Encapsulation, Polymorphism and Inheritance	257-260
29-30	To learn about Classes and Objects	Objects and Instances Class Members	289
31-32	To Learn about Class Member functions and Objects	Classes and Member functions Constructors and destructors	289-324
33-34	To define and use operators for user defined types	Operator Overloading and multiple overloading with type conversion	384-414

Lecture No	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)R1
35-36	To learn about Inheritance	Class Single and Multiple Inheritance,	417-425
37-39	To learn about Inheritance	Member Specifiers Derived classes	426-430
40-41	To learn about Polymorphism and need and importance of Virtual Functions	Virtual Function, function call binding, late binding	444-447
42	To learn about Polymorphism and need and importance of Virtual Functions	Friend function.	332,310-315,297-302

Object Oriented Programming Lab:

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

Evaluation Scheme:

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Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	07-10-2024	1-12	CB
Test 2	50 Minutes	10	18-11-2024	13-26	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	09-12-2024	1- 42	CB

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Date: 05/08/2024

Mr.ASHISH KUMBHARE
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
MCA112	**Database Management Systems**	**3**	**2**	**0**	**4**

Instructor-in-charge: Mr.NAVEEN KUMAR VAISHANV

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

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

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

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page No.s of Text/Ref. Books)
1-3	Introduction to Database Systems	Course overview, Overview of modern DBMS, Database Architecture	T1: 1.1-1.13
4-8	About Database	Data Independence, Data Dictionary, Types of Keys	T1: 2.1-2.13
8-11	Data modeling	Basic elements of ER model, Attributes, Types of Relationship	T1: 7.1-7.10
12-16	Introduction to SQL constructs	DDL & DML Commands	T1: 3.1-3.9

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page No.s of Text/Ref. Books)
17-19	Types of Operators and Functions	In, Between, Like, Aggregate Functions	T1: 5.1
20-25	Understanding additional SQL structures	Insert, Delete, Update, View Definition And Use, Temporary Tables, Nested Queries	T1: 4.1-4.5
26-30	Database design through Functional Dependencies & Normalization	Functional dependencies, Normal Forms: 1NF,2NF, 3NF, BCNF, Multi-valued dependencies:4NF,5NF	T1: 8.1-8.9
31-33	Formal Query Languages	Relational algebra operators, Relational algebra queries	T1: 61.-6.4
34-35	Integrity constraints	Integrity constraints: Not null, unique, check, primary key, foreign key, references, Triggers	T1: 4.4-4.5
36-38	Understand Database connectivity	Connectivity to the database, designing and implementation	T1: 12.1-12.8
39 - 40	Latest Technologies	Introduction to Hadoop, Big-Data, Data warehouse	T1: 14.1-14.10

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	20	07-10-2024	1-16	CB
Test 2	50 Minutes	20	18-11-2024	17-29	OB
Quiz/Assignment/Lab	Throughout the Semester	20	**	---	CB
Comprehensive Exam	3 Hours	40	11-12-2024	1- 40	CB

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Date: 05/08/2024

Mr.NAVEEN KUMAR VAISHNAV
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
MCA113	**Data Structure and Algorithm**	**3**	**2**	**0**	**4**

Instructor-in-charge: Mr.ASHISH KUMBHARE

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

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

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

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
1-3	To learn Introduction of Data structure and its types	Introduction of Data structure, Data types: primitive, non-primitive data types, Linear and non linear data structure.	T1 CH-1 1.1, 1.3, 1.4
4-6	To learn application of array and various searching techniques	Array concept (one dimension, two dimension), Linear and Binary Search Algorithms,	T1 CH-2 2.4

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
6-7	To learn various sorting techniques	Sorting Algorithms: Bubble Sort, Insertion Sort, Selection Sort	T1 CH-7 7.1, 7.2
8-10	To learn various sorting techniques using Divide and Conquer strategy.	Quick Sort, Merge Sort & Radix sort	T1 CH-7 7.3, 7.4, 7.5
11	To learn introduction to linear data structure stack.	Stack concept	T1 CH-3 3.1
12-13	To learn various stack operations.	Operations PUSH, POP, TRAVERSE, Isfull, Isempty.	T1 CH-3 3.1, 3.2
14-17	To learn Applications of stack	Infix, Prefix, Postfix representation, Conversion using stack	T1 CH-3 3.3
18-19	To learn introduction to linear data structure Queue and its types.	Introduction, and Types of Queues, Priority Queue, Circular queue, Double Ended Queue,	T1 CH-3 3.1
20	To learn various Queue operations.	Operations (INSERT, DELETE, TRAVERSE)	T1 CH-3 3.1, 3.2
21-22	To learn introduction to linear data structure Linked list and its types.	Linked List, Singly and Doubly Linear link lists, Singly and doubly circular linked list	T1 CH-4 4.1
23-24	To learn various linked List operations	Operations on linked lists insert, delete, Applications of linked lists.	T1 CH-4 4.8,4.9
25-26	To learn introduction to Nonlinear data structure Tree and its types.	Definition of trees and their types, Binary trees, Properties of Binary trees,.	T1 CH-5 5.1, 5.2
27-30	To learn various operations and traversal technique.	Insertion, deletion, Searching and traversal algorithm, Preorder, post order, in-order traversal) , BFS, DFS	T1 CH-5 5.3, 5.4, 5.5
31-32	To learn various applications of tree	Binary Search Trees, Implementations, AVL Trees, B tree,	T1 CH-5 5.6, 5.7
33	To learn introduction to Nonlinear data structure Graph and its types.	Definition of Graph and their types	T1 CH-6 6.1
34-35	To learn various applications of Graph	Adjacency and incident (matrix & linked list) representation of graphs, Weighted Graphs,	T1 CH-6 6.2

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
36-38	To learn various operations and traversal technique.	Shortest path Algorithm, Spanning tree, Minimum Spanning tree,	T1 CH-6 6.3, 6.4
39-42	To learn various operations and traversal technique.	Kruskal and prims algorithms.	T1 CH-6 6.3, 6.4

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	20	08-10-2024	1-14	CB
Test 2	50 Minutes	20	19-11-2024	15-30	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	50	13-12-2024	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: 05/08/2024

Mr.ASHISH KUMBHARE
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
MCA114	**Mathematical Foundation of Computer Science**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.ANIMESH KUMAR SHARMA

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

1. Logical structure of statement, Boolean Algebra and its applications
2. Concepts of relations and functions
3. Cartesian product of sets and grammars
4. Concept of graph theory and its matrix representation

Text Book (T1)	A Textbook of Discrete Mathematics, 9th Edition S.Chand Company Ltd. Author : Dr. Swapan Kumar Sarkar
Reference book(s) R1	Discrete Mathematics , Pearson publication ,Author Babu Ram 2012 Edition
Reference book(s) R2	Advanced Discrete Mathematics by Dr. H.K. Pathak & J.P. Chauhan, Shree Shiksha Sahitya Prakashan, Meerut, 2021 Edtion

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)
1-4	Mathematical logic	Propositions statements, Compound propositions, propositions and truth tables, Algebra of propositions, Conditional propositions	T l Ch-2 6-25
5-8	Boolean Algebra	Normal forms, Boolean algebra, Boolean functions, De-morgan's Theorem, Simplification of Boolean expression by algebraic method,	T l Ch-3 70-90

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)
9-11	Switching Circuits and logical Circuits	Applications of Boolean algebra in switching circuits, logical circuits	T l Ch-3 91-101
12-14	Relations	Relation on sets , Operations on Relations, Types of relations in a set , Properties of relations	T l Ch-7 260-277
15-17	Functions	Classification of functions, Types of functions , Composition of functions, Partially Ordered Sets	T l Ch-8 302-315
18-21	Language and Grammers	Strings, Languages, Regular Expressions, Grammars, Finite State Machine	T1 Ch-17 702-716
22-24	Graph Theory-I	Basic Concept, Types, Simple and Multi Graph, Psuedograph, Subgraph and Isomorphic Graphs,	T1 Ch-14 523-540
25-27	Graph Theory - II	Operations on Graphs, Paths, Cycles, Eulerian and Hamiltonian Graph, Shortest Path Problems	T1 Ch-15 541-554
28-31	Group Theory	Binary operations, Group, Groupoid, Monoid, Semigroup, Sub-Group, Cyclic Group	T l Ch-12 444-466
32-36	Group Theory	Permutation group, Homorphism of groups, Isomorphism of groups	T l Ch-12 468-478
37-41	Group Theory	Cosets, Lagrange's Theorem, Elements of Coding theory	T l Ch-13 479-498

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	08-10-2024	1-20	CB
Test 2	50 Minutes	10	19-11-2024	21-40	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	16-12-2024	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: 05/08/2024

Dr.ANIMESH KUMAR SHARMA
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
MCA115	**Fundamental of Computer Science**	**3**	**0**	**0**	**3**

Instructor-in-charge: Mr.NAVEEN KUMAR VAISHNAV

Scope and Objectives:
Upon successful completion of this course, students will be able to:

1. Understand Basic Computer Concepts: Gain foundational knowledge of computer organization, including the core components and their functions.
2. Comprehend Number Systems and Logic Design: Grasp the fundamentals of number systems, logic gates, and Boolean algebra, and apply these concepts to solve problems.
3. Analyze Combinational & Sequential Circuits: Understand the architecture and working principles of combinational and sequential circuits, including their real-world applications.
4. Gain Proficiency in MS Office: Develop practical skills in Microsoft Office applications, enabling students to efficiently create, edit, and manage documents, spreadsheets, and presentations.

Textbook T1	Computer Fundamental, Pradeep K. Sinha, Sixth Edition BPB Publication.
Reference Book R1	Fundamentals of computers. 6th edition, V. Rajaraman, Neeharika Adabala
Reference Book R2	Digital Computer electronics: An Introduction to microcomputers by Albert Malvino and Jerald Brown, Tata Mc graw Hill.
Reference Book R3	Microsoft office 2000 Marquis
NPTEL	http://www.nptelvideos.in/2012/11/computer-organization.html
SWAYAM	https://onlinecourses.swayam2.ac.in/cec19_cs06/preview

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page No.s of Text/Ref. Books)
1-2	Introduction to Computers	Introduction to ITT, Basics concept of IT, Concept of data and information, History of computers	T1 : Chap 1, Chap 2

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page No.s of Text/Ref. Books)
3-5	To understand Basic Computer Organization	Generations and classification of Computers	T1 : Chap 12
6-7	To learn about Components of Computer system	Input and Output devices, storage devices, memory hierarchy	T1: Pg 19-22
8-9	To Understand Software	Software and its need, Types of Software: System software, application software, utility software, Firm ware.	T1: Pg 180-185
10-12	To Understand Programming language	Types of operating system, Language translator, Types of Programming Languages	T1: Pg 23-35, T1: Pg 220-250
13-16	To Understand MS Word	Overview of MS Word, Document creation, formatting, and editing, Styles, templates, and advanced formatting techniques, Mail merge.	R3: Pg 69-86
17-19	To Understand **MS Excel**	Overview of Excel, Data entry, formulas, and functions, Creating and customizing charts and graphs	R3: Pg 639-676
20-22	To Understand MS Power Point and Access	Overview of PowerPoint, Designing and formatting presentations, adding multimedia elements and animations, Overview of MS Access, Introduction to DBMS, Features of DBMS, Working with database and tables.	R3: Pg 287-312
23-25	To Understand **Number System**	Logic Gates and their truth tables, Number System (Binary, Decimal, Octal, Hexadecimal) and conversions	T1: Chap 3, Chap 5
26-28	To Understand Computer Network	Communication process, Communication and system elements, Analog and digital signal, mode of communication, technical foundation of Internet, history of Internet, Internet Service Provider (ASP),	T1: Pg 346-250

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page No.s of Text/Ref. Books)
29-30	To understand Web Terminologies	Communication media: Wired and Wireless. Computer Network: Types, criteria, advantages and disadvantages	T1: Pg 383-388
31-34	To understand Web Concepts	Topology, LAN and other network related protocols, OSI reference model and TCP/IP model.	T1: Pg 392-400
35-38	To understand Web Terminologies	Services Available on Internet; Internet Applications: E-mail, WWW and file transfer. Internet addressing, Client server computing, Domain name system (DNS)	T1: Pg 346-250
39-42	To understand Web Services and latest trends	Search Engine, Internet Security – Fire walls, Encryptions etc., Multimedia, Artificial Intelligence, Machine learning, Cloud computing, SWAYAM, NPTEL	T1: Pg 400-405

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	20	09-10-2024	1-19	CB
Test 2	50 Minutes	20	20-11-2024	20-34	OB
Quiz/Assignment/Lab	Throughout the Semester	20	**	---	CB
Comprehensive Exam	3 Hours	40	18-12-2024	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: 04/08/2024

Mr.NAVEEN KUMAR VAISHNAV
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
CA225	**Computer Graphics**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.RAMESH KUMAR YADAV

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

1. Understand the concepts of computer graphics through theoretical, algorithmic and advanced modelling aspects along with, applications in 3D graphics and visualization in 3D.
2. To apply the concepts and techniques to various problem domain and visualization of data- sets and processes.

Text Book TI	Computer Graphics, James D. Foley, A. Van Dam, S.K. Ferrier, and J.F. Hughes,PrinciplesandPractice,2ndEditioninC,Addition-Wesley,1996.
Reference Book R1	Mathematical Elements of Computer Graphics, Rogers B. McGraw Hill, 1989.
Reference Book R2	Computer Graphics, D. Hearn and M.P. Baker, PHI, 1994.
Reference Book R3	IntroductiontoComputerGraphics,NKrishnamurthy,1st Edition, TMH, 2002.

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
01-02	What, Why & Where about Graphics	Overview of graphics systems— What, Why & Where about Graphics, Hardware & Software, Input & Output Technology, Mathematical complexity involved – Demonstration Through some examples.	Ch l Ch4
03-05	Algorithms for Drawing 2D objects Line, Circle & Ellipse.	Raster Graphics Algorithms for Drawing 2D objects: Line, Circle & Ellipse.	Ch3
06-10	Manipulation of objects	Introduction to 2D & 3D Geometry, Scaling, Translation, Rotation, Shear, Reflection, Projection and Composite Transformations	Ch5

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
11-13	Mappingof2D from world to screen	Viewing & Clipping in 2D (Cohen's and Parametric Line Methods)	Ch5 Ch3
14-17	Mapping of 3D from world to screen	Viewing & Clipping in 3D Perspective & Parallel projection, Clipping against a Canonical View Volume, Clipping in Homogeneous Coordinates, and Mapping in to a Viewport	Ch6
18-22	Drawing Smooth Curves & Surfaces	Hermit, Bezier, Continuities, B - spline Curves, Parametric Bi Cubic Surfaces, Quadric Surfaces	Ch11
23-27	Representation of Solid objects	Solid Modeling (Representations, Operations, Geometry, and Interface)	Ch12
28-31	Detection of hidden portions	Visible Surface Detection (Need &Algorithms, Ray Tracing) and Hidden Line elimination	Ch15
32-35	How to shade surfaces and solids	Rendering (Models, Physics, Shading Polygons & Surface, & Shadows)	Ch16
36-40	How to show graphics in motion	Animation (Languages, Techniques, Control, Basic Rules & Problems)	Ch21

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	10	23-09-2024	1-20	CB
Test 2	50 Minutes	10	11-11-2024	20-35	OB
Quiz/Assignment/Lab	Throughout the Semester	10	**	---	CB
Comprehensive Exam	3 Hours	70	02-12-2024	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: 04/08/2024

Dr.RAMESH KUMAR YADAV
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
MCA212	**Data Structure Algorithm**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.PINKEY CHOUHAN

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

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

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

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./S ec./Page Nos. of Text Book)
1-3	To learn Introduction of Data structure and its types	Introduction of Data structure, Data types: primitive, non-primitive data types, Linear and non-linear data structure.	T1 CH-1 1.1, 1.3, 1.4

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./S ec./Page Nos. of Text Book)
4-6	To learn application of array and various searching techniques	Array concept (one dimension, two dimension), Linear and Binary Search Algorithms,	T1 CH-2 2.4
6-7	To learn introduction to linear data structure stack.	Stack concept	T1 CH-3 3.1
8-10	To learn various stack operations.	Operations PUSH, POP, TRAVERSE, Is full, Is empty.	T1 CH-3 3.1, 3.2
11-13	To learn Applications of stack	Infix, Prefix, Postfix representation, Conversion using stack	T1 CH-3 3.3
14-15	To learn introduction to linear data structure Linked list and its types.	Linked List, Singly and Doubly Linear link lists, Singly and doubly circular linked list	T1 CH-4 4.1
15-16	To learn various linked List operations	Operations on linked lists insert, delete, Applications of linked lists.	T1 CH-4 4.8,4.9
17-18	To learn introduction to linear data structure Queue and its types.	Introduction, and Types of Queues, Priority Queue, Circular queue, Double Ended Queue,	T1 CH-3 3.1
19-21	To learn various Queue operations.	Operations (INSERT, DELETE, TRAVERSE)	T1 CH-3 3.1, 3.2
22-24	To learn various sorting techniques	Sorting Algorithms: Bubble Sort, Insertion Sort, Selection Sort	T1 CH-7 7.1, 7.2
25-26	To learn various sorting techniques using Divide and Conquer strategy.	Quick Sort, Merge Sort & Radix sort	T1 CH-7 7.3, 7.4, 7.5

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./S ec./Page Nos. of Text Book)
27-29	To learn various sorting techniques	Linear search, Binary search, Searching and modification ,Introduction to Hashing	
30	To learn introduction to Nonlinear data structure Tree and its types.	Definition of trees and their types, Binary trees, Properties of Binary trees,.	T1 CH-5 5.1, 5.2
31-33	To learn various operations and traversal technique.	Insertion, deletion, Searching and traversal algorithm, Reorder, post order, in-order traversal) , BFS, DFS	T1 CH-5 5.3, 5.4, 5.5
34-35	To learn various applications of tree	Binary Search Trees, Implementations, AVL Trees, B tree,	T1 CH-5 5.6, 5.7
36	To learn introduction to Nonlinear data structure Graph and its types.	Definition of Graph and their types	T1 CH-6 6.1
37-38	To learn various applications of Graph	Adjacency and incident (matrix & linked list) representation of graphs, Weighted Graphs,	T1 CH-6 6.2
39-40	To learn various operations and traversal technique.	Shortest path Algorithm, Spanning tree, Minimum Spanning tree,	T1 CH-6 6.3, 6.4
41-42	To learn various operations and traversal technique.	Kreskas and prims algorithms.	T1 CH-6 6.3, 6.4

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	20	24-09-2024	1-15	CB
Test 2	50 Minutes	20	12-11-2024	15-35	OB
Quiz/Assignment/Lab	Throughout the Semester	20	**	---	CB
Comprehensive Exam	3 Hours	40	09-12-2024	1- 42	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: 06/08/2024

Dr.PINKEY CHOUHAN
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
MCA213	**Dot Net Technologies**	**3**	**0**	**0**	**3**

Instructor-in-charge: Dr.RAMESH KUMAR YADAV

Learning Outcomes:
The learning objectives of this course are to:

1. Gain a thorough understanding of the philosophy and architecture of Web applications using VB.NET
2. Acquire a working knowledge of Web application development using Web Forms and Visual Studio 2019
3. Optimize an VB.NET Web application using configuration, security, and caching
4. Access databases using ADO.NET and LINQ
5. More recent VB..NET features
6. Implement rich client applications using C#.NET AJAX
7. Customize Web applications through the use of HTTP handlers and modules

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

Lecture-Wise-Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)
1-5	To understand the basics of .NET	Introduction to .NET NET Executables and the CLR , Vb.net Programming Visual Studio	T l Ch-l 1.4,1.5, T2,Ch1.6,1.9
6-10	To learn the concepts of web form architecture	Web Forms Architecture Page Class Web Forms Life Cycle Web Forms Event Model	T2 Ch-2 2.1,2.4,2.7,2.9

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)
16-20	VB.Net Overview for the Sophisticated Programmer	VB .NET First VB.Net Application Data Types Control Structures Subroutines and Functions Parameter Passing Strings Arrays Console I/O	T1 Ch-3 3.1,3.7 T2 Ch3 5.6,3.8
21-23	Object-Oriented Programming in Vb.Net	VB .NET Classes Access Control Methods and Properties Tool Box Solution Explorer	T1 Ch-4 4.7, 4.4 T2 Ch4 4.8,4.10
24-25	VB.NET Framework	Components Interfaces System.Object Collections	T1 Ch-5 5.5,5.9
26-30	Introduction to Windows Forms	Creating Windows Applications Using Visual Studio Partial Classes Buttons, Labels and Textboxes Handling Events Listbox Controls	T2 Ch-5 5.3,5.7
31-40	Using Visual Studio	MVC Concept Overview of Visual Studio Creating a Console Application ADO Debugging	T1 Ch-5,Ch6 5.7, 6.4,7.2 T2 Ch6 6.9,7.4,7.9

Evaluation Scheme:

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

Evaluation Component	Duration	Weightage	Date	Syllabus (Lec.No.)	Remarks
Test 1	50 Minutes	20	23-09-2024	1-20	CB
Test 2	50 Minutes	20	11-10-2024	21-30	OB
Quiz/Assignment/Lab	Throughout the Semester	20	**	---	CB
Comprehensive Exam	3 Hours	40	04-12-2024	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: 05/08/2024

Dr.RAMESH KUMAR YADAV
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
MCA214	**Big Data and High Performance Computing**	**3**	**2**	**0**	**4**

Instructor-in-charge: Dr.RAVI KIRAN

Learning Outcomes:

1. Provide the essential knowledge for the students to understand big data computer system, storage, management, processing, and visualization
2. Provide training in state-of-the-art big data processing frameworks
3. Provide training in big data applications
4. Provide the students with prerequisite for graduate level study in computer science
5. Prepare the students for industrial career.

Text Book T1	Title: Big Data Fundamentals: Concepts, Drivers & Techniques Author: Wajid Khattak, Paul Buhler, Thomas Erl Publisher: John Wiley & Sons, Inc ISBN: 13: 9780134291079
Reference Book R1	BIG DATA and ANALYTICS, Seema Acharya, Subhasinin Chellappan, Wiley publications
Reference Book R2	BIG DATA, Black BookTM , DreamTech Press, 2015 Edition

Lecture-Wise Plan:

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
1-6	Understanding Big Data	Concepts and Terminology Datasets Data Analysis Data Analytics Descriptive Analytics Diagnostic Analytics Predictive Analytics Prescriptive Analytics Business Intelligence (BI) Key Performance Indicators (KPI) Big Data Characteristics Different Types of Data Structured Data Unstructured Data Semi-structured Data Metadata	T1:- CHPT 1

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
		Background History Technical Infrastructure and Automation Environment Business Goals and Obstacles	
7-13	Business Motivations and Drivers for Big Data Adoption	Marketplace Dynamics Business Architecture Business Process Management Information and Communications Technology Data Analytics and Data Science Digitization Affordable Technology and Commodity Hardware Social Media Hyper-Connected Communities and Devices Cloud Computing Internet of Everything (IoE)	T1:- CHPT 2
14-20	Big Data Adoption and Planning Considerations	Privacy Security Provenance Limited Realtime Support Distinct Performance Challenges Distinct Governance Requirements Distinct Methodology Clouds Big Data Analytics Lifecycle Business Case Evaluation Data Identification Data Acquisition and Filtering Data Extraction Data Validation and Cleansing Data Aggregation and Representation Data Analysis Data Visualization Utilization of Analysis Results	T1:- CHPT 3
21-26	Enterprise Technologies and Big Data Business Intelligence	Online Transaction Processing (OLTP) Online Analytical Processing (OLAP) Extract Transform Load (ETL) Data Warehouses Data Marts Traditional BI Ad-hoc Reports Dashboards Big Data BI	T1:- CHPT 4

Lecture Nos.	Learning Objective	Topics to be covered	Reference (Ch./Sec./Page Nos. of Text Book)
27-32	Big Data Storage Concepts	Clusters File Systems and Distributed File Systems NoSQL Sharding Replication	T1:- CHPT 5
33-36	Big Data Processing Concepts	Parallel Data Processing Distributed Data Processing Hadoop Processing Workloads Batch Transactional Cluster Processing in Batch Mode Batch Processing with MapReduce Map and Reduce Tasks	T1:- CHPT 6
37-40	Big Data Storage Technology	On-Disk Storage Devices Distributed File Systems RDBMS Databases NoSQL Databases Characteristics	T1:- CHPT 7
41-42	Big Data Analysis Techniques	Quantitative Analysis Qualitative Analysis Data Mining Statistical Analysis A/B Testing Correlation Regression Machine Learning	T1:- CHPT 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	50 Minutes	20	25-09-2024	1-20	CB
Test 2	50 Minutes	20	13-11-2024	21-40	OB
Quiz/Assignment/Lab	Throughout the Semester	20	**	---	CB
Comprehensive Exam	3 Hours	40	11-12-2024	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: 06/08/2024

Dr.RAVI KIRAN
Instructor-in-charge

The ICFAI University, Raipur

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

Course Code	Course Title	L	P	T	U
MCA215	**Block Chain Technology**	**3**	**2**	**0**	**4**

Instructor-in-charge: Mrs.NISHA THAKUR

Learning Outcomes:

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	Reference (chapter/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.	T l Ch-l 1.4,1.5,1.6,1.9 Notes/PDF

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)
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	T2 Ch-2 2.1,2.2,2.3,2.9 Notes/PDF
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.	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.	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.	T1 Ch-4 4.5, 4.6 T2 Ch4 4.8,4.10 Notes/PDF
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.	T2 Ch-5 5.4,5.8 Notes/PDF

Lecture Nos.	Learning Objective	Topics to be covered	Reference (chapter/sec./Page Nos of Text/Ref. Books)
37-42	Private and Consortium based Blockchain: Hyperledger	Need for the consortium. Hyperledger stack, Multichain blockchain. Innovation in Hyperledger, distributed applications in hyperledger.	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	50 Minutes	20	24-09-2024	1-13	CB
Test 2	50 Minutes	20	12-11-2024	14-25	OB
Quiz/Assignment/Lab	Throughout the Semester	20	**	--	CB
Comprehensive Exam	3 Hours	40	06-12-2024	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: 06/08/2024

Mrs.NISHA THAKUR
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