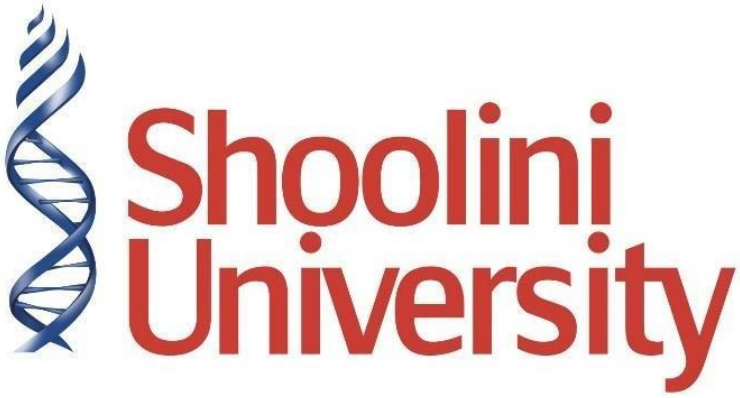

Syllabus
Bachelor of
Computer Applications

Shoolini University
Centre for Distance
and Online Education
(SCDOE)

Mission

Mission statement: The program is to equip students with a strong foundation in computer science and typically involves fostering technical skills, problem-solving abilities, and a deep understanding of computer systems to meet the evolving needs of the IT industry.

PEO, PO and PSO for BCA

Program Educational Objectives (PEOs) for BCA:

PEO1: To equip students with the ability to analyze, design, and solve complex computing problems, fostering independent research and consultancy skills.

PEO2: To provide competencies enabling students to understand the holistic view of the computing world and its broader technological environment.

PEO3: To instill knowledge, skills, and an entrepreneurial mindset, encouraging innovation, risk-taking capabilities, and creative thinking.

PEO4: To produce professionals with a strong commitment to ethical practices, respect for personal and professional integrity, teamwork, and a dedication to continuous learning in the field of computing.

PEO5: To develop the ability of students to effectively present and communicate technical information while contributing positively to society.

Program Outcomes (POs) for BCA:

PO1: To provide a strong foundation in computer science principles and applications.

PO2: To develop students' programming and software development skills.

PO3: To foster problem-solving and critical thinking abilities in the field of computing.

PO4: To impart knowledge of database management and information systems.

PO5: To prepare students for careers in IT management and technology-related roles.

PO6: To instill an understanding of web development and internet technologies.

PO7: To promote effective communication and teamwork in IT projects.

PO8: To expose students to emerging technologies and industry trends.

PO9: To encourage ethical and responsible use of technology.

PO10: To prepare graduates to adapt and innovate in a rapidly evolving tech landscape.

Program Specific Outcome (PSOs) for BCA:

PSO1: Proficiency in multiple programming languages and software development.

PSO2: Competency in database design and management.

PSO3: Ability to develop responsive web applications and websites.

PSO4: Strong problem-solving and critical thinking skills.

PSO5: Effective communication and teamwork in IT projects.

PSO6: Awareness of information security and ethical practices.

PSO7: Readiness for lifelong learning and adaptation to emerging technologies.

Program Stucture/Syllabus Credit Scheme of BCA

Semester I		
Sr No.	Course Name	Credits
1	Functional English-1	4
2	Problem Solving with Programming	4
3	Mathematics	4
4	Creativity Decoded	4
5	Open Elective (To be chosen from the elective list given below)	4
	Total Credit Hours	20

Open Elective	
Sr No.	Course Name
1	Fundamentals of Journalism
2	Principles of Management

Semester II		
Sr No.	Course Name	Credits
1	Entrepreneurship	4
2	Functional English-2	4
3	Data Structure with C	4
4	Web Technology	4
5	Open Elective (To be chosen from the elective list given below)	4
	Total Credit Hours	20

Open Elective	
Sr No.	Course Name
1	Saying it with presentations
2	Journalism in India - Historical Perspective

Semester III		
Sr No.	Course Name	Credits
1	Critical Thinking and Problem Solving	4
2	Operating System	4
3	Object-Oriented Programming with C++	4
4	Software Engineering	4
5	Open Elective (To be chosen from the elective list given below)	4
	Total Credit Hours	20

Open Elective	
Sr No.	Course Name
1	Acing the Interviews through AI
2	New Media

Semester IV		
Sr No.	Course Name	Credits
1	Database Management System	4
2	Python Programming	4
3	Digital Marketing	4
4	Organizational Behavior	4
5	Open Elective (To be chosen from the elective list given below)	4
	Total Credit Hours	20

Open Elective	
Sr No.	Course Name
1	Effective Negotiations
2	Advertising

Semester V		
Sr No.	Course Name	Credits
1	Java Programming	4
2	Specialization (AI/Cyber Security/Data Science)	4
3	Introduction to Cloud Computing	4
4	Open Elective (To be chosen from the elective list given below)	4
5	Minor Project	4
	Total Credit Hours	20

Open Elective	
Sr No.	Course Name
1	Emotional Intelligence
2	Public Relations

Semester VI		
Sr No.	Course Name	Credits
1	Project Management	4
2	Specialization (AI/Cyber Security/Data Science)	4
3	Specialization (AI/Cyber Security/Data Science)	4
4	Major Project	8
	Total Credit Hours	20

Open Elective	
Sr No.	Course Name
1	Stock Market and Investment
2	Corporate Communication

Specialization Courses

Specialization: Artificial Intelligence and Machine Learning

Semester V	
Sr No.	Course Name
1	Artificial Intelligence

Semester VI	
Sr No.	Course Name
1	Machine Learning
2	Deep Learning

Specialization: Cyber Security

Semester V	
Sr No.	Course Name
1	Introduction to Cyber Security

Semester VI	
Sr No.	Course Name
1	Biometric Security
2	Ethical Hacking

Specialization: Data Science

Semester V	
Sr No.	Course Name
1	Data Handling and Visualization

Semester VI	
Sr No.	Course Name
1	Information Security and Privacy
2	Computing for Data Science

Course Name:
Functional English I

Credits: 4

Course Objectives:

1. To enhance the skills needed to work in a formal English-speaking global environment.
2. To equip the learners with required linguistic skills, guiding them to excel in the academic field.
3. To emphasize the need for fluency in the English language and refining language proficiency.
4. To enable students to communicate better through writing and oral expression.

Course Outcomes:

At the end of the course, the student will be able to:

Sr. No.	Course Outcome
CO1	To develop proficiency in English language and reach a level of proficiency in reading, writing, speaking, and listening.
CO2	To enable students to improve their ability to communicate and their linguistic competence in English.
CO3	Acquire and hone communication skills
CO4	Lifelong: Ability to acquire knowledge and skills, including 'learning how to learn', that are necessary for participating in learning activities throughout life.

Course Content:

Unit A

- Listening and Reading
- Unseen Passage
- Comprehension

Unit B

- Functional English
- Specific fixed expressions
- Practice

Unit C

- Effective Writing
- How to write a paragraph and an essay
- Practice

Unit D

- Phrasal Verbs

- Idioms
- Collocations
- Grammatical rules
- Exercises that have to do with grammar

Teaching / Assessment Methodology:

- Synchronous lectures
- Asynchronous videos/ Lectures on LMS
- Assignments
- Quizzes
- Project work

Grading:

Internal assessment	**-**	**30%**
End Term Exam	**-**	**70%**

Suggested Reading:

Collins Cobuild, Dictionary of Phrasal Verbs, Indus
Oxford Collocation Dictionary, Oxford University Press
Manser, Martin H., *A Dictionary of Contemporary Idioms,* Pan Books Ltd. Wallace, Michael J., *Dictionary of English Idioms*, HarperCollins Publishers, India
Seidl, Jennifer & McMordie, W., *English Idioms and How to Use Them*, Oxford University Press
Allen, W. Stannard, *Living English Structure,* Orient Longman Ltd.
Wallwork, Adrian, *English for Academic Correspondence and Socializing,* Springer Colins, Steven, *Advanced Vocabulary, Phrasal Verbs, Idioms and Expressions,* Montserrrat Publishing
O'Brien, Terry, *Little Red Book of Modern Writing Skills*, Rupa Publications India Pvt. Ltd.

Useful Websites

www.Englishclub.com

www.writing centre.uottawa.ca

http//grammar.about.com

http://learnenglish.britishcouncil.org

http://www.bbc.co.uk/worldservice/learningenglish/

Course Name: **Problem Solving With Programming**

Credits: 4

Course Objectives:

- The course is designed to aim at imparting a basic level appreciation program for the common man.
- After completing the course, the incumbent can use the computer for basic purposes of preparing his personnel/business letters, viewing information on Internet (the web), sending mails, using internet banking services etc.
- This allows a common man or housewife to be also a part of computer users list by making them digitally literate.
- This would also aid the PC penetration program.
- This helps the small business communities, housewives to maintain their small account using the computers and enjoy in the world of Information Technology.
- The aim of this course is to help you understand what programming is, and what is a programming language.
- The course helps you understand the concepts of loops, reading a set of data, stepwise refinement, functions, control structures, and arrays.
- The primary focus of this course is on problem solving and aspect which means developing proper algorithms.

Course Outcomes:

After completing this course, you will be able to:

Sr. No.	Course Outcome
CO1	Write efficient algorithms to solve various problems.
CO2	Understand and use various constructs of the programming language such as conditionals, iteration, and recursion.
CO3	Implement your algorithms to build programs in the C programming language.
CO4	Use data structures like arrays, linked lists, and stacks to solve various problems.
CO5	Understand and use file handling in the C programming language.

Course Content:

Unit- A:

Knowing computer: Introduction to Computers: what is a computer, characteristics of Computers, Generations of Computers, Classifications of Computers, Basic Computer organization, Applications of computers. Input and Output Devices: Input devices, Output devices, Softcopy devices, Hard copy devices. Computer Memory and Processors: Introduction, Memory Hierarchy, Processor, Registers, Cache memory, primary memory, secondary storage devices, magnetic tapes, floppy disks, hard disks, optical drives, USB flash drivers, Memory cards, Mass storage devices, Basic processors architecture.

Unit- B:

Number System and Computer Codes: Binary number system, working with binary numbers, octal number system, hexadecimal number system, working with fractions, signed number representation in binary form. Computer Software: Introduction to computer software, classification of computer software, system software, application software, firmware, middleware, acquiring computer software, design and implementation of correct, efficient and maintainable programs.

Unit- C:

Introduction to the C Language: C Programs, Identifiers, Data Types, Variables, Constants, Input / Output, Operators (Arithmetic, relational, logical, bitwise etc.), Expressions, Precedence and Associatively, Expression Evaluation, Type conversions. Statements- Selection Statements (making decisions) – if and switch statements, Repetition statements (loops)-while, for, do-while statements, Loop examples, other statements related to looping – break, continue, go to, Simple C Program examples.

Unit- D:

Functions, Arrays and Pointers: Introduction to Structured Programming, Functions- basics, user defined functions, inter function communication (call by value, call by reference), Standard functions. Storage classes-auto, register, static, extern, scope rules, arrays to functions, recursive functions, example C programs. One-dimensional arrays, two – dimensional arrays, multidimensional arrays,
Pointers – Introduction (Basic Concepts), pointers to pointers, compatibility, Pointer Applications, Arrays and Pointers, Pointer Arithmetic, memory allocation functions, array of pointers, pointers to void, pointers to functions, command –line arguments,

Teaching / Assessment Methodology:

- Synchronous Lectures
- Lectures on LMS
- Assignments
- Quizzes
- Project Report

Grading:

Internal Assessment	30%
End Term Exams	70%

Text Books:

1. Computer Science: A Structured Programming Approach Using C, B.A. Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. The C Programming Language by Brian Kernighan and Dennis Ritchie 2nd edition

Reference Books:

1. Let Us C Yashavant kanetkar BPB.
2. Absolute beginner's guide to C, Greg M. Perry, Edition 2, Publisher: Sams Pub., 1994.
3. Computer Programming and Data Structures by E Balagurusamy, Tata McGraw Hill.

Course Name: **Mathematics**

Credits: 4

Course Objectives:

The Mathematics course aims to provide students with a foundational understanding of key mathematical concepts and their applications. The course will cover fundamental topics in algebra, calculus, and statistics, fostering analytical and problem-solving skills.

Course Outcome:

At the end of the course, the student will be able to:

Sr. No.	Course Outcome
CO1	Demonstrate proficiency in algebraic operations
CO2	Apply calculus concepts to solve mathematical problems
CO3	Analyze and interpret data using statistical methods
CO4	Solve real-world problems using mathematical models
CO5	Develop logical and analytical thinking skills
CO6	Apply mathematical concepts to other disciplines
CO7	Demonstrate effective communication of mathematical solutions
CO8	Utilize technology for mathematical analysis
CO9	Explore advanced topics in mathematics
CO10	Apply mathematical reasoning to decision-making

Course Content:

Unit-A: Algebraic Foundations

- Basic algebraic operations
- Solving linear equations and inequalities
- Quadratic equations and their applications
- Polynomial and rational functions

Unit-B: Calculus and Its Applications

- Limits and continuity

- Differentiation and its applications
- Integration and its applications
- Multivariable calculus

Unit-C: Statistical Methods

- Descriptive statistics
- Probability theory
- Inferential statistics
- Regression analysis

Unit-D: Mathematical Modeling

- Formulating mathematical models
- Solving optimization problems
- Application of mathematics in real-world scenarios
- Interdisciplinary applications of mathematics

Teaching / Assessment Methodology:

- Synchronous lectures
- Tutorials and problem-solving sessions
- Assignments
- Midterm exams
- Final exam

Grading:

- Internal assessment: 30%
- End Term Exam: 70%

Further Readings:

1. Stewart, J. (2015). Calculus: Early Transcendentals.
2. Stroud, K. A., & Booth, D. J. (2013). Engineering Mathematics.
3. Devore, J. L., & Berk, K. N. (2011). Modern Mathematical Statistics with Applications.
4. Larson, R., Edwards, B. H., & Falvo, C. (2018). Elementary Linear Algebra.
5. Paulos, J. A. (1988). Innumeracy: Mathematical Illiteracy and Its Consequences.

Credits: 4

Course Objectives:

The objective of this course is to help students understand the meaning and importance of creativity and how they can become more creative in a professional setting by using techniques used by artists (the creativity experts) in various domains. The course will equip the students withspecific strategies and standard tools to enhance their creativity and through a novel 3- S model approach, help them to systematically learn and practice creativity for problem solving, idea generation, critical thinking, communication, collaboration etc.

Course Outcomes:

At the end of the course, the student will be able to:

Sr. No.	Course Outcomes
CO 1	Enumerate the steps in the creative process and understand that it is non linear
CO2	Map the 3-S model onto the creative process and understand which techniques of creativity will be useful at what stage of creativity
CO 3	Understand the role of concepts like mindfulness, use of right brain, empathy, and curiosity in creativity
CO 4	Explain the importance of deliberate practice for achieving excellence
CO 5	Comprehend the role of opposites (upside- down) in reframing
CO 6	Understand the various ways of combining things to create something new

Course Content:

Unit-A: What is Creativity

- Defining Creativity
- Understanding the creative process
- Why learns creativity?
- The Systems Model of creativity
- Creativity and Happiness (Concept of Flow)
- The 3- S model for learning creativity from the artists

Unit-B: Seeking an Artist's Mindset

- Mindful observation
- Visualization
- Empathy
- Perspective
- Curiosity

Unit-C: Strengthening Creative Skills

- Creative excellence
- Copying to learn, copying to create
- Whole Brained Creativity

Unit-D: Shaping your Creation

- Stream of Consciousness
- Combining and Recombining
- Scope and constraints
- Collaborating
- Building upon work of others
- Adding a twist
- Overcoming creative blocks

Teaching / Assessment Methodology:

- Synchronous lectures
- Asynchronous videos/ Lectures on LMS
- Assignments
- Quizzes
- Project work

Grading:

Internal assessment	**-**	**30%**
End Term Exam	**-**	**70%**

Books and Materials:

Text Books:

Ashoo Khosla, "Off the corporate bus and into the creativity boat, Jaico Publishing House(October 2017)

Reference Books:

1. Dr Mihaly Csikszentmihalyi PhD, "Flow: The Psychology of Optimal Experience",Harper Collins, (1990)
2. Karim Benammar, "Reframing. The art of thinking differently" Boom; (June, 2012)

Course Name : **Fundamentals of Journalism**

Credits: 4

Course objective:

The objective of this course is designed to be a conceptual work based on the application of the principles of journalism. The course will equip the students in understanding the concepts of news, different forms of journalism and the role of media in a democracy.

Sl. No.	Course Outcome
CO1	Explain the process of writing for print
CO2	Explain the principles of writing for the print
CO3	Understand the different forms of journalism
CO4	Understand the role of media in a democracy
CO5	Report & write news for print.
CO6	Perform exercise of Precision, formats, synonyms, omission and inclusion, highlighting, underlining, Revise, Cross checking, headlines writing and making intros.
CO7	Write stories covering various beats, writing follow-up stories.

Course Content:

Unit - A: Concept of News

- Basics of News
- Components of News: Ingredients and elements of news
- The news process: from the event to the reader (how news is carried from event to reader)
- Hard news vs. Soft news
- Attribution, embargo, verification, balance and fairness, brevity, dateline, credit line, byline and printline.

- Structure of a Newspaper: masthead, ear panel, editorials, features, letters to editor, Columns.

Unit - B: Language of news-

- Principles of clear writing
- essential skills to write news
- 5 w and 1 H
- structure of News
- inverted pyramid Sociology of news: Factors affecting news treatment
- Paid news
- Politics of news
- Neutrality and bias in news

Unit - C: News Gathering Techniques:

- Criteria for news worthiness
- Principles of news selection
- Writing Headlines for News Stories
- Writing Intro
- Gatekeeping
- Sources of news gathering: Speeches, Meetings, News Conferences, Use of Internet

Unit - D: Different forms of Journalism

- Traditional Media
- Print
- Electronic
- Broadcast
- Digital Journalism

Teaching / Assessment Methodology:

- Synchronous Lectures
- Lectures on LMS
- Assignments
- Quizzes
- Project Report

Grading:

Internal Assessment	30%
End Term Exams	70%

Required Books and Materials:

Reference Books:

1. Bruce D. Itule and Douglas A. Anderson. *News writing and reporting for today's media;* McGraw Hill Publication, 2000.

2. M.L. Stein, Susan Paterno & R. Christopher Burnett. *News writer's Handbook: An Introduction to Journalism;* Blackwell Publishing,2006.
3. George Rodmann. *Mass Media in a Changing World*; Mcgraw Hill Publication,2007.
4. Carole Flemming and Emma Hemmingway. *An Introduction to Journalism*; Vistaar Publications,2006.
5. Richard Keeble. *The Newspaper's Handbook*; Routledge Publication,2006 T.J.S.
6. George: *Editing – A Handbook for Journalists*.

Course Name: **Principles of Management**

Credits: 4

Course Objectives:

- The purpose of this course is to impart to students an understanding of management and business concepts and practices being followed globally, with a focus on Indian perspective.
- To prepare them to face emerging challenges of managing resources and business processes.

Course Outcome:

At the end of the course, the student will be able to:

Sl. No.	Course Outcome
CO1	Define Business and its objectives.
CO2	Explore the various forms of Business and outline the pros & cons associated with each of them.
CO3	Develop an understanding of Globalization, Liberalization & Privatization and their Indian perspective.
CO4	Explain the basic concepts of the various functional aspects of the Business viz.- Marketing, Operations, HR, Finance and IT.
CO5	Define Entrepreneurship and explore the various entrepreneurial business models and opportunities available in contemporary India.
CO6	Enumerate and explain the various theories and concepts related with Leadership & Motivation.
CO7	Outline the development of management thought – from the Classical Theory till the most recent contemporary management concepts.

Course Content:

Unit- I:

Understanding Business and Its Forms

Critical evaluation of Business Objectives, Business Promotions and forms of business enterprise: Sole Proprietorship, Partnership, Joint Stock Companies, Public Utilities, Co-operative, Business Combinations, Foundation of Indian Business Spectrum of Business Activities, Manufacturing and Service Sectors. India's experience with globalization,

liberalization, and privatization. Multinational, transnational corporations and their Indian perspective.

Unit- II: Functional Aspects of Business

a) Administrative: Choice of a suitable form of business ownership. Starting and operating small venturing enterprises, Problems in starting a new business.
b) Operations: business size and location decisions. Lay out: mass production and mass customization, productivity, quality and logistics.
c) Marketing: Marketing Mix, Segmentation, PLC and consumer behavior, Product and pricing decisions, Distribution and promotional decisions
d) Finance: Money and banking, Financial management and securities markets, risk management and insurance
e) Human resources: Objective, scope & functions of HRM, Sources of human capital, Strategies for attracting (staffing) and retaining (training and compensation) human resources
f) Role of Information and Communication Technology (IT) in business: Computing, Storing & Networking. Decision Support System (DSS) and other Support Systems.

Unit-III: Process of Management

a) Entrepreneurship: Intrapreneurship and Innovation; Disintermediation; Contemporary Entrepreneurial Models: Franchising, Network Marketing, Freelancing, BPO, e-Commerce and M-Commerce

b) Management in Action: Motivation – Concept and Theories: Maslow, Herzberg, McGregor, and Ouchi; Leadership – Concept and Theories: Leadership Continuum, Situational Leadership, Transactional and Transformational Leadership; Managerial Grid, Communication – Formal and Informal

Unit- IV: Development of Management Thought

Classical, Neo-classical, Systems, Contingency and Contemporary Approach to Management – Peter Drucker's MBO, Porter's 5- Force Model, Prahalad's Core Competency, Peter Senge's Learning Organization and Tom Peters' Excellence approach

Teaching / Assessment Methodology:

- Synchronous lectures
- Asynchronous videos/ Lectures on LMS
- Assignments
- Quizzes
- Project work

Grading:

Internal assessment	**-**	**30%**
End Term Exam	**-**	**70%**

Required Books And Materials: Text Book:

1. Gupta, R.N. ‘‘*Business Organization and Management*’’, S. Chand & Company Ltd. New Delhi.

References:

2. Talloo, J, Thelma, ‘‘*Business Organization and Management*’’, Tata McGraw Hill Publishing Company, New Delhi.
3. Sharma R.K. & Gupta S.K., ‘‘*Business Organization and Management*’’, Kalyani Publishers, Ludhiana.
4. Jim, Barry, John Chandler, Heather Clark, ‘‘*Organization and Management*’’, Thomson Learning.

Course Name: **Entrepreneurship**

Credits: 4

Course Objectives:

The course consists of providing detailed insights into the evolution, theory, perception, beliefs, opportunities, threats, and application of the entrepreneurial business models that are most prevalent in contemporary India. Students will learn the basics of E-commerce, Franchising, Discount stores, Network distribution, and some other business models which might provoke entrepreneurial spirit in them. This course also provides practical proven tools for transforming an idea into a product or service that creates value for others. As students acquire these tools, they learn how to sift good ideas from bad, how to build a winning strategy, how to shape a unique value proposition, prepare a business plan, compare their innovation to existing solutions, and build flexibility into their plan and determine when best to quit. Above all, it would help them understand the magic of thinking BIG.

In collaboration with the experienced faculty, and a vibrant peer group, learners will explore and apply the skills, tools, and best practices for:

- Identifying and developing entrepreneurial opportunities.
- Building business models.
- Creating strategies for leading innovation; and
- Financing and profiting from innovation.

Course Outcome:

At the end of the course, the student should be able to:

Sr. No.	Course Outcome
CO1	Define Entrepreneurship and outline its essence.
CO2	Explore the various entrepreneurial business models and opportunities available in contemporary India.
CO3	Clearly define the basics of the entrepreneurial spirit like one to ‘Be a job creator rather than a job seeker’.
CO4	Develop an understanding of the benefits and risks associated with each of them.
CO5	Select and set a target market associated with each of the contemporary models.
CO6	Enumerate and explain the similarities and dissimilarities amongst them all.
CO7	Adapt and develop any of these entrepreneurial models at any stage of their life.

CO8	Make a comparison with the traditional business models and understand the need for change in the middlemen dominated
	system of distribution.
CO9	Formulate a strategic, tactical, and operational modus operando of these business models.

Course Content:

Unit –A:

Introduction to Entrepreneurship

Introduction to Entrepreneurship: A peep into an entrepreneur's mind, Four Pillars of Entrepreneurship, Viability Quartet, Innovation and Entrepreneurship, Indovation or Jugad. **Cash Flow Quadrant - Robert T. Kiyosaki**

Cash-flow Quadrant, Disintermediation and the need for it, Feasibility Study & preparation of Business Plan, Understanding the Laws of Success and the four businesses to stay.

Distribution Systems

Traditional distribution System, Importance of Middlemen, Disintermediation & Importance of Disintermediation, Basic framework of a Franchising business, Various advantages and disadvantages of franchising business, Setting up a Franchise, Top Franchises across the world, Introduction to Network Marketing.

Formulation of an Ideal Business

Starting a Small Business Venture & choosing suitable business ownership, Sole proprietorship, Joint Hindu Family firm, Partnership, Joint Stock Company, or Cooperative Organization.

Unit –B:

Setting up of the small-scale business

Small- Scale ventures, Types of small businesses, setting up a small-scale venture & starting a small business.

Understanding unicorns

The magic of thinking big, understanding startup -unicorns their valuations and examples, Decacron and examples, Features, ideas what made them big, why they are big? USP and problem they solved.

Discovering Ideas

Cracking the Creativity Code, Why Creativity is important? Discovery vs Delivery - What is more important? Do Schools Kill Creativity?

Why, How & What?

Is Creativity hereditary or learned? Creativity is not IQ- developing the

Epigenetics as it is aa muscle, IKIGAI - Japanese way of living, Start with Why - Simon Sinek

Unit –C:

Borrowing Ideas and creativity

Zoom in - Zoom out - Zoom in, borrowing an Idea and Implementing It- Story of M&M, The App orchard Himachal Pradesh.

Finding a problem in the marketplace

What is a problem- Defining it, what are the types, Reason why there is a Problem - Root Cause Analysis (5 why Model), New product development, Stages in NPD.

Business Plan

Why Write a business plan? Format of the Business plan? Benefits of Business plan, Business model Canvas, Case Studies - OYO, UpGrad, Ola, CRED.

Unit –D:

Social Entrepreneurship

Introduction to Social Entrepreneurship, Maslow's hierarchy of needs, Corporate Social Responsibility, Social problems, and social Innovation.

Case related to Social Entrepreneurship

Amul - Founders, History, Distribution channel, pricing, and products Grameen bank - Founders, History, Distribution channel, pricing, and products
Rang de - Concept, Founders, History, Distribution channel, pricing, and products Ashoka - Founders, History, Distribution channel, pricing, and products **Intrapreneurship**

Concept & Introduction Advantages, Differences and scope, Companies, and examples

Teaching / Assessment Methodology:

- Synchronous lectures
- Asynchronous videos/ Lectures on LMS
- Assignments
- Quizzes
- Project work

Grading:

Internal assessment	**-**	**30%**
End Term Exam	**-**	**70%**

Readings:

1. $100 Startup – Chris Guillebeau, Pan Macmillan, UK.
2. Rich Dad Poor Dad- Robert T. Kiyosaki, Manjul Publishing House, Bhopal,

India.

3. Laws of Success- Napoleon Hill, Star Publishing LLC, USA.
4. Franchising: pathway to wealth creation-Stephen Spinelli, Robert Rosenberg, PrenticeHall PTR, New Jersey, USA.
5. Complete E-Commerce book: Design, build & maintain a successful web-based business-Janice Reynolds, Taylor & Francis Inc., London, UK.
6. Business Process Outsourcing: Process, Strategy & Contracts- John K. Halvey, Barbara M. Melby, John Wiley & Sons Inc., New Jersey, USA.
7. The Grocers: The Rise and Rise of the Supermarket Chains- Andrew Seth, Geoffrey Randall, Kogan Page Publishers, Philadelphia, USA.
8. The Wellness Revolution – Paul Zane Pilzer, Simon & Schuster, New York, US

Course Name: **Functional English-II**

Credits: 4

Course Objectives:

- The objective of this course is to help students enhance their English and various other skills such as effective communication, listening, reading, writing and much more.
- The course will equip the students to effectively use the functional language in their daily life and will also teach different techniques and various methods through which students can improve their skillset.
- Students will be ace the IELTS test through many informative pointers which will be discussed throughout the course.

Course Outcomes:

At the end of the course, the student should be able to:

Sr. No.	Course Out Come
CO1	Strengthen their communicative abilities.
CO2	Improve their academic reading and writing skills, as well as their listening and speaking abilities.
CO3	Prepare for the IELTS test by coming up with test-taking tactics.
CO4	Acquire the capacity to utilize English in day-to-day life and in situations that are like real life.
CO5	Develop full fluency in the language.
CO6	Acquire certain words and expressions that may be used in a variety of contexts, such as at work, when travelling, or while meeting new people.
CO7	Learn more about themselves as well as others by improving their ability to listen.
CO8	Make connections between the concepts on the page and what you already know through effective reading.
CO9	Write and express their thoughts mindfully and express fully.
CO10	Concentrate more effectively.
CO11	Know the importance of how one should concentrate to success.
CO12	Helps decide which level of education one should pursue.
CO13	Helps become aware of fresh opportunities.
CO14	Increase their results on the IELTS test in each of the four abilities.
CO15	Prepare for the IELTS test by coming up with test-taking tactics.
CO16	Acquire the capacity to utilize English in day-to-day life and in situations that are like real life.

CO17	Develop full fluency in the language.

Course Content:

Unit - A:
Introduction to the Level 2 of Functional English, Overview of IELTS, General Training, Band Score, Fluency

Unit - B:
Lucidity and Concision, Tips to develop good communication skills, Grammar and Vocabulary, why is Functional Language important?

Unit - C:
Difference between Hearing and Listening, Role of Listening, General Training Reading, Important steps for Writing, Writing Strategies, Speaking Test

Unit - D:
Factors that influence Concentration, Inspiration, Perspiration, Tips for IELTS Preparation

Teaching / Assessment Methodology:

- Synchronous Lectures
- Lectures on LMS
- Assignments
- Quizzes
- Project Report

Grading:

Internal Assessment	30%
End Term Exams	70%

Further Readings:

L. Thimmesha- Functional English

Course Name: **Data Structures with C**

Credits: 4

Course Objectives:

The Data Structures with C course is designed to provide students with a solid foundation in data structures and algorithms using the C programming language. The course will cover essential data structures such as arrays, linked lists, stacks, queues, and trees, and introduce algorithmic concepts for efficient problem-solving.

Course Outcome:

At the end of the course, the student will be able to:

Sr. No.	Course Outcome
CO1	Understand the basics of data structures and their importance
CO2	Implement and analyze algorithms in the C programming language
CO3	Design and implement various data structures, including arrays and linked lists
CO4	Analyze the time and space complexity of algorithms
CO5	Solve problems using stack and queue data structures
CO6	Implement tree and graph data structures and associated algorithms
CO7	Apply recursion and dynamic programming for problem-solving
CO8	Develop efficient algorithms for searching and sorting
CO9	Apply data structures to real-world programming challenges
CO10	Write efficient and optimized C code

Course Content:

Unit-A: Introduction to Data Structures

- Overview of data structures and algorithms
- Basic concepts of arrays and linked lists
- Time and space complexity analysis

Unit-B: Stacks and Queues

- Implementation and applications of stacks

- Implementation and applications of queues
- Solving problems using stacks and queues

Unit-C: Trees and Graphs

- Introduction to tree data structures
- Binary trees and their traversals
- Graph data structures and algorithms

Unit-D: Algorithmic Techniques

- Recursion and its applications
- Dynamic programming concepts
- Searching and sorting algorithms
- Applications of data structures in programming challenges

Teaching / Assessment Methodology:

- Synchronous lectures
- Programming labs and coding exercises
- Assignments
- Midterm exams
- Final exam

Grading:

- Internal assessment: 30%
- End Term Exam: 70%

Further Readings:

1. Weiss, M. A. (2014). Data Structures and Algorithm Analysis in C++.
2. Horowitz, E., Sahni, S., & Mehta, D. (2007). Fundamentals of Data Structures in C++.
3. Cormen, T. H., Leiserson, C. E., Rivest, R. L., & Stein, C. (2009). Introduction to Algorithms.
4. Carrano, F. M., & Henry, M. H. (2012). Data Structures and Abstractions with Java.
5. Goodrich, M. T., Tamassia, R., & Mount, D. M. (2011). Data Structures and Algorithms in Java.

Course Name: **Web Technology**

Credits: 4

Course Objectives:
The students will be able:

1. To Understand the structure and semantics of HTML (Hypertext Markup Language).
2. To create responsive designs that work well on various devices and screen sizes.
3. To learn the principles of responsive web design.
4. To Understand the importance of web accessibility.
5. To gain industry best practices, coding standards, and code organization.

Course Outcome:
At the end of the course, the student will be able to:

S.No.	Course Outcomes
CO 1	Students should be able to create well-structured and semantically meaningful HTML documents that provide a solid foundation for web content.
CO2	Students should be proficient in using CSS to apply styling to HTML elements, creating visually appealing and consistent designs across web pages.
CO 3	Students should understand and implement best practices for securing front-end code.
CO 4	Students should demonstrate an ability to adapt to new front-end technologies and frameworks as the field of web development evolves.
CO 5	Students should be aware of accessibility standards and be able to create websites that are accessible to users
CO 6	Students should understand the principles of version control and be able to use tools like Git to manage and collaborate on code projects
CO 7	To learn various creative measures related to website.

Course Content:

Unit-A: Introduction to Front End
Overview of Front-end vs Backend, Advantages of HTML, Front-end development, CSS, Role of HTML and CSS in web development HTML Tags, Nesting of Tags, Attribute and values within Tag, Basic Structure, Formatting advantages in HTML, Background Color

Unit-B: List and Tables
Types of Lists, Nested List, Advantages of List, Links and Multimedia, Basic Table Structure, Table Syntax, Interactive Elements and Scripting, Importance of Forms, Forms and Input, Semantic Elements.

Unit-C: CSS and Responsive Design

Basics of CSS, CSS Tags, Concept of styling, Linking, CSS Box Model, CSS Layout and Positioning, Advanced Styling, Responsive designs, Importance of Responsive design, Goals, Media Queries, Importance of Maintainable CSS, CSS Methodologies, Evolution of web design, Mobile web, Core Techniques in Responsive Design, CSS Framework for Responsiveness, Benefits of using Framework, Drawbacks, Advance Responsive Patterns

Unit-D: Web Accessibility and Java Script

Principal for writing maintainable CSS, Modular CSS, Performance Optimization, Web Accessibility, Tools, Staying Updated, how to develop JavaScript, Simple JavaScript, Variables, Functions, Conditions, Loops, Arithmetic Operators, Comparison Operators, Logical Operators, Bitwise Operators, Assignment Operators

Teaching / Assessment Methodology:

- Synchronous lectures
- Asynchronous videos/ Lectures on LMS
- Assignments
- Quizzes
- Project work

Grading:

Internal assessment	**-**	**30%**
End Term Exam	**-**	**70%**

Required Books and Materials:

Textbook:

1. **HTML and CSS: Design and Build Websites" by Jon Duckett**
2. **Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics" by Jennifer Niederst Robbins**

Reference Book:

1. Headfirst HTML and CSS" by Elisabeth Robson and Eric Freeman
2. HTML & CSS: The Complete Reference, Fifth Edition" by Thomas Powell and Theresa Hunt
3. HTML5 Pocket Reference" by Jennifer Niederst Robbins

Course Name: **Saying It with Presentations**

Credits: 4

Course Objectives:

The objective of this course is to help students learn the various skills needed for presentation amongst a particular audience. This course will equip the students with various strategies and tools that will make them develop public speaking skills, better script writing, and body language, understand their target audience, and maintain command over the said audience. Apart from that, students learn to establish priorities, understand human memory, and learn organization, PowerPoint, speech mechanics, as well as observational skills.

Course Outcomes:

At the end of the course, the student should be able to:

Sr. No.	Course Out Come
CO1	Basics of Good presentation
CO2	Understand the concept and identify and understand our target audience
CO3	Understand the importance of choosing an appropriate topic
CO4	Help us retrospect the various skills like organization, logic, confidence, body language, interest, and clarity
CO5	Understand the role of eyes and voice while creating a presentation
CO6	Know how to observe and influence the audience while giving a presentation
CO7	Time management skills in presentation

Course Content:

UNIT-A

- What Exactly Is the Point of Giving a Presentation?
- Establishing Priorities and Goals
- Identifying and Understanding Your Target Audience
- The Conduct of The Audience

UNIT-B

- Human Memory: What We Remember and What We Forget
- Choosing A Topic and Organizing Your Information in Order

UNIT-C

- Writing The Script
- Visuals
- Putting Together the Presentation
- Skills – Voice, and Performance
- Body Language and Nerves

UNIT-D

- Rehearsals
- Bringing Forward the Presentation
- Maintaining Command Over the Audience

Teaching / Assessment Methodology:

- Synchronous lectures
- Asynchronous videos/ Lectures on LMS
- Assignments
- Quizzes
- Project work

Grading:

Internal assessment	**-**	**30%**
End Term Exam	**-**	**70%**

Further Reading:

- Nick Morgan – Give Your Speech, Change the World: How To Move Your Audience to Action
- Chapter 2 – Fundamentals of Engineering Technical Communications by Leah Wahlin.
- Audience Analysis (1997), Denis McQuail
- Remember: The Science of Memory and the Art of Forgetting by Lisa Genova
- Advanced Presentations by Design: Creating Communication that Drives Action by Andrew Abele

- Write Tight: Say Exactly What You Mean with Precision and Power by William Brohaugh
- Zen Design: A simple visual approach to presenting in today's world by Garr Reynolds
- The Visual Display of Quantitative Information, 2nd Ed by Edward R Tufte
- The Art of Public Speaking by Stephen Lucas
- The Definitive Book of Body Language: The Hidden Meaning Behind People's Gestures and Expressions by Barbara Pease (Author), Allan Pease (Author)
- Confession of a Public Speaker by Scott Berkun

Course Name: **Journalism in India- Historical Perspective**

Credits: 4

Course Description:

- To acquaint students with the glorious journey of journalism.
- To enhance understanding of the origin of the traditional print, electronic and web media.
- To inculcate the knowledge of growth of print, electronic and cinema.
- To acquaint leaners with technological advancements in print, electronic and web media.
- To throw light on the present status of various mass media.

Course Outcomes:

At the end of the course, the student will be able to:

Sl. No.	Course Outcome
CO1	Students would be able to acquaint themselves with the glorious journey of journalism
CO2	Students would be able to enhance understanding of the origin and of the print, electronic and web media. Electronic and web media.
CO3	Students would be able to inculcate the knowledge of growth of print, electronic and web media
CO4	Students would be able to acquaint themselves with technological advancements in print, electronic and web media.
CO5	Students would be able to throw light on the present status of various mass media

Course Content:

Unit - A:

- Earliest Communication Methods
- Folk Media
- Mass Media
- New Media

Unit - B:

- Origin of Press
- Birth of Indian News Agencies
- English Press in India

Unit - C:

- Press Before Independence
- Hindi and Vernacular Press before Independence
- Role of Press in Freedom Struggle
- Mahatma Gandhi as a Journalist

Unit - D:

- Press after Independence Origin of regulatory bodies PCI, PIB etc
- Advent of Radio and TV in India
- Eminent personalities of India Journalism after Independence

Teaching / Assessment Methodology:

- Synchronous Lectures
- Lectures on LMS
- Assignments
- Quizzes
- Project Report

Grading:

Internal Assessment	30%
End Term Exams	70%

Reference Books:

- Kumar KevalJ., MassCommunicationinIndia.Jaico, Mumbai.
- B.D. Garga, So Many Cinemas-The Motion Picture in India, Bombay, Eminence Design Pvt. Ltd, 1996.
- Erik Barnouw and S. Krishnaswamy: Indian Films, New Delhi, Oxford, 1986
- Luthra, H.R., Indian Broadcasting, Publication Division, New Delhi.
- Baruah, U.L., This is All India Radio, Publication Division, New Delhi.
- M. Chalapathi Rau, The Press
- NadigKrishnamurthu, India Journalism (From Asoka to Nehru), University of Mysore.
- Chatterjee, P.C., Broadcasting in India, New Delhi
- Rangaswamy, Parthasaratihi, Journalism in India, Sterling Publication, New Delhi.

Course Name : **Critical Thinking and Problem Solving**

Credits: 4

Course Objectives:

- The objective of this course is to help students understand how complex problems related to business or otherwise can be solved by applying critical reasoning skills in breaking them down to their smallest or fundamental elements by techniques such as why-why analysis, root cause technique, fishbone diagram, logic/issue trees and hypotheses of solutions etc.
- The course will provide an understanding of how to identify and formulate a problem at hand, design and conduct an investigation, and present the research findings as a report.
- The course will use in-house practicals to demonstrate the use of appropriate and applicable reasoning approaches, methods and techniques for different problems.

Course Outcomes:

At the end of the course, the student should be able to:

SR. No	Skill Outcome
CO1	Identify a critical thinker
CO2	Describe tools for identifying problems
CO3	Use the MECE (Mutually Exclusive and Collectively Exhaustive) approach
CO4	Understand issue tree approach to formulate a problem
CO5	Describe Fishbone analysis
CO6	Describe issue tree approach
CO7	Understand types of research and data
CO8	Critically examine claims encountered in daily life
CO9	Compose effective arguments
CO10	Describe tools for identifying problems
CO11	Use Issue Tree Approach for problem formulation
CO12	Use a Fishbone Diagram for cause-and-effect analysis
CO13	Apply MECE and CRAP to find solution to a problem
CO14	Write a research proposal

Course Contents:

Unit- I: Language of Reasoning

- Arguments vs other language forms
- Criticality vs un-criticality
- Critical thinking and its indicators
- Elements, standard and traits of critical thinking
- Classical model of Critical Thinking
- Types of reasoning and its identification

Unit- II: Identifying the Problem

- Defining the problem
- Classifying the problem
    - Simple Problem
    - Customary Problems
    - Introspective Problems
    - Complex Problems
- Tools for problem identification:
    - Why-why analysis
    - What if analysis
    - Root Cause Technique (RCT)
    - Cause and Effect diagram
    - Pareto Analysis, etc.
- Problem formulation principle

Unit- III: Breaking up of Problem

- Identifying components of problem
    - Making logic trees
    - Constructing issue maps
    - Constructing mind maps
    - Priority matrix, etc.
    - Use of MECE concept

Unit- IV: Decision Making

- Measuring the impact of problem
- Reverse cause and effect analysis
- Creating hypotheses
- Developing research instrument
- Introduction to researching
- Preparing a project report

Teaching / Assessment Methodology:

- Synchronous lectures
- Asynchronous videos/ Lectures on LMS
- Assignments
- Quizzes
- Project work

Grading:

Internal assessment	**-**	**30%**
End Term Exam	**-**	**70%**

Reference Books:

"Critical Thinking: The Nature of Critical and Creative Thought" by Robert DiYanni

"Thinking, Fast and Slow" by Daniel Kahneman

"Critical Thinking: A Concise Guide" by Tracy Bowell and Gary Kemp

Course Name: **Operating System**

Credits: 4

Course Objectives:

The Operating System course is designed to provide students with a comprehensive understanding of the fundamental concepts and principles of operating systems. The course will cover topics ranging from process management to memory management, file systems, and security.

Course Outcome:

At the end of the course, the student will be able to:

Sr. No.	Course Outcome
CO1	Understand the role and functions of operating systems
CO2	Analyze and design process management in operating systems
CO3	Evaluate different memory management schemes
CO4	Design and implement file systems
CO5	Analyze and implement input/output systems
CO6	Understand the concepts of deadlock and concurrency
CO7	Evaluate different scheduling algorithms
CO8	Implement and analyze security measures in operating systems
CO9	Analyze and implement virtualization concepts
CO10	Apply operating system principles to real-world scenarios

Course Content:

Unit-A: Introduction to Operating Systems

- Definition and functions of operating systems
- History and evolution of operating systems
- Types of operating systems (Batch, Multi-programming, Time-sharing)

Unit-B: Process Management

- Processes and threads

- Process scheduling algorithms
- Inter-process communication
- Synchronization and deadlock resolution

Unit-C: Memory Management and File Systems

- Memory hierarchy and management
- Virtual memory concepts
- File system organization and structure
- File system implementation and management

Unit-D: Input/Output Systems and Security

- I/O devices and systems
- Disk scheduling algorithms
- Security and protection mechanisms
- Virtualization concepts and implementation

Teaching / Assessment Methodology:

- Synchronous lectures
- Lab sessions for hands-on experience
- Assignments
- Midterm exams
- Final exam

Grading:

- Internal assessment: 30%
- End Term Exam: 70%

Further Readings:

1. Silberschatz, A., Galvin, P. B., & Gagne, G. (2018). Operating System Concepts.
2. Tanenbaum, A. S., & Bos, H. (2014). Modern Operating Systems.
3. Stallings, W. (2014). Operating Systems: Internals and Design Principles.
4. Tanenbaum, A. S. (2007). Distributed Systems: Principles and Paradigms.
5. Smith, J. E., & Nair, I. (2005). Virtual Machines: Versatile Platforms for Systems and Processes.

Course Name: **Object-Oriented Programming with C++**

Credits: 4

Course Objectives:

The Object-Oriented Programming with C++ course is designed to provide students with a solid understanding of object-oriented programming concepts using the C++ programming language. The course will cover topics such as classes, inheritance, polymorphism, and templates.

Course Outcome:

At the end of the course, the student will be able to:

Sr. No.	Course Outcome
CO1	Understand the principles and concepts of object-oriented programming
CO2	Design and implement classes and objects in C++
CO3	Apply inheritance and polymorphism for code reusability
CO4	Utilize templates and generic programming in C++
CO5	Implement exception handling and file handling in C++
CO6	Design and implement graphical user interfaces using C++
CO7	Apply object-oriented design principles
CO8	Develop efficient and modular C++ code
CO9	Understand and implement operator overloading
CO10	Apply advanced C++ features for real-world applications

Course Content:

Unit-A: Introduction to Object-Oriented Programming

- Basics of object-oriented programming
- Understanding classes and objects
- Constructors and destructors
- Function overloading and operator overloading

Unit-B: Inheritance and Polymorphism

- Inheritance and its types
- Polymorphism and its implementation
- Function overriding and virtual functions
- Abstract classes and interfaces

Unit-C: Templates and Generic Programming

- Introduction to templates
- Function templates and class templates
- Generic programming concepts
- Standard Template Library (STL)

Unit-D: Advanced C++ Features and Applications

- Exception handling and file handling
- Advanced topics in C++ (smart pointers, move semantics)
- Design patterns in C++
- Graphical User Interface (GUI) programming in C++

Teaching / Assessment Methodology:

- Synchronous lectures
- Coding labs and hands-on exercises
- Assignments
- Midterm exams
- Final exam

Grading:

- Internal assessment: 30%
- End Term Exam: 70%

Further Readings:

1. Stroustrup, B. (2014). Programming: Principles and Practice Using C++.
2. Eckel, B. (2003). Thinking in C++.
3. Lippman, S. B., Lajoie, J., & Moo, B. (2012). C++ Primer.
4. Schildt, H. (2012). C++: The Complete Reference.
5. Meyers, S. (2014). Effective Modern C++: 42 Specific Ways to Improve Your Use of C++11 and C++14.

Course Name: **Software Engineering**

Credits: 4

Course Objectives:

The students will be able:

1. To comprehend the various software process models.
2. To understand the types of software requirements and SRS documents.
3. To know the different software design and architectural styles.
4. To learn the software testing approaches and metrics used in software development.
5. To know about quality control and risk management.

Course Outcome:

At the end of the course, the student should be able to:

Sr. No.	Course Outcome
CO1	To compare and select a process model for a business system.
CO2	To identify and specify the requirements for the development of an application.
CO3	To develop and maintain efficient, reliable and cost-effective software solutions.
CO4	To learn about generic models of software development process.
CO5	To understand fundamental concepts of requirements engineering and Analysis Modeling.
CO6	To understand the different design techniques and their implementation.
CO7	To learn various testing measures
CO8	To learn various maintenance and project management techniques
CO 9	To learn various ISO Standards

Course Content:

Unit-A: Introduction to Software Engineering

The evolving role of software, Changing Nature of Software, Software myths. A Generic view of process: Software engineering- A layered technology, a process framework, Process patterns, process assessment. Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process, Agility and Agile Process model, Extreme Programming, Other process models of Agile Development and Tools.

Unit-B: Software Requirements

Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document. Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management. System models: Context Models, Behavioral models, Data models, Object models, structured methods. UML Diagrams.

Unit-C: Design Engineering

Design process and Design quality, Design concepts, the design model. Creating architectural design: Software architecture, Data design, Architectural styles and patterns, Architectural Design. ObjectOriented Design: Objects and classes, An Object-Oriented design process, Design evolution. Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

Unit-D: Testing Strategies

A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging. Product metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance. Metrics for Process and Products: Software Measurement, Metrics for software quality. Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, The Capability Maturity Model Integration (CMMI), Software reliability, The ISO 9000 quality standards.

Teaching / Assessment Methodology:

- Synchronous lectures
- Asynchronous videos/ Lectures on LMS
- Assignments
- Quizzes
- Project work

Grading:

Internal assessment	**-**	**30%**
End Term Exam	**-**	**70%**

Textbook:

1. Software Engineering A practitioner's Approach, Roger S Pressman, 6thedition. McGraw Hill International Edition.

2. Software Engineering, Ian Sommerville, 7th edition, Pearson education.

Reference Book:

Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.

Software Engineering: A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008

Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.

Software Engineering1: Abstraction and modelling, Diner Bjorner, Springer International, edition, 2006.

Software Engineering2: Specification of systems and languages, Diner Bjorner, Springer International edition 2006.

Software Engineering Principles and Practice, Hans Van Vliet, 3rd edition, John Wiley & Sons Ltd.

Software Engineering3: Domains, Requirements, and Software Design, D. Bjorner, Springer International Edition.

Introduction to Software Engineering, R. J. Leach, CRC Press.

Course Name: **Acing Interview through AI**

Credits: 4

Course Objectives:

- The course is structured and planned so that students may become familiar with the main difficulties they encounter throughout the interview process.
- The course will be largely concerned with life skills development and personality development. The course's goal is to familiarise students with some of the issues they run into during interviews and to offer them solutions so they won't make the same mistakes again.
- The training will thoroughly cover life skills, which will help the students comprehend
  the format of the interviews.

Course outcome:

At the end of the course, the student should be able:

Sr. No.	Course Outcome
CO1	To understand the types of question they will be facing in future.
CO2	To critically analyze their personality and what are their strengths and weaknesses.
CO3	Apply a few of the types of interview questions they will encounter.
CO4	Mock interviews can be practiced using an AI platform like Siqandar.

Course Content:

Unit - A: Introduction

- Introduction to Interviewing
- Types of interviews
- Interviewers Perspective

Unit - B: Research before interview

- Before the Interview
- Conducting Research
- Assessing Your Strengths and Skills

Unit - C: Preparation

- Preparing yoreself (best impression1)
- Key Factors that influence an interviewer (best impression2) (Verbal and Non-

Verbal)

Unit - D: Types of Questions

- Typical interview questions
- Behavioral-Based Interviewing
- Some more general questions
- Difficult or tricky situations
- Managing Yourself
- Your interview checklist
- References

Teaching / Assessment Methodology:

- Synchronous Lectures
- Lectures on LMS
- Assignments
- Quizzes
- Project Report

Grading:

Internal Assessment	30%
End Term Exams	70%

Further Readings:

David Portney- The Secret of How to ace any job interview with Confidence!

Abhishek (Andy) Anand and Pradeep (Shastry) Vedula- Acing WAT, GDs & Interviews for IIM's

Course Name: **New Media**

Credits: 4

Course Objectives:

- This course is designed to be a conceptual work based on the application of new media in various facets.
- This course will help the students to learn the uses of cyber media for journalistic purpose. This course will also aid the students in understanding the applications of the online tools for communication.
- The course will also involve the use of PPTs and Internet to demonstrate how the various aspects of new media journalism, social media and citizen journalism and blogs, etc. function.

Course Outcomes:

At the end of the course, the student will be able to:

Sl. No.	Course Outcome
CO1	Explain the uses of cyber media for journalistic purpose.
CO2	Understand the applications of the online tools for
CO3	Design Web page, Create and maintain a YouTube channel, Create and maintain Facebook page, Twitter handle
CO4	Analyses the content of a news portal and Learn to use search engines
CO5	Create an email and understand its features and blog writing
CO6	Open an account in social media website and understand their uses.

Course Content:

Unit - A:

Introduction to New Media: Introduction to concepts of digitization and convergence, Introduction to Internet, World Wide Web (WWW), Search Engines, Multimedia elements and Interactivity.

Unit - B:

Data Journalism: Web Content Management System, News on the web: Newspapers, magazines, radio and TV newscast on the web, Social Medias:

Computer Assisted Reporting (CAR), Visualization of data, Awareness regarding techniques of Digital Marketing: Search Engine Optimization, Search Engine Marketing and Email Marketing

Unit - C:

Social media: Social networking; Introduction to social profile management products- Facebook, Social Collaboration: virtual community- wikis, blogs, instant messaging, YouTube, Blogging: a brief history of blogs, blogs as narratives**,** Digital Divide**,** Security issues in using digital technology

Unit - D:

Writing for New Media: Blogs**,** Micro blogging & Social networking/Facebook/Twitter/RSS feeds, Digital marketing, Emails etc.**,** Digital Story telling formats**,** Content writing, editing, reporting and its management

Teaching / Assessment Methodology:

- Synchronous Lectures
- Lectures on LMS
- Assignments
- Quizzes
- Project Report

Grading:

Internal Assessment	30%
End Term Exams	70%

Reference Books:

1. The New Media Reader, Ed. Noah Wardrip & Fruin and Nick Montfort, The MIT Press, Cambridge, 2003
2. A Journalist Guide to the Internet: *The Net as a Reporting Tool*, Christopher Callhan, Pearson/Allyn and Bacon, 2007
3. Cyber Media Journalism: *Emerging Technologies*, Jagdish Chakraborty, Authors Press, NewDelhi, 2005
4. Online Journalism: *A Critical Primer*, Jim Hall, Pluto press, London, 2001
5. Producing Online News: *Stronger Skills, Stronger Stories*, Ryan M. Thornburg, CQ Press, Washington, 2011
6. Ronal Dewolk Introduction to Online Journalism Allyn & Bacon, ISBN 0205286895
7. John Vernon Pavlik New Media Technology Allyn & Bacon ISBN 020527093X
8. Michael M. Mirabito, New Communication Technologies: Application Menon, Narayana. *The Communication Revolution*. National Book Trust. Pavlik J.V. *Media in the Digital Age*.

Columbia University Press.

Course Name: **Database Management System**

Credits: 4

Course Objectives:

The Database Management System course is designed to provide students with a comprehensive understanding of database concepts and principles. The course will cover topics such as database design, normalization, SQL, and transaction management.

Course Outcome:

At the end of the course, the student will be able to:

Sr. No.	Course Outcome
CO1	Understand the fundamentals of database management systems
CO2	Design and implement relational databases
CO3	Apply normalization techniques for efficient database design
CO4	Utilize SQL for data retrieval, manipulation, and management
CO5	Implement transaction management and concurrency control
CO6	Design and implement database security measures
CO7	Understand and apply distributed database concepts
CO8	Develop stored procedures and triggers
CO9	Apply indexing and optimization techniques
CO10	Implement and manage NoSQL databases

Course Content:

Unit-A: Introduction to Database Management Systems

- Definition and importance of database management systems
- Components and architecture of DBMS
- Types of databases (relational, hierarchical, network, etc.)
- Data models: Entity-Relationship Model (ER Model)

Unit-B: Relational Database Design and Normalization

- Relational database concepts
- Functional dependencies and normalization
- Normal forms (1NF, 2NF, 3NF)
- Denormalization and its trade-offs

Unit-C: SQL and Transaction Management

- Structured Query Language (SQL)
- Database queries, updates, and data definition language
- Transaction management and ACID properties
- Concurrency control and locking mechanisms

Unit-D: Advanced Database Concepts

- Database security and access control
- Distributed databases and replication
- Stored procedures and triggers
- Indexing and optimization techniques
- Introduction to NoSQL databases

Teaching / Assessment Methodology:

- Synchronous lectures
- Database design and SQL labs
- Assignments
- Midterm exams
- Final exam

Grading:

- Internal assessment: 30%
- End Term Exam: 70%

Further Readings:

1. Connolly, T., & Begg, C. (2014). Database Systems: A Practical Approach to Design, Implementation, and Management.
2. Elmasri, R., & Navathe, S. B. (2016). Fundamentals of Database Systems.
3. Garcia-Molina, H., Ullman, J. D., & Widom, J. (2008). Database Systems: The Complete Book.
4. Date, C. J. (2003). An Introduction to Database Systems.
5. Atzeni, P., & Ceri, S. (1997). Database Systems: Concepts, Languages, and Architectures.

Course Name: **Python Programming**

Course Objectives

Python is a free and open-source programming language. Python is used for development and design in applications. To develop logical skills and basic technical skills so that students should be able to solve basic computing problems. The students should be able to learn the basic of any computer programming language. The course aims to provide students with the following objectives:

- Develop a strong foundation in programming: The course should help students develop a solid understanding of programming concepts, including basic syntax, control structures, data types, and algorithms.
- Master Python language features and libraries: The course should cover the most used Python language features and libraries, including collections, file I/O, exception handling, multithreading, networking, and GUI programming.
- Develop problem-solving skills: The course should challenge students with real-world problems and encourage them to use critical thinking and problem-solving skills to design and implement effective solutions.
- Write efficient and maintainable code: The course should emphasize the importance of writing clean, efficient, and maintainable code, and teach students how to use tools and techniques like debugging, testing, and code profiling to optimize their code.
- Collaborate with others: The course should teach students how to work collaboratively on software projects, including version control, code review, and collaboration tools.

Course Outcome:

At the end of the course, the student will be able to:

S.No.	Course Outcomes
CO 1	Learn basics of object-oriented programming in python
CO2	Knowledge of creating and implementing class and object in development process
CO 3	Constructors in Python – parameterized and non-parameterized and exception handling
CO 4	Ability to collaborate on software projects.
CO 5	Developed strong programming skill.
CO 6	Object Oriented programming and problem-solving skill.
CO 7	Handling inheritance in Python
CO 8	Implementing of in built class, methods and attributes
CO 9	Develop projects using OOPs Concepts

Course Content:

Unit-A: Basics of Python

No of Lectures: 10; No of Tutorials:0 No of Practicals:0
Python Installation and Working of it, get familiar with python variables and data types, Operator understanding and its usage, detail study of python blocks

Unit-B: Structure Types and mutability

No of Lectures: 13; No of Tutorials:0; No of Practicals:0
Hands on with conditional blocks using if, else and elif, Hands on examples and study of looping with range, list and dictionaries. hands on to organize python code with function

Unit-C: Exception, Testing and Debugging:
No of Lectures: 7; No of Tutorials:0; No of Practicals:0
Handling if exceptions to handle the code cracks, handling and helping file operations, coding with the exceptional handling and testing Anonymous method, Properties, Indexers, Exception Handling

Unit-D: Classes and OOP Concepts

No of Lectures: 15; No of Tutorials:0; No of Practicals:0
Procedural and Object-Oriented Programming, Classes and working with instances, Method overloading, Polymorphism, importing internal module as well as external modules in the code Packages understanding and their usage, hands on with Lamba function in python coding with the use of functions modules and external packages.

Teaching / Assessment Methodology:

- Synchronous lectures
- Asynchronous videos/ Lectures on LMS
- Assignments
- Quizzes
- Project work

Grading:

Internal assessment		
	-	**30%**
End Term Exam	**-**	**70%**

Required Books and Materials:

Textbook(s):

1. Lutz, M. (2013). Learning python: Powerful object-oriented programming. " O'Reilly Media, Inc.".
2. Head-First Python (2nd edition) Paul Barry
3. Learning with Python’ by Allen Downey, Jeff Elkner, and Chris Meyers

Reference(s):

1. Fluent Python’ by Luciano Ramalho
2. Python Cookbook’ by David Beazley and Brian K.

Course Name: **Digital Marketing**

Credits: 4

Course Objectives:

The course on digital marketing is intended to develop skills in online marketing. The course provides knowledge on aspects of various online platforms and introduces learners to key concepts of website development, SEO, analytics, content marketing, running a social media campaign and online public relations. The course will give insight into practical features through hands on experience and helping to comprehend how to design, develop and implement strategy for digital marketing.

Course Outcomes:

At the end of the course, the student will be able to:

Sr. No.	Course Outcomes
CO 1	Explain digital marketing landscape
CO 2	Describe ingredients of digital marketing
CO 3	Understand website, SEO, content and social media
CO 4	Analyze performance through analytics
CO 5	Discuss PR mix in digital marketing
CO 6	Develop strategy for marketing online
CO 7	Create effective website
CO 8	Develop skills in search engine optimization
CO 9	Successfully run social media campaign to engage customers
CO 10	Develop and implement online PR strategy

Course Contents:

Unit-A: Digital marketing strategy

- Evolution of digital marketing
- Technology behind digital marketing
- Why you need digital marketing strategy
- Your business & digital marketing
- Understanding digital consumer

Unit-B: Effective Website & Search

- Building an effective website
- Choosing domain name
- Hosting website
- Arranging information & effective web content
- Search engines & SEO

Unit-C: Analytics

- Measuring digital marketing success

- How information is measured
- Measuring what is important
- Testing, investing, tweaking & reinvesting
- Action stations

Unit-D: Art of email marketing, social media & online customer engagement

- What is email marketing
- Planning your campaign
- Forms of social media
- Rules of engagement
- Online PR & reputation management

Teaching / Assessment Methodology:

- Synchronous lectures
- Asynchronous videos/ Lectures on LMS
- Assignments
- Quizzes
- Project work

Grading:

Internal assessment	**-**	**30%**
End Term Exam	**-**	**70%**

Further Readings:

Rajan Gupta, Supriya Madan- Digital Marketing

Course Name: **Organizational Behavior**

Credits: 4

Course Objectives:

Students study the behavior of individuals and groups as part of the social and technical system in the workplace. They examine individual and group behavior, communication, conflict and various management styles, motivational techniques and coordination in the work environment and apply these concepts to the development of an organization's human resources.

Course Outcomes:

At the end of the course, the student will be able to:

Sr. No.	Course Outcomes
CO 1	Understanding individual behavior and attitude at a workplace.
CO2	Identify different personality types based on Big five model and MBTI.
CO 3	Study the relationship between motivation and performance.
CO 4	Identify common errors in perception.
CO 5	Understand how groups are formed and work in an organization.
CO 6	Address to the different leadership styles, conflict management techniques and stress management process.
CO 7	Knowledge of different organizational designs and its elements.
CO 8	Identify personalities of individual using models like MBTI and Big five model.
CO 9	Avoid biasness and other perceptual errors while decision making processes.
CO 10	To motivate one's subordinates and employees.
CO 11	To lead successfully and handle groups for higher returns.
CO 12	Effectively handle conflict and stress at work place.
CO 13	Construct an organizational structure.

Course Content:

- **UNIT-I Introduction:** Meaning and importance of organization behavior. Contributing disciplines to OB. Different models of OB.

Challenges and Opportunities of OB.

- **UNIT-II The individual behavior**: Attitude and job related attitude. Personality and two models (MBTI & Big five Model). Perception and common shortcuts. Motivation and its theories (Early theories and contemporary theories)
- **UNIT-III The Group behavior:** Group dynamics: group properties and formation. Leadership styles and theories. Conflict management techniques.
- **UNIT-IV The Organizational system:** Organization structure: Structure elements and common organizational structure designs. Stress management techniques. Change management.

Teaching / Assessment Methodology:

- Synchronous lectures
- Asynchronous videos/ Lectures on LMS
- Assignments
- Quizzes
- Project work

Grading:

Internal assessment	**30%**
End Term Exam	**70%**

Required Books and Materials:

Text Book:

1. Robbins, S, ‘‘Organizational Behaviour’’ 15th Edition, Pearson Education, New Delhi.

References:

1. Prasad, LM, Organizational Behaviour, Sultan Chand & Sons, New Delhi.

Course Name: **Effective Negotiations**

Credits: 4

Course Objectives:
This course is focused to help students understand the techniques required to holistically develop their personalities. In this course students will find the strategies to enhance their decision making in a professional environment and provide them with the different methods of Negotiation which are important in the way the world economy works, how deals are made in the corporate world, and how the art of persuasion is achieved.

Course outcomes:
At the end of this course the students will be able to:

Sr. No.	Course Out Come
CO1	Outline the significance of Negotiation
CO2	Create and claim value
CO3	Understand the methodologies of Negotiation
CO4	Strategize Negotiations
CO5	Examine overview of strategic orientation and numerous objectives
CO6	Extract the most out of Affirmations

Course content:

Unit A-

- Meaning of Negotiation
- Techniques of Negotiation
- Types and stages of Negotiation
- Strategies of Negotiation
- Setting Strategic Objectives

Unit B-

- Benefits of setting Affirmations
- Use of power of Negotiation
- Methods of Persuasion
- Negotiation resulting in a win-win situation

Unit C-

- Importance of Commitments
- Four basic precepts
- Potential Negotiation angles

- Social styles in Negotiation
- Handling high stake decision
- Gaining success in a high-stake decision

Unit D-

- Aims of Contract Discussions and Negotiations
- Meaning of Bluff
- Risks of Bluffing
- Alternatives of false statements
- Examples of Negotiation around the world

Teaching / Assessment Methodology:

- Synchronous lectures
- Asynchronous videos/ Lectures on LMS
- Assignments
- Quizzes
- Project work

Grading:

Internal assessment	**-**	**30%**
End Term Exam	**-**	**70%**

Further Readings

Negotiating at Work: Turn Small Wins into Big Gains, by Deborah M. Kolb and Jessica L.

3D Negotiation: Powerful Tools to Change the Game in Your Most Important Deals, by David A. Lax and James K. Sebenius.

The First Move: A Negotiator's Companion, by Alain Lempereur and Aurélien Colson.

Negotiation Genius: How to Overcome Obstacles and Achieve Brilliant Results at the Bargaining Table and Beyond, by Deepak Malhotra and Max H. Bazerman.

Course Name : **Advertising**

Credits: 4

Course Objectives:

This course is designed to be a conceptual work based on the application of Public relations. This course will help the students to learn the meaning, importance, functions and scope of Public relations.

Course Outcomes:

At the end of the course, the students will be able to:

Sr. No.	Course Out Come
CO1	define and explain the meaning, importance, functions & scope of Public Relations
CO2	explain important theories of Public Relations
CO3	explain various tools of PR and writing for PR
CO4	Write for PR internal publics and media
CO5	Write for press release, press briefs etc
CO6	Understand the concept of Advertising
CO7	Understand types of Advertising Agencies
CO8	Understand the working of Advertising Agencies

Course Content:

UNIT-I

Advertising – definition, historical development; social and economic benefits of advertising; mass media and advertising, types of advertising; classification of advertising – corporate – industrial – retail – national – trade – professional – social.

UNIT II

Advertising strategies, appeals, advertising spiral, market and its segmentation, sales promotion. Mass Communication , Advertising agency – structure and functions, creativity – media selection – newspapers, magazines, radio, television, outdoor, strategy, planning,

UNIT-III

Public Relations – definition – PR as a communication function – history of PR – growth of PR in India, PR, publicity, propaganda and public opinion – PR as a management function Code of ethics for PR professional organisations of PR – emerging trends in PR.

UNIT-IV

Stages of PR – planning – implementation – research – evaluation – PR practitioners and media relations – press conference – press releases – other PR tools. PR research techniques – PR and law – PR and new technology in PR

Teaching / Assessment Methodology:

- Synchronous Lectures
- Lectures on LMS
- Assignments
- Quizzes
- Project Report

Grading:

Internal Assessment	30%
End Term Exams	70%

Required Books and Materials:

Reference Books:

- Jefkins Frank Butterworth, Public Relations Techniques, Heinmann Ltd.
- Heath Robert L, Handbook of Public Relations, Sage Publications,
- Dennis L. Wilcose & Glen T, Public Relations, Pearson
- Cutlip S.M and Center A.H., Effective Public Relations, Prentice Hall
- Kaul J.M., Noya Prakash, Public Relations in India, Calcutta

Course Name: **Java Programming**

Credits: 4

Course Objectives:

The objective of a Java programming course is to teach students the fundamentals of programming in the Java language, as well as the essential tools and techniques needed to develop robust, efficient, and scalable software applications. The course aims to provide students with the following objectives:

- Develop a strong foundation in programming: The course should help students develop a solid understanding of programming concepts, including basic syntax, control structures, data types, and algorithms.
- Learn object-oriented programming: Java is an object-oriented language, and the course should teach students the principles of object-oriented programming, including classes, objects, inheritance, and polymorphism.
- Master Java language features and libraries: The course should cover the most used Java language features and libraries, including collections, file I/O, exception handling, multithreading, networking, and GUI programming.
- Develop problem-solving skills: The course should challenge students with real-world problems and encourage them to use critical thinking and problem-solving skills to design and implement effective solutions.
- Write efficient and maintainable code: The course should emphasize the importance of writing clean, efficient, and maintainable code, and teach students how to use tools and techniques like debugging, testing, and code profiling to optimize their code.
- Collaborate with others: The course should teach students how to work collaboratively on software projects, including version control, code review, and collaboration tools.

Course Outcome:

At the end of the course, the student will be able to:

S.No.	Course Outcomes
CO 1	Proficiency in Java syntax and control structures and understanding of object-oriented programming principles.
CO2	Knowledge of Java libraries and tools and ability to write efficient and maintainable code.
CO 3	Familiarity with Java frameworks
CO 4	Ability to collaborate on software projects.
CO 5	Developed strong programming skill.
CO 6	Object Oriented programming and problem-solving skill.
CO 7	Collaboration and Communication skill
CO 8	Web Development skill.
CO 9	To learn various IDE and Editions of java frameworks.

Course Content:

Unit 1: Introduction to Java Programming
No of Lectures: 6; No of Tutorials:0; No of Practicals:5

Programming language: Types and Paradigms, Computer Programming Hierarchy, Computer Architecture Affects a Language, Java History, Java Designing Goal, Role of Java Programmer in Industry, Features of Java Language, JVM, Bytecode.
The Java Environment: Installing Java, Java Program Development, Java Source File Structure, Compilation, Executions. Basic Language Elements: Lexical Tokens, Identifiers, Keywords, Literals, Comments, Primitive Datatypes, Operators Assignments.
Package: Organizing Classes and Interfaces in Packages, Package as Access Protection, Defining Package ,CLASSPATH Setting for Packages , Making JAR Files for Library Packages Import and Static Import Naming Convention For Packages.

Unit 2: Exception, Array and Thread
No of Lectures:7; No of Tutorials:0; No of Practicals:7

Exception Handling: The Idea behind Exception, Exceptions & Errors ,Types of Exception ,Control Flow In Exceptions, JVM reaction to Exceptions ,Use of try, catch, finally, throw, throws in Exception Handling ,In-built and User Defined Exceptions, Checked and Un-Checked Exceptions.
Array & String: Defining an Array, Initializing & Accessing Array, Multi –Dimensional Array, Operation on String, Mutable & Immutable String, Using Collection Bases Loop for String, Tokenizing a String, Creating Strings using String Buffer .
Thread: Understanding Threads, Needs of Multi-Threaded Programming, Thread Lifecycle, Thread Priorities, Synchronizing Threads, Inter Communication of Threads, Critical Factor in Thread –Deadlocks.

Unit 3 Classes Collection and GUI Programming
No of Lectures: 9; No of Tutorials:0; No of Practicals:5

A Collection of Useful Classes: Utility Methods for Arrays ,Observable and Observer Objects , Date & Times ,Using Scanner Regular Expression, Input/Output Operation in Java(java.io Package),Streams and the new I/O Capabilities ,Understanding Streams, The Classes for Input and Output, The Standard Streams, Working with File Object, File I/O Basics, Reading and Writing to Files, Buffer and Buffer Management, Read/Write Operations with File Channel, Serializing Objects .
GUI Programming: Designing Graphical User Interfaces in Java, Components and Containers, Basics of Components, Using Containers, Layout Managers, AWT Components, Adding a Menu to Window, Extending GUI Features Using Swing Components, Java Utilities (java.util Package) The Collection Framework : Collections of Objects , Collection Types, Sets , Sequence, Map, Understanding Hashing, Use of Array List & Vector.

Unit-4 Event Handling, JDBC and Servlet
No of Lectures: 8; No of Tutorials:0; No of Practicals:5

Event Handling: Event-Driven Programming in Java, Event- Handling Process, Event Handling Mechanism, The Delegation Model of Event Handling, Event Classes, Event Sources, Event Listeners, Adapter Classes as Helper Classes in Event Handling. Database Programming using **JDBC:** Introduction to JDBC, JDBC Drivers & Architecture, CURD operation Using JDBC, Connecting to non-conventional Databases.
Java Server Technologies: Servlet Web Application Basics, Architecture and challenges of Web Application, Introduction to servlet, Servlet life cycle, Developing and Deploying Servlets, Exploring Deployment, Descriptor (web.xml), Handling Request and Response.

Teaching / Assessment Methodology:

- Synchronous lectures
- Asynchronous videos/ Lectures on LMS
- Assignments
- Quizzes
- Project work

Grading:

Internal assessment	**-**	**30%**
End Term Exam	**-**	**70%**

Required Books and Materials:

Textbook:

1. Java: A Beginner's Guide - Herbert Schildt
2. Head-First Java - Kathy Sierra and Bert Bates
3. Effective Java - Joshua Bloch
4. Java How to Program - Paul and Harvey Deitel
5. Thinking in Java - Bruce Eckel

Reference Book:

1. Java: The Complete Reference - Herbert Schildt
2. Java in a Nutshell - Benjamin J. Evans and David
3. Core Java Volume I - Fundamentals - Cay S. Horstmann and Gary Cornell
4. Effective Java - Joshua Bloch
5. Java Concurrency in Practice -Brian Goetz et al

Course Name: **Introduction to Cloud Computing**

Credits: 4

Course Objectives:

The Introduction to Cloud Computing course aims to provide students with a foundational understanding of cloud computing concepts, services, and architectures. The course will cover topics such as cloud deployment models, virtualization, service models, and security in cloud computing.

Course Outcome:

At the end of the course, the student will be able to:

Sr. No.	Course Outcome
CO1	Understand the fundamentals and evolution of cloud computing
CO2	Analyze different cloud deployment models
CO3	Evaluate various cloud service models
CO4	Implement and manage virtualized environments
CO5	Design and deploy applications in the cloud
CO6	Understand and implement cloud security measures
CO7	Analyze and optimize cloud performance
CO8	Explore emerging trends and innovations in cloud computing
CO9	Apply cloud computing concepts to real-world scenarios
CO10	Discuss ethical considerations in cloud computing

Course Content:

Unit-A: Fundamentals of Cloud Computing

- Definition and characteristics of cloud computing
- Evolution of cloud computing
- Cloud service providers and market trends
- Cloud deployment models (public, private, hybrid, and community clouds)

Unit-B: Cloud Service Models and Virtualization

- Infrastructure as a Service (IaaS)
- Platform as a Service (PaaS)
- Software as a Service (SaaS)
- Virtualization technologies and hypervisors

Unit-C: Cloud Architecture and Application Deployment

- Cloud architecture and design principles
- Cloud storage and data management
- Cloud-based application development
- Microservices and containers in the cloud

Unit-D: Cloud Security and Optimization

- Security challenges in cloud computing
- Identity and access management in the cloud
- Data encryption and compliance in the cloud
- Performance optimization and cost management

Teaching / Assessment Methodology:

- Synchronous lectures
- Hands-on labs and practical exercises
- Assignments
- Midterm exams
- Final project (cloud deployment)

Grading:

Midterm exams - 40%

Assignments - 20%

Final project - 40%

Further Readings:

Mell, P., & Grance, T. (2011). The NIST Definition of Cloud Computing.

Armbrust, M., Fox, A., Griffith, R., Joseph, A. D., Katz, R., Konwinski, A., ... & Zaharia, M. (2010). A view of cloud computing.

Chou, D. C., & Jin, Q. (2012). Cloud computing: Strategies and tactics for business and IT decision makers.

Jamsa, K. (2013). Cloud computing: SaaS, PaaS, IaaS, virtualization, business models, mobile, security and more.

Course Name: **Minor Project**

Credits: 4

Course Objectives:

The Minor Project course aims to introduce students to project work in the field of computer applications, emphasizing fundamental research skills and practical application of theoretical knowledge. The course intends to provide a foundational understanding of project execution within the field.

Course Outcomes:

By the end of the course, the student will be able to:

Sr. No.	Course Outcomes
CO 1	Apply basic methodologies and frameworks for executing a small-scale project in computer applications.
CO 2	Demonstrate an understanding of theoretical concepts and their practical relevance within the chosen project area.
CO 3	Collect, analyze, and present basic project-related data in the field of computer applications.
CO 4	Comprehend foundational literature and research methodologies relevant to the project.
CO 5	Begin applying computer application theories to address rudimentary industry problems.
CO 6	Develop initial analytical and critical thinking abilities for data-driven decision-making in computer application scenarios.
CO 7	Collaborate effectively within a team setting for project completion within the realm of computer applications.

Project Scope:

The Minor Project can cover various scopes within the field of computer applications, including but not limited to:

1. Basic Software Development Projects
2. Database Management Systems
3. Web Development Projects
4. Simple Application Prototypes
5. Basic Networking Projects
6. System Analysis and Design Projects

7. Data Structure and Algorithms Implementations
8. Other foundational projects within computer applications

Evaluation:

The evaluation will be based on the Minor Project Report, which will contribute 100% towards the final assessment.

Project Report Structure:

The report structure should encompass the following elements:

1. Introduction to the Project
2. Literature Review (Basic)
3. Methodology Overview
4. Simple Data Analysis (if applicable)
5. Basic Findings
6. Limitations (if any)
7. Conclusions (Preliminary)
8. Recommendations (Basic)
9. Bibliography and References

Students are expected to adhere to a specified report format to effectively present their understanding and execution of the minor project.

Methodology:

Students will conceive, execute, and submit a concise project report based on a designated topic relevant to computer applications.

Course Name: **Effective Negotiations**

Credits: 4

Course Description:

This course is focused to help students understand the techniques required to holistically develop their personalities. In ths course students will find the strategies to enhance their decision making in a professional environement and provide them with the different methods of Negotitation which are important in the way the world economy works, how deals are made in the corporate world, and how the art of persuasion is achieved.

Course Outcomes:
At the end of this course the students will be able to:

Sr. No.	Course Out Come
CO1	Outline the significance of Negotiation
CO2	Create and claim value
CO3	Understand the methodologies of Negotiation
CO4	Strategize Negotiations
CO5	Examine overview of strategic orientation and numerous objectives
CO6	Extract the most out of Affirmations
CO7	Signify sources and structures of Negotiation
CO8	Discuss in detail about central-route and Peripheral-route of Persuasion
CO9	Discuss Win-Win Negotiation – Preparation, Advice, Result & Consequences.
CO10	Discuss about meaningful Commitments and few of its potential angle on negotiation along with four basic precepts.
CO11	Understand various different social styles and the ways to proceed towards negotiating each of them.
CO12	Functionally Negotiate under stress-like situations.
CO13	Learn the ways of Bluffing

Course content:

Unit - A:

- Meaning of Negotiation
- Techniques of Negotitation
- Types and stages of Negotiation
- Strategies of Negotiation
- Setting Strategic Objectives

Unit - B:

- Benefits of setting Affirmations
- Use of power of Negotitation
- Methods of Pursuasion
- Negotitation resulting in a win-win situation

Unit - C:

- Importance of Commitments
- Four basic precepts
- Potential Negotiation angles
- Social styles in Negotiation
- Handling high stake decision
- Gaining success in a high-stake decision

Unit - D:

- Aims of Contract Discussions and Negotiations
- Meaning of Bluff
- Risks of Bluffing
- Alternatives of false statements
- Examples of Negotitation around the world

Teaching / Assessment Methodology:

- Synchronous Lectures
- Lectures on LMS
- Assignments
- Quizzes
- Project Report

Grading:

Internal Assessment	30%
End Term Exams	70%

Books and Materials:

Further Readings

- Negotiating at Work: Turn Small Wins into Big Gains, by Deborah M. Kolb and Jessica L.
- 3D Negotiation: Powerful Tools to Change the Game in Your Most Important Deals, by David A. Lax and James K. Sebenius.
- The First Move: A Negotiator's Companion, by Alain Lempereur and Aurélien Colson.
- Negotiation Genius: How to Overcome Obstacles and Achieve Brilliant Results at the Bargaining Table and Beyond, by Deepak Malhotra and Max H. Bazerman.

Course Name: **Public Relations**

Credits: 4

Course Objectives:

1. The objective of this course is to Impart knowledge about the concepts and methods of Public Relations
2. To equip them with transitional knowledge from traditional to contemporary Public Relations structure & research.
3. To develop creative thinking and ideation for PR
4. Develop analytical and critical thinking skills when creating/evaluating Public Relations strategies

Course Outcomes:

At the end of the course, the student will be able to:

Sl. No.	**Course Outcome**
CO1	Good conceptual understanding of subjects including Communication, Public Relations, Corporate Communication, Research Methodology.
CO2	Research and Reasoning aptitude for any Strategic Communication planning and execution of Public Relations programs.
CO3	Creative and reflective thinking for ideation based on self-learning & digital competency.
CO4	Analytical and problem solving skills for challenging situations of the profession.
CO5	Independently work with high competency and morality in the business of Public Relations in the roles of Account Planners, Copy writers, Media Planners, PR/ CC Managers, Researchers.

Course Content:

Unit-A: Brief Introduction of PR

- Public Relations-Meaning, Definition, Nature and Scope
- Historical Background
- Technological and Media Revolution and Role in Business
- Government, Politics
- NGOs and Industry

Unit-B: Concepts of Public Relations

- Press,Publicity, Lobbying,
- Propaganda, Advertising,
- Sales Promotion and Corporate
- Marketing Services Visualization

Unit-C: Tools of Public Relations

- Press Conferences
- Meets
- Press Releases
- Announcements
- Webcasts

Unit-D:

- Public Relations and Mass Media,
- Present and future of Public Relations in India,
- Ethics of Public Relations and Social Responsibility,
- Public Relations and Writing Printed Literature, Newsletters, Opinion papers and Blogs

Teaching / Assessment Methodology:

- Synchronous Lectures
- Lectures on LMS
- Assignments
- Quizzes
- Project Report

Grading:

Internal Assessment	30%
End Term Exams	70%

Required Books and Materials:

1. Brown, Rob, Public Relations and the Social Web, Kogan Page India, New Delhi, 2010.

2. Cutlipscottetal, Effective Public Relations, London, 1995.

3. Black Sam, Practical Public Relations, Universal Publishers, 1994

4. S.M.Sardana, Public Relations: Theory and Practice.

5. J.V.Vilanilam, Public Relations in India: New Tasks and Responsibilities, SAGE Publications India Pvt Ltd, New Delhi2011

Course Name: **Project Management**

Credits: 4

Course Objectives:

The Project Management course is designed to provide students with a comprehensive understanding of project management principles and practices. The course will cover topics such as project planning, scheduling, budgeting, risk management, and leadership.

Course Outcome:

At the end of the course, the student will be able to:

Sr. No.	Course Outcome
CO1	Understand the principles and importance of project management
CO2	Apply project initiation and planning processes
CO3	Develop project schedules and budgets
CO4	Implement project risk management strategies
CO5	Apply project execution and control processes
CO6	Demonstrate effective leadership and team management skills
CO7	Evaluate project performance and implement improvements
CO8	Utilize project management tools and software
CO9	Understand ethical considerations in project management
CO10	Apply project management principles to real-world projects

Course Content:

Unit-A: Introduction to Project Management

- Definition and principles of project management
- Project life cycle and phases
- Key stakeholders and their roles
- Project management methodologies (Waterfall, Agile, Scrum)

Unit-B: Project Planning and Scheduling

- Project initiation and planning processes

- Work breakdown structure (WBS)
- Gantt charts and network diagrams
- Resource allocation and scheduling

Unit-C: Project Budgeting and Risk Management

- Project budgeting and cost estimation
- Risk identification, analysis, and response planning
- Risk monitoring and control
- Contingency planning and mitigation strategies

Unit-D: Project Execution, Control, and Leadership

- Project execution and monitoring processes
- Change management and control
- Leadership and team management in projects
- Project closure and post-project evaluation

Teaching / Assessment Methodology:

- Synchronous lectures
- Case studies and real-world project simulations
- Assignments
- Midterm exams
- Final project management plan

Grading:

- Internal assessment: 30%
- End Term Exam: 70%

Further Readings:

1. Schwalbe, K. (2018). Information Technology Project Management.
2. PMI (Project Management Institute). (2017). A Guide to the Project Management Body of Knowledge (PMBOK Guide).
3. Kerzner, H. (2017). Project Management: A Systems Approach to Planning, Scheduling, and Controlling.
4. Schwalbe, K. (2019). Agile Project Management with Scrum.
5. Heagney, J. (2016). Fundamentals of Project Management.

Course Name: **Major Project**

Credits: 8

Course Objectives:

In this course, students will undertake a comprehensive project applying their theoretical knowledge to practical scenarios. The project aims to sensitize students to real-world demands within the field of computer applications. Evaluation will emphasize the project's relevance, methodology, analysis, and presentation skills.

Course Outcomes:

At the end of the course, the student will be able to:

Sr. No.	Course Outcomes
CO 1	Develop and execute a project using established methodologies in computer applications.
CO 2	Synthesize theoretical knowledge to address practical problems in the field.
CO 3	Collect, analyze, and interpret data relevant to the project in computer applications.
CO 4	Evaluate and critically analyze existing literature and methodologies in computer science research.
CO 5	Apply computer application theories and practices to solve industry-specific problems.
CO 6	Cultivate analytical and critical thinking skills for informed decision-making in a technological context.
CO 7	Demonstrate leadership abilities in collaborative team projects within the realm of computer applications.

Project Scope:

The Research Project Work can be conducted in various settings including:

1. Software Development Firms
2. Government Institutions and Public Sector Organizations
3. International Organizations
4. Small and Medium-Sized Enterprises (SMEs)
5. Non-Governmental Organizations (NGOs)
6. Academic Institutions for specialized projects
7. Other relevant industry entities

Evaluation:

The evaluation will be conducted by a team of project guides and will focus solely on the Project Report, which accounts for 100% of the final grade.

Project Report Structure:

The report structure should encompass the following elements:

1. Executive Summary
2. Introduction to the Project
3. Literature Review
4. Methodology
5. Data Analysis
6. Findings
7. Limitations
8. Conclusions
9. Recommendations
10. Bibliography and References
11. Organizational Profile
12. Certificate from Industry Project Guide
13. Acknowledgments
14. Table of Contents
15. Table of Figures

Students must adhere to the prescribed report format to effectively communicate their semester's work, justifying the chosen project's nature and extent.

Methodology:

Students will conceive, execute, and submit a comprehensive project report on a designated topic relevant to computer applications.

Course Name: **Stock Market and Investment**

Credits: 4

Course Objectives:

The Stock Market and Investment course in the open elective category aim to provide students with a comprehensive understanding of stock markets, investment strategies, and financial decision-making. The course will cover key concepts related to stock market operations, portfolio management, risk assessment, and the role of financial instruments.

Course Outcome:

At the end of the course, the student will be able to:

Sr. No.	Course Outcome
CO1	Analyze the functioning of stock markets
CO2	Evaluate different investment instruments
CO3	Develop and manage an investment portfolio
CO4	Understand risk and return in investment
CO5	Apply fundamental and technical analysis in stock trading
CO6	Analyze the impact of economic indicators on the stock market
CO7	Demonstrate proficiency in financial decision-making
CO8	Explore ethical considerations in stock market operations
CO9	Discuss the impact of global events on financial markets
CO10	Stay informed about current trends and innovations in investment strategies

Course Content:

Unit-A: Fundamentals of Stock Markets

- Introduction to stock markets and exchanges
- Stock market participants and their roles
- Trading mechanisms and settlement procedures
- Regulatory framework and market ethics

Unit-B: Investment Instruments and Portfolio Management

- Types of investment instruments (stocks, bonds, mutual funds)
- Modern portfolio theory
- Asset allocation and diversification
- Building and managing an investment portfolio

Unit-C: Risk and Analysis in Investment

- Understanding risk and return
- Fundamental analysis of stocks
- Technical analysis and charting
- Evaluating economic indicators and their impact on investments

Unit-D: Global Perspective and Ethical Considerations

- Globalization and its impact on financial markets
- Investing in international markets
- Ethical considerations in stock market operations
- Case studies of ethical and unethical practices in finance

Teaching / Assessment Methodology:

- Synchronous lectures
- Case studies and real-world scenarios
- Assignments
- Midterm exams
- Investment simulation project

Grading:

- Internal assessment: 30%
- End Term Exam: 70%

Further Readings:

1. Bodie, Z., Kane, A., & Marcus, A. J. (2014). Investments.
2. Malkiel, B. G. (2015). A Random Walk Down Wall Street.
3. Graham, B., & Zweig, J. (2003). The Intelligent Investor.

Course Name: **Corporate Communication**

Credits: 4

Course Objectives:

This course is designed to be a conceptual work based on the application of corporate communication (CC) in mass communication. This course will help the students to comprehend the characteristics of corporate communication. Corporate communication is a set of activities involved in managing and orchestrating all internal and external communications aimed at creating favourable point of view among stakeholders on which the company depends. The course will also involve the use of PPTs and visits to corporates to demonstrate the working of corporate houses and the communication patterns.

Course Outcomes:

At the end of the course, the student should be able to:

CO1 Describe the characteristics of corporate communication
CO2 Understand the role of CC in crisis communication and disaster management
CO3 Understand building a distinct corporate identity
CO4 Understand media relations
CO5 Organize press conferences, facility visits.
CO6 Prepare press briefs

Course Content:

Unit - A:

- Defining CC, Strategic CC and management: defining strategy and its relevance in public relations and corporate communication,
- campaign planning, management and execution.

Unit - B:

- Media relations: organizing press conferences, facility visits, press briefs
- proactive and reactive media relations
- ethical aspects in media relations.

Unit - C:

- Building a distinct corporate identity: concepts, variables and process
- role of technology in CC.

Unit - D:

- Role of CC/PR in crisis communication and disaster management,
- Defining stakeholders and media selection.

Teaching / Assessment Methodology:

- Synchronous Lectures
- Lectures on LMS
- Assignments
- Quizzes
- Project Report

Grading:

Internal Assessment	30%
End Term Exams	70%

Books and Materials:

Text Books:

- Corporate Communication: Principles and Practice; Jaishri Jethwaney

Reference Books:

- Corporate Communication: A Guide to Theory and Practice; Joep P. Cornelissen

Course Name: **Artificial Intelligence**

Credits: 4

Course Objectives:

The course on Artificial Intelligence aims to introduce students to the foundational concepts, principles, and applications of AI. It covers essential AI techniques, algorithms, and their relevance in various domains.

Course Outcome:

By the end of the course, the student will be able to:

Sl. No.	Course Outcome
CO1	Understand the fundamental concepts and principles of artificial intelligence.
CO2	Analyze various AI techniques and their applications.
CO3	Apply AI algorithms for problem-solving and decision-making.
CO4	Evaluate the ethical implications of AI technologies.

Course Content:

Unit-A: Introduction to Artificial Intelligence

- Overview of artificial intelligence: definitions and history
- AI problem-solving approaches: search, reasoning, learning
- Ethics and societal impacts of artificial intelligence
- AI applications in diverse fields

Unit-B: Machine Learning Basics

- Introduction to machine learning: supervised, unsupervised, reinforcement learning
- Types of machine learning algorithms: regression, classification, clustering
- Evaluation and validation techniques in machine learning

- Feature selection and dimensionality reduction

Unit-C: Neural Networks and Deep Learning

- Basics of artificial neural networks (ANNs)
- Deep learning architectures: CNNs, RNNs, and their applications
- Training neural networks: backpropagation, optimization techniques
- Deep learning libraries and frameworks

Unit-D: AI Applications and Future Trends

- Natural Language Processing (NLP) and language understanding
- Computer vision and image recognition
- AI in robotics and autonomous systems
- Ethical considerations and future trends in AI

Teaching / Assessment Methodology:

- Lectures, discussions, and demonstrations
- Hands-on programming exercises and projects
- Case studies and presentations
- Assessments through quizzes and exams

Grading:

- Internal assessment: 30%
- End Term Exam: 70%

Further Readings:

1. Russell, S., & Norvig, P. (2021). Artificial Intelligence: A Modern Approach.
2. Goodfellow, I., Bengio, Y., & Courville, A. (2016). Deep Learning.
3. Murphy, K. P. (2012). Machine Learning: A Probabilistic Perspective.
4. Chollet, F. (2017). Deep Learning with Python.

Course Name: **Machine Learning**

Credits: 4

Course Objectives:

The course on Machine Learning aims to introduce students to the principles, algorithms, and applications of machine learning. It covers fundamental concepts, techniques, and methodologies used in machine learning.

Course Outcome:

By the end of the course, the student will be able to:

Sl. No.	Course Outcome
CO1	Understand the fundamental concepts and types of machine learning algorithms.
CO2	Implement and evaluate basic machine learning algorithms.
CO3	Apply machine learning techniques to solve real-world problems.
CO4	Analyze and interpret machine learning results.

Course Content:

Unit-A: Introduction to Machine Learning

- Basics of machine learning: definitions and applications
- Types of machine learning: supervised, unsupervised, and reinforcement learning
- Overview of machine learning frameworks and tools
- Ethical considerations in machine learning

Unit-B: Supervised Learning Algorithms

- Regression models: linear regression, logistic regression
- Classification algorithms: decision trees, k-nearest neighbors, support vector machines
- Model evaluation and selection techniques

- Ensemble learning techniques: bagging, boosting

Unit-C: Unsupervised Learning Algorithms

- Clustering techniques: k-means clustering, hierarchical clustering
- Dimensionality reduction methods: PCA (Principal Component Analysis), t-SNE (t-distributed Stochastic Neighbor Embedding)
- Association rule learning: Apriori algorithm
- Anomaly detection methods

Unit-D: Advanced Topics in Machine Learning

- Neural networks and deep learning basics
- Convolutional Neural Networks (CNNs) and their applications
- Recurrent Neural Networks (RNNs) and sequential data analysis
- Case studies and applications in various domains

Teaching / Assessment Methodology:

- Lectures, discussions, and coding sessions
- Hands-on programming assignments and projects
- Practical demonstrations using machine learning libraries
- Assessments through quizzes and exams

Grading:

- Internal assessment: 30%
- End Term Exam: 70%

Further Readings:

1. Hastie, T., Tibshirani, R., & Friedman, J. (2009). The Elements of Statistical Learning.
2. Goodfellow, I., Bengio, Y., & Courville, A. (2016). Deep Learning.
3. Murphy, K. P. (2012). Machine Learning: A Probabilistic Perspective.
4. Géron, A. (2019). Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow.

Course Name: **Deep Learning**

Credits: 4

Course Objectives:

The course on Deep Learning aims to introduce students to the principles, architectures, and applications of deep neural networks. It covers the fundamentals of deep learning, various architectures, and their use in artificial intelligence applications.

Course Outcome:

By the end of the course, the student will be able to:

Sl. No.	Course Outcome
CO1	Understand the fundamental concepts and architectures of deep neural networks.
CO2	Implement and train deep learning models using relevant tools and frameworks.
CO3	Apply deep learning algorithms in various domains.
CO4	Evaluate and optimize deep learning models for performance.

Course Content:

Unit-A: Introduction to Deep Learning

- Basics of artificial neural networks (ANNs)
- Evolution and motivation behind deep learning
- Deep learning versus traditional machine learning
- Overview of deep learning frameworks

Unit-B: Deep Neural Network Architectures

- Multilayer perceptrons (MLPs) and their training
- Convolutional neural networks (CNNs) for image data
- Recurrent neural networks (RNNs) for sequential data

- Autoencoders and generative adversarial networks (GANs)

Unit-C: Deep Learning Applications

- Image classification and object detection with CNNs
- Natural language processing (NLP) with RNNs and transformers
- Recommendation systems using deep learning
- Deep reinforcement learning in gaming and control

Unit-D: Optimization and Evaluation of Deep Models

- Optimization techniques: gradient descent, backpropagation
- Model evaluation metrics for deep learning
- Regularization and dropout techniques
- Hyperparameter tuning and model optimization

Teaching / Assessment Methodology:

- Lectures, discussions, and demonstrations
- Hands-on programming labs and exercises
- Projects involving deep learning implementations
- Assessments through quizzes and exams

Grading:

- Internal assessment: 30%
- End Term Exam: 70%

Further Readings:

1. Goodfellow, I., Bengio, Y., & Courville, A. (2016). Deep Learning.
2. Chollet, F. (2017). Deep Learning with Python.
3. Géron, A. (2019). Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow.
4. Zhang, Z., Lipton, Z. C., Li, M., & Smola, A. J. (2018). Dive into Deep Learning.

Course Name: **Introduction to Cyber Security**

Credits: 4

Course Objectives:

The course on Introduction to Cyber Security aims to provide students with foundational knowledge about cyber threats, vulnerabilities, and basic security measures. It covers essential concepts, principles, and practices in cybersecurity.

Course Outcome:

By the end of the course, the student will be able to:

Sl. No.	Course Outcome
CO1	Understand the fundamental concepts and terminologies related to cybersecurity.
CO2	Identify common cyber threats and vulnerabilities.
CO3	Apply basic security measures to safeguard systems and data.
CO4	Analyze and assess security risks in various computing environments.

Course Content:

Unit-A: Fundamentals of Cyber Security

- Introduction to cybersecurity: concepts and terminologies
- Brief history of cybersecurity and its evolution
- Key objectives and principles of cybersecurity
- Ethical and legal aspects of cybersecurity

Unit-B: Cyber Threats and Attack Vectors

- Types of cyber threats: malware, phishing, social engineering
- Common attack vectors: vulnerabilities and exploits
- Understanding cyber-attacks and their impacts
- Incident response and handling basics

Unit-C: Basic Security Measures

- Overview of security controls: preventive, detective, and corrective
- Access control mechanisms: authentication and authorization
- Introduction to encryption and cryptography
- Network security fundamentals: firewalls, VPNs, and secure protocols

Unit-D: Risk Assessment and Management

- Basics of risk assessment in cybersecurity
- Identifying and prioritizing security risks
- Mitigation strategies and risk management frameworks
- Case studies on cybersecurity incidents and their resolutions

Teaching / Assessment Methodology:

- Lectures, discussions, and case studies
- Practical exercises and simulations
- Hands-on security tool demonstrations
- Assessments through quizzes and exams

Grading:

- Internal assessment: 30%
- End Term Exam: 70%

Further Readings:

1. NIST Special Publication 800-12 Revision 1 (https://csrc.nist.gov/publications/detail/sp/800-12/rev-1/final)
2. Schneier, B. (2015). Secrets and Lies: Digital Security in a Networked World.
3. Easttom, C. (2018). Computer Security Fundamentals.
4. Rada, R. (2017). Cyber Security Basics: Protect Your Organization by Applying the Fundamentals.

Course Name: **Biometric Security**

Credits: 4

Course Objectives:

The course on Biometric Security aims to introduce students to the principles, technologies, and applications of biometrics in cybersecurity. It covers various biometric modalities, authentication methods, and their significance in secure systems.

Course Outcome:

By the end of the course, the student will be able to:

Sl. No.	Course Outcome
CO1	Understand the fundamental concepts and types of biometric systems.
CO2	Analyze different biometric modalities and their applications.
CO3	Evaluate the strengths and limitations of biometric authentication methods.
CO4	Apply biometric technologies in designing secure systems.

Course Content:

Unit-A: Introduction to Biometrics

- Basics of biometric security: definitions and concepts
- Evolution and history of biometric authentication
- Biometric traits: physiological and behavioral characteristics
- Importance of biometrics in cybersecurity

Unit-B: Biometric Modalities

- Overview of different biometric modalities: fingerprint, iris, face, voice, etc.
- Biometric data acquisition and processing techniques
- Biometric templates and feature extraction methods
- Multimodal biometrics and fusion techniques

Unit-C: Biometric Authentication and Systems

- Principles of biometric authentication
- Biometric system architecture and components

- Performance evaluation metrics in biometric systems
- Vulnerabilities and attacks on biometric systems

Unit-D: Applications and Future Trends

- Real-world applications of biometric security: access control, forensics, etc.
- Privacy and ethical concerns in biometric data usage
- Emerging trends and advancements in biometric technologies
- Case studies on successful biometric implementations

Teaching / Assessment Methodology:

- Lectures, discussions, and demonstrations
- Hands-on biometric system setups and experiments
- Case studies and projects
- Assessments through quizzes and exams

Grading:

- Internal assessment: 30%
- End Term Exam: 70%

Further Readings:

1. Jain, A. K., Ross, A., & Nandakumar, K. (2016). Introduction to Biometrics.
2. Wayman, J. L., Jain, A. K., & Maltoni, D. (2005). Biometric Systems: Technology, Design, and Performance Evaluation.
3. Ratha, N. K., Connell, J. H., & Bolle, R. M. (2001). An Introduction to Biometric Authentication Systems.
4. Ross, A., Jain, A. K., & Nandakumar, K. (2019). Handbook of Biometrics.

Course Name: **Ethical Hacking**

Credits: 4

Course Objectives:

The course on Ethical Hacking aims to provide students with an understanding of ethical hacking principles, methodologies, and techniques used to identify and resolve security vulnerabilities. It covers the ethical aspects of hacking, penetration testing, and security assessment.

Course Outcome:

By the end of the course, the student will be able to:

Sl. No.	Course Outcome
CO1	Understand the fundamental concepts and principles of ethical hacking.
CO2	Employ various hacking techniques for vulnerability assessment and testing.
CO3	Identify and assess security risks in computer systems and networks.
CO4	Apply ethical hacking methodologies for securing systems.

Course Content:

Unit-A: Introduction to Ethical Hacking

- Definitions and concepts of ethical hacking
- The difference between ethical and illegal hacking
- Ethical hacker roles and responsibilities
- Legal and ethical aspects of hacking

Unit-B: Information Gathering and Footprinting

- Reconnaissance and footprinting techniques
- Scanning networks and discovering vulnerabilities
- Enumeration techniques for system information gathering
- Tools and methodologies for information gathering

Unit-C: Vulnerability Assessment and Exploitation

- Vulnerability assessment tools and techniques

- Exploiting system and network vulnerabilities
- Social engineering attacks and mitigation strategies
- Penetration testing methodologies

Unit-D: Ethical Hacking in Practice

- Assessing web application security
- Wireless network security testing
- Incident handling and response in ethical hacking
- Case studies and real-world ethical hacking scenarios

Teaching / Assessment Methodology:

- Lectures, discussions, and demonstrations
- Hands-on lab sessions and practical exercises
- Scenario-based hacking simulations
- Assessments through quizzes and exams

Grading:

- Internal assessment: 30%
- End Term Exam: 70%

Further Readings:

1. Engebretson, P. (2016). The Basics of Hacking and Penetration Testing.
2. Oriyano, S. (2018). Ethical Hacking and Penetration Testing Guide.
3. Simpson, R. (2017). Cybersecurity: Ethics, Strategy, and Tactics.
4. EC-Council. (2018). Certified Ethical Hacker (CEH) v10 Study Guide.

Course Name: **Data Handling and Visualization**

Credits: 4

Course Objectives:

The course on Data Handling and Visualization is designed to equip students with fundamental skills in managing and visualizing data. It covers techniques for data handling, manipulation, exploration, and effective visualization methods essential for data-driven decision-making.

Course Outcome:

By the end of the course, the student will be able to:

Sl. No.	Course Outcome
CO1	Understand the principles and techniques of data handling and manipulation.
CO2	Apply various data structures and algorithms for efficient data processing.
CO3	Visualize data effectively using appropriate tools and techniques.
CO4	Analyze and interpret visualized data for meaningful insights.

Course Content:

Unit-A: Introduction to Data Handling

- Introduction to data types and structures
- Data collection and storage methods
- Data preprocessing and cleaning techniques
- Exploratory data analysis (EDA) methods

Unit-B: Data Manipulation Techniques

- Data manipulation using libraries such as Pandas in Python
- Data transformation and feature engineering
- Handling missing data and outliers
- Data aggregation and summarization techniques

Unit-C: Data Visualization Tools and Techniques

- Principles of data visualization

- Introduction to data visualization libraries like Matplotlib, Seaborn, and Plotly
- Plotting graphs, charts, and maps
- Interactive data visualization tools and dashboards

Unit-D: Interpretation and Application of Visualized Data

- Best practices in data visualization
- Interpreting visualized data for insights
- Communicating findings through visualized data
- Case studies and projects on real-world data visualization

Teaching / Assessment Methodology:

- Lectures and practical sessions
- Hands-on exercises and coding practices
- Projects and assignments
- Data visualization tool workshops
- Assessments through quizzes and exams

Grading:

- Internal assessment: 30%
- End Term Exam: 70%

Further Readings:

1. McKinney, W. (2018). Python for Data Analysis.
2. VanderPlas, J. (2017). Python Data Science Handbook.
3. Cairo, A. (2016). The Truthful Art: Data, Charts, and Maps for Communication.
4. Healy, K. (2019). Data Visualization: A Practical Introduction.

Course Name: **Information Security and Privacy**

Credits: 4

Course Objectives:

The course on Information Security and Privacy aims to provide students with foundational knowledge and practices concerning information security and privacy concerns. It covers essential concepts, methodologies, and technologies to safeguard data and systems.

Course Outcome:

By the end of the course, the student will be able to:

Sl. No.	Course Outcome
CO1	Understand the fundamentals of information security and privacy.
CO2	Analyze potential vulnerabilities and threats to information systems.
CO3	Implement security measures to protect data and systems.
CO4	Apply privacy protection techniques in various data environments.

Course Content:

Unit-A: Introduction to Information Security

- Fundamentals of information security
- Types of security threats: cyber threats, social engineering, malware
- Security policies and compliance
- Risk assessment and management in information security

Unit-B: Cybersecurity Measures and Technologies

- Cryptography and encryption techniques
- Network security: firewalls, IDS/IPS
- Secure software development practices
- Endpoint security and access control

Unit-C: Data Privacy Protection

- Privacy laws and regulations (e.g., GDPR, CCPA)
- Privacy-enhancing technologies

- Anonymization and de-identification techniques
- Privacy-preserving data mining and analysis

Unit-D: Implementation and Management of Security Measures

- Incident response and management
- Security auditing and compliance
- Ethical and legal considerations in information security
- Case studies on security breaches and their impact

Teaching / Assessment Methodology:

- Lectures and discussions
- Hands-on exercises and simulations
- Case studies and group projects
- Practical demonstrations of security tools
- Assessments through quizzes and exams

Grading:

- Internal assessment: 30%
- End Term Exam: 70%

Further Readings:

1. Schneier, B. (2015). Applied Cryptography: Protocols, Algorithms, and Source Code in C.
2. Ross, S. (2019). NIST Cybersecurity Framework: A Pocket Guide.
3. Cavoukian, A., & Jonas, J. (2013). Privacy by Design: The 7 Foundational Principles.
4. Anderson, R. (2015). Security Engineering: A Guide to Building Dependable Distributed Systems.

Course Name: **Computing for Data Science**

Credits: 4

Course Objectives:

The course on Computing for Data Science is designed to equip students with the fundamental computational concepts and programming skills essential for data science. It covers key programming languages, data structures, and algorithms used in data analysis and manipulation.

Course Outcome:

By the end of the course, the student will be able to:

Sl. No.	Course Outcome
CO1	Understand the core concepts of programming languages used in data science.
CO2	Implement data structures and algorithms for efficient data handling.
CO3	Apply computational techniques for data manipulation and analysis.
CO4	Develop basic data-driven applications using programming languages.

Course Content:

Unit-A: Introduction to Programming for Data Science

- Overview of programming languages for data science (Python, R, SQL)
- Basics of Python programming: syntax, data types, loops, and functions
- Data manipulation libraries in Python (NumPy, Pandas)
- Introduction to R programming and SQL for data retrieval

Unit-B: Data Structures and Algorithms

- Understanding data structures: arrays, lists, stacks, queues, trees
- Introduction to algorithms for sorting, searching, and data processing
- Implementation of data structures and algorithms in Python
- Algorithmic complexity and optimization techniques

Unit-C: Data Handling and Processing

- File handling and input/output operations in Python

- Data preprocessing techniques: cleaning, transformation, and normalization
- Introduction to data visualization libraries (Matplotlib, Seaborn)
- Exploratory data analysis (EDA) using Python and R

Unit-D: Developing Data-Driven Applications

- Basics of web scraping and data extraction
- Building simple data-driven applications using Python or R
- Case studies on data-driven applications in various domains
- Ethical considerations in data collection and application development

Teaching / Assessment Methodology:

- Lectures, demonstrations, and coding exercises
- Hands-on programming assignments and projects
- Practical sessions and lab exercises
- Assessments through quizzes and exams

Grading:

- Internal assessment: 30%
- End Term Exam: 70%

Further Readings:

1. McKinney, W. (2018). Python for Data Analysis.
2. Grolemund, G., & Wickham, H. (2017). R for Data Science.
3. Lutz, M. (2013). Learning Python.
4. Cormen, T. H., Leiserson, C. E., Rivest, R. L., & Stein, C. (2009). Introduction to Algorithms.