FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

of

Bachelor of Computer Applications

(Semester III-IV)

(Under Credit Based Continuous Evaluation Grading System)

Batch: 2023-26
Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA JALANDHAR (Autonomous)

PROGRAMME SPECIFIC OUTCOMES

Bachelor of Computer Applications
(Session 2024-25)

Program Specific Outcomes

PSO1: Apply skills for development of software and websites for providing efficient solution to IT based problems

PSO2: Comprehend development process in IT industry through ethical, defined and innovative techniques.

PS03: Achieve leadership role and team player role to be able to work in multidisciplinary areas at various job roles.

PSO4: Identify and demonstrate the implementation of various tools and technologies involved in the field of Information Technology.

PSO5: Demonstrate proficiency in the field of Programming, Web development and IT enabled services.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Computer Applications

Credit Based Continuous Evaluation Grading System (CBCEGS)

Session 2024-25

Bachelor of Computer Applications Semester - III										
Course Code	**Course Title**	**Course Type**	**Hours per week**	**Credit**		**Marks**				**Examination Time (in Hours)**
			L-T-P	**L-T-P**	**Total**	**Total**	**Ext.**		**CA**	
							L	**P**		
BCAL-3111	Foundation of Data Science	C	4-0-0	4-0-0	4	100	80	-	20	3
BCAL-3112	Advanced Database Management System	C	4-0-0	4-0-0	4	100	80	-	20	3
BCAL-3113	Computational Problem Solving	C	4-0-0	4-0-0	4	100	80	-	20	3
BCAL-3114	Numerical Methods and Statistical Techniques	C	4-0-0	4-0-0	4	100	80	-	20	3
BCAP-3115	Lab on Computational Problem Solving	C	0-0-4	0-0-2	2	50	-	40	10	3
BCAP-3116	Lab on Advanced Database Management System	C	0-0-4	0-0-2	2	50	-	40	10	3
AECE - 3221	* Environmental Studies (Compulsory)	AC	1-0-2	1-0-1	2	50	30	10	10	3
SECP - 3512	* Personality Development	AC	2-0-0	2-0-0	2	50	40	-	10	3
	Total				24	600				

Note:

C - Compulsory

AC - Audit Course

*** Marks of these courses will not be added in total marks and only grades will be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

Bachelor of Computer Applications

Credit Based Continuous Evaluation Grading System (CBCEGS)

Session 2024-25

Bachelor of Computer Applications Semester- IV										
Course Code	**Course Title**	**Course Type**	**Hours per week**	**Credit**		**Marks**				**Examination Time (in Hours)**
			L-T-P	**L-T-P**	**Total**	**Total**	**Ext.**		**CA**	
							L	**P**		
BCAL-4111	Data Structures	C	4-0-0	4-0-0	4	100	80	-	20	3
BCAL-4112	Information Systems	C	4-0-0	4-0-0	4	100	80	-	20	3
BCAL-4113	Internet Applications	C	4-0-0	4-0-0	4	100	80	-	20	3
BCAL-4114	Applied and Discrete Mathematics	C	4-0-0	4-0-0	4	100	80	-	20	3
BCAP-4115	Lab on Data Structures	C	0-0-4	0-0-2	2	50	-	40	10	3
BCAP-4116	Lab on Internet Applications	C	0-0-4	0-0-2	2	50	-	40	10	3
SECS- 4522	* Social Outreach	AC	2-0-0	2-0-0	2	50	-	40	10	1
	Total				22	550				

Note:

C - Compulsory

AC - Audit Course

*** Marks of these courses will not be added in total marks and only grades will be provided.**

Bachelor of Computer Applications Semester – III
(Session 2024-25)
COURSE CODE: BCAL-3111
FOUNDATION OF DATA SCIENCE

Course Outcomes:

After passing course the student will be able to:

CO1: Comprehend basic concepts of Data Science along with its components and process.

CO2: Interpret various data collection tools.

CO3: Analyze different application areas and challenges of data science.

CO4: Work with Power BI for visualization of data.

Bachelor of Computer Applications Semester – III
(Session 2024-25)
COURSE CODE: BCAL-3111
FOUNDATION OF DATA SCIENCE

L-T-P: 4-0-0 **Max. Marks: 100**
Credits: 4 **Theory: 80**
Examination Time: 3 Hours. **CA: 20**

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Introduction to Data Science: Meaning, Evolution, Need and Components of Data Science, Data Science Process. Difference between Data Science and Business Intelligence.

Understanding Data Analytics: Need, Characteristics – Four Vs.

UNIT- II

Data Collection: Data Collection sources, Data collection methods – Primary data collection methods – Interviews, Questionnaires and Secondary data collection methods. Data collection Tools – online and offline.

Types of Data Analytics: Descriptive. Predictive, Diagnostic, Prescriptive.

UNIT-III

Domain Data Analysis: Exploratory and Confirmatory data analysis

Application Areas and Challenges in Data Science. Technical Skills of a data Analyst.

Job Roles in Data Science.

UNIT-IV

Data Storytelling: Benefits and Best Practices, data visualization.

Introduction to Power BI: Need, Features, Components, Architecture and Services. Creating a Sample dashboard.

References / Textbooks:

1. Qurban A Memon, Shakeel Ahmed, Data Science: Theory, Analysis and Applications, CRC Press (2019), 1st edition.
2. Ulrika Jagare, Data Science for Dummies, Wiley (2019)
3. Joel Grus, Data Science from Scratch, O'Reilly (2015), 1st Edition
4. Pulkit Bansal, Data Science Uncovering the Reality, Notion Press (2020), 1st Edition
5. Davy Cielen, Arno D.B.Meysman, Mohamed Ali, Introducing Data Science: Big Data, Machine Learning, Dreamtech Press (2016)
6. Roger Peng, Elizabeth Matsui, The Art of Data Science, Lulu.com (2016)
7. Ramesh Sharda, DursunDelen and Efraim Turban, Business Intelligence, Analytics and Data Science: A Managerial Perspective, Pearson Education (2019), 4th Edition
8. Reza Rad, Basics of Power BI Modeling, Radacad Publications (September (2020)), Ist Edition
9. Reza Rad, Leila Etaati, Getting started with Power Query in Power BI and Excel, Radacad Publishers, Edition One.

Bachelor of Computer Applications Semester – III
(Session 2024-25)
COURSE CODE: BCAL–3112
ADVANCED DATABASE MANAGEMENT SYSTEM

Course Outcomes:
After passing course the student will be able to:

CO1: Gain knowledge of transaction management and Concurrency control.

CO2: Create, manage and access database using PL/SQL.

CO3: Create and manage database using NoSQL

CO4: Comprehend the implementation of queries using MongoDB

Bachelor of Computer Applications Semester – III
(Session 2024-25)
COURSE CODE: BCAL–3112
ADVANCED DATABASE MANAGEMENT SYSTEM

L-T-P: 4-0-0 **Max. Marks: 100**
Credits: 4 **Theory: 80**
Examination Time: 3 Hours. **CA: 20**

Instructions for Paper Setter -

Eight questions of equal marks (16 Marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

SQL: Join methods & sub query, Union, Intersection, Minus, Indexes, Views.

Transaction Management-ACID Properties, Concurrency Control, Security amongst users.

UNIT-II

PL/SQL: Introduction, advantages and limitations, block structure, constant and variables, input and output, control statements, data-types. Triggers, functions and procedures, cursors, packages, exceptions.

Big Data: Meaning, Characteristics, Benefits, CAP Theorem

UNIT III

NoSQL: Overview, Need of NoSQL, Structured Data Vs. Unstructured Data, Types of Database in NoSQL, Features of NoSQL, Advantages of NoSQL, Eventual Consistency, ACID vs BASE Properties.

MongoDB: Overview, Install MongoDB server, Environment, Create Database, Data Model, Collection (Creation and Deletion), Data types in MongoDB, CRUD: Create, Update, Delete And Query Database.

UNIT IV

SQL to MongoDB Mapping, Projection. Sorting, Limiting and Counting records. Indexes in MongoDB: Creation of Index, Options, Dropping and fetching of Index. Analyze Query performance, Plan and Profiler. MongoDB Aggregation Query: Aggregate Framework (sum, avg, min, max, push, first, etc). Replication and Sharding, MapReduce Function. Creating database backup.

Reference/ Textbooks:

1. C.J. Date, An Introduction to Database Systems, Pearson Education 2000.
2. H. F. Korth&Silverschatz, A., Database System Concepts, Tata McGraw Hill, 2010.
3. Elmasri&Navathe, Fundamentals of Database Systems, Addison-Wesley, 2011.
4. Hoffer, Prescott, Mcfadden, Modern Database Management, Paperback International, 2012.
5. Adam Fowler, "NoSQL For Dummies", Wiley, First Edition, 2015.
6. Gerardus Blokdyk, "NoSQL A Complete Guide", 5STARCooks, Second Edition, 2021.

Note: The latest editions of the books should be followed.

Bachelor of Computer Applications Semester – III
(Session 2024-25)
COURSE CODE: BCAL–3113
COMPUTATIONAL PROBLEM SOLVING

Course Outcomes:

After passing course the student will be able to:

CO1: Comprehend basics of Python programming like operators, data types, control structures, etc.

CO2: Apply list and directories for handling and accessing data through iterations.

CO3: Implement various built-in and user defined function to solve mathematical problems.

CO4: Comprehend Object Oriented Programming and modules in Python.

Bachelor of Computer Applications Semester – III
(Session 2024-25)
COURSE CODE: BCAL–3113
COMPUTATIONAL PROBLEM SOLVING

L-T-P: 4-0-0 **Max. Marks: 100**
Credits: 4 **Theory: 80**
Examination Time: 3 Hours. **CA: 20**

Instructions for Paper Setter -

Eight questions of equal marks (16 Marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Introduction to Python: Process of Computational Problem Solving, Python Programming Language

Data and Expressions: Literals, Variables and Identifiers, Operators, Expressions, Statements and Data Types

Control Structures: Boolean Expressions (Conditions), Logical Operators, Selection Control, Nested conditions, Debugging

UNIT-II

Lists: List Structures, Lists (Sequences) in Python, Iterating Over Lists (Sequences) in Python
Dictionaries: Dictionaries and Files, Looping and dictionaries, advanced text parsing
Iteration: While statement, definite loops using For, Loop Patterns, Recursive Functions, Recursive Problem Solving, Iteration vs. Recursion

UNIT-III

Functions: Fundamental Concepts, Program Routines, Flow of Execution, Parameters & Arguments
Files: Opening Files, Using Text Files, String Processing, Exception Handling

UNIT-IV

Objects and Their Use: Introduction to Object Oriented Programming
Modular Design: Modules, Top-Down Design, Python Modules
Using Databases and SQL: Database Concepts, SQLite Manager Firefox Add-on, SQL basics summary, basic Data Modeling, Programming with multiple tables.

References/Textbooks:

1. Charles Severance, Python for Informatics, Version 0.0.7.
2. Charles Dierbach, Introduction to Computer Science Using Python: A Computational Problem-SolvingFocus, Wiley Publications, 2012.
3. Guttag John V, Introduction To Computation And Programming Using Python, PHI, 2014.
4. Jeeva Jose and Sojan P. Lal, Introduction to Computating& Problem Solving Through Python, Khanna Publishers, 2015.
5. Mark J. Guzdial, Introduction to Computing and Programming in Python, PearsonEducation, 2015.
6. Kenneth Lambert, Fundamentals of Python, Course Technology, Cengage Learning, 2015
7. Mark Lutz, Learning Python, O'Reilly Media, 2013

Note: The latest editions of the books should be followed.

Bachelor of Computer Applications Semester – III
(Session 2024-25)
COURSE CODE: BCAL–3114
NUMERICAL METHODS AND STATISTICAL TECHNIQUES

L-T-P: 4-0-0
Credits: 4
Examination Time: 3 Hours.

Max. Marks: 100
Theory: 80
CA: 20

Course Outcomes:
After the completion of this course, the student will be able to:

CO1: Solve non-linear and linear equations using different methods.

CO2: Comprehend interpolation and numerical integration.

CO3: Calculate different means and deviations using statistical techniques.

CO4: Comprehend correlation, curve fitting and regression for finding solutions to various statistical problems

Bachelor of Computer Applications Semester – III
(Session 2024-25)
COURSE CODE: BCAL–3114
NUMERICAL METHODS AND STATISTICAL TECHNIQUES

L-T-P: 4-0-0
Credits: 4
Examination Time: 3 Hours.

Max. Marks: 100
Theory: 80
CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section. Students can use non-storage and non-programmable scientific calculator.

UNIT-I

Introduction: Numerical Methods, Numerical methods versus numerical analysis, Types of Error, Errors and Measures of Errors.
Non–linear Equations: Bisection Method and Newton Raphson's Method
Linear Equations: Gauss Elimination Method, Gauss Jordan Method.

UNIT-II

Interpolation: Newton's Methods: Forward Difference Method, Backward Difference Method, and Divided Difference Method.
Numerical Integration: Trapezoidal Rule, Simpson's 1/3 method and Simpson's 3/8 Method

UNIT-III

Statistical Techniques:
Measure of Central Tendency: Arithmetic mean, Median, Mode.
Measures of dispersion: Range, Quartile Deviation, Mean deviation, Standard deviation, Co–efficient of variation.

UNIT –IV

Correlation: Introduction, Karl Pearson's Coefficient of Correlation, Rank Correlation method
Regression: Regression line and regression equations, Regression Coefficient
Non Linear Curve Fitting: Fit a quadratic or polynomial equation, Fit an exponential curve,

References / Textbooks:

1. Amrinder Pal Sngh, Jaspal Singh, Anshuman Sharma, Fundamentals Of Numerical Methods And Statistical Techniques, Lakhanpal Publishers, 4th edition.
2. Kandasamy P.& et AI., Numerical Methods, S. Chand & Company (2006), Reprint Edn. 2006 Edition.
3. B.S. Grewal, Numerical Methods in Engineering & Science, Khanna Publishers (2013), 11th Edition.
4. E. Balagurusamy, Numerical Methods, Tata McGraw Hill Education (2017)
5. H.S.G. Rao, Numerical Methods, IK International Publishing House (2011)
6. S.S. Sastry, Introductory methods of Numerical Analysis, PHI (2012), 5th Edition

Bachelor of Computer Applications Semester – III
(Session 2024-25)
COURSE CODE: BCAP–3115
LAB ON COMPUTATIONAL PROBLEM SOLVING

L-T-P: 0-0-2
Credits: 2

Max. Marks: 50
Practical: 40
CA: 10

Lab based on Computational Problem Solving**.**

Bachelor of Computer Applications Semester – III
(Session 2024-25)
COURSE CODE: BCAP–3116
LAB ON ADVANCED DATABASE MANAGEMENT SYSTEM

L-T-P: 0-0-2
Credits: 2

Max. Marks: 50
Practical: 40
CA: 10

Lab based on Database Management System-II.

Bachelor of Computer Applications Semester – III
(Session 2024-25)
COURSE CODE: AECE-3221
ENVIRONMENTAL STUDIES (COMPULSORY)
(Theory)

Time: 3 Hrs. **Max. Marks: 50**
Credit: 1-0-1 **Theory: 30**
Practical: 10
CA: 10

Instructions for the Paper Setter:

The question paper should carry 30 marks. The structure of the question paper being:

Part-A: Attempt any five questions out of seven. Each question carries 2 marks. Answer to each question should not exceed 1 page

Part-B, Essay type with inbuilt choice – 20 marks

Attempt any five questions out of eight. Each question carries 4 marks. Answer to each question should not exceed 3 pages.

Unit I

The multidisciplinary nature of environmental studies

Definition, scope and importance, Need for public awareness

Unit II

Natural Resources: Renewable and non-renewable resources

Natural resources and associated problems.

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

(b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflictsover water, dams-benefits and problems.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineralresources, case studies.

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

(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use ofalternate energy sources, case studies.

(f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion anddesertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

Unit III

Ecosystems

- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession
- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems(ponds, streams, lakes, rivers, ocean estuaries)

Unit IV

Biodiversity and its conservation

- Introduction – Definition: genetic, species and ecosystem diversity
- Biogeographical classification of India
- Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and optionvalues
- Biodiversity at global, national and local levels
- India as a mega-diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

Unit V

Environmental Pollution

Definition

- Causes, effects and control measures of Air pollution, Water pollution, Soil pollution , Marine pollution, Noise pollution, Thermal pollution, Nuclear pollution

- Solid waste management: Causes, effects and control measures of urban and industrialwastes.
- Role of an individual in prevention of pollution
- Pollution case studies
- Disaster management: floods, earthquake, cyclone and landslides

Unit VI

Social Issues and the Environment

- From unsustainable to sustainable development
- Urban problems and related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Environmental ethics: Issues and possible solutions
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents andholocaust. Case studies.
- Wasteland reclamation
- Consumerism and waste products
- Environmental Protection Act, 1986
- Air (Prevention and Control of Pollution) Act, 1981
- Water (Prevention and control of Pollution) Act, 1974
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness

Unit VII

Human Population and the Environment

- Population growth, variation among nations
- Population explosion – Family Welfare Programmes
- Environment and human health
- Human Rights
- Value Education
- HIV / AIDS
- Women and Child Welfare
- Role of Information Technology in Environment and Human Health
- Case Studies

Unit VIII

Field Work

- Visit to a local area to document environmental assets river/forest/grassland/hill/mountain
- Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
- Study of common plants, insects, birds
- Study of simple ecosystems-pond, river, hill slopes, etc

References:

1. Bharucha, E. 2005. Textbook of Environmental Studies, Universities Press, Hyderabad.
2. Down to Earth, Centre for Science and Environment, New Delhi.
3. Heywood, V.H. & Waston, R.T. 1995. Global Biodiversity Assessment, Cambridge House,Delhi.
4. Joseph, K. & Nagendran, R. 2004. Essentials of Environmental Studies, Pearson Education(Singapore) Pte. Ltd., Delhi.
5. Kaushik, A. & Kaushik, C.P. 2004. Perspective in Environmental Studies, New Age International (P) Ltd, New Delhi.
6. Rajagopalan, R. 2011. Environmental Studies from Crisis to Cure. Oxford University Press,New Delhi.
7. Sharma, J. P., Sharma. N.K. & Yadav, N.S. 2005. Comprehensive Environmental Studies,Laxmi Publications, New Delhi.
8. Sharma, P. D. 2009. Ecology and Environment, Rastogi Publications, Meerut
9. State of India's Environment 2018 by Centre for Sciences and Environment, New Delhi
10. Subramanian, V. 2002. A Text Book in Environmental Sciences, Narosa Publishing House,New Delhi

Bachelor of Computer Applications Semester – III
(Session 2024-25)
COURSE CODE: SECP - 3512
PERSONALITY DEVELOPMENT

Course Title: Personality Development
Course intended for: Semester III students of Under Graduate Program
Course credits: 2 (For Credit based Continuous Evaluation Grading System)
Course Code: SECP-3512

PURPOSE
To enhance holistic development of students and improve their employability skills.

INSTRUCTIONAL OBJECTIVES
- To re-engineer attitude and understand its influence on behavior.
- To develop inter-personal skills and be an effective goal-oriented team player.
- To develop communication and problem solving skills.
- To develop professionals with idealistic, practical and moral values.

LEARNING OUTCOMES
- On completion of the course, students will be able to hone their personality by
- Realisation of the importance and incorporation of positive thinking and attitude in life
- Enhancement of self-confidence and analysis of self-capabilities
- Learning the different communication skills for self-expression
- Effective use of time to combat stress and increase in productivity
- Enhancing personality by physical grooming and fitness
- Understanding the role of design principles and appropriateness of apparel
- Incorporating social etiquettes in daily life and conduct
- Excelling in decision making and leadership qualities

CURRICULUM

Course Credits-2 **Total Contact Hours-30**

MODULE	TITLE	HOURS
1.	Positive Thinking & Attitude	2
2.	Self-Analysis & Self Confidence	2
3.	Communication Skills	10
	• Basic Communication Skills • Body Language • Interview Skills • Résumé Writing • Group Discussion • Telephone and E-mail etiquette • Public Speaking	
4.	Time Management	2
5.	Stress and Conflict Management	2

6.	Physical Fitness and Personal Grooming	2
7.	Appropriateness of Apparel	2
8.	Social Etiquette	2
9.	Decision Making process & Problem Solving Skills • Leadership Skills • Goal Setting • Motivation	5
10.	Closure	1

EXAMINATION

1. Total marks of the course will be 50 (Final Examination: 40 Marks; Internal Assessment: 10Marks)
2. The pattern of the final examination will be multiple choice questions. 25 multiple choice type questions will be set. The student shall attempt 20 questions. Each question will carry 2 mark (20 X 2 = 40). Total time allotted will be 1 hour.
3. Internal Assessment will consist of Attendance: 5 Marks, Internal: 5 Marks.(Total Internal Assessment:10 Marks)

SYLLABUS

MODULE 1: Positive Thinking & Attitude

- Factors Influencing Attitude
- Essentials to develop Positive Attitude
- Challenges & lessons from Attitude

MODULE 2: Self Analysis & Self Confidence

- Who am I
- Importance of Self Confidence
- SWOT Analysis

MODULE 3: Communication Skills

(i) Basic Communication Skills

- Speaking skills
- Listening skills
- Presentation skills

(ii) Body Language

- Forms of Non-Verbal Communication
- Interpreting body language clues
- Effective use of body language

(iii) Interview Skills

- Type of Interviews
- Ensuring success in job interviews
- Appropriate use of Non-verbal Communication

(iv) Résumé Writing

- Features
- Different types of résumé for Different posts

(v) Group Discussion

- Difference between Group discussion and debate
- Importance of Group Discussion
- Group Decision
- Ensuring success in group discussions

(vi) Telephone & E-mail Etiquette

- Telephone etiquette
- E-mail etiquette

(vii) Public Speaking

- Introductory speech
- Informative speech
- Persuasive speech
- Extempore session

MODULE 4: Time Management

- Importance of time management
- Values & beliefs
- Goals and benchmarks – The ladders of success
- Managing projects and commitments
- Prioritizing your To-do's
- Getting the results you need

MODULE 5: Stress & Conflict Management

- Introduction to stress
- Types of stressors
- Small changes and large rewards
- Stress prevention
- Overcoming unhealthy worry
- Stress at home and workplace
- Dealing with frustration and anger
- Stress reducing exercises
- Understanding conflicts
- Violent and Non-violent conflicts
- Source of conflict
- Structural and cultural violence

MODULE 6: Physical Fitness and Personal Grooming

- Fitness and exercise
- Balanced & healthy diet
- Skin care & Hair care
- Make-up skills

MODULE 7: Appropriateness of Apparel

- Apparel & Personality
- Psycho-social aspects of apparel
- Style-tips for smart dressing & effective use of design elements

MODULE 8: Social Etiquette

- Civic Sense
- Workplace skills
- Meeting and greeting people
- Table Setting and table manners

MODULE 9: Decision Making Process and Problem Solving Skills

- Anatomy of a decision
- How to use problem solving steps and problem solving tools
- How to distinguish root causes from symptoms to identify right solution for right problems
- How to improve problem solving and decision making by identifying individual problem solving styles
- The creative process for making decisions
- Tools to improve creativity
- Implementing the decision – Wrap up

(i) Leadership Skills

- Handling peer pressure and bullies
- Team work
- Decision making
- Taking initiatives

(ii) Goal Setting

- Wish list
- SMART goals
- Blueprint for success
- Short-term, Long-term, Life-term Goals

(iii) Motivation

- Factors of motivation
- Self talk
- Intrinsic & extrinsic motivators

Books Recommended

1. Rossi, P. (2011). *Everyday Etiquette: How to navigate 101 common and uncommon social situations*. St Martins Pr.
2. Pietrzak, T.,& Fraum, M. (2005). *Building career success skills*. ASTD Press.
3. Treffinger, D.J., Isaksen, S.G., & Brian, K. (2005). *Creative problem solving: An Introduction*.
4. Carr, A. (2004). *Positive Psychology: The science of happiness and human strengths*. Burnner-Routlrdge.
5. Oberg, B.C. (1994). *Speech craft: An Introduction to public speaking*. Meriwether Publishing.

Bachelor of Computer Applications Semester – IV
(Session 2024-25)
COURSE CODE: BCAL–4111
DATA STRUCTURES

Course Outcomes:

After passing course the student will be able to:

CO1: Analyze complexity of algorithms to determine their efficiency.

CO2: Comprehend various hashing method, sorting and searching algorithms.

CO3: Comprehend various operations of stack and queue along with different scenarios.

CO4: Comprehend advanced data structures such as tree and graph.

Bachelor of Computer Applications Semester – IV
(Session 2024-25)
COURSE CODE: BCAL–4111
DATA STRUCTURES

L-T-P: 4-0-0
Credits: 4
Examination Time: 3 Hours.

Max. Marks: 100
Theory: 80
CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Data Structure: Introduction, Common Operations on Data Structures, Algorithm Complexity, Big O Notation, Time – Space tradeoff between Algorithms.

Arrays: Array Defined, Representing Arrays in Memory, Operations, Bubble Sort, Linear Search, Binary Search and Multidimensional Arrays.

UNIT-II

Hashing: Hash Functions: Division Method, Mid-Square Method & Folding Method and Collision Resolution methods.

Linked Lists: Types of Linked Lists, Representing Linked Lists in Memory, Advantages of using Linked Lists over Arrays, Various Operations on Linked Lists.

UNIT-III

Stacks: Description of STACK structure, Implementation of Stack in memory, Applications of Stacks – Converting Arithmetic expression from infix notation to reverse polish and their subsequent evaluation and Quicksort method.

Queues: Description of queue structure, Implementation of queue in memory, Description of priorities of queues, Dequeues.

UNIT-IV

Trees: Description of Tree Structure and its Terminology, Binary Trees and Binary Search Trees and their representation in Memory and Heapsort.

Graphs: Description of Graph Structure, Implement Graphs in Memory using Adjacency Matrix, PathMatrix and Graph traversal techniques - DFS, BFS.

References / Textbooks:

1. Seymour Lipschutz, Data Structures with C (Schaum's Outline Series), McGraw Hill Education (2017), 1st Edition
2. Reema Thareja, Data Structures Using C, Oxford Publication (2014), 2nd Edition
3. Sahni Horowitz, Fundamentals of Data Strucetures in C (2008), 2nd Edition
4. Narasimha Karumanchi, Data Structures and Algorithms made easy, Careermonk Publications (2016), 5th Edition
5. S.K. Srivastava and Deepali Srivastava, Data Structures through C, BPB Publications (2004)
6. YedidyahLangsam, Augestein and Tanenbaum, Data Structures using C and C++, Pearson Education India (2015), 2nd Edition

Bachelor of Computer Applications Semester – IV
(Session 2024-25)
COURSE CODE: BCAL–4112
INFORMATION SYSTEMS

Course Outcomes:

After passing course the student will be able to:

CO1: Identify the importance of data and information management.

CO2: Comprehend development life cycle of information systems.

CO3: Identify the components and applications of Management Information System and Decision Support System.

CO4: Identify the role of Information System in organizations: Accounting Information systems, Inventory control systems and Marketing systems.

Bachelor of Computer Applications Semester – IV
(Session 2024-25)
COURSE CODE: BCAL–4112
INFORMATION SYSTEMS

L-T-P: 4-0-0
Credits: 4
Examination Time: 3 Hours.

Max. Marks: 100
Theory: 80
CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT - I

Basic Concepts: Systems, Data, Information, Knowledge, Database Management System. Information needs of business, Sources of information – Primary and Secondary. Online access and capture.

UNIT - II

Information System: Introduction to System, types of Systems, Information System and its types.

Planning Information systems: System Development Life Cycle and Rapid Application Development. Types of Decisions - Structured, Unstructured and Semi Structured.

UNIT - III

Management Information System: Need, Components and Functions of MIS. Planning of MIS, Implementation and Controlling MIS.

Decision Support System: Meaning, Characteristics, Types and Components of DSS.

UNIT - IV

Transaction Processing Systems: Meaning, Characteristics, Components of TPS. Difference between MIS, DSS and TPS.

Case studies of the Information System: Accounting Information systems, Inventory control systems & Marketing systems.

References / Textbooks:

1. Mohammad Azam, Management Information Systems, Tata McGraw Hill Education (2012).
2. Nagpal D.P., Textbook on Management Information System, S.Chand& Company (2011).
3. R. Kelly, Rainer and Casey G. Cegielski, Introduction to Information Systems, Wiley (2015), 4th Edition
4. C. Laudon Kenneth and P. Laudon Jane, Management Information System, Pearson Education (2018), 15th Edition.
5. Brien, Marakas and Behl, Management Information Systems, McGraw Hill Education (2017), 10th Edition
6. Suman Mann SeemaShokeen, Pooja Singh, Information Systems, Dreamtech Press (2020)

Bachelor of Computer Applications Semester – IV
(Session 2024-25)
COURSE CODE: BCAL-4113
INTERNET APPLICATIONS

Course Outcomes:

After passing course the student will be able to:

CO1: Comprehend basics of internet and email along with their effective use.

CO2: Apply HTML for development of static webpages.

CO3: Implement styling and behavior in webpages through the use of CSS.

CO4: Create and manage websites through the application of WordPress content management system.

Bachelor of Computer Applications Semester – IV
(Session 2024-25)
COURSE CODE: BCAL-4113
INTERNET APPLICATIONS

L-T-P: 4-0-0
Credits: 4
Examination Time: 3 Hours.

Max. Marks: 100
Theory: 80
CA: 20

Instructions for Paper Setter -

Eight questions of equal marks (16 marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

UNIT-I

Internet: Introduction, working, applications, DNS, IP addresses, Search engine and its working. File Transfer Protocol (FTP), Telnet, HTTP, WWW and its working.

E–Mail Basics: Introduction, Advantage and disadvantage, Protocols and structure of an e–mail message, working of e–mail (sending and receiving messages).

UNIT-II

HTML: Introduction, Features, Program Structure, Headings, Paragraph, Styling, Formatting, Hyperlink, Image, Table, List, Frame, Block, Entities, Form, Form elements, Audio, Video, Embed YouTube Video.

UNIT-III

CSS: Introduction, Advantages and Limitations, types, selector, colors, background, box model, text, font, display, position, z-index, float, clear, rounded corners, 2D Transformations, Transitions and Animations.

UNIT-IV

WordPress: Installation, Configuration, Management - Managing Posts, comments, pages, categories, Plugins, Widgets, Tags, images, users, Import and export content, Updating WordPress. Useful Plugins – MailChimp, Creating Gallery, Stripe Checkout, Verified Authorship, Google Maps, Google Analytics.

References / Textbooks:

1. Anshuman Sharma, Fundamentals of Internaet Applications, Lakhanpal Publications, 2016.
2. Ikvinderpal Singh, Internet Applications, Khanna Book Publishing Company, 1st Edition, 2011
3. P. Rizwan Ahmed, Internet & its Applications, Margham Publications, 2013.
4. Douglas E. Corner, Computer Networks and Internet with Internet Applications, Pearson, 4th Edition, 2008.
5. Satish Jain/Vineeta Pillai, Wireless Communication & Networking made Simple, BPB Publishers, 2007.
6. Laura Lerney, Rafe Colburn, Jennifer Kyrnin, Mastering HTML, CSS & Javascript Web Publishing, BPB Publishers, 1st Edition, 2016.
7. Lisa Sabin-Wilson, WordPress for Dummies, Wiley, 8th Edition, 2021.

Bachelor of Computer Applications Semester – IV
(Session 2024-25)
COURSE CODE: BCAL–4114
APPLIED AND DISCRETE MATHEMATICS

Course Outcomes:
After passing course the student will be able to:

CO1: Have knowledge of matrices, sets, relations, propositional logic.

CO2: Have knowledge of Boolean algebra.

CO3: represents world knowledge in symbolic notation through propositional calculus.

CO4: Apply discrete mathematical concepts to obtain analytical and numerical solutions.

Bachelor of Computer Applications Semester – IV
(Session 2024-25)
COURSE CODE: BCAL–4114
APPLIED AND DISCRETE MATHEMATICS

L-T-P: 4-0-0 **Max. Marks: 100**
Credits: 4 **Theory: 80**
Examination Time: 3 Hours. **CA: 20**

Instructions for Paper Setter -

Eight questions of equal marks (16 Marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

UNIT-I

Sets: Definition of sets, subsets, complement of a set, universal set, intersection and union of sets, De-Morgan's laws, Cartesian products, Equivalent sets, Countable and uncountable sets, minset, Partitions of sets.

UNIT-II

Relations: Basic definitions, domain and range of relations, graphs of relations, properties of relations, composition of relation.

Functions: Basic definitions, domain, co-domain and range of functions, types of functions, inverse of a function, composition of function.

UNIT-III

Logic and Propositional Calculus: Proposition and Compound Propositions, basic Logical Operations, Propositions and Truth Tables, Tautologies and Contradictions, Logical Equivalence, Duality law, Algebra of propositions, Conditional and Bi conditional Statements, Arguments, Logical Implication, Propositional Functions, Predicates and Quantifiers, Negation of Quantified Statements, Inference theory of the predicates calculus.

UNIT IV

Matrices: Introduction of a Matrix, its different kinds, matrix addition and scalar multiplication, multiplication of matrices, transpose etc. Square matrices, inverse and rank of a square matrix, properties of determinant, Matrix Inversion method.

References/Textbooks:

1. Seymour Lipschutz, Marc Lars Lipson, Discrete Mathematics (Schaum's outlines Series), McGraw-Hill, 1997.
2. Bernard Kolman, Robert C. Busby, Discrete Mathematical structures for Computer Science, Prentice-Hall, 1984.

3.Alan Doerr, Kenneth Levasseur, Applied Discrete Structures for Computer Science, Galgotia Publications, 1989.
4.J.P.Tremblay. and R Manohar, Discrete Mathematical Structures with Applications to Computer Science, McGraw-Hill, 1997.

Note: The latest editions of the books should be followed.

Bachelor of Computer Applications Semester – IV
(Session 2024-25)
COURSE CODE: BCAP–4115
LAB ON DATA STRUCTURES

L-T-P: 0-0-2
Credits: 2

Max. Marks: 50
Practical: 40
CA: 10

Lab based on Data Structures.

Bachelor of Computer Applications Semester – IV
(Session 2024-25)
COURSE CODE: BCAP–4116
LAB ON INTERNET APPLICATIONS

L-T-P: 0-0-2
Credits: 2

Max. Marks: 50
Practical: 40
CA: 10

Lab Based on Internet Applications.

Bachelor of Computer Applications Semester – IV
(Session 2024-25)
COURSE CODE: SECS-4522
SOCIAL OUTREACH PROGRAMME

Course Title: Social Outreach Programme

Course Duration: 30 hours

Course intended for: Semester IV students of Undergraduate Degree Programmes of all streams.

Course Credits: 2

Course Code: SECS- 4522

Course Objectives:

- The Social outreach program proposes to equip the students for community upliftment work.
- It will strive to prepare citizens who will make a marked difference in society.
- The students will be provided with numerous opportunities to build their knowledge and skills on the fundamental values of social fairness and compassion.
- The program will focus on integrating academic work with community services

Learning Outcomes:

On successful completion of this course, student will be able to

- Connect the knowledge gained in the classroom with real-life situations by getting hands-on experience through community services.
- Get an opportunity to engage in social service. It will also foster the development of civic responsibility.
- Reflect upon larger issues that affect communities through readings and discussions.
- Integrate academic learning and community engagement through practical fieldwork.
- Develop awareness, knowledge, and skills for working with diverse groups in society.

Curriculum

Course Code: SECS- 4522

Total Contact Hours: 30

MODULE	TITLE	HOURS
1.	Sensitizing the students towards Social Issues	4Hrs.

2.	Collaborating with NGO	2Hrs.
3.	Social Extension in villages & literacy drive	2Hrs.
4.	NSS, SwatchBharat ,Unnat Bharat	2Hrs.
5.	Environmental issues/NCC	2Hrs.
6.	Empathy Corner	2Hrs.
7.	Food Adulteration and MedicalCamps	2Hrs.
8.	Medical Camp/Adulteration Camp/Science Awareness Campaign Villages	2Hrs.
Total Hours		18 Hrs.

Time given to students for Project Work: 12Hrs

A. Students will be introduced to various broad areas in which they can take up projects
B. The students are expected to be actively engaged in working on any of the project areas listed below as volunteers. Evaluation will be based on consistency, commitment, and results achieved in the areas taken up.

List of Projects Are as under Social Outreach Programmes:

- Working as Motivators under the Swatch Bharat Campaign of the Government,
- Literacydrive:(I).TeachingintheCharitableSchoolAdoptedbytheCollege
  (ii).Work on projects under taken by the Rotary Club of Jalandhar for inducting students into child labor Schools.
- EnrollasNSSVolunteersforvariousprojects(Cleanliness,Women'shealth awareness)
- Counseling camps in villages
- Tree plantation(i) Maintaining the trees in the park adopted by the college. in Vikas Puri, Jalandhar
  (ii)Enrolling projects undertaken by JCI Jalandhar City
- Enrolling the Gandhian Studies Centre as a Student Volunteer for surveys in villages.

- Women Empowerment Programmes in collaboration with JCI Jalandhar Grace
- Generating awareness on voting among the youth.
- Drug Abuse (Generate awareness among the school children)
- Environment Awareness(Reduce Pollution)
- Old Age Homes/Orphanages
- Operating the Empathy Corner outside the college gate.
- Disaster Management/Relief Work

Evaluation/Assessment:

At the beginning of the semester, the students after enrolling for one of the Projects offered will be given deadlines for the project.

- Students will be responsible for recording their hours of service with the faculty and also map the progress of their subjects (children, old people, saplings, etc.).
- Therespectivedepartmentswillmonitortheinvolvementoftheirstudents.
- The students will submit a report of the project taken up by them.
- There will be no written examination, The students will be given a grade based on the evaluation of the projects by an evaluation committee, comprising of the Dean of the respective streams, the Head, and two teachers of the concerned department.

Total Marks: 25 (**Internal Assessment: 5 and Project Report: 20**) Internal Assessment based on the attendance during the Lectures Project Report based on the work done by the student.

Total marks: 25 converted to grade for final result grading system:

90% marks & above: A grade 80% - 89% marks: B grade

70%-79% marks: C grade

60%- 69% marks: D grade

50%-59% marks: E grade

Below50% marks: F grade (Fail–To repeat Project)