Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Shri Vaishnav Institute of Computer Applications

Name of the Program: BCA (BDA- IBM)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BCABDA201N	Major	Python Programming	2	0	2	3	60	20	20	30	20

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.
***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall exceed 10 Marks)

Course Education Objectives (CEOs):

- The Python Training module will make the reader accustomed to python language.
- This material will help the reader in understanding the basics of the python language, Python libraries and the use of python for the analytics.

Course Outcomes (COs): Student will be

- Able to install and get start python.
- Able to use data in python.
- Able to install Pandas and work with series and data frames.
- Able to do the analysis.
- Able to apply advanced Machine learning algorithms

UNIT I: Introduction to PYTHON

PYTHON OVERVIEW: Introduction to Python, its advantages and disadvantages, install and get start with python, basic variables and stings in python, Mathematical operators, functions.

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UNIT II: Core Programming in PYTHON

How to input data in Python, Use Boolean with python, If and elif statement in python, while loop in python, Working with lists, For statement, Deal with Syntax errors, Deal with the exceptions, Work with regular expression, Work with Pattern matching, Parse data.

UNIT III: Data Analysis with Python Libraries

Installing Pandas, Work with series and data frames, Work on grouping, aggregating and applying different functions on data, Merge and join the data.

UNIT IV: Regression and Visualization

Define regression analysis, Work with regression analysis, Define exploratory analysis, Define correlation matrix, Perform visualization using matplotlib, Implement linear regression.

UNIT V: Advanced Topics in Python

Apply advanced Machine learning algorithms, Work on Support vector machines, Define Random Forest.

Text Books:

1. Pratiyush Guleria," Basics of Python Programming, BPB Publications, March 2020.
2. Jason Cannon" Python programming for beginners, Kindle book, 2020
3. Ryan Turner, "Python Programming: 3 Books in 1: Ultimate Beginner's, Intermediate & Advanced Guide to Learn Python Step-by-Step", Kindle Edition, 2018.
4. Martin Brown, "Python: The Complete Reference", Mc-Graw-Hill, 2018.

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BCABDA203N	Major	Agile Development and Scrum	2	0	2	3	60	20	20	30	20

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit.
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Course Education Objectives: This course offers an immersive introduction to Agile methodologies and Scrum practices, focusing on real-world application through hands-on labs and scenario-based learning.

- Student will explore lean-inspired practices such as test-driven development, pair programming, and the use of Kanban boards.
- Student will develop proficiency in crafting user stories, sprint planning, backlog refinement, and collaborative team dynamics, all within a self-organizing environment guided by a Scrum Master.
-

Course Outcomes:

By the end of this course, participants will be able to:

- Implement core Agile practices such as working in small batches, building a minimum viable product, pair programming, and applying behavior- and test-driven development.
- Master the sprint planning process, including the creation and refinement of a product backlog.
- Write clear and actionable user stories, estimate tasks using story points, and manage progress using Kanban boards.
- Develop and interpret burndown charts to forecast sprint outcomes, and use performance metrics to improve productivity, performance, and stakeholder satisfaction.

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BCABDA 203N	Major	Agile Development and Scrum	2	0	2	3	60	20	20	30	20

Unit 1: Introduction to Agile and Scrum

Introduction to Agile Philosophy, Agile Principles, Methodologies Overview, Working Agile, Summary and Highlights, Practice Quiz, Scrum Overview, the 3 Roles of Scrum, Artifacts, Events, and Benefits, Summary and Highlights, Practice Quiz, Organizational Impact of Agile, Mistaking Iterative Development for Agile, Summary and Highlights, Practice Quiz, Graded Quiz, Discussion Prompt: Introduce Yourself.

Unit 2: Agile Roles and Planning Tools

Module Introduction and Learning Objectives, Destination Unknown, Agile Roles and the Need for Training, Kanban and Agile Planning Tools, Hands-on Lab: Get Set Up in GitHub, [Optional] Hands-on Lab: Get Set Up in ZenHub, Summary and Highlights, Practice Quiz.

Unit 3: User Stories and Backlog Management

Creating Good User Stories, Hands-on Lab: Create an Issue Template in GitHub, Effectively Using Story Points, Building the Product Backlog, Assemble Your Product Backlog, Summary and Highlights, Practice Quiz, Backlog Refinement, Refine Your Product Backlog, Sprint Planning, Build a Sprint Plan from the Product Backlog, Summary and Highlights, Practice Quiz, Graded Quiz.

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BCABDA 203N	Major	Agile Development and Scrum	2	0	2	3	60	20	20	30	20

Unit 4: Sprint Execution

Workflow for Daily Plan Execution, Move Stories from In Progress to Done, [Optional] Hands-on Lab: Move Stories from In Progress to Done using ZenHub, The Daily Stand Up, Summary and Highlights, Practice Quiz, Completing the Sprint, Using Burndown Charts, Setup a Burndown Chart for Your Plan,

[Optional] Hands-on Lab: Setup a Burndown Chart for Your Plan using ZenHub, Summary and Highlights, Practice Quiz.

Unit 5: Sprint Review and Agile Improvement

The Sprint Review, The Sprint Retrospective, Using Measurements Effectively, Getting Ready for the Next Sprint, End of Sprint Activities, Agile Anti-Patterns and Health Check, Summary and Highlights, Practice Quiz, Graded Quiz, Final Graded Quiz.

Final Quiz

- Final Graded Quiz

Text books:

1. Kenneth S. Rubin, Essential Scrum: A Practical Guide to the Most Popular Agile Process, Addison-Wesley Professional / Pearson Education, 1st ed., 2012.
2. Mike Cohn, Succeeding with Agile: Software Development Using Scrum, Addison-Wesley Professional, 1st ed., 2009.
3. Jeff Sutherland, Scrum: The Art of Doing Twice the Work in Half the Time, Random House / Currency, 1st major ed. 2014/2015.

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							THEORY			PRACTICAL	
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BCCA202N	Minor	Mathematical Foundation of Computer Science II	3	1	0	4	60	20	20	0	0

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***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Educational Objectives (CEOs):
To introduce the students with the numerical techniques for computer science.

Course Outcomes (COs):
After the successful completion of this course students will be able to:

1. *construct the numerical solution of the algebraic and transcendental equations.*
2. *demonstrate the techniques of the finite difference calculus.*
3. *apply the techniques of Interpolation.*
4. *discuss the numerical solution of the system of linear algebraic equations.*

UNIT – I

Root finding: Newton's Methods, Fixed point iteration, ill-behaved root finding problems.

UNIT – II

Calculus of finite differences:

Operators, forward difference operator, backward difference operator, E-operator, relation between them, difference of a polynomial, factorial polynomial, Inverse operator. forward difference table, Backward difference Table.

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Name of the Program: BCA (BDA- IBM)

Subject Code	Category	Subject Name	Teaching & Evaluation Scheme								
			Theory			Practical		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teacher Assessment	End Sem University Exam	Teacher Assessment				
BCCA202N	BS	Mathematical Foundation of Computer Science II	60	20	20	0	0	3	1	-	4

UNIT – III

Interpolation

Introduction to Interpolation; Interpolation with equally spaced interval, forward and backward interpolation formula, Interpolation with unequally spaced intervals, Newton divided difference interpolation, Langrage's formula for interpolation and inverse interpolation.

UNIT – IV

Numerical differentiation and integration- Calculation of Derivative of first order by forward and backward interpolation formula. Trapezoidal and Simpson's Rules, one-third rule, three-eight rule, Weddle's rule.

UNIT – V

Solution of system of linear algebraic equations: Gaussian elimination with pivoting, Jacobian and Gauss-Siedel iteration.

References

1. Akai Terrence J: Applied Numerical Methods for engineers, John Wiley & Sons, Inc. 1994

2. Schilling Robert J & Harried Sanddra L: Applied Numerical Methods for engineers, Thomson, 2000.

3. S. D. Conte and C. de Boor, Elementary Numerical Analysis - An Algorithmic Approach, McGraw Hill,2005.
4. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, Delhi.
5. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Ed, John Wiley Publisher.

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
BSCDS201	Minor	Data Structures	2	0	2	3	60	20	20	30	20

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
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***Teacher Assessment** shall be based on following components: Quiz/Assignment/project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Educational Objectives (CEOs):

- Allow to assess how the choice of data structures and algorithm design methods impacts the performance of programs.
- To choose the appropriate data structure and algorithm design method for a specified application.
- To solve problems using data structures such as linear lists, stacks, queues, binary trees, binary search trees, and graphs and writing programs for these solutions.
- To efficiently implement the different data structures and solutions for specific problems.

Course Outcomes (Cos): students will be able to

- Analyze the concepts of algorithm evaluation and find time and space complexities for searching and sorting algorithms.
- Implement linear data structure such as stacks, queues, linked lists and their applications.
- Implement basic operations on binary trees.
- Demonstrate the representation and traversal techniques of graphs and their applications on data.

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BSCDS201	Minor	Data Structures	2	0	2	3	60	20	20	30	20

UNIT - I

Introduction, searching and sorting: Algorithm specification: Introduction, Recursive algorithms, Data Abstraction, Performance Analysis: Space complexity, time complexity, asymptotic notation, Searching: Linear and Binary search algorithms, Sorting: Bubble sort, Selection sort, Insertion sort, quick sort, merge sort.

UNIT - II

Stacks and Queues: Stacks, stacks using dynamic arrays, queues, circular queues usingdynamicarrays, Evaluation of an expression: Expressions, evaluating postfix expression, conversion of infix expression to postfix expression.

UNIT –III

Linked Lists: Single linked lists, Representing chains, operations for chains, operations for circularly linked lists, doubly linked lists, Polynomials: Representation, adding polynomials, sparse matrix representation, linked stacks and queues.

UNIT-IV

Trees: Introduction: Terminology, representation of trees, binary trees: abstract data type, Properties of binary trees, binary tree representation, binary tree traversals: Inorder, preorder, postorder, Binary search trees: Definition, searching BST, insert into BST, delete from a BST, Height of a BST.

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BSCDS201	Minor	Data Structures	2	0	2	3	60	20	20	30	20

UNIT-V

The Graph ADT: Introduction, definition, graph representation, elementary graph operations: BFS, DFS, Spanning trees, minimum cost spanning tree: Prim's, Kruskal's algorithms.

Text Books:

1. Fundamental of Data Structures in C – 2ndEdition, Horowitz, Sahani, AndersonFreed, University Press
2. TremblyandSORRENSON,"Introduction to Data Structure with Applications".
3. TennenBaum A.M.,"Data Structures using C & C++"; PHI
4. YashwantKanetkar, "Understanding Pointers in C", BPB.

Reference Books:

1. Data Structures and Algorithm Analysis in C – 2nd Edition, Mark Allen Weiss, Pearson
2. Classic Data Structures – 2nd Edition, Debasis Samantha, PHI

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BSCDS201	Minor	Data Structures	2	0	2	3	60	20	20	30	20

List of Programs:

1. Write a program to create a two dimensional array and perform add, subtract and multiplication operations.
2. Write a program to create a two dimensional array using dynamic memory allocation.
3. Write a program to implement stack.
4. Write a program to convert infix expression into postfix expression.
5. Write a program to check balanced parentheses for a given infix expression.
6. Write a program to evaluate postfix expression.
7. Write a program to implement queue.
8. Write a program to implement circular queue.
9. Write a program to implement link list with insert, delete, search, view, anddelete function.
10. Write a program to implement ordered link list.
11. Write a program to add two polynomials.
12. Write a program to create doubly link list.
13. Write a program to implement tree with insert, delete and search function.
14. Write a program for in order, post order and preorder traversal of tree.
15. Write a program for binary search and sequential search using recursion.
16. Write a program for bubble sort and sequential search.
17. Write a program for insertion sort and quick sort.

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Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Shri Vaishnav School of Management

Choice Based Credit System (CBCS) in Light of NEP-2020
BBA+MBA - II SEMESTER (2022-2026)

ML307 ENVIRONMENTAL MANAGEMENT AND SUSTAINABILITY

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
ML307	AECC	Environmental Management and Sustainability	60	20	20	0	0	4	0	0	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; AECC- Ability Enhancement Compulsory Course

*Teacher Assessment shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objective

1. To create awareness towards various environmental problems.
2. To create awareness among students towards issues of sustainable development.
3. To expose students towards environment friendly practices of organizations.
4. To sensitize students to act responsibly towards environment.

Examination Scheme

The internal assessment of the students' performance will be done out of 40 Marks. The semester Examination will be worth 60 Marks. The question paper and semester exam will consist of two sections A and B. Section A will carry 36 Marks and consist of five questions, out of which student will be required to attempt any three questions. Section B will comprise of one or more cases / problems worth 24 marks.

Course Outcomes

1. The course will give students an overview of various environmental concerns and practical challenges in environmental management and sustainability.
2. Emphasis is given to make students practice environment friendly behavior in day-to-day activities.

COURSE CONTENT

UNIT I: Introduction to Environment Pollution and Control

1. Pollution and its types (Air, Water, and Soil): Causes, Effects and Control measures
2. Municipal Solid Waste: Definition, Composition, Effects
3. Electronic Waste: Definition, Composition, Effects
4. Plastic Pollution: Causes, Effects and Control Measures

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BBA+MBA - II SEMESTER (2022-2026)

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ML307	AECC	Environmental Management and Sustainability	60	20	20	0	0	4	0	0	4

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UNIT II: Climate Change and Environmental Challenges

1. Global Warming and Green House Effect
2. Depletion of the Ozone Layer
3. Acid Rain
4. Nuclear Hazards

UNIT III: Environmental Management and Sustainable Development

1. Environmental Management and Sustainable Development: An overview
2. Sustainable Development Goals (17 SDGs)
3. Significance of Sustainable Development
4. Environment Friendly Practices At Workplace and Home (Three Rs' of Waste Management, Water Conservation, Energy Conservation)

UNIT IV: Environmental Acts

1. The Water (Prevention and Control of Pollution) Act, 1974: Objectives, Definition of Pollution under this act, Powers and Functions of Boards
2. The Air (Prevention and Control of Pollution) Act, 1981: Objectives, Definition of Pollution under this act, Powers and Functions of Boards
3. The Environment (Protection) Act, 1986: Objectives, Definition of important terms used in this Act, Details about the act.
4. Environmental Impact Assessment: Concept and Benefits

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Controller of Examination, Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
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