Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Computer Applications

Name of the Program: BCA in Big Data Analytics in association with 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*
MABCA102	Minor	Numerical Methods and Probability	2	1	0	3	60	20	20	0	0

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 be exceed 10 Marks)

Course Educational Objectives (CEOs):

- To introduce the students with the numerical techniques used for analysis

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

- collect and represent data for numerical analysis and the role of the error in computation.
- find the numerical solution of the algebraic and transcendental equations.
- apply the techniques in the calculus of the finite difference.
- know the numerical solution of the system of linear algebraic equations.
- find the numerical solution of the ordinary differential equation.

UNIT – I

Data Representation: Fixed point numbers, Floating point numbers, Finite data representation, Propagation of Error.

UNIT – II

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

UNIT – III

Interpolation, Divided differences, Spline functions, Approximation of functions - Chevyshew polynomials, Numerical differentiation and integration- Trapezoidal and Simpson's Rules, Gaussians numerical integration

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UNIT – IV

Solution of system of linear algebraic equations: Matrix equation, Method of triangular matrices, Gaussian elimination with pivoting, Jacobian and Gauss-Siedel iteration

UNIT – V

Numerical solution of the ODE: Euler's method, Runge-Kutta methods, Multi-step method, System of differential equation.

Suggested Readings:

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

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BCABDA101	Major	Software Foundation with C	2	0	2	3	60	20	20	30	20

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Course Objectives:

- To learn the basic logic and programming skills using C.
- To understand and develop modular programming skills.
- To understand the basic idea of Arrays and Pointers.
- To handle the Strings and implement the structures.
- To provide the knowledge of Files and preprocessor directives.

Course Outcomes: Students will be able to

- Describe Logic and programming skills.
- Describe Constructs, loops and arrays
- Describe and write the programs on of function, pointers and operators
- Implement the concepts of Arrays and Strings
- Implement programs of file handling and preprocessor directives.

UNIT- I

Introduction to C Programming: Background of C, Structure of a C program, C Tokens: Identifiers, Variables, Constants, Keywords, Data Types, Operators; Control Constructs: if-else, for, while, do-while; Case switch statement; Break and Continue; Type conversion & type casting; Formatted & unformatted I/O; Type modifiers & storage classes. **5 hrs**

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BCABDA101	Major	Software Foundation with C	2	0	2	3	60	20	20	30	20

UNIT- II

Functions: Arguments; Return value; Parameter passing – call by value, call by reference; Return statement; Scope, visibility and life-time rules for various types of variable, static variable; Calling a function; **8 hrs**

Recursion: Basic Introduction, types of recursion- direct, indirect;

UNIT- III

Arrays: Declaration and Initialization; Arrays as Function Parameters; 2-Dimensional Arrays. **6 hrs**

Introduction to Pointers: Introduction; Declaring Pointer Variables; & and * operators; pointer expressions; Pointer Increments and Scale Factor; Pointer Arithmetic; Pointers and Arrays; Dynamic Memory Management functions like malloc(), calloc(), free();

UNIT- IV

Strings: Introduction to Strings; Standard String Library Functions; Array of String. **6 hrs**

Structures: Introduction; Defining a structure; declaring structure variables; accessing structure members; structure initialization; array of structures.

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UNIT- V

File Management in C: Introduction; Defining and opening a file; closing a file; Input/output and Error Handling on Files. **5 hrs**

Preprocessor: basics; #Include; #define; #undef; conditional compilation directive like #if, #else, #elif, #endif, #ifdef and #ifndef.

Text Books:

1. Kanitkar Yashwant, 'Let us C', BPB New Delhi
2. Balaguruswami, 'Ansi C', TMH, Delhi
3. Kerninghan & Ritchie "The C programming language", PHI
4. Schildt "C: The Complete reference" 4th ed TMH.
5. Cooper Mullish "The Spirit of C", Jaico Publishing House, Delhi.

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BCABDA103	Major	Software Foundation and Programming (1. Clean Coding; 2. Javascript; 3. NodeRed; 4. NodeJS)	2	0	2	3	60	20	20	30	20

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Course Objectives:

- Elevate your professionalism and increase your code quality
- Foundation for a professional development career
- Provide students a clear vocabulary for evaluating code quality.
- Understanding the basic ideas of programming
- Implementation of java script and node.js codes

Course Outcomes:

- Understand about the clean code, naming conventions and the importance of comments in the applications.
- Understand the purpose of formatting and objects.
- Describe JavaScript primitives and objects, variable declaration, control constructs and functions.
- Understand and describe the document object model (DOM) hierarchy, Node.js framework and projects and Master Express.js.
- Understand the basics of Node.js, connectivity and CRUD operations of Express.js with MongoDB and CRUD operations.

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Syllabus:

UNIT I

Introduction to Clean Coding

Understand the importance of bad and good code.
Understand the difference about marshalling and unmarshalling.
Exercise to implement JAXB.

Names and Functions

understand the importance of meaningful distinct names.
Defining meaningful context.
Usage of domain and function names
Usage of exceptions and its error code names/descriptions.
Exercise to experience in searchable names.

Comments and Formatting

Understand about clean and bad comments.
Understand the process of vertical and horizontal formatting.
Exercise on comments and formatting.

UNIT 2

Objects

Learn about data abstraction.
Understand the data and object antisymmetric.
Explain the data transfer objects.

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Javascript Basics

Nature of JavaScript language
Understand JavaScript primitive types.

Javascript objects

Understand Java Script Array Objects
Understand Java Script Date Objects
Understand Java Script Error Objects

UNIT 3

Javascript variables and Control statements

Understand how to define JavaScript Variables
Work Java Script If statements
Work Java Script switch statements Work
JavaScript for and while loop statements

Javascript Functions

Declare a JavaScript function
Creating custom objects with functions
Adding functions to prototypes
Self-executing functions

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UNIT 4

Client side Javascript

Understand Scripts in HTML documents
Describe the document object model (DOM) hierarchy
Overview of the DOM specification levels
Describe the window and document objects
Accessing document elements
Common API in web and XML scripting

Node JS Introduction

Understand NodeJS and its features
Understand Express Framework.
Understand Key features of MongoDB

UNIT 5

Installation and Configuration

Install NodeJS on command line
Hands on: Create sample NodeJS + Express project using command line
Install Node eclipse plugin
Hands-on: Create sample NodeJS + Express project using Eclipse

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File System

Understand__dirname and filename
Understand synchronous vs Asynchronous file read
Understand View Templates
How to serve static content in NodeJS
Connecting to the database using NodeJS

Install and Setup MongoDB
NodeJS Mongo Driver
Perform CRUD Operation
Understand Connection Pooling using NodeJS and Mongo Driver
Hands on Develop Web Application using Node JS and Mongo DB

Text Book

- Mastering HTML, CSS &Javascript Web Publishing by Lemay Laura, BPB Publications, ISBN: 9788183335157, 9788183335157
- Javascript by Flanagan David, Packt publishers, ISBN: 9789350237311, 9789350237311
Web technologies-black book by Dreamtech Press publications, ISBN-13 : 978-9351199076, ISBN-10 : 935119907X

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Reference Book

- Java script by example by Dani Akash S, Kindle Edition
- Java script: the good parts by D Crockford, Kindle Edition
- IBM Study Materials

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BCABDA102	Minor	Computers Fundamentals	3	0	0	3	60	20	20	0	0

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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 be exceed 10 Marks)

Course Educational Objectives (CEOs):

- To create basic understanding of Computer System
- To provide knowledge of concepts of Operating Systems
- To familiarize the students with the need, goal, function and architecture of various operating system available
- To develop the understanding of trends of IT industry, safe and ethical use of IT

Course Outcomes (COs):students will be able to

- To understand the need, goal and function of the OS
- Understand and use Windows and Linux operating systems commands.
- Organizing and manipulating files and folders.
- Understand and Use different editors of Linux
- Manipulating data using input output redirection
- Writing shell scripts
- To exercise the safe computer practices

Unit–I

Introduction to Computer Fundamentals: Introduction to Computer, Computer System Hardware, Computer Memory, Input and Output Devices, Interaction between User and Computer, Introduction to Free and Open Source Software, Definition of Computer Virus, Types of Viruses, Use of Antivirus software.

Unit–II

Computer: Definition, Classification, Organization i.e. CPU, register, Bus architecture, Instruction set, Memory & Storage Systems, I/O Devices, and System &Application Software.

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BCABDA102	Minor	Computers Fundamentals	3	0	0	3	60	20	20	0	0

Computer Application in e-Business, Bio-Informatics, health Care, Remote Sensing & GIS, Meteorology and Climatology, Computer Gaming, Multimedia and Animation etc.

Unit–III

Basics of Operating System, Definition of Operating System, Objectives, types, and functions of Operating Systems. Working with Windows Operating System: Introduction, The Desktop, Structure of Windows, Windows Explorer, File and Folder Operations, The Search, The Recycle Bin, Configuring the Screen, Adding or Removing New Programs using Control Panel, Applications in windows (Paint, Notepad, WordPad, Calculator).

Unit–IV

Introduction of Basic Commands of LINUX and Editors, Managing Files and Directories in LINUX, Programming Environment in LINUX, Writing and executing programs in LINUX.

Unit–V

Compilers & Interpreters: aspects of compilation, memory allocation, compilation of expression compilation of control structures, code optimization, interpreters. Software Tools: Software tools for program development, editors, debug monitors, programming environment, user interfaces

Text Books:

1.V. Rajaraman, “Fundamentals of Computers”, PHI.
2.Peter Norton’s, “Introduction to Computers”, TMH.
3.Operating Systems –Silberschatz and Galvin -Wiley India.
4. Andrew Tananbaum, Computer Networks:, PHI
5. PramodKoparkar “Unix for You”:, TMH.
6. MachteltGarrels, “ Introduction to Linux”.
7. Sanders, D.: Computers Today, Tata McGraw-Hill

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