ख़्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय, लखनऊ, उत्तर प्रदेश (भारत)
Khwaja Moinuddin Chishti Language University, Lucknow, Uttar Pradesh (India)
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BCA Semester III
BCA 301: Programming in JAVA

Credit: 04, IA Marks: 25, ESE Marks: 75
Lectures: 45 Hours, Tutorial: 15 Hours

OBJECTIVES OF THE COURSE:
1. To understand Object Oriented Concepts using Java Language.
2. To develop, debug and document programs in Java using OOP paradigms.
3. To develop and deploy applications and applets in JAVA.
4. To develop and deploy GUI using JAVA Swing and AWT.

UNIT-I   **Lectures: 11**

Java Programming: Data types, control structured, arrays, strings.
Object Oriented Programming: Introduction of OOPS, basics of OOP, fundamental characteristics of OOP, benefits of object-oriented programming, applications of OOP. Introduction to Programming Languages, The Evolution of Java, Object-Oriented Programming Concepts and Java, Differences between C++ and Java, The Primary Characteristics of Java, The Architecture, Programming with Java.

UNIT-II   **Lectures: 11**

Objects, classes, and methods, Constructing objects, Accessor and mutator methods, object references, Java classes: Abstract classes, static classes, Inner classes, Wrapper classes, static methods, static field, scope, introduction to strings, string tokenization, methods, method overloading, constructor overloading, use of this keyword, use of to String ( ) method, arrays.

UNIT-III   **Lectures: 11**

Extending Classes and Inheritance: Use and Benefits of Inheritance in OOP, Type of Inheritance in Java, Inheriting Data Members and Methods, Role of Constructors in inheritance, Overriding Super Class Methods, Polymorphism, Type Compatibility and Conversion, Implementing interfaces.

UNIT-IV   **Lectures: 12**

Exception handling: Importance of exceptions, throwing exceptions, checked and unchecked exceptions, Files and Streams: streams, readers, and writes, reading and writing text files. Database Connectivity JDBC architecture Establishing connectivity and working with connection interface, Creating, and executing SQL statements.
Java applets, AWT controls (Button, Labels, Combo box, list and other Listeners, menu bar) layout manager, string handling (only main functions), Introduction to JAVA Swing, Event Handling.

Course Outcome: After successful completion of this course students will be able to:

S. No.	Course Outcome	Bloom's Taxonomy
1	Understand structure and model of the Java programming language Understand	K1
2	Analyze and develop exception handling and multithreaded programs Analyze	K3
3	Design and Develop GUI based applications using AWT & Swing Create	K4, K5
4	Apply knowledge of JDBC to create programs for establishing database connectivity.	K5, K6

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Suggested Readings:

1. Patrick Naughton and HerbertzSchildt, "Java-2 The Complete Reference", TMH.
2. E. Balagurusamy, Programming With Java: A Primer, TMH.
3. Shelley Powers, "Dynamic Web Publishing", Techmedia.
4. Ivor Horton, "Beginning Java-2" SPD Publication.
5. Jason Hunter, "Java Servlet Programming" O'Reilly

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BCA Semester III
BCA 302 – Digital Electronics and Computer Organization

Credit: 06, IA Marks: 25, ESE Marks: 75
Lectures: 75 Hours, Tutorial: 15 Hours

OBJECTIVES OF THE COURSE:

1. To understand the basic structure and operation of digital computer.
2. To study the design of arithmetic and logic unit and implementation of fixed point and floating-point arithmetic operations.
3. To study the two types of control unit techniques & processor organization.
4. To study the hierarchical memory system including cache memories and virtual memory.
5. To study the different ways of communicating with I/O devices and standard I/O interfaces.

UNIT-I   **Lectures: 19**

Logic gates; Demogran's laws; Boolean laws, Circuit designing techniques (SOP, POS, K-Map). Combinational Building Blocks: Multiplexes; Decoder; Encoder; Adder and Subtracter. Sequential Building Blocks: Flip-Flop. Registers & Shift registers. Counter. Register Transfer Language, Bus and Memory Transfers, Bus Architecture, Bus Arbitration, Arithmetic Logic, Shift Microoperations, Arithmetic Logic Shift Unit. Arithmetic Algorithms (addition, subtraction, Booth Multiplication), IEEE standard for Floating point numbers.

UNIT-II   **Lectures: 19**

Control Design: Hardwired & Micro Programmed (Control Unit): Fundamental Concepts (Register Transfers, Performing of arithmetic or logical operations, Fetching a word from memory, storing a word in memory), Execution of a complete instruction, Multiple-Bus organization, Hardwired Control, Micro programmed control (Microinstruction, Microprogram sequencing, Wide-Branch addressing, Microinstruction with Next address field, Prefetching Microinstruction).

UNIT-III   **Lectures: 18**

Processor Design: Processor Organization: General register organization, Stack organization, Addressing mode, Instruction format, Data transfer & manipulations, Program Control, Reduced Instruction Set Computer.

UNIT-IV   **Lectures: 19**

Input-Output and Memory Organization: I/O
Interface, Modes of transfer, Interrupts & Interrupt handling, Direct Memory access, Input- Output processor, Serial Communication.   Memory Organization: Memory Hierarchy, Main Memory (RAM and ROM Chips), Introduction to 2D and 1/2D, Auxiliary memory, Cache memory, Virtual Memory, Memory management hardware.

Course Outcome: After successful completion of this course students will be able to:

S. No.	Course Outcome	Bloom's Taxonomy
1	Represent numerical values in various number systems and perform conversions from one number system to another	K2
2	Analyze digital combinational circuits and sequential logic circuits	K3
3	Understand the evolution of processors, their present technology and inter-process communication. hierarchical memory system including cache memories and virtual memory	K1

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4	Evaluate CPU organization and instruction, design a memory module and analyze its operation by interfacing with the CPU.	K3, K4

Suggested Readings:

1. M. Morris Mano, Digital Logic Design, Pearson.
2. Vravice, Zaky & Hamacher, Computer Organization, TMH Publication.
3. Tannenbaum, Structured Computer Organization, PHI.
4. Stallings, Computer Organization, PHI.
5. M. Morris Mano, Computer System Architecture, Pearson.
6. John P.Hayes, Computer Organization, McGraw Hill.

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BCA Semester III
BCA 303 – Optimization Techniques

Credit: 06, IA Marks: 25, ESE Marks: 75
Lectures: 75 Hours, Tutorial: 15 Hours

OBJECTIVES OF THE COURSE: To define the term optimize is "to make perfect". To solve the linear programming problems and to apply the management application. To study of queuing theory for waiting lines or queues. To understand the replacement theory for decision making process of replacing used equipment with a substitute. To understand the concept of job sequencing.

UNIT-I   Lectures: 19

Introduction: Optimization Technique, History, Advantages and Limitations.
Linear programming: Central Problem of linear Programming various definitions included Statements of basic theorem and also their properties, simplex methods, primal and dual simplex method, transport problem.
Management Application: NWCR, LC Cell Method, VAM, tic-tac problem, and its solution. Assignment problem and its solution. Graphical Method Formulation,

UNIT-II   Lectures: 19

Queuing Theory: Characteristics of queuing system Poisson Process, Classification of Queuing Model Single Channel Queuing Theory, list of Symbols, Model I (M/M/I), (N/FC FS), Birth and Death Model, Model II (M/M/I), (N/FC FS) Finite Queue Length Model. Generalization of steady state M/M/1 queuing models (Model-I, Model-II).

UNIT-III   Lectures: 18

Replacement Theory: Replacement of item that deteriorates replacement of items that fail. Group replacement and individual replacement. **Inventory Theory** Cost involved in inventory problem-single item deterministic model economics long size model without shortage and with shorter having production rate infinite and finite.

UNIT-IV   Lectures: 19

Job Sequencing: Introduction, solution of sequencing problem Johnson s algorithm for n jobs through 2 machines.

Course Outcome: After successful completion of this course students will be able to:

S. No.	Course Outcome	Bloom's Taxonomy
1	CO1. Understand concepts of optimization techniques and explain fundamental concepts of linear programming and management applications problems and solutions	K1, K2
2	CO2.Describe and comprehend concept of queuing theory and evaluate queuing models.	K2, K3
3	CO3. Understand and analyze concepts and problems of inventory and replacement theory.	K3, K4

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4	CO4.Understand and familiarize with fundamentals of Job Sequencing and solve related problems.	K3, K4

Suggested Readings:

1. Gillet B.E. "Introduction to Operation Research", TMH.
2. Taha,H.A. "Operation Research - an introduction", Pearson.
3. Kanti Swarup "Operation Research", S. Chand.
4. S.D.Sharma "Operation Research", Kedarnath, Ramnath &Co.
5. M Prabhakaran, Optimization Technique, Pragati.

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BCA Semester III (Minor Elective)
BCA 304 – Advanced Office Automation

Credit: 04, IA Marks: 25, ESE Marks: 75
Lectures: 45 Hours, Lab: 30 Hours

OBJECTIVES OF THE COURSE:

1. To explore various features of MS-Word and its applications.
2. To explore various features of MS-Excel and its applications.
3. To design the presentation using MS-Power Point.

UNIT-I   Lectures: 10

MS-Word: Opening & Saving files, Editing text documents, Inserting, Deleting, Cut, Copy, Paste, Undo, Redo, Find, Search, Replace, Formatting page & setting Margins, Converting files to different formats, Using Tool bars, Ruler, using help. Setting Font styles, Font selection- style, size, colour, etc, Type face - Bold, Italic, Underline, Case settings, Highlighting, Special symbols, Alignments, Indents, Line Space, Margins, Bullets & Numbering, Formatting Page, Page tab, Margins, Layout settings, Header & footer, Shortcut Keys; Page Numbering, Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting, Inserting ClipArt's, Pictures/Files etc.

UNIT-II   Lectures: 10

MS-Excel: Spread Sheet & its Applications, Opening Spreadsheet, **Menus**- main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spreadsheet types. **Working with Spreadsheets**- opening, Saving files, setting Margins, Converting files to different formats, Rows, Columns & Cells, Referring Cells & Selecting Cells, Shortcut Keys.
Entering & Deleting Data: Entering data, Cut, Copy, Paste, Undo, Redo, highlighting values, Find, Search & replace, Inserting Clipart, Pictures, Files etc.

UNIT-III   Lectures: 13

MS-Excel: Setting Formula- finding total in a column or row, Mathematical operations (Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formulae.
Formatting Spreadsheets: Formatting- Cell, row, column &Sheet, Alignment, Font, Border & Shading, Hiding/ Locking Cells, Sheet Name, Row height & Column width, Security, Borders & Shading, Shortcut keys. Sorting, Filtering, Validation, Creating various Charts, Printing, Error checking, Spell Checks.

UNIT-IV   Lectures: 12

MS-Power Point: Introduction to Presentation, Opening New Presentation, Different Presentation Templates, Setting Backgrounds, Selecting Presentation Layouts. Creating a Presentation: Setting Presentation style, Adding text to the Presentation, Creating, Saving and Printing a presentation, Adding a slide to presentation, Slide-show, **Formatting a Presentation-** Adding style, Colour, Adding Header & Footer, Slide Background, Adding Graphics to the Presentation, Inserting pictures, tables etc into presentation, Adding Effects to the Presentation: Setting Animation.

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Course Outcome: After successful completion of this course students will be able to:

S. No.	Course Outcome	Bloom's Taxonomy
1	CO1. Acquire knowledge about MS-Word, Starting MS-Word, Creating and Formatting a document, setting up a different formatting styles, creating tables and learning related operations.	K1, K2
2	CO2.To understand MS-Excel: spreadsheets and various operations on them, working on data in spreadsheets	K2, K3
3	CO3. To understand MS-Excel: setting formula, formatting spreadsheets, creating various charts.	K2, K3
4	CO4.Acquire knowledge about MS-Power Point, new presentation, adding slides, working with presentation templates, setting styles, slide-show functionalities, different formatting styles used, working with and animation.	K2, K3

Suggested Readings:

1. MS-Office 2000 (For Windows) – By Steve Sagman.
2. Office 2007 – By Shelly, Cengage Publication.
3. MS-Office 2007 – Michael Price
4. Comdex windows 7 with Office 2010 – By Vikas Gupta, Dreamtech Press
5. MS-Office 2000 – No Experience Required, Courter G. and Marquis A., BPB Publications.
6. Working in Microsoft Office, Mansfield R., Tata McGraw Hill Edition.
7. Teach Yourself Microsoft Office 2000, Perry G., Techmedia.

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BCA 305: Lab: Programming in JAVA

Credit: 02, IA Marks: 25, ESE Marks: 75
Lab: 60 Hours

OBJECTIVES OF THE COURSE:
1. To implement Object Oriented Concepts using Java Language.
2. To develop and deploy applications and applets in JAVA.
3. To develop and deploy GUI using JAVA Swing and AWT, JDBC.
4. To develop and deploy web applications.

Following concepts should be implemented by using JAVA programming language.

- Class, object, abstract classes and interfaces.
- Overloading, overriding and various forms of inheritance.
- Create packages and multiple threads in Java.
- Input/output and Applets.
- Exception handling.
- String handling.
- Event handling (Mouse and Keyboard events).
- Layout Manager create different applications.
- Create and manipulate Text Area, Canvas, Scroll Bars, Frames and Menus using swing/AWT
- Client Server Interaction with stream socket connections.
- Read data from disk file.

Course Outcome: After successful completion of this course students will be able to:

S. No.	Course Outcome	Bloom's Taxonomy
1	CO1. To implement Object Oriented Concepts using Java Language.	K2, K3
2	CO2. To develop and deploy applications and applets in JAVA.	K2, K3
3	CO3. To develop and deploy GUI using JAVA Swing and AWT, JDBC.	K2, K3
4	CO4.To develop and deploy web applications.	K3, K4

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BCA Semester III
SDC-3: BCA 306: Introduction to Web Design

Credit: 03, IA Marks: 25, ESE Marks: 75
Lectures: 30 Hours, Lab: 30 Hours

OBJECTIVES OF THE COURSE:
1. To understand the concept of Web Application Development and its Architecture.
2. To understand the Essentials of Web Application Development.
3. To understand and practice web page designing techniques.

UNIT-I   **Lectures: 07**

Introduction & Web Design: Introduction: Concept of WWW, Internet and WWW, HTTP Protocol: Request and Response, Web browser and Web servers, Features of Web 2.0 Web Design: Concepts of effective web design, Web design issues including Browser, Bandwidth and Cache, Display resolution, Look and Feel of the Website, Page Layout and linking, User centric design, Sitemap, Planning and publishing website, Designing effective navigation.

UNIT-II   **Lectures: 07**

HTML & STYLE SHEETS HTML: Basics of HTML, formatting and fonts, commenting code, color, hyperlink, lists, tables, images, forms, XHTML, Meta tags, Character entities, frames and frame sets, Browser architecture and Web site structure. Overview and features of HTML 5.

UNIT-III   **Lectures: 08**

Style sheets: Need for CSS, introduction to CSS, basic syntax and structure, using CSS, background images, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, positioning using CSS, CSS2, Overview and features of CSS3.

UNIT-IV   **Lectures: 08**

Java Script & XML JavaScript: Client-side scripting with JavaScript, variables, functions, conditions, loops and repetition, Pop up boxes, Advance JavaScript: JavaScript and objects, JavaScript own objects, the DOM and web browser environments, Manipulation using DOM, forms and validations, DHTML: Combining HTML, CSS and JavaScript, Events and buttons XML: Introduction to XML, uses of XML, simple XML, XML key components, DTD and Schemas.

Course Outcome: After successful completion of this course students will be able to:

S. No.	Course Outcome	Bloom's Taxonomy
1	Describe and differentiate different Web Extensions and Web Services.	K1
2	Apply fundamental computer theory to basic programming techniques and fundamental skills to maintain web server services required to host a website.	K2
3	Select and apply markup languages for processing, identifying, and presenting of information in web pages.	K3
4	Use scripting languages and web to add interactive components to	K3

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| | web pages. | |

Suggested Readings:

1. Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India
2. Web Technologies, Black Book, Dreamtech Press
3. HTML 5, Black Book, Dreamtech Press
4. Web Design, Joel Sklar, Cengage Learning.
5. C. Xavier, Web Technology and Design, New Age Publication
6. E. Bayross, Web Technology, BPB Publication.