



SYLLABI

PG Diploma in Computer Programming (DCP)

**DEPARTMENT OF COMPUTER SCIENCE
ALIGARH MUSLIM UNIVERSITY
ALIGARH-202002**

Program Educational Objectives (PEO's)

PEO1: To develop professional development and lifelong learning throughout the career.

PEO2: To develop problem-solving capabilities using computer programming and basic software.

PEO3: To develop web development skills using different web technologies.

PEO4: To develop practical and team work skills in various development activities.

Program Outcomes (PO's)

After completing PG diploma in Computer Programming, the students will be able to-

PO1: Apply knowledge of computer science to solve the real-life problems.

PO2: Identify and analyze well-defined computational problems using standard methods.

PO3: Apply programming language to develop the solutions of computational problems.

PO4: Use basic software to solve the data-processing and computational problems.

PO5: Use web technology to develop and maintain the website for their organizations.

PO6: Apply appropriate computer science technology in context of society, sustainability, environment and ethical practices.

PO7: Use computer science basic knowledge individually, as a team member or a leader to manage small projects and effectively communicate about well-defined computer science activities.

PO8: Ability to analyze individual needs and engage in updating in the context of technological changes.

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SYLLABUS

P. G. DIPLOMA IN COMPUTER PROGRAMMING (DCP)

TITLE DCP-101: INTRODUCTION TO COMPUTERS & PROBLEM SOLVING

OBJECTIVES OF THE COURSE:

- To understand the need and significance of programming languages
- To develop, debug and document programs using C/JAVA programming language.
- To understand the fundamentals of computers and algorithms.

COURSE OUTCOMES:

The students would able to:

- CO1.** Understand the fundamentals of computers and concepts of algorithms.
- CO2.** Understand to fundamentals of programming.
- CO3.** Understand the object oriented programming using JAVA.
- CO4.** Implement the various object oriented programming features in real life applications
- CO5.** Design and Implement the real life basic applications.

Sessional Marks: 30

Exam Marks: 70

Total Marks: 100

UNIT-I

Introduction to computers, advantages and applications, Hardware/Software/Firmware etc. Evolution, History, Generations and Types of computers, Number systems and data representation, Memories and storage media types and technologies, Peripherals of computers: I/O devices, Computer Software: System Software, Application Software.

UNIT-II

Introduction to algorithms and flowcharts, searching and sorting algorithms, Introduction to programming languages, Types of programming languages, Low- & High-level languages, Machine level language, Assembly Language, Structured language, Characteristics of structured Program, Advantages & Disadvantages of Structured Programming,

UNIT-III

Introduction and Features of C language, Structure of C program, Library Functions, Input/Output Statements, Arithmetic, Relational and Logical Operators, Branching: If—Else statement, Iteration statements: For Loop, While Loop, Continue and Break statements, Array: Declaration, Concept of One Dimensional and Multi-Dimensional arrays, Function: parameterized and non-parameterized functions.

UNIT-IV

Object oriented language, class, object, inheritance, polymorphism, encapsulation, Introduction of Java programming, installing and setting up java, Java editors and IDEs, Java: Constants, Variables and Data Types, Operators, Expressions, Decision Making and Branching, Looping, Arrays, Strings, Functions, Java Architecture.

UNIT-V

Introduction to Classes and object, Constructors, Inheritance, Types of Inheritance, Polymorphism: Function Overloading, Function Overriding, Nested Classes: Inner class and Outer class, Abstract Class and Interfaces

Books:

1. P. K. Sinha and Preeti Sinha, "Computer Fundamentals", B.P.B.
2. Mohd. Ubaidullah Bokhari, et.al, "Fundamentals of Information Technology", Dhanpat Rai Publications.
3. Paul Deitel, Harrey Deitel, "C-How to Program", Second Edition (2010), Pearson Education, Inc.
4. Deitel and Deitel, "Java, How to Program", Prentice-Hall, 6th Edition.
5. Cay Horstmann, "Java Concepts", John Wiley & Sons, Inc., 5th Edition.

Course Outcomes	Program Outcomes							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
1	x	X						
2			x					
3	x	X		x	x	X		
4	x		x					
5	x	X	x	x	x	X	x	x

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SYLLABUS

P. G. DIPLOMA IN COMPUTER PROGRAMMING (DCP)

TITLE DCP-102: INTERNET TECHNOLOGY & WEB DESIGNING

OBJECTIVES OF THE COURSE:

- To understand the need and significance of networks, internet technology and web designing.
- To understand the concepts of HTML, CSS, and PHP/SQL.
- To design and host commercial web applications using PHP/SQL

COURSE OUTCOMES:

The students would able to:

- CO1.** Understand the fundamentals of networking and its components.
CO2. Understand the concepts of web applications and hypertext mark-up language.
CO3. Understand the concepts of CSS, PHP, XAMPP and WAMPP.
CO4. Design and host commercial web applications using PHP/SQL.
CO5. Handle and maintain web applications using PHP/SQL.

Sessional Marks: 30

Exam Marks: 70

Total Marks: 100

UNIT-I

Fundamentals of Computer Networks: PAN, LAN, MAN, WAN etc., Network Components, Client-Server and Peer-to-Peer model, Wired and Wireless Networks, LAN: Features, Topologies, access methods, Wired and Wireless Transmission Mediums, Networking devices: Router, Bridge, Hub, etc., Popular LANs in the market like Ethernet, Token ring, FDDI, etc. Addressing: IP address, MAC address, Port Address, DNS Server, Static and Dynamic Addressing, DHCP, History of Internet, Components of Internet & their functions, WWW, Archie, Gopher, Newsgroup, Telnet, FTP etc., Intranet and Extranet Network, Internet Service Providers, E-mail: Introduction & working with E-mail Packages, Client based and Web based, Introduction to online teaching tools, like Google Meet, Zoom, Google Classroom, MOODLE, etc.

UNIT-II

Introduction to Web Technology-Web application, Client-Server architecture, Web server, Scripting languages, Introduction to HTML: HTML Tags, Web page Authoring using HTML; Concept of tags and attributes; Structural tags of HTML; Inserting break; Creating paragraph, formatting tags of HTML, HTML Color Coding, List and its types; Content creation: Creating HTML documents using a text editor Saving HTML document, Editing HTML document, Viewing HTML document in web browser, Dynamic HTML (DHTML).

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SYLLABUS

P. G. DIPLOMA IN COMPUTER PROGRAMMING (DCP)

TITLE DCP-103: P.C. BASED APPLICATION SOFTWARE

OBJECTIVES OF THE COURSE:

- To understand the need and significance of system and application software.
- To install and handle Linux and Windows operating systems.
- To understand and handle office automation application software.

COURSE OUTCOMES:

The students would able to:

- CO1.** Understand the basic concept and installation of operating systems.
- CO2.** Understand the working concepts of MS-Word, MS-Excel, MS-PowerPoint, and MS-publisher.
- CO3.** Create resume, PowerPoint presentation, mark-sheet and brochure.
- CO4.** Understand the basic concept and significance of database for an organization
- CO5.** Understand the basic commands and operations for data analysis using SPSS.

Sessional Marks: 30

Exam Marks: 70

Total Marks: 100

UNIT-I

Introduction to Operating System: Functions, Classification of O/S, System Software, Application Software, Utility Tools, Introduction to Windows and Linux/Unix Operating Systems, GUI and CLI, Management of hardware components: Printers, Scanners, mouse, digital cameras, Managing Files and Folders using windows/Linux OS. Installation of Application packages, Installation of Windows and Linux OS.

Case Study: Installation of Windows 7/10, Ubuntu/Fedora/Red Hat operating systems.

UNIT-II

Introduction to Office-automation tools: MS-Office, LIBRE Office Corel Office etc. Introduction to Microsoft-Word: Creating and operating documents; Editing Text: Insert, Copy, delete, convert case; Formatting Text: Font Styles, Sizes, setting indents & Line breaks, Line & paragraph Spacing. Aligning text. Setting Headers & Footer. Creating, Modifying & Deleting Tables. Proofing Documents: Using Spell-check, Auto spell check, Auto correct, find & Replace, AutoText, Grammar Check; References: Insert Endnote/Footnote, Table of contents; Mail Merge: Creating main document, Data source, Merging the Data source & Main document. Creating

Macros to speed up repetitive tasks; Creating Hyperlink.

Case Study: Create your resume for employment, prepare a report on any topic using template available at <https://api.amu.ac.in/storage//file/udownloads/1105.pdf>

UNIT-III

Introduction to MS-EXCEL: Introduction to Excel interface, Entering, Editing and Formatting Data, Formatting numbers and dates, Custom and Special Formats, Managing Worksheets, Understanding Formulas and Using Operations, AutoFill and Custom Lists, Conditional Formatting, Tables, Data Tools, Referencing Formulas, Multiple Sheet References, Ranges and Dates, Lookups, Conditional Logic, Text Formulas, Functions in Excel, Introduction to Charts, Formatting Charts, Adding Graphics to Spreadsheets, Outline, Sort, Filter, and Subtotal, Protecting Data, Collaboration, Saving a Workbook, Macros, Data Management with Excel, Creating & Printing Chart, Linking Documents & Exporting/Importing Data etc.

Case Study: Create mark sheet of your graduation batch, create two sheets comprising master employee records and payroll; and link both.

UNIT-IV

Introduction to MS-PowerPoint & Publisher: Overview, Creating a New Presentation, Presentation Views (Slide View, Outline View, Notes Page View, Slide Sorter View), Formatting the Presentation, Setting the Dimensions & Orientations, Applying Design Templates, Working with Objects, Proofing Presentations, Adding and Reading Notes, Inserting Pictures, Graphics, Shapes, and Other Things, Inserting Tables into Presentations, Charts, Adding Sound and Video, Adding Transitions and Animation, Use Transition Time Settings, Slides with Audio/Video Narrations, Working with Master Slides, Working with SmartArt, Printing, Sharing, and Exporting Slides.

Case Study: Create a presentation containing audio/animation on any topic.

Introduction to MS-Publisher: Getting Started, Navigate the Interface, Customize the Publisher Interface, create a Publication, Working with Templates and Objects, Adding Content to a Publication, Add Pages and Picture Placeholders, Working with Text, Text Boxes and Images.

Case Study: Create a brochure for a Conference/Seminar.

UNIT-V

Introduction to Data Processing: Overview of Data and Information, Data Processing Cycle & Data Processing Operations. **Introduction to DBMS:** Advantage of using database, Concept of Field, Record Files, Primary Key, Secondary Key, Foreign Key.

Introduction to MS-Access: Creating Database; Entering Data, Editing, Deleting Data; Listing Data, Creating Forms, manipulating data using SQL.

Case Study: Create a database of a Department comprising teachers, students and programmes, populate respective tables and perform queries using Datasheet/Design view.

Introduction to SPSS: Basic commands and operations for data analysis.

Case Study: Performing basic data analysis tasks on any dataset.

Books:

1. Peter Weverka, Microsoft Office 2019 All in One for Dummies, 2019.
2. Ken Bluttman, Excel Formulas and Functions, 5th Edition, 2018.

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P. G. DIPLOMA IN COMPUTER PROGRAMMING (DCP)

COURSE DCP-LAB-I: PROGRAMMING LAB

OBJECTIVES OF THE COURSE:

- To understand the need and significance of programming languages
- To develop, debug and document programs using C/JAVA programming language.
- To develop programs to solve basic real-world problems.

COURSE OUTCOMES:

The students would able to:

- CO1.** Understand the problem solving methods and programming paradigms.
- CO2.** Develop and debug programs in C programming language.
- CO3.** Develop and debug programs using object oriented programming JAVA.
- CO4.** Implement the various object oriented programming features in real life applications
- CO5.** Design and Implement the real life basic applications using programming.

Sessional Marks: 40

Exam Marks: 60

Total Marks: 100

1. Write the steps of algorithm of calculating factorial of a given integer and also draw its flowchart.
2. Write the steps of algorithm of displaying fibonacci series and also draw its flowchart.
3. Write the steps of algorithm for Linear Search and also draw its flowchart.
4. Write the steps of algorithm for Bubble Sort and also draw its flowchart.
5. Write a C program to print "My name is....".
6. Write a C program to add two integers.
7. Write a C program to print 10 natural numbers.
8. Write a C program whether a given number is odd or even.
9. Write a C program to add 10 natural numbers.
10. Write a C program to store 5 elements in an array and display them.
11. Write a C program to search the location of a given number in an array.
12. Write a C program to print the factorial of a number.
13. Write a C program to store 5 elements in an array and display whether they are even or odd.
14. Write a C program to check whether a given number is prime or not.

15. Write a Java program to print 'Hello World' on screen.
16. Write a Java program to print the sum (addition), multiply, subtract, divide and remainder of two numbers.
17. Write a Java program that takes a number as input and prints its multiplication table up to 10.
18. Write a Java program to print the area and perimeter of a circle.
19. Write a Java program that takes three numbers as input to calculate and print the average of the numbers.
20. Write a Java program to swap two variables.
21. Write a Java program to compare two numbers.
22. Write a Java program to check whether a number is even or odd.
23. Write a Java program to compute the distance between two points.
24. Write a Java program to print a number N times.
25. Write a Java program to calculate the sum of following series: $1 + 2 + 3 + 4 + \dots + N$
26. Write a Java program to convert a decimal number into binary number.
27. Write a Java program to find the minimum among three numbers.
28. Write a Java program to calculate the factorial of a number.
29. Write a Java program and compute the sum of the digits of an integer.
30. Write a Java program to concatenate two Strings.
31. Write a Java program to check whether two Strings are equal.
32. Write a Java program to reverse a string.
33. Write a Java program to count the letters, spaces and numbers of an input string.
34. Write a Java program to print the odd numbers from 1 to 99.
35. Write a Java program to check whether a number is prime or not.
36. Write a Java program to insert 10 items in an array and display them.
37. Write a Java program to calculate the sum of all the array elements.
38. Write a Java program to test if the first and the last element of an array of integers are same.
39. Write a Java program to swap the first and last elements of an array
40. Write a Java program to find the maximum and minimum among array elements.
41. Write a Java program to count the number of even and odd elements in a given array of integers.
42. Create a class FRUIT which has data members color, taste and price. Also create a method display() which will print values of FRUIT object. Create three objects of FRUIT class and call their display() methods.
43. Create a class FRUIT which has data members color, taste and price. It has a method set Details() which will set the values of color, taste and price. Also create a method display() which will print values of FRUIT object.
44. In previous question, set the values of using color, taste and price using Constructor.
45. Add one-argument constructor and two-argument constructor in addition to default constructor in FRUIT class.
46. Create a class Vehicle, write a method cost() in this class. Create two classes Bus and Train which have their own display() methods and inherit from Vehicle class. Create objects of Bus and Train class and call cost() and display() methods.
47. Create class Account (Data members- Id, Account_holder_name, Address; Methods deposit(), withdraw()). Create two static methods in Account calculate Simple Interest() and calculate Compound Interest() and implement them.

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COURSE DCP-LAB-II: WEB TECHNOLOGY & NETWORKING LAB

OBJECTIVES OF THE COURSE:

- To understand the need and significance of networks, internet technology and web designing.
- Understand the concepts of CSS, PHP, XAMPP and WAMPP.
- Understand the concepts of online tools for teaching.

COURSE OUTCOMES:

The students would able to:

- CO1.** Develop web pages with different functions and attributes using HTML.
- CO2.** Understand the concepts and applications of CSS and PHP.
- CO3.** Design, host, and maintain commercial web applications.
- CO4.** Understand the fundamentals of networking and its components.
- CO5.** Use Google meet & classroom, zoom for video conferencing tools.

Sessional Marks: 40

Exam Marks: 60

TotalMarks:100

1. Write HTML code to develop a web page having the background in red and title “My First Page” in any other color.
2. Create a HTML document giving details of your name, age, telephone, address, TLC code & enrollment no. aligned in proper order?
3. Write HTML code to design a page containing a text in a paragraph give suitable heading style.
4. Create a page to show different attribute of Font tag.
5. Create a page to show different attribute italic, bold, underline.
6. Design a page having background color given text color red and using all the attributes of font tab.
7. Write a HTML code to create a web page of blue color and display links in red color.
8. Write HTML code to create a Webpages that contains an Image at its center.
9. Create a web page with appropriate content and insert an image towards the left-hand side of the page when user clicks on the image. It should open another web page.
10. Create a web Page using href tag having the attribute alink, vlink etc.
11. Create a web page, when user clicks on the link it should go to the bottom of the page.
12. Write a HTML code to create a web page of pink color and display moving message in red color.
13. Create a web page, showing an ordered list of names of your five friends.

14. Create a HTML document containing a nested list showing the content page of any book.
15. Create a web page, showing an unordered list of names of your five friends.
16. Use CSS to set the background color of the document (body) to yellow.
17. Use CSS to set the font of the document to "courier".
18. Use CSS to set the text color of the document to red.
19. Use CSS to make a yellow, 1 pixel thick, border around all paragraphs.
20. Write a PHP script to get the PHP version and configuration information.
21. Write a PHP script to display the following strings.

Sample String:

'Tomorrow I \'ll learn PHP global variables.'

'This is a bad command: del c:*. *'

Expected Output:

Tomorrow I 'll learn PHP global variables.

This is a bad command: del c:*. *

22. Create a simple HTML form and accept the user name and display the name through PHP echo statement.
23. Write a PHP script to get the client IP address.
24. Write a simple PHP browser detection script.
25. Write a PHP script to get the current file name.
26. Write a PHP script, to check whether the page is called from 'https' or 'http'.
27. Write a PHP script to redirect a user to a different page.
28. Write a simple PHP program to check that emails are valid.
29. Write a PHP script to count number of lines in a file.
Write a PHP script to print current PHP version.
30. Write a PHP script to delay the program execution for the given number of seconds.
31. Write a tribute of someone you admire and publish as a web page.
32. Design and host a commercial web application using PHP/SQL for a client as assigned by the lab teacher.
33. Demonstration of Front and back panel ports, indicators and connectors of CPU cabinet; their working and usage.
34. Getting familiarize the hardware components within a CPU cabinet such as SMPS, Motherboard, FDD, HDD, CD, DVD, RAM slots, NIC etc.
35. Enter into the BIOS Set-Up of a computer and explore the options of BIOS utility.
36. Installing Hard Disk, Partition and Format Hard Disk, Scan disk, disk cleanup, disk Defragment, Virus Detecting using Anti-virus software
37. Install and configure a DVD writer and recording a DVD disk.
38. Knowing the components of Printer, Scanner, Web-Cam, Cell phone and Biometric devices, installing them and perform troubleshooting to solve common problems.
39. Assemble a Computer System and install OS in it.
40. Learn to install two OS on a single system.
41. Get familiar with the hardware components specific to a Laptop and assemble them.
42. Make the students familiar with various physical components of a LAN:
 - a. Components of a typical Network Devices (Hub, Switch, Router, Firewall etc).
 - b. Different cables (Coaxial, Twisted Pair UTP/STP CAT 5/6).
 - c. Interfaces and Connectors (RJ 45 etc.) and Terminator.
 - d. Installing NICs, Configuring Operating System for Network.
 - e. Types of network Model and topologies.

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COURSE DCP-LAB-III: OFFICE AUTOMATION & DATA PROCESSING LAB

OBJECTIVES OF THE COURSE:

- To understand the need and significance of system and application software.
- To understand office automation tools for handling an office.
- Understand basic data analysis tasks on any dataset.

COURSE OUTCOMES:

The students would able to:

- CO1.** Understand the basic concept and working concepts of MS-Word, and MS-Excel.
CO2. Understand the basic concept and working concepts of MS-PowerPoint, and MS-publisher.
CO3. Create resume, PowerPoint presentation, mark-sheet and brochure.
CO4. Understand the basic commands and operations for data analysis using SPSS.
CO5. Understand to fetch from the database using SPSS.

Sessional Marks: 40

Exam Marks: 60

TotalMarks:100

1. Introduction to Office Automation Tools (MS-Word, Libre Office, Corel Office etc.)
2. Do the followings in MS-Word/Libre office-
 - a) Creating, Opening, and Saving document
 - b) Document Preparation: Editing Text, Text Alignment; cut-copy-paste; Find and Replace; adding Header and Footer, Converting case
 - c) Text Styles; Line spacing and Paragraph spacing; Font, Size and Color, Setting Headers & Footer
 - d) Page Setup: Margins, Orientation, size; Printing a word document
 - e) Creating and Working with Tables
 - f) Insert Files, Symbols, Special characters, Pictures; word Art
 - g) Working with Hyperlink.
 - h) Creating Macros
 - i) Mail Merge, attach a file to e-mail
 - j) Add references, create table of contents, Insert Endnote/Footnote
3. Create your resume for employment, prepare a report on any topic using template available at <https://api.amu.ac.in/storage//file/udownloads/1105.pdf>
4. Do the followings in MS-Excel-
 - a) Creating, saving and opening a Worksheet
 - b) Selecting cells and ranges, Inserting and Deleting Cells, Rows, Columns
 - c) Adjusting Row Height and Column Width
 - d) Text: Numeric and Alpha; Erasing Datain Cells and Worksheet

- e) Formula & Functions
 - f) Creating simple charts
 - g) Formatting and Printing Worksheet
5. Create mark sheet of your graduation batch, create two sheets comprising master employee records and payroll; and link both.
 6. Do the followings in MS-PowerPoint
 - a) Creating an attractive and professional Presentation
 - b) Presentation Views and Formatting
 - c) Setting the Dimensions and Orientations
 - d) Applying Design Templates and Animations
 - e) Use Transition Time Settings
 - f) Running Slides
 7. Create a presentation containing audio/animation on any topic.
 8. Your organization is a well-known organization and ready to offer services to other organizations. It's time to write a letter to some organizations introducing yourselves. Use MS-publisher to create a letterhead for your organization that contains its name. Below it, place the mailing address and telephone number against the left margin and the email and website address against the right margin. Use one or more horizontal lines for effect. Change the top page margin to 0.75".
 9. Use MS-publisher to create an 8 1/2X11 Sign/Flyer that promotes either an upcoming event by your organization.
 10. Use MS-publisher to create an advertisement that promotes an upcoming event by your organization. Adjusting the margins to the Minimum amount will increase the space available on your divided page section. Inserting a table of one column and one row will allow you to use all of the features available to modify a cell. Your ad will be in printed black and greys on a white background. Use this contrast to your advantage.
 11. Use MS-publisher to create a two-fold invitation or thank you card. A two-fold card is one made by folding the paper once in half, top to bottom and once again in half side to side. You need to design a cover panel and at least one inside panel for your card.
 12. Do the followings in MS-Access-
 - a) Create database and tables, Add numeric, character, string data in different tables.
 - b) Apply SQL operators like arithmetic, comparison, logical Operators, and bitwise operators
 13. Create a database of your choice in MS-Access and do the followings-
 - c) Do a query that involves a group function such as AVG, SUM, COUNT, MAX, MIN. Use it with the GROUP BY clause.
 - d) Do a second query that involves a group function with the GROUP BY clause.
 - e) Do a query that involves a group function that excludes records prior to forming the group.
 - f) Do a query that involves a group function that excludes a group after it has been formed.
 - g) Do an update that allows the user to key in the change to made and the record to be changed.
 - h) Do a query involving two subqueries in an AND relationship.
 - i) Do a query involving two subqueries in an OR relationship.
 - j) Do a subquery using ANY or ALL

