

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES
DEVI AHILYA UNIVERSITY, INDORE**

MCA (6 Years)

I SEMESTER

JULY-DECEMBER 2018

Code	Subject	Credit
IC-101A	Mathematics-I	4
IC-103A	Physics-I	4
IC-104B	Fundamentals of Programming using C	4
IC-105A	Computer Fundamentals	4
IC-106C	English & Communication Skills	4
IC-107D	C programming Lab	2
IC-110B	Computer Fundamentals lab	2
IC-108	Comprehensive Viva	4
	Total	28

INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES
DEVI AHILYA UNIVERSITY, INDORE
MCA (6 Years) I SEMESTER
IC-101A: Mathematics-I

Aim of Course: To provide a course on elementary mathematical techniques and familiarize students with basics of differentiation and integral calculus.

Objectives:

- Understand basic concepts of Partial differentiation, Maxima & Minima of the function, convergence and divergence of the series.
- Solve mathematical problems based on the course material.
- To develop mathematical skills and methods appropriate for students in the computer science.
- To prepare students for more advanced mathematical courses.

Course Contents:

UNIT I

Differential Calculus: Successive differentiation, Leibnitz's theorem, Expansion of functions, Maclaurin's theorem, Taylor's theorem, Indeterminate forms.

UNIT II

Tangents and Normal, curvature, Asymptotes.

UNIT III

Partial Differentiation: Euler's theorem on homogeneous functions, Mean value theorem and Taylor's theorems of two variables.

Application: Maxima and minima of functions of two and more variables, Lagrange's method of undetermined multipliers.

UNIT IV

Integral Calculus: integration of irrational, and Transcendental functions, Reduction formulae, Integral as the limit of a sum, summation of series.

UNIT V

Convergence and Divergence: Convergence and Divergence of infinite series, Definition and various tests.

Text Books:

1. Gorakh Prasad, Integral Calculus.
2. Gorakh Prasad, Differential Calculus

Reference Books:

1. Shanti Narayan, Differential Calculus.

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES,
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M. C.A- I SEMESTER
IC-103A: Physics-I**

Aim of Course: To make students aware about basic concepts of Physics such as circuit elements, electromagnetic induction, capacitors and some laws related to passive elements.

Objectives:

- Develop and apply knowledge and understanding of physics.
- Develop the knowledge and skills for more advanced learning in physics.

Course Contents:

UNIT I

Static and current Electricity: Charge, coulomb's law, Electric field Intensity, Dipole fields. Electric Potential, flux of electric field, Gauss's law and its applications, Torque on a dipole in uniform Electric field.

Growth and Decay of current in R-L and R-C circuits, decay constants, A.C currents A.C. with R-L, R-C and L-C-R circuits, series and parallel resonant circuits, Q-factor and Band Width.

UNIT II

Capacitors: Capacitors, factors affecting capacity, types of capacitors, series and parallel connection of capacitors, Capacity of Parallel Plate Condenser, Capacity of Parallel Plate Condenser when dielectric is filled partially, Energy stored in a capacitor, Redistribution of charge when two conductors are connected by a conductor wire. Dielectrics and Dielectric Polarization.

UNIT III

Motion of charged particles in Electric and Magnetic fields: E as an Electric field, Electron gun, Linear Accelerator, E as a deflecting field, C.R.O and sensitivity of C.R.O, Transverse Magnetic field, Principles of Cyclotron.

UNIT IV

Basic Semiconductor Physics: Intrinsic and extrinsic semiconductors. Donor and Acceptor levels, P-N Diode, Explanation of PN diode with Forward and Reverse Bias conditions, Breakdown of P-N Diode, Zener Diode.

UNIT V

Applications of Diodes: Full Wave Rectifier, Bridge Rectifier and Qualitative concept of Filters.

Bipolar Transistors: PNP and NPN Transistors-Characteristics of a Transistor in Common Base and Common Emitter mode, Current amplification factor.

Text Book

1. Unified Physics --R.P.Goyal

Reference Books:

1. Basic Electrical circuits- Volume-I--B. L. Thareja
Basic Electronics--B. L. Thareja
2. Physics part --II- Resnick and Halliday

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES,
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MCA (6 Years) I SEMESTER**

IC-104B: Fundamentals of Programming using C

Aim of Course: To develop logic of problem solving and learn basics of programming methodologies

Objectives:

- Develop the logic for the given problem
- Recognize and understand the syntax and construction of C code
- To gain experience of procedural language programming
- Know the steps involved in compiling, linking and debugging C code
- Apply all the concepts that have been covered in the theory course

Course Contents:

UNIT I

Introduction to Programming Language & Problem solving Approach: Development of flow charts & Algorithms, Why Programming Language? Program development steps, Programming language classification, Translators, Program design techniques. History of C Language, Feature of C Language, Why is C Language Popular? Structure of C Program, A Sample C Language Program. Errors, Compilation and Execution of C Programs and Exercise.

UNIT II

Useful terms of Language: Data types, The C character set, Constants, Variables, Keywords, C Instructions, Type Modifier, Storage class specifier, Storage classes in C and Exercises. Operator Expressions and Assignment Statements: Arithmetic Operators, Relational and Logical Operators, Increment and decrement Operators, Assignment Operators and Expressions, Conditional Expression, Precedence and order of Evaluation and Exercises.

UNIT III

Control Structure in C: Decision Control Structures, Loop Control Structures, Conditional Statements and Exercises, break Statement, The continue Statement. Console Input and Output: Introduction to Input / Output, Unformatted and Formatted Input / Output Function.

UNIT IV

Array: Introduction to Array, One Dimensional Array, Multidimensional Array, Initialization, Declaration, Storage and Access Mechanisms on Array and Exercises. String Manipulation: Introduction to Strings, Two Dimensional Array of characters. Function: Introduction to Functions, Function Declaration and Prototypes, Function Definition, Call by Value and Call by Reference, return statement, exit() function, Function with arguments, Calling Function with Array, Command Line, Arguments, Recursion in Function.

UNIT V

Structure: Structure Definition, Giving Values to members, Structure initialization, Comparison of Structure variables, Array of Structure, Array within Structures, Structures within Structures, Passing Structures to Functions, Why use Structure, Features and Uses of Structures. Union: Union Definition and Declaration, Accessing a union Member, Union of Structures, Initialization of a Union Variable, Use of Union, Use of User Defined Type Declarations.

Text Books:

1. Let us C, By Y.P. Kanitkar, B.P.B. Publications

Reference Books:

1. C -The Complete Reference, Tata Mcgraw Hill Publications
2. C-How to Program, By Deitel & Deitel
3. Programming in C & C++, By S.S. Khandare, S. Chand Publications

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES,
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MCA (6 Years) I SEMESTER
IC-105A: Computer Fundamentals**

Aim of Course: To make students understand basics of computer and its working.

Objectives:

- To make students aware of basic units and model of computer.
- To understand number system for data representation in computer.
- Understand basics of Operating system and DBMS.
- Learn working with MS Office and Internet.

Course Contents:

UNIT I

Introduction to Computer: Definition, Characteristics, functions and applications of a Computer, Components of a Computer: Hardware and Software, Block diagram of a computer: Input devices, Output devices, CPU, Memory. Classification of computer, generation of computer. Data representation and computer software: Number system-Binary, Decimal, Octal, Hexadecimal and its conversion. Computer software: system software and application software. Computer languages: Machine, Assembly, High level and Fourth generation languages

UNIT II

Introduction to Operating System: Definition and functions of an Operating System, Type and classification of Operating Systems.. Introduction to Data Base Management System: Introduction, Quality of information, What is Database, DBMS? Why a database, DBMS? Types of DBMS

UNIT III

Microsoft office environment: Microsoft Word: Working with Word, Typing and Editing, Formatting Text, Page design and layout, adding tables, using graphs, mail merge Microsoft Excel: Working with excel, entering data, formatting, customizing workplace, calculation in worksheet, adding charts, advanced features of excel. Microsoft–PowerPoint: Working with PowerPoint, Adding Text, Including Multimedia, Customize PowerPoint, Microsoft Access: Creating database, addition and deletion of records, searching, sorting and indexing the records, creating tables and records, advance features of Access.

UNIT IV

Internet and World Wide Web: Introduction, Internet access, Internet basics, Internet protocols, Internet addressing, Web pages and HTML, Web browser and search engines, Electronic mail. Computer Security: Physical access restriction, Passwords, Firewalls, Cryptography, Computer virus, Bombs and worms. Antivirus software. MSDOS: DOS features, External and Internal Commands, Managing disks, advanced command techniques, working with batch programs. Microsoft Windows and its environment

UNIT V

Introduction to Multimedia: Introduction, Multimedia in entertainment, Multimedia in software training, Multimedia in education training, Multimedia server and databases, Multimedia tools.

Text Books:

1. Alexis Leon, Introduction to Computer
2. Alexis Leon, Introduction to Information Technology

Reference Books:

1. P.K.Sinha ,Fundamentals of computers .

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES,
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MCA (6 Years) I SEMESTER
IC-106C: English & Communication Skills**

Aim of Course: The aim of this course is to enable students to improve both their ability to communicate and linguistic competence in English language.

Objectives:

- To give students knowledge of correct usage of English with an emphasis on reading and writing skills.
- To practice writing skills at sentence and paragraph levels with correct grammatical structures.
- To practice and learn English speaking skills to communicate in daily situations effectively.

Course Contents:

UNIT I

Meaning and Definition of communication, Process of Communication. Objectives and functions of communication.

UNIT II

Components of effective communication, 4C's of effective communication. Group discussion. Listing skills, types of skills.

UNIT III

Types of communication – verbal, non-verbal, written and oral communication. Report writing. letter writing

UNIT IV

Communication barriers, formal and informal channels of communication. Public speaking.

UNIT V

Practical Training :

Making effective presentation

Reference Books:

1. C. S. Raydu, Communication Skills.
2. Andal N., Communication Models.
3. Keval J. Kumar, Communication Barriers.
4. Dennis Maquail, Effective Communication.

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES,
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MCA (6 Years) I SEMESTER
IC-107D 'C' programming Lab
Assignment**

Simple/Basic programs

1. WAP for addition, subtraction, multiplication, division, modulo following numbers
 - a. 2 or 3 integer numbers.
 - b. 2 or 3 characters.
 - c. 2 or 3 Real numbers.
2. Write the code for creating global (Integer, Character and Real) and local variables?
3. Write a program to exchange values of following numbers
 - a. 2 or 3 (integer, real, characters) numbers using 3rd variable.
 - b. 2 or 3 (integer, real, characters) numbers without 3rd variable.
4. Write a program to calculate result for following formulas :
 - a. Simple interest.
 - b. Compound interest.
 - c. Area and circumference of circle.
 - d. Area and perimeter of rectangle.
 - e. Area of a rectangle
 - f. Area of a triangle
 - g. Convert temperature from Centigrade to Fahrenheit.
 - h. WAP to convert temperature from Fahrenheit to Centigrade.
 - i. Convert & print this distance of 2 cities in meter, feet, inches & centimeter.
 - j. $(a+b)^2$, $(a+b)^3$, $(a-b)^2$, $(a-b)^3$
 - k. Display square and cube of a number
5. Write a program to perform following operation with entered single character:
 - a. Upper case and print it in lower case.
 - b. Lower case and print it in upper case.

If-else

1. Write a program to perform following operation:
 - a. Find out the maximum and minimum number between two numbers.
 - b. Find out the maximum and minimum number between three numbers.
 - c. Check whether enter number is positive, negative or zero
 - d. Check whether enter number is odd or even number.
2. Any character is entered through the keyboard, WAP using conditional operator to determine whether the
 - a. Character entered is a small case alphabet or not.
 - b. Special symbol or not.
3. Any year is input through the keyboard. WAP to determine whether the year is leap year or not.
4. WAP while purchasing certain items, a discount of 10% is offered if the quantity purchased is more than 1000. If quantity and price per item are input through the keyboard, then to calculate the total expenses.

5. The current year and the year in which the employee joined the organization are entered through the keyboard. If the number of years for which the employee has served the organization is greater than 3 then a bonus of Rs. 2500/- is given to the employee. If the years of service are not greater than 3, then program should not do anything.
6. In a company an employee is paid as under :
If his basic salary is less than Rs. 1500, then HRA=10% of basic salary and DA=90% of basic salary. If his salary is either equal to or above Rs.1500, then HRA=Rs. 500 and DA=98% of basic salary. If the employee's salary is entered through the keyboard WAP to find his gross salary.
7. The marks obtained by a student in 5 different subjects are input through the keyboard. The student gets a division as per the following rules:
 - Percentage above or equal to 60 - First Division
 - Percentage between 50 and 59 - Second Division
 - Percentage between 40 and 49 – Third Division
 - Percentage less than 40- Fail

Write a program to calculate and print the total, percentage, division obtained by the student.
8. If the cost price and selling price of an item is input through the keyboard, Write a program to determine whether the seller has made profit or incurred loss. Also determine how much profit he has made or loss he incurred.

Loop

Note: Create following programs by all loops (for, while, do-while)

1. Write a program to perform following operations:
 - a. Print numbers from 1 to n.
 - b. Print all odd and even numbers from 1 to n.
2. Write a program to perform following operations:
 - a. Add and print result from numbers from 1 to n.
 - b. Add and print result of all odd and even numbers from 1 to n individually.
 - c. Multiply and print result from numbers from 1 to n.
 - d. Multiply and print result of all odd and even numbers from 1 to n individually.
3. Write a program to input 5 digit number and perform following operations:
 - a. Print reverse of the given number
 - b. Input 5 digit number and Sum of the digits of the number.
 - c. Sum of the first and last digit of this number.
4. Write a program to perform following operations:
 - a. Generate Fibonacci series up to given number
 - b. Find a factorial of given number
 - c. Find a given number is prime or not
 - d. Input base and power as a number and calculate power of base number
 - e. Print table of a number
 - f. Print all prime number from 1 to 500
 - g. Print all Armstrong numbers from 1 to 500
5. Write a program to perform following operation with matrix (size can be assumed by own).
 - a. Addition of 2 matrixes
 - b. Multiplication of 2 matrixes
 - c. Transpose of a matrix.

6. Write a program to print following pyramids with the help of nested loops:

a.
1
2 2 2
3 3 3 3 3

b.
1
3 3 3
5 5 5 5 5

c.
1
2 4
3 6 9
4 8 12 16

7. Write a program to print following series till user wants:

a. $\frac{1}{2}(x-1)/x + \frac{1}{2}(x-1/x)^2 + \frac{1}{2}(x-1/x)^3 + \dots$

b. $1/! 1 + 2/! 2 + 3/! 3 + \dots$

c. $S = 1 + x + x^2 + x^3 + \dots + x^n$.

d. $S = 1*2 + 2*3 + 3*4 + \dots + n * (n+1)$.

8. If 5 digit number is input through keyboard, then WAP to print a new number by adding one to each digit. For ex. If the input is 12391 then output should be 23402.

Switch

- WAP to enter a character from user, check and print it is vowel or consonant.
- Write a program to create menu for following operators :
 - Arithmetic operator
 - Modulo operator
 - Relational operator
 - Logical operator
 - Bitwise operator
- Design any menu to perform nested switch-case for restaurant.
- Write a program to design a menu
 - For week (0 for Sunday and 6 for Saturday). Take corresponding number between 0-6 and print day according to given number.
 - For year (1 for January and 12 for December). Take corresponding number between 1-12 and print month according to given number.

String

- Write a Program:
 - To print the first letter of your name using special character.
 - Input a character from user and display its ASCII number on screen.
 - Input an ASCII value from user and display its character on screen.
- Write a program to perform following operations with string:
 - Find length of a string given by the user
 - Copy one string in to another string given by the user

- c. Concatenate one string with another string given by the user
- d. Compare one string with another string given by the user
- e. Convert lower case string in to upper case letter given by user
- f. Convert upper case string in to lower case letter given by user
- g. Reverse a string given by user
- h. Count the number of occurrences of a letter in string given by user
- i. Sets all characters of a string to a given character by user
- j. Check input string is palindrome or not
- k. Input a line from the user and print number of spaces present in it.
- l. Input string from the user and count number of upper and lower alphabets in the string.

Array

Notes: You can take assumption for all array size. (Array: 1D, 2D and 3D with Integer, Float and Character)

1. Write a program to enter 10 numbers
 - a. Input a number and search that number in a list of 10 elements. If it is found print message “Number is found” otherwise print message “Number is not found”.
 - b. Count and print total number of odd and even numbers in the list.
 - c. Count and print total number of positive, negative numbers and zeros.
 - d. Print sum of all odd and even numbers individually.
 - e. Print the sum of first and last index element.
 - f. Copy one array into another array.
 - g. Display reverse of array elements.
 - h. Find out total and average of all elements in array.
2. Write a program to read a 3x3 matrix and print it by 2D array.
3. Write a program to read two 3x3 matrix and add them , and store the results in third 3x3 matrix.
4. Write a program to read two 3x3 matrix and multiply them and store result in third matrix.

Function

1. A 5-digit positive integer is entered through the keyboard, write a function to calculate sum of digit of the 5-digit number :
 - i. Without using recursion
 - ii. Using recursion
2. Write a program to perform following operations with recursion
 - i. Sum of first 25 natural numbers.
 - j. Multiply of first 25 natural numbers.
 - k. Factorial of a number

Pointer

Notes: Print all necessary notation of pointer.

1. WAP to implement pointer working. (Pointer pointing to single variable)
2. WAP to implement pointer to pointer concept and print all possible notation of pointer (Pointer pointing to pointer)
3. WAP to implement single pointer pointing to array (1-D, 2-D, 3-D) (scanning

- and printing elements by pointer).
4. WAP to implement double pointer pointing to 2-D array (scanning and printing elements by pointer).

Structure

1. Create a structure to specify data on students given below: Roll number, Name, Department, Course, Year of joining
Assume that there are not more than 450 students in the collage.
 - (a) Write a function to print names of all students who joined in a particular year.
 - (b) Write a function to print the data of a student whose roll number is given.
2. Create a structure to specify data of customers in a bank. The data to be stored is: Account number, Name, Balance in account. Assume maximum of 200 customers in the bank.
 - (a) Write a function to print the Account number and name of each customer with balance below Rs. 100.
 - (b) If a customer request for withdrawal or deposit, it is given in the form: Acct. no, amount, code (1 for deposit, 0 for withdrawal)

Write a program to give a message, "The balance is insufficient for the specified withdrawal".
3. There is a structure called **employee** that holds information like employee code, name, and date of joining. Write a program to create an array of the structure and enter some data into it. Then ask the user to enter current date. Display the names of those employees whose tenure is 3year or more than 3 years, according to the given current date.
4. Write a menu driven program that depicts the working of a library. The menu options should be:
 1. Add book information
 2. Display book information
 3. List all books of given author
 4. List the title of specified book
 5. List the count of books in the library
 6. List the books in the order of accession number
 7. Exit
5. Create a structure called **library** to hold accession number, title of the book, author name, price of the book, and flag indicating whether book is issued or not.

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MCA (6 Years) I SEMESTER
IC-110B: Computer Fundamentals Lab
Assignments**

Assignment-1

Excel Spreadsheets

1.Introduction

Exercise 1.1 – Creating a Spreadsheet

Exercise 1.2 – Changing the look and style

Exercise 1.3 – Adding Formulae

Exercise 1.4 – Adding a Row to a Spreadsheet

Exercise 1.5 – Making a Graph of the Data

Exercise 1.6 – Multiple Sheets

Exercise 1.7 – Dynamic Linking

More Advanced Excel Functions

2. Advanced Word Techniques

Exercise 2.1 – Building a Word Template

Exercise 2.2 – Updating Normal.dot

Exercise 2.3 – Inserting a Table of Contents

Exercise 2.4 – Inserting Cross-References

3.Composite Documents

Exercise 3.1 – Producing a Spreadsheet

Exercise 3.2 – Making a Graph of the Data

Exercise 3.3 – Making a Drawing

Exercise 3.4 – Adding a Picture to the Document

Exercise 3.5 – Adding a Table to the Document

Exercise 3.6 – Adding a Graph to the Document

Exercise 3.7 – Adding an Object

Assignment -2

Ms-Power point presentation

Assignment 1

1. Add new slides at least 75% of the time
2. Enter and edit text in a slide at least 75% of the time
3. Insert a Text Box at least 75% of the time
4. Format the fill and border of a Text Box
5. Change text direction and Text alignments in Text boxes
6. Format text size, font face, color, and bold at least 75% of the time
7. Format Slide background

Assignmnt-2

1. The Learner will be able to:
2. Insert and Format Slide Text
3. Insert Picture from Clip Art at least 75% of the time
4. Format picture using Picture Tools at least 75% of the time
5. Insert an AutoShape

6. Format AutoShape color and lifestyle at least 75% of the time
7. Group and move Objects

Assignment-3

1. Create a new PowerPoint using a Design template
2. Insert and Format pictures from ClipArt or from Files at least 75% of the time
3. Use and modify animations at least 75% of the time
4. Add Sound to Custom Animation Effects
5. Insert slide transitions and modify the timing
6. View the Slide Show at least 75% of the time

Assignment-4

1. Change the View to Slide Master at least 75% of the time
2. Use the Slide Master to change the text formatting at least 75% of the time
3. Add an image to the Slide Master at least 75% of the time
4. Modify the Slide Background
5. Edit the Footer
6. Close the Slide Master and Return to the Normal View at least 75% of the time
7. Add sample text and review the slide design

Assignment-3

MS-Office -Assignment

Assignment -1

1. Format text color, bold, and size at least 75% of the time
2. Insert a file INTO an existing Word document
3. Format text into columns
4. Insert a picture from Clip Art and the Design Gallery Live at least 75% of the time
5. Change text wrapping around a picture at least 75% of the time
6. Apply borders and shading to a whole page using the Format Borders and Shading command

Assignment -2

Working with Pictures

Open a blank Microsoft Word document. You can use Microsoft ClipArt, or Clips Online, to do the following practice exercises.

Insert a picture of a sun or sunset.

Use **Format->Size** to resize the picture to 1.5" wide

Use In-Line **Text Wrapping**

Next to the picture **type**: The weather is great!

Insert a picture of a camera.

Change the Text Wrapping to Tight

Resize the picture to be 2.5 inches tall

Place the picture to the bottom of the page

Insert a picture of a beach.

Format Text Wrapping to Tight

Place the picture into the center of the page

Add a thick BLUE border around the picture

Crop the picture .5 inches from the left

Save your practice document and name it: Beginning Word Practice 2<your name>

Assignment -3

Create a Letter

Example:-Below

Type the company name and address

Open a blank Microsoft Word document. Type the following information:

Indian house Academy,8923 Park dale,New Delhi, BC,V9B 4G9 , 474-5311

Select All of the text and use the Font options to format the type:

Tahoma, 12 point, bold, centered, and dark red

Select the first line of type and make it 14 point.

Insert a Picture from ClipArt

Search for a photo or cartoon of a lighthouse

Select an images and Download it.

Use one of the pictures for a company logo

Resize the picture

Center it above the Company name and address

Insert the Date and Time

Remember, the default Date and Time updates automatically. This option is not appropriate for medical or legal documents that must be date/time stamped, but is fine for this exercise.

Type a sample business letter:

Dear Mr. Chalifour,

Assignment -4

4.1 Create a Resume.

4.2 Dos command practical with Internal and External Commands