

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

MCA (6 Years)

I SEMESTER

JULY-DECEMBER 2012

Sub. Code	Sub. Name	Credit
IC-101	Mathematics-I	4
IC-102	Statistics Methods-I	4
IC-103	Physics-I	4
IC-104	C Programming	4
IC-105	PC Software	4
IC-106	English	4
IC-107	Lab Viva	2
IC-108	Comprehensive Viva	4

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

Review of the basic concepts of calculus: Introduction, concepts of function of one variable, Idea of limit, continuity and differentiability of the function.

UNIT II

Successive differentiation: Successive differentiation, Rolle's Theorem, Mean value theorem, Taylor's theorem, Taylor's and Mac Lauren series, Intermediate forms.

Application of differentiation: Tangents and normals, Curvature, Maxima and Minima of the function sketching of curves (Cartesian and polar form) Asymptotes.

UNIT III

Integration: integration of Rational, irrational, and Transcendental function, Reduction formula, Integral as the limit of the sum, summation of series.

UNIT IV

Partial Differentiation: Partial Differentiation function of several variable, limit continuity and differentiability, partial derivatives, Euler's theorem, Mean value theorem, Taylor's theorem

UNIT V

Maxima and Minima: Maxima and minima of function of two and three variables.

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

Reference Books:

1. Differential Calculus – Shanti Narayan
2. Integral Calculus –Gorakh Prasad
3. Advanced Calculus-R.B. Thakur
4. Calculus For IInd Yr-H.K. Pathak

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES,
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MCA (6 Years) I SEMESTER
IC-102: Statistical Methods-I**

Aim of Course: The aim of this course is to make student aware about the statistical methods, which help them to build their logics.

Objectives:

- Understand basic concepts of statistical methods, probability and distribution.
- Learn to effectively display the information in data sets graphically.
- Provide a curriculum that combines the statistical knowledge in theory, practice and various applications.

Course Contents:

UNIT I

Variable and Graph statistics: Population and sample, Discrete and continuous variables, Graphs. Frequency distributions: Histogram, frequency polygons, cumulative- frequency curve (ogive). Measures of central tendency: the arithmetic mean, weighted arithmetic mean, median, mode, harmonic mean, geometric mean, quartiles, deciles and percentiles.

UNIT II

Measures of dispersion: The range, Semi-interquartile range, Mean deviation, Root mean square deviation, Standard Deviation, Coefficient of variation. Moments, moments of various types, relation between moments. Sheppard's correction of moments. Skewness and Kurtosis.

UNIT III

Elementary probability theory: Sample Space, events. Classical definition of probability, Relative frequency definition of probability. Theorem of total and compound probability, Independent and dependent events. Mutually exclusive events.

UNIT IV

Theoretical Distribution: Discrete and continuous probability distributions. Mathematical expectations, Moment generating functions. Application of degenerate, Bernoulli, Binomial distribution, Geometric, negative binomial, Hyper geometric distribution, Poisson distribution, Normal distribution.

UNIT V

Curve fitting and method of least squares: Curve fitting, fitting of parabola, straight line, Correlation theory, linear correlation, Measures of Correlation, Rank Correlation Regression, properties of regression coefficients Theory of attributes, Consistency of data, Association of attributes, coefficient of association, Contingency tables

Reference Books:

1. S.C. Gupta & V. K. Kapoor: Fundamentals of mathematical statistics, S.Chand sons.
2. Spiegel. M.R. : Statistics Schaum's outline series.
3. A.M.Gun, M.K.Gupta, B.Dasgupta: An outline of statistical theory (volume 1)
4. Kapoor & Saxena: Mathematical statistics. S. Chand and sons.
5. S.P. Gupta : Statistical methods
6. P.N. Arora : Statistics for Management. Shrivastava and Shenoy : Quantitative techniques

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES,
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MCA (6 Years) I SEMESTER
IC-103: Physics-I**

Aim of Course: To make students aware about basic concepts of physics such as circuit elements, resistance, 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

Charge, coulomb's law, electric field Intensity, dipole and quadruple fields. Electric potential, flux of electric field, gauss's law and its applications, steady current, current density non-steady current and continuity equation, Torque on a dipole in uniform electric field

UNIT II

Ohm's law, resistance, factors affecting resistance, colour code, variable resistors, power and energy, Kirchhoff's law and analysis of multiloop circuits, Rise and decay of current in R-L and R-C circuits, decay constants, AC currents RL, RC and LC circuits, series and parallel resonant circuits, Q factor and band width, power consumed in an AC circuit delta – star transformations

UNIT III

Capacitors, factors affecting capacity, type of capacitors, series and parallel connection of capacitors, Dielectrics and dielectric polarization, vector and relation between D,E, & j P, capacity of capacitor when dielectric is filled partially, energy stored in a capacitor, redistribution of charge when two conductors are connected by a conductor wire.

UNIT IV

Electromagnetic Induction, faraday's law, self induction and Mutual inductions Maxwell's displacement current, Maxwell's equations, wave equation satisfied by E & B plane electromagnetic waves in vacuum and in dielectric.

UNIT V

Force on moving charge, Lorentz force and definition of B force on a conductor carrying current in a uniform magnetic field, magnetic dipole moment, angular momentum and gyro-magnetic ratio, Biot and Savart's law calculation of B in simple geometrical situations, Ampere's law, Laplace and Poisson's equation

Reference Books:

1. Basic Electrical circuit Voluem-IB. L.Tharej
2. Resnick and Holiday – Physics part –II
3. Unified physics part –I R.P.Goyal

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES,
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MCA (6 Years) I SEMESTER
IC-104: C Programming**

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

Reference Books:

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

2. C -The Complete Reference, Tata Mcgraw Hill
3. C-How to Program, Deitel & Deitel

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES,
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MCA (6 Years) I SEMESTER
IC-105: PC Software**

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. MSDOS: DOS features, External and Internal Commands, Managing disks, advanced command techniques, working with batch programs. Microsoft Windows and its environment. 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.

UNIT V

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

Reference Books:

1. Introduction to Computer, Alexis Leon
2. Introduction to Information Technology, Alexis Leon
3. Introduction to Computer, Peter Norton's Galgotia Publications

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES,
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IC-106: English**

Aim of Course: The aim of this courses 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

Anthem – Ayn Rand

The Third Wave – Alivn Tofler: First three chapters

UNIT II

Common errors in the use of articles, prepositions, number, pronoun and all parts of speech.
Writing skills: Writing simple paragraphs, Developing a simple data, Writing simple letters and applications

UNIT III

Vocabulary: The knowledge of atleast 50 words. Their meaning, pronunciation and their usages, Synonyms, Antonyms, one word substitution, idioms and phrases, proverbs.

UNIT IV

Imaginative literature: film – Mary Poppins, life is beautiful – The elements of the novel are to be discussed

UNIT V

Poetry recitation: Elegy written in country church yard (for stress , intonation, tone & pitch)
Communication, Elements of good and effective communication, Modes of communication.

Reference Books:

1. Anthem - by Ayn Rand.
2. The Third Wave – by Alwyn Tofler
3. Developing Communication skills – by Krishna Mohan & Meera Banerji
4. Living English Structure by W.S.Allen
5. A Practical English Grammar by Thomson and Mar