

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

MCA (6 Years)

II SEMESTER

JAN 2017 – MAY 2017

| Subject Code | Subject Name | Credits |
|---------------------|---------------------------------------|----------------|
| IC-201 | Mathematics-II | 4 |
| IC-202 | Chemistry and Environmental Science | 4 |
| IC-203 | Basic Electronics | 4 |
| IC-204 | Object Oriented Programming Using C++ | 4 |
| IC-202A | French | 4 |
| IC-210D | Basic Electronics Lab | 2 |
| IC-209C | Object Oriented programming Lab | 2 |
| IC-208 | Comprehensive Viva | 4 |
| Total | | 28 |

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES
DEVI AHILYA UNIVERSITY, INDORE
MCA (6 Years) II SEMESTER
IC-201: Mathematics-II**

Aim of Course: To familiarize the students with advanced mathematical concepts and techniques.

Objectives:

- Understand basic concepts of curve tracing, rectification, groups, cosets, homomorphism and isomorphism.
- Solve mathematical problems based on the course material.
- To develop mathematical skills and methods appropriate for students in the computer science.

Course Contents:

UNIT I

Curve tracing: Introduction, pre-requisites, for the curve tracing, maxima & minima, concavity and convexity of the curve, Singular points, asymptotes, symmetry, tangents, Main points of tracing the curve in Cartesian and polar form, some problems on curve tracing. Improper integral: Improper Integral definition, types of the improper integral, their convergence, Beta Gamma function and their properties, some important deductions followed by some numerical problems

UNIT II

Rectification: Methods and formula for finding out the length of curve in Cartesian and polar form, numerical, intrinsic equation. Derivation of formula for finding the area under plane curve, followed by some problem solving. Multiple integrals: Integration of function of two and three variables. Double and triple integral. Dirichlet integral. Change of order of integration. Use of double and triple integral in finding the area and volumes of Cartesian curves.

UNIT III

Groups and their general properties : Binary Operation, algebraic structure, definition and example of groups, examples. Order of an element in a group. General properties of a group. Modulo System. Subgroup, complex subgroup, definition and examples, algebra of complexes. Criterion for a complex to be a subset of a group. Union and intersection of subgroups. Cyclic group and subgroups generated by a subset of a group. Theorems generating system of a group

UNIT IV

Coset and coset decomposition : Coset definition, properties of cosets. Cosets decomposition. Partitioning of a group. Relation of congruency modulo in subgroups. Lagrange theorem with its corollaries. Index of a subgroup in a group. Fermat and Euler theorems. Multiplication of two subgroups. Order of the product of subgroup of finite order. Normal subgroup & quotient group: Definition, example and theorems on normal subgroup quotient groups. Center and normalize of a group. Conjugate, self-conjugate elements of different groups.

UNIT V

Homomorphism and isomorphism of groups : Definition of homomorphism of groups, examples, various types of homomorphism, auto-homomorphism, inner automorphism, theorem, maximal normal subgroup. Permutation, Transformation

groups and Cayley's thermo.

Matrix : Meaning of matrices, addition, scalar multiplication, product of matrix, adjoint and inverse. Elementary Transformations. Rank of matrix, Normal forms. Application of matrix for solving system of Linear equations.

Text Books:

1. Gorakh Prasad, Integral Calculus.

Reference Books:

1. Shanti Narayan, Differential Calculus.
2. R.B. Thakur, Advanced Calculus.
3. H.K. Pathak, Calculus For IInd Yr.

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES
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MCA (6Years) II SEMESTER
IC-202: Chemistry & Environment Science**

Aim of Course: To make the students familiar with different issues related to Environment Science and Basics of Chemistry

Unit –I High Polymer :

Introduction, types and classification of polymerization, Natural & Synthetic Rubber; Vulcanization of Rubber, Preparation, Properties & uses of the following- Polythene, PVC, PMMA, Teflon, Poly acrylonitrile, Nylon 6, Nylon 6:6, Terylene, Phenol formaldehyde Resin.

Unit –II Energy

Sources of Energy : Renewable & Non Renewable, Fossil fuel, Biomass, Geothermal, Hydrogen, Solar, Wind, hydal, nuclear energy

Unit –III Ecosystem

Segments of Environment : Atmosphere, hydrosphere, Lithosphere, biosphere, Cycles in Ecosystem – Water, Carbon, Nitrogen, Biodiversity: Threats and conservation.

Unit –IV Air Pollution & Sound Pollution -

Air Pollution: Air pollutants, classification, (Primary & secondary Pollutants) Adverse effects of pollutants. Causes of Air pollution chemical, Green house effect, ozone layer depletion, acid Rain.

Sound Pollution: Causes, controlling measures, effects of sound pollution

Unit –V Water Pollution & Sound Pollution -

Water Pollution– Water Pollution: Pollutants in water, adverse effects. Treatment of Domestic & Industrial water effluent.

Society, Ethics & Human values– Impact of waste on society. Solid waste management (Thermal, Plastic, Agriculture, domestic and e-waste). Ethics and moral values, ethical situations, objectives of ethics and its study. Preliminary studies regarding Environmental Protection Acts ,

Text Book:

1. “Energy Environment Ecology and Society” By Dr. Surinder Deshwal Dhanpat Rai Publication

References:

1. Harris, CE, Prichard MS, Rabin’s MJ, “Engineering Ethics”; Cengage Pub.
2. Rana SVS ; “Essentials of Ecology and Environment”; PHI Pub.
3. Raynold, GW “Ethics in information Technology”; Cengage.
4. Svakumar; Energy Environment & Ethics in society; TMH
5. AK De “Environmental Chemistry”; New Age Int. Publ.
6. BK Sharma, “Environmental Chemistry” ; Goel Publ. House.

INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES
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MCA (6 Years) II SEMESTER
IC-203: Basic Electronics

Aim of Course: To introduce students with basic concepts of electronics.

Objectives:

- Understand basic components of circuits.
- Understand the use of diodes as power supply rectifiers.
- Understand the operation of transistors as switching circuits.

Course Contents:

UNIT I

Basic Components: Circuit Symbols, Working Principle, Classification according to construction, Specification, and applications of passive components-Resistors & Color coding, Inductors, Transformers, Switches, Relays (Electromagnetic), Thermistor, LDR, Microphone and Loudspeakers.

UNIT II

Capacitors:- Capacitance, Capacitor Specifications, Classification of Capacitor-Fixed(Mica, Paper, Ceramic, Plastic, Electrolytic etc), Variable capacitor (Trimmer, Padder, Gang), Stray capacitance, Leakage Resistance, Testing of Condenser, Area of Application, Problem related to Electrical Energy Storage.

UNIT III

Semiconductors: Conductors, Semiconductors and Insulators, Classification on the basis of Band Theory, Intrinsic and Extrinsic Semiconductors, Diode current equation (Derivation not required), Drift & Diffusion.

UNIT IV

P-N Junction-Forward and reverse bias of Diode. Concept of recombination of carriers, Temperature variation of Forward and Reverse Current through the P-N Junction. Characteristics of Forward & Reverse Bias Diode, Dynamic and Static Resistances, Voltage dependent Junction Capacitance of a P-N Junction

UNIT V

Special Diodes: Zener Diode, its construction and characteristics, Temperature coefficient of Zener Diode, Zener Diode as Voltage Regulator, Schottky Diode, Power Diode, Tunnel Diode, LED, Solar Cell, Photodiodes.

Text Books:

1. Boylstad, Electronics devices and circuit theory.
2. Milliman J. Halkias C, Integrated electronics

Reference Books:

1. Malvino A.P., Electronics principal
2. B.L. Theraja, Electrical Technology
3. V.K. Mehta Principal of electronics.

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MCA (6 Years) II SEMESTER
IC-205C: Object Oriented Programming Using C++

Aim of Course: The aim of course is to help students to gain a better understanding of OO design and program implementation by using OO language features.

Objectives:

- Understand object-oriented programming features in C++,
- Apply these features to program design and implementation,
- Understand object-oriented concepts and how they are supported by C++,
- Gain some practical experience of C++,
- Understand implementation issues related to object-oriented techniques,
- Build good quality software using object-oriented techniques

Course Contents:

UNIT I

Principle of Object Oriented Programming, Object-Oriented Terminology, OOP Paradigm, Basic concept of OOP, Benefits of OOP, Application of OOP.

Introduction of C++: Tokens, Keywords, Identifier and constants, Operator, Data Type, Variable Manipulator, Expression and Control structure.

UNIT II

Classes and Function in C++ :

Class: Defining Classes in C++, Classes and Encapsulation, Member functions, Instantiating and Using Classes, Access specifiers, Static Class Members.

Constructor and Destructor: Use of Constructors, Multiple Constructors, Types of constructor, Using Destructors to Destroy Instances.

Function: Function Introduction, Main function, Function Prototyping, inline function, friend function.

UNIT III

Inheritance & Polymorphism: Overview of Inheritance, Defining Base and Derived Classes, Constructor and Destructor Calls, Virtual base classes, Abstract classes.

Overview of Polymorphism

Operator & Function Overloading: Operator Overloading, Working with Overloaded Operator Methods, Introduction to Function overloading.

UNIT IV

Pointer and Virtual Function: Introduction of Pointer, Dynamic memory allocation, Pointers to object, this pointer, Pointers to derived classes, Virtual Functions, Pure virtual function.

UNIT V

Working with files in C++, Exceptions Handling and Templates:

Files: Standard Streams, Manipulators, Unformatted Input and Output, File Input and Output.

Exceptions: Basics of Exception handling, Exception handling mechanism.

Templates: Template Overview, Customizing a Template Method, Standard Template Library Containers.

Text Books:

1. The Complete Reference - C++, Tata Mcgraw Hill

Reference Books:

1. E. Balagurusamy, Object-Oriented Programming with C++

2. Yashwant Kanitkar ,Let us C++.

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES
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MCA (6 Years) II SEMESTER
IC-205: French**

Aim of Course

The main aim of this course is to give the students the basic knowledge of French language.

Objectives

- 1.To introduce students with a foreign language-French.
- 2.To make students understand vocabulary and grammar of French language.
- 3.To introduce some aspects of France ,its people and culture.
- 4.To emphasize and develop four linguistics skills.

Course Contents:

Unit I:A spring in Paris

Lesson 1:-Meeting

Lesson 2:-Sympathies

Lesson 3:-Tastes and preferences

Lesson 4:-Agreements and disagreements

Lesson 5:-Surprises

Unit II:Adventure in Bourgogne

Lesson 1:-Countryside house

Lesson 2:-Meals in Broussac

Unit III Grammare

Articles,Nouns Adjectives, Verbs, Interrogatives, Negatives, Conjugations, Present tense

Unit IV Communication

Introduce oneself, Invitation writing and accepting invitation, describe the person

Unit V Vocabulary:

Monuments, public places in Paris, professions, different types of houses, etc

Reference Books:

1.Apprenons le francais 2