

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

M. Tech. (IT) 5 Years

II SEMESTER

JAN 2019 – MAY 2019

Sub. Code	Subject Name	Credit
IT-201	Chemistry and Environment Sciences	4
IT-202	Probability and Statistical Methods	4
IT-203	Digital Computer Organization	4
IT-204	Basic Electronics	4
IT-206B	Programming with C++	4
IT-207B	C++ Programming Lab	2
IT-210C	Basic Electronics Lab	2
IT-208	Comprehensive Viva	4
Total		28

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES
DEVI AHILYA UNIVERSITY, INDORE
M. Tech. (IT) 5 Years II SEMESTER
IT-201: 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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M. Tech. (IT) 5 Years II SEMESTER
IT – 202 :- Probability and Statistical Methods**

Aim of Course : The aim of this course is to make student aware about the Probability and Statistical Methods for research and real life data analysis.

Objectives:

- Understand basic concepts of Probability and Statistical Methods for data analysis.
- Learn Hypothesis testing.
- Learn the application of different tests such as Chi-square, T & F statistic.

Course Contents:

UNIT 1

Theoretical Probability Distributions: Binomial Probability distribution, Poisson Probability distribution, Normal Probability distribution.

Estimation: Unbiased-ness, consistency, efficiency and sufficiency , minimum variance unbiased estimator , Cramer-Rao inequality and its application , Maximum Likelihood estimator.

Testing of Hypothesis, Simple and Composite hypothesis, Test of significance for Samples, Test for single proportion and for difference of proportion. Test of significance for single mean , Test of significance for difference of means.

UNIT II

Interval estimation: Confidence Interval and Confidence limits, Confidence limits for large samples.

Test of significance: Procedure for testing of Hypothesis, Test of significance for large samples, test for single proportion and for difference of proportions, Test of significance for single mean, Test of significance for difference of means.

UNIT III

Test of significance for small samples: Concept of Chi-square, t and F- statistics, Test for Chi-square distribution, to test goodness of fit, to test independence of Attributes, to test the homogeneity of correlation coefficients.

Test based on t- distribution: t-test for single mean, difference of means , paired t-test, t-test for testing significance of an observed sample correlation coefficient.

UNIT IV

Test based on F- distribution: Test for equality of population variance, Test for testing the significance of an observed multiple correlation coefficients.

Non parametric test: sign- test, median test, run test, Wilcoxon signed rank test .

UNIT V

Analysis of variance and design of experiments: One -way and two- way classification with one observation per cell, Design of experiments, completely randomized design randomized block design and Latin square design.

Text Book:

1. S.C. Gupta & V.K. Kapoor : Fundamentals of Mathematical statistics, S. Chand sons.

Reference Books:

1. S.C. Gupta & V.K. Kapoor : Fundamentals of Applied statistics, S. Chand sons.
2. A.M.Gun, M.K.Gupta, B Dasgupta: An outline of statistical theory(Volume 1).
3. Kapoor and Saxena : Mathematical statistics , S. Chand and sons.

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES
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M. Tech. (IT) 5 Years II SEMESTER
IT-203: Digital Computer Organization**

Aim of Course: To make students understand the organization of the computer, and the way the hardware components are connected together to form a computer system, and the development of the hardware for the computer taking into consideration a given set of specifications.

Objectives:

The course is designed to make students:

- Understand the various functional units of CPU.
- Study various units of ALU.
- Understand instruction formats and addressing modes.
- Understand interconnection and interfacing of various units of computer system.

Course Contents:

UNIT I

Introduction to computer organization, Von Neumann Architecture, Computer components, interconnection structures, Bus interconnection.

UNIT II

Input output organization: I/O interface, modes of transfer, Interrupt driven I/O, Priority interrupt, DMA, I/O processor, and serial communication, Synchronous, Asynchronous data transfer, strobe control, handshaking, PCI, Working mechanisms of Peripherals: Keyboard, Mouse, Scanners, Video Displays, Touch Screen panel etc.(features and principles)

UNIT III

Control Unit: Instruction word format, fetch and execution cycle, sequence of operation of control registers, control of arithmetic operations, microprogramming concepts.

UNIT IV

Memory Organization: Memory hierarchy, internal and external memory. Types of memories: ROM: PROM, EPROM, EEPROM, RAM: SRAM, DRAM, High speed memories: Cache memory, Organization and mapping techniques, Virtual memory, secondary storage: Magnetic disk, tape, optical memory, DROM, DVD.

UNIT V

CPU Organization: General register organization, stack organization and accumulator type organization. Instruction formats – three address instruction, two addresses, one address and zero address instructions, Instruction set selection. Addressing modes: - Immediate, direct, indirect, register, indexed etc.

Text Books:

1. Computer Organization and architecture by William Stalling, 8th edition, Prentice Hall of India
2. Computer System Architecture by M. Morris Mano, 3rd edition, Prentice Hall of India

Reference Books:

1. Computer Organization by D A Godse and A P Godse
2. Computer Architecture and Organization by J. P. Hayes, 2nd edition, Tata McGraw-Hill
3. Structured Computer Organization by A. S. Tanenbaum, 3rd edition, Prentice Hall of India

INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES
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M. Tech. (IT) 5 Years II SEMESTER
IT-204: 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

Fundamental Laws and Rules- Introduction, Ohm's law, Kirchhoff's current law (KCL), Kirchhoff's voltage law (KVL), Current division rule, Voltage division rule, Source Transformation, Some more rules about sources, Duality. Star and Delta connection, Star to delta and delta to star conversion.

UNIT II

Basic Components: Circuit Symbols, Working Principle, Classification according to construction, Specification, and applications of passive components-Resistors & Color coding, Inductors, Switches, Relays (Electromagnetic), Thermistor, LDR
Capacitors: - Capacitance, Capacitor Specifications, Classification of Capacitor-Fixed (Mica, Paper, Ceramic, Plastic, Electrolytic etc), Variable capacitor (Trimmer, Padder, Gang), Stray capacitance, Area of Application. Difference between Capacitors, Inductors, and Resistor.

UNIT III

Energy Bands in Solids and Semiconductor: The nature of the atom, Atomic energy level, Electronic structure of the element, the energy band theory of Crystal, Conductors, Semiconductors and Insulators, Classification on the basis of Band Theory, Intrinsic and Extrinsic Semiconductors, Diode.

UNIT IV

Junction Diode Characteristics:

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.

UNIT V

Special Diodes: Zener Diode, its construction and characteristics, Tunnel Diode, Varactor Diode, Schottky Diode, Step Recovery Diode, PIN Diode, Light Emitting Diode, Seven Segment Displays, Photodiode.

UNIT VI

Diode Applications: Introduction load line Analysis, Series diode configurations with DC Inputs, Parallel and Series-Parallel configurations, Half wave rectification, Full-wave rectification, Clippers and Clampers.

UNIT VII

Transistors:-Introduction, NPN and PNP Transistors, Operation on Transistor, Transistor circuit configuration, Current gain of a Transistor, Transistor Characteristics.

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.

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES
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M. Tech. (IT) 5 Years II SEMESTER
IT-206B: Programming with 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++.
3. Robert Lafore, Object Oriented Programming in Turbo C++