



Management Institute of Technology (MIT) Hyderabad

Affiliated with University of Sindh Jamshoro

Course Title:	Programming Fundamental
Course Code:	ITEC-312
Degree Program:	BS(Information Technology) P-I (1st semester)
Course rating:	3 credit hours (Theory)
Pre-requisites:	None

Course Objectives:

This course presents basic programming concepts using the C++ programming language. The organization of standard I/O classes is emphasized. Structured and Object oriented programming techniques are presented and used to design and implement a variety of programming problems.

Syllabus Outline:

Introduction: Object-Oriented Programming, Characteristics of OO Languages, C++ and C.

C++ Programming Basics: Basic Program Construction, Output Using cout, Directives, Comments, Integer Variables, Character Variables, Input with cin, Floating Point Types, Type bool, The setw Manipulator, Variable Type Conversion, Arithmetic Operators, Library Functions

Loops and Decisions: Relational Operators, Loops, Decisions, Logical Operators, Precedence, Other Control Statements.

Structures: Structures, Enumerations

Functions: Simple Functions, Passing Arguments to Functions, Returning Values from Functions, Reference Arguments, Overloaded Functions, Inline Functions, Default Arguments, Variables and Storage Classes, Returning by Reference, const Function Arguments

Objects and Classes: A Simple Class, C++ Objects As Physical Objects, C++ Objects As Data Types, Constructors, Objects as Function Arguments, The Default Copy Constructor, Returning Objects from Functions, Structures and Classes, Objects, Memory, Static Class Data, const and Classes.

Arrays and Strings: Array Fundamentals, Function Declaration with Array Argument, Arrays of Structures, Arrays As Class Member Data, Arrays of Objects, C-Strings, The Standard C++ string Class

Pointers: Addresses and Pointers, The Address-of Operator &, Pointers and Arrays, Pointers and Functions, Sorting Array Elements, Pointers and C-type Strings, Copying a String Using Pointers, Library String Functions, Arrays of Pointers to Strings, Pointers to Objects, Pointers to Pointers, Debugging Pointers

Learning Material/References:

- * **Object-Oriented Programming Using C++, 2nd Edition by Robert Lafore**
- * **Object-Oriented Programming Using C++, 2nd Edition by Ira Pohl**



Management Institute of Technology (MIT) Hyderabad

Affiliated with University of Sindh Jamshoro

Course Title:	Pakistan Studies
Course Code:	PS-303
Degree Program:	BS(Information Technology) P-I (1st semester)
Course rating:	1 credit hours (Theory)
Pre-requisites:	None

Course Objectives:

This course is meant to familiarize the students with the background of Pakistan Movement and history of Pakistan since independence.

Syllabus Outline:

The basic physical features of Pakistan: Location, Mountains, Plateau, Rivers

Climate: Four Seasons, Variation of Temperature, Environment

Social Institutions: Culture and Languages, Geo-Political and Strategic importance of Pakistan, Neighboring Countries, Pakistan's Relation with Central Asian Countries, Pakistan's Importance with reference to Middle East and Central Asian Republics.

Two-Nation Theory: Claim of Muslim being a different national from Hindu based upon cultural diversity, Cultural diversity and threats posed to Muslim's rights and interests led to and justified the demand of Pakistan, Muslim league, Lahore Resolution, Elaborated by Sir Syed Ahmad Khan, Allama Iqbal and Quaid-e-Azam Muhammad Ali Jinnah

Creation of Pakistan: Factors leading to the creation of Pakistan – Economic, Social and Political, Quaid-e-Azam and the demand of Pakistan

Constitutional Development: Semi-Parliamentary phase (1947-58), Ayub and Yahya Era (1958-71), Civilian Rule (1972-77), Zia Era (1977-88), Martial Law Regime (1977-1985), Junejo Government (1985-88), Civilian Rule (1988-99)

Agriculture: Crop pattern, Irrigation system and its limitation, Mechanization of agriculture, Inputs and yields per acre, Water logging and salinity problem, Land holdings, Fisheries, Livestock, Measures needed for improvement.

Industry: Survey of industrial landscape of the country with reference to heavy, medium, small and cottage industries, Contribution of industrial sector to the national economy, Prospects for rapid industrialization

Natural Resources: Size, extent and location of various natural resources like oil, gas, coal, minerals, precious stones etc.

Import and Export: Major categories and dimensions of Pakistan's import and exports.

Other Sources: Income from expatriate Pakistanis and benefits of transferring the money through proper channels.

National Debt Retirement Policy: The magnitude and implications of domestic and foreign aid and loans on national economy, development etc.

Energy: Available and Developed Resources. (Thermal, hydro and nuclear resources), Demand in energy sector, Potential Resources. (Solar, wind mill etc)

Social Issues: Literacy and Education, Population Growth, State of Science & Technology, Prospects for development in Information Technology, Unemployment and under employment, Drug addiction, Weaponization and lawlessness

Learning Material/References:

* **Introduction to Pakistan Studies by M. Ikram Rabbani**

* **Islamization of Pakistan by Afzal Iqbal**



Management Institute of Technology (MIT) Hyderabad

Affiliated with University of Sindh Jamshoro

Course Title:	English Composition and Comprehension
Course Code:	ENG 300
Degree Program:	BS(Information Technology) P-I (1st semester)
Course rating:	3 credit hours (Theory)
Pre-requisites:	None

Course Objective:

The objective of this course is to develop good English writing, language usage and reading skills.

Syllabus Outline:

Reading and Dictionary: Using the Dictionary and Reading for General Meaning

Pronunciation: Using the Dictionary for Pronunciation

Reading for Main Idea: Locating Main Ideas and Topic Sentence, Reading Topic, Main Idea, Identifying Supporting Ideas, Contextual References, References, Connectives and Transitional Words, Locating Information by Scanning, Synonyms and Antonyms, Reading and Vocabulary: Focus on Vocabulary, Word Formation, Suffixes, Word Formation: Prefixes

Reading Description: Locating Information, Organizing Information, Word Forms, Contextual References and Organization, Understanding Reading, Imaginative and Practical Texts, Signposting, Making Inferences

Assessing the Text: Distinguishing Facts from Opinions, Assessing Texts, Imaginative Texts

Evaluating Texts: Interpreting Visual Data, Evaluating Texts, Writer's Tone and Intention, Cloze for Comprehension, Skimming and Scanning for Overall Information, Scanning and Language Functions, Classifying, Cause and Effect, Relationships, Presenting Information Graphically, Flow Charts Writing: Sentence Types, Effective Sentences, Unity, Coherence, Emphasis, Identifying Sentence Errors, Revising Sentence Errors, Verb Agreement, Pronouns, Agreement, Reference, Effective Word Choice, Punctuation, Comma and Apostrophe

Writing Paragraphs: Structural Parts: Topic Sentence, Unity and Coherence, Unity Coherence and Organization.

Essay Writing: Essay Outlines, Selecting and Researching an Essay Topic, Ways of Organizing Texts, Linear, Cycle, Spatial, Classification Paraphrasing and Summary Writing Grammar and Usage: Tenses and Passive Sentences, Word Order, Adverbs, Articles Language Functions: Language Forms and Functions

Learning Material/References:

- * **High School English Grammar And Composition. By- Wren And Martin**
- * **Practical English Composition: Book II. By Edwin L. Miller**



Management Institute of Technology (MIT) Hyderabad

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Course Title:	Basic Electronics
Course Code:	ITEC 310
Degree Program:	BS(Information Technology) P-I (1st semester)
Course rating:	3 credit hours (Theory)
Pre-requisites:	College Level Knowledge of Physics

Course Objectives:

The objective of this course is to enable students to develop an understanding of basic analog and digital electronic elements and principles for computer hardware.

Syllabus Outline:

Semiconductor Theory: Forces, fields and energy, conduction in metals, intrinsic semiconductor, extrinsic semiconductors, variations in the properties of silicon, energy levels, diffusion.

Diodes: The open-circuited PN junction, the biased PN junction, VI characteristics of a diode, static and dynamic resistance, diode models, drift and diffusion currents, transition and diffusion capacitance, reverse recovery time, temperature effects, data sheets.

Diode Applications: Half-wave and full-wave rectification, RC filters, clippers, clampers, AND/OR gates.

Special Purpose Diodes: Zener diode characteristics and applications, Schottky diode, tunnel diode, photodiode, light emitting diodes.

Bipolar Junction Transistor: Transistor construction, operation and characteristics, the EBERS-MOLL representation of the BJT, operating modes, transistor amplifying action, common emitter, collector and base configurations, power ratings and data sheets, energy view point, variation in current gain.

BJT Biasing Circuits: DC load line and operating point, fixed bias, emitter feedback bias, collector-feedback bias, collector and emitter feedback bias, voltage divider bias, two supply emitter bias, design of DC bias circuits, bias stabilization, transistor as a switch.

Transistor Modelling: Transistor hybrid equivalent circuit, the re model, graphical determination of h-parameter.

BJT Small-Signal Analysis: Common emitter amplifier (fixed-bias, voltage divider bias and emitter feedback bias configurations), emitter follower, common base amplifier, collector DC feedback and differential amplifier, collector feedback configuration loading effects, hybrid and re models, amplifier design.

Field-Effect Transistors: General description of FET, construction and characteristics of JFET, JFET transfer characteristics, JFET parameter, MOSFET construction and characteristics, data sheets.

FET Biasing: Fixed bias, self-bias, voltage divider bias, enhancement MOSFET bias circuits, miscellaneous bias circuits, design of bias circuits, JFET analogue switch.

FET Small-Signal Analysis: JFET/Depletion MOSFET small-signal model, common source, common drain and gate amplifiers, loading effects, design of FET amplifier circuits, high frequency effects-Miller capacitance

Learning Material/References:

- * Electronic Principles by A. P. Malvino
- * Electronic Devices and Circuit Theory by Boylestad Nashelsky
- * Microelectronics by Millman Grabel

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Management Institute of Technology (MIT) Hyderabad

Affiliated with University of Sindh Jamshoro

Course Title:	Introduction to Information Technology
Course Code:	ITEC-314
Degree Program:	BS(Information Technology) P-I (1st semester)
Course rating:	2 credit hours (Theory)
Pre-requisites:	None

Course Objectives:

This course provides a general introduction to computer systems with an emphasis on understanding the application of Information Technologies in various areas. The student is introduced to the components of an information system (hardware, software, data and people), and the techniques for implementing these systems (program design and system analysis and design), and the technologies for disseminating these systems (network and internet).

Syllabus Outline:

Introduction: Basic components of computer, processor, memory, storage, I/O devices, software, hardware, firmware, types of computer according to design, size and application, data & information, data processing cycle, the concept of data storage in form of bits, number systems, decimal, binary, octal, hexadecimal; coding schemes: ASCII, BCD and Unicode.

Processors and Memory: CPU, ALU, control unit, memory unit, cache memory, volatile and non-volatile memory, RAM and its types, ROM and its types, flash memory, other types of memory, registers, memory and computing power; internal clock, bus, parallel processing, multitasking and multiprocessing

Software: Business application software, utility programs, personal / application software, entertainment software, desktop publishers, presentation software, system software, operating systems, translators, linkers, debuggers, personal development software, features of software, menu driven interface, graphic user interface (GUI).

Computer Crimes: Piracy, virus, hacking, data theft, hardware theft, invasions of privacy

Input/output Devices: Keyboard, functions of key board, mouse, using the mouse, the inner working of mouse, track ball, joystick, light pen, digitizers, scanner, touch screen, bar code and bar code reader, monitors, CRT image, comparing CRT monitors, video controller, flat panel displays, graphic adopters, printers, impact and non-impact printers (dot matrix, inkjet, laser, thermal printers and plotters)

Secondary Storage Media and Types: Magnetic storage, optical storage, magneto-optical storage devices, floppy disk, types of floppy disk, sector, tracks, disk drives, hard disks, magnetic tape, types of optical storage devices (CD-ROM, CD-Plus, WORM disk, CD-R, DVD), comparison of secondary storage devices with respect to access time, data transfer rate and storage capacitor.

Connecting Devices to the Computer: Expansions buses, slots, and adapter boards, PCMCIA slots and cards, serial and parallel I/O ports, SCSI ports

Networks & Data Communications: Network concepts, advantages and uses of networking, categories, LAN topologies, network media, interface card & protocols, modem and its types, the Internet, email, web.

Learning Material/References:

* **Computers: Information Technology in Perspective, 9/e by Larry Long and Nancy Long, Prentice Hall, 2002/ISBN: 0130929891.**

* **An Invitation to Computer Science, Schneider and Gersting, Brooks/Cole**



Management Institute of Technology (MIT) Hyderabad

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Course Title:	Calculus and Analytical Geometry
Course Code:	ITEC 316
Degree Program:	BS(Information Technology) P-I (1st semester)
Course rating:	3 credit hours (Theory)
Pre-requisites:	College Level Knowledge of Physics

Course Objectives:

The objectives of this course is to enable the students to understand the fundamental principles of the functions, limits and continuity, differential, integral calculus and analytical geometry and use the same as a tool in their field.

Syllabus Outline:

Functions: Concept of function, Algebraic, Trigonometric, Exponential and logarithms functions and their graphs.

Limits & Continuity: Concept and Definition of limit, Techniques for finding limits, Limits involving infinity and continuous functions.

Derivatives: Tangent lines and rates of change, Definition of derivative, Derivatives of algebraic, Composite functions and Chain Rule, Derivatives of Trigonometric, Inverse trigonometric, Exponential, Logarithmic, Hyperbolic, Inverse hyperbolic and Implicit functions.

Application of Derivatives: Related rates, Increasing and decreasing functions, Maxima and minima, Maclaurin's and Taylor's series, In-determinate forms and L-Hospital's Rule. Partial Differentiation: Functions of several variables, Limits and continuity, Partial derivatives, Increment and differentials, Chain Rules, Directional derivatives.

Integrals: Integration as an inverse of differentiation, Techniques of integration i.e. integration by parts, by partial fractions, by substitution, Definite integral and properties of definite integrals.

Applications of the Definite Integral: Area, Solids of revolution, Volume by cross section, Arc length and Surface of Revolution, Moments and Center of mass.

Multiple Integrals: Concept of Double and Triple integrals - Areas and Volume, Surface area, Moments and Center of Mass.

Coordinate Systems and Geometry: Rectangular coordinates in a Plane, Distance between Two Points, Polar Coordinates, Equation for a line in Polar Coordinates, Rectangular Coordinates in Space, Cylindrical Polar Coordinates, Spherical Polar Coordinates, Straight Line, Circle and Conic Sections.

Learning Material/References:

- * **Calculus and Analytical Geometry By Swokowski, Olinick and Pence.**
- * **Calculus, H. Anton, John Wiley and Sons (WIE), ISBN: 0471572608.**
- * **Calculus, William E. Boyce Richard C. Diprima, John Wiley & Sons**