



# Management Institute of Technology (MIT) Hyderabad

Affiliated with University of Sindh Jamshoro

<b>Course Title:</b>	<b>English Technical and Business Writing</b>
<b>Course Code:</b>	<b>ENG 400</b>
<b>Degree Program:</b>	<b>BS(Information Technology) P-II (1st semester)</b>
<b>Course rating:</b>	<b>3 credit hours (Theory)</b>
<b>Pre-requisites:</b>	<b>English Composition and Comprehension</b>

## Course Objectives:

This course is an introduction to technical writing. This course challenges students to demonstrate writing and speaking processes through invention, organization, drafting, revision, editing, and presentation; to define audience and purpose; to employ modes of expression in technical communications; to research and write technical documents and to give oral presentations on technical subject matters.

## Syllabus Outline:

The Principles of Effective Business Writing: Types of business documents: letters, reports, e-mails, facsimiles and minutes.

Avoiding Common Problems: The rules and reasons for grammar - avoiding common pitfalls, Building better sentences - using punctuation to aid understanding, Vocabulary, spelling, jargon and slang, Formal words, proprietary names, copyright.

The Recipient: Focusing on the reader's requirements, Using the right approach - responding to complaints, giving information, getting action, interesting customers etc, Creating an impact - getting and maintaining the reader's attention, The use of 'action words' to inspire positive response and results.

Preparation and Approach: Clearly defining the objectives of the document, Gathering factual information to assist in conveying your message, Organising your thoughts/material logically, Simple structuring.

Styles of Writing and Being Persuasive: A 'reader-friendly' style - compelling openings and positive conclusions, Informative, persuasive or assertive writing, Imaginative use of vocabulary.

Developing Your Style of Business Writing: Overcoming 'word inflation' and cutting out the 'waffle', Writing in a clear, concise and professional business manner, Expressing yourself - conversational and appealing writing, Enhancing your language skills and expanding your vocabulary.

Constructive Self-analysis: Avoiding redundant phrases, unnecessary jargon and clichés, Identifying and correcting grammatical errors, Proof-reading and editing - avoiding time-consuming rewrites.

Personal Development: Progressing your writing skills - introduction to report writing, Refining your skills - learning to get it right first time, Formulating an action plan.

## Learning Material/References:

- \* **Technical Report Writing Today, current edition by Riordan and Pauley.**
- \* **Power Tools for Technical Communication, current edition by McMurrey.**
- \* **Reporting Technical Information, by Heinle. Houp, Pearsall, Tebeaux, Dragga.**



# Management Institute of Technology (MIT) Hyderabad

## Affiliated with University of Sindh Jamshoro

<b>Course Title:</b>	<b>Digital Logic and Computer Architecture</b>
<b>Course Code:</b>	<b>ITEC 410-411</b>
<b>Degree Program:</b>	<b>BS(Information Technology) P-II (1st semester)</b>
<b>Course rating:</b>	<b>3 credit hours (Theory)</b>
<b>Pre-requisites:</b>	<b>Introduction to Information Technology</b>
<b>Course Objectives:</b>	

This course introduces the concept of digital logic, gates and the digital circuits. Further, it focuses on the design and analysis combinational and sequential circuits. It also serves to familiarize the student with the logic design of basic computer hardware components.

### Syllabus Outline:

Number Systems: Representations of Numbers, the Binary Number System, Binary-to-Decimal Conversion, Decimal-to-Binary Conversion, Octal and Hexadecimal Number Systems, Number Base Conversion of Integers, Number Base Conversion of Fractions, Number Base Conversion of Mixed Numbers, Number Base Conversion between Numbers in any Bases, Negative Numbers, Sign and Magnitude Representation, 1's Complement, 2's Complement, Floating Point Representation and Arithmetic.

Binary Logic Gates: AND Gate, OR Gate, Inverter and Buffer, NAND Gate, NOR Gate, XOR and XNOR Gate, Combining Logic Gates.

Simplifying Logic Circuits: Sum of Products Method, Product of Sum Method, De-Morgan's Theorem, NAND Logic Design, NOR Logic Design, Karnaugh Maps, Karnaugh Maps of Three and Four Variables, Multiplexers, De-multiplexers.

Digital Circuits: Logic signals and gates. CMOS logic, CMOS circuits, steady- state electrical behaviour, dynamic electrical behaviour, CMOS input and output structures.

Logic families and interfacing: CMOS logic families, bipolar logic, TTL families, CMOS/TTL interfacing and ECL logic families.

Latches and Flip-Flops: R-S Storage Latches, Clocked R-S Latches, Clocked D Latches, Master Slave R-S and D-Flip-Flop's, Master-Slave J-K, T and T=1 Flip-Flops, Edge-Triggered Flip-Flops, Master-Slave Flip-Flops with Data Lockout, Summary of Flip-Flops Characteristics.

Shift Registers: Serial in Serial Out, Serial in Parallel Out, Parallel in Serial Out, Parallel in Parallel Out, Universal Shift Registers.

Counters: Ripple Counters, Mod 10 Ripple Counters, Synchronous Counters, Counters as Frequency Dividers.

Arithmetic Circuits: Binary Addition, Half Adders, Full Adders, Three Bit Adders, Binary Subtraction, Parallel Subtractors, using Adders for Subtraction, Four Bit Adders/Subtractors, Binary Multiplication, 2's Complement Adder/Subtractors.

Memory Circuits: Random Access Memory, Read Only Memory, Programmable ROM, Introduction to Programmable Logic Devices.

Logic Families: TTL Characteristics, Logic Levels and Noise Margin, CMOS IC's, Interfacing TTL with CMOS and CMOS with TTL.

Coding Circuits: Binary Coded Decimals, BCD to Decimal Decoder, Priority Encoders, BCD to Seven-Segment Decoder.

### Learning Material/References:



# Management Institute of Technology (MIT) Hyderabad

Affiliated with University of Sindh Jamshoro

- \* **Digital Logic Fundamental by R J Tocci**
- \* **Digital Design, 2nd Ed., M. Morris Mano, Prentice Hall, 1991.**

<b>Course Title:</b>	<b>Java Programming</b>
<b>Course Code:</b>	<b>ITEC-412</b>
<b>Degree Program:</b>	<b>BS(Information Technology) P-II (1st semester)</b>
<b>Course rating:</b>	<b>3 credit hours (Theory)</b>
<b>Pre-requisites:</b>	<b>Programming Fundamental</b>

## Course Objectives:

The objective of this course is to learn how to use Object-Oriented techniques to analyze real-world requirements and to design solutions that are ready to code. Students learn how to identify and design objects, classes, and their relationships to each other which include links, associations, and inheritance. A strong emphasis is placed on diagram notation for use cases, class and object representation, links and associations, and object messages.

## Syllabus Outline:

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.

Operator Overloading: Overloading Unary Operators, Overloading Binary Operators, Data Conversion, Pitfalls of Operator Overloading and Conversion, Keywords explicit and mutable.

Inheritance: Derived Class and Base Class, Derived Class Constructors, Overriding Member Functions, Class Hierarchies, Public and Private Inheritance, Levels of Inheritance, Multiple Inheritance, private Derivation in empmult, Ambiguity in Multiple Inheritance, Containership, Classes Within Classes, Inheritance and Program Development.

Virtual Functions: Finding An object's class with typeid(), Virtual Functions, Friend Functions, Static Functions, Assignment and Copy Initialization, The this Pointer, Dynamic Type Information.

Streams and Files: Stream Classes, Stream Errors, Disk File I/O with Streams, File Pointers, Error Handling in File I/O, File I/O with Member Functions, Overloading the Extraction and Insertion Operators, Memory As a Stream Object, Command-Line Arguments, Printer Output.

Multifile Programs: Reasons for Multifile Programs, Creating a Multifile Program, A Very Long Number Class, A High-Rise Elevator Simulation, Designing the System, Listings for elev, Elevator Strategy, A Water-Distribution System, Component Input and Output, Making Connections, Simplifying Assumptions.

Templates and Exceptions: Function Templates, Class Templates, Exceptions.

The Standard Template Library: Introduction to the STL, Algorithms, Sequential Containers, Iterators, Specialized Iterators, Associative Containers, Storing User-Defined Objects, Function Objects

Object-Oriented Design: Our Approach to OOD, The Programming Problem, The CRC Modeling Team, Constructing the CRC Cards, Use Cases, Class Relationships, Class Diagrams, Writing the Program, Interacting with the Program.

## Learning Material/References:

- \* **Object-Oriented Programming in C++ by Robert Lafore**



# Management Institute of Technology (MIT) Hyderabad

Affiliated with University of Sindh Jamshoro

<b>Course Title:</b>	<b>Data Structure and Algorithms</b>
<b>Course Code:</b>	<b>ITEC 414-415</b>
<b>Degree Program:</b>	<b>BS(Information Technology) P-II (1st semester)</b>
<b>Course rating:</b>	<b>3 credit hours (Theory)</b>
<b>Pre-requisites:</b>	<b>Introduction to IT and Programming Fundamentals</b>

## Course Objectives:

The course is designed to teach students about structures and algorithms, which allow them to write programs, which can efficiently manipulate, store, and retrieve data.

## Syllabus Outline:

Introduction to data structures: Arrays, Stacks, Queues, Priority Queues, Linked Lists, Trees, and Graphs, recursion, sorting and searching algorithms, Hashing, Storage and retrieval properties and techniques for the various data structures.

Algorithm Complexity: Polynomial and Intractable Algorithms, Classes of Efficient Algorithms, Divide and Conquer, Dynamic, Greedy. Algorithm Analysis.

Introduction to recursion: Recursive algorithms and their analysis, performance issues of recursive algorithms.

Data Types and Abstract Data Types (ADTs): Common ADTs and their use in Computer Software, Arrays, Using and implementing one dimensional and multidimensional array, The List, Simple Array Implementation of Lists, Linked Lists, Doubly Linked Lists, Circularly Linked List, Stack, Implementation of Stack using array. Implementation of Stack using Linked List, Applications of Stack, Queue, Implementation of Queue, Implementation of Queue using Stack and using Link List and Application of Queues.

Overview of Trees and graphs: Tree Properties, Types of Trees etc, Binary Tree, Traversals and Iterators, Expression Trees, Binary Search Tree, B Trees Overview, Spanning Trees, Hashing, hash functions description. Open Hashing, Closed Hashing, Rehashing, Priority Queues and Binary Heap and their Implementation, Expression Evaluation and Graphs.

Sorting Techniques: Insertion Sort, Shell Sort, Merge Sort, Quick Sort, Radix Sort, etc,

## Learning Material/References:

\* **Data Structures and Algorithms (SAMS teach yourself), Lafore, Sams Publishing, 1999.**



# Management Institute of Technology (MIT) Hyderabad

Affiliated with University of Sindh Jamshoro

<b>Course Title:</b>	<b>Telecommunication Systems</b>
<b>Course Code:</b>	<b>ITEC 416</b>
<b>Degree Program:</b>	<b>BS(Information Technology) P-II (1st semester)</b>
<b>Course rating:</b>	<b>2 credit hours (Theory)</b>
<b>Pre-requisites:</b>	<b>None</b>

## Course Objectives:

To provide a first level exposure to the broad domain of telecommunication Systems.

## Syllabus Outline:

Data and Signals: Analog and Digital Data, Analog and Digital Signals, Periodic and Nonperiodic Signals, Sine Wave, Phase, Wavelength, Time and Frequency Domains, Composite Signals, Bandwidth, Bit Rate, Bit Length, Digital Signal as a Composite Analog Signal, Transmission of Digital Signals, Transmission Impairment, Attenuation, Distortion, Noise.

Data Rate Limits and Performance: Noiseless Channel: Nyquist Bit Rate, Noisy Channel: Shannon Capacity, Using Both Limits, Performance, Bandwidth, Throughput, Latency (Delay), Bandwidth-Delay Product, Jitter.

Digital Transmission: Digital-To-Digital Conversion, Line Coding, Line Coding Schemes, Block Coding, Scrambling, Analog-To-Digital Conversion, Pulse Code Modulation (PCM), Delta Modulation (DM), Transmission Modes, Parallel Transmission, Serial Transmission.

Analog Transmission: Digital-To-Analog Conversion, Aspects Of Digital-To-Analog Conversion, Amplitude Shift Keying, Frequency Shift Keying, Phase Shift Keying, Quadrature Amplitude Modulation, Analog-To-Analog Conversion, Amplitude Modulation, Frequency Modulation, Phase Modulation.

Bandwidth Utilization: Multiplexing, Spreading overview, Frequency-Division Multiplexing, Wavelength-Division Multiplexing, Synchronous Time-Division Multiplexing, Statistical Time-Division Multiplexing, Spread Spectrum, Frequency Hopping Spread Spectrum (FHSS), Direct Sequence Spread Spectrum.

Transmission Media: Guided Media, Twisted-Pair Cable, Coaxial Cable, Fiber-Optic Cable, Unguided Media, Radio Waves, Microwaves, Infrared.

Switching: Circuit-Switched Networks, Circuit-Switched Technology in Telephone Networks, Datagram Networks, Virtual-Circuit Networks, Structure of a switch, Structure Of Circuit Switches, Structure Of Packet Switches.

Telephone Network: Major Components, LATAs, Signaling, Services Provided by Telephone Networks, Dial-up modems, Modem Standards.

Digital Subscriber Line: ADSL, ADSL Lite, HDSL, SDSL, VDSL.

Cable TV Networks: Traditional Cable Networks, Hybrid Fiber-Coaxial (HFC) Network, Cable TV for Data Transfer, Data Transmission Schemes.

## Learning Material/References:

\* **Introduction to telecommunications Network Engineering, 2nd edition, T. Aattalainen, Artech House 2003, ISBN: 1580535003.**



**Management Institute of Technology (MIT) Hyderabad**  
Affiliated with University of Sindh Jamshoro

- \* [Fundamentals of Telecommunication Networks, T. Saadawi, Wiley US.](#)
- \* [Telecommunication Systems, P. G. Fonteolliet, Artech House 1991.](#)