ENG - 201 : English Composition

Module Objectives
This course aims to develop students' skill in oral and written communication in English language.

Contents
Intensive practice to improve listening comprehension for both daily and academic needs: the focus shall be on development of active listening habit and utilizing oral information in a variety of contexts. Grammatical and structural review of English: use of common structure in the English language, review of standard grammatical forms and their application in a variety of writing formats. Reading comprehension: development of reading comprehension proficiency from Information Technology related subject areas.

Detailed Course
Unit 1: LH 6
Orientation on varieties of English, <Am E> and <Br E> + Spoken and written English, Formal and Informal English, Impersonal Style, Polite and Familiar language, Tactful and Tentative Literary, Rhetorical.

Unit 2: LH 6
Intonation: Stressed and Unstressed Syllables / words, Tone Unit, Falling Intonation, Rising and Fall-Rise Intonation.

Unit 3: LH 8

Unit 4: LH 6
Different types of Questions – Positive, Standard, Tag, Negative, WH-word, Polite, Short, Echo. Reported speech, Denial and Affirmation, Agreement and Disagreement. Neutrality, Hypothetical clauses, Putative 'should', Degree of likelihood.

Unit 5: LH 6

Unit 6: LH 8
Unit 7: For essays and comprehension passages, the following passages have been prescribed for practice.

Essays and comprehension passages will be IT related.

- § Computers threatens marriage brokers. - LH 2
- § Computer virus hits Delhi varsity and Much Ado about nothing. - LH 2
- § Computers of the future. - LH 2
- § Employing computers. - LH 2
- § Science fiction. - LH 2
- § Computerization in India. - LH 2
- § Bio-gas plant. - LH 2
- § Mountaineering - LH 1
- § Chernobyl - LH 1
- § Who can you trust. - LH 1
- § Trekking - LH 1
- § Economic Impacts of Information Revolution. - LH 2

Reference
Module Objectives
This module aims to introduce students to the basics of computer and its use and application in real world situations. Students are expected to learn to use the MS Office for word processing, spreadsheet, graphic presentation, and Internet. Laboratory work is essential in this module.

Contents
Introduction to computer system, Programming Language, Computer System development, Multimedia, Network and Communication, Introduction to the Internet, Data Processing and Database, Artificial Intelligence, Computer crime and safety measures.

Detailed Course
Unit 1: Introduction to computer System

1. Introduction to computer
2. Characteristics of computer
   a. Word Length
   b. Speed
   c. Storage
   d. Accuracy
   e. Diligence
3. Types Of computer
   a. Laptop
   b. Desktop
   c. Palmtop
4. Use of Computer
5. Input output device
   a. Input device
      i. Keyboard and its use
      ii. Mouse and its use
      iii. Microphone
   b. Output Device
      i. VDU
         1. CRT and its use
         2. LCD and its use
         3. Plasma and its use
      ii. Printer
         1. Impact
            a. Dot Matrix
         2. Non-Impact
            a. Ink-jet printer
            b. Laser Printer
iii. Speakers
6. CPU(CU, ALU and Registers)
7. Bus and its type
8. Storage
   a. Primary
      i. Cache Memory
      ii. RAM and its type
      iii. ROM and its type
   b. Auxiliary
      i. Magnetic Tape
      ii. Hard Disk
      iii. Pen Drive
      iv. Memory Card
      v. Optical Disk
         1. CD
         2. DVD
         3. Magneto-optical (MO) drives
9. Software
   a. Introduction
   b. System Software
      i. OS
         1. Introduction
         2. Features
      ii. Utility Software
         1. Device Driver
         2. Anti virus
   c. Application Software
      i. Word Processor
      ii. Spread Sheet
      iii. Presentation Tool

Unit 2: Programming Language

1. Machine language and assembly language
2. High-level and low-level language
3. Assemblers, Compilers and Interpreter
4. Problem – Solving and programming
   a. Algorithms
   b. Flow Charts
   c. Three Basic Operations (sequence, selection, iteration)
   d. Procedures and programs
5. Structured Programming
   a. Features
   b. Advantages
6. OOPS
   a. Features
   b. Advantages
7. Scripting Language
   a. Introduction
   b. Client side scripting
   c. Server side scripting

Unit 3: Computer system Development
   1. Investigation
   2. Analysis
   3. Design
   4. Implementation
   5. Documentation

Unit 4: Multimedia
   1. What is multimedia?
   2. Uses of multimedia
   3. Image Quality
   4. Image File Format (TIF, JPEG, GIF)
   5. Animation
   6. Audio

Unit 5: Network and Communication
   1. Overview of Network
   2. Types of Transmission (Data communication and voice communication)
   3. Network topologies (Ring, Bus, Star)
   4. Communication media
      a) Guided
         i) Twisted pair cable
         ii) Coaxial cable
         iii) Optical Fiber
      b) Unguided
         i) Microwave System
         ii) Communication Satellites
   5. Types of Network
      a) LAN
      b) WAN
   6. Network Protocol
      a) TCP/IP

Unit 6: Introduction to the Internet
   1. IP Address and Domain Name System (DNS)
2. Client-Server Architecture
3. Hyper Text Transfer Protocol (HTTP)
4. Electronic Mail (Email)
5. File Transfer Protocol (FTP)
6. World Wide Web (WWW)
7. Remote Login (TELNET)
8. Static and Dynamic web pages
9. Search Engines

**Unit 7: Data Processing and Database**

1. Data Processing
   a) Introduction to Data processing
   b) File Processing
   c) Sequential File processing
   d) Direct-access file processing
2. Database
   a) Introduction to database
   b) E-R diagram (Symbols)
   c) Relation Database
      i) Primary Key
      ii) Foreign Key
3. Data Mining
   a) Introduction To data mining
   b) Uses of Data Mining
4. Data warehouse
   a) Introduction to data warehouse
   b) Use of data warehouse

**Unit 8: Artificial Intelligence**

1. Introduction
2. Application
3. Neural Networks
4. Genetic Algorithms
5. Expert System

**Unit 9: Computer Crime and Safety Measure**

1. Computer Crime
2. Software Piracy
3. Anti Piracy
4. Computer Virus, Worm, Spyware
5. Ethical Issues in Computer
7. Network Security
   a. Firewall
8. Data and message security
   a. Encryption and Decryption

References
Introduction to Computers, Peter Norton's, Tata McGraw-Hill
Data Mining, Pieter Adriaans, Dolf Zantinge, Pearson Education
Foundations of IT------- Atul Kahate------Tata mcGrawhill
Module Objectives
The objective of this subject is to provide the foundation in the core fundamentals of digital technology. After completing this course students will be able to design simple digital devices and implement them. Laboratory work is essential in this module.

Contents

Detailed Course
Unit 1: Number Systems, Operations and Codes
   a. Decimal, Binary, Octal, Hexadecimal Number Systems
   b. Conversion from one number system to another
   c. Complements of Binary Numbers
   d. Addition and Subtraction of Binary Numbers
   e. Digital Codes
   f. Error Detection Codes

Unit 2: Digital Design Fundamentals
   a. Digital and Analog Quantities
   b. Binary Digits, Logic Operations, Logic Levels and Digital Waveforms
   c. Introduction to the System Concept
   d. Logic Gates (Basic Gates, Derived Gates, Universal Gates)
   e. Boolean Algebra and Logic Simplification
   f. Minimizing SOP and POS expression using K-Map (up to 4 variables only)

Unit 3: Functions of Combinational Logic
   a. Adders and Subtractors
   b. Parallel Binary Adders
   c. Multiplexers and Demultiplexers
   d. Encoders and Decoders
   e. Seven segment decoder
   f. Code Converters

After Completion of Chapter 1, 2 and 3:
Student should be able to design circuits like: Arithmetic Unit (Addition, Subtraction) circuit, number system converter circuits, various decision making circuits.

Unit 4: Latches and Flip- Flops
   a. Latches
   b. Edge-Triggered Flip-Flops
   c. Flip-Flop Operating Characteristics
   d. Flip-Flop Application
Unit 5: Counters
a. Asynchronous Counters
b. Synchronous Counters
c. Up/Down Counters
d. Cascaded Counters
e. Counter Applications

Unit 6: Shift Registers
a. Basic Shift Register Operations
b. Shift Register Types
c. Bidirectional Shift Registers
d. Shift Register Counters

Unit 7: Sequential Machine Design
a. State Diagrams and State Tables
b. Design of Synchronous Counters
c. Design of Sequence Recognizer (up to 5 bits)
d. Analysis of Synchronous Circuits

After Completion of Chapter 4, 5, 6 and 7:
Student should be able to design circuits like: digital clock, voting system, counting machine, storage device, traffic control system, frequency division circuits, and analyze circuits.

Unit 8: Memories
a. Basic Memory Operations
b. Types of memories
   i. RAM and ROM (no circuit details)

Unit 9: Programmable Logic Devices
a. Introduction to various programmable devices
   i. PLA
   ii. PAL
   iii. CPLD
   iv. FPGA

Unit 10: Integrated Circuit Technologies
a. Basic Operational Characteristics and Parameters
b. CMOS, TTL, ECL
c. Levels of Integration (SSI, MSI, LSI, VLSI, ULSI)

After Completion of Chapter 8, 9 and 10:
Student should be able to interface with various types of logic families and integrated circuits.

Laboratory Works:
VHDL language should be taught to specify the logic circuits. Instructor should illustrate how VHDL can be used to specify the desired functionality and how CAD tools (eg. Altera Quartus II) provide a mechanism for developing the required circuits. Instructor should assign design projects to each individual using both methodologies: manual design and CAD tools to design logic circuits.

After Completion of Lab Works:
Student can be able to design circuits manually and using CAD tools.

Course Book:
References:


Course Objectives
This module aims to impart the basic management knowledge, and skills to the students so as to enhance their managerial capabilities and enable them to apply in the practical field.

Contents

Detailed Course
Unit 1: Introduction

Unit 2: Perspectives in Management

Unit 3: Planning

Unit 4: Organizing

**Unit 5: Leading**


**Unit 6: Controlling**


**Unit 7: Organizational Change and Development**

Nature, forces, paradigm shifts and areas (structure,technology, business process and behaviors) of organizational change. Resistance to change. Overcoming resistance to change. Concept of Organizational Development, OD intervention.

**Addendum:** At least one case will be administered at the end of each chapter. The students will also complete a project work and a few other assignments as specified by the faculty member.

**References**


Module Objectives
This module aims to provide the students with the basic mathematical skills required to understand management, IT and computing courses.

Course contents

Detailed Course
Unit 1: Set Theory and Real Number System LH 6
Concept, notation and specification of sets, Types of sets, Relation between sets and their Venn diagrams, Operations on sets. Laws of algebra of sets (without proof), Number of elements in a set and the problems relating upto three sets.

Sets of numbers (Natural numbers, Integers, Rational numbers, Irrational numbers, Real numbers), Representation of real numbers on the real line. Properties (addition multiplication, cancellation, distributive, order) of real numbers (without proof), Inequalities and their properties. Intervals, Modulus of a real number and its properties.

Numerical Exercises.

Unit 2: Complex Numbers LH 4
Definition of a complex number, Integral powers of i, Algebra of complex numbers (sum, difference, multiplication, division), Properties of complex numbers, Conjugate of a complex number and its properties, Modulus of a complex number and its properties, Representation of a complex number by a point in a plane (Argand's diagram), Polar representation of a complex number, Square roots of a complex number, DeMoivre's theorem (statement only) and its application to find upto cube roots of a complex number.

Numerical Exercises.

Unit 3: Functions, Limits and Continuity LH 6
Constant and variable, Concept of functions, Types of functions, Graphic representation of algebraic, logarithmic and exponential functions, Computation of functional values, Domain and range of a function. Application of functions to business and economics.

Idea of a limit, Limit of a function at a particular point and at infinity, Properties of limits (without proof) and use in evaluating limits involving algebraic functions.

Concept of continuity and discontinuity, Test of continuity and discontinuity for simple algebraic functions.
Numerical Exercises

Unit 4: Differentiation and Its Application

Average rate of change, Definition of derivative, Derivative as a slope of tangent to the curve, Differentiation by the first principle of algebraic, logarithmic and exponential functions, Methods of differentiation (power rule, sum rule, product rule, quotient rule, chain rule), Differentiation of implicit and parametric functions, Higher order derivatives (upto 3rd order).

Unit 5: Integration and Its Application

Concept of integration, Techniques of integration (Standard forms, Substitution method, Integration by parts), Integration of algebraic, logarithmic and exponential functions. Definite integral, Methods of evaluating definite integrals, Area under a curve, Application of integration in business and economics (including consumer's surplus and producers surplus).

Numerical Exercises

Unit 6: Differential Equations

Introduction: Differential equation: Ordinary differential equation, Order and degree of a differential equation, Solution of a differential equation, General and particular solutions.

Equations of the first order and first degree:
   a) variables separated from
   b) homogeneous equations
   c) linear equations

Numerical Exercises (without involving trigonometric functions).

Unit 7: Vectors

Definition of a vector in a plane and space, Directed line segment, Magnitude of a vector, Types of vectors, Multiplication of a vector by a scalar, Addition of vectors, Parallelogram law of addition of vectors, Collinear and coplanar vectors, Linearly dependent and independent vectors, Scalar product of two vectors, Orthogonal vectors, Vector product of two vectors.

Numerical Exercises

Unit 8: Matrices and Determinants


Solution of a system of non-homogeneous linear equations upto three variables (Cramer's rule, Inverse matrix method, Gaussian elimination method).

Unit 9: Transformation

2D/3D Transformations, Matrix Representation of Transformation, Successive and Composite Transformation
References


Mathematics for Economics, Taro Yamane, Prentice-Hall of India, New Delhi, 2nd Edition (An Elementary Survey)
