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**

Concepts of Nouns – Countable / Mass, Group, Unit, Measure species, Abstraction, etc. (exercise work) Restrictive and Non-Restrictive meaning, Present Tense – State, Event, Habit, Progressive, Temporary habit. Past Tense and Future Tense. Time-when-adverb, Prepositional phrase, Noun phrase + ago, Adverbial Clause. Place – Adverb, Prepositional phrase, Noun Phrase + away, adverbial clause. Manner, Means Instrument, Role, Standard, Viewpoint, Conditional Sentences, Open and Hypothetical Conditions.

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**

Interjections, Intensifying Adverbs, Negative Sentences, Exclamatory and Rhetorical Sentences. Emotions – Hope, Anticipation, Regret, Approval, Disapproval, Surprise, Concern and Volition. Permission and Obligation, Prohibition. Influencing People and Friendly Communication.

Unit 6: **LH 8**

Linking signals, Participle and Verbless clauses, Substitution and Omission. Main and Subsidiary Information, Fronted Topic, Inversion, Cleft Sentences, Postponement.

Unit 7: **LH 20**

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

J.G. Leech, ***Communicative Grammar of English.***

ITC – 211: Computers Information System (CIS)

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 **LH 13**

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. Micro phone
    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 Processer
        ii. Spread Sheet
        iii. Presentation Tool

Unit 2: Programming Language **LH 6**

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 **LH 4**

1. Investigation
2. Analysis
3. Design
4. Implementation
5. Documentation

Unit 4: Multimedia **LH 2**

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 **LH 4**

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 **LH 4**

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 **LH 5**

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 **LH 3**

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

Unit 9: Computer Crime and Safety Measure **LH 4**

1. Computer Crime
2. Software Piracy
3. Anti Piracy
4. Computer Virus, Worm, Spyware
5. Ethical Issues in Computer
6. Cyber Law.
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, Dolft Zantinge, Pearson Education
Foundations of IT--------- Atul Kahate-------Tata mcGrawhill

Digital Logic Design

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

Number System, Digital Design Fundamentals, Understand and Design Functions of Combinational Logic, Sequential Logic (Counters, Registers and Finite State Machine), Memories, Programmable Logic Devices, Integrated Circuit Technologies, VHDL language and Design using manual techniques and CAD tools.

Detailed Course

Unit 1: Number Systems, Operations and Codes **LH 5**

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 **LH 8**

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 **LH 7**

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 **LH 4**

a. Latches
b. Edge-Triggered Flip-Flops
c. Flip-Flop Operating Characteristics
d. Flip-Flop Application

Unit 5: Counters **LH 5**

a. Asynchronous Counters
b. Synchronous Counters
c. Up/Down Counters
d. Cascaded Counters
e. Counter Applications

Unit 6: Shift Registers **LH 5**

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

Unit 7: Sequential Machine Design **LH 6**

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 **LH 1**

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

Unit 9: Programmable Logic Devices **LH 2**

a. Introduction to various programmable devices
   i. PLA
   ii. PAL
   iii. CPLD
   iv. FPGA

Unit 10: Integrated Circuit Technologies **LH 2**

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 able to design circuits manually and using CAD tools.

Course Book:

- Floyd T. L., ***Digital Fundamentals***, 10th edition, Pearson

References:

- Brown S. and Vranesic Z., ***Fundamentals of Digital Logic with VHDL Design***, 3rd edition, Mc Graw Hill
- Rafiquzzaman M., ***Fundamentals of Digital Logic and Microcomputer Design,*** 5th edition, John Wiley & Sons, Inc.
- Holdsworth B. and Woods C., ***Digital Logic Design,*** 4th edition
- Mano M.M, ***Digital Design***, 3rd edition
- Mano M. M, Kime C. R , ***Logic and computer design fundamentals***, 2nd edition

MGT - 201 : Principles of Management

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

Concepts and functions of management. Management perspective. Planning: meaning, classification, steps and tools. Planning premises. Decision making: meaning, types, conditions and process. Organizing: meaning, process, principles, and architecture. Authority and responsibility. Centralization, delegation and decentralization. Staffing. Emerging issues in organizing. Leading: meaning, qualities and styles. Individual differences and psychological contract. Introduction to groups. Concept of managerial ethics. Motivation: concept and techniques. Communication: meaning, process, types and barriers. Controlling: meaning, process and techniques. Quality. Organizational change and development and Operation and technology management. .

Detailed Course

Unit 1: Introduction **LH 4**

Management: concepts, meaning, essence, levels and functions. Types of managers. Managerial roles and skills. Becoming a manager: role of education, experience and situation. Business environment and society-external environment, corporate social responsibility, ethics, corporate governance and ethical standards.

Unit 2: Perspectives in Management **LH 8**

Early development. Classical Perspective: scientific management, administrative management and bureaucracy. Behavioral Perspective: Hawthorne studies, human relations movement, and emergence of organizational behavior. Quantitative Perspective: management science and operations management. Integrating perspectives: systems and contingency perspectives. Emerging management issues and challenges.

Unit 3: Planning **LH 7**

Meaning. Levels of Planning: Strategic, Tactical and operational. Steps in Planning. Tools for planning. Planning premises. Pitfalls of planning. Improving planning. Decision Making: meaning, types and process. Decision making conditions – certainty, risk and uncertainty. Practical excercises on taking decisions including decision making using indicators.

Unit 4: Organizing **LH 8**

Meaning, process and principles of organizing. Organization Architecture: vertical differentiation – tall versus flat hierarchies, horizontal differentiation – functional structure, multidivisional structure, geographic structure, and matrix structure. Responsibility: establishing task and reporting relationships, creating accountability**.** Authority: line authority and staff authority. Delegation of

authority. Centralization, Decentralization and Devolution: meaning, reasons, advantages and disadvantages. Emerging issues in organization design. Staffing: concept and importance.

Unit 5: Leading **LH 7**

Meaning and qualities of leadership. Understanding Individual differences and psychological contract. Concept and types of groups. Leadership Styles: autocratic, democratic, and participative. Concept of managerial ethics. Motivation: concept, importance, and techniques. Communication: meaning, process, and networks. Concept of active listening. Types of communication, Barriers to effective communication.

Unit 6: Controlling **LH 10**

Meaning, purpose, Process and types of controls. Essentials of effective control systems. Control tools and techniques. Quality: Concept and importance. Total Quality Management: concept, components, principles, tools and techniques. Emerging issues in quality management. Production and operation management, supply chain management, Kaizen, six sigma, The Japanese 5S practice, Technology management, Management information system and IT.

Unit 7: Organizational Change and Development **LH 4**

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

Adhikari, Dev Raj. ***Principles of Management***, Sunrise Publication, Kathmandu.

Charles W.L. Hill and Steven L. McShane, ***Principles of Management,*** Tata Mc-Graw-Hill Company, New Delhi.

Griffin, Ricky W., ***Management.*** AITBS Publishers and Distributors, New Delhi.

Hitt, M.A., J.S. Black and Porter, L.W., ***Management,*** Pearson Education, New Delhi.

Pant, Prem Raj, ***Principles of Management,*** Buddha Academic Publishers and Distributors Pvt. Ltd.

Paudyal, Santosh Raj, Pradhan, Gopal Man and Bhandari, Kedar P. (2064), ***Principles of Management,*** Asmita Publication, Kathmandu.

MTH - 201 : Basic Mathematics

Module Objectives

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

Course contents

Numbers and their properties. Algebraic representation. Operations with rational expressions including polynomials. Algebraic and graphic methods for solving linear and quadratic equations. Introduction to complex numbers, exponents and radical expressions. Differential Equations. Concept of vectors and matrices.

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 **LH 9**

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 3^{rd} order).

Unit 5: Integration and Its Application **LH 6**

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 **LH 6**

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 **LH 5**

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 **LH 8**

Introduction of matrices, Types of matrices, Equality of matrices, Algebra of matrices, Transpose of a matrix. Determinant of a matrix, Minors and cofactors of matrix, Properties of determinants (without proof) and some simple problems. Singular and non-singular matrix, Adjoint and inverse of matrices.

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

Unit 9: Transformation **LH**

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

References

Computer Graphics, Hearn and Baker, Prentice Hill, 2nd Edition.

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

Calculus with Analytic Geometry, George B. Thomas and Ross L Finney, Addison – Wesley, 9th Edition.

Basic Mathematics – B.C. Bajracharya, M.K. Publishers.