

## **SEMESTER-VIII**

### **MULTIMEDIA TECHNOLOGY(IT 7107)**

Introduction to Multimedia: Concepts, uses of multimedia, hypertext and hypermedia.; Image, video and audio standards. (7L)

Audio: digital audio, MIDI, processing sound, sampling, compression. (7L)

Video: MPEG compression standards, compression through spatial and temporal redundancy, inter-frame and intra-frame compression . (8L)

Animation: types, techniques, key frame animation, utility, morphing. (8L)

Virtual Reality concepts.

Windows concepts and terminology, key elements Creating the look, communication via messages, windows resources and functions, adding multimedia and sound resources.

Writing windows applications, taking control of windows, adding menus, dialog boxes (10L)

## **E-COMMERCE & SECURITY(CS 8117)**

Introduction to E-Commerce : Definition, Scope of E-Commerce, Hardware

requirements, E-Commerce and Trade Cycle, Electronic Markets, Electronic Data

Interchange and Internet Commerce. (6L)

Business to Business E-Commerce : Electronic Markets, Electronic Data Interchange

(EDI): Technology, Standards (UN/EDIFACT), Communications, Implementations,

Agreements, Security, EDI and Business, Inter-Organizational E-commerce. (8L)

Legal issues : Risks: Paper Document vs. Electronic document, Authentication of

Electronic document, Laws, Legal issues for Internet Commerce: Trademarks and Domain

names, Copyright, Jurisdiction issues, Service provider liability, Enforceable online contract. (8L)

Security Issues : Security Solutions: Symmetric and Asymmetric Cryptosystems, RSA,

DES, and Digital Signature, Protocols for secure messaging, Secure Electronic Transaction

(SET) Protocol, Electronic cash over internet, Internet Security. (12L)

Business to Consumer E-Commerce : Consumer trade transaction, Internet, Page on the

Web, Elements of E-Commerce with VB, ASP, SQL. (6L)

E-business : Internet bookshops, Software supplies and support, Electronic Newspapers,

Internet Banking, Virtual Auctions, Online Share Dealing, Gambling on the net, E-Diversity,

Case studies through internet. (8L)

## **FINANCIAL MANAGEMENT & ACCOUNTING (CS 8118)**

Introduction (6L)  
Financial Management, Financial Planning and Capitalization- definitions, objectives, changing roles and functions, Financial Decision.

Capital Budgeting  
Nature of Investment decision, Importance of Capital Budgeting, The Capital. Budgeting (8L)  
Process - Investment Criterion, Pay-back period, Accounting, ROR (Rate of Return) Method,  
Discounting Cash flow method, Net – present value method, IRR (Internal Rate of Return) method, The benefit-Cost Ratio method.

Management of Working Capital (6L)  
Various concepts, Elements, Classification, Financing and importance of working capital,  
Investment analysis, Cash flow determination, cost of capital, capital budgeting methods.

Budgeting Control Technique (7L)  
Concepts of Budget, budgeting and budgetary control, Objectives, Functions, Uses,  
Advantages, Limitations; Master Budget and Report.

Cost – Volume – Profit Analysis (8L)  
Classification of costs, Allocation, apportionment and absorption, Cost centers, different costing systems, Cost analysis for managerial decisions, Meaning of Linear CVP analysis,  
Objectives, Assumptions, Break – Even analysis, determining the Break-Even point profit,  
Volume graph profit, Volume ratios margin of Safety.

Introduction to Accounting (8L)  
Basic accounting concepts, important definitions, uses, limitations, advantages; types of Accounting, Financial statements, introduction to Journal Accounting; different types of Vouchers, double entry bookkeeping, different types of transactions related to Financial Accounting.

Financial Control

(3L)

Posting of Ledgers and preparation of Trial Balance; preparation of Balance Sheet and Profit and Loss Accounts; Controlling other departments by Financial Accounting (A practical Approach).

## **ELECTIVES III, IV & V**

### **NATURAL LANGUAGE PROCESSING (CS 8119)**

Introduction to NLP

Definition, issues and strategies, application domain, tools for NLP,

Linguistic organisation of

NLP, NLP vs PLP.

Word Classes

Review of Regular Expressions, CFG and different parsing techniques

Morphology: Inflectional, derivational, parsing and parsing with FST,

Combinational Rules

Phonology: Speech sounds, phonetic transcription, phoneme and phonological rules, optimality

theory, machine learning of phonological rules, phonological aspects of prosody and speech

synthesis.

Pronunciation, Spelling and N-grams: Spelling errors, detection and elimination using

probabilistic models, pronunciation variation (lexical, allophonic, dialect), decision tree model,

counting words in Corpora, simple N-grams, smoothing (Add One, Written-Bell, Good-Turing),

N-grams for spelling and pronunciation.

Syntax

POS Tagging: Tagsets, concept of HMM tagger, rule based and stochastic POST, algorithm

for HMM tagging, transformation based tagging

Sentence level construction & unification: Noun phrase, co-ordination, sub-categorization,

concept of feature structure and unification.

Semantics

Representing Meaning: Unambiguous representation, canonical form, expressiveness,

meaning structure of language, basics of FOPC

Semantic Analysis: Syntax driven, attachment & integration, robustness

Lexical Semantics: Lexemes (homonymy, polysemy, synonymy, hyponymy), WordNet, internal structure of words, metaphor and metonymy and their computational approaches

Word Sense Disambiguation: Selectional restriction based, machine learning based and dictionary based approaches.

Pragmatics :

Discourse: Reference resolution and phenomena, syntactic and semantic constraints on

Coreference, pronoun resolution algorithm, text coherence, discourse structure

Dialogues: Turns and utterances, grounding, dialogue acts and structures

Natural Language Generation: Introduction to language generation, architecture, discourse planning (text schemata, rhetorical relations).

# MANAGEMENT INFORMATION SYSTEM (IT 7106)

## 1. Introduction

Definition of management, its definition, purpose, elements of science, patterns of management analysis.

Functions of managers. (2L)

## 2. People & organization.

People: psychological factors, worker's skill & abilities.

Organization: Organizational characteristics, Organizational behavior, corporate

culture, power inter-group conflict, intra-group dynamics, the MIS function in

organization, MIS personal, computer operation personal, MIS management. (4L)

## 3. System & models.

System: components of a system, environment, open Vs Closed systems.

Models: modeling systems general vs specific models, levels of models, types of

models. Models of organizational systems. A general model of organization and its

internal environment. Strategic planning models. (3L)

## 4. Management & decision making

Management: labels of management, managerial role, planning & control, Managerial styles,

Managerial decision making: characteristics of types of decision (4L)

## 5. Decision making process.

Intelligence, design, soln evaluation & choice. (2L)

## 6. Evaluating decision making.

Effectiveness vs efficiency (2L)

## 7. Transaction processing & management reporting systems.

A management information systems frame work:

----- Transaction processing framework

----- Management reporting system

----- Decision support system.

----- Knowledge based systems

----- Office systems (3L)

## 8. Transaction processing.

- nature

- function
- role of IT in transaction processing
- processing cycles
- Transaction processing subsystem. (3L)

#### 9. Management reporting system.

Evaluation of management reporting system, types of reports, structuring report content. (2L)

#### 10. Decision support system (DSS).

Component of DSS

DSS development

DSS products

DSS development tools

User interfaces

Executive information system (EIS)

Executive roles & decision making.

Executive decision making environment (3L)

#### 11. MIS in the functional areas of business.

Financial information system,

Marketing MIS

Manufacturing MIS (3L)

#### 12. Enterprise resource planning

Materials Requirement planning (MRP)

Closed loop MRP

Manufacturing Resource Planning (MRP – II)

ENTERPRISE RESOURCE PLANNING

Functional architecture of ERP

Benefits of ERP

Business Process Reengineering and ERP

ERP implementation (4L)

#### 13. Supply chain management

Introduction

Definition of SCM

Features of SCM

SCM Stages (3L)

#### 14. Cases in MIS

Case study method

Analytical Case



Issue Case

Written Case Analysis Illustrations (4L)

## **ENTERPRISE RESOURCE PLANNING (EC 8124)**

1. Electronic Commerce : Overview, Definitions, Advantages & Disadvantages of E

– Commerce, Threats of E – Commerce, Managerial Prospective, Rules & Regulations For Controlling E – Commerce, Cyber Laws. (3L)

2. Technologies : Relationship Between E – Commerce & Networking, Different

Types of Networking For

E – Commerce, Internet, Intranet & Extranet, EDI Systems (3L)

Wireless Application Protocol : Definition, Hand Held Devices, Mobility &

Commerce, Mobile Computing, Wireless Web, Web Security, Infrastructure

Requirement For E – Commerce . (4L)

3. Business Models of e – commerce : Model Based On Transaction Type, Model

Based On Transaction Party - B2B, B2C, C2B, C2C, E – Governance.

(4L)

4. E – strategy : Overview, Strategic Methods for developing E – commerce.

(2L)

5. Four C's : ( Convergence, Collaborative Computing, Content Management & Call

Center ). (5L)

Convergence : Technological Advances in Convergence – Types, Convergence and

its implications, Convergence & Electronic Commerce.

Collaborative Computing : Collaborative product development, contract as per

CAD, Simultaneous Collaboration, Security.

Content Management : Definition of content, Authoring Tools & Content Management, Content – partnership, repositories, convergence, providers, Web

Traffic & Traffic Management ; Content Marketing.

Call Center : Definition, Need, Tasks Handled, Mode of Operation, Equipment , Strength & Weaknesses of Call Center, Customer Premises Equipment (CPE).

6. Supply Chain Management : E – logistics, Supply Chain Portal, Supply Chain

Planning Tools (SCP Tools), Supply Chain Execution (SCE), SCE - Framework,

Internet's effect on Supply Chain Power. (2L)

7. E – Payment Mechanism : Payment through card system, E – Cheque, E – Cash,

E – Payment Threats & Protections. (2L)

8. E – Marketing :. Home –shopping, E-Marketing, Tele-marketing

[[[[[[[[ (2L)

9. Electronic Data Interchange (EDI) : Meaning, Benefits, Concepts, Application,

EDI Model, Protocols (UN EDI FACT / GTDI, ANSI X – 12), Data Encryption

(DES / RSA). (4L)

10. Risk of E – Commerce : Overview, Security for E – Commerce, Security

Standards, Firewall, Cryptography, Key Management, Password Systems, Digital

certificates, Digital signatures. (4L)

11. Enterprise Resource Planning (ERP) : Features, capabilities and Overview of

Commercial Software, re-engineering work processes for IT applications, Business Process

Redesign, Knowledge engineering and data warehouse .

Business Modules: Finance, Manufacturing (Production), Human Resources, Plant

Maintenance,

Materials Management, Quality Management, Sales&Distribution ERPPackage,

ERP Market: ERP Market Place, SAP AG, PeopleSoft, BAAN, JD Edwards,

Oracle Corporation

ERP-Present and Future: Enterprise Application Integration (EAI), ERP and



## **WIRELESS COMMUNICATION (EC 7112)**

Introduction to Wireless Communication Systems – evolution of mobile radio

communications, mobile radio systems around the world, radio communication

systems – paging systems, cordless telephone systems, cellular telephone systems; comparison of common wireless communications, trends in cellular

radio and personal communication, second generation (2G) cellular networks,

third generation (3G) wireless networks, introduction to radio wave propagation,

free space propagation model

Basics of mobile communication – Limitations of conventional mobile system,

mobile cellular communication – introduction, concept of frequency reuse, cluster size, cellular system architecture – mobile station, base station, MSC,

channel assignment strategies, call handover strategies, interference and system

capacity, improving capacity in cellular systems – cell splitting, sectoring, repeaters, microcell zone concept.

Global system for mobile communication – GSM services and features, system

architecture, GSM radio subsystem, GSM channel types, location updating and

call setup, introduction to CDMA digital cellular standard, comparison between

GSM and CDMA.

Wireless networking – wireless local area network standards, technology – RF

and IR wireless LAN, diffuse, quasi-diffuse and point-to-point IR wireless LAN,

advantages and applications of Wireless LAN, introduction to WI-FI, Bluetooth,

3G and 4G wireless systems  
**FIBER NETWORKS (EC 8125)**

Introduction: - Basics of Optical bench, Fibre–end preparation of fibre ends,  
launching mechanism of light into fibre end, coupling of light into detector.

Measuring Instruments: - Lock-in-Amplifier, Monochromator, Infrared viewer,  
Optical Spectrum Analyser, OTDR.

Multi-mode fibre: – Parameters for characterisation, Steady-State Power distribution, mode stripper.

Measurements of attenuation: - Loss Mechanisms in Fibre, Calorimetric Method,  
Absorption & Scattering losses, Differential mode attenuation, Cut-Back method,  
OTDR techniques; Numerical Aperture- trigonometric & Scanning methods.

Refractive Index Profile: - Reflection method, Near Field Scanning, Refracted Near  
Field methods, Interferometric Slab technique

Dispersion Measurements: - Time-Domain Method & Frequency Domain Method

Geometrical Measurements: - diameter, deformation, eccentricity, ellipticity.

Single–mode Fibre: – Mode Cut-Off wavelength, Mode-field Diameter, Equivalent

Step-Index (ESI) Profile, Dispersion, Birefringence Measurement

Mechanical Strength of Optical Fibre

International Standards for Measurements: World Bodies, RTM, ATM, Recommendations

## **COMPUTER VISION (CS 7118)**

Discrete geometry & quantization

Length estimations

Automated visual inspection

Object recognition & matching

Depth perception problems

Stereo geometry & correspondence

Motion analysis

Optical flow

Application of computer vision

Remote sensing

Bio-medical imaging

Document processing

Target tracking

## **INTERNET TECHNOLOGY (IT 7108)**

An Overview on Internet (8L)

The need for an Internet, The TCP/IP Internet, Internet services, Internet protocols and standardization, Review of Network technologies.

Internetworking Concept (8L)

Architectural model introduction, Application level interconnection, Network level

interconnection, Properties of the Internet, Internet Architecture, Interconnection through IP

Gateways or routers, Internet and Intranet.

Internet Address (7L)

Introduction, Universal identifiers, Three primary classes of IP addresses, Classless IP

address, Network and Broadcast addresses, Mapping internet addresses to physical addresses

(ARP), ARP protocol format, Transport Gateways and subnet addressing, Multicast addressing.

Internet Protocol (6L)

Internet Architecture and Philosophy, The concept of unreliable delivery, Connectionless

delivery system, The Internet Datagram, Routing direct and indirect delivery, Table driven IP

routing, Protocol layering, Reliable stream transport, TCP performance, Bootstrap protocol (BOOTP).

Routing (6L)

The origin of Gateway routing tables, Original Internet Architecture and Cores, Core

Gateways, Automatic route propagation, Vector distance (Bellman-Ford), routing, Gateway

to Gateway Protocol (GGP), Autonomous system concept, Exterior Gateway Protocol (EGP),

Interior Gateway Protocol (RIP, OSPF, HELLO), Routing Information Protocol (RIP),

Combining RIP, HELLO, and EGP, Routing with partial information.

Enterprise Networking (6L)

Corporate networking, Broadband at the Metropolitan area level, High speed dedicated WAN services and switched WAN services, ISDN, BISDN and ATM services, Frame relay technology and services, Virtual private network concepts PPTP protocol.

Internet Servers (2L)

DNS, DHCP Servers, FTP, TELNET, E-Mail

Firewall & Networking (3L)

Introduction, Implementation of Firewall, Activities of Firewall, Configuration of firewall, Firewalls & SSL, SSL implementation, Bit implementation of SSL, Use of SSL.



## **REAL TIME & EMBEDDED SYSTEM (EC 7113)**

Introduction-defining Real time systems,Embedded Real Time Systems,Special

Characteristics of real time systems,a brief evolutionary history.

Hardware Architectures of Real Time systems.

Software architectures(concepts of interrupt driven activation,need for real time

monitor,pseudo parallelism),meeting of dead lines & real time constraints.

Overview of WARD & MELLOR Methodology: Ward & Mellor Life Cycle,the essential

model step,the implementation model,real time extensions of DFD

Real time languages: overview of ADA/Java Extension

Real time Operating Systems .

System Development Methodologies.

## **BIO INFORMATICS (IT 8110)**

Introduction to Genomic data and Data Organization: Sequence Data Banks – Introduction to sequence data banks – protein sequence data bank. NBRF-PIR, SWISSPROT, Signal peptide data bank, Nucleic acid sequence data bank – GenBank, EMBL nucleotide sequence data bank, AIDS virus sequence data bank. RRNA data bank, structural data banks – protein Data Bank (PDB), The Cambridge Structural Database (CSD) : Genome data bank – Metabolic pathway data : Microbial and Cellular Data Banks. Introduction to MSDN (Microbial Strain Data Network): Numerical Coding Systems of Microbes, Hybridoma Data Bank Structure, Virus Information System Cell line information system; other important Data banks in the area of Biotechnology/life sciences/biodiversity. Sequence analysis: Analysis Tools for Sequence Data Banks; Pair wise alignment - NEEDLEMAN and Wunsch algorithm, Smith Waterman, BLAST, FASTA algorithms to analyze sequence data: Sequence patterns motifs and profiles. Secondary Structure predictions; prediction algorithms; Chao-Fasman algorithm, Hidden-Markov model, Neural Networking. Tertiary Structure predictions; prediction algorithms; Chao-Fasman algorithm, Hidden-Markov model, Neural Networking. Applications in Biotechnology: Protein classifications, Fold libraries, Protein structure prediction: Fold recognition (threading), Protein structure predictions : Comparative modeling (Homology), Advanced topics: Protein folding, Protein-ligand interactions, Molecular Modeling & Dynamics, Drug Designing.

## **INFORMATION & CODING THEORY(CS 8121)**

### Source Coding

Uncertainty and information, average mutual information and entropy, information measures

for continuous random variables, source coding theorem, Huffman codes.

### Channel Capacity And Coding

Channel models, channel capacity, channel coding, information capacity theorem, The

Shannon limit.

### Linear And Block Codes For Error Correction

Matrix description of linear block codes, equivalent codes, parity check matrix, decoding of a

linear block code, perfect codes, Hamming codes.

### Cyclic Codes

Polynomials, division algorithm for polynomials, a method for generating cyclic codes,

matrix description of cyclic codes, Golay codes.

### BCH Codes

Primitive elements, minimal polynomials, generator polynomials in terms of minimal

polynomials, examples of BCH codes.

### Convolutional Codes

Tree codes, trellis codes, polynomial description of convolutional codes, distance notions for

convolutional codes, the generating function, matrix representation of convolutional codes,

decoding of convolutional codes, distance and performance bounds for convolutional codes,

examples of convolutional codes, Turbo codes, Turbo decoding.

## **VALUES & ETHICS OF PROFESSION (IT 6105)**

Science, Technology and Engineering as knowledge and as Social and Professional Activities (2L)

Effects of Technological Growth (15L)

Rapid Technological growth and depletion of resources, Reports of the Club of Rome. Limits

of growth: sustainable development

Energy Crisis: Renewable Energy Resources

Environmental degradation and pollution. Eco-friendly Technologies.

Environmental

Regulations, Environmental Ethics

Appropriate Technology Movement of Schumacher; later developments

Technology and developing notions. Problems of Technology transfer,

Technology

assessment impact analysis.

Human Operator in Engineering projects and industries. Problems of man, machine,

interaction, Impact of assembly line and automation. Human centered

Technology.

Ethics of Profession (10L)

Engineering profession: Ethical issues in Engineering practice, Conflicts between business

demands and professional ideals. Social and ethical responsibilities of

Technologists. Codes

of professional ethics. Whistle blowing and beyond, Case studies.

Profession and Human Values (10L)

Values Crisis in contemporary society

Nature of values: Value Spectrum of a good life

Psychological values: Integrated personality; mental health

Societal values: The modern search for a good society, justice, democracy, secularism, rule

of law, values in Indian Constitution.

Aesthetic values: Perception and enjoyment of beauty, simplicity, clarity

Moral and ethical values: Nature of moral judgements; canons of ethics;

ethics of virtue;

ethics of duty; ethics of responsibility.