SAURASHTRA UNIVERSITY, RAJKOT
B.E. SEMESTER IV (CE/IT)

401 DISCRETE MATHEMATICS

TEACHING SCHEME		EXAMINATION SCHEME				
THEORY Hours	PRACTICAL Hours	THEORY Marks	PAPER Hours	PRACTICAL/ORAL Marks	TERMWORK Marks	TOTAL Marls
4		100	3			100

- **PREDICATE CALCULUS :**

Introduction, Objectives, Predicates. Statement Functions, Variable and quantifiers, Free and Bound variables, Special valid formulas involving, quantifies theory of interface for the predicate calculus.

- **FUZZY SETS :**

Some useful definitions, Basic operations on fuzzy sets, Image and inverse Images, I-V fuzzy sets, fuzzy relations.

- **GROUP THEORY :**

Definitions and examples of semigroups, Monods and groups, Alelian group, Cyclic group, Sub group permutation groups, Set Decompasition of group, Normal Subgroups, Langranges theorem.

- **LATTICES :**

Post, Lattice as a poset, Properties of Lattices, Lattices as Algebraic systems, Sublattices, Direct produce and Homomorphism, Complete Lattices, Bounds of Lattices, Distributive Lattices, Complemented Lattice.

- **BOOLEAN ALGEBRA :**

Introduction, Definition and properties, Sub-Boolean algebra direct product and homomorship, Atoms Stone's Representation Theorem. Boolean Expressions and their Equivalences. Minterm and maxterms, Boolean Algebra, Values of Boolean Expressions, Canonical forms, Boolean Functions, Symmetric Boolean functions.

- **GRAPH THEORY :**

Basic concept of Graph theory Basic definitions, Path Reachability and connectionless, Metrix Representation of Graphs, Tress.

- **COMBINATORIES**

Counting techniques- pigeon –hole principle, infinite sets, mathematical induction, Permuatations (with repetition, etc). generating functions, Recurrence relation.

REFERENCE BOOKS :

1. Descrete Mathematical Structures with Application to Computer Science By Tremblay, J.P. & Matnohar
2. Descrete Mathematics and Its Applications By Rosen, Kenneth L.
3. Applied Discrete Structures for Computer Science. By Alan Doerr & Kenneth L.
4. Discrete Mathematical Structures for Computer Science. By Kolman, B & Busby R.C.
5. Fuzzy Sets and Fuzzy Logic Theory & Application By George J. KlirBo Yuan.
6. introduction to combinatorial Mathemetiacs by Liu,C.L.

SAURASHTRA UNIVERSITY, RAJKOT
B.E. SEMESTER IV (CE/IT)
402 ELECTRONICS COMMUNICATION

TEACHING SCHEME		EXAMINATION SCHEME				
THEORY Hours	PRACTICAL Hours	THEORY Marks	PAPER Hours	PRACTICAL/ORAL Marks	TERMWORK Marks	TOTAL Marls
4	2	100	3	25	25	150

- **COMMUNICATIONS FUNDAMENTALS :**

Series RLC circuit, parallel tuned circuit, Introductio to waveform Spectra, Introducitons to Audio signal, Frequency range for speech and music, Sound pressure level, Intensty, Loudness level, Pitch frequency sound distorition, Introduction to Thermal, shot, Partion noise, filker, trasient Noice,Signal to Noise Ratio, Noise Factor.

- **ELECTRONICS COMMUNICATION CIRUCITS :**

Turned RF Amplifier Neutralizations, Frequency conversion and mixer Ifamplifier Class C and Linear Amplifier, RL phase shift, Tunned LC Crystal Oscillator, Superhetrodne Receivers, Choise of Intermediate & Oscillator frequencies Image rejection, Adjacent channel selectivity, Tracking AGC, Double conversion Receiver.

- **MODULATION OF SIGNALS :**

Amplitude Modulation, Single sideband modulation, SSB principles, SSB Generation & Reception, Pilot carrier SSB, Frequency modulation, Phase modulation, FM transmitter & Detectors.

- **PULSE MODULATION :**

PAM, PCM, PFM, PTM, PPM, PWM.

- **SATELLITE COMMUNICATIONS :**

Kepler's First, Second & Third low, Orbits, Geostationary Orbit, Power system, Attitude Control, Satellite Station Keeping, Limits of visibility, Transponders, Uplink and Downlink Frequency Concepts.

- **DIGITAL COMMUNICATIONS :**

Synchronisation, Asynchronous Transmission, Probability of Bit Error in Base band Transmission, Mutual filters, Optimum Terminal filters, Bit timing Recovery, Eye Diagrams, Digital Carrier Systems, Carrier Recovery Circuits.

- **DIGITAL MODULATION TECHNIQUES :**

Date Transmission using techniques such as PSK, FSK, DPSK, QPSK.

- **MODEM :**

Principle of MODEM, Functions, Operation of some specific Modems, Short Haul Modems, Digital Modems

- **NETWORK PROTOCOLS:**

Introduction of ISO-OSI model, RS-232, RS-422 & RS-423 communication standards.

REFERENCE BOOKS:

1. Electronics Communication — By Denish Reddy & John Coolen
2. Computer Networks — By Andrew S. Tanenbaum.

SAURASHTRA UNIVERSITY, RAJKOT
B.E. SEMESTER IV (CE/IT)

403 COMPUTER ORGANIZATIONS

TEACHING SCHEME		EXAMINATION SCHEME				
THEORY Hours	PRACTICAL Hours	THEORY Marks	PAPER Hours	PRACTICAL/ORAL Marks	TERMWORK Marks	TOTAL Marls
4		100	3			100

- **REGISTER TRANSFER AND MCROOPERATIONS**
  Register Transfer Language, Register transfer, Bus and Memory transfer, Arithmetic Micro - operations,Logic Micro-operations, Shift Microoperations, Arithmatic Logic Shift Unit.
- **BASIC COMPUTER ORGANIZATIONAND DESIGN :**
  Instruction codes,Computer registers, computer instructions, Timing and Control, Instruction cycle, Memory-Reference Instructions, Input-output and interrupt, Complete computer description, Design of Basic computer, design of Accumulator Unit.
- **PROGRAMMING THE BASIC COMPUTER:**
  Introduction, Machine Language, Assembly Language, the Assembler, Program loops, Programming Arithmetic and logic operations, subroutines, I-O Programming.

- **MICROPROGRAMMED CONTROL:**
  Control Memory, Address sequencing, Microprogram Example, design of control Unit
- **CENTRAL PROCESSING UNIT**
  Introduction, General Register Organization, Stack Organization, Instruction format, Addressing Modes, data transfer and manipulation, Program Control, Reduced Instruction Set Computer (RISC)
- **PIPELINE AND VECTOR PROCESSING**
  Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction, Pipeline, RISC Pipeline, Vector Processing, Array Processors.
- **COMPUTER ARITHMETIC**
  Introduction, Addition and subtraction, Multiplication and Division Algorithms, Floating Point Arithmetic, Decimal Arithmetic Unit and Operations

REFERENCE BOOK:

1. Computer System Architecture : By M. Morris Mano.
2. Structured Computer Organization : By Tanenbaum
3. Computer Organization : By Stallings.
4. Computer Architecture and Organization : By Hayes.

SAURASHTRA UNIVERSITY, RAJKOT
B.E. SEMESTER IV (CE/IT)
404 MANAGEMENT INFORMATION SYSTEM

TEACHING SCHEME		EXAMINATION SCHEME				
THEORY **Hours**	PRACTICAL **Hours**	THEORY Marks	PAPER Hours	PRACTICAL/ORAL Marks	TERMWORK Marks	TOTAL Marls
4	2	100	3	25	25	150

- **INTRODUCTION TO MIS**
  What is an IS?, A business perspective, organizations, management and technology dimensions of IS, information pyramid / architecture, role of IS in organizations, challenges of IS.
- **INFORMATION SYSTEM IN ORGANIZATION**
  Organization hierarchy, different kinds of systems, six major types of systems, relationship of systems to one another
- **CLASSIFICATION OF SYSTEMS BY ORGANIZATIONAL FUNCTIONS**
  Sales and marketing, manufacturing and production, finance and accounting, human resource management
  Enterprise resource planning, supply chain management, customer relationship management and knowledge management.
- **INFORMATION SYSTEM, ORGANIZATION, MANAGEMENT STRATEGY**
  Organizations and ISs, changing role of IS in organization, enhancing management decision-making, DSS and group-decision support system (GDSS), role of ESS, a case study.
- **OVERVIEW OF SYSTEM DEVELOPMENT**
- **INTERNET AND WEB TECHNOLOGY IN ORGANIZATION**
  Role of internet and web technology in organizations, electronic commerce and electronic business.
- **SPECIAL TOPICS**
  Business process re-engineering , Total Quality Management etc.
- **DATA PROCESSING USING COBOL**
  Data representation, file management in COBOL, sequential, indexed and relative files, report writer, screen management.

REFERENCE BOOKS :

1. Structured COBOL Programming with Application — By N.L. Sarda
2. COBOL Programming — By Roy & D. Ghosh Dastidar
3. Management Information system — By Louden and Louden
4. Management information system — By S.Sadagoppan
5. Management information system — By Jawdekar
6. Software Engineering — By R.S. Pressman.

SAURASHTRA UNIVERSITY, RAJKOT
B.E. SEMESTER IV (CE/IT)

405 OBJECT ORIENTED PROGRAMMING

TEACHING SCHEME		EXAMINATION SCHEME				
THEORY Hours	PRACTICAL Hours	THEORY Marks	PAPER Hours	PRACTICAL/ORAL Marks	TERMWORK Marks	TOTAL Marls
4	2	100	3	25	25	150

- **OBJECT ORIENTED CONCEPTS**
  The object oriented approach, characteristics, advantages, applications, and features.
- **OBJECT, DYNAMIC AND FUNCTIONAL MODELING**
  Object and Classes, Attributes, Link and Associations, Generalizations and Inheritance, Aggregations, Abstract Classes, Multiple Inheritance, Metadata, Constraints, Events, States, Conditions, Operations, state diagrams, Concurrency, Advanced dynamic modeling concepts, functional models, DFDs, control flow.
- **C++ PROGRAMMING TASKS**
  Basic Program Constructs, Tokens, Expressions, Control Structures, operators precedence, Functions: inline functions, prototyping, call by value , call by reference, function overloading, friend function, static functions and virtual functions.
- **CLASSES AND OBJECTS**
  Structure revisited, specifying class, defining member functions, arrays within class, Memory allocations for objects, arrays of objects, Objects as function arguments, friendly functions, returning objects.
- **CONSTRUCTORS, DESTRUCTORS & OPERATOR OVERLOADING**
  Constructors, Parameterized constructors, dynamic initialization of objects, copy constructors, destructors, Defining Operator Overloading, Overloading Unary, Binary Operators, Manipulations of strings, rules, pitfalls, type conversions
- **INHERITANCE**
  Derived class, access specifiers, single inheritance, multiple and multilevel inheritance, hybrid inheritance, containership
- **POINTERS**
  Address and Pointers, Pointers to objects, Pointers to pointers, Memory managements
- **FILES AND STREAMS**
  C++ Stream Classes, unformatted and formatted I/O operations, classes for file stream operations, opening and closing of files, file opening modes, file pointers, error handling, and command-line arguments.

REFERENCE BOOKS:

- Object-oriented programming with C++ by Balaguruswamy
- Object-oriented programming in turbo C++ by Robert Lafore
- Object-oriented Modeling and Design by James Rambaugh

SAURASHTRA UNIVERSITY, RAJKOT
B.E. SEMESTER IV (CE/IT)

406 COMPUTER PERIPHERAL

TEACHING SCHEME		EXAMINATION SCHEME				
THEORY Hours	PRACTICAL Hours	THEORY Marks	PAPER Hours	PRACTICAL/ORAL Marks	TERMWORK Marks	TOTAL Marls
	2			25	25	50

- **DETAILS OF FUNCTIONAL BLOCK DIAGRAMS AND ITS INTERFACING OF PERSONAL COMPUTERS**

STUDY AND INTERFACING OF INPUT DEVICES:
Different types of keyboards, Mouses, Scanners, optical character reader, Handwriting Recognition, Barcode Reader, Speech recognition, Digital Camera and video.

STUDY AND INTERFACING OF OUTPUT DEVICES:
CRT Displays , Liquid crystal Displays, Plasma Display Panels, Electroluminescent Displays, field emission Displays.Printers: Laser Printers, Dot Matrix Printers, Plotters, Label Printers, Digital Presses, Large Colors Printers, Photo Printers, Inkjet Printers, Digital color Copiers, Pixel view card and sound blaster card.

STUDY AND INTERFACING OF STORAGE DEVICES:
Magnetic storage Devices: Floppy Disks, Hard Disks,
Optical Disks:CD - ROM,CD-erasable, CD- rewritable ,Digital Video Disks.
Juke Boxes, Hierarchical Storage Magnetic System, Tape drive systems.

PRESENTATION PRODUCTS:
Kiosks, Auditorium slide Projectors, and Daylight Slide projectors, Over Head Projectors, 3-Gun Video Projectors, Opaque and 3-D Object Projectors, PC Compatible Desktop Projectors, Multimedia Projectors, Cordless, Sound systems. Public Address Systems.

- **POINTING DEVICES:**

Mice, Track Sticks, Track Balls, Touch Sensitive Screens, Touch Pads, Graphic Tablets, Joysticks, Cordless Mice, Virtual Mice.

- **AUXILIARY DEVICES:**

Automatic Transparency Feeder, Projection Screen, Magnetic dry-wipe Boards, CD writers, ZIP Driver.

- **TROUBLESHOOTING & SERVICING OF PC**

Sr. No.	Title	Author
1.	Information Technology, The Breaking wave	Dennis P. Curtin & others
2.	Audio & Video Products	R. G. Gupta
3.	Computer Peripherals	Wilkinson
4.	Upgrading and Repairing PCs	Scott Muller
5.	Introduction to PCs	Peter Norton

SAURASHTRA UNIVERSITY, RAJKOT
B.E. SEMESTER IV (CE/IT)
407 ADVANCE SOFTWARE DEVELOPMENT TOOL LAB

TEACHING SCHEME		EXAMINATION SCHEME				
THEORY Hours	PRACTICAL Hours	THEORY Marks	PAPER Hours	PRACTICAL/ORAL Marks	TERMWORK Marks	TOTAL Marls
	2			25	25	50

- **TO LEARN ANY ONE OF THE FOLLOWING SOFTWARE PACKAGE/TOOLS DURING LABORATOORIES** like core JAVA, Visual Basic, Visual C++, Visual FoxPro, J2ME, J2EE, Visual .NET, ASP .NET or any other latest Software tool/ Packages may be added in this list as per current scenario.

SAURASHTRA UNIVERSITY, RAJKOT
SEMESTER IV (CE/IT)

Code	Subject	Teaching Scheme			Exam Scheme			
		Lect.	Pract.	Theory	Paper Hrs.	Prac. Oral	Term Work	Total
401	Describe Mathematics	4	-	100	3	-	-	100
402	Electronics Communication	4	2	100	3	25	25	150
403	Computer Organization	4	-	100	3	--	--	100
404	Management Information System	4	2	100	3	25	25	150
405	Object Oriented Programming	4	2	100	3	25	25	150
406	Computer Peripheral.	-	2	-	-	25	25	50
407	Advance Software development tool Lab	-	2	-	-	25	25	50
	Total	**20**	**10**	**500**	**-**	**125**	**125**	**750**