

**BHAVNAGAR UNIVERSITY
SCHEME**

B. E. SEM VI (IT)							
601	COMPUTER GRAPHICS	04	02	100	25	25	150
602	COMPUTER NETWORKING	04	02	100	25	25	150
603	ADVANCE MICROPROCESSOR AND INTERFACING	04	02	100	25	25	150
604	SYSTEM ANALYSIS AND DESIGN	03	02	100	25	25	150
605	OPERATION RESEARCH AND SIMULATION	03	02	100	25	25	150
606	SOFTWARE PROJECT	00	02	00	25	25	50
		18	12				800

BHAVNAGAR UNIVERSITY
B. E. SEM VI (IT)
IT- 601 : COMPUTER GRAPHICS

Inforce-2007

TEACHING SCHEME			EXAMINATION SCHEME				TOTAL MARKS
THEORY HOURS	TUT. HOURS	PRACT. HOURS	THEORY		PRA/ORAL MARKS	T/W MARKS	
			MARKS	HOUR			
4		2	100	3	25	25	150

INTROCUION :

What is computer Graphics? Elements of a graphics, workstation device independence fundamental problems in geometry.

BASIC RASTER GRAPHICS :

Scan conversion filling and clipping geometric mainipulation transformation. Matrices. Homogeneous coordinates.

Elementary 3D graphics; Plane projections. Vanishing points specification of a 3D view.

Visibility : Image and object precision, z-buffer algorithms area based algorithms. Floating horizon.

Advanced issues : any one of the following topics :

- a- Curves and surfaces; parametric representation. Benzier and bspline curves.
- b- Rendering : raytracing, antialiasing, fractals, gourard and phong shading.
- c- User interface; Issues in user interface. Elements of window systems (x, Mac-os, mswindows), elements of toolkit programming.

TEST/ REFERENCE BOOKS (S) :

SR.NO.	TEST/ REFERENCE BOOKS (S)	AUTHOR	PUBLISHAR
1.	AN INTRODUCTION TO SPLINES FRO USE IN COMPUTER GRAPHICS AND GEOMETRIC MODELLING.	R.H.BARTELS, J.C.BEATTY AND B.A.BARSKY.	
2.	COMPUTER GRAPHICS, PRINCIPLES AND PRACTICE	J.FOLEY, A.VAN DAM, S.FEINER, AND J.JUGHES,	
3.	COMPUTER GRAPHIC	D.HEARN AND P.BAKER	
4.	INTRODUCTION TO ALGOTITHMS.	C.E.LEISERSON, T.H.CORMENT AND R.L.RIVEST	
5.	LECTURE NOTES IN COMPUTER GRAPHICS	DAVID MOUNT	
6.	PRINCIPLES OF INTERACTIVE COMPUTER GRAPHICS	W.NEWMAN AND R.SPROULL	
7.	THEORY AND PROBLEMS OF COMPUTER GRAPHICS	R.P;ASTOCK AND G.KALLEY	
8.	COMPUTATIONAL GEOMETRIC : AN INTRODUCTION	F.P.PREPARATANA AND M.I.SHAMOS	
9.	MATHEMATICAL ELEMENTS FOR COMPUTER GRAPHICS	D.ROGERS AND J.ADAMS	
10.	PROCEDURAL ELEMENTS FOR COMPUTER GRAPHICS	DAVID F. ROGERS	
11.	ADVANCED ANIMATION AND RENDERING TECHNIQUES	ALAN WATT AND MARK WATT.	
12.	WINDOW SYSTEM PROGRAMMING. OS/MOTIF EDITION	D.YOUNG, X.	

BHAVNAGAR UNIVERSITY
B.E. SEM VI (IT)
IT- 602 : DATA COMMUNICATION AND NETWORKING

TEACHING SCHEME			EXAMINATION SCHEME				TOTAL MARKS
THEORY HOURS	TUT. HOURS	PRACT. HOURS	THEORY		PRA/ORAL MARKS	T/W MARS	
			MARKS	HOURS			
4	0	2	100	3	25	25	150

INTRODUCTION :

DATA COMMUNICATION :- Components
 NETWORKS :- Distributed processing , Network criteria ,Applications
 PROTOCOLS AND STANDARDS :- Protocols, Standards
 STANDARDS ORGANIZATIONS :- Standards creation committees, Forums , Regulatory Agencies

BASIC CONCEPTS :

LINE CONFIGURATION :- Point-to-point, Multipoint
 TOPOLOGY :- Mesh, star, Tree, Bus, Ring , Hybrid Topologies
 TRANSMISSION MODE :- Simplex, Half – Duplex , Full Duplex
 CATEGORIES OF NETWORKS :-Local Area Network (LAN),Metropolitan Area Network (MAN) , wide Area Network (WAN)

THE OSI MODEL

THE MODEL:- Layered Architecture
 FUNCTION OF THE LAYERS :- Physical Layer ,Data Link layer, Network Layer, Transport Layer,Session Layer,Presentation Layer , Application Layer, Summary of Layer functions

TRANSMISSION OF DIGITAL DATA : INTERFACES AND MODEMS 121

DIGITAL DATA TRANSMISSION :- Parallel Transmission ,Serial Transmission
 DTE – DCE INTERFACE :- Data terminal Equipment (DTE) ,Data circuit Terminating Equipments (DCE) ,standards , EIA- 232 Interface ,OTHER INTERFACE STANDARDS :- EIA- 449, EIA- 530, X.21

MODEMS :- Transmission Rate ,Modem standards

TRANSMISSION MEDIA

GUIDED MEDIA:-Twisted pair cable ,Coaxial cable ,Optical Fiber
 UNGUIDED MEDIA :-Radio Frequency Allocation ,Propagation of Radio waves, Terrestrial Microwave,Satellite, Communication ,Cellular Telephony

8. DATA LINK CONTROL

LINE DISCIPLINE

ENQ/ ACK

FLOW CONTROL:- Stop – and – wait ,Sliding window

ERROR CONTROL:- Automatic Repeat Request (ARQ),stop – and – wait ARQ,Sliding window ARQ

DATA LINK PROTOCOLS

ASYNCHRONOUS PROTOCOLS

XMODEM ,YMODEM , ZMODEM, BLAST, Kermit

SYNCHRONOUS PROTOCOLS

CHARACTER-ORIENTED PROTOCOLS :- Binary Synchronous Communication (BSC) , BSC Frames, Data Transparency, BIT- ORIENTED PROTOCOLS :- HDLC, Frames, More about Frames

LOCAL AREA NETWORK

PROJECT:- IEEE 802.1,LLC,MAC,Protocol Data Unit (PDU)

ETHERNET:- Access Method : Token passing, Addressing, Electrical specification ,Frame Formats, Implementation

FDD :- Access Method : Token passing, Addressing, Electrical specification, Frame Formats , Implementation : Physical Medium Dependent (PMD) Layer

METROPOLITAN AREA NETWORKS

IEEE:- Access Method : Dual Bus ,Distributed Queues ,Ring configuration, Operation : DQDB Layers , Implementations

SMDS:- Connection and Access

INTEGRATED SERVICES DIGITAL NETWORK (ISDN)

SERVICES:- Bearer Services, Tele services , Supplementary services

HISTOERY:- Voice communication over Analog Networks ,voice and Data communication over Analog Networks Analog and Digital Network (IDN) ,Integrated Digital Network (IDN) ,Integrated services Digital Network (ISDN)

SUBSCRIBER

ACCESS TO

THE ISDN :- B Channels, D Channels ,H Channels ,User Interfaces, Functional Grouping Reference Points

THE ISDN

LAYERS:- Physical Layer ,Data Link Layer ,Network Layer

BROADBAND

ISDN:- Services, Physical specifications

13. ATM

DESIGN GOALS:- Packet Networks, Mixed Network Traffic, Cell Networks,Additional Advantages of ATM

ATM TOPOLOGY

ATM PROTOCOL

ARCHITECTURE :- Application Adaptation Layer (AAL) , ATM Layer ,Physical Layer

NETWORKING AND INTERNETWORKING DEVICES

REPEATERS, BRIDGES , ROUTERS, GATEWAYS, ROUTING ALGORITHMS

TRANSPORT LAYER

DUTIES TO THE TRANSPORT LAYERS:- End –to –End Delivery , Addressing, Reliable Delivery, Flow control Multiplexing

CONNECTION:- Connection Establishment , Connection Termination

THE QSI TRANSPORT PROTOCOL:- Transport Classes , Transport Protocol Data Unit (TPDU) , Connection oriented and connectionless services

SESSION LAYER :- Session and Transport Interaction, Synchronization Points ,Session Protocol Data Unit

PRESENTATION LAYERS :- Translation , Encryption/ Decryption, Data Compression

APPLICATION LAYERS :- Message handling system (MHS) ,File transfer, access, and management (FTAM) virtual Terminal (VT),Directory services (DS) , Common Management Information Protocol (CMIP)

OVERVIEW OF FTCP/IP :- TCP/IP and the Internet, TCP/IP and OSI, Encapsulation

NETWORK LAYER :- Internetwork Protocol (IP) ,Other protocols in the Network Layer

TRANSPORT LAYER :- User Datagram Protocol (UDP) , Transmission control protocol (TCP)

APPLICATION LAYER :- Domain Name system (DNS)

TELENT:- File Transfer protocols , File Access Using NPS and RPC ,Electronic Mail : SMTP ,Simple Network Management, Protocol (SNMP) ,Gopher ,Archie ,Veronica ,Wide Area Information Service (WAIS) ,Hypertext Transfer Protocol (HTTP) ,WORLD WIDE WEB (WWW) :- Uniform Resource Locator (URL) ,Browser Architecture

TEXT BOOK:-

1. DATA COMMUNICATION AND NETWORKING BY BEHRAUZ & FOROUZAN (TMH)

REFERENCE BOOKS :

1. COMPUTER NETWORKS A.S. TANENBAUM (PHI)
2. DATA COMMUNICATION WILLIAM L. SCHWEBER McGraw – Hill
3. DATA & COMPUTER COMMUNICATION WILLIAM STALLING MACMILLAN
4. COMPUTER COMMUNICATION & NETWORKS JOHN FREER (AFFLIATED EWP)

BHAVNAGAR UNIVERSITY
B. E. SEM IV (IT)
IT- 603 ADVANCE MICROPROCESSOR AND INTERFACING

TEACHING SCHEME			EXAMINATION SCHEME				TOTAL MARKS
THEORY HOURS	TUT. HOURS	PRACT. HOURS	THEORY		PRA/ORAL MARKS	T/W MARKS	
			MARKS	HOUR			
4		2	100	3	25	25	150

1.0 **8086 MICROPROCESSOR:**

Detailed study of internal architecture of 8086, Register organization, Bus Interface unit, Execution unit, Queuing, Address calculation, Minimum mode & maximum mode systems, Minimum system mode interface, Maximum system mode interface, system clock, Bus cycles, Instruction and execution sequence.

2.0 **8086 MICROPROCESSOR PROGRAMMING:**

Software Model of 8086 microprocessor, Assembly language and Machine language, Addressing modes, Instruction set, Data transfer, Arithmetic, Logic, Shift, Rotate instruction, Flag control instruction, Computer instruction, Jump instruction, subroutine handling instruction, Loop instruction String instruction.

3.0 **MEMORY INTERFACING :**

Block diagram, Hardware organization of memory address space, Bus status codes, control signals, Read & write Bus cycles, stack, stack segment register and stack pointer, Demultiplexing the address / Data Bus 4K word program storage memory, 1K word static RAM Data storage memory, 128 K Byte Dynamic RAM subsystem.

4.0 **INPUT/OUTPUT INTERFACE:**

Introduction, I/O Address space and data transfers. Input/output instruction & Bus cycles, Eight byte wide output ports, 8255 implementation of parallel I/O ports, Memory-Mapped I/O.

5.0 **INTERRUPT INTERFACE:**

Types of interrupts, interrupts, interrupt address pointer table, interrupt instructions, Masking of interrupts, External hardware interrupt interface & sequence, 8259 programmable interrupt controller, Minimum & maximum mode system interrupt interface using the 8259 A, software interrupts, Nonmaskable & Reset interrupt, internal interrupt functions.

6.0 **INTRODUCTION TO MICROCONTROLLER:**

Study of architecture of 8031 / 8051 Microcontroller, instruction set, Addressing modes, programming & Interfacing.

BOOKS:

1.	16 BIT Microprocessor Architecture, Software and Interface techniques	Walter A triebel & Avtar Smgh	(PHI)
2.	Microcomputer System : The 8086 / 8088 family architecture, Programming and Design	Yu-cheng Liv, & Glenn A Gibson.	(PHI)
3.	The 8086 / 8088 Family : Design, Programming and interfacing	John Uffenbeck	(PHI)
4.	Microprocessors And interfacing programming and Hardware	Douglas V. Hall	TMH
5.	The Intel Microprocessors 8086/8088, 80286, 80386 and 80486	Barry B Brey	(PHI)
6.	Intel Reference Manual For 8031 / 8051 Microcontroller.		

BHAVNAGAR UNIVERSITY
B. E. SEM IV (IT)
IT- 604 : SYSTEM ANALYSIS AND DESIGN

TEACHING SCHEME			EXAMINATION SCHEME				TOTAL MARKS
THEORY HOURS	TUT. HOURS	PRACT. HOURS	THEORY		PRA/ORAL MARKS	T/W MARKS	
			MARKS	HOUR			
4		2	100	3	25	25	150

1.0 OVERVIEW OF SAD

- 1.1 Business systems and concepts
- 1.2 Systems development
- 1.3 Life cycle
- 1.4 Project selection
- 1.5 Feasibility analysis
- 1.6 Design
- 1.7 Implementation
- 1.8 Testing

2.0 PROJECT SELECTION

- 2.1 Sources of project tequests
- 2.2 Managing project review and selection
- 2.3 Preliminary investigation

3.0 FEASIBILITY STUDY

- 3.1 Technical and economical feasibility
- 3.2 Cost and benefit analysis

4.0 SYSTEM REQUIREMENTS, SPECIFICATION & ANALYSIS

- 4.1 Fact finding techniques
- 4.2 Data flow diagrams
- 4.3 Data dictionaries
- 4.4 Process Organization and interactions
- 4.5 Decision analysis
- 4.6 Decision trees and tables

5.0 DETAILED DESIGN

- 5.1 Modularization
- 5.2 Module specification
- 5.3 File design
- 5.4 System development involving data bases

6.0 SYSTEM CONTROL AND QUALITY ASSURANCE

- 6.1 Design objectives reliability and maintenance

- 6.2 Software design and documentation tools
- 6.3 Top down
- 6.4 Bottom up and variants
- 6.5 Units and integration testing
- 6.6 Testing practices and plans
- 6.7 System controls
- 6.8 Audit trails
- 7.0 SELECTION OF HARDWARE & SOFTWARE 4 Hrs.
- 7.1 Hardware acquisition
- 7.2 Memory
- 7.3 Processes
- 7.4 Peripherals
- 7.5 Benchmarking
- 7.6 Vendor selection
- 7.7 Software selection-operating system languages
- 7.8 Language processes
- 7.9 Performance and acceptance criteria

TOTAL :- 42 Hrs.

SR.NO.	REFERENCE	AUTHOR	PUBLISHER
1	ANALYSIS AND DESIGN OF INFORMATION SYSTEMS	JAMES, A.S.	MCGRAW HILL
2.	INFORMATION SYSTEMS DEVELOPMENT SYSTEMATIC APPROACH A	LUDEBERG.M. GOLKUHL	PRENTICE HALL INTERNATIONAL
3.	SYSTEMS ANALYSIS & DESIGN	LEESON.M.	SCIENCE REASEARCH ASSOCIATIONAL
4.	SYSTEM ANALYSIS DESIGN	SEMPRIVE P.C.	PROCESS AND DEFINITION
5.	SYSTEM ANALYSIS DESIGN	RICHARD.D.	IRWIN INC.
6.	SYSTEM ANALYSIS AND DESIGN	AWARD.E.HOMEWOOD	AWARD
7.	INTRODUCING SYSTEM ANALYSIS AND DESIGN	LEE, B.S.	MANCHESTER U.K.NATIONAL COMPUTER CENTRE
8.	SYSTEM ANALYSIS DESIGN	LEARN YOUSEF	RESTON PUBLISHING
9.	PRACTICAL SYSTEM DESIGN	DANIELS	GALGOTIA PUB. PVT.LTD.
10.	SYSTEMS ANALYSIS & DESIGN	DAVIS, W.S.	ADDISON WESLEY

BHAVNAGAR UNIVERSITY
B. E. SEM VI (IT)
IT- 605 : OPERATIONS RESEARCH & SIMULATION

TEACHING SCHEME			EXAMINATION SCHEME				TOTAL MARKS
THEORY HOURS	TUT. HOURS	PRACT. HOURS	THEORY		PRA/ORAL MARKS	T/W MARKS	
			MARKS	HOUR			
4		2	100	3	25	25	150

(A) THEORY :

1. DECISION MAKING & O.R. :

Scope & phases of operation research, simple decision model its construction and solution , mathematical formulation of a problem, application of O.R. to industrial problems.

2. LINEAR PROGRAMMING :

Characteristics of L.P. problem, mathematical formulation of L.P. Problems, basic assumptions of linear models, graphical solution for L.P. problem, simplex algorithm- degeneracy, alternative optima, unbounded solution and infeasible solution ; duality method of penalty (Big-M), two phase technique , duality and its linear Programming- application, sensitivity analysis , application of simplex techniques to industrial problems Transportation models and optimality conditions unbalance problem & degenerate problem. Assignment models; mathematical formulation method for solutions unbalanced problems, maximization problem, hanger-on method and traveling salesman problem . Use of computer L.P. models.

3. DECISION THORY & GAMES :

Decision tree, decision under risk, & uncertainty game theory optimal Solution of two person zero sum games, mixed strategies saddle point, algebraic method, method of sub games, graphical method (2xn) & (mx2) game, method of matrices , L.P. method of games, solution of (mxn) game by L.P.

Integer Programming: Concepts, Formulation, Solution and Application Dynamic programming and its applications.

4. PROJECT SHEDULING BY PERT / CPM :

Arrow & network diagrams , critical path, CPM VS PERT, calculations of critical path, determination of floats, crashing the activity, construction of time chart and resource leveling, probability & cost Considerations in project scheduling , up dating and control of project. Shortest path method to develop the network diagram for routing and scheduling of transportation services.

5. QUEUEING THEORY :

Basic elements of queuing model , roles of position and exponible distribution, recognizing queueing process, single queue, simulation of queue (only application of problem)

6. SIMULATION & COMPUTER APPLICATIONS :

Nature and meaning of simulation, Monte Carlo technique , Use of random number in Monte Carlo simulation, Monte Carlo simulation applied to queuing processes, Elementary case study on simulations.

Computer application for sampling and frequency distribution (discrete probability distribution) , Curve fitting , correlation, T- tests of significance, analysis of variance and on experimental design and concepts of computer- simulation.

PRACTICAL/ORAL :

It shall be based on term work prepared as well as topic area of above syllabus.

TERM WORK :

It shall be based on major topic areas case

REFERENCE BOOKS:

- 1 Introduction to Operation Research By Billy E. Gillett.
- 2 Operations research by R.C.Patel, N.R. Dave
- 3 Operations Research by Taha
- 4 Operations Research by Wrengler
- 5 Introduction to OR by F.S.Hillier & G.J. Lieberman
- 6 Introduction to OR by A. Ravindran
- 7 Computer assisted decision models by R. Kapoor

BHAVNAGAR UNIVERSITY
B. E. SEM VI (IT)
IT- 606: SOFTWARE PROJECT

TEACHING SCHEME			EXAMINATION SCHEME				TOTAL MARKS
THEORY HOURS	TUT. HOURS	PRACT. HOURS	THEORY		PRA/ORAL MARKS	T/W MARKS	
			MARKS	HOUR			
00	00	02			25	25	50

A Fully functional Software project with database and various technologies should be developed by using one or more of the following technologies

- Java programming language related projects
- C++ Programming related projects
- Python programming related projects
- Mobile Application development using C++, Java 2 Micro Edition(J2ME), Python, Flashlite related projects
- Computer networking related protocol implementation related projects
- Computer hardware interfacing projects
- Telemetry related projects
- Linux related projects
- Ruby related projects
- Geographical information system related projects
- Biometrics related projects
- Bio-informatics related projects
- Java server pages related projects
- JDBC related projects
- Various Scripting language ex. Java scripts, VB scripts, Python etc related projects
- C sharp related projects
- ASP, ASP .NET related projects
- PHP related projects
- MySQL related projects
- Apache related projects
- Oracle/DB2/SQL Server related projects
- Any other projects related to latest and growing technologies

Reference Books:

- Training and reference: Murach's C# 2005 Murach and SPD
- Dot Net framework essential. Thai. O'reilley
- Microsoft ASP.NET step by step - George Shepherd Microsoft press
- Learning PHP and MySQL Michele davis and Jon A Phillips, O'Reilley
- AJAX for beginners Ivan Bayrons
- Object oriented PHP - Peter Lavin, No start press
- How to program JAVA Dietel and deitel Prentice Hall inc.
- Other resources from various web and online forums