

SCHEME OF INSTRUCTION & EXAMINATION

B.E II YEAR (REGULAR)

(INFORMATION TECHNOLOGY)

SEMESTER - II

Sl. No.	Syllabus Ref.No	SUBJECT	Scheme of Instructions		Scheme of Examination		
			Periods per Week		Duration in Hrs	Maximum Marks	
			L/T	D/P		Univ. Exam	Sessi-onals
1.	MAT 261	THEORY Probability & Random Processes	4	-	3	75	25
2.	BIT 252	Digital Electronics & Logic Design	4	-	3	75	25
3.	BIT 253	Electronic Communication Techniques	4	-	3	75	25
4.	BIT 254	Computer Graphics	4	-	3	75	25
5.	BIT 255	Computer Organization & Microprocessors.	4	-	3	75	25
6.	BIT 256	Data base Systems	4	-	3	75	25
		PRACTICALS					
1.	BIT 281	Microprocessor Lab	-	3	3	50	25
2.	BIT 282	Computer Graphics Lab	-	3	3	50	25
3.	BIT 283	Mini Project – II	-	3	-	-	25
		TOTAL	24	9	-	550	225

MAT 261

PROBABILITY AND RANDOM PROCESSES

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Unit- I

Probability theory: Axioms of Probability theory, Probability spaces, Joint and conditional probabilities, Independent events.

Unit –II

Random variables: Definitions, Densities and distributors, Examples, Properties of distribution and density function, Joint distributions and densities. Conditional probability distribution and density functions. Independent random variables.

Unit –III

Function of random variables and random vectors, statistical averages, Characteristic function , Inequalities of chebyshev and schwantz, Convergence concept and the central limit theorem (Proof not expected).

Unit –IV

Random Processes: Definitions, Basic concepts and examples, Stationarity and ergodicity, Second order processes, Weakly stationary and ergodicity, Second order processes, Weakly stationary processes, Covariance functions and their properties, Spectral representation Weiner - Kinchine theorem.

Unit – V

Linear operations, Gaussian processes, poisson processes Low pass and Band pass noise representations.

Text Book:

1. Papoulis: Probability, Random Variables and stochastic processes 3rd Edition, McGraw Hill, 1995.

References:

1. Davenport: Probability and Random processes for Scientists and Engineers, McGraw Hill.
2. E. Wang: Introduction to Random Process, Springer Verlag Publication.
3. H. Stark and J. Woods: probability, Random Processes and estimation theory for Engineers, Prentice Hall.

BIT 252

DIGITAL ELECTRONICS & LOGIC DESING

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Unit –I

Design Concepts – Digital Hardware, design process, design of digital hardware.

Introduction to logic circuits – Variables and functions, logic gates and networks, Boolean algebra, synthesis using gates, design examples, Introduction to CAD tools, Introduction to VHDL.

Introduction to logic families, Interfacing different logic families.

Unit –II

Programmable logic devices. Gate arrays, practical aspects of digital circuit design, Transmission gates, Implementation details of SPLDs, CPLDs and EPLDAs.

Optimized implementation of logic functions – Karnaugh map, strategies for minimization, minimizing product-of-sum functions, Multiple output circuits, NAND and NOR logic networks, Multi level synthesis, Cubical representations and minimization, CAD tools.

Unit –III

Design of Arithmetic circuits using CAD tools.

Combinational circuit building blocks – Multiplexers, Decoders, Encoders, Code converters, Arithmetic comparison circuits, VHDL for Combinational circuits.

Basic Latch, Gated SR Latch, Gated D Latch, master- Slave edge Triggered flip-flops. T Flip flop, JK flip flop, Registers, Counters, Reset Synchronization, Types of Counters, using storage elements with CAD tools, using registers and counters with CAD tools. Design examples.

Unit – IV

Synchronous Sequential Circuits – Basic design steps, State Assignment problem. Mealy state model, Design of Finite state machines with CAD tools, Example, State minimization, Design of a Counter using sequential circuit approach. FSM as and Arbiter Circuit, Analyses of Synchronous sequential circuits, Algorithmic State Machine charts, Formal model.

Unit – V

Asynchronous Sequential Circuits – Behavior, Analysis, Synthesis, State reduction, State Assignment, Hazards, example.

Digital system design – building block – circuits, Design example, clock synchronization.

Testing of logic circuits – Fault model, Complexity of a Test set, Path sensitising, Random tests, Testing sequential circuits, Built-in –self –test, printed circuit boards.

Suggested Reading:

1. Stephen Brown, Zvonko Vranesic – Fundamentals of Digital Logic with VHDL design, McGra 2000.
2. John F. Wakerly – Digital Design – Principles and Practices PH 2000.

BIT 253

ELECTRONIC COMMUNICATION TECHNIQUES

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Unit –I

Introduction to Electronic Communications – Modulation and demodulation, electro magnetic spectrum, Bandwidth, Transmission Modes, Circuit arrangements, Signal Analysis, Mixing, Noise Analysis.

Signal Generation – Oscillators, Phase locked loops, Frequency Synthesizers.

Amplitude Modulation transmission – Principle of Amplitude modulation, Am modulator circuits, AM transmitters.

Unit –II

Amplitude modulation reception – Receiver parameters, AM receivers, AM receiver circuits. Single – sideband Communication systems, Single-sideband generation, Single- sideband transmitters, Single-sideband receivers, measurements.

Angle modulation transmission – Angle modulation, Noise and angle modulation, Frequency and phase modulators, Frequency up-conversion, Direct and indirect FM transmitters

Unit – III

Angle modulation receivers – FM demodulators, PLL demodulator, Quadrature FM demodulator, FM noise suppression, FM versus PM, Linear IC FM receivers, FM stereo broadcasting. Two-way FM communications.

Transmission Lines- Transverse electromagnetic waves. Types of transmission lines, equivalent circuit, wave propagation, losses incident and reflected waves, standing waves input impedance, time-domain reflectometry, micro strip and strip line transmission lines.

Unit – IV

Electromagnetic wave propagation – Introduction , polarization, radiation, spherical wave front and inverse square law, Wave attenuation and absorption, optical properties of radio waves, terrestrial propagation, optical properties of radio waves, terrestrial propagation of electromagnetic waves, propagation terms and definitions, free space and path loss, fade margin.

Antennas and waveguides – Antennas – operation, reciprocity terminology and definitions, basic antennas, loading, Antenna arrays, special purpose antennas, UHF and microwave antennas, waveguides- rectangular, circular, ridged, flexible.

Unit – V

Microwave radio communication – Frequency modulated MW communications, diversity, protection switching arrangements, FM microwave radio stations, path characteristics, system gain.

Satellite Communications – Kepler’s law, orbits, geostationary satellites, antenna look angles, classification, spacing and frequency allocation, antenna radiation patterns, system link models, system parameters, link equations.

Suggested Reading:

1. Wayne Tomasi – Electronic Communication Systems – Fundamentals through advanced, Fourth edition, prentice Hall, 2001.

BIT 254

COMPUTER GRAPHICS

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Unit –I

Overview of Graphics Systems – Video display devices, raster-sem systems.

Random – scan system, graphics monitors and workstations. Input devices, Hardcopy devices, Graphics software.

Output primitives: Line drawing algorithms, Circle generation algorithms, ellipse generating algorithms, pixel addressing, Filled area primitives, Fill area functions, cell array, character generations.

Unit –II

Attributes of output primitives: Line attributes, curve attributes color and Gray-scale level, Area fill attributes, character attributes, and Bundled attributes Enquiry functions. Two dimensional Geometric transformations: Basic transformations, Homogenous co-ordinates, affine transformations, transformation functions. Raster methods for transformations.

Unit – III

Two dimensional viewing: Viewing pipeline, viewing transformation, viewing functions, line clipping – Cohen Sutherland line clipping, Liang Barsky line clipping, polygon clipping: Sutherland – Hodgman polygon clipping, Wiler Athertion polygon clipping.

Graphical user interfaces and interactive input methods: The user Dialogue, logical classification of input devices, Input functions and Models interactive picture construction techniques.

Unit – IV

Structures and Hierarchical Modeling: Structure concepts, editing structures, Basic modeling concepts, hierarchical modeling with structures. Graphical user interfaces and Interactive input methods: The user Dialogue, logical classification of input devices, Input functions and Models Interactive picture construction techniques.

Unit – V

Three – Dimensional object representations: Polysurfaces curved lines and surfaces, spline representation, Bezeor curves and surfaces, B-Spline curves and surface, CSG Methods: Octrees, BSP Trees.

Three Dimensional Transformation : Three dimensional viewing: Viewing coordinates, projections, Visible surface detection methods: Back-face Detection, Depth-buffer methods, scan-line methods, Depth-sorting methods, BSP – Tree Methods, Arc sub division methods, Basic illuminations models – Gourand shading phong shading.

Suggested Reading:

1. Heanry Donald, Pauline Baker M: Computer Graphics, PIH 2nd edn., 1995.
2. Harrington S: Computer Graphics A Programming Approach 2nd Edn. McGraw Hill, 1987.

BIT 255

COMPUTER ORGANIZATION & MICROPROCESSORS

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Unit –I

Basic structure of Computer Hardware and Software – Functional Units, Operational concepts, bus structures, software, performance.

Data representation – Positional Number system, representation of integers, reals and characters.

Addressing methods and Machine Program sequencing – Memory locations, Instructions and Instruction sequencing, Addressing modes, Assembly language, Basic I/O operation, Stacks and queues, subroutines.

Unit –II

Processing Unit – Fundamental Concepts , Execution of complete instruction, Hardwired control, performance considerations, micro programmed control.

8085 Microprocessor – Organization, instruction set, programming. Timings of 8085 – buses, opcode fetch cycle, memory and I/O read cycle. Memory and I/O write cycle.

Unit –III

Input – output organization – Accessing I/O devices. Interrupts, Direct memory access, I/O Hardware, Standard I/O interfaces.

8085 – Interrupt timings, interrupt acknowledgement machine cycle, Bus idle machine cycle, HALT and HOLD states.

8085 – Data transfer schemes – Programmed data transfer, DMA transfer.

Unit – IV

Computer Peripherals – I/O devices, On – Line Storage, System performance considerations.

Interfacing devices- I/O ports, programming 8255A , 8259 – programmable interrupt controller, 8257- programmable DMA controller, 8251 USART, Analog input devices analog output device, stepper motor interfaces.

Unit –V

Memories – Memory types, Characteristics of memories, Static RAMs, Dynamic RAMs, reprogrammable ROMs, memory system stability, Address Space partition, Memory interfacing, Cache memories, memory performance considerations, virtual memories.

Pipelining – concepts, instruction queue, branching, data dependency, multiple execution paths, performance considerations.

Suggested Reading:

1. V Carl Hamacher, Zvonko G, Vranesic, Safwat G. Zaky – Computer Organization, McGraw, 1996.
2. Adithya P. Mathur – Introduction to Microprocessor's Tate McGraw , 1989.

BIT 256

DATABASE SYSTEMS

Instruction

4 Periods per week

Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Unit –I

Data bases – Introduction, views, models, languages, Users and Administrators, System Structures.

E-R models – Concepts, Constraints, keys, design issues, E-R diagram, weak entities, Extended E-R, Design of E-R Schema, reduction to tables.

Relational Model – Structure, Relational algebra, Vies, Relational calculus.

Unit –II

Structured query language (SQL)

Integrity and constraints- Domain, referential, assertions, triggers, security and authorization.

Relational Database Design – Normal forms, functional dependencies, BCNF, 3NF, 4NF.

Unit – III

Storage and File Structure – Storage media , RAID Teritary Storage, access, File organization, Data --Dictionary storage.

Indexing and Hashing – Ordered Indexes, B+ and B-Trees. Static and dynamic hashing, multiple key access.

Query Processing – Selection, sorting, join, evaluation of expressions.

Unit – IV

Transactions – concepts, state, atomicity and durability, Serializability, isolation.

Concurrency control – Lock based protocols, Timestamp based protocols, validation bases protocols.

Recovery System – Failure classification, Storage structure, Recovery and atomicity, Log based recovery, shadow paging, Recovery with concurrent transactions, buffer management, advanced recovery techniques.

Unit – V

Database System Architectures- Centralized, Client Server, Parallel, Distributed.

Distributed Databases – Homogenous, Heterogeneous, data storage, transactions, concurrency control, availability, query processing directory systems.

Parallel Databases – Parallelism – I/O, interquery, intraquery, intrapoperational, interoperational.

Suggested Reading:

1. Silber Schatz, Lorth, Sudharsan – Database Ssystem Concepts, 4th Edition, McGraw 2002.

BIT 281

MICROPROCESSOR LABORATORY

Instruction	3	Periods per week
Duration of University Examination	3	Hours
University Examination	50	Marks
Sessional	25	Marks

Using 8085 kit performs the following experiments:

1. Multi word addition
2. Multiplication
3. Division
4. Conversion form ASCII to Binary and Binary to a SCII.
5. Maximum of numbers in an array.
6. A /D and D/A converter interface.
7. Key Board Interface.
8. RS 232 –C interface.
9. Stepper Motor.
10. Real Time Clock.
11. Video Display Interface.
12. Floppy drive interface.

BIT 282

COMPUTER GRAPHICS LABORATORY

Instruction	3	Periods per week
Duration of University Examination	3	Hours
University Examination	50	Marks

Sessional

25 Marks

Write C/C++ programs for the following graphics functions using Open GI/PHIGS.

1. Program generate Circle, ellipse.
2. Bar chart and Pie chart.
3. Transformations on Graphic object.
4. Clipping algorithms.
5. Character generation.
6. Pattern filling and textures.
7. Curve generation algorithms.
8. Curve generation using mouse.
9. Three dimensional Projections.
10. 3-D shading.

BIT 283

MINI PROJECT – II

Instructions
Sessionals

3 Periods per week
25 Marks

Data base development for any of Business Applications containing Atleast 10
Tables

Or

Development of any controller circuits using CPLDs or FGPAs

Or

Development of Graphics Package

