VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- III (Computer Emgg.)

Semester – V

SCHEME FOR TEACHING AND EXAMINATION

B.E.III (CO) 5th Semester		Teaching Scheme			Examination Scheme						
					Theory Exam		Practical/Quiz/Viva/T.W. etc.				
					University Exam.		University Exam.		Tutorial	Cont. Evaluation	Total Marks
Course	Course No.	L Hrs.	T Hrs.	P Hrs.	Duration Hrs.	Marks	Duration Hrs.	Marks			
Algorithm Analysis & Design	ECC 501 CO	3	0	0	3	100	0	0	0	0	0
Computer Graphics	ECC 502 CO	3	1	2	3	100	3	30	25	20	75
Microprocessors & Interfacing Techniques	ECC 503 CO	3	0	2	3	100	3	30	0	20	50
Principal of Programming Languages	ECC 504 CO	3	1	2	3	100	3	30	25	20	75
Communication Systems	ECE 505 CO	3	0	2	3	100	3	30	0	20	50
Pulse & Waveform Circuits	ECE 506 CO	3	0	2	3	100	3	30	0	20	50
	TOTAL:	**18**	**2**	**10**	**-**	**600**	**-**	**150**	**50**	**100**	**300**
Total Contact Hours: 30								**Total Marks: 900**			

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- III (Computer Emgg.)

Semester – V

ECC 501 CO : ALGORITHM ANALYSIS & DESIGN

	Lecture	Tutorial	Practical
Teaching Hours	3	0	0
Examination Scheme Marks	100	0	Cont. Evaluation : 00 Examination : 00

1. Introduction : Concept of an algorithm, program, problem; Reveiew of elementary data structures; symptotic Complexity, Notation - Priori, Posteori analysis

2. Divide & Conquer : General method - Control abstraction - MAxMin recurring relations; Sorting; erge Sort, Quick Sort, Selection sort; Computing time.

3. Greedy mehtod : General details, Optional Storage on tapes; Knapsack problem - Job Sequencing ith deadlines - Merge patterns - Minimum Spanning trees - Shortest path.

4. Dynamic Programming : General details, Multistages graphs; All pair shortest paths, Optimal bin;earch trees; 0/1 knapsack, Traveling Salesman Problem.

5. Backtracking : General details, Eight Queens problem, Sum of subsets - Graph oloring,Hamiltonian Cycles; Knapsack.

6. Branch & Bound : Method; 0/1 Knapsack problem - TSP.

7. NP-Hard and NP-Complete theory : Basic concepts; Nondeterministic algorithms - 0(n) Sorting - P-complete & NP-Hard theory - Example problems.

8. Advanced topics.

References :

1. Horowitz E & Sahni S - Fundamentals of Computer Algorithms, Galgotia Publications, Reprint 1994

2. Brassard & Bratley - Fundamentals of Algorithmics, PHI EEE. 1994

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- III (Computer Emgg.)

Semester – V

ECC 502 CO : COMPUTER GRAPHICS

	Lecture	Tutorial	Practical
Teaching Hours	3	1	2
Examination Scheme Marks	100	25	Cont. Evaluation : 20 Examination : 30

1. Introductory concepts : Coordinate representation, Pixel, Raster Scan & Random Scan methods, Video Memory, dual port memory; Color CRT Raster Scan Basics, Video Basics, Interactive Devices, Graphics Input and Output Devices : Mouse, Track-ball, Light Pen, Digitizer, Thumb-wheel. Raster Scan Graphics : Line Drawing Algorithms : Simple, DDA, Bresenham;s Line Drawing algorithm, Integer & General Bresenham's Line Drawing Algorithm; Basic Graphics Primitives.

2. Circle & Ellipse : Conventional methods & brsenham's Algorithm. Polygon : Real time Scan Conversion & Run length encoding; Representation of polygon; Conventional methods for drawing polygons; Scanline algorithm; Edge List algorithm, Edge fill algorithm, Frence fill algorithm, Edge flag algorithm, Seed Fill algorithms; Scan Line Seed Fill algorithms.

3. Transformations : Different Operations : Scaling, Rotation, Translation; Combined Transformations : Solid Body transformations, Translation & Homogeneous coordinates; 2-D transformation matrices for above operations.

4. 3-D Graphics : 3-D representation, 3-D Transformations : Scaling, Shearing Rotation, Reflection, Translation; Multiple Transformations; Projections : perspective, parallell and orthographics projection, Axonometric, Oblique projections; Perspective Tranformations. Techniques for generating perspective views; 3-D transformation matrices for different transformations.

5. Clipping : 2-D Clipping, Sultherland-Cohen subdivision Line Clipping algorithm, Mid-point subdivision algorithms, 3-D Clipping, 3-D Mid-point subdivision algorithm; Polygon Clipping, Sutherland-Hodgman algorithm; Character Clipping.

6. Hidden Lines & Hidden Surface Removal : Scan-line & z-buffer algorithm.

7. Advanced Topics : Color, additive and Subtractive picture representation, Shading, Rendering, Shadows, Texture & Ray Tracing, Fractals, Half-toning, Antialiasing.

8. Applications : HTML Web-page Design & Implementation; Introduction to VRML.

Practical work shall be based upon the theory course.

References :

1. Computer Graphics by Donald Hearn & M. Pauline Baker, PHI Second Edition, fifth Printing 1995.
2. Computer Graphics - A Programming approach by Steven Harrington, Mgh Second International Edition 1994.
3. Principles of Interactive Compouter Graphics by William M. Newman & Robert F. Sproull, MGH Interl Ed. 1993.
4. Procedural Elements for Compouter Graphics by David F Rogers, McGraw-hill International Ed, 1985 reprint.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- III (Computer Emgg.)

Semester – V

ECC 503 CO : MICROPROCESS & INTERFACING TECHNIQUES

	Lecture	Tutorial	Practical
Teaching Hours	3	0	2
Examination Scheme Marks	100	0	Cont. Evaluation : 20 Examination : 30

1. Introduction : Evalution of microprocessor; iAPX/nn Microprocessor family; Introduction to various types of processors viz Microprocessor. Bit - sliced & Microcontrollers. Intel 8085 Microprocessor Architechture and its operation; Interfacing Devices; Introduction to Interfacing Memory and Input/Output Devices.

2. Instruction & timing : Instruction Classification and Format, Instruction timing and operation status, Introduction to 8085 instruction set; Data transfer instruction, Arithmetic and logical operations, Advanced instructions.

3. Programming Intel 8085 Microprocessor : Machine Language Programming, Assembly Language Programming, Debugging a program, Programming Techniques viz Counting, looping, Indexing, Stack operations and Subroutines.

4. Interrupt Managment : Intel 8085 Interrupts, Different types of interrupts, Interrupt Service Routines, Enabling and disabling Interrupts, Interrupt Vectors, Typical Interrupt Acknowledgement and Responce.

5. Parallel Input/Output and Interfacing : Basic Interfacing Concepts, types of I/O, Interfacing Output Displays and Input Keyboards, Memory Mapped I/O and Interfacing Memory.

6. General Perpose Programmable Peripharal Devices : Basics in Programmable I/Os, Intel 8255 Programmable Peripharal Interface, Intel 8253 Programmable Interval Timer, Intel 8155 and Intel 8755 Multippurpose Programmable Devices; Interfacing, Initialization. Programming typical Applications of all the Devices.

7. Special purpose Programmable Peripharal Devices : Intefacing Intel 8279 Programmable Keyboard / Display; Intel 8259 Programmable Interrupt Controlller, modes; Intel 8257 DMA Controller, modes; Interfacing, Initialization, Programming typical application of all the devices.

8. Serial Data Communication : Serial I/O., Software Controlled Asynchronous Serial I/O, Hardware Controlled Serial I/O; Synchronous Serial Communication; Intel 8250 UART & Intel 8251 USART interfacing, initialization, programming application.

9. Typical advanced application of Microprocessor System, Devlopment & Troubleshooting Tools.

***Practical work shall be based upon the theory course*.**

References :

1. Ramesh S. Gaonkar, Microprocessor Arcitechure, Programming & Application with 8085/8080A, Wiley Eastern Ltd. 1996 Reprint.
2. B. Ram, Fundamental of Microprocessor & Microcomputers, Dhanpat Rai & Sons Fourth Edition, Reprint 1997.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- III (Computer Emgg.)

Semester – V

ECC 504 CO : PRINCIPLES OF PROGRAMMING LANGUAGES

	Lecture	Tutorial	Practical
Teaching Hours	3	1	2
Examination Scheme Marks	100	25	Cont. Evaluation : 20 Examination : 30

1. Introduction to programming languages : Why study programming languages - Major influences on the design & evolution of the programming language- Language pedigrees & Brief Historical Perspective - Criteria for the design of the programming language - Effects of the enviroment on the programming languages - Paradigms of the programming languages - Software Development Process.

2. Language Design Issues : Properties of Data types - Specification & Implementation issues of data types; Majors impact of the promitive data types; Data Aggregates methods; The concept of variable and their attributes; Evalution and assessment of some type issues viz Static & Dynamic Type Checking , Type coercion, Type compatibility; Dealing with pointers; Binding & Their types.

3. Abstraction in Programming lnguages -I : Subprograms & programmer defined data types; Abstract Data Type : Evolution, Encapsulation & Information Hiding; Subprogram Definition as Data objects. Issues in Type Definition.

4. Abstraction in Programming language - II : ADT revisited - Inheritance : Derived Classes, Methods, Abstract Classes, Objects & Messages in typical OOL; Typical operators in OOL; Operator overloading & precedence; Typical function in OOL; Constructors & Destructors.

5. Abstraction in Programming languages - III : Inheritance : Extending Classes, Virtual Base Classes, Member Classes; Virtual functions, Pointers to Objects, Pointers to Derived Classes; Streams in OOL; Templates & Exception Handling.

6. Symbolic Logic & Logics Programming : Introdution, Propositional Logic, First Order Logic, Logical Consequence, Logic Program using Horn Clause Theory, Resolution, Unification, SLD Resolution for Propositional Logic; Prolog Programming Model, Syntax & Semantics of Prolog programs, Completeness of Prolog, Built-in functions, I/O Predicates, Problem Solving Techniques, Cuts & Negations, Side-effects using Prolog, Symbolic Computation using Prolog.

7. Control Abstraction : Sequence control within expressions - /sequencing with Non-arithmetic expressions - Sequence Control between statements; Subprogram Sequence Control : Coroutines, Scheduled subprograms, Tasks.

8. Data Abstraction : Names & referencing enviroments - Static & Dynamic scope - Block Structure - Local Data & their refrencing enviroments - Shared data in Subprograms - Parameters & transmission.

9. Storage Management : Major runtime elements that require storage - Programmer controlled & system controlled storage management - Stack based & Heap based storage management.

10. Introduction to JAVA and Its standing amongst other programming languages.

Practical work shall be based upon the theory course.

References :

1. Programming Languages : Design & Implementation : T W Pratt & Zelkovitz, 3rd Ed, 1997.
2. Programming in PROLOG - R P Suri, A H Wheeler Pub, 1995.
3. Programmomg in C++, 2nd Edition : Dewhurst & Stark, 2nd edition, 1994
4. JAVA The Complete Reference - P Naughton, TMH Pub. 1997.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- III (Computer Emgg.)

Semester – V

ECC 505 CO : COMMUNICATION SYSTEMS

	Lecture	Tutorial	Practical
Teaching Hours	3	0	2
Examination Scheme Marks	100	0	Cont. Evaluation : 20 Examination : 30

1. Oscillators and Mixeres : Crystal Oscillator , Voltage - Controlled Oscillator, Frequency Synthesizers, Stability and Naturalization, Mixer Circuits.

2. Receivers : Superheeterodyne Receivers, Tuning Range, Tracking, Sensitivity and Gain, Image Rejection, Adjancent Channel selectivity , Automatic Gain Control.

3. Amplitude Modulations (AM) : AM, AM Index, Frequency spectrum, Average Power for Sinusoidal AM, Effective Voltage and Current, Nonsinusoidal Modulation, DSBSC Modulation, Amplitude modulater and Demodulater Circuits, AM Transmitters.

4. Single-Sideband (SSB) Modulation : SSB Principles, Balanced Modulators, SSB Generation and Reception.

5. Angle Modulation : Frequency Modulation (FM), Frequency spectra, Average power, Deviation Ratio, Measurement of Modulation Index, Phase Modulations (PM), Sinusoidal PM, Digital Pm, Angle Modulator Circuits, FM Transmitters, Angle Modulations Detectors, Afc

6. Pulse Modulation : Pulse Amplitude Modulation, Pulse Code Modulation, Pulse Frequency Modulation, Pulse Time Modulation, Pulse Position modilation and Pulse Width modulation.

7. Digital Communicatgions Probability of Bit Error in Baseband Transmission, The Matched Filter, Bit-timing Recovery, Digital Carrier Systems.

8. Radio-Wave Propagation : Propagation in Free Space, Tropospheric Propagation,lonosperic Propagation, Surface Waves.

9. Satellite Communications : Orbits, Geostationary Orbit, Power Systems, Attitude Control

10. Fiber-Optic Communications : Principles of Light Transmission in a Fiber losses in Fibers, Dispersion, Light Sources for Fibre Optics, Photodectors.

Practical work shall be based upon the theory course.

Books :

1. Electronics Communicatrions, 4th Edition by Dennis Roddy & John Coolen, PHI, 1995
2. Electronics Communication Systems, 3rd Edition, by George Kennedy, McGraw Hill Book Co,1993
3. Communication Systems, 2nd Edition, by Simon Haykin, Wiley Eastern Ltd.,1994

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.- III (Computer Emgg.)

Semester – V

EC 506 CO : PULSE & WAVEFORM CIRCUITS

	Lecture	Tutorial	Practical
Teaching Hours	3	0	2
Examination Scheme Marks	100	0	Cont. Evaluation : 20 Examination : 30

1. Linear wave shapping : High pass RC Circuit and its response to sinusoidal, step, pulse, square wave, exponential and ramp inputs - High pass RC circuits as a differentiator. Double Differentiaion - Low pass RC circuit and its response to sinusoidal, step, pulse, squarewave, exponential and ramp inputs - Low pass RC circuits as an integrator, Attenuators.

2. Clipping & Comparator Circuits : Diode Clippers - Transistor Clippers - Clipping at two independent levels - Emitter coupled clipper - Compensation for temperature changes in diode - Comparators - Applications of voltage Comparators.

3. Clamping & Switching Circuits : Clamping operation, Clamping circuit, Clamping circuit theorem, Practical clamping circuits, Effect of diode characterstics - Clamping in base, Synchronous clamping circuit, Transistor as a switch, Two stage overdriven amplifer, Damper diodes, Switch with inductive and capacitive load, Collector catching diode, Nonsaturating switches, Emitter follower with capacitive load.

4. Comparators using Op-amps : Zero crossing and Level sensing comparator circuits. Comparators with hysteresis - Schmitt trigger, Window comparator, Limitation of Op-amps, High speed and precision type comparators.

5. Integrated Circuits Oscillators : Operating principales and applications of voltage controlled oscillators (LM566), phase locked loop (LM565) and single chip function generator (ICL8038), V-F converter and F-V converter.

***Practical work shall be based upon the theory course*.**

References :

1. Millman & Taub, Pulse, Digital and Swithching waveforms, McGraw Hill, IS Edition, 1994.
2. Doyle J., Pulse Fundamentals, 2/e, 1993.
3. Mitchell B.B. : Semiconductor pulse circuits with experiments, Holt-Rhinehart & Winston, 1990
4. Winzer W.B. : Linear Integrated Circuits, Saunders HBJ 1992.
5. Ramakant Gayakwad : Op-amps and Linear Integrated Circuits.