GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY

KASHMERE GATE, DELHI – 110006

LESSON PLAN
SEVENTH SEMESTER (NEW SYLLABUS)

ACADEMIC YEAR 2007-08

LESSON PLAN FOR THE

SEVENTH SEMESTER (ACADEMIC YEAR 2007-08)

S. No	SUBJECT CODE	SUBJECT
1	ETEC-401	Microprocessor Systems – II
2	ETEC-403	Optical Communication
3	ETEC-407	Mobile Computing (also for CSE)
4	ETEC-409	Advanced VSLI Design
5	ETEC-411	Digital Image Processing (also for CSE)
6	ETEC-413	Power Electronics
7	ETEC-415	Advanced Computer Architecture

S. No	SUBJECT CODE	SUBJECT
8	ETCS-403	Advanced Computer Architecture
9	ETCS-405	Computer Construction (also for IT)
10	ETCS-413	Requirements & Estimation Techniques (also for IT)
11	ETCS-415	Advanced Computer Architecture (only for IT)

S. No	SUBJECT CODE	SUBJECT
12	ETIT- 401	Advanced Computer Networks (also for CSE)
13	ETIT- 403	Multimedia Applications
14	ETIT- 405	Network Technology (only for ECE)
15	ETIT- 409	VLSI Design (also for CSE)

S. No	SUBJECT CODE	SUBJECT
16	ETEE-401	Electric Drives
17	ETEE-403	HVDC Transmission
18	ETEE-405	Computer Networks (also for ICE)
19	ETEE-407	Biomedical Instrumentation
20	ETEE-413	Non-Conventional Energy Systems
21	ETEE-415	Software Engineering (also for ICE)
22	ETEE-417	Optical Communication
23	ETEE-421	Electrical Energy Conversion

S. No	SUBJECT CODE	SUBJECT
24	ETIC-401	Micro Controller
25	ETIC-403	Biomedical & Analytical Instrumentation
26	ETIC-411	Computerized Process Control

S. No	SUBJECT CODE	SUBJECT
27	ETME- 401	Computer Aided Manufacturing
28	ETME- 403	Mechatronics
29	ETME- 405	Refrigeration & Air Conditioning
30	ETME- 407	Solar Energy
31	ETME- 409	Personnel Management
32	ETME- 413	Automotive Engineering
33	ETME- 417	Computer Aided Design

ACADEMIC PLAN FOR VII SEMESTER (FOR YEAR 2007-08)

SUBJECT: MICROPROCESSOR SYSTEMS- II **Subject Code: ETEC-401**
Total Teaching weeks in Semester: 14 weeks **Total number of Lectures- 39**
Total Number of Tutorials- 13

S. No.	TOPICS TO BE COVERED	Total No. of lecture/Tutorial	
	First Term	**Lect**	**Tutorial**
1	Evolution of Microprocessor- Block diagram of Microprocessor based system, Introduction to various processors	2	1
2	Architecture of 8086- Detailed description of 8086, Segmentation of Memory used with 8086, Methods of Generating Physical address, Addressing Modes of 8086, Real Mode Memory addressing, Relocability of 8086	4	1
3	8086 Assembly language programming- Instruction set of 8086, Constructing the machine codes for 8086, Assembler Directives, Assembly language programming, Assembler, Debugger, program development tools.	6	2
4	8086 Configuration- Pin configuration of 8086, De-multiplexing 8086, Modes of operation of 8086, Clock Generation, Interrupts of 8086	6	2
	Second Term		
5	Memory interfacing- Memory interfacing with 8086, Introduction to 80186, 80286. Protected Mode memory addressing, Introduction to 80386, 80486, Memory paging, Multi-tasking and Multiprogramming, Addressing modes of 80386, Interfacing memory with 80386.	8	3
6	Co-Processor 8087- Architecture of 8087, Programming with 8087, Multiprocessor System, Problems in Multiprocessor System	4	1
7	BUS Protocols, ISA, EISA, VESA, PCI		
8	Microprocessor system designing - Aspects of Microprocessor based design, Design tools for Microprocessor Development, MDS, Logic Analyzer, In-Circuit EMUCATOR, Trouble – Shooting the Micro computer	4	1
	Third Term		
9	Introduction to Pentium and higher generation- Introduction to MMX technology, Architecture of Pentium, Introduction to Pentium-II, III, IV Celeron & Titanium processor	3	1
10	Introduction to Bit Slice processor, Signal processing processor TMS 320 etc., Transputers	2	1

ACADEMIC PLAN FOR B. TECH. VII SEMESTER (FOR YEAR 2007-08)

Subject: Optical Communication. **Subject Code: ETEC-403**

Total Number of Lectures-39

Total Teaching weeks in Semester: 14 weeks **Total Number of Tutorials-13**

S. No	TOPICS TO BE COVERED	# of Lect /Tutorial	
	FIRST TERM	**Lect**	**Tut**
1	Comparison of Optical Fiber Cables & Conventional Metallic Cables, Advantages of Optical Fiber.	2	
2	Light propagation in optical fiber. Total internal reflection, acceptance angle, and numerical aperture.	2	1
3	Measurement of information channel capacity, communication system architecture, Basic optical communication system.	2	
4	Propagation in Dielectric wave guide; Introduction	2	1
5	Step index, graded index, single and multimode fiber; modes Electromagnetic waves-step index fiber, graded index fiber.	2	
6	Field equation in step index fiber and graded index fiber, slab wave guide	1	1
7	Attenuation in optical fiber, absorption (material, intrinsic and extrinsic) scattering –Raleigh and Mie	2	
8	Very low loss material. All plastic and polymer clad silicon fibers.	1	
9	Dispersion – intra-modal, inter-modal, step index, multimode graded index fiber.	1	1
10	Overall Fiber Dispersion-Single Mode And Multimode.	2	1
11	Dispersion shifted fiber and Dispersion flattered fiber. Polarization-Modal Birefringence (single mode)		1
	Second Term		
13	Optical source , design of LED for Opt Comm.-Introduction	2	
14	LED power &Efficiency, LED structure, planner LED, DOME LEDs surface emitter LED's LED characteristic, output spectrum	2	1
15	Modulation bandwidth, Reliability, modulation semiconductor laser for optical fiber communication systems.	2	1
16	Introduction basic concepts, absorption and emission of radiation population inversion, optical feedback & laser. Hetro-junction, semiconductor injection laser efficiency, semiconductor injection laser to fiber coupling	2	1
17	Detectors Photodiodes- Detector, Introduction, Optical detection principle quantum efficiency, Responsivity, large wavelength cut-off, PN photodiode, PIN Photodiode, speed of response, Avalanche photodiode, Silicon react through Avalanche photodiode Benefits & drawbacks of Avalanche photodiode, multiplication factor, photodiode, multiplication factor, Photo multiplier tubes.	4	
18	Optical fiber com. system- Telecommunication, Local Distributor series, Computer network Local Data Transmission and Telemetry.	3	1
19	.Digital Comm. Fiber optical system-First, second and Future generation Data Communication Network – Network topologies, Star, Bus & Ring	2	1
20	**Third Term**		
21	MAC protocol, Advance multiplexing strategies OTDM, Sub Carver multiplexing, WDM	2	1
22	Networking architecture – SONET / SDM, Optical Transport Network, Optical Access Network Optical Premise Network.	1	
23	Application – Military application, Civil, Consumer & Industrial applications.	2	1

ACADEMIC PLAN FOR B. TECH. VII SEMESTER (FOR YEAR 2007-08)

Subject: Mobile Computing **Subject Code:** ETEC-407

Total Number of Lectures-39

Total Teaching weeks in semester: 14 weeks Total Number of Tutorials-13

	TOPICS TO BE COVERED	Total No. of Lecture/Tutorial	
First Term		**Lecture**	**Tutorial**
1	Introduction and PCS Architecture	01	01
2	Mobility management	01	
3	Network signaling	01	
4	Introduction to cellular system	01	01
5	Cell splitting, Interface, Hand off, location updating	02	
6	GSM Architecture	04	01
7	Mobility management	01	
8	Network signaling	01	
9	GPRS Architecture	01	01
10	GPRS Network Node	01	
11	Introduction to protocols	01	01
Second Term			
12	Wireless application protocol :Overview & application	01	01
13	Mobile Internet standard	01	
14	WAP Gateway and protocols	02	
15	Wireless markup languages	02	02
16	WLAN IEEE 802.11, Protocol	03	
17	Mobile, IP, Working, discovering COA,	03	01
18	Registering COA, Tunneling COA, introduction to mobile IPV6		01
19	Third generation mobile services	01	01
20	IMT 2000 Vision	01	
21	WCDMA, CDMA2000, QOS in 3G	02	01
22	WLL, Introduction, Architecture, Technologies	02	
Third Term			
23	Global mobile satellite system, case studies of IRIDIUM and GLOBBALSTAR	02	01
24	Wireless enterprise networks, introduction to virtual networks, virtual private networks	02	
25	Blue tooth technology, Blue tooth protocol	02	

ACADEMIC PLAN FOR VII SEMESTER (FOR YEAR 2007-08)

Subject: Advanced VLSI Design **Subject Code:** ETEC-409

Total Number of Lectures-39

Total Teaching weeks in semester: 14 weeks Total Number of Tutorials-13

	TOPICS TO BE COVERED	Total No. of Lecture/Tutorial	
First Term		**Lecture**	**Tut**
1	Review of MOS modeling.	2	
2	Integrated circuit layout: Matching concepts	1	1
3	MOS transistor layout, Resistor and capacitor layout.	2	
4	Noise in integrated circuits- Shot noise, Burst, and Avalanche noise.	1	1
5	MOS current and sources: Simple, Cascade, high swing cascade	2	1
6	MOS current mirrors: simple, Standard cascade, Wilson, Wilder regulated cascade.	3	
7	CMOS Amplifiers: Gain calculations, frequency response of active load, current source push pull inverters.	3	1
8	Large signal and small signal analysis of differential and cascade amplifiers slew rate.	2	
9	Qualitative discussion of output amplifiers.	1	1
10	CMOS op-amp – Ideal op-amp, characterization, classification.	1	
	Second Term		
11	Two stage op-amp, miller compensation	3	1
12	Qualitative discussion of PSRR.	1	1
13	Cascade and folded op-amp	1	
14	Comparators: Characterization, static & dynamic characteristics.	1	1
15	Two stage open loop comparator.	1	1
16	Auto zeroing techniques, comparator using hysterics high speed comparator	2	
17	MOSFET switch: Charge injection, capacitive feed through sample and hold circuit.	2	1
18	Switch capacitor circuit- Resistor emulation integrator, charge amplifier, switch capacitor amplifier.	2	
19	OTA filters.	1	
20	Phase Lock loop : various stage of PLL : XOR phase detector and PFD.		1
21	VCO, current starved, loop filter.	3	1
	Third Term		
22	Data converters: Current scaling DAC		
23	Voltage scaling DAC charge scaling DAC.	2	1
24	Extending resolution of parallel DAC, similar scaled DAC's. High speed ADCS, parallel or flash ADCS, interpolating ADCS, folding ADCS, multi-bit pipeline ADCS delta sigma modular, Decimators filters.	2	

ACADEMIC PLAN FOR VII SEMESTER (FOR YEAR 2007-08)

SUBJECT: DIGITAL IMAGE PROCESSING **Subject Code: ETEC-411**
Total Teaching weeks in Semester: 14 weeks **Total Number of Lectures-39**
Total number of Tutorials-13

S. No.	TOPICS TO BE COVERED	Total No. of lecture/Tutorial	
	First Term	**Lect**	**Tut**
1	Introduction to DIP Fundaments - What is DIP & its Origin, Fundamental steps, Elements of virtual perception, Sampling & Quantisation, Basic Relationship between pixel	7	2
2	Image Enhancement, Basic to gray level transformation, Histogram processing, Arithmetic logic operations, Filters spatial (i) Smoothing (ii) Shaping	5	2
3	Image Transforms, Smoothing frequency filters, Sharpening frequency filters, Homomorphism filtering	5	1
	Second Term		
4	Color Image Processing-Color Models, Pseudo-color Image Processing	4	1
5	Image Restoration-Model of Degradation, Restoration Process and noise model; Restoration in the process of noise only spatial filtering. , Reduction by Frequency Domain, Inverse and Weiner Filtering, Constrained least square filtering and geometric mean filter	5	2
6	Image Compression-Fundamentals & Compression model, Error free compression, Lossy Compression • Predictive • Transform Introduction to Image Compression (Standards)	4	2
8	a) Morphological- Basic, Dilation and Eras ion	4	1
	Third Term		
9	Representation & Description –Representation, Boundary, Regional	2	1
10	Object Recognition, Pattern & Pattern Class Recognition based on decision- theoretic methods	3	1

ACADEMIC PLAN FOR VII SEMESTER (FOR YEAR 2007-08)

SUBJECT: POWER ELECTRONICS **Subject Code: ETEC-413**

Total Lectures: 39

Total Teaching Weeks in Semester: 14 **Total Tutorials: 14**

	TOPICS TO BE COVERED	Total No. of Lecture/Tutorial	
First Term		**Lecture**	**Tutorial**
1	Introduction concept of Power Electronics & Applications	1	
2	Introduction to Thyristor, Static Anode – Cathode Characteristics of SCR	1	
3	Two – Transistor model of Thyristor and turn ON methods of an SCR	1	
4	Dynamic Turn – on & Turn off switching characteristics, Turn Off methods of an SCR.	1	1
	THYRISTOR FAMILY	4	
5	Power Diodes, Power Transistors, Power MOSFETS, IGBT, GTO		1
6	DIAC, TRIAC		
7	Static induction Thyristor, silicon – Controlled switch, Shockley diode, Opto-Isolators.		
8	Reverse Conducting Thyristors (RCT), MOS Controlled Thyristor (MCT), LASCR, GATT, ASCR Field control Thyristor (FCT).		
9	Uni-junction Transistor, Characteristics and applications of UJT, Programmable Uni-junction Transistor (PUT)		1
	Firing Circuits for Thyristors	5	
10	Requirements for Triggering Circuits & its features, resistance and Resistance – Capacitance Thyristor firing Circuits.		
11	Full Wave Control of AC with One Thyristor, Light Activated SCRs (LASCR) Control Circuit.		1
12	Pulse Transformer Triggering, Phase Control of SCR by Pedestal and Ramp.		
13	Firing SCR by UJT, Triac Firing Circuit		
	PHASE CONTROLLED RECTIFIER	4	
14	Types of Converters, Principles of Phase Control, and Single Phase half wave controlled rectifier – R, RL load.		1
15	Single Phase full wage Controlled Rectifiers- Mid point Connection, Bridge connection, Harmonics		
16	Communication Techniques		1
	Second Term		
17	Classification of Inverters, Series Inverter	1	
18	Parallel inverter		
19	Single Phase Bridge Voltage source Inverter – Half Bridge, full bridge	1	1
20	Three Phase Bridge Inverters – 180 degree mode VSI, 120 degree mode VSI	1	
21	Pulse Width Modulated Inverters	1	
22	Current Source Inverter – Single phase, three phase Comparison between VSI & CSI	1	1
	AC Voltage Controllers	**3**	

23	Types of AC Voltage Controllers, Integral Cycle Control		
24	Single Phase Voltage Controllers – R, RL – Load with harmonic analysis		1
25	Gating Signal Requirements		
	DC TO DC CONVERTERS (CHOPPERS)	6	
26	Principle of Chopper operation, Control Strategies – Constant frequency, variable frequency.		1
27	Step-up, Step-down Chopper		1
28	Chopper Configuration – First Quadrant (Type –A), Second Quadrant (Type-B), Two Quadrant (Type-C)		
29	Two quadrant (Type-D), Four Quadrant chopper (Type-E)		
30	Morgan's Chopper		
	THYRISTOR PROTECTION	3	
31	Protection, dv/dt Protection, di/dt Protection		1
32	Over voltage Protection		
	Third Term		
33	Types of Cycloconverters, Principle of operation of Cycloconverters	2	
34	Single Phase Cycloconverters – step up step down		
35	Three phase Cycloconverters		1
	INDUSTRIAL APPLICATIONS	3	
36	"One Shot" Thyristor Trigger Circuit, Simple Battery Charger		
37	Battery Charging Regulator		
38	AC static Switches, dc Static Switch		1
39	Microprocessor based applications		

ACADEMIC PLAN FOR B. TECH. VII SEMESTER (FOR YEAR 2007-08)

SUBJECT: ADVANCED COMPUTER ARCHITECHTURE

Subject Code: ETEC-415
Total Number of Lectures-39
Total Teaching Weeks in Semester: 14 Weeks **Total Number of Tutorials-13**

	TOPICS TO BE COVERED	Total No. of Lect/Tut	
	First Term	**Lect**	**Tut**
	Parallel computer models:		
1	The state of computing	1	
2	Multiprocessors and multi-computers	1	
3	Multi-vector and SIMD computers, Architectural development tracks	1	1
	Program and network properties		
4	Conditions of parallelism, Data and resource dependencies	1	
5	Hardware and software parallelism	1	1
6	Program partitioning and scheduling, Grain size and latency	1	
7	Program flow mechanisms	1	
8	Control flow versus data flow, Demand driven mechanisms	1	1
9	Data flow architecture	2	
10	Comparisons of flow mechanisms	1	1
	System Interconnect Architectures		
11	Network properties and routing, Static interconnection networks	1	
12	Dynamic interconnection Networks	2	
13	Multiprocessor system interconnects, Hierarchical bus systems, Crossbar switch and multi-port memory, Multistage and combining network.	3	1
	Second Term		
	Processors and Memory Hierarchy		
14	Advanced processor technology, Instruction-set Architectures	1	
15	CISC Scalar Processors, RISC Scalar Processors	1	
16	Super-scalar Processors, VLIW Architectures	2	1
17	Vector and Symbolic processors	1	
	Memory Technology		
18	Hierarchical memory technology, Inclusion, Coherence and Locality, Memory capacity planning	2	1
19	Virtual Memory Technology	2	1
	Back plane Bus System		
20	Back plane bus specification, Addressing and timing protocols	1	
21	Arbitration transaction and interrupt	1	1
22	Cache addressing models, Direct mapping and associative caches	1	
	Pipelining		
23	Linear pipeline processor	1	
24	Nonlinear pipeline processor	1	1
25	Instruction pipeline design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch handling techniques	2	
26	Arithmetic Pipeline Design, Computer arithmetic principles, Static arithmetic pipeline, Multifunctional arithmetic pipelines	1	1

	Third Term		
	Vector Processing Principles		
27	Vector instruction types	1	
28	Vector-access memory schemes	1	1
	Synchronous Parallel Processing		
29	SIMD Architecture and Programming Principles, SIMD Parallel Algorithms	2	1
30	SIMD Computers and Performance Enhancement	1	

ACADEMIC PLAN FOR VII SEMESTER (FOR YEAR 2007-08)

SUBJECT: ADVANCEDCOMPUTER ARCHITECHTURE Subject Code: ETCS 403

Total Lectures: 42
Total Tutorials: 14

Total teaching weeks in semester: 14 weeks

	TOPICS TO BE COVERED	Total No. of Lecture/Tutorial	
	First Term	**Lecture**	**Tutorial**
	Parallel computer models		
1	The state of computing	1	
2	Multiprocessors and multi-computers	1	
3	Multi-vector and SIMD computers, Architectural development tracks	1	1
	Program and network properties		
4	Conditions of parallelism, Data and resource dependencies	1	
5	Hardware and software parallelism	2	1
6	Program partitioning and scheduling, Grain size and latency	1	
7	Program flow mechanisms	1	
8	Control flow versus data flow, Demand driven mechanisms	1	1
9	Data flow architecture	2	
10	Comparisons of flow mechanisms	1	1
	System Interconnect Architectures		
11	Network properties and routing, Static interconnection networks	1	
12	Dynamic interconnection Networks	2	1
13	Multiprocessor system interconnects, Hierarchical bus systems, Crossbar switch and multi-port memory, Multistage and combining network.	3	1
	Second Term		
	Processors and Memory Hierarchy		
14	Advanced processor technology, Instruction-set Architectures	1	
15	CISC Scalar Processors, RISC Scalar Processors	1	
16	Superscalar Processors, VLIW Architectures	2	1
17	Vector and Symbolic processors	1	
	Memory Technology		
18	Hierarchical memory technology, Inclusion, Coherence and Locality, Memory capacity planning	2	1
19	Virtual Memory Technology	2	1
	Back plane Bus System:		

20	Back plane bus specification, Addressing and timing protocols	1	
21	Arbitration transaction and interrupt	1	1
22	Cache addressing models, Direct mapping and associative caches	1	
	Pipelining		
23	Linear pipeline processor	1	
24	Nonlinear pipeline processor	1	1
25	Instruction pipeline design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch handling techniques	2	
26	Arithmetic Pipeline Design, Computer arithmetic principles, Static arithmetic pipeline, Multifunctional arithmetic pipelines	2	1
	Third Term		
	Vector Processing Principles		
27	Vector instruction types	1	
28	Vector-access memory schemes	1	1
	Synchronous Parallel Processing		
29	SIMD Architecture and Programming Principles, SIMD Parallel Algorithms	2	1
30	SIMD Computers and Performance Enhancement	1	

ACADEMIC PLAN FOR VII SEMESTER (FOR YEAR 2007-08)

Subject: Compiler Construction **Subject Code: ETCS-405**

Total Lectures: 42

Total Tutorials: 12

Total Teaching weeks in Semester: 14 weeks

	Topics To Be Covered	Total No. of Lecture / Tutorial	
Sr.N0.	**First Term**	**Lecture**	**Tutorial**
1	Introduction to Compilation Process	1	
2	Compiler gen. Tools and other System Softwares	1	
3	Classification of Grammars	2	1
4	Context free Grammars	3	1
5	Deterministic Finite State Automata (DFA)	2	
6	Non-DFA	2	1
7	Scanners (Lexical Analyzer)	2	
8	Top down parsing (Recursive descent parsing)	1	1
9	LL grammars	2	
10	Bottom up parsing	1	1
11	Polish expression operator precedence grammar	1	
	Second Term		
12	LR grammars (SLR, LALR, CLR)	3	1
13	Comparison of parsing method	1	
14	Error handling	1	
15	Symbol table handling techniques	1	1
16	Organization for non-block and block structured languages.	1	
17	Run time storage administration	1	
18	Static & dynamic allocation	2	1
19	Intermediate forms of source program	1	
20	Polish, N-tuple and syntax trees	1	1
21	Semantic Analysis	3	
22	Code generation	3	1
	Third Term		
23	Code optimization	1	1
24	Folding, redundant sub-expression evaluation	1	
25	Optimization within iterative loops	2	1

ACADEMIC PLAN FOR VII SEMESTER (FOR YEAR 2007-08)

Subject: Requirements & Estimation Techniques **Subject Code: ETCS-413**

Total Lectures: 40

Total Teaching weeks in semester: 14 weeks **Total Tutorials: 14**

TOPICS TO BE COVERED		Total No. of Lecture/Tutorial	
First Term		**Lecture**	**Tutorial**
UNIT-I			
1	Requirements Elicitation	01	
2	Requirements Elicitation Techniques	01	01
3	Requirement Analysis	01	
4	Requirement Analysis Models	01	01
5	Requirement Documentation	01	
6	Requirement Management	01	01
7	IEEE Standard for SRS	01	
UNIT-II			
8	Function Point Analysis	03	01
9	Mask II FPA	03	01
10	LOC estimation	02	
11	Conversion between size measures	02	01
Second Term			
UNIT-III			
12	Estimation factors	02	
13	COCOMO-II	03	01
14	Putnam Estimation Model	02	
15	Estimation by Analogy	02	01
16	Validating Software estimates	03	01
UNIT-IV			
17	Introduction to software life cycle	02	
18	Management activities in software project	02	01
19	Software estimation tools	02	01
Third Term			
20	IFPUG	01	
21	UQAM-SEMRL	01	
22	COSMIC	01	01
23	IEEE	01	
24	COCOMO	01	01

ACADEMIC PLAN FOR VII SEMESTER (FOR YEAR 2007-08)

SUBJECT: ADVANCEDCOMPUTER ARCHITECHTURE Subject Code: ETCS 415

Total Lectures: 42

Total Teaching Weeks in Semester: 14 Weeks **Total Tutorials: 14**

	TOPICS TO BE COVERED	Total No. of Lecture/Tutorial	
	First Term	**Lecture**	**Tute**
	Parallel computer models:		
1	The state of computing	1	
2	Multiprocessors and multi-computers	1	
3	Multi-vector and SIMD computers, Architectural development tracks	1	1
	Program and network properties		
4	Conditions of parallelism, Data and resource dependencies	1	
5	Hardware and software parallelism	2	1
6	Program partitioning and scheduling, Grain size and latency	1	
7	Program flow mechanisms	1	
8	Control flow versus data flow, Demand driven mechanisms	1	1
9	Data flow architecture	2	
10	Comparisons of flow mechanisms	1	1
	System Interconnect Architectures		
11	Network properties and routing, Static interconnection networks	1	
12	Dynamic interconnection Networks	2	1
13	Multiprocessor system interconnects, Hierarchical bus systems, Crossbar switch and multi-port memory, Multistage and combining network.	3	1
	Second Term		
	Processors and Memory Hierarchy		
14	Advanced processor technology, Instruction-set Architectures	1	
15	CISC Scalar Processors, RISC Scalar Processors	1	
16	Super-scalar Processors, VLIW Architectures	2	1
17	Vector and Symbolic processors	1	
	Memory Technology		
18	Hierarchical memory technology, Inclusion, Coherence and Locality, Memory capacity planning	2	1
19	Virtual Memory Technology	2	1
	Back plane Bus System		

20	Back plane bus specification, Addressing and timing protocols	1	
21	Arbitration transaction and interrupt	1	1
22	Cache addressing models, Direct mapping and associative caches	1	
	Pipelining:		
23	Linear pipeline processor	1	
24	Nonlinear pipeline processor	1	1
25	Instruction pipeline design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch handling techniques	2	
26	Arithmetic Pipeline Design, Computer arithmetic principles, Static arithmetic pipeline, Multifunctional arithmetic pipelines	2	1
	Third Term		
	Vector Processing Principles		
27	Vector instruction types	1	
28	Vector-access memory schemes	1	1
	Synchronous Parallel Processing		
29	SIMD Architecture and Programming Principles, SIMD Parallel Algorithms	2	1
30	SIMD Computers and Performance Enhancement	1	

ACADEMIC PLAN FOR VII SEMESTER (Year 2007 – 08)

SUB: ADVANCED COMPUTER NETWORKS **Subject Code: ETIT 401**

Total number of Lectures: 38

Total number of Tutorials: 10

Total Teaching weeks in Semester: 14 weeks

S No.	TOPICS TO BE COVERED	No. of	
	First Term	**Lecture**	**Tutorial**
1.	Evolution of the Internet, Internet Administration, Internet Standards Process	2	-
2.	WWW: Architecture & Technologies; Static, Dynamic & Active content	2	1
3.	Review of Layered Architecture; Physical, Logical & Port Addresses; SLIP & PPP Protocol	1	-
4.	Network Layer: IP Addressing (Classful / Classless), Subnetting, Private & Special Addresses, NAT	3	1
5.	Delivery, Forwarding & Routing of packets; Address Aggregation	2	1
6.	IP, ARP, RARP, ICMP, IGMP Protocol	3	1
7.	Routing Algorithms & Protocols (RIP, OSPF, BGP)	3	1
8.	Router Operation & Configuration	2	1
	Second Term		
9.	IPv6 Features, Improvements & Comparison with IPv4	2	-
10.	Transport Layer: Design issues, Socket Addressing, UDP	2	1
11.	TCP: Flow Control, Error Control, Connection Establishment, Congestion Control	3	1
12.	Application Layer: Design issues; DNS, BOOT P, DHCP, SNMP, RNOM, E-mail, HTTP (SMTP, POP3, IMAP4)	3	1
13.	Telnet, FTP/ TFTP	2	1
14.	Network Security: Firewalls (Packet Filtering & Proxy)	2	1
15.	Cryptography: Substitution/ Transposition Ciphers, Private/ public Key Algorithms (DES/ AES, RSA)	3	1
16.	Virtual Private Networks	1	-
	Third Term		
17.	ISDN, Frame Relay, ATM	4	1

ACADEMIC PLAN FOR VII SEMESTER (YEAR 2007-08)

SUB: MULTIMEDIA APPLICATIONS

Subject Code: ETIT-403
Total Number of Lectures: 40
Total Number of Tutorials: 15

Total Teaching weeks in semester: 14 weeks

TOPICS TO BE COVERED		Total No. of Lecture/Tutorial	
First Term		**Lecture**	**Tutorial**
1	Introduction concept: Multimedia- definition, CD-ROM, the multimedia highways, use of multimedia	2	
2	Introduction to making multimedia- the stage of projects, the requirement to make good multimedia.	2	1
3	Multimedia skills and training, training opportunities in multimedia, motivation for multimedia usage, frequency domain analysis, application domain & ODA etc.	3	1
4	Multimedia hardware & software: multimedia hardware- Macintosh & Windows production platforms	2	1
5	Hardware peripherals – connections, memory & Storage devices	2	1
6	Media software – Basic tools, making instant multimedia	2	1
7	Multimedia software and authoring tools, production, standard.	2	1
8.	Multimedia- making it work, multimedia building blokes- text, sound, images, animation and video, digitalization of audio and video objects.	4	1
Second Term			
9	Data Compression concern to text, audio, video and images etc.	4	1
10	Working expose on tools like Dream weaver 3D effects, Flash etc.	2	1
11	Animation: Different techniques, 2D, 3D animation, working on 3D animation tools	3	1
12	Modeling: NUMBS, polygon, organic modeling	3	1
13	Animation: Key frame, path animation, section animation etc.	3	1
14	Expression: active and passive bodies, fields, expression constraints etc	3	1
Third Term			
15	Rendering: different rendering techniques like IPR, Mental Ray, Software, Hardware etc.	2	1
16	Shadows, Materials, light and special effects.	2	1

ACADEMIC PLAN FOR VII SEMESTER (YEAR 2007-08)

SUB: NETWORK TECHNOLOGY **Subject Code: ETIT 405**

Total number of Lectures: 38

Total number of Tutorials: 10

Total teaching weeks in semester: 14

S. No	Topics to be covered	No. of Lectures/ Tutorials	
	First Term	**Lect**	**Tutes**
1.	Evolution of Internet, www undergoing technology, Email, Application layer services and protocols	1	
2.	RPC, NFS, SMTP, FTP, TELNET	3	1
3.	Network Management address and domain Management, SNMP	2	
4.	Internet searching tools	1	
5	Gopher, Archie, Veronica, WWW, Lynx, Mosaic, Usenet, Security issue	1	1
6	Internet development tools CGI, Perl, HTML, VRML, Java, VB script	4	1
7.	SLIP/PPP dedicated lines, BOOTP, DHCP.	2	
8.	DNS, Gateway, Dialup	2	
9.	Review of LAN Node, LAN Manager, Connecting LANs and WANs	1	1
Second Term			
1.	Transport layer services	1	
2	TCP/IP, TCP/IP protocols, (TCP, UDP) IP protocol Introduction to ARP, RARP, ICMP	3	1
3.	IP addressing, CIDR (Sub netting), (Super netting)	2	1
4	Network security (Public key, private key, firewall, filters)	1	1
5.	Software of IBASE5 Node, 10BASE5(Ethernet), 10BASE2, (Cheaper net), Twisted pair, Ethernet, FDDI	3	1
6	Serial communication RS-232, (9pin-15 pin)	1	
7	Modems, Synchronous, asynchronous (Introduction to ITU-T, 56 modems)	2	
8	SONET\SDH	1	
9	Routing algorithms (Introduction)		
10	Routing protocol (RIP, BGP, OSPF)	2	1
Third Term			
1	ATM technology	1	
2.	ISDN: technology devices, protocols, flow control, error correction	2	1
3.	USART- processor interface data buffer block of 8251 A, Control Logic of USART, transmitter, receiver, SYNDET/BRKDET in 8251 A, Monitoring of 8251 A, writing character to be transmitted to 8251 A, monitoring of 8251A, read status.	2	

ACADEMIC PLAN FOR VII SEMESTER (YEAR 2007-08)

SUBJECT: VLSI DESIGN

Subject Code: ETIT-409
Total No. of Lectures: 39
Total No. of Tutorials: 11

Total Teaching weeks in semester: 14 weeks

	TOPICS TO BE COVERED	Total No. of Lecture/Tutorial	
First Term		**Lecture**	**Tutorials**
1	MOS Transistor Theory: nMOS Enhancement Transistor, pMOS Enhancement transistor, threshold voltage	02	01
2	Fabrication of MOSFET: Silicon Semiconductor technology, Water processing, Oxidation, Epitaxy	02	01
3	Deposition, Ion-implantation and diffusion	02	01
4	The Silicon Gate Process, CMOS Technology, Basic n-well CMOS process, P-well process	02	01
5	Operation of MOS Transistor as a switch	01	
6.	Twin tub process CMOS process enhancement: metal interconnect, poly-silicon / refractory metal interconnect, circuit element: Resistor, Capacitor		
7	Modeling of MOS Transistor using spice	01	
8	MOS Invertors: Static Characteristics, MOS Inverters	01	01
9	CMOS Logic, the Inverter	03	
10	Design and analysis of nMOS, pMOS & cMOS circuits	03	
Second Term			
11	NAND gate, NOR gate, Compound gate	4	01
12	Switching characteristics and interconnect effect	3	01
13	Combinational MOS logic circuit: MUX, DMUX	2	
14	Transmission gate.	2	01
15	Differential inverter, Tri state inverter	1	
16	Sequential MOS logic circuits	2	
17	Dynamic Logic circuits	4	01
Third Term			
18	Semiconductor Memories	4	01

ACADEMIC PLAN FOR SEMESTER-VII (for 2007-08)

SUBJECT: ELECTRIC DRIVES

Subject Code: ETEE-401
Total lecture available: 40
Total Tutorial Classes: 14

Total Teaching Weeks in Semester: 14

S. No.	TOPICS TO BE COVERED	Total No. of Lecture	Tutorial
	First Term		
	Introduction	1	
1.	Solid State controlled electric drive-concept	1	1
2.	Elements & Salient features	1	
3.	Power Converter motor system closed loop control of electric drives	2	1
4.	Sensing of speed & current	1	1
5.	Review of power converter circuits, performance parameters	2	1
6.	Unique features of PM machines	1	
7.	Permanent magnet materials, power limitations of PM machines	1	1
8.	Permanent magnet D C Machines	2	
9.	Permanent magnet synchronous machines, applications of permanent magnet machines	2	
10.	Control of D.C. Drive, Control of D C Separately & series excited motor derive using controlled converters (single & three phase) & choppers.	3	1
Second Term			
11.	Static war-Leonard method, control scheme	2	1
12.	Power factor improvement	1	
13.	Solid state electric braking scheme	1	
14.	Closed loop control schemes	2	1
15.	Control of A.C. motor drives, Control of 3-phase induction motor drive, using A.C. voltage controllers, cyclo converters.	3	1
16.	Voltage source & current source inverters	2	
17.	Concept of field oriented control, slip power controlled, slip ring induction motor drives.	2	1
18.	Closed loop control schemes, self-controlled synchronous motor drives.	2	
19.	Brushier DC. Motor drive.	2	1
Third Term			
20.	Switched reluctance motor drive	1	1
21	Function of microprocessor in Electric Motors	1	
22	Salient features of microprocessor control	1	1
23	Microprocessor based control schemes for DC induction & synchronous motor drives.	2	1
24	Applications	1	

ACADEMIC PLAN FOR VII SEMESTER (FOR 2007-08)

SUBJECT: HVDC TRANSMISSION | **Subject Code: ETEE - 403**

Total Number of Lectures: 40

Total Teaching Weeks in Semester – 14 | **Total Tutorial Tutorials: 13**

S. N.	TOPICS TO BE COVERED	No. of Lecture/ Tutes	
	First Term	L	T
1	**Introduction**		
	Comparison of AC and DC Transmissions	2	
	Description of DC Transmission	1	1
	Application of DC Transmission	2	
	Types of HVDC Links	1	1
	Planning for HVDC Transmission	1	
	Modern trends in DC Transmission	2	1
2	**Analysis of HVDC Converters**		
	Thyristor Device and Valve	1	
	Pulse number, choice of converter configuration	1	
	Valve rating, Transformer rating	1	1
	Simplified Analysis of Graetz Circuit – Without overlap	2	
	With overlap	1	1
	Converter Bridge Characteristics, Characteristics of 12 pulse converter Two 3 phase converters in star – star mode and their performance	3	
	Second Term		
3	**Converter & HVDC System Control**		
	Principle of DC Link Control	1	
	Converters Control Characteristics – Firing angle control	2	1
	Current and extinction angle control	2	
	Effect of source inductance on the system	1	
	Starting and stopping of DC link	1	
	Power Control – Reactive Power Control	1	1
	Reactive power requirements of steady–states, Sources of reactive power.	1	
	Power flow Analysis in AC/DC systems, Modeling of DC links	2	1
	Solution of DC Load flow – PU System for d. c. quantities	1	
	Converter fault & Protection	1	
	Converter fault - Protection against over current and over voltage in converter station	1	1
	Surge arresters – smoothing reactors – DC breakers	2	
	Effects of proximity of AC DC Transmission Lines	1	1
	Third Term		
4	Harmonics & Filters, Generation of Harmonics, Adverse effects of harmonics, Calculation of voltage & Current harmonics, Effect of Pulse number on harmonics, Use of Filters for suppression of harmonics	3	1
	Types of AC filters: Single turned filters, High pass filters	2	1

ACADEMIC PLAN FOR VII SEMESTER (FOR 2007-2008)

SUB: COMPUTER NETWORKS

Sub Code: ETEE- 405
Total Lecture Available: 40
Total Tutorial Available: 14

Total Teaching weeks in Semester: 14 weeks

S. N.	TOPICS TO BE COVERED	Total No. of Lectures/Tutes	
	First Term		
1.	Uses of Computer Networks, Network Architecture	2	
2.	Reference Model (ISO-OSI, TCP/IP-Overview), IP Address Classes, Subneting	3	1
3.	Physical Layer: Theoretical basis for Data Communication, Transmission media-Magnetic Media, Twisted Pair, Base band Coaxial Cable, Broadband Coaxial Cable, Fiber Cable, Structured Cabling, Cable Mounting, Cable Testing, Wireless transmission	3	2
4.	Data Link Layer: Data Link Layer design issues, error detection and correction Data link protocols, sliding window protocols, Examples of Data Link Protocols	2 3	1
5.	Domain Name Registration & Registrars	2	1
6.	ATM, ATM Architecture, ATM Layers, ATM Applications	2	1
	Second Term		
7.	Medium Access Sub Layer: channel allocation, Static channel allocation, Dynamic channel allocation.	2	1
8.	Medium Access Protocol 1. Aloha 2. CSMA Protocol 3. Collision Free Protocol 4. Wire Less LAN Protocol	3	2
9.	IEE standard 802 for LANS and WAN: Ethernet / CSMA / CD, Token Bus, Token Ring, Distributed Queue Dual Bus, Logical Ring Control.	3	1
10.	High speed LANs (FDDI, Fast Ethernet)	1	
11.	Satellite alight Networks (CDMA, PDMA, FDMA, Poling)	2	
12.	Network Devices-Repeaters. Hubs, Switches, Bridges	1	
13.	Network Layer: Network layer Design Issues, Routing Algorithms: Shortest Path Routing, Distance Vector Routing, Link State Routing, Broadcast Routing, Multicast Routing.	3	1
14.	Cognition Control Algorithms	3	1
	Third Term		
15	Internetworking, Layer in internet, Network Layer in ATM	3	1
16	Narrowband ISDN, Broadband ISDN, Telephone System	3	

ACADEMIC PLAN FOR VII SEMESTER (FOR 2007-08)

SUBJECT: BIOMEDICAL INSTRUMENTATION **Subject Code: ETEE-407**

Total Lecture: 40

Total Teaching Weeks in Semester: 14 **Total Tutorial: 14**

S. No.	TOPICS TO BE COVERED	No. of Lecture/Tutes	
1.	**Introduction**: The age of Biomedical Engineering, Development of Biomedical Instrumentation, Man Instrumentation system, Components, Physiological system of the body, Problem encountered in measuring a living system.	2	1
2.	**Transducers & Electrodes**: Transducers & Transduction principles, Active transducers, Passive Transducers, Transducer for Biomedical Applications.	3	1
3.	**Sources of Bioelectric Potentials**: Resting & Action potentials, propagation of active potential	1	
4.	The Bioelectric potentials – ECG, EEG, EMG and Evoked responses	3	1
5.	Electrodes: Electrodes theory, Bio-potential Electrodes-Microelectrodes Body surface electrodes, Needle Electrodes, Biochemical Transducers, Reference electrodes, PH electrodes, Blood Gas electrodes.	3	1
6.	Human Anatomy & Physiology: Bioelectric potentials, leads & electrodes, Transducers for biological applications, Biomaterials.	2	1
7.	Monitor and Recorders	1	
8.	Bio-potential Amplifiers	1	
9.	Recorders & monitors: Galvanometric, potentiometer, ultra violet, electrostatic, ink jet.	2	1
Second Term			
9.	Video monitors, color printers Electro Physiological recorders,	2	1
10.	ECG-working principles & clinical applications.	2	1
	Nervous System Measurement		
11.	Anatomy of Nervous system, neuronal communication, EPSP & IPSP	2	1
12.	Neuronal firing measurements.	1	
	EMG – block diagram, various Rhythms, EEG in diagnostics	2	
13.	EMG and applications.	2	1
	Therapeutic Instruments		
14.	Diathermy, Defibrillator, cardiac pacemaker, stimulators	2	1
15	Laser applications in machine, X-Rays production & use,	2	1
16.	Radiographic Diagnostic and Therapeutic, Film construction and processing, Interaction with body.	2	1
17.	Fundamentals of radiation therapy.	1	
Third Term			
	Ophthalmology Instruments		
18.	Electro-Retinogram, Electro-oculogram	2	
19.	Ophthalmoscope, Tonometer for eye pressure measurement	2	1

ACADEMIC PLAN FOR VII SEMESTER (for 2007-08)

SUBJECT: NON-CONVENTIONAL ENERGY SYSTEM **Code No.: ETEE 413**

Total No. of Lectures: 40

Total No. of Tutes: 13

Total No. of weeks in Semester: 14

S. N.	Topic Details	No. of Lectures/ Tutes	
	First Term	L	T
1.	Introduction: Various non-conventional energy resources.	1	
2.	Their availability, classification, relative merits and demerits.	1	
3.	Solar Cells: Theory of solar cells, solar cell materials	1	1
4.	Solar cell power plant & limitations of solar cells	1	
5.	Solar Thermal Energy: Solar radiation flat plate collectors and their materials	1	
6.	Applications and performance of solar radiation flat plate collectors	1	1
7.	Focusing of collection and their materials.	1	
8.	Its applications and performance	1	
9.	Solar thermal power plants	2	1
10.	Thermal energy storage for solar heating and cooling, limitations.	2	1
11.	Geothermal Energy: Resources of geothermal energy.	1	
12.	Thermodynamics of geo-thermal energy conversion-electrical conversion	1	1
13.	Thermodynamics of geo-thermal energy conversion-non-electrical conversion	1	
14.	Environment consideration	1	
Second Term			
15.	Magneto-hydrodynamics (MHD): Principle of working	1	
16.	Various types of fuel cells and their working	2	
17.	Performance and limitations of MHD	1	1
18.	Thermo-electrical and thermionic conversion: Principle of working.	2	1
19	Performance and limitations of Thermo-electrical and thermionic conversion.	2	1
20	Wind Energy: Wind power and its sources,	1	
21	Site selection, criterion, momentum theory,	2	1
22	Classification of rotors, concentrations and augments,	2	
23	Wind characteristics, performance	1	1
24	Limitations of energy conversion systems	1	
25	Biomass: Availability of biomass and its conversion theory.	2	
26	Ocean Thermal Energy Conversion (OTEC),	1	1
Third Term			
27	Availability, theory and working principle of OTEC	2	
28	Performance and limitation of OTEC.	1	1
29	Wave and Tidal Wave: Principle of working	1	
30	Performance and limitations	1	
31	Waste Recycling Plant.	1	1

ACADEMIC PLAN FOR SEMESTER-VII (FOR 2007-08)

SUBJECT: SOFTWARE ENGINEERING **Subject Code: ETEE-415**

Total Lectures: 40

Total Tutorials: 13

Total Teaching Weeks in Semester: 14

S. No.	TOPICS TO BE COVERED	Total No. of Lecture/Tutorial	
	First Term		
1.	INTRODUCTION: Software crisis, Software Process Characteristics, Software like cycle models, waterfall prototype, evolutionary and spiral models.	3	1
2.	Software requirements analysis and specifications: Requirement engineering, requirement elicitation techniques like fast, QFD & use case approach, requirements analysis using DFD, Data dictionary & ER diagrams, requirements documentation. Nature of SRS, characteristics organization of SRS.	6	2
3.	Software Design: Cohesion and coupling, classification of cohesiveness and coupling	2	1
4.	Function oriented design: Deriving structure chart from DFD.	2	1
5.	Software project planning: size estimation like, lines of code and function count, cost estimation models, cocomo, cocomo-II, Putnam resource allocation model, risk management	5	
	Second Term		
6.	Object oriented design: steps for object oriented design	2	1
7.	Software metrics: Software measurement what & why token count, halstead software science measures, design metrics, data structure metrics, and information flow metrics.	6	2
8.	Software reliability: Importance hardware reliability and software reliability failure & faults, reliability models, basic model, logarithmic passion model, software quality CMM & ISO 9001.	5	2
9.	Introduction to Testing	1	
10.	Software Testing: Testing process, design a test case, functional testing, boundary value analysis, equivalence class graph structure testing, path testing, data flow and mutation testing, unit testing, integration and system testing, debugging, alpha & beta testing, testing tools & standards.	4	2
	Third Term		
11.	Software maintenance: Management of maintenance, maintenance process, maintenance models, regression testing, reverse engineering software re-engineering, configuration management, and documentation.	4	1

ACADEMIC PLAN FOR B. TECH. VII SEMESTER (FOR YEAR 2007-08)

SUBJECT: OPTICAL COMMUNICATION.
Total Teaching weeks in Semester: 14 weeks

Subject Code: ETEE-417
Total number of Lectures- 40
Total Number of Tutorials- 13

S. No.	TOPICS TO BE COVERED	No. of Lectures/ Tutorials	
	First Term	L	T
1	Comparison of Optical Fiber Cables & Conventional Metallic Cables, Advantages of Optical Fiber.	1	
2	Light propagation in optical fiber. Total internal reflection, acceptance angle, and numerical aperture.	2	1
3	Measurement of information channel capacity, communication system architecture, Basic optical communication system.	2	
4	Propagation in Dielectric wave guide; Introduction	1	1
5	Step index, graded index, single and multimode fiber; modes Electromagnetic waves-step index fiber, graded index fiber.	2	1
6	Field equation in step index fiber and graded index fiber, Slab wave guide	1	
7	Attenuation in optical fiber, absorption (material, intrinsic and extrinsic), Raleigh and Mie Scattering	2	1
8	Very low loss material. All plastic and polymer clad silicon fibers.	1	
9	Dispersion, intra-modal, inter-modal, step index, multimode graded index fiber.	1	
10	Overall Fiber Dispersion-Single Mode And Multimode.	2	1
11	Dispersion shifted fiber and Dispersion flattered fiber. Polarization-Modal Birefringence (single mode)	2	1
	Second Term		
12	Optical source and Detector-source and design of LED	1	
13	Efficiency, LED structure, planner LED, DOME LEDs surface emitter LED's, LED characteristic, output spectrum	2	1
14	Modulation bandwidth, Reliability, modulation, Semiconductor laser for optical fiber communication systems.	2	1
15	Introduction to basic concepts, absorption and emission of radiation population inversion, optical feedback & laser. Hetro-junction, semiconductor injection laser efficiency, semiconductor injection laser to fiber coupling	2	1
16	Detectors, Photodiodes- Detector, Introduction, Optical detection principle quantum efficiency, Responsitivity, large wavelength cut-off, PN photodiode, PIN Photodiode, speed of response, Avalanche photodiode, Silicon react through Avalanche photodiode Benefits & drawbacks of Avalanche photodiode, multiplication factor, photodiode, multiplication factor, Photo multiplier tubes.	9	2
17	Optical fiber com. system- Telecommunication, Local Distributor series, Computer network Local Data Transmission and Telemetry.	2	1
	Third Term		
18	MAC protocol, Advance multiplexing strategies OTDM, Sub Carrier multiplexing, WDM	2	1
19	Networking architecture – SONET / SDM, Optical Transport Network, Optical Access Network Optical Premise Network.	3	

ACADEMIC PLAN FOR VII SEMESTER (FOR 2007-2008)

SUBJECT: ELECTRICAL ENERGY CONSERVATION

Subject Code: ETEE-421
Total Lecture Available: 40
Total Tutorial Available: 13

Total Teaching weeks in Semester: 14 weeks

S. N.	TOPICS TO BE COVERED	Total No. of Lecture/Tutorial	
	First Term	L	T
1.	Energy Auditing Introduction	1	
2.	Analysis of Investments	2	
3.	Present value Criteria, Av. Rate of return criterion	2	1
4.	Return on investment, Pay back period criterion	2	1
5.	Electrical Load management-Introduction, Xer	1	
6.	Reduction of Xor Losses	1	
7.	Power factor improvement	1	1
8.	Methods of Improving pf.	2	
9.	Location of capacitor installation	1	
10.	Demand Management	2	1
11.	Energy Efficiency issues	2	2
12.	Electric Motor – Introduction	1	
	Second Term		
13.	Field Testing	1	
14.	Energy Efficiency motors	1	1
15	Existing Motor details	1	
16	Power factor correction	1	
17.	Variable speed drives	2	1
18.	Energy saving controllers	2	1
19.	Lighting - Introduction	1	
20.	Illumination, glare, color & color rendering	2	1
21.	incandescent high intensity discharge	1	
22.	Fluorescent high intensity discharge	1	
23.	Lower pressure sodium	1	
24.	Energy efficiency	1	
25.	Replacing lamp & fixtures	1	1
26.	Improving lighting control	1	
27.	Maintenance of lighting	1	1
	Third Term		
28.	Energy Management Information system-Introduction field	2	
29.	PLC	1	
30.	Communication Network energy bench marking	1	1

Academic Lesson Plan for VII semester (for 2007-2008)

Subject: Micro-controller

Subject code: ETIC-401
Total Lectures: 41
Total Tutorials: 14

Total Teaching weeks: 14

Sr. No.	Contents	No. of Lectures	No. of Tutorials
	First Term		
1.	8048, 8049 Functional overview.	1	1
2.	8048 Series microcomputer pins and signal description	1	1
3.	8048 timings and instruction execution.	1	1
4.	Internal and external Interrupts	1	1
5.	8048 Microcomputer Series instruction set	1	1
6.	8051 Internal Architecture	3	1
7.	8051 I/O Configuration	2	
8.	Serial Interface & 8051 Interrupts	3	
9.	Power Saving Modes of operation	1	
10.	8051 Addressing Modes	4	
	Second Term		
11.	8051 Instruction Set	3	1
12.	Assembly Language Programming	3	1
13.	Saving CPU Status during Interrupts	1	1
14.	Passing Parameters on the Stack, Inline Code Parameter passing	2	1
15.	N way branching, Computing branch destination at run time	2	
16.	I/O Configuration	1	
17.	8253 Interfacing	2	
18.	Software delay timing, I/O driver	2	1
19.	Serial Port and Timer configurations, I/O driver	2	1
	Third Term		
20.	Transmitting Serial Port character strings	2	
21.	Introduction to Intel 8096	1	1
22.	Introduction to MC68H11 Microcontrollers	1	
23.	Introduction to PLC's	1	1

ACADEMIC PLAN FOR VII SEMESTER (for 2007-08)

Subject: Biomedical Instrumentation **Subject Code: ETIC - 403**

Total Number of Lectures: 40

Total Teaching Weeks: 14 **Total Number of Tutorials: 14**

S.N.	Topics to be covered	Total No. of Lecture / Tutorials	
		L	T
	First Term		
	Introduction to Biomedical Instrumentation		
1	Biometrics, Development of Biomedical Instrumentation	1	
2	Physiological systems of the body	1	1
3	Basic Medical Instrumentation system	1	
4	Problems encountered in Biomedical measurements	1	
5	Sources of Bio-electric potential, active and resting potential	1	1
	Basic Bio-Medical Transducer Principles		
6	Active and Passive Transducers, Bio-medical applications	2	1
7	Bio-potential electrodes, Bio-chemical electrodes	2	1
	Bioelectric Potential Recorders		
8	Introduction and analysis of ECG	3	1
9	Construction and working principles of pace makers and defibrillators	2	1
10	Introduction and analysis of EMG, Introduction and analysis of EEG	4	2
	Second Term		
	Biomedical Measurements		
11	Measurement of Blood Pressure: direct and indirect methods	2	1
12	Heart rate, respiration rate, pulse rate measurements, body temperature measurements	3	
13	Ultrasonic and electromagnetic blood flow meters	2	1
	Patient Monitoring System		
14	Bedside and Central patient monitoring systems	2	
15	Elements of Intensive Care monitoring, Instrumentation for patient monitoring system	2	1
16	Mass Spectrometer – Introduction, components of mass spectrometer, resolution, types of mass spectrometers	3	1
17	Gas Chromatography – Theory and working of gas chromatography, Gas-solid chromatography	3	1
	Third Term		
	Analytical Instrumentation		
18	Introduction to types of analytical methods and Instrumentation analysis	1	
19	Introduction to absorption spectrometer	1	1
20	Introduction to UV spectrometer, Spectrophotometer Infrared spectrometer	3	

Academic plan for VII semester (2007-2008)

Subject: Computerized Process Control

Subject Code: ETIC-411
Total Lectures: 41
Total Tutorials: 14

Total Teaching weeks: 14

S. No.	Contents	No. of Lectures	No. of Tutorials
	First Term		
1	Overview & introduction to Computer control system, Functional block diagram	2	
2	Data Acquisition System	2	1
3	Supervisory control and working	2	
4	DDC and working	1	1
5	SCADA system Architecture, significance & its applications	2	
6	Virtual instrumentation, graphical programming and its advantages	2	1
7	VI's, sub VI's, loops charts and arrays	2	
8	Distributed control system, Architecture Elements, Display in DCS	4	2
	Second Term		
9	Introduction to DCS cards, DCS integration to PLC, DCS integration to PC, Overview of TDC-3000 DCS (Honeywell)	6	3
10	Overview of communication protocols: TCP/IP	2	
11	Overview of communication links: FIB, MODBUS	2	1
12	Review of PC hardware and instrumentation buses	2	1
13	Instrumentation buses: ISA, PCI, IEEE488, serial RS232 & RS 485	2	1
15	Introduction to intelligent instrumentation	1	
16	Case Study of steel plant	3	1
	Third Term		
17	Case study of sugar	3	1
18	Case study of cement plant	3	1

Academic Plan for VII Semester 2007-08

Subject: Computer Aided Manufacturing **Subject Code: ETME 401**

Total Lectures: 40

Total Teaching Weeks in Semester – 14 **Total Tutorials: 13**

S.No.	Topics to be covered	Total Number of Lecture / Tute	
	First Term	**Lecture**	**Tutorial**
1	**Introduction**		
	Overview of automation in Industry Types of production continuous, mass, batch & Job shop and automation achievements.	1	
	Product cycle and CAD/CAM, influence of CAD/CAM on product cycle.	1	1
	Automation strategies Mathematical model for employing and justifying CAD/CAM in different areas of operation.	1	
2	**Programmed Automation & Numerical Control.**		
	Program controlled machine tools.	1	
	Punched card and punched tape machine tools	1	
	Numerical control and its basis Axes designation	1	1
	NC motion control system: point-to-point straight cut & continuous path control systems	1	
	Application of NC in metal cutting and Non metal cutting areas	1	1
3	**Part Programming**		
	Process Planning and flowchart for part programming.	1	
	Tool systems, tool nomenclature and tools geometries of modern indexable carbide tools. Tool presetting and modular tooling.	1	
	Selection of tools based on machining capacity, accuracy and surface finish.	1	1
	Elements of programming for turning and milling. Composition of part program.	1	1
	Preparatory codes G. Miscellaneous functions M	1	
	Interpolation, Tool compensation.	1	
	Cycles for simplifying programming.	1	1
	Part programming for typical components on turning machines and machining centers.	3	1
	Second Term		
	Computer Numerical Control		
	Block diagram of CNC operation, Nomenclature types and features of CNC M/C tools.	1	
	Elements of CNC machines and system.	1	
	Machine control unit, position control and its significance.	1	1
	Engineering analysis of NC positioning system.	1	
	Open loop and closed loop systems	1	
	Precision in NC positioning systems, control resolution, accuracy and repeatability.	1	1

	Actuators DC servomotors, AC servomotors, stepper motors. **Transducers and Feed back Elements** Resolver, inductosyn, optical grating and encoders. **Modern CNC Machines** CNC lathes, turning centre & machining center. Automatic pallet changer, Automatic tool changer. Direct numerical control and applications	2 2 1 1	 1 1
	CNC Design Features Supporting structures, Guide ways, ball Screws and Nut mechanisms M/C spindles, concepts of rigidity and relation with accuracy.	1 1	
	Computer Aided Part Programming APT part programming, Introduction to computer aided part programming through Pro-E	3	1
	Third Term		
	Computer Aided Inspection Co-ordinate measuring machines and their applications. Introduction to Machine vision and applications	2 3	 1

Academic Plan for VII Semester 2007-08

SUBJECT: MECHATRONICS

Subject Code: ETME 403
Total Lectures: 40
Total Tutorials: 13

Total Teaching Weeks in Semester – 14

S.No.	Topics to be covered	Total Number of Lecture / Tute	
	First Term	**Lecture**	**Tutorial**
1	**Introduction**		
	Overview, Mechanical Activation System – Kinematics Chains, Cam, Gear, Train, Ratchet Mechanism, Belt, Bearing	**2**	**1**
2	**Hydraulic and Pneumatic Activation System**	**2**	**1**
	Overview, Pressure control valves, cylinders, Direction control valves, Rotary Activators, Accumulators, Amplifiers, and Pneumatic sequencing problems.	**2**	**1**
3	**Electrical Activation Systems**		
	Switching Devices, Mechanical Switches – SPST, SPDT, DPOT, Debounahy keypads, Relays	**1**	
	Solid State Switches, Diodes, Thyristors, Transistors Solenoid Type Devices	**1**	
	Solenoid Operated Hydraulic and Pneumatic values, Electro – Pneumatic sequencing problems	**2**	**1**
	Control of DC motors, permanent magnet DC motors Brush less permanent magnet DC motors	**1**	
	AC motors, stepper motors	**1**	
	Stepper motor controls, servo motors	**1**	**1**
4	**Interfacing Controllers**		
	Interfacing, Buffers, Darlington pair, I/o port, interface requirements.	**1**	
	Handshaking, Serial and parallel port interfacing Peripheral Interface, Adapters	**1**	
5	**Digital Logic**		
	Number Systems, Binary Mathematics, Boolean Algebra	**1**	
	Gates & Integrated Circuits like 7408, 7402, Karnaugh Maps		**1**
	Application of logic gates as: Primary Generators, Digital Comparators, BCD to Decimal Decodes	**1**	
	Flip Flops		
	Introduction to Micro controller – Intel 8051, Selecting a Microcontroller	**1**	
	Second Term		
6	**Sensors, Transducers and Applications**		
	Performance Terminology, static and Dynamic	**1**	
	Characteristics, displacement, position and proximity sensors.	**1**	**1**
	Potentiometer sensors, strain gauge elements LVDT.	**1**	

	Optical Encoders, Pneumatic sensors	1	
	Hall effect sensors, Tachogenerators, strain gauge Load cell, thermostats	1	
	Photo Darlington, Interfacing sensors in Mechatronic systems as – temperature switch circuit, float systems	1	1
7	**Introduction to Signal Conditioning**		
	Signal conditioning processes, inverting amplifiers, and non-inverting amplifiers.		
	Summing, Integrating Differential, Logarithmic amplifiers. Comparators, Amplifier errors, Filtering, Wheatstone Bridge	2	1
	Temperature Compensation, Thermocouple, Compensation, Analog to Digital conversion	1	1
	Digital to analog conversion, sample and Hold Amplifiers, Multiplexers, Time division Multiplexing Data Acquisition, Digital Signal Processing, Pulse Modulation	1	
8	**System Models**		
	Mechanicals system models application like – Machine on a floor, car wheel moving along a road etc. Model Development of an Electrical systems	1	
	Fluid system and Thermal systems	1	
	Rotational – Translation systems for motor	1	
	Speed control and Hydraulic Mechanical systems	1	
9	**Programmable Logic Controllers**		
	PLC structure, I/O processing, programming, Language (Ladder Diagram)	1	
	Logic functions, Latching, sequencing	1	1
	Timers, Internal Relays and counters		
	Shift Registers, Master & Jump controls, Jumps	2	1
	Data Movement, Code Conversion, Ladder circuits		
	Third Term		
10	**Case Studies**		
	Auto focus camera, Printer / Domestic washing Machine	2	
	Optical Mark Reader, Bar code Reader and Pick and place Robot Arm	2	1

Academic Plan for VII Semester 2007-08

Subject: Refrigeration & Air-Conditioning **Subject Code: ETME 405**

Total Lectures: 40
Total Teaching Weeks in Semester – 14 **Total Tutorials: 13**

S.No.	Topics to be covered	Total Number of Lecture / Tute	
	First Term	**Lecture**	**Tutorial**
1	**Air Refrigeration** Brief History of Refrigeration, Refrigerating Machine – Second Law of Thermodynamics – Interpretation	**1**	
	Carnot Cycle, Reversed Carnot Cycle. Heat Engine, Refrigerating Machine. Heat Pump. COP Unit of Refrigeration	1	1
2	**Vapor Compression Refrigeration System** Simple Saturated Cycle, T-s, P-h, h-s, P-v diagrams, Dry and Wet compression	1	
	Effect of operating parameters, Effect of under-cooling and superheating, Methods of improving saturation cycle.	2	1
	Details of various types of compressors, Condensers, Expansion, devices and Evaporators	3	1
3	**Refrigerants** ASHRAE Nomenclature, Eco friendly Refrigerants, Thermodynamic requirements for a Good Refrigerant, Introduction to Azeotropic & Non Azeotropic Refrigerant Mixtures.	2	1
4	**Psychrometry** Brief History of Air–conditioning, working substance in Air condition Dalton's Law of Partial Pressures	1	
	Psychometric Properties and Psychrometric Chart	2	1
	Psychrometric Process, Concepts of Room sensible Heat Factor, Grand Sensible Heat Factor, Apparatus Dew point, Effective Sensible Heat Factor	3	1
	High Latent Heat Load Applications, Summer &Winter Air conditioning.	2	1
	SECOND TERM		
5	**Compound Vapor Compression Systems** Necessity of Compound system	1	
	Concepts of (a) Flash cooler and (b) Flash Inter cooler, Optimum Inter-stage Pressure	1	
	Multiple Evaporators and compressors. Use of Individual Expansion valves, back pressure valves and multiple expansion valves.	2	1
6	**Comfort Air conditioning** Factors influencing Human comfort, Concept of Effective Temperature, Factors governing optimum effective temperature.	2	1
7	**Heat Load Estimation** Inside and outside design conditions, solar heat gain through glass and structures.	1	

	Occupancy load, Lighting load and miscellaneous loads, Infiltration and Ventilation. Summary of Heat Load	1 1	 1
8	**Duct Design** Transmission and distribution of air flow, Types of supply air outlets, Mechanism of flow of air through outlets Pressure drop and friction loss in ducts, Rectangular equivalents of circular ducts Methods of Duct design	 2 3	 1
	Vapor Absorption system: Simple vapor Absorption System, Practical vapor absorption system, Electrolux Refrigerator	3	
	THIRD TERM		
9	**Steam Jet Refrigeration**: System Components and analysis	1	1
	Cascade Refrigeration: Limitation of vapor compression system for low temperature refrigeration, Cascade staging.	1	
	Manufacturing of Dry Ice	1	
	Controls: Sensing and Actuating Elements H. P/L.P. cut out, Thermostat, Solenoid value, Humidistat, Anemometer etc.	2	1

ACADEMIC PLAN FOR VII SEMESTER (FOR 2007-2008)

Subject: Solar Energy **Subject Code: ETME-407**

Total Lectures: 39

Total Tutorials: 12

Total Teaching Weeks in the Semester: 14

S. N.	TOPICS TO BE COVERED	L	T
	First Term		
	Heat Transfer		
1	Introduction		
2	Heat Transfer modes- conduction, convection, and radiation	2	1
3	Properties and radiation characteristics of (1) Opaque media, and (2) Partially transparent media	6	2
	Solar Radiations		
4	Origin, nature and availability of solar radiations,	3	1
5	Solar geometry, and angles	2	
6	Measurements of Solar Radiation data and its estimation	2	1
7	Effects of receiving surface orientation and motion.	2	
	Second Term		
	Components, Process, System Modes		
8	Design consideration and performance of (a) Flat plate collectors and (b) Focusing collectors	4	1
9	Energy storage components: Water storage, packed bed and phase change		
10	Energy storage; mathematical models of various solar systems and components.	5	2
	Applications		
11	Solar water heating, solar air heaters		
12	Solar space heating and Cooling,	3	1
13	Solar pumps	3	1
		3	1
	Third Term		
14	Solar Thermal Power, Solar Furnaces, and Solar Distillation.	4	1

ACADEMIC PLAN FOR VIII SEMESTER 2006-2007

SUBJECT: PERSONNEL MANAGEMENT **Subject Code ETME-409**

Total Lectures : 39
Total Tutorials: 10

TOPICS TO BE COVERED	No. of Lectures/Tutorials	
	L	T
First Term		
Work Organization Organization its Structure and Importance of PM, PM Vs Human Resource Management, Role and Responsibilities of PM & HRM, Characteristics of a good Personnel Management	1 2	1
Personnel Policies Aims & objectives of personnel & HR policies, Principles of personnel & Essential characteristics of HR policy	2 2	1
Growth Philosophy Essential skills for P.M & HRM and PM & HRM as a profession, Roots & component of HRM	2	
Recruitment & Selection Process Forecasting HR requirement, Identifying talent pool, Advertisement for Recruitment, Interview & Selection	2	1
Promotion, Transfer & Separation Promotion: Types & purpose, procedure; Transfer: Purpose, Procedure, Policy	5	1
Training & Development Need analysis, Instruction Design, Validation, Implementation, and Evaluation		
Second Term		
Performance Appraisal Importance, purpose, process of appraisal, Methods evaluation, Problems of appraisal ethics	2 2	1
Wage & Salary Administration Purpose, determining and factors, Types of wages, wage theory, wages differentials	3 3	1 1
Job Evaluation Techniques Job description, Job specification, Job evaluation methods	2	
Implementation Features, firing benefits, Employee services, Benefits	2	1
Motivation Meaning, objectives, types; Motivation methods and techniques	4	1
Communication Corporate Communication, Important components of corporate communication, Selection of media, Mass communication, Effective corporate communication		
Third Term		
Safety, Health & Relations Introduction of safety measures, Company's law of safety measures, Industrial health, Corporate relation	3	1
Case Studies 360 Degree, LG (Korea & India), Designing Professional Development programmes.	2	

ACADEMIC PLAN FOR VII SEMESTER (FOR 2007-08)

Subject: Automotive Engineering **Subject Code: ETME-413**

Total Lectures: 38

Total Tutorials: 13

Total Teaching Weeks in the Semester: 14

S. N.	TOPICS TO BE COVERED	L	T
	First Term		
1	Introduction to Automobile Engineering: Description and Performance of an Automobile	1	
2	Power Plant: Classification and Application, Requirements of Power Plant for an Automobile, Criterion for selection of power plant	2	1
4	Principle of Engine Operation: S.I. Engine (4-s and 2-s) & C.I Engine	1	
5	Modification in engines for use of CNG and LPG as fuels	1	
6	Engine parts and their functions: Cylinder, piston, piston rings, Connecting rod, Crankshaft, Valve Mechanisms, Air Cleaner, Oil filters, Manifolds, muffler, radiator, Carburetor and Fuel Injection systems (Numericals)	3	1
7	Resistance to Vehicle motion: Load, air and grade resistances	1	
8	Matching of Engine output and Demand power (Numericals)	1	1
9	Performance requirements for various vehicles	1	
10	Performance characteristics of I.C. Engine (Numericals)	1	1
11	Drive effectiveness relationship for 2 wheel and 4 wheel drive vehicles	1	
12	Introduction to Suspension System, Functions, requirements and elements of suspension system, Suspension systems for front wheel: wishbone, trailing link, Sliding pillar, Suspension systems for rear wheel: Leaf spring, Independent, Interconnected	3	1
Second Term			
13	Purpose of requirement of Transmission systems	1	
14	General arrangement of clutch, gear box and rear axle transmission	1	
15	General arrangement of rear engine and vehicle with live axles.	1	
16	General arrangement of dead axle and axle-less transmission	1	1
17	De-Dion drive, arrangement of front engine and front wheel drive, 4 wheel transmission	1	
18	Clutch: Requirements and principle of operation, Friction materials (Numericals)	1	1
19	Classification: Single and multi-plate clutches, Centrifugal Clutch	1	
20	Automatic transmission systems: Fluid couplings	1	
21	Description of working of Sliding mesh and constant mesh gear boxes, synchro-mesh	1	1
22	Hydraulic torque converter, Construction, working and performance	1	
23	Semi Automatic transmission: Wilson Gear box	1	1
24	Final drive and differentials, Rear Axles, Overdrive	2	
25	Steering System: Functions, requirements and geometry, Steering gears, steering ratio, Camber, King-pin inclination, Caster, Toe-in, Toe-out; Steering Mechanisms: Davis and Ackerman Steering, Power steering	4	2

Third Term			
26	Mechanical and Hydraulic brakes, Shoe arrangements and analysis, Disc brake analysis, Shoe & Disc brake, Braking effectiveness, relationship for 4 wheel drive,	3	1
27	Wheel and tyre requirements, size, general definitions, wheel, rim	1	
28	Tyre constituents and construction	1	1

ACADEMIC PLAN FOR VII SEMESTER (for 2007-08)

SUBJECT: COMPUTER AIDED DESIGN **SUBJECT CODE: ETME-417**

Total Lectures: 41

Total Tutorials: 14

TOPICS TO BE COVERED	L	T
First Term		
Introduction to CAD		
CAD Tools and Definition	1	1
Role of CAD in Product Cycle & Industrial Look at CAD	1	
CAD Hardware		
Types of System: Mainframe Based, Minicomputer Based, Microcomputer Based, Workstation Based	1	
System Evaluation Criteria: System Consideration, Geometric Modeling Capabilities, Design Documentation, Input Devices and Output Devices	2	1
CAD Software		
GraPrentice Hall Indiacs Standards	1	1
Definitions: Data Structure, Database, DBMS, Database Coordinate System, Working Coordinate System, Screen Coordinate system		
Modes of GraPrentice Hall Indiacs Standards, user interface	1	
Software Modules: OS Module, GraPrentice Hall Indiacs Module, Application Module, Programming Module, Communication Module	1	
Modeling and viewing		
Mapping of Geometric Models		
Translation, Rotational, General, Changes in Coordinate System	3	1
Three Dimensional Transformation		
Point representation &Transformation Matrices	3	1
Translation, Rotation, Scaling, Reflection		
Projections		
Orthogra Prentice Hall Indiacs, Isometric, Perspective, Point at Infinity, vanishing Points	3	1
Second Term		
Curves: Representation of Space Curves, Cubic Splines, Normalized Cubic Splines, Biezer Splines, B-Spline Curves	3	1
Surface Generation		
Plane Surface, Ruled Surface, Surface of Revolution	2	1
Sweep Surface, Beizer Surface, Cubic Surfaces, B-Spline Surface, Composite Surface	2	1
Solid Modeling		
Solid Representation, Set Theory & Boolean Operators	2	1
Boundary Representation, Constructive Solid Geometry, Sweep Representation, Spatial Enumeration	3	1
Computer Animation: Types, Techniques, Simulation	2	-
Geometric property formulation	2	1
Curve Length and Surface Volume, Volume and Mass Calculation, Centriod Calculation		
CAD/CAM Data Exchange: Introduction, IGES and PDS	2	-
Third Term		
Finite Element Method		
Introduction and General Procedure	2	
Finite Element Analysis, Evaluation of Element Matrices	2	1
Engineering Applications	2	1

NEW SYLLABUS

SEVENTH SEMESTER

ACADEMIC YEAR 2007-08

BACHELOR OF TECHNOLOGY
(Electronics & Communication Engineering)

SEVENTH SEMESTER

Code No.	Paper	L	T/P	Credits
THEORY PAPERS				
ETEC 401	Microprocessor Systems - II	3	1	4
ETEC 403	Optical Communication	3	1	4
ELECTIVE PAPERS (Choose any two)				
ETIT 405	Network Technology	3	1	4
ETEC 407	Mobile Computing	3	1	4
ETEC 409	Advanced VLSI Design	3	1	4
ETEC 411	Digital Image Processing	3	1	4
ETEC 413	Power Electronics	3	1	4
ETEC 415	Advanced Computer Architecture	3	1	4
ETCS 417	Computer Graphics & Multimedia	3	1	4
ETEC 419	Project	-	-	4
PRACTICAL/VIVA VOCE				
ETEC 451	Microprocessor Systems – II Lab	0	2	1
ETEC 453	Optical Communication Lab	0	2	1
ETEC 455	Practicals (based on Electives)	0	2	1
ETEC 457	#Seminar	0	2	1
ETEC 459	*Minor Project	0	8	4
ETEC 461	#^Practical Training	0	0	1
	TOTAL	**12**	**20**	**25**

NON UNIVERSITY EXAMINATION SYSTEM

*The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format. The student will have to present the progress of the work through seminars and progress reports.

^Practical training was conducted after sixth semester. However, Viva-Voce for evaluation of Practical Training will be conducted in this semester.

Paper Code: ETEC-401 **L T C**
Paper: Microprocessor System- II **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from Q. No. 1 rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

Unit I
Evolution of Microprocessor, Internal microprocessor (8086 to Pentium) architecture of 8086; Programming Model, Real mode memory addressing, Introduction to protected mode memory addressing memory paging.
Addressing modes: Data, program, Stack, memory-addressing modes **[No. of Hours: 11]**

Unit II
Instruction set of 8086, Assembly language programming for 8086 microprocessor, Memory Segmentation. **[No. of Hours: 11]**

Unit III
16 and 32 – bit memory interfacing, various bus protocols like ISA, EISA, VESA, PCI.
Architecture Co- processor (8087), programming with 8087, Multi Processor System, Introduction to MMX technology. **[No. of Hours: 11]**

Unit IV
Introduction to Pentium and its higher generations: architecture, memory management.
Assembler, debugger, Introduction to bit Slice processor , Signal processing processor and transputers , Introduction to development tools , MDS , logic analyzer , in-circuit emulator. **[No. of Hours: 11]**

Text Books:

1. Barry B. Brey, "The Intel Microprocessors: Architecture, Programming & Interfacing" PHI, 6th Edition, 2003.
2. D. V. Hall, "Microprocessor and Interfacing Programming & Hardware" TMH – 2nd Edition.

Reference Books:

1. Uffenback, "The 8086 Family Design" PHI, 2nd Edition.
2. Lice & Gibson, "Microcomputer System 8086 / 8088" PHI, 2nd Edition.
3. H. P. Messmer, "Family Architecture Programing & Design: The Indispensible PC Hardware Book" Addison Wesley, 1997.

Paper Code: ETEC-403 **L T C**
Paper: OPTICAL COMMUNICATION **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from Q. No. 1 rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

Unit I

Introduction: Measurement of Information, Channel Capacity, Communication System Architecture, Basic Optical Communication System, Advantage of Optical Communication System.
Propagation in Dielectric Waveguides: Introduction, Step-index Fibers, Graded Index Fibers, Modes & Rays, Slab Wave Guide. **[No. of Hours: 11]**

Unit II

Attenuation in Optical Fibers: Introduction, Absorption, Scattering, Very Low Loss Materials, All Plastic & Polymer-Clad-Silica FibersS

Wave Propagation: Wave Propagation in Step-Index & Graded Index Fiber, Overall Fiber Dispersion-Single Mode Fibers, Multimode Fibers, Dispersion-Shifted Fiber, Dispersion, Flattened Fiber, Polarization. **[No. of Hours: 11]**

Unit III

Source & Detectors: Design of LED's for Optical Communication, Semiconductor Lasers for Optical Fiber Communication System, Semiconductor Photodiode Detectors, Avalanche Photodiode Detectors & Photo multiplier Tubes.

Optical Fiber Communication System: Telecommunication, Local Distribution Series, Computer Networks Local Data Transmission & Telemetry, Digital Optical Fiber Communication System-First Generation, System, Second Generation System, Future System. **[No. of Hours: 11]**

Unit IV

Data Communication Networks- Network Topologies, Mac Protocols, Analog System.
Advanced Multiplexing Strategies- Optical TDM, Sub carrier Multiplexing, WDM Network Architecutres; SONET/SDH, Optical Transport Network, Optical Access Network, Optical Premise Network.
Applications-Military Applications, Civil, Consumer & Industrial Applications. **[No. of Hours: 11]**

Text Books:

1. "Optical Fibre Communication Senior", PHI – 2nd Edition.
2. J. Gowar, "Optical Communication System" EEE – 2nd Edition.

Reference Books:

1. Keiser, "Optical Fibre Communication" Mc. Graw Hill – 2nd Edition.

Paper Code: ETIT-405 **L T C**
Paper: NETWORK TECHNOLOGY **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from Q. No. 1 rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

Unit I

Evolution of Internet, WWW undergoing technology, E-mail, Application layer services and protocols (RPC, NFC, SMTP, FTP, TELNET) Network Management Address and domain Management, (SNMP), Internet searching tools, gopher, Archie, Veronica, WWW, Lynx, Mosaic, WAIS, Usenet, Security issues, CGI, PERL, HTML, VRML, JAVA, VB script and other internet development tools.

[No. of Hours: 11]

Unit –II

SLIP/PPP Dedicated lines, BOOTP, DHCP, Domain management (DNS), Transport Layer issues, TCP/IP, Gateway, Dial-up, Internet networking TCP/IP protocols, IP addressing, Network Security.

[No. of Hours: 11]

Unit –III

Review of LAN, Node, LAN Manager, Software of IBASE5 Node, 10BASE5 Ethernet and 10BASE2 (Cheaper net), Twisted pair Ethernet, Serial Communication, Connecting LANs and WANS, FDDI, Serial Communication Circuits, Modems, SDH/SONET, Inter Networking Routing Algorithms, Routing protocols (RIP, BGP, OSPF). **[No. of Hours: 11]**

Unit IV

USART-Processor Interface Data Buffer Block of 8251A, Control logic of USART, PROTOCOLS, Transmitter, Receiver, Synchronous Modems and Asynchronous Modems. SYNDET/BRKDET ion 8251A, Monitoring of 8251A, writing characters to be transmitted to 8251A, Monitoring of 8251A. Read status, ISDN: Technology, devices, Architecture Protocols, Flow Control Error detection and Correction, ATM, Technology. **[No. of Hours: 11]**

Text Books:

1. Forouzan, "TCP/IP", Mc- Graw Hill, 2004.
2. Tannenbaum " Computer Networks," PHI – 4th Edition

Reference Books

1. Forouzan, "Data Communication and Networking", Mc- Graw Hill, 2nd Edition
2. Ross and Kurose " Computer Networks"

Code No.: ETEC 407	L	T	C
Paper: Mobile Computing	3	1	4

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Introduction to Personal Communications Services (PCS): PCS Architecture, Mobility management, Networks signalling.

Global System for Mobile Communication (GSM) system overview: GSM Architecture, Mobility management, Network signalling.

General Packet Radio Services (GPRS): GPRS Architecture, GPRS Network Nodes.

[No. of Hrs.: 11]

UNIT – II

Mobile Data Communication: WLANs (Wireless LANs) IEEE 802.11 standard, Mobile IP.

Wireless Application Protocol (WAP): The Mobile Internet standard, WAP Gateway and Protocols, wireless mark up Languages (WML). **[No. of Hrs.: 11]**

UNIT – III

Third Generation (3G) Mobile Services: Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G.

Wireless Local Loop(WLL): Introduction to WLL Architecture, wireless Local Loop Technologies.

[No. of Hrs.: 11]

UNIT – IV

Global Mobile Satellite Systems; case studies of the IRIDIUM and GLOBALSTAR systems.

Wireless Enterprise Networks: Introduction to Virtual Networks, Blue tooth technology, Blue tooth Protocols. **[No. of Hrs.: 11]**

TEXT BOOKS:

1. Yi-Bing Lin & Imrich Chlamtac, "Wireless and Mobile Networks Architectures", John Wiley & Sons, 2001.
2. Raj Pandya, "Mobile and Personal Communication systems and services", Prentice Hall of India, 2001.
3. Hansmann, "Principles of Mobile Computing", Wiley Dreamtech, 2004.

REFERENCE BOOKS:

1. Mark Ciampa, "Guide to Designing and Implementing wireless LANs", Thomson learning, Vikas Publishing House, 2001.
2. Ray Rischpater, "Wireless Web Development", Springer Publishing, 2000.
3. Sandeep Singhal, "The Wireless Application Protocol", Pearson Education Asia, 2000.
4. P.Stavronlakis, "Third Generation Mobile Telecommunication systems", Springer Publishers, 2001.

Paper Code: ETEC-409 **L T C**
Paper: ADVANCED VLSI DESIGN **3 1**
4

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from Q. No. 1 rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

Unit I

Review of MOS modeling , Integrated circuit layout : Matching concepts , MOS transistor layout, Resistor and capacitor layout Noise in integrated circuits – Shot noise, Burst, Avalanche noise
MOS current and sources : Simple ,cascade , high swing cascade
MOS current mirrors: Simple, standard cascade, Wilson, wilder regulated cascade.

[No. of Hours: 11]

Unit II

CMOS amplifiers: Gain calculations, frequency response of active load, current source push pull inverters. Large signal and small signal analysis, of differential and cascade amplifiers slow rate Qualitative discussion of output amplifiers.
CMOS opanp- Ideal opamp, characterization, classification, Two stage opamp, miller compensation Qualitative discussion of PSRR, cascade and folded opamp. **[No. of Hours: 11]**

Unit III

Comparators: Characterization, static & dynamic characteristics Two stage open loop comparator, Auto zeroing techniques, comparator using hysteresis high speed comparators
MOSFET switch: Charge injection, capacitive feed through sample and hold circuits.
Switch capacitor circuits- Resistor emulation integrator, charge amplifier, switch capacitor amplifier OTA filters. **[No. of Hours: 11]**

Unit IV

Phase Lock loop: Various stage of PLL: XOR phase detector and PFD, VCO, current starved, loop filter
Data Converters: Current scaling DAC, Voltage scalling DAC charge scaling DAC, Extending resolution of parallel DAC, similar scaled DACs
High speed ADCS, parallel or flash ADCS, interpolating ADCS, folding ADCS, Multibit pipeline ADCS delta sigma modular, Decimators filters. **[No. of Hours: 11]**

Text Books:

1. P. E. Allen, D. R. Holberg "CMOS Analog Circuit Design" Oxford University Press 2002.
2. R. J. Baker, H. W. Li and D. E. Boyce, "CMOS Circuit Design, Layout and Simulation" PHI – 2000.

Reference Books:

1. B. Razavi, "Design of Analog CMOS Integrated Circuits" TMH – 2002.
2. P. R. Gray, P. J. Hurrt, S. H. Lweic, RoG. Meyer, "Analysis and Design of Analog Integrated Circuits" John Wiley and Sons Inc. 2001.
3. D. A. John, Ken Martin " Analog Integrated Circuits" Wiley, 1997.
4. Geiger, Allen, Strader "VLSI Design Techniques for Analog and Digital Circuits" Mc. Graw Hill, 1990.

ECE-6

Code No.: ETEC 411 **L T C**
Paper: Digital Image Processing **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT -I

Introduction And Digital Image Fundamentals: The origins of Digital Image Processing, Examples of Fields that Use Digital Image Processing, Fundamentals Steps in Image Processing, Elements of Digital Image Processing Systems, Image Sampling and Quantization, Some basic relationships like Neighbours, Connectivity, Distance Measures between pixels, Linear and Non Linear Operations.

Image Enhancement in the Spatial Domain: Some basic Gray Level Transformations, Histogram Processing, Enhancement Using Arithmetic and Logic operations, Basics of Spatial Filters, Smoothening and Sharpening Spatial Filters, Combining Spatial Enhancement Methods.

[No. of Hrs.: 10]

UNIT - II

Image Enhancement in the Frequency Domain: Introduction to Fourier Transform and the frequency Domain, Smoothing and Sharpening Frequency Domain Filters, Homomorphic Filtering.

Image Restoration: A model of The Image Degradation / Restoration Process, Noise Models, Restoration in the presence of Noise Only Spatial Filtering, Pereodic Noise Reduction by Frequency Domain Filtering, Linear Position-Invarient Dedradations, Estimation of Degradation Function, Inverse filtering, Wiener filtering, Constrained Least Square Filtering, Geometric Mean Filter, Geometric Transformations. **[No. of Hrs.: 12]**

UNIT - III

Image Compression: Coding, Interpixel and Psychovisual Redundancy, Image Compression models, Elements of Information Theory, Error free comparison, Lossy compression, Image compression standards.

Image Segmentation: Detection of Discontinuities, Edge linking and boundary detection, Thresholding, Region Oriented Segmentation, Motion based segmentation. **[No. of Hrs.: 12]**

UNIT - IV

Representation and Description: Representation, Boundary Descriptors, Regional Descriptors, Use of Principal Components for Description, Introduction to Morphology, Some basic Morphological Algorithms.

Object Recoginition: Patterns and Pattern Classes, Decision-Theoretic Methods, Structural Methods. **[No. of Hrs.: 10]**

TEXT BOOKS:

1. Rafael C. Conzalez & Richard E. Woods, "Digital Image Processing", 2nd edition, Pearson Education, 2002.
2. A.K. Jain, "Fundamental of Digital Image Processing", PHI, 1989.

REFERENCES:

1. Bernd Jahne, "Digital Image Processing", 5th Ed., Springer, 2002.
2. William K Pratt, "Digital Image Processing: Piks Inside", John Wiley & Sons, 2001.

Paper Code: ETEC-413 **L T C**
Paper: POWER ELECTRONICS **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from Q. No. 1 rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

Unit I

Power Semiconductor Devices: Two-transistor Model of Thyristor, Methods of Triggering a Thyristor, Thyristor Types.

Triggering Devices: Triggering Devices, Unijunction Transistor, Characteristics and Applications of UJT, Programmable Unijunction Transistor, DIAC, Silicon-Controlled Switch, Silicon Unilateral Switch, Silicon Bilateral Switch, Shockley Diode, Opto-Isolators. **[No. of Hours: 11]**

Unit II

Thyristor Firing Circuits Turn on systems: Requirements for Triggering Circuits, Thyristor Firing Circuits, Full Wave Control of AC with One Thyristor, Light Activated SCRs (LASCR) Control Circuit, Pulse Transformer Triggering, Firing SCR by UJT, TRIAC Firing Circuit, Phase Control of SCR by Pedestal and Ramp

Controlled Rectifier: Types of Converters, Effect of Inductive Load, Commutating Diode or Free-Wheeling Diode, Controlled Rectifiers, Bi-Phase Half-Wave (Single Way), Single-Phase Full-Wave Phase Controlled Converter Using Bridge Principle (Double Way), Harmonics

Singal Phase full-wave phase controlled converter using bridge principal (Double way) harmonics.
[No. of Hours: 11]

Unit III

Inverters: Types of Inverters, Bridge Inverters, Voltage Source Inverters (VSI), Pulse Width Modulated Inverters, Current Source Inverter

AC Voltage Controllers: Types of AC Voltage Controllers, AC Phase Voltage Controllers, Single-Phase Voltage Controller with R-L Load, Harmonic Analysis of Single-Phase Full-Wave Controller with R-L Load, Gating Signals

DC to DC Converters (Choppers): DC Choppers, Chopper classification, Two Quadrant Chopper, Four Quadrant Chopper, Morgan Chopper. **[No. of Hours: 11]**

Unit IV

Cycloconverters: Types of Cycloconverters, Single-Phase Cycloconverter, Three-Phase Cycloconverters. Thyristor Protection: Protection, dv/dt Protection, di/dt Protection, Over Voltage Protection Thyristor protection : Protection , dv / dt protection, di / dt protection , Over voltage protection.

Industrial Applications: "One Shot" Thyristor Trigger Circuit, Overvoltage Protection, Simple Battery Charger, Battery Charging Regulator, AC Static Switches DC Static Switch Microprocessor based Applications. **[No. of Hours: 11]**

Text Books:

1. "Power Electronics: Circuits, Devices & Applications" PHI – 2nd Edition.
2. P. C. Sen, "Power Electronics" TMH – 2nd Edition.

Reference Books:

1. H. C. Rai, "Power Electronics Devices, Circuits, Systems and Application", Galgotia, 3rd Ed.
2. P. S. Bimbhara, "Electrical Machinery, Theory Performance and Applications" Khanna Publications, 7th Ed.

Code No.: ETCS 415 **L T C**
Paper: Advanced Computer Architecture **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75

1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Parallel computer models: The state of computing , Multiprocessors and multicomputers, Multivector and SIMD computers, Architectural development tracks

Program and network properties :Conditions of parallelism, Data and resource dependences,Hardware and software parallelism,Program partitioning and scheduling, Grain size and latency, Program flow mechanisms,Control flow versus data flow,Data flow architecture,Demand driven mechanisms,Comparisons of flow mechanisms **[No. of Hrs.: 11]**

UNIT - II

System Interconnect Architectures : Network properties and routing, Static interconnection networks, Dynamic interconnection Networks, Multiprocessor system interconnects, Hierarchical bus systems, Crossbar switch and multiport memory,Multistage and combining network.

Processors and Memory Hierarchy : Advanced processor technology, Instruction-set Architectures,CISC Scalar Processors, RISC Scalar Processors, Superscalar Processors,VLIW Architectures, Vector and Symbolic processors

Memory Technology :Hierarchical memory technology, Inclusion, Coherence and Locality, Memory capacity planning, Virtual Memory Technology **[No. of Hrs.: 11]**

UNIT - III

Backplane Bus System: Backplane bus specification, Addressing and timing protocols, Arbitration transaction and interrupt, Cache addressing models, Direct mapping and associative caches.

Pipelining: Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch handling techniques, Arithmetic Pipeline Design, Computer arithmetic principles, Static arithmetic pipeline, Multifunctional arithmetic pipelines **[No. of Hrs. 11]**

UNIT - IV

Vector Processing Principles : Vector instruction types, Vector-access memory schemes.

Synchronous Parallel Processing : SIMD Architecture and Programming Principles, SIMD Parallel Algorithms, SIMD Computers and Performance Enhancement **[No. of Hrs.: 11]**

TEXT BOOKS:

1. Kai Hwang, "Advanced computer architecture"; TMH, 2000.

REFERENCES BOOKS:

1. J.P.Hayes, "computer Architecture and organization", MGH, 1998.
2. M.J Flynn, "Computer Architecture, Pipelined and Parallel Processor Design", Narosa Publishing, 1998.
3. D.A.Patterson, J.L.Hennessy, "Computer Architecture :A quantitative approach", Morgan Kauffmann, 2002.
4. Hwang and Briggs, " Computer Architecture and Parallel Processing"; MGH, 2000.

Paper Code: ETCS-417 **L T C**
Paper: COMPUTER GRAPHICS AND MULTIMEDIA **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from Q. No. 1 rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

Unit I

Basic raster graphics, algorithms for drawing 2 D Primitives lines, circles, ellipses, arcs, clipping, clipping circles, ellipses & polygon.
Polygon Meshes in 3 D, curves, cubic & surfaces, Solid modeling. **[No. of Hours: 11]**

Unit II

Geometric Transformation: 2 D, 3 D transformations, window to view port transformations, achromatic and color models. **[No. of Hours: 11]**

Unit III

Graphics Hardware: Hardcopy & display techniques, Input devices, image scanners
Image manipulation & storage: File formats for BMP, GIF, TIFF, JPEG, MPEG-II, Introduction to animation techniques.
Elementary filtering techniques, elementary Image processing techniques, Geometric & multi-pass transformation mechanisms for image storage & retrieval.
Procedural models, fractals, grammar-based models, multi-particle system, volume rendering.
[No. of Hours: 11]

Unit IV

Shading Techniques: Transparency, Shadows, Object reflection, Guard & Phong shading techniques. Visible surface determination techniques for visible line determination, Z-buffer algorithm, scan line algorithm, algorithm for oct-tres, algorithm for curve surfaces, visible surfaces ray-tracing, recursive ray tracing, radio-city methods. **[No. of Hours: 11]**

Text Books:

1. Hern & Baker, "Computer Graphics" PHI – 2nd Edition.
2. Foley and others "Computer Graphics, Principles & Practices", Pearson Education – 2nd Edition.

Reference Books:

1. Harrington, "Computer Graphics, A Programming Approach" Mc. Graw Hill, 2nd Editon.

ECE-10

BACHELOR OF TECHNOLOGY
(Computer Science & Engineering)
SEVENTH SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits
THEORY PAPERS				
ETIT 401	Advanced Computer Networks	3	1	4
ETCS 403	Advanced Computer Architecture	3	1	4
ELECTIVE PAPERS (Choose any two)				
ETCS 405	Compiler Construction	3	1	4
ETEC 407	Mobile Computing	3	1	4
ETIT 409	VLSI Design	3	1	4
ETEC 411	Digital Image Processing	3	1	4
ETCS 413	Requirements & Estimation Techniques	3	1	4
ETCS 415	Project	-	-	4
PRACTICAL/VIVA VOCE				
ETIT 451	Advanced Computer Network Lab.	0	2	1
ETCS 453	Practical Lab (based on Electives)	0	2	1
ETCS 455	#Seminar	0	2	1
ETCS 457	*Minor Project	0	8	5
ETCS 459	#^Practical Training	0	0	1
	TOTAL	**12**	**18**	**25**

NON UNIVERSITY EXAMINATION SYSTEM
*The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format. The student will have to present the progress of the work through seminars and progress reports.
^Practical training was conducted after sixth semester. However, Viva-Voce for evaluation of Practical Training will be conducted in this semester.

ETCS 417 Computer Graphics & Multimedia

Code No.: ETIT 401	L	T	C
Paper: Advanced Computer Networks	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Review of Physical & Data link layer, ISDN, Frame Relay, ATM **[No. of Hrs.: 11]**

UNIT – II

Network Layer: ARP and RARP, Routing algorithms and protocols, Congestion control algorithm, Router Operation, Router configuration, Internetworking, IP Protocol, IPv6 (an overview). **[No. of Hrs.: 11]**

UNIT – III

Transport Layer: UDP, TCP (Flow Control, Error Control, Connection Establishment) **[No. of Hrs.: 11]**

UNIT – IV

Application layer: DNS, SNMP, RMON, Electronic Mail, WWW.

Network Security: Firewalls (Application and packet filtering), Cryptography, Virtual Print, **[No. of Hrs.: 11]**

TEXT BOOKS:

1. B. A. Forouzan, "TCP/IP Protocol Suite", TMH, 2nd Ed., 2004.

REFERENCE BOOKS:

1. U. Black, "Computer Networks-Protocols, Standards and Interfaces", PHI, 1996.
2. W. Stallings, "Computer Communication Networks", PHI, 1999.
3 W. Stallings, "SNMP, SNMPv2, SNMPv3, RMON 1&2", 3rd Ed., Addison Wesley, 1999.
4. Michael A. Miller, "Data & Network Communications", Vikas Publication, 1996.
5. William A. Shay, "Understanding Data Communications & Networks", Vikas Publication, 1999.
6. A. S. Tananbaum, "Computer Networks", 3rd Ed, PHI, 1999.
7. Laura Chappell (ed), "Introduction to Cisco Router Configuration", Techmedia, 1999.

CSE-2

Sem VII (CSE)

Code No.: ETCS 403	L	T	C
Paper: Advanced Computer Architecture	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Parallel computer models: The state of computing , Multiprocessors and multicomputers, Multivector and SIMD computers, Architectural development tracks

Program and network properties :Conditions of parallelism, Data and resource dependences,Hardware and software parallelism,Program partitioning and scheduling, Grain size and latency, Program flow mechanisms,Control flow versus data flow,Data flow architecture,Demand driven mechanisms,Comparisons of flow mechanisms

[No. of Hrs.: 11]

UNIT - II

System Interconnect Architectures : Network properties and routing, Static interconnection networks, Dynamic interconnection Networks, Multiprocessor system interconnects, Hierarchical bus systems, Crossbar switch and multiport memory,Multistage and combining network.

Processors and Memory Hierarchy : Advanced processor technology, Instruction-set Architectures,CISC Scalar Processors, RISC Scalar Processors, Superscalar Processors,VLIW Architectures, Vector and Symbolic processors

Memory Technology :Hierarchical memory technology, Inclusion, Coherence and Locality, Memory capacity planning, Virtual Memory Technology

[No. of Hrs.: 11]

UNIT - III

Backplane Bus System: Backplane bus specification, Addressing and timing protocols, Arbitration transaction and interrupt, Cache addressing models, Direct mapping and associative caches.

Pipelining :Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch handling techniques, Arithmetic Pipeline Design, Computer arithmetic principles, Static arithmetic pipeline, Multifunctional arithmetic pipelines

[No. of Hrs. 11]

UNIT - IV

Vector Processing Principles : Vector instruction types, Vector-access memory schemes.

Synchronous Parallel Processing : SIMD Architecture and Programming Principles, SIMD Parallel Algorithms, SIMD Computers and Performance Enhancement

[No. of Hrs.: 11]

CSE-3

TEXT BOOKS:

1. Kai Hwang, "Advanced computer architecture"; TMH, 2000.

REFERENCES BOOKS:

1. J.P.Hayes, "computer Architecture and organization", MGH, 1998.
2. M.J Flynn, "Computer Architecture, Pipelined and Parallel Processor Design", Narosa Publishing, 1998.
3. D.A.Patterson, J.L.Hennessy, "Computer Architecture :A quantitative approach", Morgan Kauffmann, 2002.
4. Hwang and Briggs, " Computer Architecture and Parallel Processing"; MGH, 2000.

Code No.: ETCS 405	L	T	C
Paper: Compiler Construction	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT - I

Classification of grammars, Context free grammars, Deterministic finite state automata (DFA) Non-DFA.

[No. of Hrs.: 10]

UNIT - II

Scanners, Top down parsing, LL grammars, Bottom up parsing, Polish expression Operator Precedence grammar, IR grammars, Comparison of parsing methods, Error handling.

Symbol table handling techniques, Organization for non-block and block structured languages. **[No. of Hrs.: 12]**

UNIT - III

Run time storage administration, Static and dynamic allocation, Intermediate forms of source program, Polish N-tuple and syntax trees, Semantic analysis and code generation.

[No. of Hrs.: 12]

UNIT - IV

Code optimization, Folding, redundant sub-expression evaluation, Optimizatiion within iterative loops. **[No. of Hrs.: 10]**

TEXT BOOKS:

1. Tremblay, et. al., "The Theory and Practice of Compiler Writing", McGraw Hill, New York, 1985.
2. A. Holub, "Compiler Design in C", PHI, 2004
3. Aho, Ullman & Ravi Sethi, "Principles of Compiler Design", Pearson Education, 2002

REFERENCES BOOKS:

1. Andrew L. Appel, "Modern Compiler Implementation in C", Delhi, Foundation Books, 2000.
2. Dick Grune et. Al., "Modern Compiler Design", Wiley Dreamtech, 2000.

CSE-5

Code No.: ETEC 407	L	T	C
Paper: Mobile Computing	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Introduction to Personal Communications Services (PCS): PCS Architecture, Mobility management, Networks signalling.

Global System for Mobile Communication (GSM) system overview: GSM Architecture, Mobility management, Network signalling.

General Packet Radio Services (GPRS): GPRS Architecture, GPRS Network Nodes.

[No. of Hrs.: 11]

UNIT – II

Mobile Data Communication: WLANs (Wireless LANs) IEEE 802.11 standard, Mobile IP.

Wireless Application Protocol (WAP): The Mobile Internet standard, WAP Gateway and Protocols, wireless mark up Languages (WML). **[No. of Hrs.: 11]**

UNIT – III

Third Generation (3G) Mobile Services: Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G.

Wireless Local Loop(WLL): Introduction to WLL Architecture, wireless Local Loop Technologies. **[No. of Hrs.: 11]**

UNIT – IV

Global Mobile Satellite Systems; case studies of the IRIDIUM and GLOBALSTAR systems.

Wireless Enterprise Networks: Introduction to Virtual Networks, Blue tooth technology, Blue tooth Protocols.

[No. of Hrs.: 11]

TEXT BOOKS:

1. Yi-Bing Lin & Imrich Chlamtac, "Wireless and Mobile Networks Architectures", John Wiley & Sons, 2001.
2. Raj Pandya, "Mobile and Personal Communication systems and services", Prentice Hall of India, 2001.
3. Hansmann, "Principles of Mobile Computing", Wiley Dreamtech, 2004.

REFERENCE BOOKS:

1. Mark Ciampa, "Guide to Designing and Implementing wireless LANs", Thomson learning, Vikas Publishing House, 2001.
2. Ray Rischpater, "Wireless Web Development", Springer Publishing, 2000.

Code No.: ETIT 409	L	T	C
Paper: VLSI Design	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

MOS Transistor Theory: nMOS Enhancement Transistor, pMOS Enhancement transistor, Threshold voltage, Fabrication of MOSFET: Silicon Semiconductor technology, Wafter processing, Oxidation, Epitaxy, Deposition, Ion-implanation and diffusion, The silicon gate Process, CMOS Technology, basic n-well cmos process, p-well process, twin tub process CMOS process enhancement: metal interconnect, Polysilicon / Refractory metal interconnect, Circuit element: Resistor, Capacitor. **[No. of Hrs.: 11]**

UNIT – II

Operation of MOS transistor as a switch, Design and analysis of nMOS, pMOS and CMOS circuits, CMOS Logic, The Inverter, NAND gate, NOR Gate, Compound Gate. **[No. of Hrs.: 11]**

UNIT – III

Modeling of MOS transistors using SPICE, MOS Inverters: Static Characteristics, MOS Inverters: Switching Characteristics and Interconnect Effects, Combinational MOS Logic Circuits: MUX, DMUX, Transmission gate, Differential Inverter, Tristate Inverter. **[No. of Hrs.: 11]**

UNIT – IV

Sequential MOS Logic Circuits, Dynamic Logic Circuits, Semiconductor Memories. **[No. of Hrs.: 11]**

TEXT BOOK:

1. Sung-Mo Kang and Yusuf Leblebici, "CMOS – Digital Integrated Circuits Analysis and Design", TMH, 2004.

REFERENCE BOOKS:

1. Douglas A. Pucknell, "Basic VLSI Design, 3rd Edition, 2004.
2. Neil H. E. Weste & K. Eshranghian, "Principles of CMOS VLSI design", 2nd Edition, Addison Wesley, 2003.
3. S. M. Sze, "VLSI Technology, Wiley, 2000.
4. Demassa & Ciccone, "Digital Integrated Circuits", Wiley Publications, 2003.
5. Jacob Millman and Arvin Grabel, "Microelectronics", TMH, 2004.

CSE-7

Code No.: ETEC 411	L	T	C
Paper: Digital Image Processing	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT -I

Introduction And Digital Image Fundamentals: The origins of Digital Image Processing, Examples of Fields that Use Digital Image Processing, Fundamentals Steps in Image Processing, Elements of Digital Image Processing Systems, Image Sampling and Quantization, Some basic relationships like Neighbours, Connectivity, Distance Measures between pixels, Linear and Non Linear Operations.

Image Enhancement in the Spatial Domain: Some basic Gray Level Transformations, Histogram Processing, Enhancement Using Arithmetic and Logic operations, Basics of Spatial Filters, Smoothening and Sharpening Spatial Filters, Combining Spatial Enhancement Methods.

[No. of Hrs.: 10]

UNIT - II

Image Enhancement in the Frequency Domain: Introduction to Fourier Transform and the frequency Domain, Smoothing and Sharpening Frequency Domain Filters, Homomorphic Filtering.

Image Restoration: A model of The Image Degradation / Restoration Process, Noise Models, Restoration in the presence of Noise Only Spatial Filtering, Pereodic Noise Reduction by Frequency Domain Filtering, Linear Position-Invarient Dedradations, Estimation of Degradation Function, Inverse filtering, Wiener filtering, Constrained Least Square Filtering, Geometric Mean Filter, Geometric Transformations. **[No. of Hrs.: 12]**

UNIT - III

Image Compression: Coding, Interpixel and Psychovisual Redundancy, Image Compression models, Elements of Information Theory, Error free comparison, Lossy compression, Image compression standards.

Image Segmentation: Detection of Discontinuities, Edge linking and boundary detection, Thresholding, Region Oriented Segmentation, Motion based segmentation.**[No. of Hrs.: 12]**

UNIT - IV

Representation and Description: Representation, Boundary Descriptors, Regional Descriptors, Use of Principal Components for Description, Introduction to Morphology, Some basic Morphological Algorithms.

Object Recoginition: Patterns and Pattern Classes, Decision-Theoretic Methods, Structural Methods. **[No. of Hrs.: 10]**

TEXT BOOKS:

1. Rafael C. Conzalez & Richard E. Woods, "Digital Image Processing", 2nd edition, Pearson Education, 2002.

CSE-8

Code No.: ETCS 413	**L**	**T**	**C**
Paper: Requirements & Estimation Techniques	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Requirements engineering: Requirements Elicitation, Requirement Elicitation techniques, Requirement Analysis, Requirement Analysis Models, Requirement Documentation, Requirement Management, IEEE Std. For SRS **[No. of Hrs.: 10]**

UNIT - II

Size Estimation: Function Point Analysis, Mask II FPA, LOC estimation, Conversion between size measures **[No. of Hrs.: 12]**

UNIT - III

Effort, schedule & cost estimation: Estimation factors, COCOMO-II, Putnam Estimation Model, Estimation by Analogy, Validating Software Estimates **[No. of Hrs.: 12]**

UNIT - IV

Introduction to software life cycle, management activities in software project
Tools: Software Estimation Tools

Industry Resources; IFPUG, UQAM-SEMRL, COSMIC, IEEE, COCOMO
[No. of Hrs.: 10]

TEXT BOOKS:

1. Swapna Kishore, Rajesh Naik, "Software Requirements and Estimation", TMH, 1992.

REFERENCE BOOKS:

1. K.K. Aggarwal & Yogesh Singh, "Software Engineering", 2nd Ed., New Age International Publishers, New Delhi, 2005.
2. Roger Pressman, "Software Engineering: A Practitioiner's Approach", 3rd Edition, McGraw Hill, 1992.

CSE-9

Paper Code: ETCS-417 **L T C**
Paper: COMPUTER GRAPHICS AND MULTIMEDIA **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from Q. No. 1 rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.	

Unit I

Basic raster graphics, algorithms for drawing 2 D Primitives lines, circles, ellipses, arcs, clipping, clipping circles, ellipses & polygon.

Polygon Meshes in 3 D, curves, cubic & surfaces, Solid modeling.

[No. of Hours: 11]

Unit II

Geometric Transformation: 2 D, 3 D transformations, window to view port transformations, achromatic and color models.

[No. of Hours: 11]

Unit III

Graphics Hardware: Hardcopy & display techniques, Input devices, image scanners

Image manipulation & storage: File formats for BMP, GIF, TIFF, IPEG, MPEG-II, Introduction to animation techniques.

Elementary filtering techniques, elementary Image processing techniques, Geometric &

multi-pass transformation mechanisms for image storage & retrieval.

Procedural models, fractals, grammar-based models, multi-particle system, volume rendering.

[No. of Hours: 11]

Unit IV

Shading Techniques: Transparency, Shadows, Object reflection, Guard & Phong shading techniques. Visible surface determination techniques for visible line determination, Z-buffer algorithm, scan line algorithm, algorithm for oct-tres, algorithm for curve surfaces, visible surfaces ray-tracing, recursive ray tracing, radio-city methods.

[No. of Hours: 11]

Text Books:

1. Hern & Baker, "Computer Graphics" PHI – 2nd Edition.
2. Foley and others "Computer Graphics, Principles & Practices", Pearson Education – 2nd Edition.

Reference Books:

1. Harrington, "Computer Graphics, A Programming Approach" Mc. Graw Hill, 2nd Editon.

CSE-10

BACHELOR OF TECHNOLOGY
(Information Technology)

SEVENTH SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits
THEORY PAPERS				
ETIT 401	Advanced Computer Networks	3	1	4
ETIT 403	Multimedia Applications	3	1	4
ELECTIVE PAPERS (Choose any two)				
ETCS 405	Compiler Construction	3	1	4
ETEC 407	Mobile Computing	3	1	4
ETIT 409	VLSI Design	3	1	4
ETEC 411	Digital Image Processing	3	1	4
ETCS 413	Requirements & Estimation Techniques	3	1	4
ETCS 415	Advanced Computer Architecture	3	1	4
ETIT 417	Project	-	-	4
PRACTICAL/VIVA VOCE				
ETIT 451	Advanced Computer Network Lab.	0	2	1
ETIT 453	Multimedia Applications Lab.	0	2	1
ETIT 455	Practical Lab (based on Electives)	0	2	1
ETIT 457	#Seminar	0	2	1
ETIT 459	*Minor Project	0	8	4
ETIT 461	#^Practical Training	0	0	1
	TOTAL	**12**	**20**	**25**

NON UNIVERSITY EXAMINATION SYSTEM

*The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format. The student will have to present the progress of the work through seminars and progress reports.

^Practical training was conducted after sixth semester. However, Viva-Voce for evaluation of Practical Training will be conducted in this semester.

Code No.: ETIT 401	**L**	**T**	**C**
Paper: Advanced Computer Networks	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Review of Physical & Data link layer, ISDN, Frame Relay, ATM **[No. of Hrs.: 11]**

UNIT – II

Network Layer: ARP and RARP, Routing algorithms and protocols, Congestion control algorithm, Router Operation, Router configuration, Internetworking, IP Protocol, IPv6 (an overview). **[No. of Hrs.: 11]**

UNIT – III

Transport Layer: UDP, TCP (Flow Control, Error Control, Connection Establishment) **[No. of Hrs.: 11]**

UNIT – IV

Application layer: DNS, SNMP, RMON, Electronic Mail, WWW.

Network Security: Firewalls (Application and packet filtering), Cryptography, Virtual Print, **[No. of Hrs.: 11]**

TEXT BOOKS:

1. B. A. Forouzan, "TCP/IP Protocol Suite", TMH, 2nd Ed., 2004.

REFERENCE BOOKS:

1. U. Black, "Computer Networks-Protocols, Standards and Interfaces", PHI, 1996.
2. W. Stallings, "Computer Communication Networks", PHI, 1999.
3 W. Stallings, "SNMP, SNMPv2, SNMPv3, RMON 1&2", 3rd Ed., Addison Wesley, 1999.
4. Michael A. Miller, "Data & Network Communications", Vikas Publication, 1996.
5. William A. Shay, "Understanding Data Communications & Networks", Vikas Publication, 1999.
6. A. S. Tananbaum, "Computer Networks", 3rd Ed, PHI, 1999.
7. Laura Chappell (ed), "Introduction to Cisco Router Configuration", Techmedia, 1999.

Code No.: ETIT 403	L	T	C
Paper: Multimedia Applications	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Introductory Concepts: Multimedia – Definitions, CD-ROM and the Multimedia Highway, Uses of Multimedia, Introduction to making multimedia – The Stages of project, the requirements to make good multimedia, Multimedia skills and training, Training opportunities in Multimedia. Motivation for multimedia usage, Frequency domain analysis, Application Domain & ODA etc.

Multimedia-Hardware and Software: Multimedia Hardware – Macintosh and Windows production Platforms, Hardware peripherals – Connections, Memory and storage devices, Media software – Basic tools, making instant multimedia, Multimedia software and Authoring tools, Production Standards.

[No. of Hrs.: 11]

UNIT – II

Multimedia – making it work – multimedia building blocks – Text, Sound, Images, Animation and Video, Digitization of Audio and Video objects, Data Compression: Different Compression algorithms concern to text, audio, video and images etc., Working Exposure on Tools like Dream Weaver, 3D Effects, Flash Etc.,

[No. of Hrs.: 11]

UNIT – III

Animation: Different techniques, 2D and 3D Animation, working on 3D animation tools.

Modelling: NURBS, Polygon, Organic modeling.

Animation: Keyframe, Path animation, skeleton animation, etc. **[No. of Hrs.: 11]**

UNIT – IV

Dynamics: Active and Passive bodies, fields, expressions, constrains, etc.

Rendering: Different rendering techniques like IPR, Mental ray, software, hardware etc., Shadows, materials, light and special effects. **[No. of Hrs.: 11]**

TEXT BOOKS:

1. Steve Heath, "Multimedia & Communication Systems", Focal Press, UK, 1999.
2. Tay Vaughan, "Multimedia: Making it work", TMH, 1999.
3. K. Andleigh and K. Thakkar, "Multimedia System Design", PHI, PTR, 2000.

REFERENCES BOOKS:

1. Keyes, "Multimedia Handbook", TMH, 2000.
2. Ralf Steinmetz and Klara Naharstedt, "Multimedia: Computing, Communications & Applications", Pearson, 2001.
3. Steve Rimmer, "Advanced Multimedia Programming", MHI, 2000.

Code No.: ETCS 405	L	T	C
Paper: Compiler Construction	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT - I

Classification of grammars, Context free grammars, Deterministic finite state automata (DFA) Non-DFA.

[No. of Hrs.: 10]

UNIT - II

Scanners, Top down parsing, LL grammars, Bottom up parsing, Polish expression Operator Precedence grammar, IR grammars, Comparison of parsing methods, Error handling.

Symbol table handling techniques, Organization for non-block and block structured languages

[No. of Hrs.: 12]

UNIT - III

Run time storage administration, Static and dynamic allocation, Intermediate forms of source program, Polish N-tuple and syntax trees, Semantic analysis and code generation.

[No. of Hrs.: 12]

UNIT - IV

Code optimization, Folding, redundant sub-expression evaluation, Optimizatiion within iterative loops. **[No. of Hrs.: 10]**

TEXT BOOKS:

1. Tremblay, et. al., "The Theory and Practice of Compiler Writing", McGraw Hill, New York, 1985.
2. A. Holub, "Compiler Design in C", PHI, 2004
3. Aho, Ullman & Ravi Sethi, "Principles of Compiler Design", Pearson Education, 2002

REFERENCES BOOKS:

1. Andrew L. Appel, "Modern Compiler Implementation in C", Delhi, Foundation Books, 2000.
2. Dick Grune et. Al., "Modern Compiler Design", Wiley Dreamtech, 2000.

Code No.: ETEC 407	L	T	C
Paper: Mobile Computing	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Introduction to Personal Communications Services (PCS): PCS Architecture, Mobility management, Networks signalling.

Global System for Mobile Communication (GSM) system overview: GSM Architecture, Mobility management, Network signalling.

General Packet Radio Services (GPRS): GPRS Architecture, GPRS Network Nodes.

[No. of Hrs.: 11]

UNIT – II

Mobile Data Communication: WLANs (Wireless LANs) IEEE 802.11 standard, Mobile IP.

Wireless Application Protocol (WAP): The Mobile Internet standard, WAP Gateway and Protocols, wireless mark up Languages (WML). **[No. of Hrs.: 11]**

UNIT – III

Third Generation (3G) Mobile Services: Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G.

Wireless Local Loop(WLL): Introduction to WLL Architecture, wireless Local Loop Technologies. **[No. of Hrs.: 11]**

UNIT – IV

Global Mobile Satellite Systems; case studies of the IRIDIUM and GLOBALSTAR systems.

Wireless Enterprise Networks: Introduction to Virtual Networks, Blue tooth technology, Blue tooth Protocols.

[No. of Hrs.: 11]

TEXT BOOKS:

1. Yi-Bing Lin & Imrich Chlamtac, "Wireless and Mobile Networks Architectures", John Wiley & Sons, 2001.
2. Raj Pandya, "Mobile and Personal Communication systems and services", Prentice Hall of India, 2001.
3. Hansmann, "Principles of Mobile Computing", Wiley Dreamtech, 2004.

REFERENCE BOOKS:

1. Mark Ciampa, "Guide to Designing and Implementing wireless LANs", Thomson learning, Vikas Publishing House, 2001.
2. Ray Rischpater, "Wireless Web Development", Springer Publishing, 2000.

3. Sandeep Singhal, "The Wireless Application Protocol", Pearson Education Asia, 2000.
4. P.Stavronlakis, "Third Generation Mobile Telecommunication systems", Springer Publishers, 2001.

Code No.: ETIT 409	L	T	C
Paper: VLSI Design	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

MOS Transistor Theory: nMOS Enhancement Transistor, pMOS Enhancement transistor, Threshold voltage, Fabrication of MOSFET: Silicon Semiconductor technology, Wafter processing, Oxidation, Epitaxy, Deposition, Ion-implanation and diffusion, The silicon gate Process, CMOS Technology, basic n-well cmos process, p-well process, twin tub process CMOS process enhancement: metal interconnect, Polysilicon / Refractory metal interconnect, Circuit element: Resistor, Capacitor.

[No. of Hrs.: 11]

UNIT – II

Operation of MOS transistor as a switch, Design and analysis of nMOS, pMOS and CMOS circuits, CMOS Logic, The Inverter, NAND gate, NOR Gate, Compound Gate.

[No. of Hrs.: 11]

UNIT – III

Modeling of MOS transistors using SPICE, MOS Inverters: Static Characteristics, MOS Inverters: Switching Characteristics and Interconnect Effects, Combinational MOS Logic Circuits: MUX, DMUX, Transmission gate, Differential Inverter, Tristate Inverter.

[No. of Hrs.: 11]

UNIT – IV

Sequential MOS Logic Circuits, Dynamic Logic Circuits, Semiconductor Memories.

[No. of Hrs.: 11]

TEXT BOOK:

1. Sung-Mo Kang and Yusuf Leblebici, "CMOS – Digital Integrated Circuits Analysis and Design", TMH, 2004.

REFERENCE BOOKS:

1. Douglas A. Pucknell, "Basic VLSI Design, 3rd Edition, 2004.
2. Neil H. E. Weste & K. Eshranghian, "Principles of CMOS VLSI design", 2nd Edition, Addison Wesley, 2003.
3. S. M. Sze, "VLSI Technology, Wiley, 2000.
4. Demassa & Ciccone, "Digital Integrated Circuits", Wiley Publications, 2003.
5. Jacob Millman and Arvin Grabel, "Microelectronics", TMH, 2004.

Code No.: ETEC 411	L	T	C
Paper: Digital Image Processing	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

1. Question No. I should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. I, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT -I

Introduction And Digital Image Fundamentals: The origins of Digital Image Processing, Examples of Fields that Use Digital Image Processing, Fundamentals Steps in Image Processing, Elements of Digital Image Processing Systems, Image Sampling and Quantization, Some basic relationships like Neighbours, Connectivity, Distance Measures between pixels, Linear and Non Linear Operations.

Image Enhancement in the Spatial Domain: Some basic Gray Level Transformations, Histogram Processing, Enhancement Using Arithmetic and Logic operations, Basics of Spatial Filters, Smoothening and Sharpening Spatial Filters, Combining Spatial Enhancement Methods.

[No. of Hrs.: 10]

UNIT - II

Image Enhancement in the Frequency Domain: Introduction to Fourier Transform and the frequency Domain, Smoothing and Sharpening Frequency Domain Filters, Homomorphic Filtering.

Image Restoration: A model of The Image Degradation / Restoration Process, Noise Models, Restoration in the presence of Noise Only Spatial Filtering, Pereodic Noise Reduction by Frequency Domain Filtering, Linear Position-Invarient Dedradations, Estimation of Degradation Function, Inverse filtering, Wiener filtering, Constrained Least Square Filtering, Geometric Mean Filter, Geometric Transformations.

[No. of Hrs.: 12]

UNIT - III

Image Compression: Coding, Interpixel and Psychovisual Redundancy, Image Compression models, Elements of Information Theory, Error free comparison, Lossy compression, Image compression standards.

Image Segmentation: Detection of Discontinuities, Edge linking and boundary detection, Thresholding, Region Oriented Segmentation, Motion based segmentation.**[No. of Hrs.: 12]**

UNIT - IV

Representation and Description: Representation, Boundary Descriptors, Regional Descriptors, Use of Principal Components for Description, Introduction to Morphology, Some basic Morphological Algorithms.

Object Recoginition: Patterns and Pattern Classes, Decision-Theoretic Methods, Structural Methods. **[No. of Hrs.: 10]**

TEXT BOOKS:

1. Rafael C. Conzalez & Richard E. Woods, "Digital Image Processing", 2nd edition, Pearson Education, 2002.
2. A.K. Jain, "Fundamental of Digital Image Processing", PHI, 1989.

REFERENCES:

1. Bernd Jahne, "Digital Image Processing", 5th Ed., Springer, 2002.
2. William K Pratt, "Digital Image Processing: Piks Inside", John Wiley & Sons, 2001.

Code No.: ETCS 413	L	T	C
Paper: Requirements & Estimation Techniques	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

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2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Requirements engineering: Requirements Elicitation, Requirement Elicitation techniques, Requirement Analysis, Requirement Analysis Models, Requirement Documentation, Requirement Management, IEEE Std. For SRS **[No. of Hrs.: 10]**

UNIT - II

Size Estimation: Function Point Analysis, Mask II FPA, LOC estimation, Conversion between size measures

[No. of Hrs.: 12]

UNIT - III

Effort, schedule & cost estimation: Estimation factors, COCOMO-II, Putnam Estimation Model, Estimation by Analogy, Validating Software Estimates **[No. of Hrs.: 12]**

UNIT - IV

Introduction to software life cycle, management activities in software project
Tools: Software Estimation Tools

Industry Resources; IFPUG, UQAM-SEMRL, COSMIC, IEEE, COCOMO**[No. of Hrs.: 10]**

TEXT BOOKS:

1. Swapna Kishore, Rajesh Naik, "Software Requirements and Estimation", TMH, 1992.

REFERENCE BOOKS:

1. K.K. Aggarwal & Yogesh Singh, "Software Engineering", 2nd Ed., New Age International Publishers, New Delhi, 2005.
2. Roger Pressman, "Software Engineering: A Practitioiner's Approach", 3rd Edition, McGraw Hill, 1992.

Code No.: ETCS 415	L	T	C
Paper: Advanced Computer Architecture	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

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2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Parallel computer models: The state of computing , Multiprocessors and multicomputers, Multivector and SIMD computers, Architectural development tracks

Program and network properties :Conditions of parallelism, Data and resource dependences,Hardware and software parallelism,Program partitioning and scheduling, Grain size and latency, Program flow mechanisms,Control flow versus data flow,Data flow architecture,Demand driven mechanisms,Comparisons of flow mechanisms**[No. of Hrs.: 11]**

UNIT - II

System Interconnect Architectures : Network properties and routing, Static interconnection networks, Dynamic interconnection Networks, Multiprocessor system interconnects, Hierarchical bus systems, Crossbar switch and multiport memory,Multistage and combining network.

Processors and Memory Hierarchy : Advanced processor technology, Instruction-set Architectures,CISC Scalar Processors, RISC Scalar Processors, Superscalar Processors,VLIW Architectures, Vector and Symbolic processors

Memory Technology :Hierarchical memory technology, Inclusion, Coherence and Locality, Memory capacity planning, Virtual Memory Technology **[No. of Hrs.: 11]**

UNIT - III

Backplane Bus System: Backplane bus specification, Addressing and timing protocols, Arbitration transaction and interrupt, Cache addressing models, Direct mapping and associative caches.

Pipelining :Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch handling techniques, Arithmetic Pipeline Design, Computer arithmetic principles, Static arithmetic pipeline, Multifunctional arithmetic pipelines **[No. of Hrs. 11]**

UNIT - IV

Vector Processing Principles : Vector instruction types, Vector-access memory schemes.

Synchronous Parallel Processing : SIMD Architecture and Programming Principles, SIMD Parallel Algorithms, SIMD Computers and Performance Enhancement **[No. of Hrs.: 11]**

TEXT BOOKS:

1. Kai Hwang, "Advanced computer architecture"; TMH, 2000.

REFERENCES BOOKS:

1. J.P.Hayes, "computer Architecture and organization", MGH, 1998.
2. M.J Flynn, "Computer Architecture, Pipelined and Parallel Processor Design", Narosa Publishing, 1998.

17-11

BACHELOR OF TECHNOLOGY

(Electrical & Electronics Engineering)

SEVENTH SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits
THEORY PAPERS				
ETEE 401	Electrical Drives	3	1	4
ETEE 403	HVDC Transmission	3	1	4
ELECTIVE (SELECT ANY TWO)				
ETEE 405	Computer Networks	3	1	4
ETEE 407	Biomedical Instrumentation	3	1	4
ETEE 409	Reliability Engineering & Application to Power System	3	1	4
ETEE 411	Modelling and Simulation of Electrical Machine	3	1	4
ETEE 413	Non-conventional Energy System	3	1	4
ETEE 415	Software Engineering	3	1	4
ETEE 417	Optical Communication	3	1	4
ETEE 419	Telemetry & Data Acquisition System	3	1	4
ETEE 421	Electrical Energy Conservation	3	1	4
ETEE 423	Soft Computing	3	1	4
ETEE 425	Project	-	-	4
PRACTICAL/VIVA VOCE				
ETEE 451	Electrical Drives Lab	0	2	1
ETEE 453	Practical based on Elective	0	2	1
ETEE 455	#Seminar	0	2	1
ETEE 457	*Minor Project	0	8	4
ETEE 459	#^Practical Training	-	-	1
	Total	**12**	**18**	**24**

NON UNIVERSITY EXAMINATION SYSTEM

*The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format. The student will have to present the progress of the work through seminars and progress reports.

^Practical training was conducted after sixth semester. However, Viva-Voce for evaluation of Practical Training will be conducted in this semester.

Code No.: ETEE 401	L	T	C
Paper: Electrical Drives	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **Max. Marks-75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Q. No.1 rest of the paper shall consist of four units as per the syllabus, every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Unit I

Introduction:

Solid state controlled electric drive-Concept, elements and salient features, power converter motor system, closed loop control of electric drives, sensing of speed and current, review of power converter circuits, performance parameters.

Permanent Magnet Machines:

Unique features of PM Machines, Permanent magnet materials, Power limitations of PM machines, Permanent magnet d.c. machines, Permanent Magnet synchronous Machines, Applications of Permanent magnet machines. **[No. of Hrs.13]**

Unit II

Control of D. C. Drives: Control of d.c. separately and series excited motor drives using controlled converters (single phase and three phase) and choppers, static Ward-Leonard, control scheme, power factor improvement, solid state electric braking scheme, closed loop control schemes. **[No. of Hrs.11]**

Unit III

Control of A. C. Motor Drives: Control of three phase induction motor drive using a.c. voltage controllers, cyclo converters. Voltage source and current source inverters; concept of field oriented control, slip power controlled slip ring induction motor drives, closed loop control schemes, self controlled synchronous motor drives, brushless dc motor drive, switched reluctance motor drive. **[No. of Hrs.11]**

Unit IV

Microprocessor Control of Electric Drive: Functions of microprocessor in electric drive control, salient features of microprocessor control, microprocessor based control schemes for d.c. induction and synchronous motor drives, applications. **[No. of Hrs. 09]**

Text Books:

1. G. K. Dubey, "Power Semiconductor controlled Drives", Narosa Publications, 1999
2. J. M. D./ Mruphy & I. G. Turnbull, "Power Electronic Control of a.c. motors", Pergamon Press.

Reference Books:

1. B. K. Bose, "Power Electronics and ac Drives", Peasrson, 2002
2. S. B. Dewan & G. R. Stemon & A. Straughen, "Power semiconductor Drives", Wiley Inter Science
3. V. Subrahmanyam, "Thyristor Control of Electric Motors", Tata McGraw Hill
4. P. C. Sen, "Thyristor dc Drives", Wiley International
5. S. A. Nasar: Electric Machines and Power Systems.

Code No.: ETEE 403	L	T	C
Paper: HVDC Transmission	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **Max. Marks-75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Q. No.1 rest of the paper shall consist of four units as per the syllabus, every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Unit I

Economic & Terminal equipment of HVDC transmission systems: Types of HVDC Links – Apparatus required for HVDC Systems – Comparison of AC & DC Transmission, Application of DC Transmission System – Planning & Modern trends in D. C. Transmission.

[No. of Hrs.09]

Unit II

Analysis of HVDC Converters: Choice of Converter configuration – analysis of Graetz – characteristics of 6 Pulse & 12 Pulse converters – Cases of two 3 phase converters in star – star mode – their performance. **[No. of Hrs.10]**

Unit III

Converter & HVDC System Control – Principal of DC Link Control – Converters Control Characteristics – Firing angle control – Current and extinction angle control – Effect of source inductance on the system; Starting and stopping of DC link, Power Control; Reactive Power Control: Reactive power requirements of steady-states;Sources of reactive power.

Power flow Analysis in AC/DC systems: Modelling of DC Links – Solution of DC loadflow – P. U. System for d.c. quantities.

Converter fault & Protection: Converter faults – Protection against over current and over voltage in converter station – surge arresters – smoothing reactors – DC breakers – Effects of proximity of AC DC Transmission Lines. **[No. of Hrs.13]**

Unit IV

Harmonics & Filters: Generation of Harmonics – adverse effects of harmonics – Calculation of voltage & Current harmonics – Effect of Pulse number on harmonics – Use of Filters for suppression of harmonics – Types of AC filters: Single tuned filters – High pass filters. **[No. of Hrs.12]**

Text Books:-

1. HVDC Power Transmission Systems: Technology and System Interactions- by K. R. Padiyar, New Age International (P) Limited, and Publishers.
2. HVDC Transmission – J. Arrillaga, Peter Peregrinus.
3. Direct Current Transmission – by E. W. Kimbark, John Wiley & Sons.

Reference Books:

1. HVDC Power Converters and Systems – B. J. Cory, Mc Donald.
2. EHVAC and HVDC Transmission Engineering and Practice – S. Rao
3. Power Transmission by Direct Current – by E. Uhlmann, Springer-Verlag.

Paper Code– ETEE - 405 **L T C**

Paper Computer Networks **3 1 4**

INSTRUCTIONS TO PAPER SETTERS: **Max. Marks-75**
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Q. No.1 rest of the paper shall consist of four units as per the syllabus, every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I

Uses of Computer Networks, Network Architecture, Reference Model (ISO-OSI, TCP/IP-Overview, IP Address Classes, Subneting), Domain Name Registration & Registrars

The Physical Layer: Theoretical basis for data communication, transmission media-Magnetic Media, Twisted Pair, Baseband Coaxial Cable, Broadband Coaxial Cable, Fibre Cable, Structured Cabling, Cable Mounting, Cable Testing, Wireless transmission, the telephone system, narrowband ISDN, broadband ISDN and ATM. **[No. of Hrs.: 11]**

UNIT – II

The Data Link Layer: Data link layer design issues, error detection and correction, data link protocols, sliding window protocols, Examples of Data Link Protocols.

[No. of Hrs.: 11]

UNIT - III

The Medium Access Sublayer: The channel allocation problem, multiple access protocols, IEEE standard 802 for LANS and MANS, high-speed LANs, satellite networks, Network devices-repeaters, hubs, switches and bridges. **[No. of Hrs.: 11]**

UNIT – IV

The Network Layer: Network layer design issues, routing algorithms, congestion control algorithm, internetworking, the network layer in the internet, the network layer in ATM networks. **[No. of Hrs.: 11]**

TEXT BOOKS:

1. A. S. Tananbaum, "Computer Networks", 3rd Ed, PHI, 1999.

REFERENCE BOOKS:

1. U. Black, "Computer Networks-Protocols, Standards and Interfaces", PHI, 1996.
2. W. Stallings, "Computer Communication Networks", PHI, 1999.
3. Laura Chappell (ed), "Introduction to Cisco Router Configuration", Techmedia, 1999.
4. Michael A. Miller, "Data & Network Communications", Vikas Publication, 1998.
5. William A. Shay, "Understanding Data Communications & Networks", Vikas Publication, 1999.

Code No.: ETEE 407	L	T	C
Paper: Biomedical Instrumentation	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **Max. Marks-75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Q. No.1 rest of the paper shall consist of four units as per the syllabus, every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Unit I

Introduction: The age of Biomedical Engineering, Development of Biomedical Instrumentation, Man-Instrumentation system, Components, Physiological system of the body, problem encountered in measuring a living system.

Transducers & Electrodes: The Transducers & Transduction principles, Active transducers, Passive Transducers, Transducer for Biomedical Applications.

Sources of Bioelectric Potentials: Resting & Action potentials, propagation of active potential, The Bioelectric potentials – ECG, EEG, EMG and Envoked responses.

Electrodes: Electrodes theory, Biopotential Electrodes – Microelectrodes Body surface electrodes, Needle Electrodes, Biochemical Transducers, Reference electrodes, PH electrodes, Blood Gas electrodes. **[No. of Hrs.11]**

Unit II

Human Anatomy & Physiology: Bioelectric potentials, leads & electrodes, Transducers for biological applications, Biomaterials.

Monitor and Recorders: Biopotential, amplifiers, recorders, monitors, Galvanometric, potentiometric, ultra violet, electrostatic, ink jet recorder video monitors, colour printers, Electro Physiological recorders, ECG-working principles & clinical applications.

[No. of Hrs.12]

Unit III

Nervous system measurement: Anatomy of Nervous system, Neuronal communication, EPSP & IPSP, Neuronal firing measurements, EEG-block diagram, various Rythms, EEG in diagnostics, EMG and applications. **[No. of Hrs.09]**

Unit IV

Ophthalmology Instruments: Electro retinogram, Electrooculogram, Opthalmoscope, Tonometer for eye pressure measurement.

Therapeutic Instruments: Dia thermy, Defibrillator, cardiac pacemaker, stimulators, Laser applications in machine, X-Rays production & use, Radiographic Diagnostic and Theraputic, Film construction and processing, Interaction with body. Fundamentals of radiation therapy. **[No. of Hrs.12]**

Text Books:

1. Khandpur R. S. / Biomedical Instrumentation/TMH
2. Tompkins/ Biomedical DSP: C Languages Examples and Laboratory Experiments for the IBM PC/PHI

Reference Books:

1. Cormwell/Biomedical Instrumentation and Measurements /PHI
2. W.F. Ganong / Review of Medical Physiology / 8th Asian Ed. / Medical Publishers, 1977
3. J. G. Webester ed / Medical Insturmentation / Houghton Mifflin, 1978
4. A. M. Cook and J. G. Webester, eds / Therapeutic Medical Devices / PHI, 1982

Code No.: ETEE 409 **L T C**
Paper: Reliability Engineering & Application to Power Systems 3 1 4

INSTRUCTIONS TO PAPER SETTERS: **Max. Marks-75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Q. No.1 rest of the paper shall consist of four units as per the syllabus, every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Unit I

Basic probability theory – rules for combining probabilities of events – Bernoull's trails – probability density and distribution functions – binomial distributions – expected value and standard deviation of binomial distribution. **[No. of Hrs.10]**

Unit II

Network Modelling and Reliability Analysis of Series, Parallel, Series-Parallel networks – complex networks – decomposition method

Reliability functions F (t), R (t), H (t) and their relationships – exponential distributions – Expected value and standard deviation of exponential distribution – Bath tub curve – reliability analysis of series parallel networks using exponential distribution – reliability measures MTTF, MTTR, MTBF **[No. of Hrs.11]**

Unit III

Markov chains – concept of stochastic transitional probability Matrix, Evaluation of limiting state Probabilities – Markov processes one component repairable system – time dependent probability evaluation using Laplace transform approach – evaluation of limiting state probabilities using STPM – two component repairable models – Frequency and duration concept – Evaluation of frequency of encountering state, mean cycle time, for one, two component, repairable models – evaluation of cumulative probability and cumulative frequency of encountering merged states. **[No. of Hrs.12]**

Unit IV

Generation system reliability analysis – reliability model of a generation system – recursive relation for unit addition and removal – load modeling – merging of generation load model – evaluation of transition rates for merged state model – cumulative probability, cumulative frequency of failure evaluation – LOLP, LOLE.

Composite system reliability analysis decomposition method – distribution system reliability analysis – radial networks – weather effects on transmission lines – Evaluation of load and energy indices. **[No. of Hrs.11]**

Text Books:

1. Reliability Evaluation of Egg. System – R. Billinton, R. N. Allan, Plenum Press
2. Reliability Evaluation of Power System – R. Billinton, R. N. Allan, Plenum Press

Reference Books:

1. An Introduction to Reliability and Maintainability Engineering. Sharles E. Ebeling, Tata McGraw Hill edition.

Code No.: ETEE 411 **L T C**
Paper: Modelling and Simulation of Electrical Machine **3 1 4**

INSTRUCTIONS TO PAPER SETTERS: **Max. Marks-75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Q. No.1 rest of the paper shall consist of four units as per the syllabus, every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Unit – I

Energy state functions. Basic principles of electromechanical energy conversion, general expressions of generated voltage and force/torque; basic modeling of electrical machine from coupled circuit point of view; techniques of transformations, general volt ampere and torque equations under stationary and rotating reference from instantaneous symmetrical components and generated operational equivalent circuits, space vector concepts. **[No. of Hrs.10]**

Unit – II

Modelling of D.C. Machines: Analysis under motoring and generating, simulation for transient and dynamic conditions, voltage build up in generators, effects of load change, run-up and dynamic operators of motors under different excitations, response under load change, reversal and braking. **[No. of Hrs.09]**

Unit – III

Modeling of Synchronous Machines: d-q- transformations fixed to field structure-steady and dynamic equations, phaser diagrams for cylindrical rotor and salient pole machines, electromagnetic and reluctance torques, response under short circuit conditions, subtransient, transient and steady state conditions, simulation of vector controlled synchronous motors, computer simulation using mathematical softwares. **[No. of Hrs.10]**

Unit – IV

Modeling of Induction Machines: Equations under stationary and rotating reference frames, derivation of equivalent circuits, correlation of inductances, run-up transients, dynamics under load change, speed reversal and braking; computer simulation to predict dynamic response, simulation of induction motors under soft start; VVVF and vector controlled drives. Unbalanced and asymmetrical operations, symmetrical components and rotating field theory – modeling and simulation of single phase motors.

Modeling and analysis of Permanent Magnet, Switched Reluctance and Stepper Motors.

Development of computer softwares using latest simulation tools to predict the behavious of different machines. **[No. of Hrs.15]**

Text Books:

1. Bernard Adkins, "The General Theory of Electrical Machines", Chapman & Hall Ltd.
2. Paul C. Krause, "Alalysis of Electric Machinery", Mc-Graw Hill.

Reference Books:

1. C. V. Jones, "Unified Theory of Electrical Machines", Butterworths Publishers.
2. D. C. White and H. H. Woodson, "Electromechanical Energy Conservation", Mc-Graw Hill.
3. I. P. Kopylov, "Mathematical Models of Electric Machines", Mir Publisher.

Code No.: ETEE 413 L T C
Paper: Non-Conventional Energy System 3 1 4

INSTRUCTIONS TO PAPER SETTERS: **Max. Marks-75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Q. No.1 rest of the paper shall consist of four units as per the syllabus, every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Unit - I

Introduction: Various non-conventional energy resources – Introduction, availability, classification, relative merits and demerits.

Solar Cells: Theory of solar cells, solar cell materials, solar cell power plant, limitations.

Solar Thermal Energy: Solar radiation flat plate collectors and their materials, applications and performance, focusing of collection and their materials, applications and performance; solar thermal power plants, thermal energy storage for solar heating and cooling, limitations.

[No. of Hrs.: 12]

Unit - II

Geothermal Energy: Resources of geothermal energy, thermodynamics of geo-thermal energy conversion-electrical conversion, non-electrical conversion, environment consideration.

Magneto-hydrodynamics (MHD): Principle of working of various types of fuel cells and their working, performance and limitations. **[No. of Hrs.: 10]**

Unit - III

Thermo-electrical and thermionic conversion: Principle of working, performance and limitations.

Wind Energy: Wind power and its sources, site selection, criterion, momentum theory, classification of rotors, concentrations and augments, wind characteristics, performance and limitations of energy conversion systems. **[No. of Hrs.: 11]**

Unit - IV

Bio-mass: Availability of bio-mass and its conversion theory.

Ocean Thermal Energy Conversion (OTEC), Availability, theory and working principle, performance and limitation.

Wave and Tidal Wave: Principle of working performance and limitations. Waste Recycling Plant. **[No. of Hrs.: 11]**

Text Books:

1. C D Rai - Non Conventional energy sources, Khanna Publishers, 2004.
2. Rao, Parulakar – Energy Technology, Khanna Publishers, 2002

Reference Books Books:

1. Andra Gabdel, "A Handbook for Engineers and Economists".
2. A. Mani, "Handbook of Solar radiation Data for India".
3. Peter Auer, "Advances in Energy System and Technology". Vol. I & II Edited by Academic Press.
4. F. R. the MITTRE, "Wind Machines" by Energy Resources and Environmental Series.
5. Frank Kreith, "Solar Energy Hand Book".
6. N. Chermissinogg and Thomes, C. Regin, "Principles and Application of Solar Energy".
7. N. G. Clavert, "Wind Power Principles".
8. W. Palz, P. Chartier and D. O. Hall, "Energy from Biomass".

Paper Code– ETEE - 415 **L T C**
Paper SOFTWARE ENGINEERING **3 1 4**

INSTRUCTIONS TO PAPER SETTERS: **Max. Marks-75**
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Q. No.1 rest of the paper shall consist of four units as per the syllabus, every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I

Introduction: Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models

Software Requirements analysis & specifications: Requirement engineering, requirement elicitation techniques like FAST, QFD & Use case approach, requirements analysis using DFD, Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS. **[No. of Hrs.: 11]**

UNIT – II

Software Project Planning: Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, COCOMO-II, Putnam resource allocation model, Risk Management.

Software Design: Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design **[No. of Hrs.: 11]**

UNIT - III

Software Metrics: Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics, Information Flow Metrics

Software Reliability: Importance, Hardware Reliability & Software Reliability, Failure and Faults, Reliability Models, Basic Model, Logarithmic Poisson Model, Software Quality Models, CMM & ISO 9001. **[No. of Hrs.: 11]**

UNIT - IV

Software Testing: Testing process, Design of test cases, functional testing: Boundary value analysis, Equivalence class testing, Decision table testing, Cause effect graphing, Structural testing, Path Testing, Data flow and mutation testing, Unit Testing, Integration and System Testing, Debugging, Alpha & Beta Testing, Testing Tools & Standards.

Software Maintenance: Management of Maintenance, Maintenance Process, Maintenance Models, Regression Testing, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation. **[No. of Hrs.: 11]**

TEXT BOOKS:

1. K. K. Aggarwal & Yogesh Singh, "Software Engineering", 2nd Ed., New Age International, 2005.
2. R. S. Pressman, "Software Engineering – A practitioner's approach", 5th Ed., McGraw Hill Int. Ed., 2001.

REFERENCE BOOKS:

1. Stephen R. Schach, "Classical & Object Oriented Software Engineering", IRWIN, TMH, 1996.
2. James Peter, W. Pedrycz, "Software Engineering: An Engineering Approach", John Wiley & Sons, 2004.
3. I. Sommerville, "Software Engineering", Addison Wesley, 2004
4. K. Chandrasehakhar, "Software Engineering & Quality Assurance", BPB, 2005.

Code No.: ETEE 417 **L T C**
Paper: Optical Communication **3 1 4**

INSTRUCTIONS TO PAPER SETTERS: **Max. Marks-75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Q. No.1 rest of the paper shall consist of four units as per the syllabus, every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Unit – I

Introduction:

Measurement of Information, Channel Capacity, Communication System Architecture, Basic Optical Communication System, Advantage of Optical Communication System.

Propagation in Dielectric Waveguides:

Introduction, Step-index Fibers, Graded Index Fibers, Modes & Rays, Stab Wave Guide.

[No. of Hrs.: 10]

Unit – II

Attenuation in Optical Fibers:

Introduction, Absorption, Scattering, Very Low Loss Materials, All Plastic & Polymer-Clad-Silica Fibers.

Wave Propagation:

Wave propagation in Step-Index & Graded Index Fiber, Overall Fiber Dispersion-Single Mode Fibers, Multimode Fibers, Dispersion-Shifted Fiber, Dispersion, Flattened Fiber, Polarization.

[No. of Hrs.: 11]

Unit – III

Source & Detectors:

Design & LED's for Optical Communication, Semiconductor Lasers for Optical Fiber Communication System, Semiconductor Photodiode Detectors, Avalanche Photodiode Detector & Photo multiplier Tubes. **[No. of Hrs.: 11]**

Unit – IV

Optical Fiber Communication System:

Telecommunication, Local Distribution Series, Computer Networks Local Data Transmission & Telemetry, Digital Optical Fiber Communication System-First Generation, System-Second Generation Future System.

Data Communication Networks – Network Topologies, Mac Protocols, Analog System.

Advanced Multiplexing Strategies – Optical TDM, Sub carrier Multiplexing, WDM Network.

Architectures: SONET/SDH. Optical Transport Network, Optical Access Network, Optical Premise Network.

Applications-Military Applications, Civil, Consumer & Industrial Applications.

[No. of Hrs.: 12]

Text Books:

1. Optical Electronics – A. Yariv – SBS College Publishing, Newyork 1985
2. Optical Information Processing – F. T. S. Yu – Wiley, Newyork, 1983

Code No.: ETEE 419	L	T	C
Paper: Telemetry & Data Acquisition System	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **Max. Marks-75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Q. No.1 rest of the paper shall consist of four units as per the syllabus, every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Unit – I

Sampling fundamentals: Introduction to sampling theorem and sampling process, convolution, computing minimum sampling rate, Aliasing Errors.

Digital Modulation Techniques: Review of PCM, DPCM, Methods of binary data transmission, Data Formats, DM code converters, PSK, QPSK, FSK, Probability of error, Phase ambiguity Resolution and differential encoding, Error detection Error correction, Error correcting codes. **[No. of Hrs.: 14]**

Unit – II

Data handling system: Block schematic, Sensors, Signal conditioners, Multiplexing – high level and low level, ADC – Range and Resolution, Word Format, Frame format, Frame of Synchronizer codes, RF links, X24, RS422, RS423, RS232C interfaces, Multi terminal configuration, Multiplier & concentrator, Data Modems, Data transmission over telephone lines. **[No. of Hrs.: 10]**

Unit – III

Data reception systems: Bit Synchronizers, Frame Synchronizers, Sub frame Synchronizers, PLL, Display System.

Remote Control: Communication Based Processing Control Systems, Pipelines, Operational security system components, Pipeline control, Power system control, Programmable controllers for factor automation. **[No. of Hrs.: 10]**

Unit – IV

Command: Tone Command system, Tone Digital Command system, ON/OFF command and Data commands.

Aerospace Telemetry: Signal Formation and Conversion, Multiplexing Techniques in Telecontrol installations, Reliability in Telecontrol installations. **[No. of Hrs.: 10]**

Text Books:

1. Telemetry principles, By Patranabis TMS.
2. Telemetry Systems, Border & Mayewise.

Reference Books:

1. Data Communication, Schweber, McGraw Hill

Code No.: ETEE 421	**L**	**T**	**C**
Paper: Electrical Energy Conservation	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS: **Max. Marks-75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Q. No.1 rest of the paper shall consist of four units as per the syllabus, every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Unit I

Energy Auditing

Introduction, Economics Analysis of investments, Present value criterion, Average rate of return criterion, Return on investment, Payback period criterion. **[No. of Hrs.: 09]**

Unit II

Electrical Load Management

Introduction, Transformer, Reduction of transformer losses, Power factor improvement, Methods of improving power factor, Location of capacitor installation, Demand Management, Energy efficiency issues. **[No. of Hrs.: 11]**

Unit III

Electric motors

Introduction, Selection and application, Factors affecting performance, operational improvements, Retrofit improvements, Field testing, Energy Efficiency motors, Existing motor details, Power factor correction, variable speed drives, Energy saving controllers. **[No. of Hrs.: 12]**

Unit IV

Lighting

Introduction, Illumination, Glare, Colour and colour rendering, Incandescent, Fluorescent, high intensity discharge, Low pressure sodium, Energy efficiency, Replacing lamps and fixtures, Improving lighting control, maintenance.

Energy management Information System

Introduction, Field transducers, PLC, Communication network energy bench marking. **[No. of Hrs.: 12]**

Text Books:

1. Handbook on Energy Audits & Management – A.X.Tyagi – Teri, New Delhi

Code No.: ETEE 423	**L**	**T**	**C**
Paper: Soft Computing	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS: **Max. Marks-75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Q. No.1 rest of the paper shall consist of four units as per the syllabus, every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Unit -I

Neural Networks: History, overview of biological Neuro-system, Mathematical Models of Neurons, ANN architecture, Learning rules, Learning Paradigms-Supervised, Unsupervised and reinforcement Learning, ANN training Algorithms-perceptions, Training rules, Delta, Back Propagation Algorithm, Multilayer Perceptron Model, Hopfield Networks, Associative Memories, Applications of Artificial Neural Networks. **[No. of Hrs.: 11]**

Unit-II

Fuzzy Logic: Introduction to Fuzzy Logic, Classical and Fuzzy Sets: Overview of Classical Sets, Membership Function, Fuzzy rule generation.

Operations on Fuzzy Sets: Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations.

Fuzzy Arithmetic: Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on Intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations. **[No. of Hrs.: 11]**

Unit-III

Fuzzy Logic: Classical Logic, Multivalued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Hedges.

Uncertainty based Information: Information & Uncertainty, Nonspecificity of Fuzzy & Crisp Sets, Fuzziness of Fuzzy Sets. **[No. of Hrs.: 11]**

Unit-IV

Introduction of Neuro-Fuzzy Systems, Architecture of Neuro Fuzzy Networks.

Application of Fuzzy Logic: Medicine, Economics etc. Genetic Algorithm: An Overview, GA in problem solving, Implementation of GA **[No. of Hrs.: 11]**

Text Books:

1. AI & Expert system, Janki Raman ,MacMillen,2003
2. Artificial Intelligence, Knight ,TMH,1991.
3. Artificial Intelligence, G.F luger,Pearson education,2003

References Books :

1. Artificial Intelligence, Patricks henry ,Winston,Pearson education,2001
2. Artificial Intelligence, Nilsson , Morgon, Kufmann 1998.

BACHELOR OF TECHNOLOGY
(Instrumentation & Control Engineering)

SEVENTH SEMESTER

Code No.	Paper	L	T/P	Credits
THEORY PAPERS				
ETIC 401	Micro Controller	3	1	4
ETIC 403	Biomedical & Analytical Instrumentation	3	1	4
ELECTIVES (SELECT ANY TWO)				
ETEE 405	Computer Networks	3	1	4
ETIC 407	Project	-	-	4
ETIC 409	Instrumentation Diagnostic	3	1	4
ETIC 411	Computerized Process Control	3	1	4
ETIC 413	Database Management System	3	1	4
ETEE 415	Software Engineering	3	1	4
ETIC 417	Process Modeling & Optimization Techniques	3	1	4
PRACTICAL/VIVA VOCE				
ETIC 451	Micro Controller Lab.	0	2	1
ETIC 453	Biomedical Lab.	0	2	1
ETIC 455	#^Practical Training	0	0	1
ETIC 457	*Minor Project	0	8	4
ETIC 459	#Seminar	0	2	1
	Total	**12**	**18**	**24**

NON UNIVERSITY EXAMINATION SYSTEM

*The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format. The student will have to present the progress of the work through seminars and progress reports.

^Practical training was conducted after sixth semester. However, Viva-Voce for evaluation of Practical Training will be conducted in this semester.

Sem VII (ICE)

Paper Code: ETIC – 401 **L T C**
Paper Microcontroller **3 1 4**

INSTRUCTIONS TO PAPER SETTERS: **MAXIMUM MARKS: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

8048 Microcontroller: 8048, 8049 functional overview, 8048 series microcomputer pins & signals, 8048 series timing and instruction execution, Internal & external Interrupts, 8048 microcomputer series instruction set **[No. of Hrs.: 11]**

UNIT – II

8051 Microcontroller: 8051 Internal Architecture, I/O configuration, serial interface, interrupts, Power saving modes of operation, Addressing modes, Instruction set. **[No. of Hrs.: 11]**

UNIT - III

Assemble Language Programming with Microcontroller: Assembly Language Programming, Saving CPU status during interrupts, Passing Parameter on the stack, N way branching, computing branch destination, at run time, In line code parameter passing. **[No. of Hrs.: 11]**

UNIT – IV

Peripheral Interface Techniques: I/O configuration, 8253 interfacing, Software delay timing, Serial port & timer configurations, simple I/O driver, Transmitting serial port character strings.

Introduction to Intel 8096, MC 68H 11 Microcontrollers, Introduction to PLC's **[No. of Hrs.: 11]**

TEXT BOOKS:

1. The 8051 Microcontroller, Kenneth J. Ayala / Penram International Publishing, 1996
2. Programming and Customizing 8051 microcontroller ,Myke Predko,TMH 1999

REFERENCE BOOKS:

1. Microcontroller Intel Handbook
2. Microcontroller A. Mazdi / TMH

ICE-2

Paper Code – ETIC - 403 **L T C**

Paper: Biomedical & Analytical Instrumentation **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Introduction to Biomedical Instrumentation: Biometrics, development of Biomedical Instrumentation, problems encountered in Bio-medical measurements, sources of Bio-electric potential, active and resting potentials.

Basic Bio-Medical Transducer Principles: The transduction in active and passive transducers, applications in bio-medical instrumentation, Bio-potential electrodes and Bio-chemical transducers. **[No. of Hrs.: 11]**

UNIT – II

Bioelectric Potential Recorders: Introduction and analysis of ECG, EMG & EEG, construction and working principles, pace makers and defibrillators.

Biomedical Measurements: Measurement of blood pressure, direct-indirect methods, heart rate, respiration rate and pulse rate measurements, body temperature measurements, ultrasonic blood flow meters, electromagnetic blood flow measurements. **[No. of Hrs.: 11]**

UNIT – III

Patient Monitoring System: Besides and Central patient monitoring systems, elements of I.C. monitoring, Instrumentation for patient monitoring.

Mass Spectrometer: Introduction, components of mass spectrometers, Resolution, types of mass spectrometers.

Gas Chromatography: Theory of gas chromatography, working of gas chromatography, gas-solid chromatography. **[No. of Hrs.: 11]**

UNIT – IV

Analytical Instrumentation: Introduction Types of analytical methods, instrumentation analysis, Introduction to absorption, spectroscopic, UV, Visible spectra photometery, Infrared spectrometer. **[No. of Hrs.: 11]**

TEXT BOOKS:

1. Medical instrumentation application and design,John G. Webster,John wiley,1998
2. Review of medical physiology, W.F. ganong , Medical publisher, 1977
3. Biomedical instrument and measurement, Cromwell,PHI, 2000

REFERENCE BOOKS:

1. Handbook of biomedical instrument, khandpur, TMH

ICE-3

Paper Code – ETEE - 405 **L T C**

Paper Computer Networks **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Uses of Computer Networks, Network Architecture, Reference Model (ISO-OSI, TCP/IP-Overview, IP Address Classes, Subneting), Domain Name Registration & Registrars

The Physical Layer: Theoretical basis for data communication, transmission media-Magnetic Media, Twisted Pair, Baseband Coaxial Cable, Broadband Coaxial Cable, Fibre Cable, Structured Cabling, Cable Mounting, Cable Testing, Wireless transmission, the telephone system, narrowband ISDN, broadband ISDN and ATM. **[No. of Hrs.: 11]**

UNIT – II

The Data Link Layer: Data link layer design issues, error detection and correction, data link protocols, sliding window protocols, Examples of Data Link Protocols. **[No. of Hrs.: 11]**

UNIT - III

The Medium Access Sublayer: The channel allocation problem, multiple access protocols, IEEE standard 802 for LANS and MANS, high-speed LANs, satellite networks, Network devices-repeaters, hubs, switches and bridges.

[No. of Hrs.: 11]

UNIT – IV

The Network Layer: Network layer design issues, routing algorithms, congestion control algorithm, internetworking, the network layer in the internet, the network layer in ATM networks. **[No. of Hrs.: 11]**

TEXT BOOKS:

1. A. S. Tananbaum, "Computer Networks", 3rd Ed, PHI, 1999.

REFERENCE BOOKS:

1. U. Black, "Computer Networks-Protocols, Standards and Interfaces", PHI, 1996.
2. W. Stallings, "Computer Communication Networks", PHI, 1999.
3. Laura Chappell (ed), "Introduction to Cisco Router Configuration", Techmedia, 1999.
4. Michael A. Miller, "Data & Network Communications", Vikas Publication, 1998.

ICE-4

Paper Code – ETIC - 409 **L T C**

Paper: Instrumentation Diagnostics **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Introduction to fault model & fault simulation. Fault location & Board level testing, Test generation for combinational circuits. D – Algorithm & its improvement. **[No. of Hrs.: 11]**

UNIT – II

Introduction. Maintenance Concepts, Maintenance Strategies – Corrective, Preventive and predictive maintenance **[No. of Hrs.: 11]**

UNIT – III

Condition Monitoring Techniques & Signature Analysis Applications – Vibration Monitoring, Oil Analysis, Temperature and current. Monitoring, Performance Monitoring and Non – destructive Techniques. Maintenance Planning. Maintenance Documentation. **[No. of Hrs.: 11]**

UNIT – IV

Training and Safety Aspects in Maintenance, Filtration and Contamination Control, Introduction to residual life assessment studies.

[No. of Hrs.: 11]

TEXT BOOK:

1. Instrumentation Measurement & Analysis., B C Nakra, K K Chaudhry,PHI,2003
2. Mechenical Fault Diagnosis and condition Monitoring,R.A.colacott,John Wiley & sons,1997

REFERENCE BOOKS:

1. Handbook of condition monitoring,B.K.N. Rao,Ne

Paper Code – ETIC – 411 **L T C**

Paper Computerized Process Control **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT - 1

An Overview Introduction to Computer Control system: Functional block diagram. Data Acquisition Systems. Supervisory Control and control digital control (DDC) and their working.

Introduction to SCADA System Architecture Significance and its application in industry. Introduction to Virtual Instrumentation: graphical programming data flow & Advantages of VI techniques, VIS & Virub VIS loops & charts , arrays **[No. of Hrs.: 11]**

UNIT - II

Distributed Digital Control Systems: Architecture of DCS, Various displays, DCS element, Introduction to DCS cards, DCS system integration with PLC and PC, Overview of typical Data Honeywell TDC- 3000 DCS, Communication links and overview of protocols (TCP/IP, FIB, MODBUS)

[No. of Hrs.: 11]

UNIT – III

Case study of Steel Plant, Sugar Plant , cement plant **[No. of Hrs.: 11]**

UNIT - IV

PC hardware Review & Instrumentation bases:- ISA, PCI, IEEE 488, Serial Intricacy RS232 RS45, Introduction to Intelligent Instrumentation **[No. of Hrs.: 11]**

TEXT BOOKS:

1. Lab view graphical programming , Gary John Son ,II Edition ,MagrawHill ,1977.
2. PC interface For Data Acquiring & Process Control, S. Gupta, JP Gupta 2nd Ed./Instrument Society of America 1994.

REFERNCE BOOKS:

1. Liptak, B. G. (E.d.), "Instrument Engineers Handbook", vol. I to III, M. C. Graw Hill

ICB-6

Paper Code – ETIC - 413 **L T C**

Paper Database Management System **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Introduction : Concept and goals of DBMS, Database Languages, Database Users, Database Abstraction.

DBMS models: Basic Concepts of ER Model, Relationship sets, Keys, Mapping, Design of ER Model **[No. of Hrs.: 11]**

UNIT – II

Hierarchical model: Concepts, Data definition, Data manipulation and implementation. Relation Model: Relational database, Relational Algebra, Relational Calculus **[No. of Hrs.: 11]**

UNIT - III

Network Model: Network Data Model, DBTG Set Constructs, and Implementation. Relational Database Design and Query Language: SQL, QUEL, QBE, Normalization using Functional Dependency, Multivalued dependency and Join dependency. **[No. of Hrs.: 11]**

UNIT - IV

Concurrency Control: Lock Based Protocols, Time Stamped Based Protocols, Deadlock Handling, Crash Recovery.

New Applications: Distributed Database, Objective Oriented Database, Multimedia Database, Data Mining, Digital Libraries. **[No. of Hrs.: 11]**

TEXT BOOKS:

1. C. J. Date, "An Introduction to Data Base Systems" Pearson Education, 2001
2. Silberschate, Korth, Sudarshan, "Database System Concepts" Mc. Graw Hill, 4th Edition

REFERENCE BOOKS:

1. Desai, "An Introduction to Database Systems" Galgotia, 2003.
2. Navathe, "Fundamentals of Database Systems" Pearson Education, 3rd Edition.

ICE-7

Paper Code – ETEE - 415 **L T C**

Paper Software Engineering **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT – I

Introduction: Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models

Software Requirements analysis & specifications: Requirement engineering, requirement elicitation techniques like FAST, QFD & Use case approach, requirements analysis using DFD, Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS.

[No. of Hrs.: 11]

UNIT – II

Software Project Planning: Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, COCOMO-II, Putnam resource allocation model, Risk Management.

Software Design: Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design **[No. of Hrs.: 11]**

UNIT - III

Software Metrics: Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics, Information Flow Metrics

Software Reliability: Importance, Hardware Reliability & Software Reliability, Failure and Faults, Reliability Models, Basic Model, Logarithmic Poisson Model, Software Quality Models, CMM & ISO 9001.

[No. of Hrs.: 11]

UNIT - IV

Software Testing: Testing process, Design of test cases, functional testing: Boundary value analysis, Equivalence class testing, Decision table testing, Cause effect graphing, Structural testing, Path Testing, Data flow and mutation testing, Unit Testing, Integration and System Testing, Debugging, Alpha & Beta Testing, Testing Tools & Standards.

Software Maintenance: Management of Maintenance, Maintenance Process, Maintenance Models, Regression Testing, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation.

[No. of Hrs.: 11]

TEXT BOOKS:

1. K. K. Aggarwal & Yogesh Singh, "Software Engineering", 2nd Ed., New Age International, 2005.
2. R. S. Pressman, "Software Engineering – A practitioner's approach", 5th Ed., McGraw Hill Int. Ed., 2001.

REFERENCE BOOKS:

1. Stephen R. Schach, "Classical & Object Oriented Software Engineering", IRWIN, TMH, 1996.

ICE-8

Paper Code – ETIC - 417 **L T C**

Paper Process Modeling & Optimization Techniques **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT - 1

Classification of models, major activity in model bonding, use of mathematical models, scope of coverage, principles of formulation.

Fundamental Laws: Continuity equations, energy equations, of Motions, Transport equations, Equations of state equilibrium, Chemical kinetics

[No. of Hrs.: 11]

UNIT - II

Solving the mathematical models for dynamic systems heat transfer system, tanks types reactor systems, vaporizer, flashdrum, batch reactors, continuous distillation in multi-tray columns, dynamic modeling loop. **[No. of Hrs.: 11]**

UNIT - III

Process Identification: Purpose, Time domain "Eyeball" fitting of step test data, direct sine, pulse, and step signal testing. ATV identification. **[No. of Hrs.: 11]**

UNIT - IV

The nature & organization of optimization problems, formulation of objective function, cost, time.

Value of money, measure of probability, methods of least squares.

Single & multivariable optimization, linear programming and simplex method, sequential quadrate programming & reduced gradient optimization technique. Introduction to geometric programming & dynamic programming. **[No. of Hrs.: 11]**

TEXT BOOKS:

1. Process Modeling & Simulation Control for Chemical Engineers by W. L. Luben, McGraw Hill. 1995
2. Applied instrumentation in the process industries, vol 1,2,3,W.G. Andrews and Williams, Gulf publishing company 2002

REFERNCE BOOKS:

1. Process Instrumentation Manifolds, Instrumentation society of America.,

BACHELOR OF TECHNOLOGY
(Mechanical & Automation Engineering)

SEVENTH SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits
THEORY PAPERS				
ETME 401	Computer Aided Manufacturing	3	1	4
ETME 403	Mechatronics	3	1	4
ELECTIVES (Choose any two)				
ETME 405	Refrigeration & Air-Conditioning	3	1	4
ETME 407	Solar Energy	3	1	4
ETME 409	Personnel Management	3	1	4
ETME 411	Metal Forming	3	1	4
ETME 413	Automotive Engineering	3	1	4
ETME 415	Manufacturing Information Systems	3	1	4
ETME 417	Computer Aided Design	3	1	4
ETME 419	Project	-	-	4
PRACTICAL/VIVA VOCE				
ETME 451	Computer Aided Manufacturing Lab.	0	2	1
ETME 453	Mechatronics Lab.	0	2	1
ETME 455	Practical based on Electives	0	2	1
ETME 457	Programming-V Lab. (Pro-E-II)	0	2	1
ETME 459	*Minor Project	0	8	4
ETME 461	#^Practical Training	-	-	1
	TOTAL	**12**	**20**	**25**

NON UNIVERSITY EXAMINATION SYSTEM

*The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format. The student will have to present the progress of the work through seminars and progress reports.

^Practical training was conducted after sixth semester. However, Viva-Voce for evaluation of Practical Training will be conducted in this semester.

MAE-1

Paper Code:ETME - 401 L T C

Paper: Computer Aided Manufacturing 3 1 4

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT - I

Introduction: Overview of automation in industry. Type of production: continuous, mass, batch and job shop and automation achievements therein. Product cycle and CAD/CAM influence CAD/CAM on product cycle. Automation strategies, mathematical model for employing and justifying CAD/CAM in different areas of operation.

Programmed Automation and Numerical Control: program controlled machine tools, punched card and punched tape machine tools. Numerical control and its basics. Axis designation. NC motion control systems: point-to-point, straight-cut and continuous path control systems. Applications of NC in metal-cutting and non-metal cutting areas.

[No. of Hrs.: 11]

UNIT - II

Computer numerical control: Block diagrams of CNC operations. Nomenclature, types and features of CNC machine tools. Elements of CNC machines and systems. Machine control unit. Position control and its significance. Engineering analysis of NC positioning systems. Open loop and closed loop systems. Precision in NC positioning systems: control resolution, accuracy and repeatability. Actuators: DC servomotor, ac servomotor, stepper motor. Transducers and feedback elements: resolvers, inductosyns optical grating and encoders. **[No. of Hrs.: 11]**

UNIT - III

Part programming : Process planning and flow chart for part programming. Tooling systems, tool nomenclature and tool geometries of modern indexable carbide tools. Tool presetting & Modular Tooling. Selection of tools based on machining capacity, accuracy and surface finish. Elements of programming for turning and milling. Composition of a part program. Preparatory codes G, Miscellaneous functions M. Interpolation, Tool compensations, cycles for simplifying programming. Part programming for typical components on turning machines and machining centres.

Computer aided programming: APT Part Programming. Introduction to computer aided programming through Pro-E. **[No. of Hrs.: 11]**

UNIT - IV

Modern CNC machines : CNC lathes. Turning centres. Machining centres. . Automatic pallet changers. Automatic tool changers. Direct numerical control and applications. CNC machine design features. Supporting structures. Guide ways. Ball screw-and-nut mechanisms. Machine spindles. Concept of rigidity and relation with accuracy.

Computer aided Inspection: Coordinate measuring machines and their applications. Introduction to machine vision and applications.

[No. of Hrs.: 11]

Text Books:

MAE-2

1. Mikell P. Groover, "Automation, Production Systems and Computer-Integrated Manufacturing", 2nd Edition, Pentice Hall, 2001.
2. S.K. Sinha, "CNC Programming", Galgotia Publications 2003.
3. "HMT Mechatronics", Tata McGraw Hill, 2001.

Reference Books:

1. Mikell P. Groover, Emory W.Zimmers, "CAD/CAM", Pearson Education, 2001.
2. P.N. Rao, "CAD/CAM Principles and Applications", Tata McGraw Hill, 2003.

Paper Code: ETME - 403 **L T C**

Paper: Mechatronics **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT - I

Introduction: Overview: Mechanical Actuation System – Kinematic Chains, Cam, Gear, Train Ratchet Mechanism, Belt, Bearing.

Hydraulic And Pneumatic Actuation Systems: Overview: Pressure Control Valves, Cylinders, Direction Control Valves, Rotary Actuators, Accumulators, Amplifiers, and Pneumatic Sequencing Problems. **[No. of Hrs.: 11]**

UNIT - II

Electrical Actuation Systems: Switching Devices, Mechanical Switches – SPST, SPDT, DPDT, Debouncing keypads; Relays, Solid State Switches, Diodes, Thyristors, Transistors, Solenoid, Types Devices: Solenoid Operated Hydraulic and Pneumatic Vlaves, Electro-Pneumatic Sequencing Problems. Control of DC Motors, Permanent Magnet DC Motors, Control of DC Motors, Bush less Permanent Magnet DC Motors, AC Motors, Stepper Motors, Stepper Motor Controls, Servo Motors.

Interfacing controllers: Interfacing, Buffers, Darlington Pair, I/O Ports, Interface Requirements, Handshaking, Serial and Parallel Port Interfacing, Peripheral Interface, Adapters.

Digital logic: Number Systems, Binary Mathematics, Boolean Algebra, Gates and Integrated Circuits Like 7408, 7402, Karnaugh Maps, Application of Logic Gates as: Parity Generators, Digital Comparators, BCD to Decimal Decoders, Flip Flops. Introduction to Microcontroller – Intel 8051, Selecting a Microcontroller.

Sensors and transducers and application: Performance Terminology, Static and Dynamic Characteristics, Displacement, Position and Proximity Sensors, Potentiometer Sensors, Strain Gauge Element, LVDT, Optical Encoders, Pneumatic Sensors, Hall Effect Sensors, Tachogenerators, Strain Gauge Load Cell, Thermostats, Photo Darlington. Interfacing Sensors in Mechantronic System as – Temperature Switch Circuit, Float Systems. **[No. of Hrs.: 12]**

UNIT - III

Introduction to signal conditioning: Signal Conditioning Processes, Inverting Amplifiers, Non Inverting Amplifiers, Summing, Integrating, Differential. Logarithmic Amplifiers, Comparators, Amplifiers Error, Filtering, wheatstone Bridge, Temperature Compensation, Thermocouple Compensation, Analog to Digital Conversion, Digital To Analog Conversion, Sample and Hold Amplifiers, Multiplexers, Time Division Multiplexing, Data Acquisition, Digital Signal Processing, Pulse Modulation.

System models: Mechanical System Models Applications like – Machine on a floor, Car Wheel Moving along a road etc. Model Development of an Electrical Systems, Fluid System, and Thermal Systems: Rotational – Translation Systems, DC Motors, Speed Control and Hydraulic – Mechanical Systems.

[No. of Hrs.: 11]

UNIT - IV

Programmable logic controllers (plc):PLC Structure, Input / Output Processing, Programming, Language (Ladder Diagram), Logic Functions, Latching, Sequencing, Timers, Internal Relays and
Counters, Shift Registers, Master and Jump Controls, Jumps, Data Movement, Code Conversion, Ladder Circuits.

Case studies: Auto-Focus Camera, Printer, Domestic Washing Machine, Optical Mark Reader, Bar Code Reader and Pick and Place robot Arm. **[No. of Hrs.: 11]**

Text Book:

1. W. Bolton, "Mechatronics", Pearson Education Ltd., 2003.

Reference Books:

1. Mohammad Ali Mazidi Janice Gillispier Mazidi, "The 8051 Microcontroller", Pearson Education Inc.,2004.
2. Gary Dunning, "Introduction to Programmable Logic Controllers", Thomson Asia P. Ltd., Singapore, 1998.
3. Gopal K. Dubey, "Fundamentals of Electrical Drives", Narosa Publishing House, 2001.
4. Charles H. Roth, "Jr. Fundamentals of Logic Design", Jaico Publishing House, 2001.
5. "HMT Mechatronics", Tata McGraw Hill Publishing Co. Ltd., 2001.
6. Devdas Shetty, Richard A. Kolk "Mechatronics System Design", Thomson Asia Pvt. Ltd., Singapore, 2001.
7. A.K. Tayal, "Instrumentation & Mechanical Measurements", Galgotia Publication Pvt.Ltd., 2003.
8. D. Rana Durgaiah, "Fluid Mechanics & Machinery", New Age Int. Publishers, 2004.
9. Nitaigour Premchand Mahalik, "Mechatronics Principles, Concepts & Application", Tata McGraw Hill Publishing Co.Ltd., 2003.
10. Mikell P. Groover, "Automation, Production Systems and Computer-Integrated Manufacturing", 2nd Edition, Prentice Hall, 2001.

Paper Code: ETME 405 **L T C**

Paper: Refrigeration & Air Conditioning 3 1 4

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT - I

Air Refrigeration : Brief History of Refrigeration. Refrigerating Machine-Second Law of Thermodynamics---Interpretation. Carnot Cycle, Reversed Carnot Cycle, Heat Engine, Refrigerating Machine, Heat Pump, COP. Unit of Refrigeration. Bell Coleman Cycle, Dense Air System, Reversed Brayton Cycle, Air Refrigeration Cycle for Aircraft. Ram Compression. Comparison of various cooling systems for aircraft.

Vapour Compression Refrigeration System : Simple Saturated Cycle. T-s, P-h, h-s, P-v diagrams. COP. Dry and Wet Compression. Effect of operating parameters. Effect of under-cooling and superheating. Liquid-Suction Heat Exchanger. Actual vapour compression cycle. Details of various types of Compressors, Condensers, Expansion devices and Evaporators. Matching of Components.

[No. of Hrs.: 11]

UNIT - II

Refrigerants : ASHRAE Nomenclature. Eco Friendly Refrigerants, Thermodynamic Requirements of a Good Refrigerant. Introduction to Azeotropic & Non Azeotropic Refrigerant Mixtures (NARM)

Compound Vapour Compression System : Concepts of (i) Liquid Flash cooler, (ii) Flash Inter cooler. Optimum Interstage Pressure.

Multiple Evaporators and Compressors : Use of Individual Expansion valves, Back pressure valves and multiple expansion valves.

Miscellaneous: Vapour Absorption System : Thermal refinements, Practical vapour absorption system Electrolux Refrigerator. **[No. of Hrs.: 11]**

UNIT III:

Steam Jet Refrigeration : System components and analysis.

Cascade Refrigeration : Limitations of vapour compression system for low temperature refrigeration. Cascade staging. Dry ice.

Controls : Sensing and Actuating Elements H.P/L.P cut out, Thermostat, Solenoid valve, Humidistat, Anemometer etc.

Psychrometry : Brief History of Air Conditioning. Working substance in Air Conditioning. Dalton's Law of Partial Pressures. Psychometric Properties and Psychometric Chart. Psychometric Processes , Concept of Room Sensible Heat Factor, Grand Sensible Heat Factor, Apparatus Dew point, Effective Sensible Heat Factor. High Latent Heat Load applications, Summer & Winter Air Conditioning

[No. of Hrs.: 11]

UNIT - IV

Comfort Air Conditioning: Factors influencing Human comfort. Concept of Effective Temperature. Factors governing optimum effective temperature.

Heat Load Estimation : Inside and Outside design conditions. Solar heat gain through glass and structures. Occupancy load, Lighting load and miscellaneous loads. Infiltration and Ventilation. Summery of Heat Loads.

Duct Design : Transmission and distribution of air flow. Types of supply air outlets, Mechanism of flow of air through outlets. Pressure drop and friction loss in ducts. Rectangular equivalents of circular ducts. Method of Duct design.

[No. of Hrs.: 11]

Text Books:

1. P L Ballany: "Refrigeration & Air Conditioning", Khanna Publisher.
2. C.P. Arora, "Refrigeration & Air Conditioning", Tata McGraw Hill

Reference Books:

1. Domkundewar & Arora, "A Course in Refrigeration & Air conditioning", Dhanpat Rai & Co.
2. Marsh & Olivo, "Principles of Refrigeration", C.B.S Publications.
3. Paul Lang, "Principles of Air Conditioning", C.B.S Publications

Paper Code: ETME 407 L T C
Paper: Solar Energy 3 1 4

INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT - I

Selected topics in Heat Transfer: Heat transfer modes, properties and radiation characteristics of opaque and partially transparent media.

[No. of Hrs.: 11]

UNIT - II

Solar Radiation: Origin, nature and availability of solar radiation, measurements of solar radiation data and its estimation, effects of receiving surface orientation and motion.

[No. of Hrs.: 11]

UNIT - III

Components, process and system modes: Design consideration and performance of flat plate and focussing collectors; energy storage components, water storage, packed bed and phase-change energy storage; mathematical models of various solar systems and components.

[No. of Hrs.: 11]

UNIT - IV

Application: Solar water heating, solar air heaters, solar space heating and cooling, solar pumps, solar thermal power, solar furnaces and solar distillation. **[No. of Hrs.: 11]**

Text Books:

1. H.P. Garg and J. Prakash, "Solar Energy fundamental and Applications", Tata McGraw Hill Pulishing Co. Ltd.
2. Magal, "Solar Power Engineering", Tata McGraw Hill Publishing Co. Ltd.

Paper Code:ETME: 409 L T C
Paper: Personnel Management 4 0 4

INSTRUCTIONS TO PAPER SETTERS: MAXIMUM MARKS: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.

2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT I

Nature, Scope, Objective and Growth of Personnel Programme personnel department and its Functions; Profile of a Good Personnel Manager; Formulation of personnel policy manpower planning.

Recruitment and Selection – Traditional and Scientific approach; Job Change-Promotion, Transfer and Separation; Training and Development-Counselling and Succession Planning; Performance Appraisal and Merit Rating; Wage and Salary.

[No. of Hrs.: 11]

UNIT II

Administration –equitable wage structure; wage disparities and differentials-job evaluation; Motivation in actual practice; Motivation Research; Communication Channel; Media and Forms of Communication; Barriers; How to issue Instructions; Industrial Relations – Meaning and Cope-Role of Employers, Machinery; Welfare Activities; Employee Benefits and Service-Statutory and Non-Statutory.

[No. of Hrs.: 12]

UNIT III

Concept, Objectives. Manpower Data Bank. Supply forecast reconciling demand & supply, budgeting and control, audit and improvement, acquisition and redeployment, reporting, performance evaluation & appraisal, training, compensation, Counseling policies, Safety & Health, Carrier development, Test and interviews.

[No. of Hrs.: 12]

UNIT IV

Applications & Case Studies. **[No. of Hrs.: 09]**

Text Books:

1. Morappa & Saiya Ram, "Personnel Management", Tata McGraw Hill, 1998
2. T.N. Chhabra, "Human Resource Management", Dhanpat Rai & Sons, 4th Edition, 2004.

Reference Books:

1. S.P. Robbins, "Human Resource Management", Prentice Hall India
2. C.B. Memoria, "Personnel Management", Himayala Publishing House.

Paper Code:ETME: 411 L T C

Paper: Metal Forming 3 1 4

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT - I

Introduction: Metal forming, Review of tensile test, strain hardening, plastic yield criteria, Flow of metals, classification of processes and their characteristic. Friction and lubrication in forming processes.

[No. of Hrs.: 11]

UNIT - II

Mechanics of forming processes, spring back, effect of various parameters
Strip and disc forming – Mechanics, pressure distribution, total force
Drawing, drawing force, power, maximum allowable reduction
Extrusion, force required in extrusion, maximum reduction **[No. of Hrs.: 11]**

UNIT - III

Deep drawing, stress distribution effect of friction, blank to folding force
Rolling, roll pressure, roll separating force, driving torque and power, roll pass design
Bending : Work load **[No. of Hrs.: 11]**

UNIT - IV

Presses
Introduction to dies and wear

High Energy Rate Forming : Introduction, Principle of operation, Advantages, Limitations, uses & applications of Explosive Forming, Electro Hydraulic Forming, Magnetic Pulse Forming.

[No. of Hrs.: 11]

Text Books:-

MAE-8

1. Ghosh & Mallick, "Manufacturing Science", East West Affiliated.
2. P.C. Sharma, "Production Engineering", S.Chand & Co., 2002

Reference Books:

1. G.R. Nagpal, "Metal Forming Processes". Khanna Publishers 2000.
2. K.P. Sinha, S.C. Prasad, "Theory of Metal Forming & Metal Cutting", Dhanpat Rai Publications, 1995.

Paper Code:ETME - 413	**L**	**T**
C		
Paper: Automotive Engineering	**3**	**1**
4		

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT - I

Power Plant: Selection of power plant for automotive vehicle, requirements of vehicle. Characteristics of various power plants (Petrol engines, Diesel engines, CNG LPG engine, Gas Turbines); constructional details of C.I. and S.I. engines, crank shafts, connecting rods, pistons, piston pins, piston rings, valves mechanisms. manifolds, air cleaners, mufflers, radiators and oil filters.

Vehicular Performance : Load, air and grade resistance; matching of engine output and demand power, performance requirements of various vehicles like Passenger cars, heavy duty trucks etc. performance characteristics of internal combustion engines, drive effectiveness relationship for 2 wheel and 4 wheel drive vehicles.

[No. of Hrs.: 11]

UNIT II

Transmission Systems : Transmission requirements, general arrangement of clutch, gear box and rear axle transmission, general arrangement of rear engines and vehicles with live axles. General arrangement of Dead axle and axle-less transmission, De-Dion drive, arrangement of front engine and front wheel drives, four wheel drive transmission.

Clutches: Principle of friction clutch, single and multiplate clutches, centrifugal clutch. Friction materials. Bonding materials. Fluid fly wheel clutch. **[No. of Hrs.: 11]**

UNIT III

Transmission : Description and working of manually operated gearboxes like sliding mesh, constant mesh, synchromesh. Hydraulic torque converter and its construction working and performance. Semi-automatic transmission (Wilson Gear Box). Analysis of differentials, live axles, construction and working. Requirement of overdrive.

Steering System : Steering geometry, Ackermann steering, Center point steering, Power steering. **[No. of Hrs.: 11]**

UNIT IV

Suspension : Independent suspension; Perpendicular arm type, Parallel arm type. Dead axle suspension. Live axle suspension, air suspension, shock absorbers.

Wheels, Tyres and Brakes : Wheel and tyre requirements, tyre dynamics, mechanical and hydraulic brakes, shoe arrangements and analysis, disc brakes, braking effectiveness relationship for 4 wheel drive.

[No. of Hrs.: 11]

Text Books:

1. Kirpal Singh, "Automobile Engg.", Vol.I & II, Standard Publishers, 2004
2. N.K. Giri, "Automotive Mechanics", Khanna Publishers
3. Narang G.B.S., "Automobile Engg.", Khanna Publishers
4. Srinivasan, "Automotive Engines", Tata McGraw Hill
5. K.K. Jain & R.B. Asthana, "Automobile Engineering", Tata McGraw Hill

Reference:

1. Joseph Haitner, "Automotive Mechanics", C.B.S. Publications

Paper Code: ETME 415 **L** **T** **C**

Paper: Manufacturing Information Systems **3** **1** **4**

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT - I

Introduction to Data Processing and Informational Systems, Fundamentals of Information Technology.

Data Bank Concepts, CAD/CAM databases, Data-Bank-Information storage and retrieval, Data life cycle, Desirable characteristics of data processing system, Level of decision making and Information requirements, Data Dictionaries in Manufacturing, Integrated Information System, Object Oriented Models.

[No. of Hrs.: 11]

UNIT II:

Structured Query Language, Implementation of an Information System.

Distributed Databases, Information processing systems, Use of computer networks, Elements of Computer Communication Networks, Elements of Automated Manufacturing Systems.

[No. of Hrs.: 11]

UNIT III:

Networks in Manufacturing, Local Area Networks-Architectures and Protocols, Manufacturing Message Specification, Manufacturing Automation Protocol, Network

and Protocol Implementation. **[No. of Hrs.: 11]**

UNIT IV:

LAN design and performance, Sensor level network, Machine level network, Cell level network, Network performance Evaluation.

Multimedia information systems, management of Multimedia database. **[No. of Hrs.: 11]**

Text Books:

1. Elmasri Navathe, "Fundamentals of Database Systems", Pearson Education Asia, 2001.

Paper Code: ETME 417 L T C

Paper: Computer Aided Design 3 1 4

INSTRUCTIONS TO PAPER SETTERS:	MAXIMUM MARKS: 75
1.	Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2.	Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

UNIT - I

Introduction to CAD: CAD tools and their definition, Role of CAD in typical product cycle, Industrial look at CAD

CAD Hardware: Types of Systems, CAD Systems Evaluation Criteria, Input Devices, Output Devices

CAD Software: GraPrentice Hall Indiacs Standards, Basic Definitions – Data Structure, Database, DBMS, Database Coordinate System, Working Coordinate System, Screen Coordinate System, Modes of GraPrentice Hall Indiacs Operations, User Interface, Software Modules – OS Module, GraPrentice Hall Indiacs Module, Applications Module, Programming Module, Communications Module, Modelling and Viewing

Mapping of Geometric Models: Translation, Rotational, General, Changes of Coordinate System

[No. of Hrs.: 11]

UNIT II

Three Dimensional Transformations: Point representations, Transformation Matrices, Scaling, Translation, Rotation, Reflection

Projections: OrthograPrentice Hall Indiac, Isometric, Perspective, Point at Infinity & Vanishing Point

Curves: Representation of Space Curves, Cubic Spline, Normalized Cubic Splines, Bezier Curves, B-spline Curves

Surface Generation: Plane Surfaces, Ruled Surfaces, Surface of Revolution, Sweep Surface, Bezier Surface, Cubic Surface Patch, B-Spline Surface, Composite Surface**[No. of Hrs.: 11]**

UNIT III

Solid Modeling: Set Theory, Boolean Operations, B-rep Modeling, CSG, Sweep Representations, Spatial Occupancy Enumeration

Computer Animation: Animation Types, Animation Techniques, Simulation

Geometric Property Formulation: Curve Length, Surface Area, Volume Calculation, Mass Calculation, Centroid Calculation **[No. of Hrs.: 11]**

UNIT IV

CAD/CAM Data Exchange: Introduction, IGES, PDS

Finite Element Methods: General Method for FEM, Finite Element Analysis**[No. of Hrs.: 11]**

Text Books:

1. Ibrahim Zeid, "CAD/CAM Theory and Practice", Tata McGraw-Hill Publishing Company Limited, 6th Edition 1998.
2. David F. Rogers and J. Alan Adams, "Mathematical Elements for Computer GraPrentice Hall Indiacs", Tata McGraw-Hill, 2nd Edition 2002.

Reference Book:

1. Ibrahim Zeid, "Mastering CAD/CAM", Tata McGraw-Hill Publishing Company Limited,