N.C.College of Engineering

Israna-132107 (Panipat)

Scheme and Syllabus

w.e.f 2015-16 Session

ELECTRONICS & COMMUNICATION ENGINEERING

FOURTH Year (7th and 8th Semester)

SCHEME OF STUDIES & EXAMINATION
B.TECH (Semester VII)
Electronics & Communication Engineering

S. No.	Subject Code	Subject	BOS	L	T	P	Contact Hours	Credit
1		Elective*	ECE	3	1	-	4	4
2	EC-471	VLSI Design	ECE	3	1	-	4	4
3	EC-472	Embedded Systems Design	ECE	3	1	-	4	4
4	EC-473	Wireless & Mobile Communication	ECE	3	1	-	4	4
5	EC-474	Data Communication Network	ECE	3	1	-	4	4
6	EC-47P1	Embedded Systems Design Lab	ECE	-	-	3	3	2
7	EC-47P2	Minor Project	ECE	-	-	6	6	4
8	EC-47P3	Seminar	ECE	-	-	2	2	1
9	EC-47P4	Industrial Training	ECE	-	-	-	-	4
		TOTAL		15	5	11	31	31

List of Electives*

(i) Television Engineering(EC-47E1)
(ii) MEMS(EC-47E2)

B.TECH VII SEMESTER
VLSI DESIGN
(EC-471)

L	T	Cr	
3	1	4	

On Semester Evaluation:100 Marks
End Semester Evaluation: 100 Marks

Time: 3 hrs
Marks:100

NOTE: There shall be nine questions in total. The question No.1 is compulsory and will have four parts a, b, c, d covering entire syllabus. There shall be two questions from each unit and students have to attempt one question from each unit. All questions will carry equal marks. Question paper should have 25 % numerical part.

UNIT-I

Introduction: Introduction to IC Technology, Basic MOS Transistors, Enhancement mode & Depletion mode transistor action, NMOS & CMOS Fabrication Process Sequence, Basic Electrical Properties of MOS Circuits, MOS Design Process: MOS Layers, Stick Diagram & Design rules & Some design examples, Inverter, NAND gates, Multiplexer, Logic Function Block, Power Dissipation & Gate Capacitance in CMOS Circuits.

UNIT-II

Scaling of MOS Circuits & Basic Circuit Concepts: Scaling models and scaling factors for device parameters & Limitations of Scaling, Sheet resistance and its concept applied to MOS transistors and inverters ,Area capacitance and Standard unit of capacitance, Delay unit and Inverter delay, Driving large capacitive load ,Propagation delay & Wiring Capacitance .

Introduction to physical design of IC's: Introduction, Layout rules & circuit abstract model, Cell Generation, Layout environments, Layout methodologies, Packaging & MCM Technology, Computational Complexity and Algorithmic Paradigms.

UNIT-III

Placement: Partitioning & Partitioning Algorithms, Floorplanning, Placement.
Routing: Fundamentals, Global Routing, Detailed Routing, Routing in FPGA's.

UNIT-IV

Performance issues in Circuit Layout: Delay Models, Timing Driven placement, Timing Driven Routing, Via Minimization and Other Issues in Via Minimization, Power Minimization and other issues.

Reference Books:

1. Pucknell DA & Eshraghian K, Basic VLSI Design, PHI.
2. Sanfarazdeh M. & Wong C.K, An Introduction to VLSI Physical Design,Mc Graw Hill.

B.TECH VII SEMESTER

EMBEDDED SYSTEMS DESIGN

(EC-472)

L	T	Cr	On Semester Evaluation:100 Marks
3	1	4	End Semester Evaluation: 100 Marks

Time: 3 hrs **Marks:100**

NOTE: There shall be nine questions in total. The question No.1 is compulsory and will have four parts a, b, c, d covering entire syllabus. There shall be two questions from each unit and students have to attempt one question from each unit. All questions will carry equal marks. Question paper should have 25 % numerical part.

UNIT- I

Introduction: Introduction to embedded system, Classification of embedded system, Needs of embedded system, Different types of microcontrollers: Embedded microcontrollers, External memory microcontrollers; Processor architectures: Harvard V/S Princeton, CISC V/S RISC; Microcontrollers memory types; Features of 8051 microcontroller: Clocking, I/O pins, Interrupts, Timers, Peripherals**.**

UNIT – II

Microcontroller Architecture: Introduction to PIC microcontrollers, Harvard Architecture and pipelining, Pin description and block diagram of PIC16C61 and PIC16C62, Program memory considerations, Register file structure and addressing modes,Instruction set, Simple operations.

UNIT-III

Interrupts and I/O Ports: Interrupt logic, Timer2 scalar initialization, IntService interrupt service routine, Loop time subroutine, External interrupts and timer 0, timer 1, Pulse-width modulated outputs, Synchronous serial port module, Serial peripheral device, O/P port Expansion, I/P port expansion, UART

UNIT-IV

Programming with Microcontrollers: Arithmetic operations, Bit addressing, Loop control, Stack operation, Subroutines, RAM direct addressing, State machines, Oscillators, Timer Interrupts, Memory mapped I/O.

Designing using Microcontrollers: Marya's music box, Mouse wheel turning, Aircraft demonstration, Light sensors for robots, Ultrasonic distance measuring, Temperature Sensor.

Text Book:

1. Design with PIC Microcontrollers by John B. Peatman , Pearson.

Reference Books:

1. Programming and Customizing the 8051 Microcontroller : Predko ; TMH.
2. Designing Embedded Hardware : John Catsoulis ;SHROFF PUB. & DISTR. ND.
3. Programming Embedded Systems in C and C++ : Michael Barr; SHROFF PUB. & DISTR. ND

B.TECH VII SEMESTER

WIRELESS & MOBILE COMMUNICATION

(EC-473)

L	T	Cr	On Semester Evaluation:100 Marks
3	1	4	End Semester Evaluation: 100 Marks

Time: 3 hrs **Marks:100**

NOTE: There shall be nine questions in total. The question No.1 is compulsory and will have four parts a, b ,c ,d covering entire syllabus. There shall be two questions from each unit and students have to attempt one question from each unit. All questions will carry equal marks. Question paper should have 25 % numerical part.

UNIT- I

Cellular System: Cellular concept, Frequency reuse, Geometry of hexagonal cell layout, Channel assignment strategies, Handoff strategies, Interference & system capacity, Tracking & grade of services, Improving coverage & capacity in cellular system.

UNIT – II

Radio Wave Propagation: Free space propagation model, Propagation mechanisms, Large scale path loss: Ground reflection model, Log-distance path loss model, Log-normal shadowing, Outdoor & Indoor propagation models, Small-scale multipath propagation, Parameters of mobile multipath channels, Types of small-scale fading, Rayleigh and Ricean distributions.

UNIT-III

Digital Modulation: ∏/4 QPSK, MSK, GMSK, Spread Spectrum Modulation Techniques, Diversity Techniques, Rake demodulator, Multiple Access Techniques: FDMA/ TDMA/ CDMA and their spectrum efficiencies.

UNIT-IV

Wireless Standards: GSM: 'Objectives, Services and features, Architecture, Subsystems, Interfaces, Logical channels, Frame structure, Signal processing, Mobility management, Location tracing, IS-95: 'Frequency and channel specifications, Forward CDMA channel, Reverse CDMA channel',.

Text Book:

1. Theodore S. Rappaport, Wireless Communications Principles & Practice, IEEE Press, Prentice Hall.

Reference Books:

1. William C.Y.Lee, Mobile Cellular Telecommunications, Analog and Digital Systems, McGraw Hill Inc.
2. Kamilo Feher, Wireless Digital Communications: Modernization & Spread Spectrum Applications, Prentice Hall of India, New Delhi.
3. Vijay Kumar Garg, Principles & Applications of GSM, Pearson Education.

B.TECH VII SEMESTER
DATA COMMUNICATION NETWORK
EC-474

L	T	Cr	On Semester Evaluation:100 Marks
3	1	4	End Semester Evaluation: 100 Marks

Time: 3 hrs
Marks:100

Instructions: There shall be nine questions in total. The question No.1 is compulsory and will have four parts a,b,c,and d covering entire syllabus. There shall be two questions from each unit and students have to attempt one question from each unit. All questions will carry equal marks.

Unit1: Introduction: A Communication model, Data Communications, Data Communication Networking, Need for Protocol Architecture, A Simple Protocol Architecture, OSI Model, the TCP/IP Protocol Architecture.

Unit2: Data Communications: Concepts, Analog and Digital Data Transmission, Transmission Impairments, Chmmel Capacity, Guided Transmission Media,
Signal Encoding Techniques: Digital Data-Digital Signals; Digital Data-Analog Signals; Line Coding, Block Coding, Sampling and Transmission Mode, LAN: Background, Topologies and LAN Protocol Architecture

Unit3: Digital Data Communication Techniques: Asynchronous and Synchronous Transmission, Types of Errors, Error Detection, Error correction.
Data Link Control: Flow control, Error Control, High-Level Data Control.
Multiplexing: Multiplexing using Frequency Division, Synchronous Time Division and Statistical Time Division; Asymmetric Digital Subscriber Line, Xdsl.

Unit4: WAN: Circuit Switching and Packet Switching Networks, X.25, Frame Relay.
Asynchoronous Transfer Mode: Protocol Architecture, ATM Logical Connections, ATM Cells, Transmission of ATM Cells, ATM Service Categories, ATM Adaptation Layer, Wireless LANS: IEEE802.11 & Blue tooth.

References:

1. W Stallings, Data and Computer Communications, Prentice Hall of India, 1997
2. Behrouz A Forouzan, Data Communication and Networking, TMG Pub. Co. Ltd, 4th edition, 2006.
3. R G Gallager and D Bertsekas, Data Networks, Prentice Hall of India, 1992
4. M Deprycker, ATM-solutions [or Broadband ISDN, Prentice-Hall of USA, 1995

B.TECH VII SEMESTER

TELEVISION ENGINEERING

(EC-47E1)

L	T	Cr	On Semester Evaluation:100 Marks
3	1	4	End Semester Evaluation: 100 Marks

Time: 3 hrs **Marks:100**

NOTE: There shall be nine questions in total. The question No.1 is compulsory and will have four parts a, b ,c ,d covering entire syllabus. There shall be two questions from each unit and students have to attempt one question from each unit. All questions will carry equal marks. Question paper should have 25 % numerical part.

UNIT- I

Elements of a Television System: Picture transmission, sound transmission, Picture reception, Sound reception synchronization, Receiver controls. Analysis and synthesis of Television Pictures: Gross structure, Image continuity, No. of scanning lines, Flicker, Fine structure, Tonal gradation. Composite Video signal , Channel B.W. Vestigial side band transmission and reception, TV standards.

UNIT – II

The Picture Tube : Monochrome picture tube, Beam deflection, Picture tube screen, Picture tube characteristics, Monochrome picture tube troubles and controls, Television camera tubes: Basic principle, Image orthicon, Vidicon, Plumbicon.

Monochrome Signal Transmission & Reception: Block diagram of monochrome signal transmitter and receiver, Explanation of different sections, Transmitting and receiving antennas, Interference suffered by TV signals.

UNIT-III

Elements of Color TV: Introduction, Compatibility considerations, Interleaving process, Three color theory, Chrominance Signal, Composite color signal, Comparison of NTSC, PAL and SECAM Systems, Color television display tubes (Delta gun, PIL, Trinitron), Common faults in color picture tube, Color signal transmission, Bandwidth for color signal transmission.

UNIT-IV

Advanced Topics in TV Engineering: Introduction & working and block diagram of the Projector TV, 3D-TV, HDTV, Digital TV, Camcorders, Liquid Crystal & Plasma Screen TV.

Television Applications: Cable television, CCTV, Remote control (Electronic control system), Video tape recording & playback, CD & DVD Discs- recording & playback.

Suggested Books:

1. AM Dhake, Monochrome and Colour TV, TMH.
2. R.R.Gulati, Monochrome & Colour TV.Engg. Wiley Eastern Ltd.
3. SP Bali, Colour TV theory & practice, TMH

B.TECH VII SEMESTER

Micro Electro Mechanical Systems (MEMS)

(EC-47E2)

L	T	Cr	On Semester Evaluation:100 Marks
3	1	4	End Semester Evaluation: 100 Marks

Time: 3 hrs **Marks:100**

NOTE: There shall be nine questions in total. The question No.1 is compulsory and will have four parts a, b ,c ,d covering entire syllabus. There shall be two questions from each unit and students have to attempt one question from each unit. All questions will carry equal marks. Question paper should have 25 % numerical part.

Unit I

Overview of MEMS and Microsystems: Introduction Microsystem vs. MEMS, Microsystems and Microelectronics, the Multidisciplinary Nature of Microsystem design and manufacture, Application of MEMS in various industries. MEMS and Miniaturization: Scaling laws in miniaturization: Introduction to Scaling, Scaling in: Geometry, Rigid Body dynamics, Electrostatic forces, Electromagnetic forces, Electricity, Fluid Mechanics, Heat Transfer. Materials for MEMS and Microsystems – Si as substrate material, mechanical properties of Silicon, Silicon Compounds (SiO2, Si3N4, SiC, polySi, Silicon), Piezoresistors, GaAs, Piezoelectric crystals, Polymers, Packaging Materials.

Unit II

Micromachining Processes: Overview of microelectronic fabrication processes used in MEMS, Bulk Micromachining – Isotropic & Anisotropic Etching, Comparison of Wet vs Dry etching, Surface Micromachining – General description, Processing in general, Mechanical Problems associated with Surface Micromachining, Introduction to LIGA process, Introduction to Bonding. Assembly of 3D MEMS - foundary process.

Unit III

Microsystems & MEMS Design: Design Considerations: Design constraints, Selection of Materials, Selection of Manufacturing processes, Selection of Signal Transduction, Electromechanical system, packaging. Process design, Mechanical Design – Thermo mechanical loading, Thermo mechanical Stress Analysis, Dynamic Analysis, Interfacial fracture Analysis, Mechanical Design using Finite Element Method.

Unit IV

Design case using CAD. Principles of Measuring Mechanical Quantities: Transduction from Deformation of Semiconductor Strain gauges: Piezo resistive effect in Single Crystal Silicon, Piezo resistive effect in Poly silicon Thin films, Transduction from deformation of Resistance. Capacitive Transduction: Electro mechanics, Diaphragm pressure sensors. Structure and Operation of Accelerometers, Resonant Sensors, Thermal Sensing and actuation.

References:

1. Microsystem Design By Stephen D. Senturia, Kluwer Academic Publishers (2003)
2. Micro Technology and MEMS By M. Elwenspoek and R. Wiegerink, Springer (2000)
3. Micro Fabrication by Marc Madaon, CRC Press

4. MEMS & Microsystems Design and Manufacture by Tai-Ran H Su, Tata Mc graw.

B.TECH VII SEMESTER

EMBEDDED SYSTEMS DESIGN LAB

(EC-47P1)

P	**Cr**	**On Semester Examination : 120 Marks**
3	**2**	**End Semester Examination: 80 Marks**

LIST OF EXPERIMENTS

1. Design & simulate the CMOS Inverter.
2. Design & simulate J-K Flip-Flop using NAND & NOR representations.
3. Design & simulate T Flip-Flop using NAND & NOR representations.
4. Design & simulate Master Slave J-K Flip-Flop using NAND & NOR representations.
5. Design (using verilog), simulate and synthesize a micro-programmed control unit of CPU.
6. Design (using verilog), simulate and synthesize RISC architecture based 8-bit CPU.
7. Design and simulate two stage CMOS operational amplifier.
8. Design (using verilog), simulate and synthesize 8-bit Direct digital Synthesizer.
9. Layout design of 4-bit ALU and its performance verification by simulation.
10. Layout design of a CMOS differential amplifier and its performance verification by simulation.

SCHEME OF STUDIES & EXAMINATION
B.TECH (Semester VIII)
Electronics & Communication Engineering

S. No.	Subject Code	Subject	BOS	L	T	P	Contact Hours	Credit
1.		Open Elective	MGT/ECE/ME	3	1	-	4	4
2		Elective*	ECE	3	1	-	4	4
3.	EC-481	Neuro-Fuzzy Systems	ECE	3	1	-	4	4
4.	EC-482	Image Processing	ECE	3	1	-	4	4
4.	EC-48P1	Major Project	ECE	-	-	12	12	12
5.	EC-48P2	Seminar	ECE	-	-	2	2	1
6.	EC-48P3	IP Lab	ECE	-	-	2	2	1
7	EC-48P4	Neuro-Fuzzy Systems Lab	ECE	-	-	2	2	1
8	EC-483	General Proficiency & Fitness Viva	ECE	-	-	-	-	2
		Total		12	4	18	34	33

Open Elective

- **(i) Principles of Management(MGT-481)**
- **(ii) Technopreneurship (MGT-48OE1)**
- **(iii) Computer Organisation & Architecture (EC-48OE1))**
- **(iv) Mechatronics (ME-473)**

List of Electives*

- **(i) Mobile Computing (EC-48E1)**
- **(ii) Advanced Microprocessors (EC-48E2)**

(ii) Data Base Management Systems (EC-48E3)

B.TECH VIII SEMESTER

NEURO-FUZZY SYSTEMS

(EC-481)

L	T	Cr	On Semester Evaluation:100 Marks
3	1	4	End Semester Evaluation: 100 Marks
Time: 3 hrs			Marks:100

NOTE: There shall be nine questions in total. The question No.1 is compulsory and will have four parts a, b ,c ,d covering entire syllabus. There shall be two questions from each unit and students have to attempt one question from each unit. All questions will carry equal marks. Question paper should have 25 % numerical part.

UNIT- I

Introduction to Neural Networks: Introduction, Characteristics of neural networks, Biological neural networks, Biological neural network Vs. computers, Historical developments, Applications of ANN,

Artificial Neural Networks: Terminology (Activation and Synaptic dynamics), Models of neuron: Basic model, McCulloch-Pitts Model, Perceptron model, Adaline model**,** Types of neuron activation functions, Topologies, Learning laws, Learning methods.

UNIT – II

Hopfield Networks: Structure, Discrete and continuous version, Training, and applications, Stability.

Back propagation: Architecture, Applications and Back propagation training algorithms.

Counter Propagation Networks: Kohonen network, Gross berg network & training, Application of counter propagation, Image classification

UNIT-III

Bi-directional Associative Memories: BAM architecture, BAM training algorithm, Retrieving and encoding a stored association, Memory capacity, BAM energy function

ART: ART architecture, ART classification operation, ART implementation and characteristics of ART.

Radial basis function neural networks: Architecture and working

UNIT-IV

Fuzzy Logic: Basic concepts of fuzzy logic, Fuzzy vs. Crisp set, Linguistic variables, Membership functions, Operations of fuzzy sets, Fuzzy IF- THEN rules, Variable inference techniques, Defuzzification, Fuzzy system design.

Genetic Algorithms: Basic concepts, Operators, Working principle, Procedures of GA, Genetic representations, (encoding), GA evolving neural network.

Text Books:

1. Simon Haykin, "Neural Networks", Prentice Hall India, 2005.
2. Rao, Vallinu B.,and Rao, Hayagriva "Neural networks and fuzzy Logic", Second Edition, BPB Publication
3. B.Yegna Naryana, "Artificial Neural Networks", Prentice Hall India, 2009.

Reference Books:

1. James A Freeman and Davis Skapura, Neural Networks Pearson Education, 2002
2. Kumar Satish, "Neural Networks" Tata McGraw Hill.

3. S. Rajasekharan and G. A. Vijayalakshmi pai, "Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications", PHI Publication, 2004.
4. S.N.Sivanandam, S.Sumathi, S.N.Deepa "Introduction to Neural Networks using MATLAB 6.0", TMH, 2006

B.TECH VIII SEMESTER

IMAGE PROCESSING

(EC-482)

L	T	Cr	On Semester Evaluation:100 Marks
3	1	4	End Semester Evaluation: 100 Marks
Time: 3 hrs			Marks:100

NOTE: There shall be nine questions in total. The question No.1 is compulsory and will have four parts a, b, c, d covering entire syllabus. There shall be two questions from each unit and students have to attempt one question from each unit. All questions will carry equal marks. Question paper should have 25 % numerical part.

UNIT- I

Introduction: Digital image and types**,** What is digital image processing?, Origins of digital image processing, Elements of an image processing system: 'CCD and CMOS sensors and image scanners, Storage systems & display', Image resolution, Image file formats, Components of a DIP system, Elements of visual perception: 'Structure of human eye, Image formation, Brightness adaptation and discrimination', A simple image formation model.

UNIT – II

Image Transforms and Operations: Basic concept of sampling and quantization, Toeplitz & circulant matrices, Orthogonal & unitary matrices, 2-D Z-transform of sequences and its properties, 2-D linear & circular convolution by matrix method, 2-D linear & circular correlation by matrix method, 2-D DFT and its properties, Hadamard transform, Slant transform, Discrete Cosine Transform.

UNIT-III

Image Enhancement and Restoration: Gray level transformation functions, Histogram equalization, Spatial filtering of image, its smoothing and sharpening (using 1^{st} and 2^{nd} derivative), LPF & HPF : 'Ideal, Butterworth & Gaussian', Degradation/ Restoration model, Inverse filtering, Wiener filtering

UNIT-IV

Image Compression: Fundamentals, Redundancy and its types, Basic compression model, Compression standards, Huffman coding, Run-length coding, Shannon-Fano coding, Arithmetic coding, LZW coding, Predictive coding, Block truncation coding.

Reference Books:

1) Rafael C.Gonzalez & Richard E.Woods : "Digital Image Processing", Pearson Education, 2002.

2) Anil K.Jain: “Fundamentals of Digital Image Processing”, PHI, 2003.
3) S.Jayaraman, S.Esakkirajan & T.Veerakumar: “Digital Image Processing”, McGraw Hill, 2009.

MECHATRONICS AND MANUFACTURING AUTOMATION

ME-473

1. **There will be NINE questions in the question-paper. All questions carry equal marks.**
2. **First question covers the whole syllabus. It is objective/ short answer type (at least ten questions). Two questions will be taken from each of the four units.**
3. **Attempt five questions in all. FIRST question is compulsory. Attempt ONE question from each of the other four Units**

UNIT 1

Introduction: Definition of mechatronics. Mechatronics in manufacturing, products and design. Review of fundamentals of electronics.

Mechatronics Elements (Introductory Part): Data conversion devices, sensors, micro sensors, transducers, signal processing devices, relays, contactors and timers.

UNIT 2

Drives & Mechanisms of An Automated System: Drives: stepper motors, servo drives. Ball, screws, linear motion bearings, cams, system controlled by camshafts, electronic cams, indexing mechanisms, tool magazines, and transfer systems.

Processors /Controllers (Brief Introduction): Microprocessors, microcontrollers, PID controllers and PLCs.

UNIT 3

Pneumatic System: Pneumatics: production, distribution and conditioning of compressed air, system components and graphic representations, design of systems.

Hydraulic System: flow, pressure and direction control valves, actuators, and supporting elements, hydraulic power packs, pumps. Design of hydraulic circuits.

UNIT 4

CNC technology and Robotics: CNC machines and part programming. Industrial Robotics. Stages in designing Mechatronics Systems, Possible Design Solutions. Case studies of Mechatronics systems- Pick and place Robot.

Text Book:

K.P Ramachandran, G.K Vijyaraghvan, M.S Balasundram, “Mechatronics Integrated Mechanical Electronics System”, John Wiley India.M. Groover, “Automation, Production Systems, and CIM”, PHI.

Reference:

W. Bolton, “Mechatronics Electronics Control System in Mechanical and Electrical Engineering”, Pearson Publication.

S.R Deb, “Robotics technology & Flexible Automation”, TMH.

E-Learning Resource: ***http://nptel.ac.in/syllabus/112103174/***

8th Semester (Elective & to be offered to all branches)
TECHNOPRENEURSHIP
MGT 48OE1

L	T	Cr
3	0	3

On Semester Evaluation: 100
End Semester Evaluation: 100

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to this compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus. Each question will carry 20 marks.
Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

Overview:
It takes courage and a certain mindset to become a technopreneur. It also takes interdisciplinary skills and the ability to think differently in order to survive the business. The best way to learn this discipline is to get your hands dirty while learning some useful theories and tips along the way. The Technopreneurship course will guide you through the experience of setting up a small tech-based business. It combines practice, reflection and mentoring to let you get a taste of what it takes to start up a business. Statistically speaking, some will succeed, most won't. What's important in the end is whether you learned your lesson and get up again to start the next venture. This experience will help you learn more about yourself and prepare for real-world technopreneurship.

Objectives:
At the end of the course, participants will be able to start up a technology-based business.

Methodology:
This course relies on adult learning techniques -- experiential, interactive and facilitated. Students will be grouped into project teams. They will go through a series of exercises and projects that will help them create a start up from idea to execution. Optional: groups will be tasked to invite technopreneurs who will speak in class to describe their experience.

UNIT-I

What it takes to be a technopreneur: Qualities of an entrepreneur; Case studies of entrepreneurs and technopreneurs. **Where to get your ideas**: Techniques for generating ideas; Creativity and innovation; Observe the world around you; find a need /problem and make a creative solution.

UNIT-II

What it takes to start up: Bootstrapping ; Prototyping ; Will it make money? **Designing your product / service:** Design thinking; process thinking'; Designing services and products; Strategic thinking: external, internal, plans.

UNIT-III

Leading your startup : Self-awareness and self-mastery; Sense of mission; When things get tough (and they always will). **Marketing:** Traditional guerilla marketing techniques; Online marketing: social networking.

UNIT-IV

Funding: (Entrepreneurial Financing sources) ; Assessing financial needs ; Structuring finance ; Sources of finance : Debt-Equity financing alternatives - How venture capitalists (VCs) evaluate and structure deals - How to interface VCs . **Legal stuff:** Property rights; Registering your business; Trade laws.

Text & Reference Books:

[1] Daniel Mankani. 2003. Technopreneurship: The successful Entrepreneur in the new Economy. Prentice Hall.

B.TECH VIII SEMESTER
COMPUTER ORGANIZATION & ARCHITECTURE
(EC-48OE1)

L	T	Cr	On Semester Evaluation:100 Marks
3	1	4	End Semester Evaluation: 100 Marks
Time: 3 hrs			Marks:100

NOTE: There shall be nine questions in total. The question No.1 is compulsory and will have four parts a, b ,c ,d covering entire syllabus. There shall be two questions from each unit and students have to attempt one question from each unit. All questions will carry equal marks. Question paper should have 25 % numerical part.

UNIT- I

General System Architecture: Introduction to computer organization & architecture, Store program control concept, Flynn's classification of computers (SISD, MISD, MIMD), Multilevel viewpoint of a machine: digital logic, Micro-architecture, ISA, Operating systems, High level language.

Instruction Set Architecture: Instruction set based classification of processors (RISC, CISC, DISC and their comparison), Addressing modes: Register, Immediate, Direct, Indirect, Indexed, Operations in the instruction set; Arithmetic and Logical, Data transfer, Control flow.

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UNIT – II

Basic Non-Pipelined CPU Architecture: CPU architecture types (Accumulator, Register, Stack, Memory/ Register), Detailed data path of a typical register based CPU, Fetch-Decode-Execute cycle; Microinstruction sequencing, Implementation of control unit, Enhancing performance with pipelining.

Computer Organization: Instruction codes, Computer register, Computer instructions, Timing and control, Instruction cycle, Type of instructions, Memory reference, Register reference, I/O reference, Accumulator logic, Control memory, Micro-instruction formats, Micro-program sequencer, Stack organization, Instruction formats, Types of interrupts

UNIT-III

Memory Hierarchy & I/O Techniques: The need for a memory hierarchy (Locality of reference principle), Memory hierarchy in practice: Cache, Main memory and Secondary memory, Memory parameters: Access/Cycle time, Cost per bit), Main memory (Semiconductor RAM & ROM organization, Memory expansion, Static & Dynamic memory types), Cache memory (Associative & Direct mapped cache organizations).

UNIT-IV

Introduction to Parallelism: Goals of parallelism (Exploitation of concurrency, throughput enhancement), Instruction level parallelism (Pipelining, Super scaling– Basic features), Processor level parallelism (Multiprocessor systems overview), Modes of transfer : DMA, Programmed I/O, Interrupt initiated I/O.

Text Books:

1. M. Mano , "Computer System Architecture", Prentice-Hall India, 2001.
2. John P. Hayes, "Computer Architecture and Organization", 3rd Edi, TMH, 1998..

Reference Books:

1. A.S. Tanenbaum, "Structured Computer Organization", 4th edition, Prentice-Hall of India, 1999.
2. W. Stallings, "Computer Organization & Architecture: Designing for performance", 4th edition, Prentice-Hall International edition, 1996.
3. IEEE Transaction on Computers.

B.TECH VIII SEMESTER
PRINCIPLES OF MANAGEMENT
(MGT-481)

L	T	Cr	On Semester Evaluation:100 Marks
3	1	4	End Semester Evaluation: 100 Marks

Time: 3 hrs **Marks:100**

1. There are NINE questions in a set of question paper. All questions carry equal marks.
2. Attempt five questions in all. FIRST question is compulsory which covers the whole syllabus.
3. Attempt ONE question from each of the other four units.

unit-I

Meaning, Characteristics and Principles of Management, Management as an Art, Science and Profession, Functions of Management, Corporate Social Responsibility
Communication -Process and Barriers.

Unit-II

Marketing management-Meaning, Nature, Scope and Functions of marketing Management, Marketing Research, Marketing Mix, Marketing Information system
International Marketing Management- Meaning, Nature and Scope.

Unit-III

Financial Management-Objectives, Scope and Functions of financial management, Capital Structure, Sources of Finance, Project Management- meaning, Feasibility study of Project, Social Cost Benefit Analysis.

Unit-IV

Human Resource Management- Meaning, Nature, Scope and Functions of Human Resource Management, Difference between Personal management and Human Resource Management, Job Analysis-meaning and process, Performance Appraisal

Suggested Readings

a) Philip Kotler.(2003). Marketing Management: Analysis, Planning, Implementation and Control. Prentice Hall of India
b) Michael, J.E.,Bruce, J.W. and William, J.S. (13th Edition,2004). Marketing Management. Tata McGrawHill, New Delhi.
c) Aswatthapa, K.; Human Resource and Personnel Management, TMH, 1997
d) C.B.Gupta Management Theory and Practice, Sultan Chand and Sons
e) D. Cenzo, D.A. & Robbins S.P. : Human Resource Management, 5th ed, NY, 1994
f) Pandy I.M Financial Mgt, Vikas Publication
g) Parsana Chandra, Financial Mgt, Tata McGraw New Delhi
h) Khan M.Y and Jain P.K Financial Mgt, Problem and Cases, Tata McGraw Hill,New Delhi

B.TECH VIII SEMESTER

IP Lab

(EC-48P3)

P	Cr	
2	1	**On Semester Examination : 120 Marks**
		End Semester Examination: 80 Marks

LIST OF EXPERIMENTS

1. WAP to perform basic operations on image:

   (a)Addition of images

   (b)Subtraction of images

   (c)Multiplication of images.

   (d)Division of images.

2. WAP to perform the following grey level transformation functions:

   (a) Image negative

   (b) Log transformation of image.

   (c) Power Law transformation.

3 WAP to perform thresholding operation on an image.

4 WAP to perform the following manipulation on an image:
(a) Brightness enhancement.

(b) Brightness Supression.

(c) Contrast Manipulation.

5 WAP to perform histogram equalization on an image.

6 WAP to perform spatial domain filtering on an image.

7 WAP to perform low pass filtering and high pass filtering using Butterworth filters

8 WAP to perform low pass filtering and high pass filtering using Gaussian filters.

9 WAP to perform Wiener filtering of an corrupted image.

10 WAP to compute 2-D DFT of an image.

11 WAP to compute the circulation correlation and circular convolution between two images.

12 WAP to perform image compression using block truncation coding (BCT).

NOTE: At least 10 experiments are to be performed from above list.

B.TECH VIII SEMESTER

Neural Fuzzy Systems Lab

(EC-48P4)

P	**Cr**	
2	**1**	**On Semester Examination : 120 Marks** **End Semester Examination: 80 Marks**

LIST OF EXPERIMENTS

1. To design AND, OR and NOT gate using Neuron.
2. To classify odd and even numbers using Perceptron.
3. To Design Back Propagation Neural Network for alphabet recognition.
4. To Design Hopfield network for recognizing pattern such as '+' and '-'.
5. To Design NN for XOR classification using back propagation.
6. To design CPN for image classification.
7. To create Name and Telephone number recognition system.

B.TECH VIII SEMESTER
MOBILE COMPUTING
(EC-48E1)

L	T	Cr	On Semester Evaluation:100 Marks
3	1	4	End Semester Evaluation: 100 Marks
Time: 3 hrs			Marks:100

NOTE: There shall be nine questions in total. The question No.1 is compulsory and will have four parts a, b ,c ,d covering entire syllabus. There shall be two questions from each unit and students have to attempt one question from each unit. All questions will carry equal marks. Question paper should have 25 % numerical part.

UNIT- I

Introduction to Mobile Computing: Overview of mobile technologies, Anatomy of a mobile device, Survey of mobile devices, Mobile computing, Applications of mobile computing, Future of mobile computing.

WLAN: Infra-red vs radio transmission, Infrastructure and ad-hoc networks, IEEE 802.11, Bluetooth: User scenarios, Physical layer, MAC layer, Networking, Security, Link management.

UNIT – II

(Wireless) Medium Access Control: Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

Mobile Network Layer: Mobile IP (Goals, Assumptions, Entities & Terminology, IP packet delivery, Agent advertisement and discovery, Registration, Tunneling and Encapsulation, Optimizations), Dynamic Host Configuration Protocol (DHCP).

Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/ fast recovery, Transmission/ time-out freezing, Selective retransmission, Transaction oriented TCP.

UNIT-III

Database Issues: Hoarding techniques, Caching invalidation mechanisms, Client server computing with adaptation, Power-aware and context-aware computing, Transactional models, Query processing, Recovery and quality of service issues.

Data Dissemination: Communications asymmetry, Classification of new data delivery mechanisms, Push-based mechanisms, Pull-based mechanisms, Hybrid mechanisms, Selective-tuning (indexing) techniques.

UNIT-IV

Mobile Ad hoc Networks (MANETs): Overview, Properties of a MANET, Spectrum of MANET

applications, Routing and various routing algorithms, Security in MANETs.

Protocols and Tools:Wireless Application Protocol- WAP (Introduction, Protocol architecture, and

Treatment of protocols of all layers) and J2ME.

Text Books:

1. Jochen Schiller, "Mobile Communications", Addison-Wesley. (Chapters 4, 7, 9, 10, 11), Second edition, 2004.
2. Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing" ,Wiley, 2002, ISBN 0471419028. (Chapters 11, 15, 17, 26 and 27)

Reference Books:

1. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, October 2004.

B.TECH VIII SEMESTER

ADVANCED MICROPROCESSORS

(EC-48E2)

L	T	Cr	On Semester Evaluation:100 Marks
3	1	4	End Semester Evaluation: 100 Marks

Time: 3 hrs **Marks:100**

NOTE: There shall be nine questions in total. The question No.1 is compulsory and will have four parts a, b, c, d covering entire syllabus. There shall be two questions from each unit and students have to attempt one question from each unit. All questions will carry equal marks. Question paper should have 25 % numerical part.

UNIT- I

Intel's X86 Family: Introduction, Register set, Addressing modes, Interrupts, Memory hierarchy, Pipelining, Segmentation, Paging, Real and virtual mode execution, Selectors & descriptors, Protection mechanism, Task management.

UNIT – II

Architecture of Intel X86 Family: '80186, 80286, 80386, 80486- CPU block diagrams, Pin diagrams and internal descriptions, Paging mechanisms, Real and virtual operating modes, Memory system', Difference between 8086 and 80186, Intel X86 instruction set, Assembler directives.

UNIT-III

Arithmetic Co-processors: 80287 & 80387- Architecture, Pin diagram, Internal architecture, Status register, Control register; Tag register, Instruction set – Data transfer, Arithmetic, Comparison, Transcendental operations, Constant operations and control instructions, Interfacing 80287 with 80286, Interfacing 80387 with 80386.

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UNIT-IV

Pentium: Introduction, Architecture, Description of pin diagram, Memory system, Branch prediction logic, Super pipelining vs Superscaler, Paging.

Introduction to P 6 Processors: Pentium-pro, Pentium-II, Celeron & Celeron A, Pentium III, Xeon Processors.

Reference Books:

1. Daniel Tabak, Advanced Microprocessors (2nd ed) McGraw Hill Pub.
2. Barry B.Brey, The Intel Microprocessors (4th ed) PHI Pub.
3. DV-Hall , Microprocessors & Interfacing (2nd ed) Mc Graw Hill Pub.

4. John Uffenbeck, The 80X86 Family (Design, Programing and Interfacing)- 3rd ed, Pearson Edu.
5. A.K.Rai, K.M. Bhurchandi, Advanced Microprocessors & Peripherals (2nd ed), Tata McGraw Hill.

B.TECH VIII SEMESTER

DATA BASE MANAGEMENT SYSTEMS

(EC-48E3)

L	T	Cr	On Semester Evaluation:100 Marks
3	1	4	End Semester Evaluation: 100 Marks

Time: 3 hrs **Marks:100**

NOTE: There shall be nine questions in total. The question No.1 is compulsory and will have four parts a, b ,c ,d covering entire syllabus. There shall be two questions from each unit and students have to attempt one question from each unit. All questions will carry equal marks. Question paper should have 25 % numerical part.

UNIT- I

Basic Concepts: What is database system, Why database, Data independence, 3 levels of architecture; External level, Conceptual level, Internal level, Mapping DBA, DBMS, Organization of databases, Components of DBMS, Data models, Relational models, Networks data model, Hierarchical model, Semantic data model.

. UNIT – II

Relational Model: Introduction – Relational model, Base tables & views, Relations, Domains, Candidate keys, Primary key, Alternate keys, Foreign key, Integrity rules, SQL, Data base design – Introduction, Basic definitions, Non-loss decomposition and functional dependencies, Normalization, 1NF, 2NF, 3NF.

UNIT-III

Parallel Transactions: Transactions, Transaction state, Concurrent executions, Serializability Lock based protocols, Timestamp based protocols, Validation based protocols, Deadlock handling.

UNIT-IV

Advanced Databases: Introduction to spatial databases, Spatial data representation: Raster, Vector, Geographic Information Systems (GIS), GIS desktop systems, GIS server systems, Data warehousing, Data mining

Text Books:

1. Database System Concepts by A. Silberschatz, H.F. Korth and S. Sudarshan, 3rd edition, 1997, McGraw-Hill, International Edition.
2. Introduction to Database Management system by Bipin Desai, 1991, Galgotia Pub.

Reference Books:

1. Fundamentals of Database Systems by R. Elmasri and S.B. Navathe, 3rd edition, 2000, Addision-Wesley, Low Priced Edition.
2. An Introduction to Database Systems by C.J. Date, 7th edition, Addison-Wesley, Low Priced Edition, 2000.

3. Database Management and Design by G.W. Hansen and J.V. Hansen, 2nd edition, 1999, Prentice-Hall of India, Eastern Economy Edition.
4. Database Management Systems by A.K. Majumdar and P. Bhattacharyya, 5th edition, 1999, Tata McGraw-Hill Publishing