

## SEVENTH SEMESTER

Code No.	Paper	L	T/P	Credits
<b>THEORY PAPERS</b>				
ETIC 401	Micro Controller	3	1	4
ETIC 403	Biomedical & Analytical Instrumentation	3	1	4
<b>ELECTIVES (SELECT ANY TWO)</b>				
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
<b>PRACTICAL/VIVA VOCE</b>				
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
	<b>Total</b>	<b>12</b>	<b>18</b>	<b>24</b>

### # 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.

## EIGHTH SEMESTER

Code No.	Paper	L	T/P	Credits
<b>THEORY PAPERS</b>				
ETIC 402	Soft Computing	3	1	4
ETIC 404	Robotics	3	1	4
<b>ELECTIVES - SELECT ANY ONE</b>				
ETEC 406	Consumer Electronics	3	1	4
ETIT 408	Embedded System	3	1	4
ETEE 410	Object Oriented Software Engineering	3	1	4
ETEC 412	Digital image processing	3	1	4
ETEE 414	Advanced Computer Networks	3	1	4
<b>PRACTICAL/VIVA VOCE</b>				
ETIC 452	Soft Computing Lab	0	2	1
ETIC 454	Robotics Lab	0	2	1
ETIC 456	Elective Lab.	0	2	1
ETIC 458	*Major Project	0	12	7
<b>Total</b>		<b>09</b>	<b>21</b>	<b>22</b>

\*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.

### NOTE:

- The total number of the credits of the B.Tech. (I & CE) Programme = 214
- Each student shall be required to appear for examinations in all courses. However, for the award of the degree a student shall be required to earn the minimum of 200 credits.

### INSTRUCTIONS TO PAPER SETTERS:

**MAXIMUM MARKS: 75**

- 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.
- 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.

**Paper Code: ETIC -**

**401**

**L T**

**C**

**Paper Microcontroller**

**3 1 4**

**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

**PAPER CODE – ETIC - 403**

**L T C**

**PAPER: BIOMEDICAL & ANALYTICAL INSTRUMENTATION**

**3 1 4**

**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 photometry, 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

**Paper Code – ETEE - 05**  
**Paper Computer Networks**

**L T C**

**3 1 4**

**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", 3<sup>rd</sup> 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.

**Paper Code - ETIC -  
409**

**L T C**

**Paper: Instrumentation  
Diagnostics**

**3 1 4**

**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]**

**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]**

**11]**

**UNIT – IV**

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

**[No. of Hrs.: 11]**

**11]**

**TEXT BOOK:**

1. Instrumentation Measurement & Analysis., B C Nakra, K K Chaudhry, PHI, 2003
2. Mechanical 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  
ontrol****3 1 4****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.

**11]****[No. of Hrs.:****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)

**11]****[No. of Hrs.:****UNIT - III**

Case study of Steel Plant, Sugar Plant, cement plant

**11]****[No. of Hrs.:****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 2<sup>nd</sup> 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

**Paper Code - ETIC - 413****L T C****Paper Database Management system****3 1 4****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, 4<sup>th</sup> Edition

**REFERENCE BOOKS:**

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

**Paper Code - ETEE -  
415**

**L T C**

**Paper Software Engineering  
3 1 4**

**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", 2<sup>nd</sup> Ed., New Age International, 2005.
2. R. S. Pressman, "Software Engineering - A practitioner's approach", 5<sup>th</sup> 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. Chandrasekhkar, "Software Engineering & Quality Assurance", BPB, 2005.

**Paper Code - ETIC -  
417**

**L T C**

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

**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.,

<b>Code</b>		<b>No.</b>	<b>:</b>	<b>ETIC</b>
<b>451</b>				
<b>L</b>	<b>P</b>	<b>C</b>		
<b>Paper: Micro Controller</b>				
<b>Lab.</b>				
<b>0</b>	<b>2</b>	<b>1</b>		

Practical will be based on Micro Controller.

<b>Code</b>	<b>No.</b>	<b>:</b>	<b>ETIC</b>
			<b>453</b>
	<b>L</b>	<b>P</b>	<b>C</b>
<b>Paper: Biomedical Lab.</b>			
	<b>0</b>	<b>2</b>	<b>1</b>

Practical will be based on Biomedical.

<b>Code</b>		<b>No.</b>	<b>:</b>	<b>ETIC</b>
<b>455</b>				<b>L</b>
<b>P</b>	<b>C</b>			
<b>Paper: #^Practical Training</b>				
	<b>0</b>	<b>0</b>	<b>1</b>	

#NUES

^Practical training conducted after sixth semester will be evaluated in the Seventh Semester based on Viva-Voce.

<b>Code</b>		<b>No.</b>	<b>:</b>	<b>ETIC</b>
<b>457</b>				<b>L</b>
<b>P</b>	<b>C</b>			
<b>Paper: Minor Project</b>				
	<b>0</b>	<b>8</b>	<b>4</b>	

Students may choose a project based on any subject of Electrical & Electronics Engineering. 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.

**Code No. : ETIC 459**  
**L P C**

**Paper:**  
**#Seminar**  
**0 2 1**

#NUES

A college committee will evaluate the performance of the students & marks will be awarded accordingly.

**Paper Code: ETIC - 402**  
**L T C**  
**Paper: Soft Computing**  
**3 1 4**

#### 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

#### **REFERENCE BOOKS;**

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

**Paper Code: ETIC - 404**

<b>L</b>	<b>T</b>	<b>C</b>
<b>Paper: Robotics</b>		
	<b>3</b>	<b>1</b>
		<b>4</b>

#### UNIT - I

Introduction : Robotics concept and problems , Co-ordinates and co-ordinate inversion, Trajectory P planning , some system concepts. Clocks, sensors , Actuators and control , Signal processing Generation of Robots Kinematics : Introduction , reference frames, rotation matrix , Rigid body , Motion , Angular velocity of rigid body , moving , motion relative4 to moving reference frames , Homogenous frames Homogenous co- ordinates. **[No. of Hrs.:**

**11]**

#### UNIT - II

Euler's Laws: Introduction , Theorems and facts about moment , Euler's law of motion Sensors and Instrumentation: Used sensors, the piezoelectric Accelerometer hall effect sensors. Optical encoders, Tactile & force sensors.

**[No. of Hrs.: 11]**

**UNIT - III**

Image Identification : Lenses , Vidicon tube , solid state vision systems, image processing binary image analysis identification , the transformation. **[No. of Hrs.: 11]**

**UNIT - IV**

Actuators and Power Transmission Devices: Pneumatic and hydraulic Actuators. Electrical Actuators, power transmission Trajectory Planning & control: Manipulator Equations of motion manipulator control, the measure of the Robot **[No. of Hrs.: 11]**

**TEXT BOOKS:**

1. Robotics Control Sensing , Vision and Intelligence, K.S.Fu / ./ McGraw Hill, 1st Edition
2. Introduction to Robotics ,J.Craig, Addison Wesley

**REFERENCE BOOKS:**

1. Analytical Robotics and Mechatronics , WolframStadler , McGraw Hill

**Paper Code: ETEC - 406**

	<b>L</b>	<b>T</b>	<b>C</b>
<b>Paper: Consumer Electronics</b>			
	<b>3</b>	<b>1</b>	<b>4</b>

**UNIT - I**

Audio System : Hi-Fi systems, stereophonic sound system , public address systems, Acoustics Quadraphonic sound systems, Graphics Equalizer, speed Synthesizer, Electronic tuning. **[No. of Hrs.: 11]**

**UNIT - II**

Video Systems : B& W TV , color TV and HD TV systems , Electric cameras, VCR , VCP , CD systems , Memory diskettes , Discs and drums vide monitoring audio , video Recording media and systems. **[No. of Hrs.: 11]**

**UNIT - III**

Dolby noise reduction digital and analog recording. Switching Systems: Switching systems for telephone exchange , PAB EPABX , modular telephones, Telephone massage recording concepts, remix controlled systems. **[No. of Hrs.: 11]**

**UNIT - IV**

Home Appliances : Electronics toys , microwave oven , Refrigerators , washing machines, calculators, data organizers **[No. of Hrs.: 11]**

**TEXT BOOKS:**

1. R.R.Gulati / Monochrome and color television / New age publisher
2. Encyclopedia of video & TV /Focal press.

**REFERENCE BOOKS:**

1. **Handbook of Electronics & Telecommunication.**

**Paper Code: ETIT - 408**

**L T C**

**Paper: Embedded System**

**3 1 4**

**UNIT - I**

**Introduction to an embedded systems design &**

**RTOS:** Introduction to Embedded system, Processor in the System, Microcontroller, Memory Devices, Embedded System Project Management, ESD and Co-design issues in System development Process, Design cycle in the development phase for an embedded system, Use of target system or its emulator and In-circuit emulator, Use of software tools for development of an ES. Inter-process Communication and Synchronization of Processes, Tasks and Threads, Problem of Sharing Data by Multiple Tasks, Real Time Operating Systems: OS Services, I/O Subsystems, Interrupt Routines in RTOS Environment, RTOS Task Scheduling model, Interrupt Latency and Response times of the tasks.

**[No. of Hrs.: 11]**

**UNIT - II**

**Overview of Microcontroller:** Microcontroller and Embedded Processors, Overview of 8051 Microcontroller family: Architecture, basic assembly language programming concepts, The program Counter and ROM Spaces in the 8051, Data types, 8051 Flag Bits and PSW Register, 8051 Register Banks and Stack Instruction set, Loop and Jump Instructions, Call Instructions, Time delay generations and calculations, I/O port programming Addressing Modes, accessing memory using various addressing modes, Arithmetic instructions and programs, Logical instructions, BCD and ASCII application programs, Single-bit instruction programming, Reading input pins vs. port Latch, Programming of 8051 Timers, Counter Programming .

**[No. of Hrs.: 11]**

**UNIT - III**

Communication with 8051: Basics of Communication, Overview of RS-232, I<sup>2</sup>C Bus, UART, USB, 8051 connections to RS-232, 8051 serial communication programming, 8051 interrupts, Programming of timer interrupts, Programming of External hardware interrupts, Programming of the serial communication interrupts, Interrupt priority in the 8051

**11]**

**[No. of Hrs.: 11]**

**UNIT - IV**

Interfacing with 8051: Interfacing an LCD to the 8051, 8051 interfacing to ADC, Sensors, Interfacing a Stepper Motor, 8051 interfacing to the keyboard, Interfacing

a DAC to the 8051, 8255 Interfacing with 8031/51, 8051/31 interfacing to external memory. **[No. of**

**Hrs.: 11]**

**TEXT BOOKS:**

1. Raj Kamal, "Embedded Systems", TMH, 2004.
2. M.A. Mazidi and J. G. Mazidi, "The 8051 Microcontroller and Embedded Systems", PHI, 2004.

**REFERENCES BOOKS:**

1. David E. Simon, "An Embedded Software Primer", Pearson Education, 1999.
2. K.J. Ayala, "The 8051 Microcontroller", Penram International, 1991.
3. Dr. Rajiv Kapadia, "8051 Microcontroller & Embedded Systems", Jaico Press
4. Dr. Prasad, "Embedded Real Time System", Wiley Dreamtech, 2004.

**Paper Code: ETEE - 410**

**L T C**

**Paper: Object Oriented Software Engineering**

**3 1 4**

**UNIT – I**

Introduction to Software Engineering: Software Engineering Development, Software Life Cycle Models, Comparison of various models

Requirement Elicitation: Introduction to Object Oriented Methodology, Overview of Requirements Elicitation, Requirements Model-Action & Use cases, Requirements Elicitation Activities, Managing Requirements Elicitation. **[No. of Hrs.: 11]**

**UNIT – II**

Architecture: Introduction, System development is model building, model architecture, requirements model, analysis model, the design model, the implementation model, test model

Analysis: Introduction, the requirements model, the analysis model

**[No. of Hrs.: 11]**

**UNIT – III**

Construction: Introduction, the design model, block design, working with construction Testing: introduction, on testing, unit testing, integration testing, system testing, the testing process. **[No. of Hrs.: 11]**

**11]**

**UNIT – IV**

Modelling with UML: Basic Building Blocks of UML, A Conceptual Model of UML, Basic Structural Modeling, UML Diagrams. Case Studies **[No. of Hrs.: 11]**

**TEXT BOOKS:**

1. Ivar Jacobson, “Object Oriented Software Engineering”, Pearson, 2004.
2. Grady Booch, James Runbaugh, Ivar Jacobson, “The UML User Guide”, Pearson, 2004.
3. Wendy Boggs, Boggs, Michael Boggs “Mastering UML with Rational Rose”, BPB Publication, 2003.

**REFERENCES BOOKS:**

1. Stephen R. Scach, “Classical & Object Oriented Software Engineering with UML and Java: McGraw Hill, 1999.
2. Richard C. Lee, William M. Tepfenhard, “UML and C++, A Practical guide to object-oriented Development”, Pearson Education, 2002.

**Paper Code: ETEC - 412**

**L T C**

**Paper: Digital Image  
Processing  
4**

**3 1**

**UNIT - I**

Introduction and digital image fundamentals : Digital image Representation , Fundamental steps in image processing ,elements of digital image processing systems , sampling and quantization , some basic relationship like neighbors , connectivity , Distance measure between pixels . Imaging Geometry Image Transforms: Discrete Fourier Transform , some properties of the two-dimensional Fourier transform , fast Fourier transform, Inverse FFT. **[No. of Hrs.: 11]**

**UNIT - II**

Image Enhancement : Spatial domain methods, frequency domain methods , Enhancement by point processing , spatial filtering .low[pass filtering , High pass filtering Homomorphic filtering, Colour image processing **[No. of Hrs.: 11]**

**UNIT - III**

Image Restoration : Degradation model, Diagonalization of Circulant and block-Circulant Matrices , Algebraic Approach to restoration , Inverse filtering , Wiener filter , Constrained least square Restoration , Interactive Restoration , Restoration in spatial Domain. Image Compression: Coding , Interpixel and psycho visual Redundancy , Image compression models error free comparison , lossy compression,Image compression standards.

**[No. of Hrs.: 11]**

**UNIT - IV**

Image segmentation: Detection of Discontinuities Edge linking and boundary detection Thresholding , region oriented segmentation ,motion based segmentation.

Representation and Description : Representation schemes like chain coding , polygonal Approximation , signatures , boundary segments , skeleton of region , boundary description , regional descriptors , Morphology . Recognition and Interpretation : Elements of image analysis , pattern classes , Decision theoretic methods , structural methods, interpretation. **[No. of Hrs.: 11]**

**11]**

**TEXT BOOKS:**

1. Digital image processing, Rafael C. Gonzalez & R.E . Woods,Pearson ,5<sup>th</sup> edition 2005
2. Digital Image Processing, A.K. Jain ,PHI, 2004
3. Digital Image Processing, Chanda & Majumdar ,PHI,2002

**REFERENCE BOOKS:**

1. Digital Image Processing ,Nick efford,Pearson education 2004.
2. Digital Image Processing , Kenneth R. Castlema

**Paper Code: ETEE - 414**

**L            T            C**

**Paper: Advanced Computer Networks**

**3            1            4**

**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).

**[N**

**o. 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, 2<sup>nd</sup> 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", 3<sup>rd</sup> 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", 3<sup>rd</sup> Ed, PHI, 1999.
7. Laura Chappell (ed), "Introduction to Cisco Router Configuration", Techmedia, 1999.

**Code No. : ETIC 452**  
**L P C**  
**Paper: Soft Computing Lab.**  
**0 2 1**

Practical will be based on Soft Computing.

**Code No. 454** **ETIC**  
**L P C**  
**Paper: Robotics Lab.**  
**0 2 1**

Practical will be based on Robotics

**Code No. 456** **ETIC**  
**L P C**  
**Paper: Electives**  
**0 2 1**

Practical will be based on Electives

**Code No. 458** **ETIC**  
**L P C**  
**Paper: Major Project**  
**0 12 7**

**GURU GOBIND SINGH  
 INDRAPRASTHA  
 UNIVERSITY**

**Note:** Students may choose a project based on any subject of Electrical & Electronics Engineering. 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.