

UNIVERSITY OF MUMBAI
SCHEME OF INSTRUCTIONS & EXAMINATION
BE (ELECTRONICS ENGINEERING)

SEMESTER VII

Sr. No.	Subjects	No. of Periods per Week			Duration of Theory Paper(Hrs)	Marks				
		Lectures	Practicals	Tutorials		Theory Paper	Term Work	Practical	Oral	Total
1.	Basics of VLSI	4	2	-	3	100	25	-	25	150
	Instrumentation Systems	3	2	-	3	100	25	-	-	125
2.	Digital Communication	3	2	-	3	100	25	-	25	150
3.	Filter Theory and Applications	4	2	-	3	100	25	-	-	125
4.	Elective -I	4	2	-	3	100	25	-	25	150
5.	Project-A	-	-	4	-	-	25	-	-	25
Total		18	10	4	-	500	150	-	75	725

Elective I
Image Processing
Process Control & Instrumentation
Microcomputer System Design
DSP Architectures and Systems
Wireless Communication

B.E. ELECTRONICS ENGINEERING

FOURTH YEAR semester VII

SUBJECT: **Basics of VLSI**

Rationale: This subject shall foundation for understanding the intricacies of very large scale integrated circuits and analyzing these circuits. The knowledge gained shall be useful for further elective on designing with VLSI circuits

DETAILED SYLLABUS

Physics of FET

NMOS, PMOS, enhancement and depletion mode transistor, MOSFET, threshold voltage, flatband condition, threshold adjustment, linear and saturated operation, FET capacitance, mobility saturation; thermal variation, short channel and hot electron effect

Silicon semiconductor technology .

Wafer processing, mask generation, oxidation, epitaxy ion implantation, diffusion, metalization, basic NMOS and PMOS processes. Process simulation using CAD tools

Scaling

Scaling of MOS circuits, type of scaling, functional limitations of scaling, scaling of wires and interconnects

Design rules and layout

Purpose of design rules, NMOS and CMOS design rules and layout, Design of NMOS and CMOS inverters, NAND and NOR gates. Interlayer contacts, butting and buried contacts, stick diagrams, layout of integrated circuits, use of layout tools like MAGIC for integrated circuits.

MOS Inverters

MOSFET aspect and inverter ratio, Enhancement VS Depletion mode pull ups, standard CMOS inverter, transit time and switching speed of NMOS and CMOS inverters, NMOS and CMOS gates, transistor sizing and power dissipation, noise margin calculations, SPICE models and circuit simulation using PSPICE.

Design of basic VLSI circuits

Design of circuits like multiplexer, decoder, priority encoder, Flip flops, shift registers using MOS circuits

Design Methodologies

Design analysis and simulation, design verification, design implementation, design synthesis, validation and testing of manufactured circuits.

BOOKS

Text Books:

1. E. D. Fabricus, Introduction to VLSI design, McGraw Hill Publications, first edition, 1990
2. Neil H.E. Weste, Kamran Eshraghian, Principles of CMOS VLSI Design: A System-Level Perspective, second edition, Addison Wesley Publications, 1993
3. Rabaey Jan M., Chandrakasan Anantha, Nikolic Borivoje, Digital Integrated Circuits: A Design Perspective, second edition, Prentice Hall of India

TERM WORK

The Term work shall consist of at least four computer programs and at least six assignments covering the whole syllabus, duly recorded and graded. This will carry a weightage of fifteen marks. A term work test shall be conducted with a weightage of 10 marks.

ORAL EXAMINATION

An oral examination is to be conducted based on the above syllabus.

B.E. ELECTRONICS ENGINEERING

FOURTH YEAR semester VII

INSTRUMENTATION SYSTEMS

Lectures : 3 Hrs per week
Practical : 2 Hrs per week

Theory : 100 Marks
Term Work : 25 Marks

Rationale: The art of measurement plays an important role in all branched of engineering & science. With the advancement of technology, measurement techniques have taken rapid strides during recent year with the introduction of different types of instrumentation devices. The aim is to bring these developments together.

Fundamental Concept Of Measurement & Performance Characteristics of An Instrumentation System

System Configuration-Block diagram of a generalized measurement system "Generalized measurements- Transfer function representation & sinusoidal Transfer function.

*Zero order system

*First order system- Response of a system to Step, Ramp, Impulse input & Frequency response ..•

*Second order system - Response of the system to Step, Ramp input , Frequency response of. Second order system.

Dead time element

Dynamic response of measurement systems

Transducers

Classification and Requirements

"Displacement-

principle of transducers, potentiometric displacement transducer, LVDT

Variable capacitance transducer, Hall effect- angular displacement transducer

Digital transducer.

Strain-

Types of Strain gauge, theory of operation of resistance strain gauge electrical strain gauge, Materials for strain gauge, Gauging techniques gauge circuits, Temperature compensation, Application.

"Vibration

Vibration sensing *Devices*- Velocity transducer, Bonded Strain Gauge Accelerometer, Piezoelectric Accelerometer, servo Accelerometer, Digital Accelerometer Signal conditioners for vibration transducer output.

Voltage amplifier, Charge amplifier.

Temperature

Classification of temperature sensors

Resistance type temperature sensor, Platinum resistance thermometer

Thermistor

Thermocouples- Properties, Materials used for construction, Reference junction compensation, Thermocouple o/p linearizing circuits

Temp measurement by radiation method. Optical pyrometer

Solid state transducer

Pressure

Diaphragms, capsule, Borden tube, Bellows, Variable reluctance type, Variable capacitance type, Thin film pressure transducer, Digital pressure, piezoelectric

Force and torque

Different types of load cells configuration, Effect of temp variation, Dynamic response of elastic transducer, Digital force transducer.

Torque measurement- absorption type, Transmission type, Stress type, and deflection type.

Flow

Classification of flow meter, Head type, Electromagnetic type, Rotameter, Anemometer, Ultrasonic flow meter.

Photoelectric transducer

The photomultiplier tube, Photoconductive cell, photovoltaic cell, Semiconductor photo diode, photo transducer

Data acquisition

- Generalized data acquisition system, Multi-channel DAS, Data logger, PC based data acquisition System, Concept of Virtual Instrumentation.

BOOKS

Text Books:

1. Rangan, Sharma & Mani, Instrumentation Devices and Systems, Tata McGraw Hill, second edition

Additional Reading:

1. Doebelin E.O., Measurement systems - Applications and Design, fourth edition, Tata McGraw Hill, fourth edition, 1990.
2. Jones and Chin, Electronic Instruments and Measurements, John Wiley and Sons, 1987.
3. Nakra and Chaudhary, Instrumentation, Measurement and Analysis, Tata McGraw Hill, second edition, 2003

BE ELECTRONICS ENGINEERING
FOURTH YEAR semester VII
SUBJECT : Instrumentation Systems

Lectures : 3 Hrs per week
Practical : 2 Hrs per week

Theory : 100 Marks
Term Work : 25 Marks

Rationale : The art of measurement plays an important role in all branches of engineering & science. With the advancement of technology, measurement techniques have been rapid strides during recent year with the introduction of different types of instrumentation devices. The aim is to bring these developments together.

Detailed syllabus

Fundamental Concept of Measurement & Performance Characteristics of An Instrumentation System

System Configuration-Block diagram of a generalized measurement system,
Generalized measurements- transfer function representation & sinusoidal transfer function.
Zero order system
First order system- Response of a system to Step, Ramp, Impulse input & Frequency response.
Second order system – Response of the system to Step, Ramp input & Frequency response of Second order system.
Dead time element.
Dynamic response of measurement systems.

Transducers

Classification and Requirements.

Displacement- Principle of transducers, potentiometric displacement transducer, L.V.D.T. variable capacitance transducer, Hall effect –angular displacement transducer, Digital transducer.

Strain- Types strain gauge, theory of operation of resistance strain gauge, types of electrical strain gauge, materials for strain gauge, gauging techniques, strain gauge circuits, Temperature compensation, application.

Vibration

Vibration sensing Devices- Velocity transducer, Bonded strain gauge Accelerometer, Piezoelectric Accelerometer, servo Accelerometer, digital Accelerometer.

Signal conditioners for vibration transducer output.

Voltage amplifier, charge amplifier.application

Temperature-Classification of temperature sensors. Resistance type temperature sensor, platinum resistance thermometer. Thermistor.

Thermocouples-Properties, Material used for construction, reference junction compensation, Thermocouple output linearizing circuits.

Temperature measurement by radiation method-optical pyrometer. Solid state transducer.

Pressure-Diaphragms, capsule, bourdon tube, bellows, variable reluctance type, variable capacitance type, thin film pressure transducer, digital pressure transducer, piezo electric transducer.

Force and Torque- Different types of load cell configuration, effect of temp, variation, dynamic response of elastic transducer, digital force transducer.

Torque Measurement-Absorption type, Transmission type, Stress type, and deflection type.

Flow- Classification of flow meter, Head type flow meter, Electromagnetic type, Rotameter, Anemometer, Ultrasonic flow meter.

Photo Electric Transducer- The photo multiplier tube, photo conductive cell, photo-voltaic cell, semiconductor photo diode, photo transducer.

Data Acquisition

Generalized data acquisition system, Multi-channel DAS, Data logger, PC based data acquisition system, Concept of virtual instrumentation.

Books

Text Books:

1. Rangan, sharma & mani, Instrumentation devices and systems, Tata Mcgraw hill, Second edition.

Additional Reading:

1. Doebelin E.O., Measurement systems- Applications and design, fourth edition, Tata Mcgraw Hill, fourth edition, 1990.
2. Jones and chin Electronic Instruments and Measurements, John willey and Sons, 1987.
3. Nakra and Chaudhary, Instrumentation, Measurement and Analysis, Tata Mcgraw hill, second 2003.
4. Neubert H.K. instrument transducers, oxford university press second edition.

Term work

1. Term work shall consist of at least eight practicals covering the topics of the syllabus.
2. A term work test shall be conducted with a weightage of 10 marks.

B.E. ELECTRONICS ENGINEERING

FOURTH YEAR semester VII

SUBJECT: Digital Communication

Lectures: 3 Hrs per week

Theory: 100 Marks-

Practical: 2 Hrs per week

Term Work: 25 Marks

Cral: 25 Marks I

Rationale: The increase in demand for data transmission coupled with the availability of wideband communication channels and sophisticated integrated circuits have led to the development of efficient and reliable digital communication.

DETAILED SYLLABUS|

Random variables

Review of probability theory, communications examples, Random variables, probability Distribution function, probability density function, joint cumulative distribution and probability density, average value and variance of a random variable, The error function, The Gaussian probability density The Rayleigh probability density. The central limit theorem_

Information Theory

Discrete messages. the concept of amount of Information, Entropy, Information r2te. coding to increase Average Information per bit - Huffman coding, Lempel Ziv coding Shannon's Theorem, Channel capacity, capacity of a Gaussian channel, Bandwidth - S/N trade - off.

Error control coding

Rationale for coding and types of codes, Discrete memoryless channel, some Algebraic concepts - code efficiency and Hamming bound, linear block codes, Cyclic codes, Convolutional codes, maximum likelihood decoding of convolutional codes ..

Baseband shaping for data transmission

Discrete PAM signals, Power spectra of discrete PAM signals. Intersymbol Interference. Nyquist's criteria for distortion less baseband, Binary transmission, correlative coding eyepattern , Baseband M - ary PAM syst.ems. i

Baseband Detection

Correlation receiver, Matched filter receiver, Detection of signals with unknown phase in noise, Equalization concepts [no algorithms expected]. Tapped - Delay Lines equalization, linear predictive vocoders.

Digital Modulation techniques

Digital Modulation formats, coherent binary modulation techniques, coherent quadrature modulation techniques, Noncoherent binary modulation techniques, Comparison of binary and quaternary modulation techniques, M-ary modulation, Power spectra, Bandwidth efficiency, Applications of digital modulation techniques ..

Spread spectrum modulation

Pseudo - noise sequences, Baseband spread spectrum system, SS - BPSK; processing gain, Probability of error, Jamming Margin, Frequency - Hop spread spectrum, Applications.

BOOKS

Text Books:

1. Simon Haykin, Digital communication John Wiley and sons [Topics 3,4,5,6,7]
2. Taub and Schilling : Principles of communication systems - Tata McGraw Hill, second edition

Additional Reading:

1. John G. Proakis, Digital Communications, McGraw Hill
2. Bernard Shklar, Digital Communication, Pearson Education
3. K Sam Shanmugam - Digital and Analog Communication systems, John Wiley and sons.
4. Lathi B.P., Modern Digital and Analog communications systems - PRISM Indian edition

TERM WORK

1. Term work shall consist of at least eight practicals and assignments covering the topics of the syllabus.
2. A term work test shall be conducted with a weightage of 10 marks

ORAL EXAMINATION

An oral examination is to be conducted based on the above syllabus.

BE ELECTRONICS ENGINEERING
FOURTH YEAR semester VII

Subject : Filter Theory and Applications

Lectures : 4 Hrs per week

Theory : 100 Marks

Practical : 2 Hrs per week

Term Work : 25 Marks

Rationale: Digital filters are widely used today in many diverse application areas naturally filter design techniques play vital role in DSP applications. Some of these techniques are based on analog domain designing. It is therefore necessary to know different analog & digital filter designing concepts.

Detailed syllabus

Filter Analysis in Frequency domain

- Review of frequency response of IIR filter
- Linear phase FIR systems
- Condition for linear phase
- Magnitude & phase response for four types of linear phase system
- Location of zeros.

Analog filter designing techniques

- The design process
- The Butterworth filter
- The Chebyshev approximation
- The elliptic approximation
- The Bessel function

IIR Digital filter Design

- Methodology, Analog & digital domain mapping, spectral transformations
- Impulse-Invariance Method
- Bilinear transform technique
- Matched Z-Transform technique
- Intuitive approaches

FIR Digital filter Design

- FIR versus IIR filters
- Window-based design of different types of filters
- Gibbs' phenomenon
- Design using different windows
- Use of Kaiser window
- Half-Band FIR filters
- Frequency sampling technique
- Design of optimal linear phase FIR filters
- Structures for implementation of filters

Quantization Effects

- Quantization methods
- Limit cycle oscillations due to Quantization
- Errors in frequency response due to coefficient quantization

Books

Text Books:

1. A. Antoniou, Digital Filters: Analysis Design Design and Applications, Tata Mc Graw Hill Publication, 2001.
2. Ashok Ambandar, Analog and Digital Signal Processing, Thomson Learning Publication, second edition, 2001.

Additional Reading:

1. T.J.Cavicchi, Digital Signal Processing, Wiley Publication, 2002
2. S.K.Mitra, Digital Signal Procesing, Tata McGraw-Hill Publication, 2001.

Term Work

1. Term work shall consist of at least six software programs written in C/MATLAB and two assignments covering the topics of the syllabus.
2. A tem work test shall be conducted with a weightage of 10 marks.

BE ELECTRONICS ENGINEERING

FORTH YEAR semester VII

Subject : Elective – I image processing

Lecture : 4 Hrs per week
Practical : 2 Hrs per week

Theory : 100 marks
Term Work : 25 Marks Oral: 25 Marks

Rationale: Image processing has grown considerably due to fast computational systems. Many important real life applications in diverse fields are therefore possible. This first course in image processing shall teach basic concepts in the subject.

Detailed Syllabus

Digital Image Processing Systems: Image acquisition, storage, processing, communication and display.

Visual Perception: Structure of human eye, image formation in the human eye, brightness, adaptation and discrimination.

Image model: Uniform and non-uniform sampling and quantization.

Discrete 2-D linear processing: Superposition and convolution, unitary transforms, linear processing techniques.

Image transforms: 2-D DFT/FFT, walsh, hadamard transforms, discrete cosine and sine transforms, haar transform, slant transform, hotelling transform.

Image enhancement: Contrast manipulation, Histogram modification, noise cleaning, edge sharpening, frequency domain methods, like low-pass and high-pass filtering, homomorphic filtering.

Image segmentation: Detection of discontinuity, point line and edge detection, edge linking and boundary detection, thresholding, image interpretation.

Image Compression: Coding redundancy, psycho-visual redundancy. Fidelity criteria, MSE, fundamental coding theorem. Error-free compression, variable, length coding bit plane coding. Loss-less predictive coding. Lossy predictive coding, transform coding, DPCM,DM,ADM.

Books

TEXT BOOKS:

1. W.Pratt, digital image processing, wiley publication, third edition, 2002.
2. Gonzalez & Woods, digital image processing, pearson, education, second edition.
3. A.K.Jain, fundamentals of image processing, prentice hall of India publication. 1995.

Additional Reading:

Term work

1. Term work shall consist of at least six software programs written in C/MATLAB and two assignments covering the topics of the syllabus.
2. A term work test shall be conducted with a weightage of 10 marks.

Oral Examination

An oral examination is to be conducted based on the above syllabus.

BE ELECTRONICS ENGINEERING

FOURTH YEAR semester VII

Subject: Elective -1 , Process Control Instrumentation

Lectures: 4 Hrs per week

Theory : 100

Marks

Practical : 2 Hrs per week

Term Work : 25

Marks

Oral: 25 Marks

Ratioale:

DETAILED SYLLABUS

Introduction to Process Control, Feedback Control, Types of Processes, Performance Characteristics of measuring systems.

Measurement methods of different process parameters like pressure, force, torque, velocity, specific gravity, pH, humidity and liquid level.

Controllers-Modes of control like ON/OFF, proportional, derivative, integral, PD, PI & PID cpntrollers. Slection of a proper control mode for a given process, pneumatic control mechanisms, electronic controllers, Electronic and Pneumatic signal transmission.

Control valves like globe, pinch, butterfly ball valve etc., characteristics of valves, cavitation and flashing, selection of control valves for a process, valve sequencing.

Introduction to PLC, PLC ladder logic, drawing of ladder diagrams, Programming of PLC.

Generalized data acquisition and data distribution systems, multichannel DAS, Data Logger.

Books

Text Books:

1. Anderson N.A.Instrumentation for Process Measurement and Control, third edition, Chilton Company, 1980.
2. Johnson C., Process Control Instrumentation Technology, fourth edition, Prentice Hall of India, 2001.

Additional Reading:

1. Dunning Gary, Introduction to Programmable logic controllers, Delmar Thomson Learning, 2001.
- 2.Patranabis D.Principles of Process Control, Tata McGraw Hill, second edition, 2001.

Term work

- 1.Term work shall consist of at least 10 practicals and two assignments covering the topics of the syllabus.
- 2.A term work test shall be conducted with a weightage of 10 marks.

Oral Examination

An oral examination is to be conducted based on the above syllabus.

BE ELECTRONICS ENGINEERING
FOURTH YEAR SEMESTER VII
Subject : Microcomputer System Design

Lectures : 4 Hrs per week
Practical : 2 Hrs per week

Theory: 100 Marks
Term Work : 25 Marks
Oral : 25 Marks

Rationale: A Microcomputer system is made of different components. This subject shall teach the functional units of these components and how to make them work together in a microcomputer system.

Detailed Syllabus

The Pentium Processor : Functional units of Pentium processor. Overview of cache operation and cache types. Pentium cache overview. Pentium signals interface. Address bus, data bus, misaligned transfers, communications with 8, 16, 32 and 64 bit devices, bus control signals, bus master signals, System test and initialization. System management tools. Reliability and error reporting.

Code cache and instruction pipeline. Introduction to the prefetcher, instruction branch prediction, code cache organization and operation, the floating point pipeline.

The data cache and burst bus cycles. Introduction to internal data cache, structure of internal data cache, the bus cycle state machine, anatomy of write hit and miss, inquire cycles. Bus cycle overview, burst cycles, single transfer bus cycle pipelined and non pipelined, special cycles.

Interrupt acknowledge bus cycle, bus cycle state machine, bus and bus state transition.

PCI Bus : Local Bus concept. Introduction to PCI bus operation; introduction to reflected wave switching, PCI Bus functional signal groups. PCI bus Arbitration, Arbiter, arbitration algorithms, hidden bus arbitration, example of arbitration between two masters, bus access latency, PCI read and write transfers, PCI I/O addressing, interrupt acknowledge. Interrupt routing, interrupt chaining.

Peripheral Bus Interfaces

The IDE interface, timing specifications, IDE protocol, Model of an IDE Disk Drive. SCSI Bus. SCSI hardware. SCSI Bus Protocol.

Universal Serial Bus (USB)

Introduction to USB, PC requirements, bus topology, understanding the host and the peripheral, the development process. USB transfer basics, Elements of a transfer, successful transfers. Transfer types, Control transfer, bulk transfer, interrupt transfer, Isochronous transfer, time critical transfers.

Books

Text Books:

1. Tom Shanley et al, Pentium processor system Architecture, Addison Wesley press.
2. Tom Shanley et al, PCI system architecture, Addison Wesley press.
3. F. Schmidt, SCSI bus and IDE interface, Addison Wesley press.
4. Jan Axelson, USB complete, penram publication, second edition.

Additional Reading:

Term Work

1. Term work shall consist of at least four practicals and six assignments covering the topics of the syllabus.
2. A term work test shall be conducted with a weightage of 10 marks.

Oral Examination

An oral examination shall be conducted based on the above syllabus.

BE ELECTRONICS ENGINEERING
FOURTH YEAR semester VII
SUBJECT : Elective-1, DSP Architectures & Systems

Lectures: 4 Hrs per week
Practical : 2 Hrs per week

Theory : 100 marks
Term Work : 25 Marks
Oral : 25 Marks

Rationale: Digital Signal Processing has applications in many fields. The DSP algorithms are better implemented on DSP processors having specially tailored architectures. It is therefore essential for a DSP systems designer to understand these processors and apply them in system design.

Detailed syllabus

Introduction to programmable digital signal processors

TMS 320c5X

Architecture

Assembly language instructions

Pipelining

Applications

TMS 320C54X

Architecture

Assembly language instructions

Pipelining

Applications

An Overview of TMS 320C6X

An overview of Motorola DSP 563XX Processors

Books

Text Books:

1 B. Venkataramani and Bhaskar, Digital Signal Processors: Architecture, Programming & Applications, Tata McGraw-Hill Publication, 2002.

Additional Reading:

1.A. Bateman & W.Yates, Digital Signal Signal Processing Design Wheeler Publication, 1988.

Term Work

1.Term work shall consist of at least six practicals on actual DSP processors and two assignments covering the topics of the syllabus.

2.A term work test shall be conducted with a weightage of 10 marks.

Oral Examination

An oral examination is to be conducted based on the above syllabus.

B.E. ELECTRONICS ENGINEERING
FOURTH YEAR semester VII
WIRELESS COMMUNICATION

Lectures: 4 Hrs per week
Practical: 2 Hrs per week

Theory: 100 Marks
Term Work: 25 Marks
Oral: 25 Marks

Rationale: Rapid increase in the numbers of mobile subscribers and use of mobile networks for multimedia transmission has made wireless technology, the most rapidly evolving field in telecommunications. This subject teaches basics of wireless communication.

DETAILED SYLLABUS

Introduction

Introduction to wireless communication systems.

The cellular concept

Frequency reuse, Hand - off strategies, Interference and system capacity, Tracking and grade of service, Improving coverage and capacity in cellular systems.

Mobile Radio propagation

Large scale path Loss: Reflection, Ground reflection (2 ray model), Diffraction, Scattering, Practical Link Budget - Design using path loss models.

Smallscale fading and multipath: Small scale multipath. propagation, Parameters of Mobile Multipath channels, Types of small scale fading, Rayleigh and Ricean Distributions. Diversity Techniques:

Wireless systems and standards

Analog Cellular systems: AMPS and ETACS - System overview, cell Handling, Air Interface, N - AMPS

Digital cellular system: GSM - Services and Features, system architecture, Radio subsystem channel types, frame structure, signal Processing, Typical call Flow sequences in GSM.

CDMA Digital cellular standard - Frequency and channel specifications, forward CDMA channel, Reverse standard channel

Cordless Telephones: CT 2, Standard, DECT, PACS (Personal access Communication system), PHS (Personal Handy phone system)

Mobile Data Communications:

Specialized packet and mobile Radio Networks, Circuit switched Data services on cellular, Networks, Packet switched Data services on cellular Networks, Data over low power wireless and cordless Networks.

BOOKS

TEXT BOOKS:

1. Theodore S Rappaport: Wireless Communication - Pearson Education, second edition.
2. Raj Pandya, Mobile and Personal Communication System and Services, Prentice Hall of India

Additional Reading:

- 1) J. Goddman, Wireless Personal Communication Systems, Addison Wesley publication.
- 2) Joachim Tesal, GSM cellular Radio, John Wiley publication.

TERM W:ORK

1. Term work shall consist of at least eight practicals / assignments *covering* the topics of the syllabus.
- 2.- A term work test shall be conducted with a weightage of 10 marks.

An oral examination is to be conducted based on the *above* syllabus.

BE ELECTRONICS ENGINEERING

FOURTH YEAR semester VII

SUBJECT : Project –A

Lectures : Hrs per week

Term Work: 25

Marks

Practical : 4 Hrs per week

Rationale : Project allows the student to work independently to put the knowledge of electronics engineering theory into practice.

Detailed syllabus

The students of Electronics Engineering degree course are expected to take up a project under the guidance of a teacher in the institute, on any Electronics Engineering problem, to be completed in the Semester VII and Semester VIII.

This may include:

Experimental analysis/verification,

Development of design methods and verification

Design and fabrication of models

Developing software for analysis and/or design or decision making

Developing a mathematical/empirical model

The students shall work in group with no more than five students in each group.

Basic study through review of literature on the topic selected shall be completed. The scope of the project, identification of necessary data, sources of such data etc. shall be identified. The student group has to prepare a brief report on the work done. The report should include objective of the project, scope of the project, methodology and the review of literature.

Term work

Term work should consist of the above mentioned activities which shall be evaluated and shall carry a weightage of 25 marks.