

# **SWAMI VIVEKANAND UNIVERSITY, SIRONJA, SAGAR (M.P.)**



## **SYLLABUS**

**For**

### **DIPLOMA IN ENGINEERING (3 YEAR) ELECTRONICS & COMMUNICATION ENGINEERING**

**Course Code: DEC**

Department of Electronics & Communication  
Engineering

Faculty of Engineering

Duration of Course : 3 Year

Examination Mode : Semester

Examination System : Grading

Swami Vivekanand University, Sironja Sagar (M.P.)

2016-2017







# Swami Vivekanand University, Sagar (M.P.)

## Scheme of Examination



Faculty of Engineering

Department of Electronics & Comm. Engg

Scheme of Course : Diploma in Engg.(3 Year) – Electronics & Comm. Engg. Course Code : **DEC**

Semester/Year – 5<sup>th</sup>Sem

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal		Total (G= E+F)	
						Max (A)	Min	TW (B)	MST (C)		Max (E)	Min				
DEC-0501	Instrumentation & Control System	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs
DEC-0502	Data Communication & Networks	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs
DEC-0503	Industrial Electronics	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs
DEC-0504	Antenna And Microwave Engineering	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs
DEC-0505	Electronic Workshop Practice	-	2	2	4	-	-	-	-	-	60	18	40	100	100	-
DEC-0506	Professional Activities	3	1	-	4	-	-	-	-	-	-	-	-	-	-	
	<b>Total</b>	15	7	10	32	280	-	40	80	400	180	-	120	300	700	-



# Swami Vivekanand University, Sagar (M.P.)

## Scheme of Examination

Faculty of Engineering

Department of Electronics & Communication Engg.

Scheme of Course : Diploma in Engg.(3 Year) – Electronics & Comm. Engg. Course Code : **DEC**

Semester/Year – 6<sup>th</sup>Sem

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal		Total (G= E+F)	
						Max (A)	Min	TW (B)	MST (C)		Max (E)	Min				
DEC-0601	Consumer Electronics	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs
DEC-0602	Advanced Communication	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs
DEC-0603	Elective – II (List given below)	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs
DEC-0604	Project	-	-	8	8	-	-	-	-	-	100	31	100	200	200	-
DEC-0605	Seminar	-	-	2	2	-	-	-	-	-	-	-	50	50	50	-
DEC-0606	Professional Activities	3	1	-	4	-	-	-	-	-	-	-	-	-	-	-
	<b>Total</b>	12	4	16	32	210	-	30	60	300	190	-	210	400	700	-

List of Elective Papers –

**Elective – II**

DEC-0603(A) – Computer Programming

DEC-0603(B) – Programmable Logic Controllers



## DEC-0301 ELECTRONIC COMPONENTS & MATERIALS

### Unit I

**Conductors and Insulators:** Introduction, Atomic Structure, band structure of solids, energy band diagram of conductors, semiconductors and insulators, reliability specifications for electronic components, stability, drift, catastrophic failure, MTBF, MTTF, resistivity / conductivity as a basic material property , conductivity / resistivity of different types of materials , effect of temperature on conductivity, low, medium & high resistivity materials, Classification of insulating materials, properties & applications of Insulating materials, Difference among conductor, insulator and semiconductors based on: atomic structure, band theory, Role of semiconductors in making semiconductor devices.

### Unit II

**Magnetic Materials:** Introduction, Properties of magnetic materials, Permeability, B-H curve and hysteresis effect, curies temperature, Residual magnetism, Factor affecting the properties of magnetic materials such as: over temperature, mechanical damage, and direction of current, Classification of magnetic materials such as: hard and soft magnetic materials, Dai, para, ferro & ferrite magnetic materials

**Jointing and Cleaning Materials:** Jointing techniques, Screw jointing, Soldering and welding, Types of screw heads, screw shafts, Soldering: Types of solders (soft & hard), soldering process, Different soldering materials used in electronics, Adhesives. Cleaning Materials: IPA (Isopropyl alcohol), CTC(Carbon tetra chloride), Acetone etc.

### Unit III

**Cells and Batteries:** Principle of a cell , theory of operation , concept of Ideal voltage and current source, Internal resistance, Ampere hour rating, Primary and secondary cells and batteries.

**Types of primary cells:** carbon - zinc, mercury oxide, silver oxide , lithium. Types of secondary cells; Lead storage battery , Solar cells, Primary and Secondary cells & batteries, Maintenance requirements for various batteries, Choice of batteries for different applications.

### Unit IV

**Relays and Switches:** relay Characteristics, relay performance, Contact types, Specifications and applications of different types of relays.

**Switches:** Types of manually operated switches, their features and applications, Manually operated Selector Switches, Keyboards and sensing switches; their principle of operation and applications, Types, Operation, and applications of electrically operated switches.

### Unit V

**Connectors and Packages:** level of connections, generic types and specifications of connecting devices for connection levels 2,3 and 4, ratings and specifications of connectors, types of Connectors , Factors affecting choice of connectors; choice of connectors for different applications.

### References:

1. Electrical Engineering Materials by TTTI , Madras
2. Electrical Engineering Materials by Indulkar and Tiruvenkadam
3. Electrical Engineering Materials by M.L.Gupta.
4. Electrical Engineering by P.L.Kapoor



**DEC-0.302 ELECTRONIC DEVICES AND CIRCUIT**

**Unit-I**

**PN Junction Diodes:** Basic Structure and symbol, Forward & Reverse Biasing, V-I Characteristic, Various application of Junction Diode, Special purpose Diodes, Constructional features, symbol and applications of Zener Diode, Tunnel Diode, Schottky Diode, Varactor Diode, Photo Diode, LED, Switching Diode.

**Unit-II**

**Diode Circuits:** Need of rectification, Types of rectifier: Half Wave, Full Wave and Bridge rectifier, Comparison, Average, Peak and rms Values, Filter Circuits, Need of Filter Circuits, Types of filter circuits: shunt capacitor, L- type and pie type, Ripple factor, Bleeder Resistance, Rectifier with filter, Basics of Voltage multiplier, Clipping Circuit, Clamping circuit.

**Unit-III**

**Junction Transistors:** Bipolar Junction Transistor (BJT), Basic Structure, Types: PNP & NPN transistors Transistor action, Transistor Configuration: CE, CC and CB mode, V -I characteristics: Input and Output Characteristics, Regions of Transistor operation, active, saturation & cutoff, Expression for currents: Alpha (  $\alpha$  ) and Beta (  $\beta$  ), relation between alpha & beta, Transistor as a Switch, Transistor Biasing : fixed bias, Base Bias, Emitter feedback Bias, Collector feedback Bias, Voltage divider Bias, Emitter Bias, transistor specifications, FET: Types of FET, Compare FET with BJT, FET operation, V -I characteristics, FET applications, Structural diagram of UJT, working of UJT, Applications of UJT in relaxation oscillator and blocking oscillator.

**Unit-IV**

**Amplifiers:** Transistor as an Amplifier, CE Amplifier, Cascading of Amplifier, Meaning & necessity of cascade amplifier, Circuit Diagram of cascade amplifier with transistor coupling: RC coupling, Direct Coupling, Transformer coupling, Classification of Amplifiers: Class A, class B, class AB & class C amplifier, Distortion in amplifiers: Amplitude or Non linear distortion, Frequency Distortion, Phase shift distortion, Frequency response of amplifier, Feed Back Amplifier, Importance & concept of Feed Back, Advantage of negative feedback, block diagram of a feedback amplifier, Darlington Pair, Power Amplifiers, Audio Power Amplifier, Push pull Amplifier, Phase Splitter.

**Unit-V**

**Oscillator:** Principle of Oscillator, Barkhausen circuit criteria for oscillation, Types of Oscillators- Phase shift oscillator, Resonance – Circuit LC oscillator, Wein Bridge oscillator, Colpitt's Oscillator, Hartley Oscillator, Crystal Oscillator.

**Multivibrators:** Basic form of operation, Astable (free running) multivibrator, Monostable (Single shot) multivibrator, Bistable (Trigger) Multivibrator.

**References:**

1. Electronic Devices & Circuits By Robert Boylestad
2. Electronic Devices and Circuits by Millman & Halkias
3. Electronic Devices and Circuits by Mathur&Chadha

## List of Experiments

1. To plot the V-I characteristics of a –
  - (a) Silicon Diode
  - (b) Germanium Diode
2. To verify the action of diode as a positive clipper and negative clipper.
3. To verify the action of diode as a positive clamper and negative clamper.
4. To verify the V-I characteristics of Zener Diode.
5. To obtain the input and output Transistor Characteristics for CB configuration.
6. To obtain the input and output Transistor Characteristics for CE configuration.
7. To obtain the input and output Transistor Characteristics for CC configuration.
8. To verify the operation of FET as a switch.
9. To verify the V-I Characteristics of UJT.
10. To setup the circuit and verify the waveforms of
  - (i) HW rectifier
  - (ii) FW (centre tapped) rectifier
  - (iii) Bridge rectifier
11. To observe the output waveform of a rectifier circuit with
  - (i) capacitor filter
  - (ii) L-inductive filter
12. To observe the performance (frequency response) of a CE amplifier.
13. To observe the performance (frequency response) of an emitter follower amplifier.
14. To determine the overall voltage gain and frequency response of two stage cascade amplifier.
15. To analyze the performance of a class A amplifier.
16. To observe the characteristics of
  - (i) current series feedback amplifier
  - (ii) voltage series feedback amplifier.
17. To setup a RC phase shift oscillator and analyze its operation.
18. To verify the action of UJT as a relaxation Oscillator.





**DEC - 0303 BASIC ELECTRICAL ENGINEERING**

**Unit-I**

**Laws of Basic Electricity:** energy, nature of electricity, electric circuits and diagrams, the international system of units, scientific notation and engineering prefixes, current and Voltage, the coulomb, the ampere, potential difference, conventional current, Ohm's law of constant proportionality, Define resistance, types of resistance, Factors governing resistance, Dependence of resistance upon temperature, voltage, magnetic field, light, pressure and their typical applications, non linear resistors, series and parallel combination of resistance, equivalent resistance, work and power, energy and work efficiency, kilowatt-hour, interrelationship of basic electrical units.

**Unit-II**

**Magnetic Fundamentals:** magneto motive force, reluctance, permeability, flux density, Magnetic field intensity, magnetic materials, magnetization curves, Hysteresis, magnetic effect of electric current, electromagnetic induction, eddy current, magnetic shielding.

**AC Fundamentals:** Concepts of alternating voltage and current, Difference between AC and DC voltage, Concepts of Cycle, Frequency, Period, Amplitude, Instantaneous value, average value, RMS value, Peak value and form factor, the radian, Graphical representation of different periodic waves (signals), Relation of V&I Phasors in RL, RC and RLC series circuit, Representation of sine waves on Phasor diagrams, Impedance and admittance, impedance triangle, Concepts of real (Watt), reactive (VARs) and apparent power (VA) and power triangle.

**Unit-III**

**Transformers:** use of transformer (Electronics & Electrical), definition of transformer, Principle of working of transformer, construction of transformer, Classification based on core construction, elementary theory of an ideal transformer, EMF equation of a transformer, Voltage transformation ratio(K) and Impedance ratio, Elementary Knowledge of Special Types of transformers- Auto transformer, Ferrite core type, Potential Transformer (PT) and Current transformer (CT).

**Unit-IV**

**DC Machine:** Basic Working Principles of D.C. Generator and Motors, comparison of generator and motor action, significance of Generated emf and Back emf and their voltage equations, Different types of DC motor. Basic methods of speed control of a DC motor, Basic motor characteristics- Torque vs Armature current, Speed vs Armature current, Speed vs Torque, Application of DC motor in electronics and electrical.

**Unit-V**

**AC Machine:** Types of ac machines, construction of motor, Basic working principle of operation, production of rotating magnetic field, Basic knowledge of slip in induction motors. Torque-slip characteristic of induction motor, Basic methods of speed control of induction motor, construction of a single phase induction motor, Elementary Knowledge of different types of single phase induction motor, Their applications in industries & households.

**Electrical Safety Measure:** Need of earthing, Protection against electric shocks.

**References:**

1. Electrical technology – Volume I & II by B.L. Theraja
2. Fundamentals of Electrical Engineering Technology by V. Deltero.
3. Basic Electricity by Van Valkenberg

## **List of Experiments**

01. Identify various resistances and understand their specifications.
02. Identify various capacitors and understand their specifications.
03. Familiarization of Digital Multimeters and Analog Multimeters.
04. Measure hot and cold resistance of filament of electric bulb.
05. Verification of Ohms law.
06. Series and parallel combination of resistance.
07. Measurement of single phase power by using Wattmeter, Ammeter and Voltmeter.
08. Series resistive-capacitive (R-C) circuits.
09. Series resistive -inductive (R-L) circuits.
10. Series resistive inductive and capacitive (R-L-C) circuits.
11. Demonstrate various transformer and understand their specifications.
12. Extending the range of basic meter movement:
  - (a) Meter Multipliers
  - (b) Meter shunts
13. Study of fan regulator circuit (Resistive & Electronic).
14. Study of tube light circuit.
15. Speed control of DC shunt motor:
  - (a) By varying field current-armature voltage kept constant.
  - (b) By varying armature voltage – field current constant.



### Unit-I

**Network Transformation:** Introduction, Topology-Definitions, Nodes, Branches, Tree, Co-Tree, Twings, Tie-Set, Cut-set, Indices Matrix, Reduced Indices Matrix, KVL analysis, KCL analysis, Mesh and node circuit analysis, Principle of duality, Reduction of complicated network, Conversion between T and (pie) Section, Superposition Theorem, Reciprocity Theorem, Thevenin's Theorem, Norton's Theorem, Millman's Theorem, Maximum Power transfer theorem, Mutual Impedance and their dot conversion, Delta and Wye (Y) Transformation.

### Unit-II

**Resonance:** Quality Factor or Q- Factor, Series Resonance, Resonance frequency, Bandwidth and Selectivity of Series resonance circuit, Parallel Resonance or Anti Resonance, Resonance frequency, Band Width and Selectivity of Parallel Resonance circuit, Phasor diagrams for L-C, R-L, R-C and R-L-C Circuits.

**Steady State & Transient Response:** Analysis of step and sinusoidal inputs, Steady state & transient response for RL Circuit, RC Circuit, forced and unforced response.

### Unit-III

**Filters:** Introduction, Decibel & Neper- Definitions, Classification of Filters according to Pass & Stop Bands, Constant K Low pass filter, Constant K High pass filter, Band pass and band elimination filter, Elementary m- Derived filter, Elementary Composite Filters.

### Unit-IV

**Two Port Network & Their Parameters:** Short Circuit, Admittance parameters, Open circuit Impedance parameters, Z parameters, Y Parameters, Hybrid Parameters, Transmission Parameters, Inverse transmission Parameters, Introduction to Image impedance, Symmetric Network, Ladder network, Bridge 'T' network, Parallel 'T' network, Lattice network

**Attenuators:** types of attenuators, Basics of Equalizers and types.

### Unit-V

**Laplace Transformation:** Initial condition in elements, A procedure for evaluating initial condition, The Laplace transformation, Laplace transform of elementary function, Application of Laplace transform for transient and steady state behavior of RL, RC and RLC circuits.

### References:

1. Network Lines by Umesh Sinha
2. Network Lines and Fields by Ryder
3. Network Analysis by G. K. Mithal

### List of Experiments

1. Familiarization of CRO.
2. Familiarization of Function Generator.
3. Pass band check of low pass, high pass, band pass & band stop filters.
4. To study and Verify Superposition theorem.
5. To study and Verify Reciprocity theorem.
6. To study and Verify Thevenin's theorem.
7. To study and Verify Norton's theorem.
8. To study and Verify KCL AND KVL.
9. Series resonance circuit.
10. Parallel resonance circuit.



**DEC - 0305 DIGITAL ELECTRONICS**

**Unit-I**

**Number System and Binary Codes:** Binary, Hexadecimal, Octal, Decimal and their inter conversion, 1's complement, 2's complement numbers, 9's complement & 10's complement, Introduction to Binary codes, Weighted, Non Weighted codes, Excess 3 code, Grey code, BCD code, Hamming code.

**Boolean Algebra & Logic Gates:** Introduction to Boolean Algebra, Law of Boolean Algebra, De Morgan's theorem, Simplification of Boolean functions with Boolean laws, Karnaugh Map method, simplification of Boolean equation using K-Map (up to four variables)

**Unit-II**

**Logic Families:** Introduction to logic families, DTL, ECL, TTL, C-MOS and their comparison on the basis of their characteristics, Familiarization of ICs related to digital circuits like 74 series, 50 series

**Unit-III**

**Combinational Logic:** Half adder, Full Adder, Half Subtractor, Full Subtractor, Binary Adder, Binary Subtractor, Encoder, Decoder, Multiplexer, Demultiplexer.

**Unit-IV**

**Sequential Logic Circuits:** Definition of Sequential circuits, Definition of Latch & Flip-Flop and their differences, RS Flip-Flop, JK Flip-Flop, D Flip-Flop, JK Master-Slave Flip-Flop with their timing diagrams and truth tables, Definition of Register, Shift Register, Buffer Register with their timing diagrams and truth tables. Definition of Counters, Synchronous, Asynchronous, Up-Down Counter, Ring Counter.

**Unit-V**

**A/D & D/A Converter:** Introduction to A to D and D to A converter, Successive Approximation method and Ladder N/W method for A/D & D/A conversion.

**Programming Logic Devices:** Description of programming logic devices: PAL, PLA, GALs, FPLA, PLD, CPLD, FPGA.

**Memories:** Introduction to memories, Primary & RAM and their types, ROM and their types, Flash memories, Secondary memories, Floppy disk, Hard disk, CD-ROM, Blue Ray Disc.

**References:**

1. Digital Systems by Ronald Tocci
2. Digital Electronics by Malvino-Leach
3. Digital Fundamentals by Thomas L.Floyd
4. LM on Digital Electronics by NTTF Electronics Centre, Bangalore
5. Digital Electronics by Gothman
6. Digital Electronics by Malvino-Brown

**List of Experiments**

01. Study of Logic Gates- AND, OR, NOT, X-OR, X-NOR.
02. Study of Universal Gates-NAND, NOR.
03. Implementation of Basic Gates with the help of Universal gates
04. Study of BCD to Grey code Conversion.
05. Implementation of De Morgan's Theorem.
06. Study of combinational Logic. Half Adder, Full Adder, Half Subtractor, Full Subtractor, Encoder, Decoder, Multiplexer, Demultiplexer.
07. Study of Comparator.
08. Study of latch & RS flip flop.
09. Study of D flip flop, JK-flip flop, JK master slave flip flop.
10. Study of digital troubleshooting with:
  - a. Logic Probe
  - b. Current Tracer,
  - c. Logic Pulsar

- d. Logic Chip
- e. Logic Comparator
- f. Logic Analyzer



## DEC - 0306 PROFESSIONAL ACTIVITIES

Professional Activities is not a descriptive course, as per conventional norms therefore specific content for this course cannot be prescribed. It is a group of open-ended activities; where in variety of tasks are to be performed to achieve objectives. However general guidelines for achieving the target and procedure for its assessment are given under the course content.

As the student has to practice this course in all the six semesters, the guidelines given therein are common and applicable to each semester.

### **OBJECTIVES:**

- To allow for professional development of students as per the demand of engineering profession.
- To provide time for organization of student chapter activities of professional bodies i.e. (Institute of engineers, ISTE or Computer Society of India etc.)
- To allow for development of abilities in students for leadership and public speaking through organization of student's seminar etc.
- To provide time for organization of guest lectures by expert engineers/eminent professionals of industry.
- To provide time for organization of technical quiz or group discussion or any.
- To provide time for visiting library or using Internet.
- To provide time for group discussion or solving case studies.
- To provide time for personality development of students.
- To provide time for working for social cause like awareness for environment and ecology etc.

### **DETAILED INSTRUCTIONS TO CONDUCT PROFESSIONAL ACTIVITIES:**

- Study hours, if possible should be given greater time slot with a minimum of two hrs/week to a maximum of four hrs/week.
- This course should be evaluated on the basis of grades and mark sheet of students, should have a separate mention of the grade awarded. There will be no pass/fail in professional activities (PA).
- Following grade scale of evaluation of performance in PA has been established.  
Grades Level of performance  
A Excellent  
B Good  
C Fair  
D Average  
E Below Expectations
- Grades once obtained in a particular examination shall become final and no chance of improvement in grades will be given to the students.
- Assessment of performance in PA is to be done internally by the Institution, twice in a Semester/Term through a simultaneous evaluation of the candidate by a group of three teachers, of the department concerned. Group of teachers will jointly award the grade to candidate in the assessment. Best of the grades obtained by the student in these two assessments shall be finally taken on the mark sheet of the respective Semester/Term.  
Candidate abstaining from the prescribed course work and/or assessment planned at the Institute shall be marked ABSENT in the mark sheet, instead of any grade.
- While awarding the grades for performance in PA, examining teacher should reach the final consensus based on the attendance, punctuality, interest, presentation skills in seminar on the topic assigned (collection of relevant data, observations, analysis, findings/conclusion) and its written report, awareness of latest developments in the chosen programme of study.
- Institution shall maintain the record of grades awarded to all the students in PA for a period of 1 year.
- It shall be mandatory for students to submit a compendium for his PA in the form of a Journal.
- Compendium shall contain following:
  1. Record of written quiz.
  2. Report/write up of seminar presented.

3. Abstract of the guest lecturers arranged in the Institution.
  4. Topic and outcome of the group discussion held.
  5. Report on the problems solved through case study.
  6. Report on social awareness camps (organized for social and environmental prevention).
  7. Report on student chapter activities of professional bodies like ISTE, IE (India), CSI etc.
- PA is not a descriptive course to be taught in the classroom by a particular teacher. Various activities involved in the achievement of objectives of this course should be distributed to a number of teachers so that the talent and creativity of group of teacher's benefit the treatment of the course content.
  - These activities should preferably be conducted in English language to maintain continuity and provide reinforcement to skill development. Small groups shall be formed like in tutorials, group discussion, case studies, seminar, project methods, role play and simulation to make the development of personality affective.
  - Treatment of PA demands special efforts, attention, close co-operation and creative instinct on the part of teachers of department concerned. Since this course is totally learner centered, many of the activities planned under this course shall come out from the useful interaction of student among themselves and with the teachers. The guide teacher/s shall best act as a facilitator of these creative hunts/ exercises, which unfold many of the hidden talents of the students or bring out greater amount of confidence in them, to execute certain activity.



**DEC- 0401 - LINEAR INTEGRATED CIRCUITS**

**Unit I**

**Introduction to Operational Amplifier:** Differential amplifier, Principle, differential and common mode of operation, concept of inverting and non- inverting input.

**OpAmp:** Block Diagram, IC Packages, Ideal characteristics, Electrical parameters, Input offset voltage, Input resistance, CMRR, Slew rate, Gain, Bandwidth, 741 OP- Amp characteristics, pin out and power supply requirements,

Interpreting and comparison of data (as per data sheet) of 741, op07, 351, 311, TL082, LM 324.

**Unit II**

**Linear Application:** Inverting amplifier, non-inverting amplifier, Voltage follower, Adder and Subtractor, Differentiator, integrator, Scaling Amplifier, AC and DC Amplifier, Instrumentation amplifier.

**Active filters:** low pass, high pass and band pass, Voltage to Current converter, Current to Voltage converter

**Unit III**

**Nonlinear applications:** Comparators: functions of a comparator, modes of operation of comparator, Open loop- zero crossing detector, Schmitt trigger: Threshold levels, Inverting and non-inverting, Hysteresis curve, Converters: Voltage to Frequency Conversion, Frequency to Voltage Conversion, Sample / Hold circuit, Precision Rectifier, Oscillators: Wein Bridge Oscillator, Phase shift Oscillator, Relaxation Oscillator, Logarithmic amplifier and antilogarithmic amplifier, Basics of analog multiplier and dividers

**Unit IV**

**Voltage Regulators:** Need of Regulators, Series Regulator, Shunt Regulator, Pass Transistor Regulator, Switching Regulator, Basics of Regulator ICs like 723, LM317, 78XX, 79XX and SMPS TEA1507, TEA152X

**Series Timers:** Introduction, functional block diagram of a timer, Pin diagram of 555 timer, operation of timer in mono and astable modes, 555 as wave generators: square wave, Saw tooth wave and Triangular Wave

**Unit V**

**Phase Lock Loop (PLL):** functional block diagram, Lock & Capture range, transfer characteristics, Basic Applications of PLL 567, PLL 565, Applications of PLL

**References:**

1. Operational Amplifiers and Linear Integrated Circuits by R.F. Coughlin- F.F Driscall (PHI).
2. Op-Amps and Linear Integrated Circuits by R.A. Gayakwad
3. Electronic Devices & Circuits by Robert boylestad
4. Electronic Devices & Circuits by Allen Mottershead
5. Integrated Electronic by Millman Halkias
6. Art of Electronics by Horowitz Winfield Hill
7. Operational Amplifiers and Integrated Circuits by Denton Daily
8. WBLM on Electronics circuits and design by IIT, Delhi.



## List of Experiments

1. Measurement of Different characteristics of an Op-Amp in open loop configuration.
  - (a) Output Resistance
  - (b) Different Input Resistance
2. Measurement of Differential characteristics of an Op-Amp in open loop configuration.
  - (a) Voltage Gain
  - (b) Unity Gain Bandwidth
2. Inverting Amplifier :
  - (a) AC analysis
  - (b) DC analysis
  - (c) Unity Gain Buffer
3. Non –Inverting Amplifier:
  - (a) AC analysis
  - (b) DC analysis
  - (c) Unity Gain Buffer
4. Op-Amp as active Filter:
  - (a)Low pass filter
  - (b)High pass filter
  - (c)Band pass filter
5. Signal Generator using Op-Amp and Timer IC
  - (a) Triangular wave generator
  - (b) Schmitt Trigger
6. Signal generator using Op-Amp and Timer IC
  - (a) Saw tooth wave generator
  - (b) Ramp generation
7. Oscillator using Op-Amp
  - (a) Wein Bridge Oscillator
  - (b) R.C.Phase Shift Oscillator



**DEC -0402 MICROPROCESSOR AND MICROCONTROLLER**

**Unit I**

**8085 Microprocessor:** 8085 Architecture, Pin assignments, Block Diagram and its detailed description, Machine cycle & BUS Timing, Memory Interfacing, Address and data BUS descriptions, Interrupts and its types, 8085 Instructions Set, Addressing modes of 8085, Data Transfer operation, Arithmetic Operation, Logic operation, Branch Operation, Stack, Subroutine and related instruction.

**Unit II**

**Assembly Language Programming:** How to write, assemble and execute a simple program, 8085 Programming Model, write an assembly language program for addition, subtraction, multiplication, division and ascending & descending number series.

**Unit III**

**Peripherals and Other Microprocessors:** Peripherals: 8255 programmable peripheral interface, 8279 programmable key board interface, 8254/8253 programmable interval timer, 8259 programmable interrupt controllers, 8257 DMA controller Introduction for- Z-80, MC 6800, 8088/8086 Microprocessor.

**Unit IV**

**Microcontroller:** 8031/8051/89c51 Architecture, I/O port their structure, Addressing modes, SFRs and RAM, Use of all SFRs, Bit addressable locations, Memory organization, Internal memory, external memory, Introductions to other microcontrollers like 89c52, 89c2051 and 89c535.  
Interfacing of Microcontroller with: 7-segment display, LCD display, Key pad, A/D and D/A Converters.

**Unit V**

**Applications of Microprocessors and Microcontrollers:** Block diagram, flow diagram and their interfacing of the followings:  
Temperature control and monitoring system, Speed control of DC motor, Traffic Signal control system, Elevator control system, Basics of embedded system, Data Acquisition System.

**References:**

1. Microprocessor architecture programming and application with 8085/8080A by Ramesh S. Gaonkar
2. Introduction to Microprocessor by Aditya P. Mathur
3. Microprocessor & Interfacing Douglas V. Hall
4. Microprocessors & Fundamentals by B. Ram
5. 8051 Microcontroller by Kenneth Ayala
6. 8051 Microcontroller and assembly language programming by Mazidi
7. Solid state circuit design with Microcontrollers by C.K. Dwivedi (Das Publisher)

## **List of Experiments**

1. Study of Assembler, Compiler, cross compiler, emulator, simulator.
2. Write a program in 8085 Assembly language for addition of two 8 bit numbers.
3. Write a program in 8085 Assembly language for subtraction of two 8 bit numbers.
4. Write a program in 8085 Assembly language for multiplication of two 8 bit numbers.
5. Write a program in 8085 Assembly language for division of two 8 bit numbers.
6. Write a program to perform AND, OR, Ex-OR logic operation in 8085.
7. Write a program which can move data from one memory location to another.
8. Write a program to exchange two numbers.
9. Write a program in 8051(microcontroller) assembly language programming for addition of two 8 bit numbers.
- 10 Write a program in 8051 assembly language programming for subtraction of two 8 bit numbers.



**DEC - 0403 ELECTRONIC MEASUREMENTS**

**Unit-I**

**Measuring System:** Basic elements of measuring devices: Sensing Element suitability, Signal Conditioning Element, Output Element

Basic Parameters of Measuring devices: Accuracy, Precision, Error (Gross, Systematic & Random), Linearity, Hysteresis, Resolution, Threshold, Repeatability, Reliability or Maintainability, Span (Range), Calibration.

**Standard & Units of Measurement:** Primary Standard, Secondary Standard, International Standard, Voltage Standard, IEEE Standard

**Basic Measuring Instrument:** (Construction, working, application): PMMC Instrument, Moving iron instrument, Multimeter- Analog & Digital (Block Diagram)

**Unit-II**

**Basics principles of Measurement:**

**Resistance Measurement:** Low Resistance Method: Potentiometer method, Kelvin's double bridge, Medium Resistance Measurement: Wheatstone Bridge, Ammeter, Voltmeter method, substitution method. High Resistance Measurement: Loss of charge method, Meggar method.

**Inductance Measurement:** Approximation Method: V-I method, ammeter method, ammeter method, voltmeter method, Alternating Current Bridge Method, Maxwell's Bridge, Anderson's bridge, Hay's Bridge, Mutual Inductance Measurement : Fellies Method

**Capacitance Measurement:** Schering Bridge.

**Unit-III**

**Range Extension Methods:** Needs of range extension, Range Extension of Ammeter, Range Extension of Voltmeter, Need of Instrument Transformer, Advantages of Instrument Transformer, Current Transformer & Potential

**Unit-IV**

**Cathode Ray Oscilloscope:** Introduction, Construction, Block Diagram of a general Purpose C.R.O., Cathode Ray Tube (C.R.T.), Time Base Generator, Applications of C.R.O., Use of C.R.O. to Measure: Voltage, Current, Frequency, Phase Difference, Lissajou's Pattern Special Purpose C.R.O.: Dual Beam Oscilloscope, Dual Trace Oscilloscope, Digital Storage Oscilloscope

**Unit-V**

**Transducers:** Introduction and Classification of Transducers, Selecting a Transducer Sensors: diagram, bionet pattern, allic' strip, bourden tube, bellows, LVDT, variable capacitance Level measurement: Capacitance sensors, Ultrasonic transducers Pressure Measurement: Potentiometric pressure transducer, Strain gauge, piezoelectric load cell Temperature Measurement: Resistance Transducers, Thermocouple, Thermistor, Photoconductive Cells, Photo Voltaic Cell, Optical Pyrometer

**References:**

1. Electronic Instrumentation and measurement techniques by Cooper
2. Instrumentation Devices & Systems by Rangan
3. Electrical Measurements & Measuring instruments by Golding & Widdis
4. A course in Electrical & electronic measurement & instrumentation by A.K. sawhney

## List of Experiments

1. Self Inductance measurement by Ammeter and voltmeter method.
2. Self Inductance measurement by 3 voltmeter method.
3. Self Inductance measurement by 3 Ammeter method.
4. Self Inductance measurement by general 4 arm bridge network method.
5. Self Inductance measurement by
  - (a) Maxwell Bridge method
  - (b) Hays Bridge Method
  - (c) Anderson Bridge Method.
- Mutual Inductance measurement by Felicis Method.
- Capacitance measurement by Wein Bridge Method.
- Capacitance measurement by Schering Bridge Method.
- Low Resistance Measurement by –
  - (a) Ammeter Voltmeter Method
  - (b) Potentiometer method
- Medium Resistance measurement by –
  - (a) Substitution method
  - (b) Wheat Stone Bridge Method.
- High Resistance Measurement by –
  - (a) Ohm meter
  - (b) Meggar Ammeter range extension using shunts.
- Voltmeter range extension using voltage multiplier circuit.
- Study of C.R.O.
- Measurement on CRO
  1. Voltage measurement on C.R.O.
  2. Current measurement on C.R.O.
  3. Frequency measurement on C.R.O.
  4. Phase Difference measurement on C.R.O.



**Swami Vivekanand University, Sagar (M.P.)**



**DEC -0404-COMMUNICATION ENGINEERING**

**UNIT-I:**

**Introduction to Communication:** Meaning of communication, Verbal & Non verbal communication, Machine communication, Concept of communication system: Information transmission ,channel, reception, basic block diagram, Allocation of frequency spectrum for communication, Attenuation (in dB), bandwidth, Noise, source and types, signal to noise ratio, noise figure, Analog signal, Digital signal, Comparison between Analog and Digital communication, Advantages of digital communication systems.

**UNIT-II:**

**Modulation Techniques:** Need of modulation, Analog Modulation: Amplitude Modulation, modulation index, bandwidth and signal power, DSB, SSB and VSB, AM features and Drawbacks, Frequency Modulation: modulation index, FM spectrum and Bandwidth, FM features, comparison with AM, Graphical explanations of pulse amplitude modulation (PAM), pulse width modulation (PWM), pulse position modulation(PPM),Pulse Code Modulation (PCM): sampling, Quantization and encoding, data rate for digital voice channel.

**UNIT-III:**

**Digital Modulation Techniques:** Graphical explanations of NRZ, RZ, Manchester, binary ASK, FSK,PSK, Quadrature Modulation, Multiplexing Techniques: Need of multiplexing, frequency division multiplexing(FDM),time division multiplexing (TDM), comparison between FDM and TDM, Digital hierarchy in India.

**UNIT-IV:**

**Fundamentals of Wire Telephone:** Frequency range used for technology. Voice/Audio signal parameters: Sound pressure level, Sound intensity, loudness, loudness level, pitch & frequency, sound distortion. Electronic Telephone Instrument, Subscriber's loop, DTMF dialing, Signaling tones, Telephone Lines

**Telephone Switching Techniques:** Electro-mechanical switching, analog switching, digital switching techniques, Digital Time Switch, Digital Space Switch, single stage, two stage, three stage space switch, Telephone traffic calculation

**UNIT-V:**

**Fundamentals of Electronic Exchange:** An overview of manual exchange, Introduction of electronic exchange, Chronological development of electronic exchanges, Basic principles of SPC exchange, Block diagram of SPC exchange, Working of SPC exchange: Terminal equipment, switching processor, switching peripheral, signaling interfaces, data processing peripheral, Telephone signaling: Telephone signals, addressing modes, call connection, subscriber's line signaling, calling subscriber's line signals, called subscriber's line signals, PBX/PABX/EPABX.

**References:**

1. Electronic Communication systems by Dennis Roddy & John coolen
2. Electronics communication systems by Kennedy
3. Telephony by Das & Biswas.
4. Introduction to Telephony & telegraphy by E.H. Jolly(wheeler)
5. Electronic Communication System by Willium Schwber
6. Electronic Communication System by Wayne Tomasi
7. Telecommunication switching systems and Networks by Vishwanathan

**List of Experiments:**

1. Study of Amplitude Modulation.
2. Study of Frequency Modulation.
3. Determine the percentage of modulation.
4. PAM, PWM, PPM Circuits for Modulation and Demodulation.
5. Study of ASK, FSK, PSK, QAM Signals.
6. Study of PCM - Pulse Code Modulation.
7. Study of FDM and TDM.
8. Study of operation of fax machine and its control.
9. Study various components of handset telephone instrument.



**DEC – 0405(A) ENTREPRENEURSHIP**

**Unit-I**

**Introduction to Entrepreneurship:** Definition of Entrepreneur / Entrepreneurship, Difference between Entrepreneur / Entrepreneurship, Need for Entrepreneurship, Qualities of successful entrepreneur, Myths about Entrepreneurship, Classification of entrepreneurs on the basis of different criteria, Reasons for the failure of entrepreneurs.

**Unit-II**

**Industries and Business Organization:** Concept of Industry or Enterprise, Classification of Industries, Tiny Industry, Small Scale, Medium Scale, Large Scale, Rural Industry, Cottage Industry.

**Forms of Business Organization:** Proprietorship, Board & Co-operative, Partnership, public Ltd, Private Ltd, IT Sector, Govt. policies for SSI promotions, Sector / Product for SSI.

**Unit-III**

**Institutional Assistance:** Infra - structural assistance, Technical Assistance, Financial assistance, Marketing, Assistance Information / guidance & Training- SISI, ASK, MPCON, CSIR, CED- MA, NRDC Infrastructure: D/C, AVN/AKVN Finance: SIDBI, KVIB, MPFC, NABARD, MPWDC, NSIC, M.P.A.V.V.N. Marketing: MP- AGRO, NSIC, PMLUN, EXPORT CORPORATION, KVIP, MPHSVN, MPLDC, Quality Control: BIS, FPO, MPLUN, F.D.A., AG. MKT.

**Unit-IV**

**Planning of Industrial Unit:** Pre- Planning Stage, Scanning the environment, Market survey, Seeking information, product / project selection, Implementation Stage:- PPR Preparation, DIC registration, Arrangement of Land, Arrangement of Power, Obtaining NOC / Licenses from various Deptt, DPR Preparation, Seeking financial assistance, Commercial Production, Post Implementation stage, Permanent registration from D.I.C., Availing Subsidies, Diversification / Modification, Setting up of marketing channel / Distribution.

**Unit-V**

**Achievement Motivation:** Historical perspective, Concept of achievement motivation, Significance of achievement motivation, Development of achievement motivation, Financial Management of an Industrial Unit (SSI): Tools of financial analysis, Ratio analysis, Fund Flow / Cash flow analysis, Working capital and Concepts, Financial accounting.

**References:**

1. Entrepreneurial Development Vol. I,II,III by Vasant Desai Himalaya Publication
2. CEDMAP (Center of Entrepreneurial development Madhya Pradesh)

**ASSIGNMENT**

1. To prepare chart to showing various factors affecting entrepreneurship.
2. To collect details related to various schemes run by the Government for Self Entrepreneurship.
3. To identify and select a project and conduct Market-Survey thereof.
4. To collect various formats used in industries & departments/institutions working entrepreneurship.
5. Visit few small scale industries situated in city, nearby industrial area.
6. Discuss the problems related to SSI (Small Scale Industries) with an era.



7. Collect information about market rates quality and quantity of goods for their choice.
8. Develop logical and analytical approach to purchase the raw material / finished goods.
9. To prepare case study of successful entrepreneurs.
- 10 .Preparation of Project report for the industry/ Business they are willing to start.



**DEC – 0405(B) MARKETING MANAGEMENT**

**UNIT- I**

**Marketing and Concept:** Evolution of marketing-a historical background, The stage of barter, The stage of money economy, The stage of industrial revolution, The stage of competition, The emergence of marketing, Selected definitions of marketing, Different concept of marketing, The exchange concept, The production concept, The product concept, The sales concept, The marketing concept, Difference between selling & marketing, Benefits & significance of marketing, Helps to remove causes for under development, Improve productivity & efficiency, Canalize country's economic resources properly, Insure better deal for consumer, Make economic planning meaningful & relevant etc.

**UNIT- II**

**Marketing Environment:** Internal & external factors, Demographic environment, Economic environment, Political environment, Physical environment, Technological environment, Competitive environment, Social & cultural environment, Micro & macro environment.

**UNIT- III**

**Marketing Planning & Organization:** Scope & importance of planning, Steps in marketing, planning process: Purpose & principle of organization, Models of marketing organization, Line & staff type, Product based organization, Territory oriented organization, Complex organization, Task of chief marketing executive, Decentralization.

**UNIT- IV**

**Market Segmentation:** Types of market, Definitions & benefits of segmentation, Methods of segmentation, Geographic segmentation, Demographic segmentation, Psychographic segmentation, Buyer behavior Segmentation, Volume segmentation, Steps in market segmentation, Market targeting.

**UNIT- V**

**Marketing research & sales forecasting:** Definition & importance of marketing research, Steps in marketing research, Defining problem, Problem analysis, Developing research design, Developing research procedure, Data collection –Primary & secondary, Analyzing & interpretation, Summarizing & preparing the research report, Method of market research, Necessity & purpose of sales forecasting, Methods of sales forecasting.

**References:**

1. Marketing management - Analysis, Planning & Control Philip Kotler
2. Principles & practice of Marketing in India - C.B.Memoria & R.L.Joshi
3. Contemporary Marketing – Louis & Boone & David L. Kurtz
4. Essential of Management –Koontz
5. Marketing management- S.A. Sherlekar



**DEC – 0406 PROFESSIONAL ACTIVITIES**

**RATIONALE**

Professional Activities is not a descriptive course, as per conventional norms; therefore specific content for this course cannot be prescribed. It is a group of open-ended activities; where in variety of tasks are to be performed, to achieve objectives. However general guidelines for achieving the target and procedure for its assessment are given under the course content.

As the student has to practice this course in all the six semesters, the guidelines given therein are common and applicable to each semester.

**OBJECTIVES:**

- To allow for professional development of students as per the demand of engineering profession.
- To provide time for organization of student chapter activities of professional bodies) i.e. Institute of engineers, ISTE or Computer Society of India etc.)
- To allow for development of abilities in students for leadership and public speaking through organization of student's seminar etc.
- To provide time for organization of guest lectures by expert engineers/eminent professionals of industry.
- To provide time for organization of technical quiz or group discussion or any other group activity.
- To provide time for visiting library or using Internet.
- To provide time for group discussion or solving case studies.
- To provide time for personality development of students.
- To provide time for working for social cause like awareness for environmental and ecology etc.

**DETAILED INSTRUCTIONS TO CONDUCT PROFESSIONAL ACTIVITIES:**

- Study hours, if possible should be given greater time slot with a minimum of two hrs/week to a maximum of four hrs/week.
- This course should be evaluated on the basis of grades and mark sheet of students, should have a separate mention of the grade awarded. There will be no pass/fail in professional activities (PA).
- Following grade scale of evaluation of performance in PA has been established.  
Grades Level of performance  
A Excellent  
B Good  
C Fair  
D Average  
E Below Expectations
- Grades once obtained in a particular examination shall become final and no chance of improvement in grades will be given to the students.
- Assessment of performance in PA is to be done internally by the Institution, twice in a Semester/Term through a simultaneous evaluation of the candidate by a group of three teachers, of the department concerned. Group of teachers will jointly award the grade to candidate in the assessment. Best of the grades obtained by the student in these two assessments shall be finally taken on the mark sheet of the respective Semester/Term.
- Candidate abstaining from the prescribed course work and/or assessment planned at the

Institute shall be marked ABSENT in the mark sheet, instead of any grade.

- While awarding the grades for performance in PA, examining teacher should reach the final consensus based on the attendance, punctuality, interest, presentation skills in seminar on the topic assigned (collection of relevant data, observations, analysis, findings/conclusion) and its written report, awareness of latest developments in the chosen programme of study.
- Institution shall maintain the record of grades awarded to all the students in PA for a period of 1 year.
- It shall be mandatory for students to submit a compendium for his
- PA in the form of a Journal.
- Compendium shall contain following:
  1. Record of written quiz.
  2. Report/write up of seminar presented
  3. Abstract of the guest lecturers arranged in the Institution.
  4. Topic and outcome of the group discussion held.
  5. Report on the problems solved through case studies.
  6. Report on social awareness camps (organized for social and environmental prevention).
  7. Report on student chapter activities of professional bodies like ISTE, IE (India), CSI etc.
- PA is not a descriptive course to be taught in the classroom by a particular teacher. Various activities involved in the achievement of objectives of this course should be distributed to a number of teachers so that the talent and creativity of group of teacher's benefit the treatment of the course content.

These activities should preferably be conducted in English language to maintain continuity and provide reinforcement to skill development.

Small groups shall be formed like in tutorials, group discussion, case studies, seminar, project methods, roll play and simulation to make the development of personality affective.

Treatment of PA demands special efforts, attention, close co-operation and creative instinct on the part of teachers of department concerned. Since this course is totally learner centered, many of the activities planned under this course shall come out from the useful interaction of student, among themselves and with the teachers. The guide teacher/s shall best act as a facilitator of these creative hunts/ exercises, which unfold many of the hidden talents of the students or bring out greater amount of confidence in them, to execute certain activity.



**DEC- 0501 - INSTRUMENTATION AND CONTROL**

**Unit I**

**Electronic Instrumentation System:** Block diagram, Review of primary sensing elements and Transducers.

**Signal conditioning:** Block diagram of DC system and AC system, Data acquisition system.

**Unit II**

**Data transmission and Telemetry:** Introduction, Method of Data Transmission, General Telemetry System, Type of Telemetry System, Brief Description of land line and R.F. telemetry system, Signal conditioning and data acquisition system.

**Unit III**

**Displays and Recorders:** Displays: Analog Indicator /Displays, Digital Display, Light Emitting Diodes, Liquid Crystal Displays.

**Recorders:** Graphic Recorders, Strip chart recorders, X-Y Recorders, Ultra-Violet Recorders.

**Unit IV**

**Control System:** Basic concept of open loop and closed loop control system and their comparison, Transfer function definition, Simple Mathematical problems on block diagram and signal flow graphs, Simple Mathematical model of physical systems, Analogy between different systems- Mechanical, Electrical, Thermal.

**Unit V**

**Time Domain Analysis:** First and Second order control System (Without mathematical treatment), Definition of different performance indices as delay time, rise time, peak time, percentage peak overshoot, Settling time, steady state error, Type-0, Type -1, type-2, system definition.

**Concept of stability:** absolute stability, relative stability, Routh and Hurwitz Criteria for stability.

**Root Locus Techniques:** Introduction, Root Locus concept, Construction of Root Loci.

**Frequency Domain Analysis:** Introduction, Nyquist Stability Criteria, Bode plots of simple control system.

**Reference:**

1. Modern Electronic Instrumentation and Measurement Technique by Cooper
2. Electrical Measurements & Measuring Instruments by H. W. Golding
3. Electrical and Electronic Measurements and Instrumentation by S.Ramabhadran
4. Instrumentation Devices & Systems by Rangan
5. A course in Electrical & electronic measurement & instrumentation by A.K. Sawhney.
6. Automated Process Control Systems by Ronald & Hunter

**List of Experiments:**

To design practical circuits from the theoretical class room learning of

1. Photo electric system for –
  - (i). Measurement of speed
  - (ii). Liquid level measurement
  - (iii). Linear speed measurement
  - (iv). Tracking luminous object
  - (v). Any other application
2. Water level indication and control systems
3. Temperature control systems
4. Pressure measurement system
5. Density measurement
6. To design basic automatic system
7. To measure the resistance of LDR with the source of light at defferent distances
8. To measure the resistance of LDR with different color light.
9. To observe the effect of temperature on the resistance of thermister.
10. Visit to Industrial units where instrumentation and control system is utilized.
11. To draw the block diagram of sequential control system
12. To study a microprocessor controlled industrial control system.



**DEC -0502 DATA COMMUNICATION AND NETWORKS**

**Unit I**

**Introduction to Data Communication:** Data Transmission mode: simplex, half duplex, full duplex  
Difference between Digital and Data Communication, Serial and parallel data transmission.

**Character codes:** Baud code, ASCII code, Error Detection techniques: VRC, LRC, CRC Error Correction techniques: symbol substitution, Retransmission, Forward Error Correction (Hamming Code).

**Serial Transmission:** Asynchronous and Synchronous data transmission.

**Unit II**

**Hardware and Interface:**

Data communication Hardware: basics and applications of: DCE, DTE, UART, USRT Data communication interfaces: specifications and applications of: RS 232C, USB Data MODEMS: Need of a Modem, Bandwidth, Data rate and Baud rate, Baseband and Broadband systems, Types of Modem

**Unit III**

**Introduction to Networks:** Definition of Computer Network, Applications of Computer Networks, Categories of Networks: LAN, MAN and WAN, Concept of Protocol, Open System Interconnection (OSI) Model: Layer Architecture, brief function of layers, Switching: Circuit switching, Packet switching and Message switching techniques, Introduction to Integrated Service Digital Network (ISDN) and its Applications

**Unit IV**

**Local Area Network:** advantages of LAN, Network topologies: Mesh, Star, Tree, Bus and Ring comparison, Component of Computer Networks

**Understand working and application of:** Server & Workstation, NIC, Hub, (Active/ Passive), Repeater, Switch, Bridge, Router, Gateway, Cabling: structure and specifications of: UTP, STP, Co-axial and Optical Fiber Access Methods: CSMA/CD and Token Passing Types of LAN: Ethernet, Token Ring and FDDI comparison, Knowledge of LAN Software: WINNT, WIN2000, LINUX

**Unit V**

**Inter Networking:** Structure of Internet, Goals of Internet, TCP/IP Protocol suite, Comparison between OSI and TCP/IP, IP addressing concept, address classification- class A, class B, class C addresses, Domain Name System (DNS) and Uniform Resource Locator(URL) Internet services: E-mail, FTP and Telnet.

**Reference Books**

1. Computer Networks by Tenenbaum
2. Introduction to Digital & Data communication by Michael A. Miller
3. IBM PC and Clones by Govindrajalu

**List of Experiments**

1. Their connectors
2. Study of RS 232C interface
3. Study of different type of Modem
4. Study of Network Operating Systems available in the Lab Installation and Configure Server and Workstation software
5. Study of Various Interconnecting devices like NIC, Hub, Switch etc.
6. Study of Internet for data transfer and its various applications.



**DEC - 0503 INDUSTRIAL ELECTRONICS**

**Unit-I**

**Review of the characteristics of power electronic devices:** power diode, SCR, TRIAC, DIAC, UJT & Power Transistors: Static & Dynamic Characteristics, Turn on & Turn off methods (communication), Selection & technical Specification (data-Sheet), Protection against over voltage & over current.

**Unit-II**

**Single phase and three phase rectifier Diode & SCR:** Uncontrolled with R load under continuous current mode function, Controlled with R load under continuous current mode function, Input & output wave form, Quantitative description and comparison of technical parameters such as  $V_{dc}$ ,  $V_{rms}$ , efficiency, RF etc, Merits & Demerits.

**Unit-III**

**Triggering Circuits:** Principle features of firing circuits, UJT pulse triggering circuits, Phase Shift Triggering.

**Inverter and Chopper:** Principle, Types and classification, Transistorized inverter and chopper, 3 Phase operation of inverter, Practical Applications of each.

**Unit-IV**

**Simple speed control methods of DC and AC motors:** Speed torque characteristics of DC & AC motor, Methods of Speed control (AC&DC), Basic Elements /Components of Speed Control (AC&DC), Open loop & closed loop methods (AC&DC), Block Diagram, Armature & Field Control, Block Diagram(DC), Frequency & Slip Control block Diagram (AC description), Choice between AC & DC Drive.

**Unit-V**

**Miscellaneous applications of power electronics:** Introduction, Principle & working, Different types, Block Diagram, Practical Applications of the: UPS, Resistance Welding, RF Heating, Diathermy, Ultra Sonic, Electronic Ignition

**References:**

1. Electrical Machinery by P.S. Bimbhra
2. Power Electronics by P.C.Sen
3. Thyristor Engineering by M.S.Berde
4. Thyristorized Power Controller by Sugandhi & Sugandhi
5. Industrial Electronics by G.K.Mithal





DEC -0504-ANTENNA AND MICROWAVE ENGINEERING

**UNIT-I**

**Wave Propagation:** Ranges of Electromagnetic waves for Communication, frequency-wavelength relation, attenuation of EM waves in air, review of Reflection, refraction, interference, diffraction and Polarization of EM waves, Ground wave propagation, Space wave propagation: radio horizon, fading.

**Sky wave propagation:** Ionosphere layers, day and night effect, reflection & refraction of radio waves in ionosphere, critical frequency and Maximum usable frequency, Optimum working frequency, Skip distance and single hop/multi hop transmission. Frequency ranges, advantages & disadvantages.

**UNIT-II**

**Transmission lines & their characteristics:** Parallel wire and co -axial cables, Primary and secondary constants of transmission line, equivalent circuit, Propagation constant, attenuation constants, Transmission line losses, Characteristics impedance of parallel wire and co-axial cable, Incident wave, reflected wave and standing wave, Standing wave ratio (SWR) and Reflection coefficient, Open circuit and short circuit lines, Voltage and current distribution.

**Impedance matching:** Need, quarter wave transformer matching, stub matching

**UNIT-III**

**Waveguides and components:** Waveguides concept, Comparison with transmission lines, Rectangular and circular waveguide comparison, Cutoff wavelength and frequency in Rectangular waveguide, Dominant  $TE_{10}$  Mode: field pattern & its excitation in rectangular waveguide, Waveguide passive components: List and their uses.

**UNIT-IV:**

**Microwave Solid State devices:** Limitations of transistors at microwave frequency, microwave transistors, Concept of negative resistance devices, parametric amplifier (PARAMP) and frequency converters, Gunn effect and Gunn diode oscillators

**Microwave Tubes:** Limitation of conventional tubes, Klystron amplifier, Reflex Klystron, Traveling Wave Tube (TWT), Magnetron

**UNIT-V:**

**Antenna Fundamental & their characteristics:** Introduction: antenna as a radiator, Reciprocity, Radiation resistance, Efficiency, Radiated field strength at a point, Isotropic radiator, Gain & Directivity, Radiation pattern and Beam width, Bandwidth of an antenna, Antenna Polarization, Effective height and effective aperture.

**Type of Antenna and their uses:** Dipole antenna, half wave antenna and folded dipole, distribution of voltage & current for half wave dipole. Antenna arrays: need of array, Physical Structure and applications of the following Antennas: Marconi antenna, Yagi-Uda Antenna, Parabolic reflector antenna, Horn antenna

**Reference Books**

3. Microwaves by Gupta K.C.
4. Antennas by Kraus

## 5. Electronic Communication System by Tomasi

### **List of Experiments:**

1. Demonstration of microwave component
2. Study of VSWR meter.
3. Measurement of frequency of microwaves
4. Measurement of standing wave ratio (VSWR) and reflection coefficient.
5. Measurement of cutoff wavelength (TE<sub>10</sub> mode) Using  $c = 2\sqrt{(m/a)^2 + (n/b)^2} = 2a$
6. Measurement of guided power in waveguide and Transmission lines.
7. Measurement of attenuation in dB for a given component.
8. Measurement of characteristics of klystron tube. Measurement of V-I characteristics of Gunn Diode.  
Performance of Gunn Oscillator.
9. Measurement of attenuation in Db for a given component.
10. Measurement of radiation pattern for different antenna.
11. Power Measurement in Transmission lines and Waveguide



**DEC - 0505 ELECTRONIC WORKSHOP PRACTICE**

**Unit-I**

**Electrical & Electronics Maintenance:** Awareness of cleaning of dust & corrosion, Oiling & greasing for lubricating of moving parts of tools and equipment, Protection of tools & equipment from dust and temperature

**Unit-II**

**Review of Tools and Electrical Accessories:** Identification and selection of tools like Pliers, screw drivers, Poker, Hammer, Hacksaw, Firmer, Hand drill, Phase tester, Study of different types of wires and their specifications, Study of Switches, resistors, capacitors and transformers

**Unit-III**

**Electronic Work Shop:** Material required in electronic work shop like tag points, terminal soldering, metal flux etc, Identification & testing of electronic components including ICs and SMDs

**Soldering:** selection of soldering iron, Soldering metal flux, soldering technique, desoldering technique, AC & Dc voltage & current measurement with multimeter, continuity test, measurement of resistance

**Unit-IV**

**P.W.B. Fabrication:** Specify the need of PWB in electronic circuits. Merits and Demerits of PWB, Describe the methods of PWB making: photo printing and screen printing. Describe features of different types of copper clad and laminates. State properties and applications of various types of PWB's like single layer, double layer and multiplayer. PWB Fabrication for SMD components PWB Designing using software like Circuit Maker etc

**Unit-V**

**Designing and Fabrication of Small Electronic Project:** Use data book to get the relevant information of components. Check digital and Linear IC's on bread board with the help of data book, Make Art work for a small project, Prepare the PWB for the project, Check and test the PCB Fabricate cabinet, Prepare project report, Demonstrate the function / working of the prepared project

**References:**

The Design and drafting of Printed CircuitsBy – Mr. Darryl Lindsey

**List of Experiments:**

1. To Study of UV Exposure
2. To Study of Dip Coating Machine
3. To Study of Curing Oven
4. To Study of Electronic Tool Kit
5. To Study of Mechanical Tool Kit
6. To Study of Crimping Tools
7. To Study of Clamping/ Tong Tester
8. To Study of Etching Machine
9. To Study of Temperature Controlled Soldering Iron unit
10. To Study of Shearing Machine



**DEC – 0506 PROFESSIONAL ACTIVITIES**

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As the student has to practice this course in all the six semesters, the guidelines given therein are common and applicable to each semester.

**OBJECTIVES:**

- \_ To allow for professional development of students as per the demand of engineering profession.
- \_ To provide time for organization of student chapter activities of professional bodies) i.e. Institute of engineers, ISTE or Computer Society of India etc.)
- \_ To allow for development of abilities in students for leadership and public speaking through organization of student's seminar etc.
- \_ To provide time for organization of guest lectures by expert engineers/eminent professionals of industry.
- \_ To provide time for organization of technical quiz or group discussion or any other group activity.
- \_ To provide time for visiting library or using Internet.
- \_ To provide time for group discussion or solving case studies.
- \_ To provide time for personality development of students.
- \_ To provide time for working for social cause like awareness for environmental and ecology etc.

**DETAILED INSTRUCTIONS TO CONDUCT PROFESSIONAL ACTIVITIES:**

- A. Study hours, if possible should be given greater time slot with a minimum of two hrs/week to a maximum of four hrs/week.
- B. This course should be evaluated on the basis of grades and marksheet of students, should have a separate mention of the grade awarded. There will be no pass/fail in professional activities(PA).
- C. Following grade scale of evaluation of performance in PA has been established.  
Grades Level of performance  
A Excellent  
B Good  
C Fair  
D Average  
E Below Expectations
- D. Grades once obtained in a particular examination shall become final and no chance of improvement in grades will be given to the students.
- E. Assessment of performance in PA is to be done internally by the Institution, twice in a Semester/Term through a simultaneous evaluation of the candidate by a group of three teachers, of the department Concerned. Group of teachers will jointly award the grade to candidate in the assessment. Best of the grades obtained by the student in these two assessments shall be finally taken on the mark sheet of the respective Semester/Term.
- F. Candidate abstaining from the prescribed course work and/or assessment planned at the Institute shall be marked ABSENT in the mark sheet, instead of any grade.
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- H. Institution shall maintain the record of grades awarded to all the students in PA for a period of 1 year.
- I. It shall be mandatory for students to submit a compendium for his PA in the form of a Journal.

J. Compendium shall contain following:

1. Record of written quiz.
2. Report/write up of seminar presented.
3. Abstract of the guest lecturers arranged in the Institution.
4. Topic and outcome of the group discussion held.
5. Report on the problems solved through case studies.
6. Report on social awareness camps( organized for social and environmental prevention).
7. Report on student chapter activities of professional bodies like ISTE, IE (India), CSI etc.

K. PA is not a descriptive course to be taught in the classroom by a particular teacher.

Various activities involved in the achievement of objectives of this course should be distributed to a number of teachers so that the talent and creativity of group of teacher's benefit the treatment of the course content.

These activities should preferably be conducted in English language to maintain continuity and provide reinforcement to skill development.

Small groups shall be formed like in tutorials, group discussion, case studies, seminar, project methods, roll play and simulation to make the development of personality affective.

Treatment of PA demands special efforts, attention, close co-operation and creative instinct on the part of teachers of department concerned. Since this course is totally learner centered, many of the activities planned under this course shall come out from the useful interaction of student, among themselves and with the teachers. The guide teacher/s shall best act as a facilitator of these creative hunts/ exercises, which unfold many of the hidden talents of the students or bring out greater amount of confidence in them to execute certain activity.



**DEC – 0601 CONSUMER ELECTRONICS**

**UNIT- I**

**Audio Technology:** Principle & working of microphone, types of microphone and their application- Carbon granule microphone, Condenser, Ribbon, crystal,  
Principle & working of speakers, types of speakers: PPMC, Frequency response of speaker, Audio amplifier, application of audio amplifiers: PA system

**UNIT- II**

**Broad Casting Receiver:** AM Receiver: Explain- TRF, super heterodyne, Double heterodyne FM Receiver, Ratio Detector, Foster sealed phase discriminator, FM Channels, Qualities of receivers

**UNIT- III**

**TV Technology:** Principles of Television: TV standards, Scanning, Video Bandwidth, Modulation techniques, Channel allocation, Composite Video signal  
TV Camera: Principle & working of Videocon TV Camera.  
TV Receiver: block diagram and working of B&W receiver and PAL Receiver  
Display Technologies: CRT Monitor, LCD Monitor, PLASMA monitor

**UNIT- IV**

**Media Players: Block Diagram of Players:** Audio CD Players, Video CD Players, DVD Players  
Introduction to Blue Ray disc player, HD DVD  
Multimedia: Introduction to multimedia, Different audio and video formats related to multimedia, MPEG1, MPEG2, MPEG3, MPEG4, Multimedia editing tools- Movie Maker, Nero wave Editor.  
Application of multimedia in education, entertainment, advertisement, research.  
PROJECTORS : DLP Projector, LCD Projector

**UNIT- V**

**Security & Safety System:** Burglar's alarm, Video door phone, CCTV, Electronic combination locks, Fire alarm

**Reference Books:**

1. Monochrome & Color TV- R.R. Gulati
2. Television – Dhake
3. Audio & Video Techniques- R.G.Gupta
4. Electronic Communication- Roody & Coolen
5. Electronic Communication System – Kennedy
6. Audio & Video Techniques- Ajay Sharma

## **List of Experiments**

1. Study of different microphones & speakers
2. Plotting of directional property of microphones & speakers
3. Frequency response character of microphones &
4. speakers
5. Study of audio amplifiers stages (pre amplifier, voltage amplifier, power amplifier)
6. Study of AM receiver characteristics i.e sensitivity, selectivity, fidelity, SNR, stability
7. Study of FM receiver characteristics i.e sensitivity, selectivity, fidelity, SNR, stability
8. Demonstrate B/W TV receiver
9. Demonstrate Color TV receiver
10. Study of composite video signal using pattern generator
11. Market survey of different types of monitors & their comparison
12. Assembly & disassembly of CD player mechanism Market survey & comparison of different types of monitors i.e LCD, CRT, LED monitors
13. production of multimedia CD using general multimedia software i.e Movie maker
14. Study of multimedia format
15. study of security and safety systems



**DEC – 0602 ADVANCED COMMUNICATION**

**UNIT- I**

**Optical fiber communication:** Light propagation through optical fiber; basic fiber structure, total internal reflection, Numerical Aperture, Acceptance angle, Attenuation in optical fiber.

Dispersion: basics of Modal dispersion, Material and waveguide dispersion, relation between data rate and dispersion

**Types of fibers:** Single mode fiber, Multimode fiber, Graded index fiber; comparison Structure of Fiber optic cables, Optical Communication system: block diagram, Light source: LED and Laser Diode, Detectors: PIN, photodiode and Avalanche photodiode, Specification criteria in selection of transmitter & receiver

**Tool for Installation and maintenance:** Application of: Optical power meter, OTDR, Fusion Splicing Machine.

**UNIT- II**

**Cellular Communication:** The Cellular Concept, Frequency bands and cellular coverage, Geometry of a cell: Cell size and Number of possible users, Frequency reuse and hand-off.

**Cellular system implementation:** Cell office, MTSO, Block diagram of cellular hand set, Introduction to handset operating systems, Access technology- FDMA, TDMA & CDMA, comparison, GSM Services, speech group call and related services, general packet radio service (GPRS), short message services, (SMS), CDMA based digital cellular system, spread spectrum modulation, frequency hopping, Features of Third generation cellular service

**UNIT- III**

**Satellite Communication:** advantages and disadvantages of Satellite system, Frequency bands, Uplink and Downlink frequencies, Satellite basics- Orbits, Altitude, footprint, Low orbit regional satellites, Geostationary satellite, Satellite system link model- uplink, transponder, downlink, cross link, Block diagram of Satellite, Earth station, Block diagram of Satellite and communication transponder, Satellite multiple access- FDMA, TDMA & CDMA, TV channel reception via Satellite, Global Positioning System (GPS) and GPS, Navigation basics, Direct to home (DTH) basics.

**UNIT- IV**

**RADAR:** Basic RADAR system and applications, Frequencies and Powers used in RADAR, Definition of Range, pulse width, PRF, duty cycle, RADAR Range equation and factors that affect Range, Scanning methods, Search and Track RADAR system, Display method: PPI, Basic pulsed RADAR system, MTI and CW Doppler RADAR.

**UNIT- V**

**Emerging Trends in Technology:**

Bluetooth Technology: Introduction, Standards Services, applications, Introduction to IP TV, iPhone, Introduction to WAP, EDGE, HSPDA, OTA, VOIP

**Reference Books:**

1. TV & VIDEO- R. G. GUPTA
2. Basic television system- R.R. Gulati



**List of Experiments:**

1. Measurement of attenuation in optical fiber
  - (a) Measurement of Propagation loss
  - (b) Measurement of bending loss
2. Measurement of numerical aperture
3. Measurement of characteristics of fibre optic LED and photo detector.
4. Measurement of Radiation Pattern of LED
5. Forming simple fiber optic analog link.
6. Study of PC- to- PC communication using optical fiber link and two RS 232 cards.
7. Setting up CW Doppler RADAR and measure speed of a moving object
8. Experiments based on Mobile communication.
9. Experiments based on GPS system.
10. Experiments based Satellite communication.
11. Experiments based on Bluetooth devices



**DEC – 0603(A) COMPUTER PROGRAMMING**

**UNIT- I**

**Introduction:** program concept, Assembler, Compiler & Interpreter, characteristics of a good program, various stages in program development, Algorithms, Flowcharts, pseudo- codes, programming technique- top down, bottom-up, structured programming.

**UNIT- II**

**Fundamentals of C:** History & Features of C, C program structure, pre-processor directives, C tokens character set, keywords, identifiers, constants, variables, data types, data types conversion, Expressions, Statements, Use of header files, Defining macros, input/output functions- printf(), scanf(), getchar(), putchar(), gets(), puts() etc. Formatted I/O using control string.

**UNIT- III**

Operators in C: Arithmetic Operators, Logical Operators, assignment operator, Relational Operators, Bitwise Operators, Special Operators: exp, exit(), sizeof(), increment and decrement (post and pre). operators-precedence & associatively, Type casting, C expression data type, order of evaluation of expression.

**UNIT- IV**

**Control Statements:** Loop statements: for statement, while statement, Do-while statement, break-continue statement, nested loop.

**Branching statements:** if statement, if- else, nested if, Unconditional branching: go to statement  
Multiple branching statements: switch case statement.

**UNIT- V**

**FUNCTIONS:** Basics of function, types of C Functions, Bindings of function, parameters of functions, local and global variables.

User-defined Functions - Function declaration, Function prototype, scope and life of variable-actual, formal, call by value, call by reference.

Implementations, Accessing a Function, Arguments and Parameter passing mechanisms, recursion, Storage classes – static auto, extern, and register, built-in function: declaration, Accessing, Parameter passing.

**Reference Books:**

1. Theory and problems of programming with 'C', Gottfried., Schaum's series
2. Chapman, Understanding windows, BPB Publication
3. C: the complete reference, Herbert schildt,4 edition, McGraw-Hill Osborne Media
4. Complete reference of C++,

**List of Experiments:**

1. Working with turbo C editor
2. Program using printf() scanf() and formatted I/O, string manipulations. Defining and using Macros
3. Program using Operators
4. Program using various Control Statements
5. Program using Single dimensional and Two-dimensional array, Program using Functions
6. Program using call by Value & Call by reference Program using Static, Auto, & Extern function, Program using Structure & Union
7. Program using Pointers & Files.
8. Program to print hello using classes in c++ ,Program to print hello in java.
9. Program to learn, to write assembly language in C
10. One Small Project must be developed in C & C++ language.



**DEC – 0603(B) PROGRAMMABLE LOGIC CONTROLLERS**

**UNIT- I**

**Introduction to PLC:** What is PLC, Technical Definition of a PLC, Advantage of PLC, Chronological Evolution of a PLC, Type of PLC, Block diagram of PLC.

**UNIT- II**

**PLC Hardware:** Timers & Counters- Relays, Ladder logic diagram, PLC Connection, Electrical Wiring diagram, JIC Wiring Symbols, Latches, Timer, Classification of Timer, PLC Counters, Operation of PLC Counter, Counter Parameters.

**UNIT- III**

**Advance Instruction & Programming Techniques:** Introduction, Comparison Instruction, Discussions on Comparison Instruction- EQUAL, NOTEQUAL, LESS THAN, LESS THAN OR EQUAL, GRATER THAN, MASKED COMPARISION FOR EQUAL, LIMIT TEST. Mathematical Instruction, Logical Instruction, Data handling Instruction.

**UNIT- IV**

**PLC Input-Output (I/O) Modules Power Supply:** Introduction, Classification of Input Output Modules, Input-Output System Sinking Sourcing, Special Input Modules, RTD Input Module, Stepper Motor Control Module, Thermocouple, Input Module Power Supply Configuring, Power Line conditioner, Reliability, Safety and Redundancy Filter.

**UNIT- V**

**PLC Applications:** Distributed control system (DCS), Industrial control systems (ICS), Programmable automation controller (PAC), Industrial safety systems SCADA.

**Reference Books:**

1. Programmable Logic Controllers
2. Programmable Logic Controllers

**List of Experiments:**

1. Develop a Simple Ladder Logic Program that will turn on an output X if
2. Input A and B or C is on
3. Develop a relay based Controller that will allow three switches in a room to control a single light
4. How temperature control system can be developed in a process industry
5. Develop a traffic control System
6. Speed control of Induction Motor.



### DEC – 0604 PROJECT

Project work is the area in which a student can show his creativity resources fullness, knowledge and various skills attained through the labs and work-shop during the course duration.

Project work leads the student to develop his original thinking, group discussion, leadership, interpersonal relations, inter disciplinary relation and polishes his behavior in the society.

He is also exposed to market survey for procurement of components, suiting to the circuit, their equivalents, the process of try outs of circuits, modification of circuit values and finally getting the desired result.

An electronics diploma student has very vast scope of preparing project, as electronics has entered in every walk of life of the society and every hour of one's daily life.

The support of the institution, faculty members, and supporting staff is of paramount importance and their quality is also reflected in the quality of the final shape of the project.

A good project work earns credit for all concerned and increase scope of employment / self employment when presented to potential employer. With this view curriculum can not be bound in any limits and boundary on papers. Reasonable freedom has to be given for selecting the project work as far as the project is feasible and economically viable and socially useful.

The objective of the course 'Project' is

- \_ To provide students with a comprehensive experience for applying the knowledge gained so far by studying various courses.
- \_ To develop an inquiring aptitude and build confidence among students by working on solutions of small industrial problems.
- \_ To students an opportunity to do something creative and to assimilate real life work situation in institution.
- \_ To adapt students for latest developments and to handle independently new situations.
- \_ To develop good experiences, power and presentation abilities in students.

Students already have a glimpse of project work as they have worked on Minor Project Work in V semester. This gives the students an occasion to observe the work on real life projects and select some application area in which he/she will be undertaking project. External guide from industry can also be selected for project work along with an internal guide to prepare innovative and real projects. Students also have the flexibility of extending the minor project work into Major project, if the area has a scope for that.

The purpose of providing six hours per week is to orient the student's in-groups on the following objectives:

- \_ Provide general guidelines regarding execution of work.
- \_ Impart instructions regarding write-up work and preparation of project documents.
- \_ Sharing and solving common problems associated with execution of project work.
- \_ Monitor and evaluate the progress of project work.

The faculty and student should work according to following schedule:

1. Each student undertakes substantial and individual project in an approved area of the subject and supervised by member of staff.
2. The student must submit outline and action plan for the project execution (time schedule) and the same be approved by the concerned faculty.
3. The project development must be carried out according to following steps and final write-up should have the same sequence.
  - \_ Project objectives.
  - \_ Requirement gathering.
  - \_ Modeling of project should be done in any well- known modeling tools.
  - \_ Analysis of Project.
  - \_ Design of Project.

- \_ Implementation of project.
- \_ Testing on project.
- \_ Quality consideration of project.
- \_ Designing a small user manual.
- \_ Estimating the cost of the project.
- \_ Future scope and suggestions.

**ACTION PLAN FOR PROJECT WORK AND EVALUATION SCHEME (SUGGESTIVE):**

- Orientation of students by HOD/Project supervisor.
- Literature survey and resource collection.
- Selection and finalization of topic before a committee.
- Detailing and preparation of project (Modeling, Analysis and Design of Project work)
- Development Stage.
- Testing, improvements, quality control of project.
- Acceptance testing.
- Report writing.
- Presentation before a committee (including user manual)

Committee comprises of HOD, all project supervisors including external guide from industry the above marking scheme is suggestive, it can be changed to alternative scheme depending on the type of project, but the alternative scheme should be prepared in advance while finalizing the topic of project before a committee and explained to the concerned student as well.

**REFERENCES / SOURCES FOR GUIDANCE TO STUDENT FOR SELECTION OF PROJECT WORK:**

1. Electronics Magazines & Journals.
2. District Industries Center.
3. Industry-Institution Interaction
4. Small Scale industry
5. Industrial problems discussed during industry visit/training.
6. Entrepreneurship development Board Magazine.
7. “Prime Minister Rojgar Yojana” projects from district Collectorate.



**DEC – 0605 PROFESSIONAL ACTIVITIES**

Professional Activities is not a descriptive course, as per conventional norms; therefore specific content for this course cannot be prescribed. It is a group of open-ended activities; where in variety of tasks are to be performed, to achieve objectives. However general guidelines for achieving the target and procedure for its assessment are given under the course content.

As the student has to practice this course in all the six semesters, the guidelines given therein are common and applicable to each semester.

**OBJECTIVES:**

- \_ To allow for professional development of students as per the demand of engineering profession.
- \_ To provide time for organization of student chapter activities of professional bodies) i.e. Institute of engineers, ISTE or Computer Society of India etc.)
- \_ To allow for development of abilities in students for leadership and public speaking through organization of student’s seminar etc.
- \_ To provide time for organization of guest lectures by expert engineers/eminent professionals of industry.
- \_ To provide time for organization of technical quiz or group discussion or any other group activity.
- \_ To provide time for visiting library or using Internet.
- \_ To provide time for group discussion or solving case studies.
- \_ To provide time for personality development of students.
- \_ To provide time for working for social cause like awareness for environmental and ecology etc.

**DETAILED INSTRUCTIONS TO CONDUCT PROFESSIONAL ACTIVITIES:**

- A. Study hours, if possible should be given greater time slot with a minimum of two hrs/week to a maximum of four hrs/week.
- B. This course should be evaluated on the basis of grades and marksheet of students, should have a separate mention of the grade awarded. There will be no pass/fail in professional activities(PA).
- C. Following grade scale of evaluation of performance in PA has been established.  
Grades Level of performance
  - A Excellent
  - B Good
  - C Fair
  - D Average
  - E Below Expectations
- D. Grades once obtained in a particular examination shall become final and no chance of improvement in grades will be given to the students.
- E. Assessment of performance in PA is to be done internally by the Institution, twice in a Semester/Term through a simultaneous evaluation of the candidate by a group of three teachers, of the deptt. Concerned. Group of teachers will jointly award the grade to candidate in the assessment. Best of the grades obtained by the student in these two assessments shall be finally taken on the mark sheet of the respective Semester/Term.
- E. Candidate abstaining from the prescribed course work and/or assessment planned at the Institute shall be marked ABSENT in the mark sheet, instead of any grade.
- F. While awarding the grades for performance in PA, examining teacher should reach the final consensus based on the attendance, punctuality, interest, presentation skills in seminar on the topic assigned (collection of relevant data, observations, analysis, findings/conclusion) and its written report, awareness of latest developments in the chosen programme of study.
- G. Institution shall maintain the record of grades awarded to all the students in PA for a period of 1 year.

H. It shall be mandatory for students to submit a compendium for his PA in the form of a Journal.

I. Compendium shall contain following:

1. Record of written quiz.
2. Report/write up of seminar presented
3. Abstract of the guest lectures arranged in the Institution.
4. Topic and outcome of the group discussion held.
5. Report on the problems solved through case studies.
6. Report on social awareness camps( organized for social and environmental prevention).
7. Report on student chapter activities of professional bodies like ISTE, IE (India), CSI etc.

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