SEMESTER-I

Code No.	Subject	Study Scheme Period/Week			Evaluation Scheme						Total Marks
		L	T	P	Internal Assessment		External Assessment Exam				
					Theory	Practical	Written		Practical		
					Max	Max. Marks	Max. Marks	Hrs.	Max. Marks	Hrs.	
*1	Communication Techniques – I	3	2	-	50	-	100	3	-	-	150
*2	Applied Maths – I	3	2	-	50	-	100	3	-	-	150
*3	Applied Physics	4	-	2	50	25	100	3	50	3	225
4	Basic Electricity	4	-	2	50	25	100	3	50	3	225
*5	Introduction to Computers	1	-	4	-	50	-		100	3	150
6	Workshop practices	-	-	6	-	50	-	-	100	3	150
**	Student Centered activities	-	-	5							
	TOTAL	15	4	21	200	150	500		200		1050

Syllabus for Semester I (Electronics and Communication Engineering)
CRRIT Kanjhawala Delhi-81

Course code: EC-170 Course: Communication Technique-I
L: 3 hrs., T: 2 Per Week Total Marks: 150
Designation::Required coordinator: Mrs Suman

Course Outcomes

On completion of this lab students will be able to :

(i) An ability to communicate effectively.
(ii) A recognition of the need for, and an ability to engage in life long learning
(iii) Knowledge of contemporary issued.
(iv) Developing reading writing and communication skills among the students so as to develop confidence in them in writing and oral techniques.
(v) It helps the students in their continuing their education needs.

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1. The Prose Textbook entitled "A Book of English for Polytechnic Students", prepared by National Institute of Technical Teachers' Training and Research (NITTTR), Chandigarh and published by Macmillan India Limited. (30%)

Questions to test the comprehension and critical appraisal of the lesson are to be given. Three questions out of five are to be attempted. Word limit for answer is to be approximately 150 words each.

2. **Vocabulary** (10%)

Antonyms, synonyms, homonyms and one word substitution.

A brief review of easy forms of tenses (present indefinite, present continuous, present perfect, present perfect continuous, past indefinite, past continuous, past perfect, past perfect continuous and future indefinite). Conversions of direct into indirect narration and vice versa (only simple sentence) Punctuation articles, prepositions, voice, auxiliary (be, have, do and models).

4. **Comprehension:** (20%)

A passage of 100 – 150 words may be given to test the comprehension skill of the students. Simple question to test the understanding of the contents and vocabulary may be given.

5. **Essay** (20%)

Choice of attempting one out of three topics may be given. The essay will be of 300 –

350 words. Descriptive, narrative and reflective topics from areas such as science, technology, environment, current problems, and socio-economic issues may be given.

Tutorials workout:

1. Telephonic conversation – Making and Receiving Calls
2. Mock exercises on interview for a job.
3. Group discussions on current issues
4. Listening comprehension from Radio or TV talk in English
5. Extempore speech / Declaration contest
6. Presentation of a report with the help of Audio-Visual aids.

Syllabus for Semester I (Electronics and Communication Engineering)
CRRIT Kanjhawala Delhi-81

Course Code: EC171 Course: Applied Physics

L: 3Hr., T: 1Hr., Per week Total Credits: 150

Course Outcomes

1. Student will get the wealth of information that will clarify various concepts of physics like measurement System, sound system, concept of light, laser, atomic structure etc.
2. Study of physics provides an idea about modern atomic theory.
3. By studying the radioactivity in physics student can understand the concept of half life and mean life in Radioactivity and also able to understand the advantages and disadvantages of radiations.
4. By studying physics students can get information of three dimension photography i.e. holography.
5. By studying the topic ultrasonic sound student can understand how to guide the ships in foggy weather and measure different kind of distances which cannot be measured by ordinary methods .
6. By studying the physics student can design the buildings according to good reception of sound.

Unit I.
Measurement
a) Units and Dimensions

Fundamental and derived units, SI units, dimensions of physical quantities, dimensional formula and dimensional equation, principles of homogeneity of dimensions and applications of homogeneity principle in:
- Checking the Correctness of physical equation.
- Deriving relation among various physica1quantities.
- Conversion of numerica1 va1ues of physICa1 quantities from
one system of units into other system

b) Errors in measurement accuracy, estimation of percentage error
in the result of measurement.

Unit II.
WAVES

Generation of waves by vibrating partic1es, progressive wave, equation of waves, energy transfer by particles and waves, superposition of waves and its applications to interference, beats and stationary waves (graphical); sound and light as waves - range of frequencies, wavelengths, velocities and their nature, electromagnetic spectrum Doppler effect.

Unit III.
Sound
a) Acoustic

Reflection., refraction and absorption of sound waves by materials; definition of pitch, loudness ,quality and intensity of sound waves, unIts of intensity (bel and decibel); Echo and reverberation time control of reverberation time Acoustic insulation ; (qualitative treatment only of reverberation).

b) Ultrasonic

Production of ultrasonic waves by magnetostriction and piezoelectric effects,detection and properties of ultrasonic;application to drilling,cold welding,cleaning, flaw detection and exploration(sonar).

Unit IV
Light
Geometrical optics

Defect in image formation,eyepieces construction and principles of preparation of telephoto and zoom lens; principles of optical projectors, optical principles of OHP and slide film projectors.Interference and diffraction of light waves;Interference of light waves; basic ideas about diffraction and polarization of light waves.

Unit V

Wave Optics

Interference of light waves; Young's experiment; Newton's ring application of interference (Plainness testing measurement of small thickness), basic idea about diffraction and polarization of light waves.

Unit VI

Laser and its Applications

Laser principle, types of Lasers; detailed study of the He-Ne and Ruby laser and their applications, Fluorescent tube; mercury arc light, xenon source, sodium lamp.

Unit VII

Atomic Structure and Energy Level

Bohr model of atomic structure,Energy levels,ionization and resonance potentials; Energy levels of conductors, insulators and semiconductors.Atomic and crystal structure of silicon and germanium,covalent bonds,Effect of temperature on conductivity of germanium and silicon.

Unit VIII

Radioactivity and Detection of Radiations

Natural radioactivity; half life; decay constant; mean life; radioactive transformation; principles of nuclear fission and fusion; energy generation; source of background radiations; health hazards of radiations; unit of radiations.

Text Books:

Reference Books:

Syllabus for Semester I (Electronics and Communication Engineering)
CRRIT Kanjhawala Delhi-81

Course Code: EC171 Course: Applied Mathematics-I

L: 3Hr., T: 2Hr., Per week Total Marks: 150

Prerequisite: nil Coordinator: Dr. Aman Sinha

Course outcomes:

on completion of this lab students will be able to :

1 The topic matrix & determinants has very wide applications in communication theory, network analysis etc.

2 The topic algebra, trigonometry & coordinate geometry are used to develop analytical abilities on the basis of applied mathematics.

3 Student will be able to solve complex problems.

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1. ALGEBRA 15%

(i) Arithmetic Progression (A.P.) – its n^{th} term, sum to n terms. Geometric Progression (G.P.) - its n^{th} term, sum to n terms. And infinite Geometric series.

(ii) Partial Fractions.

(iii) Binomial theorem for positive integral index (without proof), Binomial theorem for any index, Expansions.

2. TRIGONOMETRY 15%

(i) Sum and difference formulas for trigonometric ratios of angles and their application (without proof). Formula from product to sum, difference and vice-versa. Ratio of multiple angles, sub multiple angles (like 2A, 3A, A/2).

(ii) In a triangle sine formulas, cosine formulas, Napier's analogy. Solution of triangle.

(iii) Simple problems on height and distance.

(iv) Plotting of curves y = f(x), f(x) being algebraic function (maximum upto third degree) or trigonometric functions (Sine, Cosine, Tangent).

3. COORDINATE GEOMETRY 40%

(i) Equation of straight line in various standard forms. Intersection of two straight lines and angle between them. Concurrent lines, perpendicular distance formula.

(ii) General equation of a circle and its characteristics. Equation of a circle given center and radius, three point form and diametrical form.

(iii) Definition of a conic section, standard equation of a parabola equation of parabola given its focus and Directrix. Given the equation of parabola finding its focus axis, vertex, Directrix and latus section.

(iv) Ellipse and hyperbola (standard equation, without derivation) determining the equation of ellipse and hyperbola given the Directrix, focus and eccentricity. Given the equation of the ellipse and hyperbola finding the focii, Directrixes,. axes,latusrectum,vertex and eccentricity.

4. VECTOR ALGEBRA 10%

(i) Concept of a vector, Position vector of a point. Addition and subtraction of vectors.

(ii) Multiplication of a vector by a scalar product and vector product of two vectors. Application to problems on work done and moment (torque)

5. DETERMINANT AND MATRIX 20%

(i) Definitions Evaluation of a determinant of order two and three. Minor and cofactors. Properties of determinants. Solving simultaneous equations by Cramer's rule.

(ii) Concept of a matrix, definitions, Transpose of a matrix, Symmetric and Skew Symmetric matrix, Diagonal matrix, Unit matrix, Addition and Multiplication of matrices, Adjoint and Inverse of a matrix, solving simultaneous equations by matrix methods.

Text Books:

1.Applied maths I & II by H.K.Dass

2.Applied mathematics by Dr. R.D.Sharma published by Dhanpat Rai Publications.

3.Applied maths I & II by Dr. Neeraj Pant

Syllabus for Semester I, B.E. (Electronics and Communication Engineering)
CRRIT Kanjhawala Delhi-81

Course code: EC-173 Course: Basic Electricity
L: 4 hrs., T: 1 Per Week Total Marks: 150
Designation::Required Course coordinator: Ms P.Swami

Course Outcomes

1. The course provides the students Understanding the "basic concepts and principles of DC and AC power; DC and AC circuits.
2. Students will be familiar with basic electrical circuits and devices to apply the knowledge further.
3. Students will understand the professional and ethical responsibility.
4. Students will be able to design a system, component, conduct experiments and processes to meet desired needs with in realistic constraints.
5. Gaining ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

Unit 1

Review the following
Coulomb's law, Electric field, Electric intensity, Electric lines of force in simple charge configuration, Gauss's theorem (No proof) , Field around a charged conductor, plane sheet and a sphere, concept of potential difference, potential due to a point charge, potential gradient, equipotential surfaces, breakdown potential and dielectric strength.

Unit 2
Capacitor
Concepts of capacitance and capacitors, Units of capacitance, capacitor ratings, Parallel plate, spherical and cylindrical capacitors and their capacities, Energy stored in a capacitor, Concept of dielectric and its effect on capacitance, Series and parallel combination of capacitors, simple problems of capacitors.
Unit 3
DC Circuits
Concept and units of electric current, Ohm's law, concepts of resistance, conductance, resistivity and conductivity, their units and dependence on temperature in conductor, Power and energy, heating effect of electric current and 'conversion of mechanical to electrical units and vice- versa, Kirchhoff's voltage and current laws and their applications in simple DC circuits, Series and parallel combination of resistors, wattage consideration, Simple problems.

Unit 4

Basic Magnetism
Magnetism, Nature of magnetism, Magnetic field, lines og magnetic flux, coulomb's law, Magnetic intensity, permeability, reluctance, Magnetic flux, magnetic density, Intensity of magnetization, hysteresis, relation between B and H, Analogy between electric and magnetic circuits .

Unit 5
Electro Magnetism
Magnetic effect of electric current, work law & its application, Bio Savart's law, Field outside a long current carrying conductor, Field strength due to a solenoid, Field strength of the axis of a circular loop, force between two current carrying parallel conductors, Faraday's laws, Lenz'-s law and rules of electromagnetic induction, principles of self and mutual induction, self and mutually induced e.m.f, simple numerical problems, Energy stored in a magnetic field, concept of current growth, decay and rise time constant in an inductive(RL) circuit , Energy stored in an inductor.

Unit 6

A.C. Theory
Concept of alternating voltage and current, difference between AC and DC, Concept of cycle, frequency, period, amplitude, instantaneous value, average value, rms value and peak value, Form factor, Equation of sinusoidal waveform, representation alternating quantities, concept of phase difference.

Unit 7

Measuring Instrument
Electrical instruments, Essentials of Indicating type instruments, Permanent magnet moving coil instrument, Difference between ammeter and voltmeter, extension of their range and simple numerical problems, Dynamometer type moving coil instrument, Principle and working of wattmeter (dynamometer type), Moving iron instruments(attraction type and repulsion type).

Unit 8

Voltage and Current Source
Concept of constant voltage source, symbol and graphical representation, characteristics of ideal and practical voltage source, Concept of constant current source, symbol, characteristics and graphical presentation of ideal and practical current sources, Equivalence of current and voltage sources.

Unit 9

DC Circuit Theorems
Thevenin's theorem, Norton's theorem, superposition theorem, Maximum power transfer theorem, application of network theorems in solving DC circuit problems.

Text Books:

1. Fundamentals of Electrical and Electronics Engineering: *S.K Sahdev, Dhanpat Rai Publications.*
2. Electrical Circuit Analysis: *A.K Chakrabarti, Dhanpat Rai Publications.*

Reference Books:

1. Electrical Circuits: *M.L Soni, Dhanpat Rai Publications.*
2. Basic Electricity: *J.B Gupta, Rajeev Manglik, Rohit Manglik: Katson Books.*
3. Electrical Circuits: *Mukesh Kumar Saini, Dhanpat Rai Publications.*

Syllabus for Semester I (Electronics and Communication Engineering)
CRRIT Kanjhawala Delhi-81

Course Code:EC180 Course:Applied Physics

P:3Hr.,Per week Total Credits:50

LIST OF PRACTICALS

1. Use of vernier calipers and micrometer for determination of diameter of a wire.

2. Study of interference of sound waves using Quincke's tube .

3. Study of resonance in air- column and determination of velocity of sound in air.

4. To make a, telescope by combination of suitable lenses and determine, its magnifying power.

5. Measurement of small thickness by interference method (by Fresnel's Biprism method)

6. To make a compound Microscope by suitable combination of 1enses and determine its magnifying power.

7. To determine the wavelength of sodium 1ight by Newton's ring method

8. Setting an OHP lenses and mirrors for its best performance

9. Determination of wavelength of various spectral lines of mercury lamp.

10. Measurement of illumination level of a white surface under: Natural daylight, incandescent light and fluorescent light.

11. To compare the intensity of illumination by Bunsen's photometer.

12. Study of: diffraction of. He-Me laser beam by markings on a vernirescale and determination of its wavelength.

13. To measure the first ionisation potential of Ha using diode.

Syllabus for Semester I (Electronics and Communication Engineering)
CRRIT Kanjhawala Delhi-81

Course code: EC-182 Course - Introduction to computer
L: 1 hrs P: 4 hrs., Per Week Total marks: 75
Prerequisite: Computer basic books Coordinator: Mrs Monika

Course Outcomes

6. Students will gain the knowledge of all basic areas of computer technology that will clearly influence all aspects of our life..
7. Students will be able to get knowledge of basic parts of computer and working of all those parts(introduction to computer) which is essential for being exposed to this area of work or study.
8. Students will understand the working and magnitude of Operating system that is necessary in professional areas and business world.
9. Students will be able to achieve a great knowledge of windows and all M.S Package to design a system, component and processes to meet desired needs with in realistic constraints.
10. Gaining ability to use the computer that provides that the exposure will enable the student to enter the world with confidence.

Unit 1. Elements of Computer and its working.

(i) Block diagram of a computer& overview of its working.
(ii) Computer Generations.
(iii) Types of Computers Stand alone. Multi-user, network/distributed, personal, micro computers, workstations, servers, mainframes and supercomputers.
(iv) Input, output and storage devices interconnections of various peripherals with computer.
(v) Memory- primary and secondary.
(vi) Classification of programming languages.
(vii) Evolution of programming paradigm.
(viii) Fourth generation languages(4GL)
(ix) System s/w V/s application software/programs.
(x) File organization, file types.

Unit 2. Familiarization With Operating System

(i) Introduction to computer operating system (DOS, windows 95/98/2000/XP/Vista/Windows 2007) along with their comparisons.

Unit 3. Preparation Of Documents Through Word Processing.

(i) Characterization of documents. .
(ii) Spell checking.
(iii) Mail Merge.
(iv) Paragraph and alignment and justification
(v) Table, Charts, graphs , diagrams.

Unit 4. Preparation Of Documents using Power point – Preparation of slides and its presentation , Hyperlinks.

Unit 5. Concept of Spreadsheet – handling using spreadsheet formula , graphs and charts.

Unit 6. Introduction to Internet.

(i) What is internet? Search engine.
(ii) About Internet addresses.
(iii) Hardware required for internet
(iv) Server types, connectivity (TCP/IP, Shell), applications of internet like – email and browsing.

Reference Books:

1. Fundamentals of computers & programming in C by A.K. Sharma.
2. Fundamentals of computers & Programming in C by G.S. Baluja & G.K. Baluja and introduction to computer.
3. Computer Fundamentals by Prabhat Mittal & Ritendra Goel.

Syllabus for Semester I , Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC183 Course Title: Workshop for practices

T: 4 Hrs. Per Week Total Marks: 150

Designation: Required Course Coordinator: Mr,Ajit Kr,Jiya Lal,Bijender

Pre –requisite: nil

1.Student will be practice on saw

2.Student can create job of various joints.

3.Student will be practice on various fitting shop.

4.Student will be able to practice on filling on non ferrous metal

5.Student will be understand various job of sheet metal and joints.

The following trades are considered basic.

1. **Carpentry**
2. **Fitting**
3. **Sheet Metal & Jointing**

1. CARPENTRY SHOP

Keeping in view the essential elements of knowledge and skill, the following exercises are planned:

(i) Introduction to raw materials, various hand tools and safety measures to be observed.
(ii) Exercise on Marking and Sawing
(iii) Planning Practice.
(iv) Chiseling practice
(v) Introduction of joints, their relative advantages and uses.
(vi) Preparing of half lap joint
(vii) Preparing of mortise and tennon joint.
(viii) Preparation of dovetail joint.
(ix) Preparation of miter joint
(x) Demonstration job showing use of rip saw, bow saw and trammel
(xi) Demonstration of job on band saw circular saw.

2. FITTING SHOP

(i) Common materials used in fitting shop and description of work bench, holding devices and files.
(ii) Filing practice (production of flat surfaces). Checking by straight edge.
(iii) Filing a dimensioned rectangular or square piece to an accuracy of 0.25 mm.

(iv) Description of chisels, hammers etc. and chipping practice
(v) Simple operation of hack sawing, description of various types of blades, their uses and how to fit the blade and Hack sawing practice.
(vi) Description of drills, selection of drills for tapping, types of taps, tapping and dieing operations.
(vii) Drilling practice on soft metals (AI, Brass and lead).
(viii) Handling of measuring instruments, checking of zero error, finding of least count etc.
(ix) Practice of filing on non ferrous metal

3.SHEET METAL & JOINTING SHOP

(i) Introduction to sheet metal shop, use of hand tools and accessories, e.g. different types of hammers, hard and soft mallet, sheet and wire gauge, necessary allowances required during job fabrication. Selection of materials.

(ii) Demonstration of the use of hand shears, sheet metal machines, creasing and grooving tools.
(iii) Preparation of a sheet metal job involving rolling, shearing, creasing, binding, corner making and round cutting.
(iv) Preparation of a sheet metal jobs involving shearing, grooving, greasing, circle cutting folding beading, etc.
(v) Different types of rivets and their applications. Use in puncher and pullers.

(vi) Practice of riveting in different fashion e.g. lap, butt, chain, zigzag etc.
(vii) Preparation of utility jobs.

Introduction to soldering and brazing and; Demonstration on brazing by the instructor

Reference material: Lab Manual

SEMESTER-II

Code No.	Subject	Study Scheme Period/Week			Evaluation Scheme						Total Marks
		L	T	P	Internal		External Assessment Exam				
					Theory	Practical	Written		Practical		
					Max Marks	Max. Marks	Max. Marks	Hrs.	Max. Marks	Hrs.	
*1	CommunicationTechniques - II	3	-	-	50	-	100	3	-	-	150
*2	Applied Maths - II	3	2	-	50	-	100	3	-	-	150
3	Electrical Machines	4	-	2	50	25	100	3	50	3	225
4	Electronic Components and	4	-	-	50	-	100	3	-	-	150
5	Electronic Devices and Circuits - I	3	1	3	50	25	100	3	50	3	225
6.	Electronics and Electrical Workshop	-	-	8	-	50	-	-	100	3	150
6	Engineering Drawing	-	-	3	-	50	-	-	100	3	150
**	Student Centered activities	-	-	1							
	TOTAL	17	3	20	250	150	500	-	300	-	1150

Syllabus for Semester II (Electronics and Communication Engineering)
Kanjhawala dehi-81

Course code:EC270 Course: Applied Mathematics-II
L:3 P:0 T:2 Total Marks: 150
Prerequisite: nil Coordinator: Dr Aman Sinha

Course Outcomes:

on completion of this lab students will be able to :

1 The main aim at developing abilities on the basis of limits, differentiation, integration and differential equations. The differential equations play very important role in engineering branches. The equations are from many practices problems such as circuit & systems, filter response.

1. **COMPLEX NUMBERS** **(5%)**

(i) Euler's exponential form (modulus argument form)

(ii) Hyperbolic function, relation between hyperbolic and circular functions.

(iii) Phaser, addition of sinusoidal form, Phaser diagram of R-L, R-C, and L-R-C circuits.

2. **DIFFERENTIAL CALCULAS**. **(40%)**

(i) Functions, concept of evaluation of following limits.

$\text{Limit}_{x \to 0} \frac{\sin x}{x}$, $\text{Limit}_{x \to a} \frac{x^n - a^n}{x - a}$,

$\text{Limit}_{x \to 0} \frac{}{(1+x)^x}$, $\text{Limit}_{x \to a} \frac{a^x - 1}{}$,

(ii) Differential coefficient. Its physical application. As rate measure, Geometric interpretation as slope of a curve. Differentiation from first prim of functions

like x^n, a^x, Log x , Sin x, Cos x and Tan x. Differentiation of sum, product and quotient of functions.

(iii) Differentiation of Trigonometric and inverse Trigonometric functions.

Differentiation of function of a function, Implicit functions, parametric functions, Logarithmic differentiation.

(iv) Application of differentiation in finding errors, Tangent and normal of curves.

Maxima of functions.

3. **INTEGRAL CALCULAS**. **(35%)**

(i) Integration as inverse operation of differentiation. Integral of standard functions. Integration by substitution, by parts and by partial fractions.

(ii) Evaluation of integral of rational and irrational functions of the form.

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(iii) Simple definite integrals. Reduction formulae. Evaluation of $\int Sin^n x\,dx$, $\int Cos^n x\,dx$, $\int Sin^m x \cdot Cos^n x\,dx$.(m,n positive integers)

(iv) Applications of integration to finding area under a curve and axes, volume of solid of revolution of area about axes (simple problems). Mean value and R.M.S. value of a function.

(v) Numerical integrations. Approximate evaluation of definite integral by Trapezoidal rule and by Simpson's rule (without proof).

4. **PARTIAL DIFFERENTIATION**. **(10%)**

(i) First order and second order partial derivatives of functions of two variables.

(ii) Euler's theorem on partial differentiation of homogeneous functions. Total differentiation.

5. **SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS**. **(10%)**

(i) Order and degree of a differential equation. Solving first order first degree differential equation – variable separable form, Homogeneous form and linear differential equation.

(ii) Solving second order differential equation – complementary function, particular integral with functions of the form e^x , Sin ax , Cos ax , x^n, on the right hand side of the equation.

(iii) Applications to L-C-R electric circuits

Text Books:

1 Applied maths I & II by H.K.Dass

2 Applied mathematics by Dr. R.D.Sharma published by Dhanpat Rai Publications.

3 Applied maths I & II by Dr. Neeraj Pant

Syllabus for Semester II (Electronics and Communication Engineering)
Kanjhawala dehi-81

Course code:EC270 Course: CT-II
L:3 P:0 T:0 Total Marks: 150
Prerequisite: nil Coordinator: Mrs Suman Dahiya

Course Outcomes:

On completion of this lab students will be able to :

(vi) An ability to communicate effectively.
(vii) A recognition of the need for, and an ability to engage in life long learning
(viii) Knowledge of contemporary issued.
(ix) Developing reading writing and communication skills among the students so as to develop confidence in them in writing and oral techniques.
(x) It helps the students in their continuing their education needs.

1. **Précis writing:** (15%)
Précis writing of simple passages of about 250 words.

2. **Concepts of Communication:** (20%)

Importance of communication, one way and two way communication, methods of communication – oral, written and non-verbal, barriers to communication and techniques of overcoming the barriers, concept of effective communication, telephonic communication, public speaking and attending interviews.

3. **Correspondence:** (40%)

(i) Business, official, social letters and letters to pres. Two questions of 10 marks each are to be attempted out of four.

(ii) Telegrams, press release, advertisement, notices and memorandum. Two questions of 10 marks each are to be attempted out of four.

4. **Report Writing:** (15%)
Choice to attempt one out of three topic is to be given.

Syllabus for Semester II (Electronics and Communication Engineering)
Kanjhawala dehi-81

Course code:EC272	Course: Electronics components and material
L:4 P:0 T:0	Total Marks: 150
Prerequisite: nil	Coordinator: Mr. Ashok Kumar

Course Outcomes:

on completion of this lab students will be able to :

1 To study & familiar of different Electronic components i.e. types of capacitors, Resistors, Indictors. Their specifications & details of testing also symbolic representation.
2 Different types of transformers, manufacturing processs & testing.
3 To understand various types of switches & relays, ie.e. sensing, manually operated.
4 SMDs & PCB manufacturing process.
5 To categories the materials into three categories.

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1. Materials **(50%)** Classification of materials into conducting, semi conducting and insulating materials through a brief reference to atomic Structure.

(a) Conducting Materials:

(i) Resistivity and factors affecting resistivity such as temperature, alloying and mechanical stressing

(ii) Classification of conducting materials into low resistivity and high resistivity materials. Some examples of each and their typical applications.

(b) Insulating Materials:

(i) Electrical properties – volume resistivity, surface resistance, dielectric loss, dielectric strength (breakdown voltage) and dielectric constant

(ii) Thermal properties – heat resistance, classification according to temperature endurance, thermal conductivity

(iii) Plastics – classification into thermo plastic and thermo-setting categories; examples of each and their typical applications

(iv) Important relevant (electrical, mechanical and thermal) characteristics and applications of the following materials:

Mica	Epoxy Glass	Polythene
Ceramic	Asbestos	Polyester
Glass	Varnish	Phosphor – Bronze alloy
Cotton	Lacquer	Beryllium – copper alloy
Jute	Enamel	Soldering lead alloy
Teflon	Paper (dry and impregnated)	Copper
Acrylics	Rubber	Silver, gold
Silicon grease	Silicon rubber	
Bakelite	PVC	

(c) Magnetic Materials:

(i) Different magnetic materials; (Dia, para, ferro) their properties

(ii) Ferromagnetism, ferrimagnetisms, domains, permeability, Hysteresis loop (including coercive force and residual magnetism and magnetic saturation)

(iii) Soft and hard magnetic materials, their examples and typical applications

2. Components (50%)

(i) Capacitor Polyester, Metallised Polyester ceramic paper, mica and electrolytic types, constructional details and testing, specifications, temperature and frequency stability and other limitations. Mutual comparison.

(ii) Resistors-carbon film, carbon composition wire wound and variable types (presets and potentiometers) Constructional details and testing, specifications, temperature and frequency dependence and noise considerations. Mutual comparison

(iii) Transformers Inductors and RF Coils: Methods of manufacture of inductors, RF coils and small transformers (upto 1 KVA) and their testing. Properties of cores. Need and types of shielding.

(iv) Surface Mounted Devices (SMD)

(v) Connectors, Relays and Switches:

(vi) Various types of switches, e.g. slide, rotary, push, toggle. Micro-switches etc.

Their symbols, specifications and applications

(vii) Concept of 'make' and 'break' contacts in relays. Operating current, Holding current, various types of relays. Their symbols, specifications and applications.

(viii) Various types of connectors. Their symbols specifications and applications

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Text Books:

1. K.S.Jamwal Published by S.k Kataria and sons

Syllabus for Semester II (Electronics and Communication Engineering)
Kanjhawala dehi-81

Course code: EC-273 Course: Electrical Machines
L: 4 hrs., T: 1hrs, Per Week Total Marks: 150
Prerequisite: BE Coordinator:Ms Pallavi Swami

Course Outcomes

11. Any electronic system is a combination of electronic circuits and electrical components. In order to carry out his job function effectively, apart from the knowledge and skills of electronics, he must possess sound knowledge about basic principles of working of electrical machines and equipment.
12. Students will be able to apply knowledge of basic engineering which can be applied in multidisciplinary problems.
13. The knowledge of machines will be applied in different power sectors.
14. Students will be able to design a system, component, conduct experiments and processes to meet desired needs with in realistic constraints.
15. Gaining ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

Unit 1

Transformers

Principles of operation and constructional details of single phase and three phase transformer, core type and shell type transformers, difference between single phase and three phase transformers and advantages and disadvantages, Voltage Regulation of a transformer, Losses in a transformer, Efficiency, condition for maximum efficiency and all day efficiency, Auto transformers and instrument transformer (CT and PT).

Unit 2

Generalized Treatment of Electrical Machines

Introduction, Definition of motor and generator, Basic principles of generator and motor, Torque due to alignment of two magnets and the concept of torque angle. Basic Electromagnet laws, E.M.F. induced in a coil rotating in a magnetic field, Elementary concept of an Electrical Machine, Common features of rotating electrical machines.

Unit 3

DC Machines

Main constructional features, principles of working, Function of the commutator for motoring and generating action**,** Armature winding**,** Factors determining induced e.m.f.**,** Factors determining Electromagnetic torque**,** principles of generating and motoring**,** Action and relationship between terminal voltage and induced e.m.f**,** Factors determining the speed of a DC motor, Different types of a excitation**,** Performance and characteristics of different types of DC machines**,** Starting of DC machines, motors and starters**,** Application of DC machines.

Unit 4

Three Phase Supply

Advantage of three phase system over single phase system, Star Delta connections, Relation between phase and line voltages of single phase and three phase systems, Power and power factor in three phase system and their measurements.

Unit 5

A.C. Motors

Brief introduction about three phase induction motors, its principle of operation**,** Types of induction motors and constructional features of squirrel cage and slip ring motors, Starting and speed control: Star Delta and DOL (Direct on-line) starters**,** Reversal of direction of rotation of 3 phase motors**,** Applications of induction motors.

Unit 6

Single Phase and Fractional Kilowatt Motors

Introduction, Principle of operation of single phase motors, Types of single phase motors and their constructional details (split phase, capacitor start, capacitor start and run, shaded pole), Single phase synchronous motor-reluctance motor (hysteresis motor), AC series motors and universal motors, Introduction to servo-motors and stepper motors.

Text Books:

1. Fundamentals of Electrical and Electronics: *S.K Sahdev, Dhanpat Rai Publications.*
2. Electrical Engineering: *Rajeev Manglik, Katson punlications.*

Reference Books:

1. Electrical Machines: *Ashfaq Hussain, Dhanpat Rai Publications.*
2. Electrical Machines I and II: *Tarlok Singh, Kataria and Sons.*
3. Electrical Machines I and II: *B.R Sharma, Satya Prakashan.*
4. Electrical Machines: P.K Mukharjee, S Chakravarthi, Dhanpat Rai Publications.

Syllabus for Semester II , Diploma (Electronic and Communication Engineering)CRRIT Kanjhawala Delhi

Course Code :-274 Course Title:- Electronic Devices & Circuits – I

Designation :- Required Total Marks:-150

L: 3Hrs, T:1Hrs Per week Course Coordinator: Mr Vinay Panwar

Course Outcomes

1.To understand concepts such as active and passive components their various types, specifications and colour codes

2.To understand the classification of conductors, insulator and semiconductor and their energy level diagrams. Types of semiconductors

3. To understand the different types of rectifiers .

4. To understand the bipolar transistor their configuration and characteristics and load line of transistor.

5 To understand the FET and MOSFET their construction , operation , characteristics and comparsion.

UNIT-1 INTRODUCTION

Introduction to active and passive components, passive components, fixed and variable resistors their various types and specializations including thermistor, LDR and VDR fixed and variable capacitors, their various types and important specification and colour codes.

UNIT-2 SEMICONDUCTORS PHYSICS

Intrinsic semiconductors – Conductivity, atomic and crystal structure of germanium and silicon, covalent bonds, generation and recombination, effect of temperature on conductivity of intrinsic semiconductors, energy level diagram of conductor, insulator and intrinsic semiconductor. Extrinsic semiconductor material – Doping of impurity, P and N type semiconductor and their conductivity. Minority and majority carriers, Drift and Diffusion current.

UNIT-3 SEMICONDUCTOR DIODE

P-N junction diode, mechanism of current flow in P-N junction, drift and diffusion current, depletion layer, potential barrier, behavior of P-N junction characteristics, Zener and avalanche breakdown, concept of junction capacitance in forward and reverse bias conditions.
Semiconductor diode characteristics, static and dynamic resistance and their calculation from diode characteristics. Dynamics resistance of diode in terms of diode current.
Diode as rectifier, half wave rectifier, fullwave rectifier including bridge rectifier, relationship between DC output voltage and AC input voltage, rectification efficiency and ripple factor for rectifier circuits, filter circuits: Shunt capacitor, series inductor, capacitor input filter, bleeder resistance, physical explanations of the working of the typical applications of each
Different type diodes; brief idea and typical applications of power, zener diodes; varactor diodes and point. Contact. Important specification of rectifier dioce and zener .

UNIT-4 INTRODUCTION To BIPOLAR TRANSISTOR

Concept of bipolar transistor as two junction threeter kinds of current carries; PNP and transistors, their, symbols a mechanisms of current Concept of leakage, current ICBO, effect of temperature leakage current CB,CE and CC configuration, Common configuration (CD) : Input and output characterist determination of transistor parameter input dynamic resistance, current amp1ificatien factor. emitter configuration : collector current relations in configuration, collector current in terms of base andleakage current. (ICBO) relationship between the current in CB and CE configuration input and characteristics, determination of dynamic in and output resistances and current amplification factor from the characteristics. Common collector configuration expression of emitter current in terms, of the base and leakage current in CC configuration Comparison of and CE configuration with regard to input and resistance, current gain and leakage current, performance CE configuration over CB configuration. Transistor as amplifier in CE configuration. DC load line, its and drawing it on collector characteristics. Determination of small signal voltage and currents gain of a transistor amplifier using CE gain as product of the voltage and current gain.

UNIT-5 TRANSISTOR BIASING AND STABL1SATION OF OPERATING POINT

Different transistor biasing circuit for fixing operating point, temperature and 'Bdc' operatint point need for stabilization of operating point operatingpoint in cut off and sat on region performance of the amplifier.Calculation of operation point for different circuits. Simple design problems on potential divider biasing circuit.

UNIT-6 SINGLE STAGE TRANSISTOR AMPLIFIER

Single stage CE amplifier circuit with proper biasing components, AC load, line andits use in :

- Calculation of current and voltage gain of a Sinq1e amp1ifier circuit.
- Explanation **O**f phase reversal **OF** the output voltage with respect to inputvoltage .
- Explanation of phase reversal of the output voltage with respect to input voltage.
- Transistor hybrid low frequency model in CE configuration, 'h' parameters and their physical significance, typical values of the parameters.
- Expressions for voltage gain, current gain, input and output impedance for a single stage CE amplifier circuit in 'h' parameters, appropriate approximation.

UNIT-7 FIELD EFFECT TRANSISTOR (FET)

Construction, operation, characteristics and equivalent circuit; of JFET and its circuit app1ication.Construction, operation, characteristics and equivalent circuit of MOSFET indepletion, enhancment modes and its circuit applications.CMOS, advantage and application.. Comparison of JFET, MOSFET, BJT Simple FET amplifier circuit and its working.

TEXT BOOKS: S.K. Sahdev Published by Dhanpat Rai.

REFERENCE BOOK:

Milimum Halkiyas published by Tata Macgrahill .

3. Microelectroelectronics by Sedra Smith Published by Tata Macgrawhill

Syllabus for Semester II , Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC573 Course Title: Engg.Drawing

T: 4 Hrs. Per Week Total Marks: 150

Designation: Required Course Coordinator: Mr.Pramod Kumar

Pre –requisite: nil

1.Student will be able to sketch neatly diagram.

2.Student can acquire more concept about geometrical shape .

3.Student will understand about various view and its projection .

4.Student will be able to identify various object in different plane.

5.Student will be understand concept of isometric view.

Introduction to instruments and materials used in drawing.

Plate No. 1	Free hand sketching	**(5%)**
Plate No.2	Conventional representation of lines, materials, breaks, electric and electronic symbols.	**(5%)**
Plate No.3	Free hand lettering and numerals in 3,5,8 and 12 mm series. Vertical and inclined lettering at 75*. Instrumental single stroke lettering in 12 mm.	**(10%)**
Plate No.4	Dimensioning techniques	
Plate No.5	Three views of an object in 1st angle projection.	**(8%)**
Plate No.6	Six views of an object in 1st angle projection.	**(8%)**
Plate No.7	Three views of an object in 3rd angle projection.	**(8%)**
Plate No.8	Six views of an object in 3rd angle projection.	**(8%)**
Plate No.9	Identification of surfaces from different objects including inclined and curved	

	surfaces.	
Plate No.10	Sections – conventional representation of materials, general conventions of revolved and removed sections.	**(8%)**
Plate No.11	Representation of pictorial/isometric view of a simple object.	**(8%)**
Plate No.12	Isometric views of simple objects including slant and curved surfaces.	**(8%)**
Plate No.13	Isometric of circle, semicircle, arcs and angles.	**(8%)**
Plate No.14	Missing views and lines.	**(8%)**
Plate no.15	Scales, diagonal scale, scale of chords.	**(8%)**

Text Books:

1.Engineering drawing – N.D.Bhatt

.Reference Material :- CD

Syllabus for Semester II, EM (Electronics and Communication Engineering)
CRRIT Kanjhawala

Course code: EC-273 Course: Electrical Machines
L: 4 hrs., T: 0 hrs, Per Week Total marks: 75
Designation: Required Course coordinator:Ms P.Swami

Course Outcomes

1. Any electronic system is a combination of electronic circuits and electrical components. In order to carry out his job function effectively, apart from the knowledge and skills of electronics, he must possess sound knowledge about basic principles of working of electrical machines and equipment.
2. The practical work done in this subject will help in developing skills of operating, repairing and testing of electrical machines and components (e.g. small electrical motor, transformer etc).
3. The knowledge of machines will be applied in different power sectors.
4. Students will be able to design a system, component, conduct experiments and processes to meet desired needs with in realistic constraints.
5. Gaining ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

List of Practical's:

1. Conversion of Galvanometer into Ammeter and Voltmeter.

2. To measure power and power factors in a 3 phase system with
a) balanced load
b) unbalanced load by the two wattmeter method and any one other method.

3. To find the value of capacitance and power factor of a capacitor by approximate method.

4. To draw the equivalent circuit of a transformer and to determine efficiency and regulation by performing:
a) Open circuit test
b) Short circuit test

5. To measure the induced e.m.f. of a separately excited DC generator as a function of field current.

6. To measure the terminal voltage of a separately excited DC generator as a function of load current

7. To measure the terminal voltage of a DC shunt generator as a function of load Current.

8. To measure the speed of a separately excited DC motor a function of load torque at rated armature voltage.

9. To measure the speed of a dc series motor .as a function of load torque at rated armature voltage

10. To determine the efficiency of a DC shunt motor by the measurement of losses (Sunburn's method)

12. To observe the difference in the effect of switching on a single phase capacitor start induction motor with
(i) the capacitor disconnected
(ii) the capacitor connected
Also to determine how to reverse the direction of rotation.

Syllabus for Semester II , Diploma (Electronic and Communication Engineering)
CRRIT Kanjhawala Delhi

Course Code :- EC281 Course:- Electronic Devices & Circuits – I (Lab)
Designation :- Required Total Marks: 75marks
P:3Hrs Per weak Course Codinator :- Mr Vinay Panwar

List of Practicals

1. Experiments to be Performed
i) Measurement of voltage at var1ous setting (low and high voltages) of reulgated power supply by using <w> and digital multimeter.
ii) Measurement of voltage and current by loading the regulated power supply.
iii) To obtain various voltages like +15V + 5V and measure them with the help of analog and digital multimeter.
iv) Practice in the use of signal generator and CRO : measurement of d.c. and a.c. voltages, time period/frequency of sine/square wave using sweep CRO

2. Identification and familarisation of passive components..
i) Measurement of resistors by and ordinary multimeter and an electronic multimeter and their vertification on the basis of colour code & specification.
ii) Measurement of transformer turn ratio of a transformer and to note its specification.
iii) Note the variations in resistance by variation of and to note its specification.
(a) light on LDR (b) temperature on a thermistor

3. Semiconductor diode characteristics :
i) Identification of types of packages, terminals and ting different ratings using data books for various types of semiconductor diodes. (germanium point contact, silicon low power and high power and switching diodes.
ii) Plotting of forward V.I characteristics for a <W> P.N. Diode (silicon and germanium diodes).

4. Rectifier circuits using semiconductor diode measurement of input and output voltage and plotting of input and waveshape
i) half wave rectifier. (ii) fullwave rectifier, (iii) bridge rectifier diode circuits.

5. Plot forward and reverse V-I characteristics for a zener Diode.

6. Plot the waveshapes of a full wave rectifier with <W> Capacitor, series inductor, and pie filter circuit.

7. Ploting input and output characteristics and calculation of Parameters of a transistor in common base configuration.

8. Ploting input and output characteristics and calculation of Parameters of a transistor in common emitter configuration.

9. Transistor biasing circuit. Measurement of operating point (IC and VCE) for a:
i) fixed bias circuit (ii) potential divider biasing circuit.
(Measurement can be made by changing the transistor in the circuits by another of same type number).

10. Single stage common emitter amplifier circuit.
i) Measurement of voltage gain at 1 KHz for different load resistances.
ii) Measurement of input and output impedance of the amplifier circuit.

11. a) Plot the FET characteristics and determine the FET parameters from its characteristics.

b) Measure voltage gain and plot the frequency response of JFET or MOSPET amplifier circuit.

Reference Material: Lab Manuals

Syllabus for Semester II , Diploma (Electronic and Communication Engineering)
CRRIT Kanjhawala Delhi

Course code: EC282 Course: Electronics and electrical workshop
P: 3hrs per week coordinator:Mrs Poonam/Ashok Kr

Course Outcome:

1. Student will get knowledge of various electronics and electrical assembly and designing tools
2. Student will practices on various electronics and electrical tools
3. Student will work as a team
4. Student will aware about assembly of various electronics and electrical system.

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1. Identification and familiarization with the following electronic instruments :
a) Multi-meter digital (Three and half digit)
b) Single beam simple CRO function of every knob on the front panel
c) Audio-oscillator sine and square wave output
d) Power supply fixed voltage and variable voltage, single output as well as dual output.
2. Practice in the use of above mentioned equipment a small experiment may be done by them so that they can just use of them.
3. Identification and familiarization with commonly used tools; statement of their uses. Identification and familiarization with active and passive components; colour code and types of resistor and potentiometers (including VDR, LDR and thermister); some small practical exercises on measurement of these components; identification of diode and transistor terminals. Identification of other components including LED, LCD, UJT, FET, Coils, relays, switches (SPDT, DPDT, etc) connectors, micro-switches, read relays, transformer (mains, audio and RF etc) Linear and Digital Ics, Thyristors, etc.
4. Study of wires & cables and develop technical skill to cut, strip, join and insulate two length of wires/cables (repeat with different types of wires/cables)
5. To develop technical skill to connect/solder/crimp different kinds of wires/cables (included shielded cable) to different types of Power / General purpose / Audio / Video / Telephone plug, socket, jacks, terminal, binding posts, terminal strip, connector's. The task should include making complete recording / Playback / Antena / Speaker loads for common consumer electronics products such as Radio, T.V., VCR, cassette recorder, Hi-Fi equipment, Head set, Microphone etc.
6. Study of soldering techniques:
(a) Various tools for Soldering (Soldering iron, Soldering station or temperature control soldering iron, Exposure to Modern Soldering Process.)
(b) Soldering material (solder wire, flux, cleaning fluid)
(c) Develop skill to cut, bend, insert and solder components (Resistance, Capacitance., diodes, Transistors. I.F.T. type coil, IC's etc.) on a PCB.
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(d) Demonstrate the skill to assemble component on PCB, wiring of a small Ckt on a PCB involving lacking, sleeving and use of identifier tags.
7. Study of De-Soldering Techniques:
(a) Various tools for De-soldering (De-Soldering Pump, De-Soldering Gun, De-Soldering strip/wick, Exposure to modern De-Soldering process.
(b) Demonstrate the skill to remove and clean the components, wires from a given equipment or PCB.

NOTE: Demonstration Boards for the above components should be made.

8. Demonstrate (or explain) the joining (or connecting) methods or/and mounting and dismantling method as well as uses of the items mentioned below :

a) Various types of single, multi-cored insulated screened pour, Audio video, general purpose wires/cables

b) Various types of plugs, sockets, conn4ectors suitable for general purpose audio video use. Some of such connectors area : 2 and 3 pin mains plug and sockets, Banana plugs and sockets, BNG, RCA, DIN, UHF, Ear phone speaker connector, telephone jacks and similar male and female connectors and terminal strips.

c) Various types of switches such as : normal/miniature toggle, slide, push button piano k4ey, rotary, SPST,SPDT,DPST,DPDT, band selector, multi-way Master Mains Switch.

d) Various types of protective devices such as : Wire fuse, cartridge fuse, slow acting/fast acting fuse, HRC fuse, thermal fuse, single/multi-pole miniature circuit breakers, over and under current relays.

9. Explain (or demonstrate) various methods of making and laying of cable forms, wiring techniques

10. Field visits

11. Electric Shop

- Demonstration of tools commonly used in Electric Shop
- Safety precaution, electric shock treatment
- Demonstration of common Electric material Material like : wires, fuses, ceiling fans, batteries, ciets and allied items
- Demonstration of voltmeter, Ammeter, Multimeter & Energy meter
- Job : Wiring Practice in batten wiring, plastic casing-capping and conduit
- Job : Control of one lamp by one switch
- Job : Control of one bell by one switch
- Job : Assemble a Tube light
- Job : Dismantle study, find out fault, repair the fault, assemble and test domestic appliances like Electric Iron, Electric Mixer, Ceiling & Table fan, Tube light, Water heater (Geyser) and desert cooler
- Job : Laying out of complete wiring of a jpise (Single-phase and Threephase)

SEMESTER - III

Code No.	Subject	Study Scheme Period/Week			Evaluation Scheme						Total Marks
		L	T	P	Internal Assessment		External Assessment Exam				
					Theory	Practical	Written Paper		Practical		
					Max Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
1	Principles of Communication Engineering	4	-	3	50	25	100	3	50	3	225
2	Digital Electronics	4	-	3	50	25	100	3	50	3	225
3	Networks, Filters and Transmission Lines	4	-	3	50	25	100	3	50	3	225
4	Electronic Devices and Circuits – II	4	-	3	50	25	100	3	50	3	225
*5	Computer Programming and Applications	3	-	3	50	25	100	3	50	3	225
6	Electronic Fabrication & Product Design	1	-	3	-	75	-	-	100	3	175
	Student Centered activities	-	-	2	-	-	-	-	-	-	
	TOTAL	20	-	20	250	200	500		350		1300

Syllabus for semester III, Diploma. (Electronics and communication engineering)

Course code: EC370 **Course: Principle of communication Engineering**

L: 3Hrs, T: 1 Hr, per week **Total marks-150**

Prerequisite: Nil **Coordinator: S.K. Ranjan**

Course outcomes

1. The students should be able to understand the basic concept of communication system.

2.The student should study the advantages and limitations of various analog and digital modulation system.

3.The students should study the different techniques of modulation and demodulation process.

4. The students should know the limitation s of communication system.

5.The student should know the difference between analog and digital communication system.

UNIT I : Introduction (2 Hrs)

Need for modulation and demodulation in communication systems.Basic scheme of modern communication system.

UNIT II : Amplitude Modulation (4 Hrs)

(a) Derivation of mathematical expression for an amplitude modulated wave showing Carrier and side band components. Significance of Modulation index, spectrum and bandwidth of AM wave, relative power distribution in carrier and sidebands.Elementary idea of DSB-FC, DSB-SC, SSB-SC, ISB and VSB modulations, their comparison and areas of applications.

UNIT III

Frequency Modulation (5 Hrs)

(a) Derivation of expression for frequency modulated wave and its frequency spectrum (without proof and analysis of Bessel function), modulation index, maximum frequency

deviation and deviation ratio, BW of FM signals, Carlson's rule Effect of noise on FM carrier, noise triangle, need for pre-emphasis and de-emphasis, capture effect. Comparison of FM and AM communication system.

UNIT IV : Phase Modulation (2 Hrs)

Derivation of expression for phase modulated wave, modulation index, comparison with frequency modulation.

UNIT V: Principle of AM Modulators (4 Hrs)

orking principles and typical applications of Collector Modulator, Base Modulator, Balanced Modulator.

UNIT VI: Principles of FM Modulators (6 Hrs)

(a) Working principles and applications of reactance modulator, variactor diode modulator, VCO and Armstrong phase modulator, stabilization of carrier using AFC. Block diagram and working principles of reactance transistor and Armstrong FM transmitters.

UNIT VII : Demodulation of AM waves (3 Hrs)

(a) Principles of demodulation of AM wave using diode detector circuit, concept of diagonal clipping and formula for minimum distortion (No derivation). Principle of demodulation of AM wave using synchronous detection.

UNIT VIII Demodulation of FM waves (4 Hrs)

(a) Basic principles of FM detection using slope detector. Principles & working of the following FM demodulators.(!) Foster-Seeley Discriminator(2) Ratio Detector(3)Quadrature Detector(4) Phase Locked Loop (PLL) FM Detector

UNIT IX

Pulse Modulation (4 Hrs)

Statement of sampling theorem and elementary idea of sampling frequency for pulse modulation.

Basic concepts of time division multiplexing (TDM) and frequency division multiplexing (FDM).Basic ideas about PAM,PPM,PWM and their typical applications.Pulse code modulation (PCM): basic scheme of PCM system, Quantization, quantization error, block diagram of TDM-PCM communication system and function of each block, Advantages of PCM systems, concept of differential PCM (DPCM). (4 Hr)

(e)Delta Modulation: Basic principle of delta modulation system, advantages of delta modulation over PCM system, limitation of delta modulation, concept of adaptive delta modulation system (ADM). (3 Hr)

(f)Basic Block diagram and working principle of ASK, PSK, FSK & QPSK. (4 Hrs)

Text book:

1.Principle of communication engineering A

2. Communication system: Symonhykin

3. analog and digital communication system : B.P. lathi

Reference books

1 communication system: singh and shapre

2. Principle of communication engineering: George Kanady

Syllabus for semester III, Diploma. (Electronics and communication engineering)
CRRIT Kanjhawala

Course code:371 **Course : Digital Electronics**

Contact hours:- L-4 , T-1 per week **Total Marks:150**

Prerequisite: nil **Coordinator: Mrs Poonam Dalal**

Couse outcomes

On completion of this course, students are expected to:-

(I) To be capable of understanding the various analog &digital communication signals.

(ii) Basic idea of number system to perform various arithmatic operation.

(iii) They will also learn the basic concept of Logic gates.

(IV) They are capable of implementing using K-Map.

(v) They will also learn the basic concept & types of combinational & sequential circuits.

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1. Introduction

(a) Basic difference between analog and digital signal.

(b)Applications and advantages of digital signals.

2. Number systems

(a) Binary,Octal and Hexadecimal number system, conversion from one from to another.

(b) Concept of code,weighted and non weigthed codes,BCD(8421 code only),excess -3 and grey code.

(c) Concept of parity,single and double parity and error detection.

(d) Alphanumeric codes(ASCII).

(e) Binary arithmetic (addition,subtraction,multiplication and division including binary points).BCD addition, 1's and 2's compliment method of addition/subtraction.

3. Logic Gates

(a) Concept of negative and positive logic.

(b) Definition,symbol and truth table of NOT,AND,OR,NAND,NOR,EX-OR,EX- NOR, Gates, working of AND and OR gates using simple diode circuits, NAND and NOR as universal gates.

4. Logic Simplification

(a) Postulates of Boolean algebra ,De-Morning's theorems, various identities, formulation of truth table and Boolean equation for simple problems, implementation of boolean (logic) equation with logic gates.

(b) Karnaugh map (up to 4 variables) and simple application in developing combinational logic circuits.

5. Logic Families

(a) Logic family classification;

(i) Defination of SSI,MSI,LSI,VLSI

(II) Comparision of TTL and MOS family characteristics with respect to delay, speed, noise margin, logic levels,power dissipation,fan-in,fan-out,power supply requirement.

(b) Logic Circuits: Open collector,wired -OR ,totem pole output circuit operation for TTL NAND gate.

(c) Tri-state switch/ Buffer.

6. Arithmetic Circuits

(a) Half adder and Full adder circuits, design and implementation.

(b) Half and Full subtractor circuits,design and implementation.

(c) 4 bit adder/subtractor.

7. Display Devices

LED,LCD,Seven segment displays,basic operation of common anode and common cathode types of displays.

8. Multiplexer, Demultiplexers and Decoders

Basic functions and block diagram of MUX,DEMUX,Encoders and Decoders.

Detailed functioning of 3x8 decoders/demux.

9. Latches and Flip flops.

(a) Concept and tyres of latch with their working and their application.

(b) Operation using waveforms and truth tables of RS,JK,D,Master/slave JK and T flip flops.

(c) Use of D flip flop as latch.

(d) Flip flop as basic memory cell.

10. Counters

(a) A synchronous counters:

(i) Binary counters

(ii) Modulus of a counter, modified count of a counter, Mod-8 and Mod-10 counter (including design),difference between decade and mod-10 counter.

(iii) Presettable and programmable counters.

(iv) Down counter, up/down counter.

(b) Synchronous counters(only introduction)

(c) Difference between asynchrounous and synchronous counters

(d) Ring counter and Johnson counter with timing diagram.

11. Shift Register

(a) Introduction and basic concepts including shift left and shift right.

(b) Serial in parallel out,serial in serial out,parallel in serial out,parallel in parallel out.

(c) Universal Shift Register.

(d) Buffer register,Tri -state buffer Register.

12. Applications

Digital Clock and Calculator

Text Books/Reference Material:-R.P Jain(Tata Mc. graw Hills),R.K Gaur(Dhanpat Rai Publication), B.R Gupta(Kataria Publication).

Syllabus for semester III, Diploma. (Electronics and communication engineering)

CRRIT Kanjhawala

Course code: EC372 **Course: N.F.T.L**
L: 3Hrs, T: 1 Hr, per week **Total marks-150**
Prerequisite: nil **coordinator: Mr. S.K.Ranjan**

Course outcomes

1. The students should be able to write the equilibrium equation on mesh and nodal basis
2. The students should be able to understand the different types of networks.
3. The students should be able to study the properties of symmetric and asymmetric two port networks.
4. The students should be able to implement the source transformation and find the exact solution for all types of circuits.
5. The students should be able to understand the various types filters and its uses.
6. The students should be to design a simple filter circuits.
7. The students should be able to study the different types of transmission medium on the basis of frequency.
8. The should be able to study the different types of loses occurring in the transmission medium.
9. The students should be able to study the different types of matching techniques

UNIT I

Introduction to networks (20%)

Two port networks, network elements, classification i.e, symmetrical and asymmetrical networks, balanced and unbalanced, T-network, pi –network, ladder network , lattice network, L-network, bridge-network. Symmetrical network parameters concepts and significance i.e, characteristic impedance, propagation constant, attenuation constant, phase shift constant and insertion loss,Asymmetrical network parameters concepts and significance i.e., iterative impedance, image impedance image transfer constant and insertion loss.**Network analysis**: analysis of symmetrical T and pi networks derivation of Zo, a, b, c, d parameters, open circuits and short circuits analysis, simple design problems.The half section of symmetrical T and pi section, derivation of iterative impedance, image impedance, open circuit and short circuit impedance of half section. Use of half section.

UNIT II **Attenuators**(15%)

Unit of attenuation (decibel and nepers), general characteristics of attenuators. Types of attenuators.Analysis and design of simple attenuators of the following types (i) symmetrical T (ii) symmetrical pi (iii) L Type.

UNIT III

Filters

(30%)

Brief idea of the use of filters in different communication systems. Types of filters. Concept of LPF, HPF, BPF, BSF, basic concept about response curve of butterworth, chebyshev and caur type filters.Theorem connecting attenuation constant and characteristic Zo impedance, determination of cut –off frequency of constant K- filter.

Prototype of LPF and HPF using t, pi configuration. Following curves and simpledesign problems.Reactance,M-derive filter section: limitation of prototype filter, advantage of m-derive filter, expression for m in terms of fc and fa for LPF and HPF plots of attenuation , Zo with frequency, simple design problems.Concept of composite filter and matching of it's various components.**Crystal filter**: crustal and its equivalent circuits, special properties of crystal filter and their use.**Active filter**: Basic concept of active filter, comparision with passive filters, simple design problem on LPF,HPF, first and second order butter worth filters, concept of all pass filter , active BPF and BSF.

UNIT IV Transmission lines. (35%)

Transmission lines and their application, different types of transmission lines including optical cable and submarine cable wave guide and stripline. Operating frequency range bandwidth of different types of transmission lines .Primary constant of transmission lines , equivalent circuit of an infinite line T and pi type representation of a section of transmission lines.Definition , significance of characteristic impedance of a line, concept of short line terminated in Zo, current and voltage along an infinite line, propagation constant, attenuation and phase shift constant of the line.Relationship of Zo, Y in terms of primary constant of the line.Condition for minimum distortion and minimum attenuation of signal on the line, necessity and different method of loading the communication lines.Concept of reflection andstanding waves on a transmission lines, definition of SWR, relation between VSWR and voltage reflection coefficient , maximum impedance on a line in terms of Zo and VSWR.Transmission line equation, expression for voltage , current & impedance at a point on the line with and without losses. Expression for input impedance of the line (no derivation)Input impedance of an open and short circuited line and its graphical

representation.Transmission line at high frequency, effect of high frequency on the losses of a transmission line, application of transmission lines as a reactive component and impedance transformer(quarter wave transformer)Principle of impedance matching using single stub , comparison of open and short circuited stubs. Concept of broad band matching.

Text Book

1) Network and system : D p roy andchaudhary
2) Network filter and transmission line: A. chakrabarti

Reference Books:

1) Network analysis and synthesis : A. chakrabarti
2) Transmission lines and networks: Umeshsinha

Syllabus for Semester IIIrd, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code:EC-373 **Course Title :Electronics Devices and circuits-II**

L:4hr T:1hr **Total Marks: 150**

Designation : required **Coordinator: Mr.Jashvir Singh Chhikara**

Course Outcomes:

1.Student will be able to understand about multistage amplifier .

2. Student will be learn to calculate overall gain and response of amplifier

3. Student will be known about audio amplifier and their type.

4. Student will be capable to know about feedback amplifier and its importance in various fields.

5. Student will get concept of oscillation and their application.

6. Student will get about OPAMP (741 IC)and their various application.

7.Students will acquire the basics of optoelectronics devices and opt couplers.

Unit-1: Multistage Transistor Amplifier (15%)

Need of multistage amplifier, different coupling schemes and their working; brief mention of application of each of the types of coupling, working of R-C coupled and transformer coupled multistage amplifier, approximate calculation of voltage gain of two stage R-C coupled amplifier. Frequency response for R-C coupled and transformer coupled amplifiers and physical significance of the terms bandwidth, upper and lower cross over frequencies. Direct coupled amplifier and its limitation; difference amplifier typical diagram and working.

Unit-2:Audio Power Amplifiers (15%)

Difference between voltage and power amplifiers; importance of impedance match in power amplifier, collector efficiency of power amplifier. Typical single ended power

amplifier and its working, graphical method of calculation of output power; heat dissipation curve and importance of heat sinks; class A, class B and Class C Amplifier; collector efficiency and distortion in class A,B and C amplifier (without derivations) working principles of push pull amplifier circuits, its advantages over single ended power amplifier, cross over distortion in Class B operation and its reduction. Different driver stages for push pull amplifier circuit. Working principles of complementary symmetry push pull circuit and its advantages. Transformer less audio power amplifiers and their typical applications.

Unit-3: Feedback in Amplifier (15%)

Basic principles and types of feedback Derivation of expression for the gain of an amplifier employing feedback Effect of negative feedback on gain, stability, distortion and bandwidth (only physical explanation), Typical feedback circuits RC coupled amplifiers with emitter by pass, capacitor removed Emitter follower and its application, simple mathematical analysis for voltage gain and input & output impedance of above circuits.

Unit-4 :Operational Amplifier (15%)

Characteristics of ideal operational amplifier and its block diagram, definition of inverting and non-inverting inputs, differential voltage gain, input and output voltages, input offset current, input bias current, common mode rejection (CMRR), Power Supply Rejection Ratio (PSRR) and slew rate. Method of offset, Null Adjustment, use of Opamp as an invertor, scale changer, Adder, Subtractor, Differentiator, Integrator. Schmitt trigger circuit, time base generator circuit, S/H switch circuit.

Unit-5:Sinusoidal Oscillators (15%)

Application of oscillators.Use of positive feedback, negative feedback & negative resistance for generation of oscillation, Barkhousen criterion for oscillations. Different oscillator circuits tuned collector Hartley, colpitts, phase shifts, wiens bridge and crystal oscillators and their working principles (no mathematical derivation), Operational amplifier as Wein Bridge Oscillator and phase shift oscillator

Unit-6: Tuned Voltage Amplifiers (15%)

Classification of amplifiers on the basis of frequency. Series and parallel resonant circuits, expression for resonant frequency, expression for impedance at resonance; relationship between resonant frequency, Q and Band width (no derivation) Hybrid equivalent circuits of transistor and its parameters, h parameters model of single and double tuned amplifiers; their working principles and frequency response (no mathematical derivation) Concepts of neutralization. Staggered tuned amplifier and typical applications in brief.

Unit-7:Optical Electronics Devices and Their Applications (10%)

Working principles and characteristics of photo resistors, photo diodes, photo transistors, photo voltaic cells, LEDS, LCDs and optical couplers. Simple application of optical electronic devices (one example of each may be mentioned)

Text Books:

1. Electronic devices and circuits by S.K. SahdevDhanpatRai and corporation pvt Ltd.
2. Electronic devices and circuits BY J.B. Gupta Satyaprakashanpvt Ltd.

Reference Books:

1. Integrated Electronics by MilimumHelikyas Tata Macrahill

Electronic devices and circuits By boystied

Syllabus for Semester IIIrd, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code:EC-374 **Course Title :Computer Programming &application**

L:4hr T:1hr **Total Marks: 150**

Designation : required **Coordinator: Mrs.MonikaChhikara**

Course Outcomes

1 It has become essential that students are exposed to computers and their applications along with associated peripheral related to there are of work.
2 Understand, analyze and implement software development tools like algorithm, pseudo codes and programming structure
3 Study, analyze and understand logical structure of a computer program, and different construct to develop a program in 'C' language
4 Write small programs related to simple/ moderate mathematical, and logical problems in 'C'.
5 Study, analyze and understand simple data structures, use of pointers, memory allocation and data handling through files in 'C'.
6 Create, Study and analyze the data base using DBMS &extract the different keys .
7 Achieve general knowledge of CAD & familiar with CAD windows.
8 Study about internet basics, search engine (how to store & access the data)

Unit - 1 Programming in C/ C++.

(i) Basic structure of C program.
(ii) Executing a C program.
(iii) Identifiers & Keywords, data types, constants, variables.

(iv) Operators, expressions & statements.
(v) Library functions.
(vi) Managing input – output operations, like reading a character, writing a character, formatted input, formatted output through print, scanf , getch, putch statements ect.
(vii) Decision making and branching using if – else, Switch, go to statements.
(viii) Decision makings and looping using while, do – while, & for statements.
(ix) Array – one dimensional and multi – dimensional.
(x) Functions
(xi) Recursion
(xii) Structures & Unions.
(xiii) OOPS concepts.

Unit –2 Information Storage and Retrieval

(i) Need for information Storage and Retrieval.
(ii) Creating data base file.
(iii) Querying database file on single and multiple key.
(iv) Ordering the data on a selected key.
(v) Programming a very simple application.
(vi) Indexing and storing , concepts of storage.

Unite - 3 Computation and Graphic Tools.

1 Use of Computation tools for

(i) Evaluation of functions
(ii) Tabulation of functions
(iii) Integration of Function
(iv) Matrix calculation
(v) Statistical Calculation

2. Use of Graphic tools.

(i) Retrieving different view & 2-D details of models.
(ii) Importing and exporting data for preparing a design.
(iii) Assembly modeling – check for fits & tolerances.

Unit 5 Applications of Computers

1. Web Technologies

(i) Introduction to W.W.W. , Search Engines.

(ii) E- Mail, News.

(iii) Basic of audio & video conferencing.

(iv) Languages used for web technologies

Reference books :

1. Programming in C by G.S. Baluja& G.K. Baluja and introduction to computer.

Syllabus for Semester IIIrd, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC380 **Course Title: P.C.E**

P:-3hrs., Per Week **Total Marks: 75**

Designation: Required **Course Coordinator: Mr. Ashok Dabas**

Pre –requisite: nil

Course outcomes

On completion of this lab/ students will be able to

1. Observe the performance of amplitude modulation and demodulations under various changing parameters.
2. To understand the concept of different types of other modulations. i.e. Freq. modulation, phase modulation.
3. To understand the concept of digital & data modulation, one can access the various types of modulations. i.e. Pam, PWM, PCM
4. Also one can closely observe the process of TDM, sampling theorem.

To get the experience of designing different types of modulation systems also on CRO one can observe the various patterns of modulated

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List of Practical:

1. (a) To conserve an AM wave on CRO produced by a standard signal generator using internal and external modulation.

   (b) To measure the modulation index of the wave obtained in above practical.

2. (a) To obtain an AM wave from a collector modulator circuit and observe the AM pattern on CRO.

(b) To measure index of modulation of the AM signal for different levels of modulating signal.

3. To obtain a FM wave from reactance tube modulator/voltage controlled oscillator circuit and measure the frequency deviation for different modulating signals.
4. To obtain modulating signal from an AM detector circuit and observe the pattern for different RC time constants and obtain its optimum value for least distortion.
5. To obtain modulating signal from a FM detector (Fosterseely/Ratio detector/quradrature/IC) circuit and plot the discriminator characteristics.
6. To observe the sampled signal and compare it with the analog input signal. Note the effect of varying the sampling pulse width and frequency on the sampled output.
7. To verify the sampling theorem.
8. To time division multiplex the two given signals.
9. To observe and note the pulse modulated signals (PAM, PPM, PWM) and compare them with the corresponding analog input signal.
10. To measure the quantization noise in a 3 bit/4 bit coded PCM signal.
11. To feed an analog signal to a PCM modulator and compare demodulated signal with the analog input. Also note the effect of low pass filter at the demodulated output.
12. To study the process of delta modulation/demodulation.

Syllabus for Semester III , Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC371 Course Title: Digital Electronics Lab

L: 4 Hrs. T: 1 hrs., Per Week Total Marks: 75

Designation: Required Course Coordinator: Mrs.Poonam

Pre –requisite: nil

Course outcomes:-

1. On completion of this course, students are expected to be capable of understanding the various ICs & their pin description with pin diagram & different logic gates.

2 .Use of universal gates such as NAND/NOR .Also designing of half adder & full adder ckts.

3. They will also learn the basic concept of shift of data either through serial and parallel data registers.

4. Students become able to understand various flip flops and their uses in counters. Students will also learn about display devices LEDs display.

5. A basic introductory concept of digital communication is also developed through these practicals. It is expected that students will be able to design systems based on above mentioned ICs of digital.

List of Practical:-

1. Study of pin configuration of different Ics(e.g.DIP ICs etc.)

2. Verification and interpretation of truth tables for AND, OR, NOT,NAND, NOR,EX-OR and EX-NOR gates.

3. Logic functions using Universal logic gates.

(a) Realization of logic functions with the help of NAND or NOR gates.

(b) Construction of a NOR gate latch and verification of its operation.

4. Half adder /subtractor circuits

(a) Construction of half adder using EX-OR and NAND gates and verificaton of its operations.

(b) Construction of a full adder using EX-OR and NAND gates &verification of its operations.

5. 4 bit adder/subtractor circuit.

(a) Construction of a 4 bit adder 2's compliment subtractor circuit using a 4 bit adder IC and EX-OR and verify the operation of the circuit.

6. IC Flip flop

(a) Verification of truth table for some positive edge triggered , negative edge triggered, level triggered IC flip flops(at least one IC each of D latch, D flip flop, edge triggered JK and Master slave flip flops)

7 .Display Devices and their decoder /drivers

(a) Familiarization and use of different types of single LEDs, common anode and common cathode seven segment LED displays. use of 7447,7448 or equivalent decoder/driver ICS for seven segment displays.

8. Tristate gate ICs

(a) Verification of truth tables and study the operation of tri state buffer IC 744126 or equivalent.

(b) Construction of a 4/8 bit bidirectional bus using an appropriate IC.

9. Decoder, encoder, multiplexer, and demultiplexer

(a) Verification of truth tables for any one each of encoder and decoder ICs.

(b) Verification of truth tables for one/two each of multiplexer/demultiplexer ICs.

(c) Shift register

(d) Construction of a 4 bit serial in serial out /serial in parallel out right shift register using JK flip flops and verification of its operation.

Syllabus for Semester IIIrd, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC382	Course Title: N.F.T.L Lab
L: 4 Hrs. T: 1 hrs., Per Week	Total Marks: 75
Designation: Required	Coordinator: Mr. S.K.Ranjan
Pre –requisite: nil	

Course Outcomes:-

Students will practice and verify symmetrical and asymmetrical networks

1. Students will practically verify of various filters and their characteristics.
2. Students will verify characteristics of transmission line.

1.To measure the characteristic impedance of a symmetrical T and Pi network.

2. To measure the image impedance of a given asymmetrical T/Pi network
3. For a prototype low pass filter:
   (a) Determine the characteristic impedance experimentally
   (b) Plot the attenuation characteristics
4. To design and measure the attenuation of a symmetrical T/Pi type attenuator
5. For a prototype high pass filter :
   (a)Determine the characteristic impedance experimentally
   (b) To plot the attenuation characteristic
   (c)To plot the impedance characteristic of a prototype band-pass filter
   (d) To plot the attenuation characteristic of a prototype band pass filter
   (e) To plot the impedance characteristic of a m-derived low pass filter
   (f) To plot the attenuation characteristics of a m-derived high pass filter

6. To assemble and test the following Butterworth active filters

(a)First order low pass and high pass

(b) Second order low pass and high pass

7. To observe the formation of standing waves on a transmission line and measurement of SWR and characteristic impedance of the line.

(a)To measure following parameters of a Transmission line.

(i) Attenuation

(ii)Input Impedance

(iii) Phase displacement between the Current & Voltage.

(iv) Frequency characteristics.

8. Draw the attenuation characteristics of a crystal filter.

Syllabus for Semester 3rd EDC-II (Electronics and communication Engg.)

Course code: EC-373 Course Title: EDC-II Lab

P:3Hrs Total Marks: 75

Prerequisite: EDC-I Coordinator: Mr. Jashvir Singh Chhikara

Course Outcomes:

1. Student will practice on multistage amplifier

2. Student will practice on power amplifier, tuned voltage amplifier.

3. Student will perform and verify tuned circuits and oscillators .

4. Student will practices on OPAMP.

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1. Two stage R.C. Coupled Amplifier to measure the overall gain of two stages at 1 KHZ and compare it with the gain of 1st stage. Also to observe the loading effect of second stage on the first stage.

2. To plot the frequency response curve of two stage amplifier and compare it with that of the single stage amplifier

3. For a single ended power amplifier measurement of optimum load, maximum undistorted power (by giving maximum allowable signal), collector efficiency and percentage distortion factor.

4. For a push-pull amplifier measurement of optimum load, maximum undistorted power (by giving maximum allowable signal), collector efficiency and percentage distortion factor.

5. For a complementary symmetry amplifier measurement of optimum load, maximum undistorted power (by giving maximum allowable signal), collector efficiency and percentage distortion factor.

6. Feedback in Amplifier: Single stage amplifier with and without by-pass capacitor measurement of voltage gain and plotting of frequency response in both cases (i.e. with and without by-pass capacitor).

7. Feedback in Amplifier: Emitter follower circuit measurement of voltage gain and plotting of frequency response curve.

8. Sinusoidal oscillator (LC): Hartley/Colpittis oscillator circuit measurement of frequency and amplitude oscillations by plotting the wave shape from CRO

9. Sinusoidal oscillator (RC): Wein bridge oscillator circuit – measurement of resonant frequency and amplitude of oscillations by plotting the wave-shape from CRO

10. Tuned Voltage Amplifier Series and parallel resonant circuit – measurement of resonant frequency. Plotting of the resonance curve (i.e. graph between input frequency and impedance) and calculation of Q of the resonant circuit from this plot.

11. Plotting of the frequency response of single tuned voltage amplifier and calculate the Q of the tuned circuit load.

12. Use of op-amp (IC741) as inverting and non-inverting amplifier, adder, integrator, buffer, scale changer

13. To measure the output off ser voltage of an op-amp (741) and zero adjustment using nulling techniques.

Note : Use of simulation software such as OrCADPSpice MULTISIM, ELECTRONIC WORK BENCH etc. for performing some of the above on the computer also, which will enhance the understanding of the students beyond traditional laboratory experiments.

Syllabus for Semester IIIrd, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code:EC-384Course Title :Computer Programming &application

P:-3 hrs per week **Total Marks: 75**

Designation : required **Coordinator: Mrs.MonikaChhikara**

Course Outcomes

1. After completion of this course, the students would be able toApply and practice logical ability to solve the problems.
2. Understand C programming development environment, compiling, debugging, linking and executing a program using the development environment
3. Analyzing the complexity of problems, Modularize the problems into small modules and then convert them into programs
4. Understand and apply the in-built functions and customized functions for solving the problems.
5. Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.
6. Document and present the algorithms, flowcharts and programs in form of user-manuals

Practical based on following topics.

1. Create / Querying the database.
2. Programming in SQL/ PL SQL
3. Programming exercise on defining variables and assigning values to variables.
4. Programming exercise on Arithmetic and relational operators.
5. Programming exercise writing input / output statement.
6. Programming exercise on simple for, if, IF- ELSE, statement.
7. Programming exercise on switch statement.
8. Programming exercise on while, do – while statement.
9. Programming exercise on one dimensional array, two dimensional array
10. Programming exercise on creating objects in C++.
11. Programming exercise on link lists.
12. Programming exercise on sorting data.
13. Designing a simple object using CAD software.
14. Retrieving 2D drawing from the designed 3D object.

Syllabus for Semester IIIrd, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code:EC-385 **Course :Electronics fabrication and production**

L: 1, P:-3 hrs per week **Total Marks: 175**

Designation : required **Coordinator: Mr. S.K.Ranjan**

Course Outcomes:

1. Student will understand about assembly of electronics components on PCB
2. Students will practices on various electronics devices which are used in design system.
3. Student will update about soldering and desoldering process.
4. Student will be practices on troubleshooting process
5. Student will be aware about PCB

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1. Introduction to PCB

(a) Need of PCBs
(b) Types of PCBs
(c) Types of materials used for PCB, their characteristics and limitations
(d) Brief summary of all the processes involved in fabrication of PCB from schematic diagram to final stage.
(e) Use of active and passive components. Manuals for using mechanical parameters of components

2. 2. Manual Design of PCB

(a) Layout generation
(b) Minimization of layout
(c) Layout transfer
(d) Etching of PCB
(e) Drilling

3. Introduction to PCB design software

(a) Familiarization and use of PCB software like ORCAD (minimum 9.1), Eagle, Pro E, PCB Express, Lab View (Any two) Electronics Workbench.

(b) Practice in PCB designing of circuits of the following categories;
   (i) Communication circuits
   (ii) Digital circuits (counters, shift registers, multiplexers, de-multiplexer etc.)
   (iii) Audio & Video
   (iv) Microprocessor based circuits

4. Fabrication and testing

(a) Fabrication of small analog and digital (minimum one each) circuits, CMOS ICs.
(b) Final assembly, troubleshooting of the developed product and product
(c) demonstration.
(d) Criterion for selection and mounting of heat sinks.

5. Fabrication Techniques

(a) Soldering methods, manual and demo on machine soldering
(b) Comparison of soldering methods
(c) Practice on PCB soldering/desoldering.
(d) Component forming and placement on the PCB
(e) Tools and precautions to be observed during manual soldering.

Text Books:

Electronics drawing and Design By Singh and Singh Dhanpat Rai

SEMESTER - IV

Code No.	Subject	Study Scheme Period/Week			Evaluation Scheme						Total Marks
		L	T	P	Internal Assessment		External Assessment Exam				
					Theory	Practical	Written Paper		Practical		
					Max Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
1	Electronic Devices and Circuits - III	4	-	3	50	25	100	3	50	3	225
2	Introduction to Microprocessors	4	-	3	50	25	100	3	50	3	225
3	Electronic Instruments and Measurements	4	-	3	50	25	100	3	50	3	225
4	Personal Computer Organisation	4	-	3	50	25	100	3	50	3	225
5	Electronic Design and Drawing	-	-	4	-	50	-	3	100	3	150
6	Minor Project	-	-	6	-	50	-	-	100	3	150
	Student Centered activities	-	-	2	-	-	-	-	-	-	
	TOTAL	16	-	24	200	200	400		400		1200

Syllabus for Semester IVth, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC-470 **Course Title: Electronics Devices and circuits**

L: 4hr T: 1hr **Total Marks: 150**

Prerequisite:EC274 **Coordinator: Mr.Jashvir Singh Chhikara**

Course Outcomes:

1. Student will get the general idea about linear and nonlinear circuits.

2.Students will be learn about timer IC(555) and its applications

3. Student will be capable to know about various types of nonsinusiodal oscillator

4. Student will be acquire knowledge to time base circuits .

6. Student will be understand the fabrication process of the monolithic IC .

7. Student will get concept of unregulated and regulated power supply.

8. Student will find concept of PLL devices

9.Student will get the knowledge of thermistors family.

Unit-I: Wave shaping Circuits (15%)

General idea about different wave shapes. Review of transient phenomena in R-C and R-L Circuits. R-C and R-L differentiating and integrating Circuits.The applications (physical explanation for square/ rectangular input wave shapes only). Diode clippers, series and shunt biased type. Double clipper circuits.Zener diode clipper circuits.Use of transistors for clipping. Diode clamping circuit for clamping to negative peak, positive or any other level for different input waveforms (e.g. sine, square, triangular), ideal transistor switch, explanation using C.E. output characteristics.

Unit-2:Timer I.C. (10%)

Block diagram of I.C. timer (such as 555) and its working. Use of 555 timer as mono-stable and astablemultivibrators.

Unit-3:Multivibrator Circuits (15%)

Concept of multivibrator :astable, monostable, bistable. 555 timer as mono and astablemultivibrator. Op-amp as monostable, astablemultivibrator and schmitt trigger circuit.

Unit-4:Time Base Circuits (15%)

Need of time base (sweep) wave forms, special features of time base signals. Simple method of generation of saw tooth wave using charging and discharging of a capacitor. Constant current generation of linear sweep voltage circuit using op-amp.

Unit-5:Integrated Electronics (5%)

Fabrication of transistor by planner process, a typical fabrication process for ICS (brief explanation).

Unit-6:Regulated Power Supply (15%)

Concept of regulation.Principles of series and shunt regulators.Three terminal voltage regulator ICs (positive, negative and variable applications). Block diagram of a regulated power supply. Concepts of cv,cc and foldback limiting, short circuit and overload protection. Major specifications of a regulated power supply and their significance (line and load regulation, output ripple and transients). Basic working principles of a switched mode power supply (SMPS). Concept of floating andngrounded power supplies and their interconnections to obtain multiple output supplies. Brief idea of CVT,UPS and dual tracking power supply.

Unit-7:VCO (IC565) and PLL(IC566) and their applications (10%)

Unit-8:Thysistors and UJT (15%)

Name,symbol,characteristics and working principles of SCR, Triac, diac, SCS, SUS,SBS and LASCR. Mention of their applications. Basic structure, principle of operation and VI characteristics of UJT.Explanation of working of UJT as relaxation oscilliator and its use in thyristor.

Text Books:1. Electronic devices and circuits by S.K. ShahdevDhanpat Roy and corporation pvt Ltd.

3. Electronic devices and circuits BY J.B. Gupta Satyaprakashanpvt Ltd.

Reference Books:

2. Integrated Electronics by MilimumHelikyas Tata Macrahill
3. Electronic devices and circuits By boystierd

Syllabus for Semester IVth, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC471 **Course : Introduction to Microprocessors**

L:4Hrs per Week **Total Marks: 150**

Designation: Required **Course Coordinator: Mrs. Poonam**

Prerequisite: Nil

Course Outcomes:-

1.On completion of this course, students are expected to be capable of understanding the history need of microprocessor,

2.the internal architecture details, instruction sets, their timing diagram and various addressing modes of 8085 microprocessor and

3.8051 microcontroller. They will also learn the basic concept of serial and parallel data communication of 8085.

4.Students become able to understand various Interrupts and their uses using 8085 Microprocessor and 8051 Microcontroller

5.Students will also learn to interface 8255/8253/8251 peripheral chips and I/O devices with the same processors and controller.

6. A basic introductory concept on DMA controller also developed through this course. It is expected that students will be able to design systems based on above mentioned processors and controller by means of efficient assembly language programmings.

1. Introduction

(a) Typical organization of a microcomputer system and functions of its various blocks.

(b) Microprocessors, its evolution,function and impact on modern society.

2.Architecture of microprocessor (with reference to 8085 microprocessor).

(a)Concept of bus,bus organization of 8085.

(b) Functional block diagram of 8085 and function of each block.

(c) Pin details of 8085 and related signals.

(d) Demultiplexing of address/data bus (AD0-AD7),generation of read,writes control signals.

3. Instruction timing and cycles

(a) Instruction cycles,machine cycle and T states.

(b) How a stored programme is executed- Fetched and Execute cycles.

4. Programming (with respect to 8085 microprocessor)

(a) Brief idea of machine and assembly languages, machine and mnemonics codes

(b) Instruction format and addressing mode,identification of instructions as to which addressing mode they belong.

(c) Concept of instruction set,explation of the instructions of the following groups of instruction set of 8085.Data transfer group,Arithmeticgroup,logicgroup,stack, I/O and machine control group.

(d) Programming exercises in assembly language (examples can be taken from the

5 Memories and I/O Interfacing

(a) Memory organization,memorymap,partitioning of total memory space,address decoding concept of mapped I/O and memory mapped I/O.

(b) Concept of memory mapping,concept of stack and its function.

6. Interrupts

(a) Concept of interrupts ,maskable and non -maskable ,edge triggered interrupts ,software interrupts,restart instruction and its use.

(b) Various hardware interrupts of 8085,servicinginterrupts,extending interrupts system.

7. Data Transfer Techniques

(a) Concept of programmed I/O Operations, sync data transfer ,async data transfer(handshaking),interrupt driven data transfer,DMA,serial output data,serial input data.

8. Brief idea and programming of interfacing chip 8255.

9. Microcontrollers

(a) Introduction,architecture of 8051 only applications of microcontrollers.

10. Comparison

(a) 8085,Z80,6800(8 bit microprocessors)

TEXT BOOKS:

Microprocessor architecture, programming and application with 8085 – R. Gaonkar (Penram International) (strongly recommended)

The 8051 microcontroller -mazidi

An Introduction to Microprocessor and Applications –B.Ram

Introduction to Microprocessor by Sharma and P.K.Patel

References:

Microprocessors and microcontrollers - N. Senthil Kumar, M. Saravanan and Jeevananthan (Oxford university press).

Syllabus for Semester IVth , Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC472 **Course : Electronic Instrument & Measurement**

L: 4 Hrs. T: 1 hrs., Per Week **Total Marks: 150**

Designation: Required **Course Coordinator: Mr.S.K.Ranjan**

Pre –requisite: nil

Course outcomes

On completion of this course student s will be able:

1. To identify various errors in measurement system and correct them.

2. To understand different indicating types of instruments and its advantages.

3.To measure the electrical parameters with the help of measuring instruments.

4. To analyse the importance and advantages of electronic instruments.

5. developed the capability to select the best instruments according to their requirements.

UNIT I

Basics of Measurement (5%)

(i) Review of performance, specifications of instruments, accuracy, precision, sensitivity, resolution range etc. Errors in measurement and loading effects.

UNIT II

Multi-meter: (10%)

Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance in a multi-meter,Specifications of a multi-meter and their significance,Limitations with regards to frequency and input impedance

UNIT III

Electronic Voltmeter: (10%)

Advantages over conventional multi-meter for voltage measurement with respect to input impedance and sensitivity, Principles of voltage, current and resistance measurements (block diagrams only),Specifications of an electronic Voltmeter/Multi-meter and their significance.

UNIT IV

AC Milli-voltmeter (10%)

Types of AC millivoltmeters : Amplifier-rectifier and rectifier-Amplifier, Block diagram and explanation of the above types of ac millivoltmeters, Typical specifications and their significance

UNIT V

Cathode Ray Oscilloscope: (20%)

Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only – no mathematical treatment) Deflection sensitivity, brief mention of screen phosphor for CRT in relation to their visual persistence and chemical composition, Explanation of time base operation and need for blanking during fly back ; synchronization. Block diagram explanation of a basic CRO and a triggered sweep oscilloscope, front panel control

Specifications of a CRO and their significance, Use of CRO for the measurement of voltage (dc and ac) frequency, time period and phase angles, Special features of dual treace, delayed sweep and storage CROs (brief mention only); introduction to digital CRO,CRO probes, including current probes.Digital storage Oscilloscope: Block diagram and principle of working.

UNIT VI

Signal Generators and Analysis Instruments: (15%)

Block diagram, explanation and specifications of laboratory type low frequency and RF si

pulse generator and function generator,Brief idea for testing, specification for the above instruments, Distortion factor meter, wave analysis and spectrum analysis

UNIT VII

Impedance Bridges and Q-Meters (15%)

(i) Block diagram explanation of working principles of a laboratory type (balancing type) RLC bridge. Specifications of a RLC bridge.

(ii) Block diagram and working principles of a Q-meter

UNIT VIII

Digital Instruments: (15%)

(i) Comparison of analog and digital instruments, characteristics of a digital meter

(ii) digital voltmeter

(iii) Block diagram and working of a digital multi-meter

(iv) Working principle of time interval, frequency and period measurement using universal counter/frequency counter, time-base stability, accuracy and resolution.

(v) Principles of working and specifications of logic probes, signature analyzer and logic analyzer.

(vi) Digital, LCR bridges

Text book

1. Electronics instruments and measurement: A.k.sahni

2.Electronics instrumentation : H.S . kalsi

Reference books

1.Anand M. M. S: Electronic Instruments And Instrumentation Technology

2 Cooper &Helfrick: Electronic Instrumentation And Measurement Tech.

Syllabus for Semester IVth , Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC473 **Course : PCO (Personal Computer Organization)**

Pre – requisites - nil **Total Marks: 150**

L: 4 Hrs, T: 1 hrs.Per Week **Coordinator: Mrs Monika**

Course Outcomes

1. Study will be able to know about the Hardware details of Personal Computer with Microprocessor .
2. Study, analyze and understand simple working of PC, data buses, addressing techniques and different controllers with different types of ports.
3. Understand the working of video monitor and differentiation between monochrome, TFT, Color video monitor.
4. Understand the working of different peripheral devices, like keyboard, mouse, printers.
5. Learn about the hard disk Structure, storage techniques, and constructional features.
6. Understand the different types of service of BIOS and DOS.
7. Study of advance micro processor with pipelining , comparisons between different Pentium Processors that provide great knowledge at part of hardware & Software.

Units-1. Hardware Organization of PC:

Microcomputer Organization, 8086/8088 microprocessor, its architecture, brief view of instruction set, memory address and addressing techniques and I/O addressing, the Motherboard of PC: memory organization, system timers/counters, interrupts, vectoring, interrupt controller, DMA controller and its channels, PC-bus slots, various types of digital buses, serial I/O ports e.g., COM1 & COM2, parallel port.

Unit- 2 The Video Display of the PC:

The basic principles of the working of video monitors, video display adapters (monochrome and colour graphic). Video modes, detailed study of colour video monitors, introduction to TFT monitors, difference between monochrome, colour and TFT video monitors.

Unit -3 The Keyboard of the PC:

The basic principles of the working of a PC keyboard scan codes, introduction to multimedia keyboard.

Unit - 4 Disk Drives:

Constructional features of Hard disk, Floppy disk and their drives and HDD, DVD drive and CD ROM drive, Pen drive working principle of HDD drive, CD ROM drive, DVD drive, introduction to special type of disk drives like Zip drive, MO drive, Logical structure of a disk and its organization, Boot record. File Allocation Table (FAT), NTFS Disk Directory.

Unit -5 Peripheral Devices:

Basic features of various other peripheral devices e.g. mouse, scanner, plotter, digitizer, modem, light pen and joystick, working principle of DMP, Inkjet and Laser printers, Basic operation digital camera, FAX.

Unit -6 Power Supply:

SMPS used in PC and its various voltages, basic idea of constant voltage transformer (CVT) and Uninterrupted Power Supply (UPS) – offline and line interactive types.

Unit – 7 The BIOS and DOS Services:

The basic ideas of BIOS and DOS services for Diskette, Serial Port, Key board, Printer and Misc. services.

Unit -8 Advances Microprocessors:

Introduction to RISC and CISC system and comparison between the two introduction to superscalar architecture, detailed study of Pentium IV processor, mother board of PC, memory organization, Catch memory, keyboard interfacing, serial and parallel ports, introduction to pipelining.

Reference Books :

1. Personal computer organization by S.K.Chauhan.
2. Microprocessor or advanced microprocessor by B.Ram.
3. Personal computer organization BY Sharma and Pate

Syllabus for Semester IVth , Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC-480 **Course : EDC-II Lab**

P:3Hrs **Total Marks: 75**

Prerequisite: Nil **Coordinator: Mr. Jashvir Singh Chhikara**

Course Outcomes:

1. Student will practice on linear and nonlinear circuits.

2. Student will practice on555 Timer and applications.

3. Student will perform and verify transistorsmultivibrator.

4. Student will practices schemitt trigger and UJT Oscillator .

5. Student will perform the characteristics of SCR and Triac.

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1. Observe and Plot the output Waveshapes of R-C differentiating circuits

2. Observe and Plot the output Waveshapes R-C integrating circuits for squarewave input (observe the effect of the R-C time constant of the circuit on the output waveshape for both the circuits)

3. Construct biased and unbiased series and shunt clipping circuits for positive and negative peak clipping of a sine wave using switching diodes and d.c. sources.

4. Construct a double clipper circuit using diodes and sources and observe wave shapes.

5. Construct zener diode and transistor clipper circuits for positive peak, negative peak and double clipping of sine (other wave shapes).

6. To clamp sine and square wave to their positive and negative peaks and to a specified level.

7. To plot input vs. output characteristics of schmitt trigger circuit and plot the input output waveshapes with aine wave input.

8. To test mono and astablemultivibrator and to plot waveform.

9. To make and test the operations of monostable and astablemultivibrator circuits using 555 timer.

10. To determine and plot firing characteristics of SCR by varying anode to cathode voltage and varying gate current.

11. To note the waveshapes and voltages at various points of a UJT relaxation oscillator circuit.

12. To plot the firing characteristics of a triac in different modes, namely, mode I+, mode I-, mode III+ and mode III

Note : Use of simulation software such as OrCADPSpice MULTISIM, ELECTRONIC WORK BENCH etc. for performing some of the above on the computer also, which will enhance the understanding of the students beyond traditional laboratory experiments.

Syllabus for Semester IVth , Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC471 **Course: Introduction to microprocessor Lab**

P: 3 Hr, per week **Total marks-75**

Prerequisite : nil

Course outcomes

1. Student will perform their logical program on training kit and verify results.
2. Student can understand real performance of Microprocessor Chip
3. Student can develop small assembly language program and verify results through training kits.

List of Practical

1. Addition of two 8 bit numbers.

2. (a) To obtain 2's compliment of 8 bit number.

   (b) To subtract a 8 bit number from another 8 bit number using 2's compliment .

3. Extract fifth bit of a number in A and store it in another register.

4. Count the number of bits in high state in accumulator.

5. Check even parity and odd parity of a binary number.

6.Addition of two sixteen bit numbers.

7. Subtraction of a sixteen bit numbers from another sixteen bit number.

8. Multiplication of two 8 bit numbers by repetitive subtraction.

9.Divide two 8 bit numbers by repetitive subtraction

10.(a) Smallest number of three numbers.

   (b) Largest number of three numbers.

11. To sort array of unsigned binary numbers in decreasing/increasing order.

12. Generate timing delay through software.

Reference Material:- Lab Mannual.

Syllabus for SemesterIVth, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC482Course **Title: E.I.M**

P:-3hrs., Per Week **Total Marks: 75**

Designation: Required **Coordinator: Mr. S.K.Ranjan**

Pre –requisite: nil

Course outcomes

On completion of this laboratory students will be able:

1. To know the various techniques for the measurement of resistance.
2. To measure the frequency of the signals
3. To measure the voltage and time period
4. To operate CRO for measurement of various parameters.
5. To measure the voltage and current throughmultimeter.

LIST OF PRACTICALS

1. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance
2. To observe the limitations of a multimeter for measuring high frequency voltages and currents
3. To measure Q of a coil and observe its dependence on frequency, using a Q-meter
4. Measurement of voltage, frequency, time period, and phase angle using CRO
5. Measurement of time period, frequency, average period using universal counter/frequency counter
6. Measurement of rise, fall and delay times using a CRO
7. Measurement of distortion of a LF signal generator using distortion factor meter
8. Measurement of R,L and C using a LCR bridge/universal bridge

Syllabus for Semester IVth, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC483Course **Title: PCO Lab**

P:-3hrs., Per Week **Total Marks: 75**

Designation: Required **Coordinator: Mrs. Monika**

Pre –requisite: nil

1. To identify various components, devices and sections of a PC.
2. To interconnect the system unit with the video monitor, mouse and key board, and test the operation of the PC.
3. To connect various add-on cards and I/O devices to a PC motherboard, and test their working.
4. To note the voltages and waveforms at various terminals in the I/O channel (Bus Slots).
5. To study the SMPS circuit of a PC, measure various supply voltages, and connect it to the motherboard and other appropriate I/O devices.
6. To study the operation of a CVT used to supply power to a PC.
7. To study the operation of an uninterrupted power supply (UPS).

Syllabus for Semester ivth , Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC484 **Course Title: EDD**

T: 4 Hrs. Per Week **Total Marks: 150**

Designation: Required **Course Coordinator: Mr. Ashok Kumar**

Pre –requisite: nil

Course Outcome:-

1. Understand & observe symbols of various electronic & electrical components & devices.

2.Also he can familiar of different types of electronics & electrical components i.e. Resistors, capacitor, inductors various types, LDR, VDCR, Semi conductor, Diode, Transistors.

3.Concept of elementary design & drawing of semi conductor devices.

4.Designing of circuits of half wave full wave rectifiers.

5.Designing of regulated power supplies amplifiers square wave generator using 555.

6.To understand the designing of various types of circuits using voltmeter & ammeter

1. Draw the standard symbols of the following (30%)

(a) (Different parts of ISI Standard IS.2032 may be referred to) for electronics with specification in Digital EC and Microprocessor System Design.

(b) Components : Resistors – Fixed, tapped and variable(presets and potentio-meters LDR, VDR and Thermistor, Capacitors – Fixed, tapped and variable types RF and Af chokes and inductors air cored, solid cored and laminated cored. transformer – step up, step down, Af and Rf types, Auto transformer, IF transformer, three phase transformer, Antenna, chasis, Earth, loudspeaker, Microphone, ear-phone, fuse, indicating lamp, co-axial cables, switches – double pole-on/off double pole, double throw an drotary types, terminal and connections of conductors.

(c) Devices: Semiconductor – rectifier diode, zener diode, variactor diode, tunnel diode, photo diode, light emitting diode (LED), Bipolar transistor,

(d) Working principles of ramp, dual slope and integrating type of field effect transistor (FET), MOSFET Photo transistor. Unjunction transistor (UJT) silicon control Rectifier (SCR), Diac and Triac case outlines (with their type numbers) of

different types of semiconductor diodes, transistors, SCR, diacs, triacs and ICS (Along with indicators for identifying pins etc.)

2. Draw the Following (30%)

Circuit diagram of typical multimeter, Circuit diagram of a typical electronic multimeter – Circuit diagram of a typical transistor radio receiver. Complete lock diagram of a typical monochrome TV transmitter and receiver system. Front panel details of typical CRO.

3. Design and Draw for the given Specifications the following : (40%)

(a) A small power transformer. A simple power supply using a full wave rectifier and different types of filters. A simple zener regulated power supply. A small-signal (single-stage low-frequency amplifier) given specifications being the input impedance, load impedance, voltage gain and input signal level and the frequency range.

(b) Square-wave generator using 555 timer. sinusoidal oscillator-Wein's Bridge type using an op-amp. Voltage-controlled oscillator using IC565. Circuitory for using a DC micro-ammeter as
   (i) a voltmeter
   (ii) a current meter
   (iii) for specified ranges

Text Books:

1.Engineering drawing and design by Vineet Singh and Gurmeet Singh Published by Satyaprakashan

Syllabus for Semester IVth, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC485Course **Title: MINOR PROJECT**

P: 6 Hrs. per Week **Total Marks: 150**

Designation: Required **Course Coordinator: Mrs. Bhawna**

Pre –requisite: nil

Course Outcomes:

On completion of this course:

16. Student will be able to design complete electronics system.
17. Student will work as multi-disciplinary and as leaders
18. Student will be able to work as conclusive of their program

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Students should be asked to assemble the minor projects on the following topics:

1. Communication
2. Industrial Electronics
3. Digital Electronics.
4. Microprocessor based projects
5. Medical Electronics
6. Instrumentation & Control

And the students will assemble & test the projects in the Lab of respective polytechnic/Institute.

Students are expected to visit at least two industries during 4th semester & prepare the project report of the industries visited by them.

CRITERIA FOR EVALUATION

Assembly & Testing of Project	80%
Visit to Industries & Report Writing	20%

SEMESTER - V

Code No.	Subject	Study Scheme Period/Week			Evaluation Scheme						Total Marks
		L	T	P	Internal Assessment		External Assessment Exam				
					Theory	Practical	Written Paper		Practical		
					Max Marks	Max. Marks	Max. Marks	Hrs.	Max. Marks	Hrs.	
1	Object Oriented Programming using C++	4	-	3	50	50	100	3	50	3	250
2	Industrial Electronics and Instrumentation	4	-	3	50	50	100	3	50	3	250
3	Communication Systems	4	-	3	50	50	100	3	50	3	250
4	Microwave Engineering	4	-	3	50	50	100	3	50	3	250
5	Troubleshooting and Maintenance of Electronic Equipments	4	-	3	50	50	100	3	50	3	250
6	Industrial Training Report Presentation	-	-	1	-	50	-	-	100	3	150
	Student Centered activities	-	-	4	-	-	-	-	-	-	
	TOTAL	20	-	20	250	300	500		350		1400

Syllabus for Semester vth , Diploma (Electronic and Communication Engineering)
CRRIT Kanjhawala Delhi

Course code: EC-570 **Course Title: Communication System**

L: 4hr T: 1hr **Total Marks: 150**

Prerequisite: ECE 370 **Coordinator: Mr. Jashvir Singh Chhikara**

Course Outcomes:

1. Student will understand the audio system.

2.Students will be learn about AM/FM Transmitters and receiver with its applications

3. Student will be capable to know about various types of antennas.

4.,Student will be understand about wave propagation in various media.

5. Student will get concept of optical fibre communication .

6. Student will find concept of satellite technology.

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1. Audio systems (12 Hr)

Microphones: Construction, working principles and applications of carbon, moving coil, velocity, crystal, condenser type, cordless microphone.Loudspeakers: Direct radiating, horn loaded woofer, tweeter, mid-range, multi speaker system, baffles and enclosures.Sound Recording on magnetic tape, its principles, block diagram and tape transport mechanism, digital sound recording on tape and disc.

2. AM/FM transmitters (6 Hr)

Classification of transmitters on the basis of power & frequency.Concept of low level and high level modulation. Block diagram of low level and high level

modulation. AM transmitters and working of each stage.Block diagram and working principles of reactance transistor and Armstrong FM transmitter.

3. AM/FM Radio Receiver (10 Hr)

Principles of working with block diagram of super heterodyne AM receiver function of each block and typical waveforms at input and output of each block.Performance characteristics of a radio receiver sensitivity, selectivity, fidelity, S/N ratio, image-rejection ratio and their measurement procedure, ISI standards on radio receivers (brief idea).Selection criteria for intermediate frequency(IF) , Concepts of simple and delayed AGCBlock diagram of an FM receiver, function of each block and waveforms at input and output of different blocks. Need for limiting and de-emphasis in FM reception.Block diagram of communication receivers, differences with respect to broadcast receivers.

4. Antennas: (8 Hr)

Electromagnetic spectrum and its various ranges: VLF, LF, HF, UHF, Microwave. Physical concept of radiation of electromagnetic energy from a dipole. Concept of Polarization of EM waves.Definition and physical concepts of the terms used with antennas like point source, gain, directivity, aperture, effective area, radiation pattern, beam angle, beam width and radiation resistance.Types of antennas – brief description, characteristics and typical applications of dipole, medium wave (mast) antennas, folded dipole, turns tile, loop antenna, yagi and ferrite rod antenna(used in transistor receivers).Brief description of board-side and end fire arrays, their radiation pattern and applications (without analysis); brief idea about Rhombic antenna and disc antenna.

5. Propagations: (8 Hr)

(i) Basic idea about different modes of radio wave propagation and typical areas of applications. Ground wave propagation & its characteristics, summer field equation for field strength.

(ii) Space wave communication _ line of sight propagation, standard atmosphere, concept of effective earth radius, range of space wave propagation in standard atmosphere.

(iii) Duct propagation: sky wave propagation-ionosphere & its layers, explanation of terms-virtual height, critical frequency, skip distance maximum usable frequency, multiple hop propagation.

6. Fiber Optic Communications (8 Hr)

(i) Advantages of fiber optic communication

(ii) Constructional features of optical fiber and fiber optic cables, concepts of numerical aperture (NA), modes of propagation in an optical fibers, fiber attenuation and dispersion.
(iii) Light sources-diode laser, LEDs and their characteristics
(iv) Light detectors and their characteristics
(v) Basic idea of fiber connection techniques
(vi) Block diagram of fiber –optic communication link

7. Satellite Communication (2 Hr)

(i) Basic idea, passive and active satellites, meaning of the terms, orbit, apogee, perigee.
(ii) Geostationary satellites and its need, block diagram and explanation of satellite communication link.

Text Books:1.

4. Principle of communication Engineering byAnokh Singh and A.K.Chhabra published by S.Chand.
5. Communication system By A.K.Gautam Published by S.K. Katariya.

Reference Books:

4. Analog Communication system by SimenHeykins Published by Tata Macrhill
5. Analog Communication system by J.B.Gupta Published by S.K. Katriya and sons

Syllabus for Semester Vth, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course Code:EC571 **Course: Industrial Electronics & Instrumentation**

L:4 Hrs, T:1 Hr Hrs per week **Total Marks: 150**

Prerequisite: EC373 **Coordinator: Mrs Bhawana Ahlawat**

Course Outcomes:

On completion of this course students will be able to have:

1. An ability to understand basic operation of various power semiconductor devices and passive components.
2. An ability to understand the basic principle of switching circuits.
3. An ability to analyze and design an AC/DC rectifier circuit.
4. An ability to understand the role power electronics play in the improvement of energy usage efficiency and
   the development of renewable energy technologies.

Unit I:

Thyristor ratings and gate rating. Turn on methods – DC gate, AC Gate, Pulse Gate Triggering and R-C trigger circuits. Turn off methods – Nature and Forced turn off methods.

Unit II:

Internal power dissipation and need for heat sinks in thyristors. Definition of following terms and their relationship with the power dissipation of the device(no derivation).

i. Heat Sink efficiency.
ii. Heat Sink transfer co-efficient.
iii. Heat dissipating area of a Heat Sink. Concept of thermal resistance of Heat sinks. Various types of Heat sinks and techniques of mounting device on heat sinks.

Unit III:

Principle of operation and working of the following switching circuits, using SCRs and Triacs.

Automatic Battery Charger,Voltage regulator,Emergency light,Alarm circuit,Time delay relay circuit,Circuits for over voltage and over current.

Unit IV:

Explanation of the working of a 3 phase half wave and full wave bridge rectifier with the help of waveforms. Explanation of working of following controlled rectifier using SCRS and resistive and inductive loads with the help of wave forms and appropriate mathematical expression (No derivations).

Unit V:

Principle of working of AC phase control circuit using triac and its applications.

i. Illumination Control
ii. Fan speed control
iii. Temperature Control
iv. Speed control of DC and small AC motors.

Unit VI:

Principles of operation of basic inverter circuits. Basic series & parallel commutated inverters.

Unit VII:

Principles of induction and dielectric heating and their typical applications.

Unit VIII:

Introduction to instrumentations:

Basic measurement system, functions of its elements namely the transducer, signal conditioner, display or read-out and power supply.

Unit IX:

Transducers:

Distinction between active and passive transducers with examples. Basic requirements of a transducer.Principle of operation of the following transducers and their applications in measuring the physical quantities listed against each one of them. Transducer Physical Quantities, Variable Resistance Type, Variable capacitance Type, Variable Inductance Type & Other Types.Transducer Physical Quantities : Variable Resistance Type

i. Potentiometeric : Displacement and force
ii. Strain gauge : Torque and displacement
iii. Thermistor : Temperature

iv. Resistance Hydrometer : Humidity

a. Variable capacitance Type
   a. Pressure gauge : Displacement and pressure
   b. Dielectric gauge : Liquid Level and thickness
b. Variable Inductance Type
   - LVDT : Pressure, force, displacement and position
c. Other Types
   - ❖ Solid State Sensor : Temperature
   - ❖ Thermocouple : Temperature
   - ❖ Piezoelectric device : Force
   - ❖ Photoelectric device : Light
   - ❖ Proximity probes : r. p. m
   - ❖ Digital transducer : displacement

Unit X:

Security & Surveillance devices:

Block diagram, application and use of the following:

Hand held metal detector and door frame,Analog and IP CCTV including DVR & NVR with video analysis. Access control system (biometric).Attendance recording system.

Unit XI:

Output Devices and Displays:

Basic principles of operation, constructional features and application of the following:

- ❖ Graphic Recorder
- ❖ X-Y Recorder.

Text Books:

1. Industrial Electronics and Instrumentation, Sunil Kumar, Kataria Sons.
2. Power Electronics, P.S.Bimbhra, Khanna Publishers.

Reference Books:

1. 1. N. Mohan, T. Undeland, W. Robbins, Power Electronics, Wiley, 3rd Edition, 2003
   2. M. Rashid, Power Electronics, Prentice-Hall, 3rd Edition, 2003.

Syllabus for Semester Vth, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course Code:EC572 **Course: OOPs**

L:4 Hrs, T:1 Hr Hrs per week **Total Marks: 150**

Prerequisite: EC374 **Coordinator: Mrs Monika**

Course Outcomes

1. Object orientation is a new approach to understand the complexities of the real world.
2. This is model programming language c++ that shall helped the students to implement the various concepts of object orientation practically.
3. Design, implement, test, debug, and document programs in C and C++
4. Program with pointers and arrays, perform pointer arithmetic, and use the preprocessor.
5. Program low-level input and output routines in C and streaming input and output operators in C++.
6. Program low-level input and output routines in C and streaming input and output operators in C++
7. Understand how to write and use functions, how the stack is used to implement function call, and parameter passing options.
8. Use classes, constructors, destructors, inheritance, and operator overloading and the standard Template library in C++.
9. Map an object-oriented program design into the more primitive data structures and program organization of C.

Unit 1 – Introduction

Problems with procedure oriented Programming techniques, concepts of oops, Characteristic of oops, advantages of oops languages.

Unit 2 – C++ Basic Programming

Basic data types, type compatibility, operators in c++, scope resolution operator, control structure

Unit 3 – Functions of c++

Functions prototyping, Call by reference, Inline function, Function overloading, Library Function.

Unit 4 – Class and objects

Comparison of class and C-structure, Create objects, Arrays with Class, Arrays of Objects, Objects as Function Arguments.

Units 5- Constructor and Destructor

Constructor and its characteristics , Parameterized Constructor, Multiple Constructor in a class, Copy Constructor, Overloading Constructor, Destructor and its characteristics.

Units 6 - Operator Overloading

Overloading of unary operator, Overloading of binary operator, Manipulation of String using operator, Type conversion – basic type of class & class to basic type.

Units 7- Inheritance

Type of inheritance, need of protected members, Application of inheritance.

Units 8-Virtual & Friend Function

Pointers to objects, this pointers, pointer to provide classes, Virtual Functions, Pure virtual functions, Concepts of late & early binding.

Units 9- Managing console Input and Output operation.

Unformatted Input and Output operation, Formatted Input and Output operation: fill, precision, width, Input and Output stream.

Units – 10 File Operations

Opening & closing a file, Programming with files.

Reference Books:

1. Programming with C & C++ G.S. Baluja & G.K. Baluja.
2. Programming with C++ (object oriented programming) by Robert laugher .

Syllabus for Semester vth , Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC573 **Course Title: Microwave Engineering**

L: 4 Hrs. T: 1 hrs., Per Week **Total Marks: 150**

Prerequisite: EC171 **Coordinator: Mr.P.K.Patel**

Course Outcomes

19. Student will able to understand about basics of electromagnetic theory.
20. Students will be familiar with basic of waveguides and cavity resonators to apply the knowledge further.
21. Students will to understand about various microwave components such as E-plane, H-Plane, Magic Tee's, Hybrid ring , Waveguide joints, bends, corners, transition and twists, Waveguide irises, posts and tuning screws
22. Students will be able to understand about S-parameters and its representation for microwave devices
23. Students will find understanding of various microwave devices
24. Student will get various concept of microwave antenna and system communication.
25. Students will be able to understand about RADAR system
26. Student will be able to understand about full working system of microwave oven.
27. Gaining ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

Unit 1: **Introduction** to microwaves and its applications, frequency bands as per IEEE, advantages of microwave **(2Hr)**

Unit 2: Electromagnetic theory (8 Hr)

Coulomb's law, Electric field intensity, Electric flux and Gauss's law, Ampere's law, Faraday's law, magnetic flux density, Maxwell's equations. Simple numerical problems on Electric and magnetic fields.Concept of plane waves, uniform plane waves, wave equations,Boundary conditions, free space impedance, skin effect, pointing vector (no derivations)

Unit 3: **Wave Guides** (4 Hr)

Rectangular and circular waveguides and their applications.Cut-off frequency, cut-off wave length, guide wave length, guide impedance, phase velocity and group velocity and their relations.TE and TM modes in wave guides, impossibility of TEM made in waveguide, degenerate modes, simple numerical problems on rectangular and circular wave guides, dominant modes.Field patterns in rectangular wave guides for TE10, TE20 and TM11 modes,Methods of exciting wave guides

Unit 4: **Cavity Resonators** (2Hr)

Physical ideas of rectangular and cylindrical and reentrant cavity resonators, applications, coupling methods, tuning and Q factor of cavity resonators,Calculations of resonant frequencies (simple numerical problems) of rectangular and circular cavity resonators (no derivation)

Unit 5: **Microwave Components** (4Hr)

Constructional features, characteristics and applications of:-

E-plane, H-Plane, Magic Tee's, Hybrid ring,Waveguide joints, bends, corners, transition and twists,Waveguide irises, posts and tuning screws,Coupling probes, coupling loopsTerminations, fixed and variable attenuators,Isolator, circulator, two hole directional couplers,Duplexer (Y-type and branch type), coaxial to waveguide adapter

Unit 6: **S-Parameters** (2Hr)

Concept of scattering (s) parameters,S-parameters of E,H, and magic Tee's (no derivations)

Unit 7: Microwave Devices (10 Hr)

Basic concept of thermionic emission and vacuum tubes,Effect of inter electrode capacitance, load inductance and transit time effect on high frequency performance of conventional vacuum tubes and steps to extend their high frequency operations. Construction,, characteristics principles, bunching process and typical applications of the following:

Two cavity klystron amplifier,Reffex klystron,Multi cavity magnetron, phased focusing effect, electronic tuning, strapping, frequency pulling and pushing,Travelling wave Tube (TWT),Gunn diode,IMPATT diode,Concept of parametric amplifiers.

Unit 8: **Microwave Antennas** (3Hr)

Parabolic reflector / dish antenna, gain, beam width, feeding methods, typical applications,Horn antenna, sectoral, pyramidal and circular, flase angle of horn antenna, typical applications. Basic idea of slot antenna.

Unit 9: **Microwave communication systems** (3Hr)

Block diagram and working principles of microwave communication link,Block diagram of tropospheric communication link and its working principles, advantages and disadvantages ,Digital microwave communication systems block diagram and its working.

Unit 10: **Radar Systems** (6Hr)

Introduction to RADAR and its various applications,Radar range equation and its applicationsBlock diagram and operating principles of Pulse, CW, FMCW and MTI Radar systems and their applications,Radar displays : A-scope, B-scope, E-scope, F-scope and Plan position Indicator (PPI)

UNIT 11.**Microwave oven** (2Hr)

Block diagram and its working

Text Books:1. Microwave and Radar Engineering: By M. Kulkarni

2. Microwave Devices and circuits : By S.Y. LIAO

Reference Books:

1. Electronic communication systems : by George Kennedy & Bernard Davis
2. Theory and problems of Electromagnetics : by Schaum's outline services

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Syllabus for Semester vth , Diploma (Electronic and Communication Engineering)
CRRIT Kanjhawala Delhi

Course Code :- EC 574 **Course:- T.S.M.E**
Designation :- Required **Course Coordinator:- Mr Vinay Panwar**
L: 4Hrs Per week **Total Marks: 150 marks**

Coures Outcome

1.To understand concepts of maintenance and its policy their various types and basic procedures of service and maintenance.

2.To understand the concepts of trouble shooting techniques

3. To understand the procedure for checking passive and active components .

4. To understand the trouble shooting procedures using digitals tools like logic clip, logic probe, logic pulser etc

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Unit:-1 Repair, Servicing and Maintenance Concepts

Introduction, Modern electronic equipment, Mean time between failures (MTBF), Mean time to repair (MTR), Maintenance policy, potential problems,preventive maintenance, corrective maintenance.

a) Study of basic procedure of service and maintenance

b) Circuit tracing techniques

c) Concepts of shielding, grounding and power supply considerations in

instruments.

UNIT:-2 Fundamental Trouble Shooting Procedures

Fault location

Fault finding aids

- Service manuals

- Test and measuring instruments

- Special tools

Trouble Shooting Techniques

- Functional Areas Approach

- Split half method

- Divergent, convergent and feedback oath circuits analysis

- Measurement techniques

UNIT:-3 Passive components

Test procedures for checking passive components, resistors, capacitors, inductors, chokes and transformers.

UNIT:-4 Semiconductor Devices (From Testing procedure point of view)

Dicoes rectifier and zener diodes <W> transistors. Field effecr transistors JFET and FET Thyirstors. unijuction transistors, Photo cells, Transistor equivalents. Data Books on

transistors.

UNIT:-5 Trouble-shooting Digital Systems

Typical faults in digital circuits. Use of Logic clip, logic probe, logic pulser,IC tester.

UNIT:-6 Typical Examples of Trouble Shooting

Trouble shooting procedures for the following:

- Oscilloscope

- Power supplies

- Digital multimeters

- Signal generator

- PA system

- Tape reorder and

- Stereo amplifier

UNIT:-7 Log Book & History Sheet

Introduction, preparation and significance of log book and History sheet.

Text Books:

1. TSME books by R.S.Khandpur Published by S.K.Katariya

Syllabus for Semester Vth, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code: EC580 **Course: Communication System Lab**

P: 3Hrs, per week **Total marks-100**

Prerequisite : Nil **Coordinator: Mr.Ashok Kumar**

Course outcomes :

1 Make an Idea about the frequency response of load speaker & microphone.

2 Also one can observe the tape transport mechanism.

3 To understand various characteristics of super heterodyne Radio Receiver (AM) i.e. selectivity, sensitivity & fidelity.

4 He can make an Idea of Fiber optic comm.. system in which also different types of losses i.e. light attenuation, propagation loss & bending losses.

5 Concept of radiation pattern of directional experiment BASED on following topic:

(i) Fiber optic communication.

(ii) Characteristics of Radio receiver (Superhetrodyne type)

(iii) Different types of fiber optic components

(iv) Tape recorder.

(v) Loud speaker & microphone

(vi) Antenna

List of Practicals

1. To plot the frequency response of microphone.
2. To plot the frequency response of loudspeaker.
3. To study the tape transport mechanism.
4. To plot the sensitivity characteristics of a radio receiver.
5. To plot the selectivity characteristics of a radio receiver.
6. To plot the fidelity characteristics of a radio receiver.
7. Familiarization and identification if fiber optic components.
8. To assemble the fiber optic communication set up and compare the transmitted signal with the output of the receiver.
9. To plot the radiation pattern of a directional and omni directional antenna.
10. To measure the light attenuation of the optic fibres.

Reference material: Lab manual

Syllabus for Semester Vth, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course Code:EC581 **Course: Industrial Electronics & Instrumentation**

P:3 Hrs per week **Total Marks: 100**

Prerequisite: Nil **Coordinator: Mrs Bhawana Ahlawat**

Course Outcomes:

On completion of this Laboratory students will be able to have:

1. Learn the principles of operation of ac-dc rectifiers using different triggering techniques.
2. Learn the principles of operation of different power devices.
3. Learn the principles of operation of various transducers.
4. Learn the principles of operation of security & surveillance devices.

Practical's:

1. Observation of wave shape & measurement of voltage at relevant points of an SCR based single phase half wave controlled rectifier circuit using resistive (in phase gate triggering circuit).
2. Observation of wave shape & measurement of voltage at relevant points of an SCR based single phase half wave controlled rectifier circuit using RC phase shift gate triggering circuit.
3. Observation of wave shape & measurement of voltage at relevant points of an SCR based single phase half wave controlled rectifier circuit using UJT relaxation oscillator for gate triggering.

4. Observation of wave shape & measurement of voltage at relevant points of an SCR based single phase controlled bridge rectifier circuit.

5. Observation of wave shape & measurement of voltage at relevant points in a triac based AC phase control circuit used for lamp intensity and/or AC fan speed control.
6. Observe the wave shape & measure voltages at various points of a circuit for over voltage protection using SCR.
7. Study of various transducers like strain gauge, thermistor, photo diode, photo transistor etc.
8. Study of security and surveillance devices.
9. Study an XY recorder and graphic recorder.

Syllabus for Semester Vth, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course Code:EC582 **Course: OOP Lab**

P:3 Hrs per week **Total Marks: 100**

Prerequisite: EC384 **Coordinator: Mrs Monika**

Course Outcomes

1. Student will be able to write and learn clear elementary C++ programmes.
2. Understanding algorithmic thinking and apply it to programming.
3. Understanding problem solving techniques.
4. Code with C++ arithmetic, increment, decrement assignment, relational, equality and logical operators.
5. Code C++ control structure (if, if-else, switch, while, do-while, for) and use built in data types.
6. Use standard Library functions.
7. Learn about user defined function definitions.
8. Understand and manipulate array.
9. Pass array to functions and pointers.

Practical based on following topics.

1. WAP to read elements of given two matrices of order n*n and perform matrix multiplication. Use a separate function for multiplication.
2. WAP to read a set of lines from the keywords, store it in a two dimensional array and determine the number of characters in the lines. Functions to read line.
3. WAP to read two string and concatenate them and display it.
4. WAP to perform addition, subtraction, multiplication and division on complex numbers. Create a class complex and the above operations must be made as public functions of the class.
5. WAP to find the distance between two points using the pointers to class objects.
6. WAP to generate a series of Fibonacci numbers using a copy constructor.

7. WAP to calculate the sum of private data of a class with private data of another class through the common friend functions.
8. WAP to displays the objects address using this pointer. Also access member data with this pointer and display them.
9. Using function overloading find the square of integer data, floating point data and double precision data.
10. WAP to create a class of object say obj 1 and obj 2 and assign the contents of obj 1 to obj 2 using operator overloading.
11. Develop a program to read the following information from the keyword in which the class consist of employee name, code and designation and the desired class containing the data members like years of Experience and age. Employee Name, Department, Experience, age, create a virtual base for the item employee name and write code for the same.
12. WAP base class for item employee name and write code for the same can be read – Name of Student, roll No. ,Subject Code, Subject Name, Internal Marks, External Marks, Construct the data base with suitable member functions for initialing and destroying the data using construction and destructors.

Syllabus for Semester vth , Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code:EC583 **Course: MWE Lab**

. P: 3 hrs., Per Week **Total Marks: 100**

Prerequisite: Nil **Coordinator: Mr. P.K.Patel**

Course Outcomes

28. Generation of high frequency oscillations and amplification..
29. Measurement of high frequency parameters
30. Extension of 2 port analysis to microwave range

4.. waveguides, E,H, Magic Tee's, directional coupler, isolator, circulator, variable attenuator, VSWR meter, frequency meter, and Microwave bench, Reflex klystron tube, slotted section, Detector mount

5. Understanding of RADAR device

6. Student able to understand about micro oven home appliance

List of Practical

1. To study various microwave components and devices such as waveguides, E,H, Magic Tee's, directional coupler, isolator, circulator, variable attenuator, VSWR meter, frequency meter, and Microwave bench, Reflex klystron tube, slotted section, Detector mount
2. To study the characteristics of the reflex klystron tube and to determine electronic and mechanical tuning range
3. To measure the frequency and wavelength in a rectangular waveguide in TE10 mode
4. To measure VSWR and reflection coefficient of a given load
5. To measure directivity and coupling factor of a directional coupler
6. To verify the properties of magic tee
7. To measure radiation (polar) pattern and the gain of a waveguide Horn antenna
8. To study the I-V characteristics of Gunn diode
9. To study the Radar system trainer
10. To study the Microwave oven

Syllabus for Semester vth , Diploma (Electronic and Communication Engineering)

CRRIT Kanjhawala Delhi

Course Code :- EC584 **Course:- T.S.M.E (Lab)**
Designation :- Required **Total Marks: 100 marks**
P:3Hrs Per week **Course Coordinator :- Mr Vinay Panwar**

Course outcomes:

1. Student will be understood about various tools that are used to troubleshoot electronics devices and circuits.

2. Student will aware about assembly of components.

3. Student can understand about testing of equipments .

List of Practicals

1. Selection, demonstration and correct use of tools and accessories, tools pliers',wire cutter, wire stripper, tweezers, soldering iron, desoldering tools, neontester, screw driver. Accessories insulating tapes, solders, solder tips, flux, desoldering, wick , solder cleaning fluids , sleeves , tags , identifiers

2. Develop skill in assembly of components, wiring, soldering and deso1dering Methods

3. Selection and use of commonly used passive components and accessory

4. Testing of active and passive components.

5. Testing of 1inear integrated circuits

6. Use of .digital tools for troubleshooting digital components

7. Trouble, shooting at least two of the following equipments: Oscilloscope , Power supplies, electronic multimeter , signal generator, PAsystem, Tape recorder and Stereo amplifier

Reference Material :- Lab Manuals

Syllabus for Semester VIth, Diploma (Electronics and Communication Engineering)

CRRIT Kanjhawala Delhi

Course code:EC585 **Course: Industrial training preparation & Report**

P: 1 hrs., Per Week **Total Marks: 150**

Prerequisite:nil **Coordinator:Mr. P.K. Patel**

Course Outcomes

1. Student will be able to work in industrial atmosphere.
2. Student wil be able to work with live site.
3. Student will able to project themselves as representative.

Industrial training report presentation means for solving live problems faced electronics industries by applying the knowledge and skills obtained through the diploma course in electronics. The institute offering the course will identify live problems pertaining to Electronics industries. The activity of problem identification should begin well in advance (say in the beginning of fourth semester). Students should be allotted a problem of interest to him/her. The students will execute the work under the guidance of teachers. Each teacher would not have more than six students for guiding and supervise.

The students shall go for industrial training for a period of 4 to 6 weeks in the summer vacation after the examination of IV semester. The students will submit a comprehensive training report (in a presentable manner, preferably typed and bound) for evaluation by the teacher guide, an expert from the industry and an external examiner.

The industry for training should be related to Electronics, Microprocessor, Electronic Instruments and institution like Scientific Laboratories, Radio Station, VSNL, Radio & TV Transmitters, Telephone Exchange or any other electronics related field.

Assessment Method:

(i)	Attendance and Punctuality	-	15% weightage
(ii)	Initiative in problem solving	-	30% weightage
(iii)	Relationship with people	-	10% weightage
(iv)	Report-Writing	-	45% weightage

SEMESTER VI

Code No.	- VI Subject	Study Scheme Period/Week			Evaluation Scheme						Total Marks
		L	T	P	Internal Assessment		External Assessment Exam				
					Theory	Practical	Written Paper		Practical		
					Max Marks	Max.Marks	Max. Marks	Hrs.	Max. Marks	Hrs.	
1	Advanced Communication Systems	4	-	3	50	50	100	3	50	3	250
2	Television Engineering	4	-	3	50	50	100	3	50	3	250
ELECTIVE: 3	Industrial Management & Entrepreneurship Development	4	-	-	50	-	100	3	-	-	150
4	Digital System Design	4	-	3	50	50	100	3	50	3	250
5	Elective - I	4	-	3	50	50	100	3	50	3	250
6	Major Project	-	-	4	-	100	-	-	100	3	200
	SCA	-	-	4							
	TOTAL	20	-	20	250	300	500		300		1350

Elective: 1.Advanced Microprocessor 2. Microprocessor Based System Design 3. Programming in JAVA 4. Multi Media Application

Syllabus for Semester VIth, Diploma (Electronics and Communication Engineering)
CRRIT Kanjhawala Delhi

Course code: EC-670 **Course : Advanced Communication System.L: 4hr T: 1hr**
Total Marks: 150

Prerequisite: 570 **Coordinator: Mr Jashvir Singh Chhikara**

Course Outcomes:

1. Student will get the information about didgital communication and its coding

2.Students will be learn about digital modulation technique.

3. Student will be capable to know about various types Modems.

4.,Student will be understand about UART and USART.

5. Student will get concept of various interfacing standards.

6. Student will find concept of exchange ,fax ,mobile communication.

Unit-1:In**troduction**of Basic block diagram of digital and data communication systems. Their comparison analog communication system. Review of sampling theorm and PCM
(4 Hr)

Unit-2:Coding **(8 Hr)**

(i) Introduction to various some loads like, Lempel, Shannon faro, ha ziv code etc.
(ii) Code error detection and correction techniques – Redundancy, parity, block check character (B Vertical Redundancy check (VRC), Longitudinal Redundancy, Check (LRC), Cyclic Redund check (CRC), Hamming code, Cycle codes, Linean block codes.

Unit-3:**Digital Modulation Techniques:** **(6 Hr)**

(i) To study the basic block diagram and principle of working of their modulator and demodulator o following
  (a) Amplitude shift keying (ASK): Interrupted continuous wave (ICW), two tone modulations
  (b) Frequency shift keying (FSK).
  (c) Phase shift keying (PSK)
  (d) Quadrature Amplitude modulation (QAM), DPSK, Quadrature PSK.

Unit4: Characteristics/working of data transmission circuits; bandwidth requirements, data transmission speeds, n cross talk, echo suppressers, distortion, equalizers. **(4 Hr)**

Unit-.5UART, USART: **(2 Hr)**

Their need and function in communication systems and study of their block diagram.

Unit-6:**Modems:** **(4 Hr)**

Need and function of modems, Mode of modems operation (low speed, medium speed and high s modems). Modem interconnection, Modem data transmission speed, Modem modulation method, Mo interfacing (RS 232 Interface, other interfaces).

Unit-7:Network and Control Considerations: **(8 Hr)**

Protocols and their functions. Data communication network organisation, Basic idea of various mode digital switching – circuit switching, message switching, packet switching.Basic concept of Integ Services of Digital Network (ISDN),Digital Network (ISDN) its need in modern communication, brief id ISDN interfaces.Basic idea of local area Network (LAN), and its various topologies.

Unit-8:**Telemetry**: radio-telemetry, and its application. Block diagram of DTM and FDM telemetry sy **(2 Hr)**

Unit-9:**Electronic Exchange:** Typical telephone network. Various switching offices (Regional Centre, Dis Centre, Toll Centre, Local Office) and their hierarchy. **(6 Hr)**

Principles of space division switches. Basic block diagram of a digital exchange and its working. Combined s and time switching: Working principle of STS and TST switches.Functions of the control system of an auton exchange. Stored programme Control (SPC) processor and its application in electronic exchange and telephone exchange.Introduction to PBX, PABX and EPABX. Function of PBX. PABX relation with ce office. Modern PABX capabilities.

Unit-10:Operation of CELLULAR mobile telephone system. Concept of cells and frequency reuse. Sp features of cellular mobile telephone. Introduction of GSM CDMA, their advantages & disadvantages. Basic id spread spectrum, 2g & 3G Technology. **(2 Hr)**

Unit-11:**Facsimile (FAX)** **(2 Hr)**

Basic idea of FAX system and its applications. Principle of operation and block diagram of modern FAX system. Important features of modern FAX machines

Text Books:1.

6. Principle of communication Engineering byAnokh Singh and A.K.Chhabra published by S.Chand.
7. Communication system By A.K.Gautam Published by S.K. Katariya.

Reference Books:

6. Analog Communication system by SimenHeykins Published by Tata Macrhill

Syllabus for Semester I, Diploma (Electronics and Communication Engineering)
CRRIT Kanjhawala Delhi

Course code: **Course Title: Microwave Engineering**
L: 4 Hrs. T: 1 hrs Per Week **Total Marks: 150**
Prerequisite: Nil **Coordinator: Mr. P.K.Patel**

Course Outcomes

31. Student will able to understand about basics principles of television .
32. Students will be familiar with basic of tv camera and picture tube to apply the knowledge further.
33. Students will to understand about various TV bandwidth and channel adopted in India.
34. Students will be able to understand about TV communication process.
35. Students will find understanding of various TV standard like PAL,NTSC and SECAM
36. Student will get various concept of cable TV.
37. Students will be able to understand about color TV system
38. Student will be able to understand about video CD player.
39. Students will understand about latest TV markets product.

Unit 1. **(20 Hr)**

(i) Fundamentals of TV Communication

(a) Elements of TV communication system
(b) Scanning, its need for picture transmission
(c) Need for synchronizing and blanking pulses
(d) Progressive scanning, Interlaced scanning, its need, persistence of vision, frame field and line frequencies, bandwidth requirement for picture transmission, concept of picture resolution and its dependence on the bandwidth.
(e) Composite video signal (CVS), blocker than black level, CVS at the end of even and odd fields, equalizing pulses and their need.
(f) Construction and working of monochrome picture tube, comparison of magnetic and electrostatic deflection of beam.
(g) Construction and working of vidicon and plumbicon camera tubes, typical voltages at different electrodes, block diagram of monochrome TV camera and the transmitter chain.
(h) Block diagram of a TV receiver, function of each block and waveforms at the input and output of each block.
(i) Frequency range of various VHF, UHF bands and channels used in India, major specifications of CCIR-B system.

(ii) System adopted in India – channel bandwidth and transmitted RF spectrum. (8 Hr)

(a) Concepts of positive and negative modulation, VSB transmission, trap frequencies and aspect ratio.

(b) Typical circuits of scanning and EHT stages of TV receiver and explanation of their working principles, function of keyed AGC.

(c) Function and location of brightness, contrast, V-hold, H- hold and centering control.

(d) Identification of faulty stage by analyzing the symptoms and basic idea of a few important faults and their remedies.

Unit 2. Color TV Communication (12 Hr)

(i) Relative sensitivity of eye to different spectral colours (visibility curve)

(ii) Primary colours, tristimulus values, trichromatic coefficients, concepts of additive and subtractive mixing of colours, concepts of luminance, hue and saturation, representation of colour in colour triangle, non-spectral colours.

(iii) Compatibility of colour system with the monochrome TV system, block diagram of colour TV camera, basic colour TV systems – NTSC, SECAM and PAL, their advantages and disadvantages.

(iv) Construction and working principles of Trinitron and PIL types of color picture tubes, concepts of convergence and purity.

(v) Need for luminance signal and band sharing by color signals, sub-carrier frequency, colour difference signal, its need, synchronous quadratic modulation and representation of colour by a vector, burst signal, its need, chrominance signals.

(vi) Block diagram of PAL TV receiver and explanation of its working.

Unit 3. Elements of Cable TV (2 Hr)

- Introduction, signal reception, signal processing and signal distribution, Conditional Access System (CAS), Concepts and block diagram.

Unit 4. Video CD player (3 Hr)

- Introduction, CD structure, VCD encoding, block diagram of a VCD player and its explanation.

Unit 5. Latest Trends in TV Technology (3 Hr)

- Concepts of Plasma TV, LCD, LED TV, Comparison between Plasma and LCD and introduction to DTH and basic principle of transmission & reception of DTH (Set Top Box). Concepts of High Definition TV (HDTV).

Text Books: 1. R.R.Gulati

Syllabus for Semester VIth, Diploma (Electronics and Communication Engineering)
CRRIT Kanjhawala Delhi

Course code:EC672 **Course Title: DSD**
L: 4 Hrs. T: 1 hrs Per Week **Total Marks: 150**
Prerequisite: Nil **Coordinator: Mrs Poonam Dalal**

Course outcomes:-On completion of this course, students are expected to:-

(I) To be capable of understanding the various types of memory & RAM cell.

(ii) Basic idea of A/D and D/A converters.

(iii) They will also learn the basic concept of Logic gates.

(IV) They are capable of implementing using K-Map.(5 variable) tabular method

(v) They will also learn the basic concept & types of combinational & sequential circuits

(VI) Designing of sequential circuits,flip flops,counters,multiplexers & demultiplexer.

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1. **Memories**

(i) Basic RAM Cell ,NXM bit RAM,Expansion of word length capacity,static and dynamic RAM,basic idea of ROM,PROM,EPOM,EEPROM.

2. A/D and D/A Converters

(i) General Principles of A/D and D/A conversion and brief idea of their applications.

(II) D/A Converter : Binary Ladder

(iii)A/D Converter : Simultaneous method,Counter type and Continuous Counter, successive Approximation types of ADCs,integrating type(single slope and dual slope)

3. Conbinational Circuits

(i) Boolean algebra and minimization techniques

(a) Review of logic variables,Boolean expression,and minimization of Boolean expression using K-map method (up to 5 variables) Tabular method of function minimization.

(ii) Combinational circuit design

(b) Components of combinational circuits.

(c) Design procedures and implementation using gates(SSI approach)e.g. half and full adder, half and full subtractors,multiplexer,demultiplexer/decoder(MSI approach) ROM/PLA(LSI approach)

4. Sequental circuits

(i)Essential Components of a Sequential Circuits,Synchronous and asynchronous sequential circuits.Classification of sequential circuits (Mealy and Moore Machines)

(ii) Sequential Circuit Design Sequential logic circuit,review of RS,D,JK(Including Master/slave JK) and T flip flops .Their truth tables,characteristic tables,characterstic equation,exciatation tables,conversion of one flip flop to another.

(iii) Design of clocked sequential circuits:nGeneration of primitive state table/diagram, minimization of states ,state assignment,choice of memory element.Design of counters.

5.Synchronization of asynchronous inputs

Text Book:

1. Digital Electronics by S.S.Mishra Published by Dhanpat Rai
2. Digital Electronics by R.P.Jain Published by Dhanpat & co.sons

Reference Books:

1. Digital system Design by Morrismanno publisher Tatamacgrahill

Syllabus for Semester VIth, Diploma (Electronics and Communication Engineering)
CRRIT Kanjhawala Delhi

Course Code: EC673 **Course: Advance Microprocessor (Elective)**

L: 4 Hrs, T: 1 Hr, P: 3 Hrs per week **Total marks: 150**

Prerequisite:EC471 **Coordinator: Mrs Bhawana Ahlawat**

Course Outcomes:

On completion of this course students will be able to have:

1. Understand the evolution of the microprocessors.
2. Program a 16 bit microprocessor.
3. Compare different microcomputer buses.
4. Realize the existing microprocessor based system technology

Unit I

16 bit microprocessors:

Introduction to 16 bit microprocessors

8086 microprocessors: Internal Architecture, Internal Registers, logical address, physical address generation, maximum and minimum modes, clock generator (8284), design of minimum system, comparison between 8086 & 8088.

Unit 1I

Programming 8086:

Addressing modes, instruction format, Instruction template and hand assembly, instruction set, data transfer, arithmetic bit manipulation, string instruction, program transfer & processor control instructions.

Unit III

Assembler and Assembler directive, programming exercises based on the instruction set and use of assemblers.

Unit IV

Memory and I/O interface:

Memory interface block diagram, I/O interface (direct and indirect).

Unit V

Interrupt interface of 8086:

Types of interrupt masking, software interrupts.

Unit VI

Introduction to microcontroller:
Main features detailed architecture and applications of 8051 family of micro-controllers.

Unit VII

Advanced processor features:

- Pipelining
- Cache memory
- Vector processing

Case Study:

Pentium IV processor block diagram, register organisation, address generation, memory and I/O interfacing.

Text Books:

1. Microprocessors and Interfacing: Programming and Hardware, Douglas V. Hall.
2. Microprocessors and Interfacing , Vaneet Singh, Satya prakashan.
3. 8051 Microcontroller and Embedded systems, M.A. Mazidi , Pearson Education.

Reference Books:

1. The Intel Microprocessor Architecture, Programming and Interfacing, Barry B. Brey.

Syllabus for Semester VIth, Diploma (Electronics and Communication Engineering)
CRRIT Kanjhawala Delhi

Course Code: EC673 **Course: Advance Microprocessor**

(Elective)

L: 4 Hrs, T: 1 Hr, P: 3 Hrs per week **Total marks: 150**

Prerequisite:EC471 **Coordinator: Mrs Bhawana Ahlawat**

Course Outcomes:

On completion of this course students will be able to have:

5. Understand the evolution of the microprocessors.
6. Program a 16 bit microprocessor.
7. Compare different microcomputer buses.
8. Realize the existing microprocessor based system technology

Unit I

16 bit microprocessors:

Introduction to 16 bit microprocessors

8086 microprocessors: Internal Architecture, Internal Registers, logical address, physical address generation, maximum and minimum modes, clock generator (8284), design of minimum system, comparison between 8086 & 8088.

Unit 1I

Programming 8086:

Addressing modes, instruction format, Instruction template and hand assembly, instruction set, data transfer, arithmetic bit manipulation, string instruction, program transfer & processor control instructions.

Unit III

Assembler and Assembler directive, programming exercises based on the instruction set and use of assemblers.

Unit IV

Memory and I/O interface:

Memory interface block diagram, I/O interface (direct and indirect).

Unit V

Interrupt interface of 8086:

Types of interrupt masking, software interrupts.

Unit VI

Introduction to microcontroller:

Main features detailed architecture and applications of 8051 family of micro-controllers.

Unit VII

Advanced processor features:

- Pipelining
- Cache memory
- Vector processing

Case Study:

Pentium IV processor block diagram, register organisation, address generation, memory and I/O interfacing.

Text Books:

4. Microprocessors and Interfacing: Programming and Hardware, Douglas V. Hall.
5. Microprocessors and Interfacing , Vaneet Singh, Satya prakashan.
6. 8051 Microcontroller and Embedded systems, M.A. Mazidi , Pearson Education.

Reference Books:

2. The Intel Microprocessor Architecture, Programming and Interfacing, Barry B. Brey.

Syllabus for Semester VIth, Diploma (Electronics and Communication Engineering)
CRRIT Kanjhawala Delhi

Course Code: EC674 **Course: Industrial Management & Entrepreneurship Development**
L:4 Hrs, T:1 Hr,P:3 Hrs per week **Total marks: 150**
Prerequisite: Nil **Coordinator: Mrs Bhawana Ahlawat**

Course Outcomes:

On completion of this course students will be able to have:

1. Analyse, organise, manage and assuming the risk of the business.
2. Know the function as an entrepreneur.
3. Able to assist organisation in developing new business opportunities.

Unit I:

Introduction:
pattern of economics i.e. socialistic economy, capitalistic economy and mixed economy. Industrial growth in India.

Unit II:

Business Organisation:
Salient features of sale proprietary, partnership private and public limited companies, cooperative societies and public sector. Role of public & private sectors in growth of economy and their social obligations towards society; monopoly and price restriction.

Unit III:

Entrepreneurship:
Entrepreneurial qualities, selection of products, estimation of capital expenditure resources of capital financial agencies, procedural formalities for registrations of firm. Exposure to sales tax registration import export procedures and project report preparation.

Unit IV:

Financial Management:
Brief idea of money banking, international trade, foreign exchange, various taxes such as property, wealth company income, excise duty, sales tax, finance forecasting. Types of accounts and accounts books, trail balance, final accounts and statements.

Unit V:

Personnel Management:
Duties and responsibilities of personnel department, manpower planning, sources of employment, recruitment selection, various methods of testing, training and development of workers and supervisors. Promotions, retirement, retrenchment. Industrial relations, discipline, industrial fatigue, leadership, attitudes and human behaviour, moral maintenance, motivation systems, payment of wages, personnel records.

Unit VI:

Technician:

Role of engineer and technician in the industry and in society: duties and responsibilities of a technician (foreman) towards management, workers and work.

Unit VII:

Industrial Safety and House Keeping:

Magnitude and cost of accidents, causes of accidents, job safety analysis, safety planning and its implementation safety education instructions and visual aids, obligatory provision, first aid, investigation of accidents, fire fighting, BIS standards, security watch and ward.

Unit VIII:

Marketing:

Importance of marketing, theory of demand and supply forecasting demand and supply, product pricing, branding and packaging, sales promotions, advertising and publicity, warranty, after sales service, product improvement and development, salesmanship, tenders and contracts, installations and commissioning, feedback invoicing and trade documents.

Unit IX:

Industrial Legislation:

Important provisions of the following acts: Factory Act, ESI, ESI, GPF, Bonus, Trade Union, Industrial Dispute, Shop, Minimum Wages, Compensation, Apprenticeship, Payment of wages act and Commercial Establishment Act.

Text Books:

1. Industrial management by S.Kumar &Ikjot Singh
2. Industrial Engineering and management by Abhijit Chatterji

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Course code: EC-680 **Course : ACS Lab**
P:3Hrs **Total Marks: 100**
Prerequisite: nil **Coordinator: Mr. Jashvir Singh**
Chhikara

Course Outcomes:

1. Student will practice on Hamming code transmission in serial link

2. Student will practice on ASK,FSK ,PSK.TDM,FDM etc.

3. Student will perform and verify function of modems.

4. Student will study on UASRT,UART,Mobile ,Fax

1. Transmission of humming code on a serial link and its reconverson at the receiving end.
2. Observe wave forms at input and output of ASK, FSK, PSK and QAM modulators.
3. To transmit parallel data on a serial link using USART.
4. Transmission of data using MODEM.
5. Observe wave forms at input and output of a TDM and FDM circuit.
6. To study the construction and working of a telephone handset.
7. To study the construction and working of a FAX machine.
8. To study the construction and working of an EPABX.
9. To study the working of a LAN system.
10. To study the working of GSM cellular mobile system.
11. To study the working of CDMA cellular mobile system

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Course code:EC681 **Course: TE Lab**
. P: 3 hrs., Per Week **Total Marks: 100**
Prerequisite: Nil **Coordinator: Mr Ashok Kumar**

Course Outcom

1. To identify all types of receiver components mounted on the chasis of B/W & colour TV receiver.
2. To understand the concept of transmit ion & reception of TV signals.
3. Manually operated controls on front panel & also he can observe the effect of adjustment of various controls i.e. Brightness control, contrast control, fine tunning vertical hold, horizontal hold, colour channel selector.
4. Students can observe various types of wave shapes on various stages & also can measure DC voltages.
5. Concept of using pattern generator.
6. Also locating various types of faults occurring in TV receiver.

1. To identify the receiver components, and locate different stages on the chassis of a Black & White TV receiver.
2. To identify the receiver components, and locate different stages on the chassis of a PAL colour TV receiver.
3. To operate various controls and adjustments on a B/W TV receiver, and observe their effect (Contrast Brightness, volume, tone, fine tune, hold, height, width, H and V linearity, AGC, raster centering corner and pin-cushion correction etc.).
4. To operate various controls and adjustment on a PAL TV receiver and observe their effect (colour control, AFT, ACC, grey scale tracking).
5. To note DC voltages and the wave forms at various points in a B/W TV receiver.
6. To note DC voltages and the wave forms at various points in a PAL colour TV receiver.
7. (i) To observe the effect of brightness control on the grid-to-cathode bias of the B/W picture tube and note the cut off bias for a typical picture tube.
   (ii) To observe the effect of contrast control on the luminance signal at the cathode of the B/W picture tube.
8. To use a colour pattern generator and subjectively evaluate the raster reproduction.
9. To install and study satellite TV receiver system including dish antenna and the receiver.
10. To study typical faults in different sections of a B/W TV receiver.
11. To study typical faults in different sections of a PAL TV receiver.

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Course code:EC682 **Course: DSD Lab**

. P: 3 hrs., Per Week **Total Marks: 100**

Prerequisite: EC381 **Coordinator:Mrs Poonam Dalal**

Course Outcom

7. Student will be capable to implement and design of code converter .
8. Student can design and implement digital circuits.
9. Student can acquire concept of Memory IC data writing or storing.
10. Student will be able to understand about A/D and D/A conveter
11. Student will be able to design combinational and sequential circuits.

1. Design and implement a code converter for Binary to Grey code conversion using decoder.
2. Design and implement full adder and full subtractor using multiplexer.
3. Program an EPROM using EPROM Programmer.
4. Using PROM / PLA design and implement a combinational circuit.
5. Design and implement a Modulo 5 synchronous counter using JK flip-flops.
6. From a given problem statement, design and test a typical sequential circuit.
7. Design a 4 bit sequence generator using JK Flip Flops.
8. To Construct & test 4/8 bit D/A converter using IC.
9. To Construct & test 4/8 bit A/D converter using IC.
10. Design a BCD adder and implement using combinational logic.
11. Design 4 bit up/down counter using T-Flip Flops.

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Course Code: EC683 **Course: Advance Microprocessor (Elective)**
P: 3 Hrs per week **Total Marks: 100**
Prerequisite: EC481 **Coordinator: Mrs Bhawana Ahlawat**

Course Outcomes:

a) Student will be able to perform logical concept to physical action.
b) Student will practice on working of processor
c) Student can develop software program for microprocessor chip.
d) Student will be able to develop various assembly programs.

List of Practical's:

1. Write a program to perform multi-byte addition.
2. Write a program to add 10 sixteen bit integers & store the result.
3. Write a program to multiply 2 sixteen bit signed integers and store the result.
4. Write a program to divide a sixteen bit signed number by another sixteen bit signed number and store the result (use sign extension to convert 16 bit data to 32 bit data).
5. Write a program to sort data in ascending/descending order (use bubble sort technique).
6. Write a modular program to compute the following expression:
    a. $Y=ax^3+bx^2+cx$
    b. The main program should call one subroutine that compute x^2 and another subroutine that compute x3. Choose appropriate values for a, b & c.
7. Write a program that transfer a string from one memory area to another memory area. Use ASCII code to represent string character. Assume string end with NULL character.
8. Write a program that convert GREY code to BINARY code (use XLAT instruction).
9. Write a program to determine the no. of 1's in a sixteen bit data stored in a particular memory location.
10. Write a program to convert a string of 20 characters from lowercase to uppercase.

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Course code:EC684 **Course: Major Project**
P: 4 hrs., Per Week **Total Marks: 200**
Prerequisite:nil **Coordinator: P.K.Patel**

Course Outcomes

40. Student will be able to design complete electronics system.
41. Student will work as multidisplinary and as leaders
42. Student will be able to work as conclusive of their program

The students will assemble and test a major electronic working useful project; model in the lab classes under the supervision of concerned teacher/lecturer. For example projects related to the following may be taken up:

1. Digital based projects
2. Micro-processor based projects
3. Software projects related to electronics field
4. Communication based projects
5. Any other project related; to electronic; industry

Assessment method:

Evaluation will be based on the presentation of project developed including Viva. The marks are 100 each internal and external examinations.