SEMESTER-I

Code No.	Subject	Study Scheme Period/Week			Evaluation Scheme						Total Marks
					Internal Assessment		External Assessment Exam				
		L	T	P	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 Medical Electronics

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

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.

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, Medical Electronics

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 Medical Electronics

Course Code: EC171   Course: Applied Mathematics-I
L: 3Hr., T: 2Hr., Per week   Total Marks: 150

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.

1. ALGEBRA   15%

(i)   Arithmetic Progression (A.P.) – its nth term, sum to n terms. Geometric Progression (G.P.) - its nth 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, Medical Electronics

Course code: EC-173   Course: Basic Electricity
L: 4 hrs., T: 1   Per Week   Total Marks: 150

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.*

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 Medical Electronics

Course code: EC-182   Course - Introduction to computer
L: 1 hrs P: 4 hrs., Per Week   Total marks: 75

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.

Course code: EC183   Course Title: Workshop for practices
T: 4 Hrs. Per Week   Total Marks: 150

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