CURRICULUM OF ELECTRICAL & ELECTRONICS ENGINEERING (EEE) RGUKT BASAR

FOR THE ACADEMIC YEAR 2016 - 17

I YEAR
I SEMESTER

S.No	Subject Code	Subject Name	L-T-P	C
1	EE1101	Basic Electrical Engineering	4-0-0	4
2	PH1001	Engineering Physics	4-0-0	4
3	MA1101	Engineering Mathematics-I	4-0-0	4
4	CS1101	Programming in C	4-0-0	4
5	HS1101	Communication Skills – 1	2-0-0	1
6	CE1001	Engineering Drawing	2-0-2	4
7	ME1601	Engineering Workshop	0-0-3	2
8	PH1601	Engineering Physics Lab	0-0-3	2
9	CS1701	Programming in C Lab	0-0-3	2
		Total Credits		**27**

L-Lectures; T-Tutorials; P-Practicals; C-Credits

EE1101   BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Externals: 60Marks   **L-T-P-C**
Internals: 40Marks   **4-0-0-4**

Objectives:
This course introduces the concepts of

- Electrical DC and AC circuits, basic law's of electricity, different methods to solve the electrical networks
- Construction operational features of energy conversion devices i.e., DC and AC machines, transformers.
- It also emphasis on basics of electronics, semiconductor devices and their characteristics and operational features.

UNIT- I DC CIRCUIT ANALYSIS
Electrical Circuits - R-L-C Parameters, Voltage and Current Independent and Dependent Sources, Source Transformation – V–I relationship for Passive elements, Kirchoff's Laws, Network reduction techniques – series, parallel, series parallel, star–to-delta, delta-to-star transformation, Mesh Analysis and Nodal Analysis

UNIT- II AC CIRCUIT ANALYSIS
Single Phase AC Circuits - R.M.S. and Average values, Form Factor, steady state analysis of series, Parallel and Series parallel Combinations of R, L and C with Sinusoidal excitation, concept of reactance, Impedance, Susceptance and Admittance – phase and phase difference, Concept of Power Factor, j-notation, complex and Polar forms of representation.
Resonance – Series resonance and Parallel resonance circuits, concept of bandwidth and Q factor, Locus Diagrams for RL, RC and RLC Combinations for Various Parameters.

UNIT- III NETWORK THEOREMS AND THREE PHASE AC CIRCUITS
Network Theorems - Thevenin's, Norton's, Maximum Power Transfer, Superposition, Reciprocity, Tellegen's, Millman's and Compensation theorems
Three phase ac circuits -Three phase EMF generation, delta and Y connections, line and phase quantities, solution of three phase circuits, balanced supply voltage and balanced load, phasor diagram, measurement of power in three phase circuits

UNIT- IV BASIC ELECTRONICS
Introduction to electronics and electronic systems, Semiconductor and devices like diodes, zener diode, BJT, FET, MOSFET, Rectifier and ripple Filters, Transistor biasing. Small signal transistor amplifiers, Operational amplifiers, Feedback and Oscillators, Introduction to digital circuits

UNIT- V ELECTRICAL MACHINES
DC machines: Construction, EMF and Torque equations, Characteristics of DC generators and motors, speed control of DC motors and DC motor starters.

Transformers : Construction, EMF equation, ratings, phasor diagram on no load and full load, equivalent circuit, regulation and efficiency calculations, open and short circuit tests, auto-transformers.

Induction motors: The revolving magnetic field, principle of orientation, ratings, equivalent circuit, Torque-speed characteristics, starters for cage and wound rotor type induction motors.

TEXT BOOKS:

1. Electrical Technology- Hughes Prentice Hall, 7th edition
2. Problems In Electrical Engineering- S. Parker Smith, 9 edition
3. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, PEI/PHI, 9th Ed, 2006.
4. Millman's Electronic Devices and Circuits – J.Millman and C.C.Halkias, Satyabratajit, TMH, 2/e, 1998.
5. Engineering circuit analysis- by William Hayt and Jack E. Kemmerly, Mc Graw Hill Company, 6th edition.
6.   Electric Machines –by I.J.Nagrath & D.P.Kothari,Tata Mc Graw Hill, 7th Edition.2005

REFERENCES:

1. Electronic Devices and Circuits - K. Lal Kishore, B.S. Publications, 2nd Edition, 2005.
2. Electronic Devices and Circuits – Anil K. Maini, Varsha Agarwal –Wiley India Pvt. Ltd. 1/e 2009.
4. Network Theory by N.C.Jagan & C.Lakshminarayana, B.S. Publications.
5. Network Theory by Sudhakar, Shyam Mohan Palli, TMH.
6. Electrical machines-PS Bhimbra, Khanna Publishers.

PH 1001   **ENGINEERING PHYSICS**

Externals: 60Marks   **L-T-P-C**

Internals: 40Marks   **4-0-0-4**

Objectives:

1. To inculcate in the Students a sense of yearning to learn the basic Physics behind the applications that we look around in day to day life.

2. To deliver the basic Principles of Physics that forms the basis for the development of Technology.

3. The basic details of Solid state Physics, Optics and Electrodynamics and Quantum Physics provided in a subtle fashion dealt in finer details to have strong basics in these areas.

UNIT – I
MATHEMATICAL PHYSICS (3)

1.1 Gradient, Divergence, Curl and their physical significance
Scalar and Vector point Functions, Differential operator, Gradient , Physical significance, Divergence, Significance, Curl, Physical Significance, Vector Identities

1.2 Stokes theorem & Gauss theorem
Vector Integral Theorems, Line Integral, Surface and Volume Integrals, Stokes Theorem, Gauss-Divergence Theorem, Application

1.3 Curvilinear coordinates
Types of Coordinate systems, Polar coordinates, Cylindrical and Spherical coordinates, Equations Relating Cartesian, Spherical and Cylindrical coordinate

UNIT – II
ELECTRODYNAMICS (6)

2.1 Maxwell's Equations
Electrodynamics before Maxwell, Fixing of Ampere's Law, Maxwell Equation in matter, Boundary Conditions.

2.2 Poynting theorem and conservation laws
Continuity Equation, Poynting Theorem, Conservation Law Newton Third law in Electrodynamics

2.3 Wave equation
Wave equation, wave form Boundary conditions, Reflection and Transmission

for a string

2.4 Electro Magnetic Waves in vacuum
Wave equation for E and B, Monochromatic Plane Waves, Energy and Momentum in EM Waves in vacuum

2.5 Electro Magnetic waves in Matter
Propagation in Linear Media, Reflection and Transmission at Normal Incidence Oblique   Incidence

2.6 EM wave in conducting surface.

Reference Books :

1. Electrodyamics by David j.Griffiths

UNIT – III
OPTICS (12)

3.1 Interference by division of wave front (Biprism)
Introduction , Interference of Light Waves, Interference Pattern , Intensity Distribution,   Fresnel Biprism

3.2 Interference by division of amplitude (Newton's rings)
Interference by Plane parallel Wave, Cosine Law, Interference by a film with Non-Parallel reflecting surface, Wedge, Newton's Rings.

3.3 Michelson's interferometer
Interference by Plane film illuminated by a point source, Michelson's Interferometer.

3.4 Fraunhoffer diffration (Single slit)
Introduction, Types of Diffraction,Single Slit Frauhoffer Diffraction, Position of Maxima and Minima,Graphical Method for determining roots

3.5 Frauhoffer diffraction Double slit & multiple slits
Double slit Fraunhoffer diffraction by N- Parallel slits

3.6 Diffraction Gratings, Grating and Resolving Power
Diffraction Grating, Construction of Grating, Grating Spectrum, Resolution, Resolving Power of a diffraction Grating

3.7 Fresnel diffraction and Zone Plate
Types of Diffraction, Fresnel diffraction, Fresnel Half Period zones, Zone plate Application of Zone, Lens

a. Production of Plane Polarised light & double refraction

Introduction , Polarisation of Light waves, Representation of various types of light, Polarization by Reflection,Brewster's Law, Laws of Malus and proof, Geometry of Calcite Crystal, Double Refraction, Nicol's Prism, Applications.

a. Quarter & Half – wave plate, elliptical & circular polarized lights
    Huygen's Theory of Double Refraction, Quarter Wave plate, Half Wave Plate, Elliptically and Circularly Polarised light.

3.10 Production & detection of elliptical & circular Polarised lights

    Elliptically polarised Light, Circularly polarised light, Conversion of Elliptically polarized light to Circularly polarised light, Analysis of polarized light of Different Kinds.

3.11 Theory of Laser
    Introduction, Spontaneous Emission, Stimulated Emission, Relation between Spontaneous and Stimulated emission Probabilities, Population Inversion, Pumping, Active systems.

3.12 Different kinds of Lasers
    Ruby laser Working Semiconductor laser,He-Ne laser ,Application of Laser.

Reference Books :
1. Engineering Physics By Malik and Singh
2. Optics by Ajoy Ghatak
3. Optics by Pedrotti and Pedrotti.

UNIT – IV
QUANTUM MECHANICS (6)
    4.1 Failures of classical physics
        Limitations of classical physics, Blackbody Radiation, Spectral Lines, Photoelectric   Effect, Planck's Quantum Hypothesis, Einstein's Theory of photoelectric Effect, Compton   effect, Existence of stationary states, Stern-Gerlach Experiment

    4.2 DeBroglie waves & Uncertainity Principle
        Introduction, Matter waves Electron Diffraction Experiment Standing waves of an electron in orbit, Uncertainty Principle Single Slit Experiment, Application of Uncertainty Principle.

    4.3 Wave function, Schrodinger Equation & probablity interpretation
        Time Dependent Schrodinger Equation ,1- D Equation for a free particle,

extension to 2-D, Inclusion of forces, Probability current Density

4.4 Operators , expectation values & Time independent Schrodinger Equation
Operators ,Expectation Value, Ehrenfest Theorem, time independent schrodinger Equation and Admissibility Conditions on Wave function.

4.5 Solution for generalised potential
Motion of a particle in a Potential – Classical view .

4.6 Particle in a box
Square well potential with Rigid walls, Energies and Wave functions

Reference Books:

1. Modern Physics by A. Beiser
2. Quantum Mechanics by Aruldhas.

UNIT – V
CONDENSED MATTER PHYSICS (6)

5.1 CRYSTALLOGRAPHY-I
Introduction, Crystal ,Single, poly and Amorphous state, Lattice Points and Space Lattice, Unit cell, Primitive Unit Cell in 2-D ,Non-primitive Unit Cell in 2-D lattice ,Primitive unit cell in 3-D ,Non Primitive unit cell in 3-D,Bravais Lattice and crystal systems, Atomic Packing, Crystal structure

5.2 Crystallography-II
Miller Indices, Positions, Directions, Planes Obtaining Miller indices, Important Cubic crystal   structures, SC, BCC, FCC, Closed Packed structures, Packing fraction, NaCl Structure, Diamond , ZnS Structure.

5.3 X-ray diffraction
Introduction, Bragg's Law, Diffraction Direction Experimental Methods of x-Ray Diffraction, Powder method Debye - Scherrer Method Measurement of Bragg Angle

5.4 Defects in crystals
Introduction, Classification of Imperfections, Point Defects, vacancies, Schottky defects, Intersitial, Frenkel defects, Impurities, Colour centres, Line defect Planar Defects, Volume Defects, Thermodynamical consideration for Existence of Defect   equilibrium concentration of Schottky defects in metals, Equilibrium concentration of schottky defects in Ionic crystals, Frenkel defect in metals, Frenkel defects in ionic crystals

5.5 Electron theory of metals
Important properties of metals, electron theory of solids, classical free elecrtron

theory, DC Electrical Conductivity, Gains of Drude Model, Sommerfeld quantum Model, Fermi Energy, Density of Energy States, carrier Concentration, Drawbacks of Sommerfeld Theroy

5.6 Band theory of solids

Introduction, Formation of Energy Bands in Crystals, Characteristics, Bonding, Classification, Intrinsic and Extrinsic Semiconductors, Band structure, Energy Bands, Fermi Level and Fermi Energy, Carrier Concentration, Density of electrons in Conduction band, Position of Fermi level, Hall Effect, Applications

Reference Books:
1. Solid state Physics by Dekker
2. Solid state Physics By C.Kittel

MA1101   **MATHEMATICS-I**

Externals: 60Marks   **L-T-P-C**

Internals: 40Marks   **4-0-0-4**

Objectives:

- To give a thorough explanation of real sequences and series.
- To introduce the concepts of Euclidean space and the behavior of functions in them.
- To emphasize the applications of differentiation on real functions and their geometrical inferences.
- Introduction to Numerical analysis.
- To Introduce Fourier series and it's applications.

UNIT-I

Sequence: Definition of sequence, convergence, limit of a sequence, divergence, oscillation, bounded and monotonic sequences, Bounded sequences, Sandwich theorem, Algebra of limits, L'Hospital Rule in sequences, subsequences and its limit.

Series: Infinite series, partial sum, convergence, divergence, oscillation, Geometric series, Telescoping series, Algebra of Limits, n^{th}- term test, Comparison test, Comparison test (Limit Form), Integral test, D'Alembert's Ratio test, Cauchy's Root test, Alternating series, Leibnitz's Rule, Absolute convergence, Conditional convergence, Power series, Radius of convergence for a power series.

UNIT-II

Differential calculus: Rolle's theorem, Lagrange's mean value theorem, Cauchy's Mean-value theorem, Taylor's Theorem and Expansion, Maclaurin's Theorem and Expansion, Indeterminate forms and application of L'Hospital Rule. Radius of curvature, Envelope, Increasing and decreasing functions, concavity, convexity and point of inflexion, Asymptotes-Curve Tracing(Sketching)

UNIT-III

Functions of Several Variable Calculus:
Definition of continuity and differentiability in single variable, n-dimensional Euclidean space, Neighborhood of a point in n-dimensional Euclidean space, Functions in n-variables, Functions in 2 & 3 variables, Interior points, Boundary points, open and closed regions, Limit and continuity, Two-path test, Discontinuities, Partial Differentiation, Clairaut's theorem(for mixed Partial Derivatives), Laplace equation, Homogeneous functions , Euler's theorem for Homogeneous functions, Differentials and derivatives, Derivatives of composite functions, Chain Rule, Jacobians, Taylor's Theorem, Maxima and minima, Lagrange's method of multipliers.

UNIT-IV:

Fourier Series:
Definition of Fourier Series, Fourier Series representation of function, Limit of Convergence of Fourier Series, Even & Odd functions, Gibb's Phenomenon, Sine and Cosine Series, Limit of Convergence of Sine & Cosine Series. Integration and Differentiation of Fourier Series, Bessel's Inequalities, Parseval's Theorem.

UNIT-V

Numerical Methods:
Introduction: True value, Approximate Value, Error, Error percentage, Application of Numerical Analysis in various fields.

Numerical Analysis in solving Algebraic equations: Algebraic equations, Transcendental equations, Bisection Method, Regula -Falsi Method, Newton-Raphson Method.

Numerical Integration: Trapezoidal Rule, Simpson $\frac{1}{3}$ Rule, Simpson $\frac{3}{8}$ Rule

Text Books:
1. Thomas Calculus, Maurice D.Wier, Joel Hass Eleventh Edition, Pearson Education ,2008

2. R.K. Jain & S.R.K.Iyengar, Advanced Engineering Mathematics, Third Edition, Narosa publications, 2007.

3. Erwin Kreyszig, Advanced Engineering Mathematics, 8th Edition, John Wiley & Sons Ltd 2006.

   Suggested References:
1. B.S. Grewal and J.S. Grewal, "Higher Engineering Mathematics",(40th Edition), Khanna Publishers,2007
2. S.S. Sastry ,Introductory Methods of Numerical Analysis ,Third Edition, Prentice Hall India

*L-T-P-C stands for number of lectures, tutorials, practices and credits

CS1101   **PROGRAMMING IN C**

Externals: 60Marks   **L-T-P-C**

Internals: 40Marks   **4-0-0-4**

Objectives:
- This course starts from the basics of computers and program development
- It covers various concepts of C programming language
- To learn how to write modular and readable C Programs
- To learn to write programs (using structured programming approach) in C to solve problems.
- To introduce the students to basic data structures

UNIT – I
Introduction to Computer Programming: Computing Environments, Computer Languages, Creating and Running Programs. Algorithms and Flow charts : Definition of Algorithms, examples, Symbols used in Flow chart, examples. Introduction to C Language - Background, C Identifiers, Data Types, Operators, Variables, Constants, Input / Output, Expressions, C Programs, Precedence and Associativity, Evaluating Expressions, Type Conversion, Statements, Bitwise Operators.

UNIT-II
Selection: Logical Data and Operators, if-else, switch Statements, Standard Functions. Repetition: loops, while, for, do-while statements, Loop examples, break, continue, go to. Arrays - Concepts, Using Arrays in C, Array Applications, Two- Dimensional Arrays, Multidimensional Arrays, Linear and Binary Search, Selection, Bubble, Insertion Sorts.

UNIT – III
Functions: Designing Structured Programs, Functions Basics, User Defined Functions, Inter Function Communication, Standard Functions, Scope, Storage Classes-auto, Register, Static, Extern, Scope Rules, and Type Qualifiers. Recursion- Recursive Functions, Preprocessor Commands. Strings - Concepts, C Strings, String Input / Output Functions, Arrays of Strings, String Manipulation Functions.

UNIT – IV
Pointers - Introduction, Pointers to Pointers, Compatibility, void Pointers, Arrays and Pointers, Pointer constants, Pointers and Strings, Pointers to Functions, Pointers to Constant Objects, Constant Pointers, Pointer Arithmetic. Call-by-reference: Pointers for Inter-Function Communication, Passing Arrays to a Function. Dynamic Memory Allocation: Memory Allocation Functions, Programming Applications, Command-line Arguments.

UNIT – V
The Type Definition (type def), Enumerated Types Structure: Definition and Initialization of Structures, Accessing Structures, Nested Structures, Arrays of Structures, Structures and Functions, Pointers to Structures, Self Referential Structures, Unions. Input and Output: Files, Streams, Standard library Input Output Functions, Character Input Output Functions.

Suggested References:
1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.

2. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill.
3. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.
4. Seymour Lipschutz, Data Structures, Schaum's Outlines Series, Tata McGraw-Hill.
5. Ellis Horowitz, SatrajSahni and Susan Anderson-Freed, Fundamentals of Data Structures in C, W. H. Freeman and Company.
6. R. G. Dromey, How to Solve it by Computer, Prentice-Hall of India.

HS1101   **COMMUNICATION SKILLS – 1**

Externals: 60Marks   **L-T-P-C**
Internals: 40Marks   **2-0-0-1**

Objectives:
 ➢ To improve the English language learning ability of the students by emphasizing on LSRW.
 ➢ To complement the comprehensibility of the Technical subjects in a better way.

UNIT-I
Basics of Technical Communication - Introduction - Importance of Technical Communication (2hrs) - **Visual Aids in Technical Communication** - Tables - Graphs - Chart - Drawings and Diagrams - Photographs – Maps - **Non-verbal Communication** - Introduction - Kinesics - Proxemics - Chronemics - Correlating Verbal and Non-verbal Communication - Cross-cultural Variations - Significance of Understanding Culture

UNIT-II
Speaking – JAM - Dialogue conversations - Telephonic Conversations and Etiquette - Telephonic Conversation Practice – Jokes – Proverbs – Quotes

UNIT-III
Writing- Dialogue writing

Suggested References:

1. Technical Communication – Meenakshi Raman & Sangeeta Sharma

ENGINEERING DRAWING

Externals: 60Marks **L-T-P-C**
Internals: 40Marks **2-0-2-4**

Objectives:
- To understand the basic concepts of drawing and use of drafter.
- To draw the basic geometrical constructions and curves used in engineering.
- To understand and draw the projections of points, lines, planes and solids.
- To know about isometric projections.

Concepts and conventions: Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning

UNIT-1
Plane curves and free hand sketching: Basic Geometrical constructions, Curves used in engineering practices: Conics – Construction of ellipse, parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the above curves, Scales: Construction of Diagonal and Vernier scales. Visualization concepts and Free Hand sketching: Visualization principles – Representation of three Dimensional objects – Layout of views- Free hand sketching of multiple views from pictorial views of objects

UNIT-II
Projection of points, lines and plane surfaces: Orthographic projection- principles- Principal planes- First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces - Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method

UNIT-III
Projection of solids: Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes by rotating object method and auxiliary plane method.

UNIT-IV
Projection of sectioned solids and development of surfaces: Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids – Prisms, pyramids cylinders and cones. Development of lateral surfaces of solids with cut-outs and holes

UNIT V

Isometric and perspective projections: Principles of isometric projection – isometric scale –Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions and miscellaneous problems. Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method.

Computer aided drafting (demonstration only)

Introduction to drafting packages and demonstration of their use.

Suggested Readings:

1. Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, 50 Edition, 2010.
2. Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age publications
3. Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Stores, Bangalore, 2007.
4. Luzzader, Warren.J. and Duff,John M., "Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern EconomyEdition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.
5. Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age

ME1601   **ENGINEERING WORKSHOP**

Externals: 60Marks   **L-T-P-C**
Internals: 40Marks   **0-0-3-2**

Objectives:
The budding Engineer may turn out to be a technologist, scientist, entrepreneur, practitioner, consultant etc. There is a need to equip the engineer with the knowledge of common and newer engineering materials as well as shop practices to fabricate, manufacture or work with materials. Essentially he should know the labour involved, machinery or equipment necessary, time required to fabricate and also should be able to estimate the cost of the product or job work. Hence engineering work shop practice is included to introduce some common shop practices and on hand experience to appreciate the use of skill, tools, equipment and general practices to all the engineering students.

1. TRADES FOR EXERCISES:
a. Carpentry shop–
Two joints (exercises) involving tenon and mortising, groove and tongue: Making middle lap T joint, cross lap joint, mortise and tenon T joint, Bridle T joint from out of 300 x 40 x 25 mm soft wood stock

b. Fitting shop–
Two joints (exercises) from: square joint, V joint, half round joint or dove tail joint out of 100 x 50 x 5 mm M.S. stock

c. Sheet metal shop–
 Two jobs (exercises) from: Tray, cylinder, hopper or funnel from out of 22 or 20 guage G.I. sheet

d. House-wiring–
Two jobs (exercises) from: wiring for ceiling rose and two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp, wiring for a water pump with single phase starter.

e. Foundry–
Preparation of two moulds (exercises): for a single pattern and a double pattern.

f. Welding –
Preparation of two welds (exercises): single V butt joint, lap joint, double V butt joint or T fillet joint

2. TRADES FOR DEMONSTRATION:
a. Plumbing
b. Machine Shop
c. Metal Cutting

Apart from the above the shop rooms should display charts, layouts, figures, circuits, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, Plastics, steels, meters, gauges, equipment, CD or DVD displays,

First aid, shop safety etc. (though they may not be used for the exercises but they give valuable information to the student). In the class work or in the examination knowledge of all shop practices may be stressed upon rather than skill acquired in making the job.

REFERENCE BOOKS:
1. Engineering Work shop practice for JNTU, V. Ramesh Babu, VRB Publishers Pvt. Ltd., 2009
2. Work shop Manual / P.Kannaiah/ K.L.Narayana/ SciTech Publishers.
3. Engineering Practices Lab Manual, Jeyapoovan, Saravana Pandian, 4/e Vikas
4. Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House.

PH 1601   **ENGINEERING PHYSICS LAB**

Externals: 60Marks   **L-T-P-C**

Internals: 40Marks   **0-0-3-2**

1. Coupled Pendula

2. Specific rotation - Polarimeter

3. Diffraction Grating

4. Dispersive power of a prism

5. Franck Hertz experiment

6. Photoelectric effect

7. Four probe Experiment

8. Hall effect

9. Ultrasonic Waves

CS1701 **PROGRAMMING IN C LAB**
Externals: 60Marks **L-T-P-C**
Internals: 40Marks **0-0-3-2**

Objectives:
- Able to have fundamental concept on basics commands in Linux.
- Able to write, compile and debug programs in C language.
- Able to formulate problems and implement algorithms in C.
- Able to effectively choose programming components that efficiently solve computing problems in real-world

Experiments:
Suggested assignments to be conducted on a 3-hour slot. It will be conducted in tandem with the theory course so that the topics for problems given in the lab are already initiated in the theory class. The topics taught in the theory course should be appropriately sequenced for synchronization with the laboratory. A sample sequence of topics and lab classes for the topic are given below:

1. Familiarization of a computer and the environment and execution of sample programs
2. Expression evaluation
3. Conditionals and branching
4. Iteration
5. Functions
6. Recursion
7. Arrays
8. Structures
9. Files

For the detailed list of programs refer the lab manual.
Note: Any experiment according to the syllabus of CS1101 can be substituted