



**BASAVESHWAR ENGINEERING COLLEGE (Autonomous),
BAGALKOT - 587103**

An Institution Permanently affiliated to Visvesvaraya Technological University
Belagavi-590 018, Karnataka State, Approved by AICTE

SYLLABUS
for
I & II Semester B.E. Programmes
2017-2018



Vision

To be recognized as a premier technical institute
committed to developing exemplary professionals, Offering
research based innovative solutions and inspiring
inventions for holistic socio economic development.

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**SCHEME OF TEACHING AND EXAMINATION
B.E. I SEMESTER
2017-2018**

PHYSICS GROUP

Sl No.	Subject Code	Subject	Credits	Hours/Week			Examination Marks		
				Lecture	Tutorial	Practical	CIE	SEE	Total
1	UMA121C	Engineering Mathematics-I	4.0	4	0	0	50	50	100
2	UPH122C	Engineering Physics	4.0	4	0	0	50	50	100
3	UME124C	Elements of Mechanical Engineering	4.0	4	0	0	50	50	100
4	UEE125C	Basic Electrical Engineering	4.0	4	0	0	50	50	100
5	UCS130C	Computer Concepts and C Programming	4.0	4	0	0	50	50	100
6	UHS151C	Constitution of India and Professional Ethics	2.0	2	0	0	50	50	100
7	UCS135L	Computer Programming Practice using C	1.5	0	0	3	50	50	100
8	UPH127L	Engineering Physics Laboratory	1.5	0	0	3	50	50	100
9	UBE153L	Basic Engineering Laboratory-I	1.0	0	0	2	50	50	100
10	UHS144K*	Kannada Manasu	0	2	0	0	—	—	—
11	UHS145K**	Kannada Kali	0	2	0	0	—	—	—
		Total	26	24	0	8	450	450	900

* Only for students who have studied Kannada at Primary level.

** Students who have not studied Kannada at primary level.

**SCHEME OF TEACHING AND EXAMINATION
B.E. I SEMESTER
2017-2018**

CHEMISTRY GROUP

Sl No.	Subject Code	Subject	Credits	Hours/Week			Examination Marks		
				Lecture	Tutorial	Practical	CIE	SEE	Total
1	UMA121C	Engineering Mathematics-I	4.0	4	0	0	50	50	100
2	UCH129C	Engineering Chemistry	4.0	4	0	0	50	50	100
3	UEC 132C	Basic Electronics	4.0	4	0	0	50	50	100
4	UCV146C	Engineering Mechanics	4.0	4	0	0	50	50	100
5	UME131C	Engineering Graphics	2.0	2	0	0	50	50	100
6	UBT152C	Environmental Studies	2.0	2	0	0	50	50	100
7	UCH134L	Engineering Chemistry Laboratory	1.5	0	0	3	50	50	100
8	UME150L	CAED Laboratory	1.5	0	0	3	50	50	100
9	UBE154L	Basic Engineering Laboratory-II	1.0	0	0	2	50	50	100
10	UHS143K	English	0	2	0	0	—	—	—
		Total	24	22	0	8	450	450	900

SCHEME OF TEACHING AND EXAMINATION
B.E. II SEMESTER
2017-2018

PHYSICS GROUP

Sl No.	Subject Code	Subject	Credits	Hours/Week			Examination Marks		
				Lecture	Tutorial	Practical	CIE	SEE	Total
1	UMA221C	Engineering Mathematics-II	4.0	4	0	0	50	50	100
2	UPH222C	Engineering Physics	4.0	4	0	0	50	50	100
3	UME224C	Elements of Mechanical Engineering	4.0	4	0	0	50	50	100
4	UEE225C	Basic Electrical Engineering	4.0	4	0	0	50	50	100
5	UCS230C	Computer Concepts and C Programming	4.0	4	0	0	50	50	100
6	UHS251C	Constitution of India and Professional Ethics	2.0	2	0	0	50	50	100
7	UCS235L	Computer Programming Practice using C	1.5	0	0	3	50	50	100
8	UPH227L	Engineering Physics Laboratory	1.5	0	0	3	50	50	100
9	UBE253L	Basic Engineering Laboratory-I	1.0	0	0	2	50	50	100
10	UHS244K*	Kannada Manasu	0	2	0	0	—	—	—
11	UHS245K**	Kannada Kali	0	2	0	0	—	—	--
		Total	26	24	0	8	450	450	900

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** Students who have not studied Kannada at primary level.

SCHEME OF TEACHING AND EXAMINATION
B.E. II SEMESTER
2017-2018

CHEMISTRY GROUP

Sl No.	Subject Code	Subject	Credits	Hours/Week			Examination Marks		
				Lecture	Tutorial	Practical	CIE	SEE	Total
1	UMA221C	Engineering Mathematics-II	4.0	4	0	0	50	50	100
2	UCH229C	Engineering Chemistry	4.0	4	0	0	50	50	100
3	UEC232C	Basic Electronics	4.0	4	0	0	50	50	100
4	UCV246C	Engineering Mechanics	4.0	4	0	0	50	50	100
5	UME231C	Engineering Graphics	2.0	2	0	0	50	50	100
6	UBT252C	Environmental Studies	2.0	2	0	0	50	50	100
7	UCH234L	Engineering Chemistry Laboratory	1.5	0	0	3	50	50	100
8	UME250L	CAED Laboratory	1.5	0	0	3	50	50	100
9	UBE254L	Basic Engineering Laboratory-II	1.0	0	0	2	50	50	100
10	UHS243K	English	0	2	0	0	—	—	—
		Total	24	22	0	8	450	450	900

UMA121C : ENGINEERING MATHEMATICS – I

4 CREDITS (4-0-0)

Course objectives:

To enable the students to apply the knowledge of Mathematics in various engineering fields by making them

1. To understand the generalisation of n^{th} order derivatives.
2. To study the coordinate method to locate the point and transform Cartesian form to polar form and vice-versa.
3. To understand the mathematical measure of bending of curves.
4. To analyze and compute the variation of function of several variables using partial derivatives.
5. To trace and analyse the Cartesian polar and parametric curves.
6. To evaluate multiple integrals to find area, volume and surface area bounded by the curves

Course outcomes:

On completion of this course, students are able

1. To apply the knowledge of the n^{th} order derivatives to find the approximate value of the function.
2. To compute the angle between the curves in the polar coordinate system.
3. To apply the knowledge of partial derivatives to optimise the function of several variables.
4. To impart the knowledge of tracing curves to find area, volume surface area bounded by the geometrical curves.
5. To evaluate the function of several variables using multiple integrals.
6. To use radius of curvature in different forms

UNIT-I

Differential Calculus:

13 Hours

Determination of n^{th} derivative of standard functions-problems. Leibnitz's theorem (without proof) and Problems. Polar curves: Angle between the radius vector and tangent, angle between two curves, pedal equation of polar curves. Radius of Curvature- Cartesian, parametric, polar and pedal forms and problems. Taylor's and Maclaurin's theorems for function of one variable (statement only) – problems.

UNIT-II

Differential Calculus:

13 Hours

Partial derivatives - Euler's theorem - problems. Total derivatives, total differentiation, partial differentiation of composite and implicit functions. Jacobians and their properties-problems. Errors and approximations-problems. Maxima and minima for function of two variables, Lagrange's method of undetermined multipliers for two variables, extreme values. Taylor's and Maclaurin's theorems for function of two variables (without proof)-problems.

UNIT-III

Integral Calculus:

13 Hours

Reduction formulae for integration of $\sin^n \theta$, $\cos^n \theta$, $\tan^n \theta$ and $\sin^n \theta \times \cos^n \theta$ (m and n are positive integers) and evaluation of these integrals with standard limits– problems. Tracing of standard curves in Cartesian form, parametric and polar forms: i) Lemniscates of Bernoulli ii) Cissoid iii) Astroid iv) Cycloid v) Cardioid.

Applications of Integral Calculus:

Area, perimeter, surface area generated by revolution of curves and volume computation of solids of these intercept of the curves (i) Astroid (ii) Cycloid & (iii) Cardioid.

UNIT-IV

Integral Calculus:

13 Hours

Multiple Multiple integrals: Double integrals-Evaluation by change of order of integration, change of variables. Triple integrals (simple examples). Beta and Gamma functions, properties, relation between Beta and Gamma functions-problems

Total 52 Hours

Text Books :

1. Dr. B.S. Grewal, “Higher Engineering Mathematics”, Khanna Publishers, New Delhi.
2. E. Kreyszig, “Advanced Engineering Mathematics”, vol-I, Edition: 2014 (John Wiley & Sons).

Reference Books :

1. B. V. Ramana, “Higher Engineering Mathematics”, Tata McGraw-Hill.
2. H. K. Das. “Higher Engineering Mathematics”, Khanna Publishers.
3. S. S. Shastri. “Engineering Mathematics”, Vol.-1, Eastern Economy Edition.

Question paper pattern for SEE:

1. Total of eight questions with two from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than four subdivisions.
3. Any five full questions are to be answered choosing at least one from each unit.

UPH122C/UPH222C : ENGINEERING PHYSICS

4 CREDITS (4-0-0)

Course objectives:

1. To understand basic concepts and principles of physics.
2. To learn basics of modern physics and quantum mechanics.
3. To impart the knowledge of basic concepts and properties of metals, semiconductors and superconductors.
4. To learn basics of crystal structures and dielectric materials.
5. To understand the concepts of laser and optical fiber for modern developments.
6. To learn basics of ultrasonic waves and shock waves.

Course outcomes:

1. An ability to apply basic concepts and principles of physics to identify, formulate and solve engineering problems.
2. An ability to use basics of modern physics and quantum mechanics for modern developments in engineering applications.
3. Gain the knowledge of basics, properties and applications of materials.
4. An ability to identify a new material and its crystal structure.
5. Concepts of laser and optical fiber help in design and development of new devices for engineering applications.
6. Gain the knowledge of properties and engineering applications of ultrasonic waves and shock waves.

UNIT-I

Modern Physics and Quantum Mechanics:

13 Hours

Introduction. Quantization of energy levels, Frank-Hertz experiment. Wave particle dualism, de-Broglie hypothesis, de-Broglie wavelength, de-Broglie wavelength associated with electrons. Davisson and Germer experiment. Matter waves and their characteristic properties. Phase velocity, group velocity, expression for group velocity (superposition of two waves). Relation between phase velocity and group velocity in dispersive medium, relation between group velocity and particle velocity. Relation between phase velocity, group velocity and velocity of light. Expression for de-Broglie wavelength using the concept of group velocity. Application of de-Broglie hypothesis.

Heisenberg's uncertainty principle and its physical significance (no derivation). Application of uncertainty principle (non-existence of electron in the nucleus). Wave function, Properties and physical significance of a wave function. Probability density and normalization of a wave function. Setting up of a one dimensional time independent Schrodinger wave equation. Eigen

functions and eigen values. Applications of Schrodinger wave equation- eigen function and energy eigen values of a particle in a potential well of infinite height and for a free particle. Finite potential well (qualitative) and tunnel effect (qualitative) and its applications.

UNIT - II

Electrical Properties of Metals and Semiconductors:

13 Hours

Free electron concept (Drude-Lorentz Theory). Classical free electron theory-assumptions. Mean collision time, mean free path, relaxation time and drift velocity. Expression for drift velocity. Expression for electrical conductivity in metals. Effect of impurity and temperature on electrical resistivity of metals (Matthiessen's rule). Failures of classical free electron theory. Quantum free electron theory-assumptions. Fermi-Dirac statistics. Density of states and its derivation (3 dimension). Fermi energy, Fermi factor and variation of Fermi factor with energy for different temperatures. Derivation of Fermi energy for 0K. Merits of quantum free electron theory.

Semiconductors, concentration of electrons and holes in intrinsic and extrinsic semiconductors (qualitative). Fermi level in intrinsic and extrinsic semiconductors (qualitative). Direct and indirect band gap semiconductors. Derivation of electrical conductivity for semiconductors. Hall effect, derivation of Hall voltage and Hall coefficient, experimental measurement of Hall voltage and Hall coefficient. Applications of Hall effect.

Superconductivity:

Temperature dependence of resistance in conductors and superconductors. Meissner effect, critical magnetic field, Type I and Type II superconductors. BCS theory (qualitative). Applications of superconductors.

UNIT – III

Crystal Structure:

13 Hours

Space lattice, unit cell, primitive cell, lattice parameters, crystal systems, Bravais lattices. Directions and planes in a crystal. Miller indices. Expression for inter-planar spacing in terms of Miller indices. Co-ordination number, atomic packing factor for SC, BCC, FCC. Relation between lattice constant and density of material. Crystal structures of CsCl, NaCl, ZnS and Diamond. Bragg's Law and Bragg's X-ray spectrometer - determination of wavelength. Determination of cubic crystal structures using diffractograms.

Dielectric materials:

Polar and non-polar dielectrics. Dielectric polarization, polarization process in polar and non-polar dielectrics, polarization mechanisms. Dielectric constant, relation between polarization and dielectric constant. Internal field and derivation of internal field in solids and liquids (one dimensional). Clausius - Mossotti relation. Frequency dependence of polarization. Dielectric loss and its derivation. Ferroelectrics and piezoelectrics. Applications of dielectric materials.

UNIT -IV

Lasers:

13 Hours

Introduction, absorption, spontaneous emission and stimulated emission, Einstein's coefficients (expression for energy density). Conditions for laser action, requisites of a laser system, working mechanism. Characteristics of a laser. Classification of lasers. Construction and working of Nd:YAG, carbon dioxide and semiconductor diode lasers. Applications of lasers- industry, defense, medical and environmental. Holography-construction and reconstruction of a hologram. Applications of holography. Laser Safety.

Optical fibers:

Introduction, propagation mechanism in optical fibers, angle of acceptance, numerical aperture and its derivation. Modes of propagation (qualitative), types of optical fibers and attenuation. Applications-optical fiber communication system, optical fiber as a sensor and fiber laser.

Ultrasonic and Shock Waves:

Ultrasonic Waves: Introduction, generation of ultrasonic waves (magnetostriction and piezoelectric methods) and properties. Measurement of velocity of ultrasonic waves in solids and liquids. Applications of ultrasonic waves-non-destructive testing of materials, Medical and elastic constants of solids and liquids.

Shock Waves: Mach number, distinctions between- acoustic, ultrasonic, subsonic and supersonic waves. Shock waves – characteristics. Method of producing shock waves–Reddy shock tube. Applications of shock waves.

Total: 52 Hours

Text Books :

1. M.N.Avadhanulu and P.G.Kshirsagar, “A text book of engineering physics”, 8th edition, S. Chand & Company, 2006.
2. S.O.Pillai, ”Solid state physics”, sixth edition, New Age International, 2007.

Reference:

1. R.K.Puri and V.K.Babbar, “Solid state physics”, S.Chand & Company, 2010.
2. Arthur Beiser, “Modern physics”, sixth edition, T.M.H, 2002
3. Kenneth Krane, ”Modern physics”, second edition, Wiley India Pvt. Ltd., 2006
4. B. B. Laud, “Lasers and non linear optics”, second edition, New Age International, 1991.

5. K.Rajagopal, “Engineering physics”, PHI, 2009.
6. V.Rajendran, “Engineering physics”, Tata McGraw Hill, 2009.
7. Wiley precise text book series, “Engineering physics”, Wiley India Pvt. Ltd., 2014
8. Chintoo S. Kumar, K. Takayana and K. P. J. Reddy, “Shock waves made simple”, Wiley India Pvt. Ltd., 2014.

Question Paper Pattern:

1. Total of **eight** Questions with two from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than **four** subdivisions.
3. Any **five** full questions are to be answered choosing at least **one** from each unit.

**UME124C/UME224C: ELEMENTS OF MECHANICAL
ENGINEERING**

4 CREDITS (4-0-0)

Course objectives:

After taking this course the students shall be able :

1. To understand basic concepts of energy sources, utilization of energy, light bulbs and electricity.
2. To have an understanding of types of steam, steam properties, working of steam boilers.
3. To have the knowledge of water and steam turbines.
4. To have the knowledge of automobiles, power transmission, electrical and hybrid vehicles.
5. To learn concepts of refrigeration and air conditioning.
6. To understand the working of lathe, drilling, milling, and grinding machines.
7. To learn welding and other metal joining processes, lubrication and bearings, concept of Industrial Engineering.

Course outcomes :

At the end of this course the student will be :

1. Able to have the basic concepts of energy, steam properties, boilers and turbines.
2. Able to understand automobiles, power transmission, refrigeration and air conditioning.
3. Able to understand machine tools.
4. In a position to understand metal joining operations, bearings and lubrication and concepts of industrial engineering.

UNIT-I

12 Hours

Energy: Forms, Sources and classification of energy, Utilization of energy with simple block diagrams.

Steam formation: Types of steam, Steam properties: specific volume, enthalpy and internal energy (numerical problems), Working of steam boilers: Babcox and Wilcox Boiler, Lancashire Boiler, List of mountings, accessories, their locations and applications. (No sketches for mountings and accessories).

Water Turbine: Classification, Working principle and operation of Pelton wheel, Francis turbine and Kaplan turbine

Steam Turbine: Classification, Working principle and operation of Impulse and Reaction turbine, Necessity of compounding of Impulse turbine

UNIT-II

13 Hours

Automobile Engineering: Introduction, History and development of an automobile, Classification of automobiles, Layout of four wheeler (Layout diagram), Definition and working (function and block diagram): clutch, gear box, rear axle, Differential.

Internal Combustion Engines: Classification of I.C. engines, Parts of I. C. engines, I.C. engines nomenclature ,Working of four stroke and two stroke petrol engines, Working of four stroke and two stroke diesel engines, Comparison of two stroke and four stroke engine, Comparison between SI and CI engines, Calculations: I.P., B.P., mechanical efficiency, thermal efficiency, problems.

Refrigeration and air- conditioning: Definition of Refrigeration, Principle of refrigeration, Unit of refrigeration (TR), Co-efficient of performance, Relative co-efficient of performance, Working of vapour compression refrigerator , Working of room air- conditioner .

UNIT-III

14 Hours

Metal Joining Process: Definition: Soldering, brazing and welding, Working principle: soldering and brazing, Welding process: Definition, Principles, Classification, Application, Advantages & limitations of welding, Types of gas flames, Comparison between soldering, brazing and welding.

Lubrication and Bearings: Lubricants: classification and properties, Classification of bearings, Working with sketch: Bush bearing, pedestal bearing, pivotal bearing, collar bearing and antifriction bearing.

Power transmission: Belt drives: open belt drive, crossed belt drive, Derivation: Length of belt for open system and crossed systems, velocity ratio of belt drives, power transmitted by a belt drive, Comparison between flat and V belt drives, problems.

Gear drives: Type of gear drives, working with sketch of spur gear, advantage of gear drives, dis- advantages of gear drives, velocity ratio of gear drives, gear trains: simple and compound gear trains, problems.

Industrial Engineering: Concept of Industrial Engineering: Definition, History and development, Roles of Industrial Engineer, Application of Industrial Engineering, Scope of Industrial Engineering

UNIT-IV

13 Hours

Lathe: Working principle of a central lathe, Parts of lathe, Operations: turning, facing, thread cutting, drilling, and taper turning by compound rest swiveling method, Specification of lathe.

Drilling machine: Working principle and classification of drilling machines, Working of radial drilling machine, Drilling machine operations: drilling, reaming, tapping, counter sinking, counter boring and spot facing

Milling machine: Principle of milling, Types of milling machines, Working principle of horizontal milling machines, Milling processes: plane milling, end milling, spot milling, angular milling.

Grinding machine: Classification of grinding machines, Working principle of grinding machines, Types of grinding machines, Principle and working: surface grinding, cylindrical grinding machines.

Total 52 Hours

Note: Use of steam table permitted in examination.

Text Books :

1. K. R. Gopal Krishna, "A Text Book of Elements of Mechanical Engineering", Subhash publishers, Bangalore.
2. SKH Chowdary, AKH Chowdhary, Nirjar Roy, "The Elements of work Shop Technology", – Vol. I & II, 11th Edition 2001, Media Promoters and Publishers, Mumbai.

Reference Books:

1. G.M.Sunag, Dr. P. B. Gangavati & B. K.Venkanna, "Elements of Mechanical Engineering", Ellite publishers, Mangalore, 2006
2. O.P.Khanna, Danapat Rai Publications, 2006 "Industrial Engineering and Management"
3. T.R.Banga, S.C.Sharma and M.K.Agarwal, "Industrial Engineering and Management Science", Khanna Publications, 2007
4. Work Study ILO Universal Book Corporation
5. G.B.S.Narang "Automobile Engineering"
6. Kirpalsingh "Automobile Engineering", vol I and VII

Question Paper Pattern for SEE:

1. Total of **eight** Questions with **two** from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than **four** subdivisions.
3. Any **five** Full questions are to be answered choosing at least **One** from each unit.

UEE125C / UEE225C: BASIC ELECTRICAL ENGINEERING 4 CREDITS (4-0-0)

Course objectives:

1. To study Electromagnetic Induction and its significance.
2. To compare magnetic and electric circuits.
3. To study DC circuits wiring and safety
4. To study fundamentals of single phase and three phase AC systems.
5. To study Transformer, AC/DC power generators & AC/DC motors.

Course outcomes :

1. Ability to differentiate between dynamic & Static induced emf
2. Ability to adopt normal safety methods.
3. Ability to understand concepts of DC machines.
4. Analysis of Single phase electrical circuits
5. Analysis of 3- phases AC circuits and its significance over 1-phase circuits.
6. Ability to understand the concept of 1- phase transformer and AC machines.

UNIT – I

01. MAGNETIC CIRCUIT :

04 Hours

Definitions of magnetic field, flux, flux density, magnetizing force, permeability, mmf and reluctance, comparison between magnetic and electric circuits, series parallel magnetic circuit, Leakage flux and fringing

02. ELECTROMAGNETIC INDUCTION :

04 Hours

Faraday's laws, Lenz's law, Fleming's rules, statically and dynamically induced emf, self and mutual inductance, coefficient of coupling, inductances in series aiding and series opposing, energy stored in a magnetic field.

03. DC CIRCUITS

05 Hours

Active elements, passive elements, Ohms Law, Kirchhoff's laws, Mesh analysis, Nodal analysis, Delta- star and star- delta transformation

UNIT – II

04. SINGLE-PHASE A.C. CIRCUITS:

07 Hours

Generation of sinusoidal voltages, explanation of phase, in phase and phase difference of an A.C. wave, average value, rms value, form factor and peak factor. Phasors, j-operator, AC through resistance, inductance and capacitance, voltage and current relationships, instantaneous and average power, AC series circuits, voltage and current relationships, instantaneous and average power, problems on series and parallel circuits.

05. THREE – PHASE A.C. CIRCUITS : 06 Hours

Generation of three phase A.C. voltage, Advantages of three phase supply over single phase. phase sequence, voltage and current relationship for star and delta connection. Measurement of power using two wattmeters (for balanced load only), expression for power factor in terms of wattmeter readings, effect of power factor on wattmeter readings.

UNIT – III**06. D.C.MACHINES : 07 Hours**

Generator: Construction, principle of operation, emf equation, types of DC generators.

Motor: Principle of operation, types of motors, derivation of voltage, speed and torque equations significance of back emf, characteristics of motors, necessity of starter, 3-point starter, applications of DC motors.

07. ALTERNATOR: 03 Hours

Construction, types and principle of operation. Frequency of the Generated emf, derivation of emf equation (No Derivation of K_p & K_d)

08. ELECTRICAL WIRING AND SAFETY: 03 Hours

Fuses, current limiter (MCB), necessity of earthing., types of earthing, Electrical wiring.

UNIT – IV**09. TRANSFORMER : 07 Hours**

Principle of operation and construction of single phase transformer and its classification, emf equation. Ideal transformer, losses in the transformer, Transformer without-load and with-load operation (explanation with phasor diagrams), efficiency, condition for maximum efficiency, and definition of voltage regulation.

10. THREE PHASE INDUCTION MOTOR : 06 Hours

Construction of induction motor and types of motors, principle of operation of three phase induction motor, production of rotating magnetic field, frequency of rotor current, torque equation, torque slip characteristics, necessity of starters and star delta starter. Applications of induction motors.

TEXT BOOKS:

1. E. Hughes “Electrical Technology”, International Students 9th edition, Pearson, 2007.

2. Mittal V.N. & Mittal A., “Basic Electrical Engineering”, 2nd Edition, TMH New Delhi, 2008.

Reference Books:

1. Tharaja B.L. “Fundamentals of Electrical Engineering and Electronics”, 1st Multi Colour Edition, S. Chand & Co. Limited, New Delhi 2008
2. Rajendra Prasad, “A Text Book on Fundamentals of Electrical Engineering”, 2nd Edition, PHI, 2009.

Question Paper Pattern for SEE:

1. Total of **eight** Questions with **two** from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than **four** subdivisions.
3. Any **five** Full questions are to be answered choosing at least **One** from each unit.

Course objectives :**At the end of the course student will be able :**

1. To introduce general problem solving process and applying the process for problem solving.
2. To familiarize the basic concepts of computer programming
3. To present the syntax and semantics of the C language.
4. To provide a comprehensive study of the C programming language.
5. To develop the attitude of application development using C.

Course outcomes :

1. Identify the parts of the computer system and explain functioning of computer components.
2. Design an algorithmic solution and write a C program for a given problem.
3. Trace the given C program manually.
4. Write a C program for simple applications of real life.
5. Explain role of Operating system in computer system and applications of computer networks.

UNIT-I**13 Hours**

Introduction to digital computers : Introduction to digital computers: Definition of computer, Computers for individual users, Computers for organizations, Computers in Society and Applications of Computers, Parts of Computer System, Information Processing cycle.

Algorithms and flowcharts: Algorithms, flowcharts, writing algorithms and drawing flowcharts.

Overview of C language: Introduction, features, structure of C program, Compilation and Execution on Windows and Linux Platform. Constants, Variables and Data types: Character set, C tokens, keywords and identifiers, constants, variables, data types, declaration of variables, Coding Standards. Operators and Expressions : Arithmetic operators, logical operators, relational operators, assignment operators, increment and decrement operators, conditional operators, bitwise operators, special operators, arithmetic expressions, evaluation of expressions, precedence of arithmetic operators, type conversion in expressions, operator precedence and associativity.

Managing Input/Output operations: Formatted and unformatted input/output statements.

UNIT-II**13 Hours**

Decision making and branching: Decision making with if, if-else, nested if statements, else-if ladders, switch statement, ?: Operator, goto statement. **Looping:** while statement, do while statement, for statement, jumps in loops. **Arrays:** One-dimensional arrays, declaration of one-dimensional arrays, initialization of one dimensional arrays, Declaration of two-dimensional arrays, initialization of two-dimensional arrays, Examples.

Strings: Introduction, Declaration of strings, initialization of strings, string-handling functions.

UNIT-III**13 Hours**

Introduction to pointers : Definition, declaration, initialization of pointers, usage of pointers.

User defined functions : Need of user-defined functions, a multifunction program, elements of user defined functions, definition of function, return values and their types, function calls, function declaration, category of functions, no arguments and no return values, arguments but no return values, arguments with return values, no arguments but a return value, functions that return multiple values, nesting of functions, Introduction to recursion(factorial), passing arrays to functions, passing strings to functions, scope visibility and life time of variables, Command line arguments, multi-file programs.

UNIT-IV**13 Hours**

Introduction to structures: Defining a structure, Declaring structure variables, accessing structure members, Initialization, Copying and comparing structure variables, Operations on individual members, array of structures.

Introduction to files: Defining and opening a file, closing a file, Input output operations on files.

Hardware and Software: Hardware - Input devices – keyboard, mouse, Output devices-Monitors, printers, Storage devices- Magnetic storage devices, optical storage devices, Flash memory, processors, Software - System software, Application software, Operating system - Definition, Purpose, types of operating systems, providing user interface, running programs, managing hardware, enhancing operating system with utility software.

Networking basics: Uses of networks, Common types of networks, network topologies, protocols, Internet.

Introduction to parallel programming.

Text Books:

1. Peter Norton, 2006, "Introduction to Computers", Sixth Edition, Tata McGraw Hill Publication.
2. E. Balaguruswamy, 2002, "Programming in ANSI C", Third Edition, Tata McGraw Hill Publications.

Reference Books:

1. B. S. Anami, S. A. Angadi & S. S. Manvi, 2007, "Computer Concepts and C programming, A Holistic approach to learning C", First Edition, PHI.
2. Yashwant Kanitkar, "Let us C", Seventh edition, BPB publications, 2007.
3. V. Rajaraman, "Computer Programming in C", First Edition, PHI publications, 2002.
4. Robert Seacord, 2009, "The CERT Secure coding Standards", Pearson Education.
5. Alan Bridger, Mice Brooks, Jim Pisano, 2001 "C Coding Standards".
6. P. B. Kotur, "Computer Concepts and C Programming", Sapna Publications, 20th Edition.
7. Ananth Grama, Anshul Gupta, George Karypis, Vipin Kumar, "Introduction to Parallel Computing", 2nd Edition, Pearson Education, 2003.

Question Paper pattern for SEE

1. Total of **eight** questions with **two** from each Unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than **four** sub divisions.
3. Any **five** full questions are to be answered choosing at least **one** from each unit.

UHS151C/UHS251C: CONSTITUTION OF INDIA AND PROFESSIONAL ETHICS

2 CREDITS (2-0-0)

Course objectives:

1. To gain the knowledge of Indian Constitution.
2. To understand the fundamental rights and duties
3. To learn constitutional design of institutions with their structures and actual working.
4. To gain the knowledge of professional ethics

Course outcomes :

1. An ability to have knowledge of Indian Constitution.
2. An ability to understand fundamental rights and duties
3. To gain the knowledge of federal system of our governments' structure.
4. An Ability to gain knowledge of professional ethics.

UNIT – I

Introduction Indian constitution:**06 Hours**

The Salient Features of the Indian Constitution. Preamble to the Constitution of India. Fundamental Rights and Fundamental Duties: Introduction to Fundamental Rights and their classification. General exercise of Fundamental Rights and their limitations. Fundamental Duties Under Article 51A of The Constitution and their Relevance.

UNIT - II

The Union Government of India:**07 Hours**

The Union Executive-The President of India, his Election, Powers and Functions. The Vice-President of India, his Election, Powers and Functions. The Prime Minister, his Appointment, Powers and Functions. The Union Council of Ministers their Powers and Responsibilities. The Union Legislature-The Parliament of India, its composition and Procedure to pass Bills. The Union Judiciary - The Supreme Court of India and its Structure. Appointment and Qualifications of Supreme Court Judges. Its Powers and Functions.

UNIT - III

The Indian State Government:**06 Hours**

Executive - The Governor-Appointment, Powers and Functions of the Governor. The Appointment of Chief Minister, his Powers and Functions. The State Council of Ministers and their Functions. The State legislature and The State Legislative Council.- their composition and procedure to pass the Bills. The State Judiciary - The High Court Appointment and Qualifications of High Court Judges, its Powers and Jurisdiction.

UNIT – IV

Professional Ethics:

07 Hours

Meaning of profession, characteristics of profession, importance of professional ethics . Engineering Ethics: Its Aims and Scope, Responsibilities of Engineers, Impediments to their Responsibilities, Honesty, Integrity, Reliability, Risk and Safety Measures, Liabilities of Engineers.

Total 26 hours

Text Books :

1. Dr. J. N. Pandey. “Constitutional law”, 51th edition, Central Law Agency
2. Charles Harries. JR and Michard and Michael J Rabins “Engineering Ethics”

Reference Books:

1. B.R.Venkatesh and Merunandan.K.B. “An introduction to the constitution of India and Profession Ethics”, Idea International Publication Bangalore
2. K.R. Phaneesh, “The Constitution of India and Professional Ethics”, Sudha Publication Bangalore.

Pattern of question paper

1. Total of **Eight** Questions with Two from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than **Four** subdivisions.
3. Any **Five** Full questions are to be answered choosing at least **One** from each unit.

UCS135L / UCS235L COMPUTER PROGRAMMING PRACTICE USING C

1.5 CREDITS (0-0-3)

Course objectives :

1. To make students understand the basic concepts of structure of C program, C Program development and developer tools used.
2. To enable the students to use constants, variables, identifiers, operators, type conversion and other building blocks of C Language.
3. To facilitate the students on use of conditional statements and looping statements to solve problems associated with conditions and repetitions.
4. To imbibe the skills of handling of set of data using arrays, structures and pointers. File handling for permanent storage of data or records.
5. To inculcate the modular programming skills using functions.

Course outcomes :

1. Design an algorithmic solution for a given problem and draw flowcharts for the solution.
2. Write a C program for a given algorithm.
3. Write well documented and indented program according to coding standards.
4. Develop the debugging skills, apply learnt techniques for problem solving.

PART - I

1. Given the marks in three subjects, write a C program to check the eligibility of a student for admission to professional course by considering following conditions.
 - a) Marks in Mathematics ≥ 60
 - b) Marks in Physics ≥ 50
 - c) Marks in Chemistry ≥ 40
 - d) Total in all three subjects ≥ 200 or Total in Mathematics and Physics ≥ 150 .
2. If cost and selling price of an item are the inputs, write a C program to determine whether the seller has made profit or incurred loss. Also determine how much profit he made or loss he incurred.
3. Given the coordinates of three points on a plane, write a C program to check whether they form the triangle.

4. Write a C program to find all the roots of a quadratic equation.
5. Write a C program to display the position of a given point with coordinates (x, y) on a plane.
6. Write a C program to read a double type value X that represents angle in degrees and character variable T that represents type of trigonometric function and display the value of
 - a) $\sin(X)$ if s or S is assigned to T
 - b) $\cos(X)$ if c or C is assigned to T
 - c) $\tan(X)$ if t or T is assigned to T using switch statement.
7. Write a C program to read N integers and count total number of positive and negative numbers.
8. Write a C program to find the GCD and LCM of two integers.
9. Write a C program to check whether the number is prime or not. Display appropriate message.
10. Write a C program to find the sum of the following series :
 $\cos(X) = 1 - X^2/2! + X^4/4! - X^6/6! + \dots$

PART-II

1. Write a C program to read N integers and arrange them in ascending order using bubble sort.
2. Write a C program to read sorted list of N integers and search the given key element using binary search. Display the result using the suitable message.
3. Write a C program to read a matrix of order MXN and find the sum of principal and secondary diagonal elements.
4. Write a C program to accept a string and reverse it without using library functions. Display the original and reversed string and also check whether string is palindrome or not.
5. Write a C program to read N elements into an array and compute the sum of all the elements stored in an array using pointer and also display the elements of an array in reverse order.
6. Write a C program to find the factorial of a given integers using recursive function. Accept number as a command line argument.
7. Write a C program to read list of integers and find the mean, standard deviation and count number of integers less than mean of the list. Display all results in main function.

Define the following functions:

- i. To read given list of numbers.
 - ii. To find mean and standard deviation (single function).
 - iii. To find the number of elements those are less than the mean of that list.
8. Write a C program to read a matrix of order (MXN) and (PXQ) and compute the product of two matrices. Define functions ,
 - i. To read matrix.
 - ii. To compute the product of two matrices.
 - iii. To print matrix.
 9. Write a C program to read N students information consisting of roll number, name, marks of three subjects and display the information with appropriate headings, where each student information consists of roll number, name , marks of three subjects and total marks scored.
 10. Write a C program to create a file of integers - intdata. Read intdata file and count number of integers greater than 100.

NOTE:

1. Each assignment in Part-I and PART- II will be evaluated for 1.5 marks.
2. The Continuous Internal Evaluation (CIE) is done for a total of 30 marks .
3. The lab test for CIE will be conducted for 20 marks and evaluated as per the following: Write-up: 5 marks, Execution of program: 10 marks, Viva: 5 marks.
4. In Semester End Exam (SEE), the student has to execute one assignment from each part and evaluated as per the following: Write up: 25% marks, Execution of program: 50% marks, Viva: 25% marks.

UPH127L/UPH227L: ENGINEERING PHYSICS LABORATORY

1.5 CREDITS (0-0-3)

Course objectives :

1. To practice independent experimental skills.
2. To understand the basics of precision in measurements.
3. To learn the ability to construct electrical circuits.
4. To measure the physical properties of materials.

Course outcomes :

1. An ability to develop individual experimental skills.
2. An ability to use basic measuring tools for precision measurements.
3. Gain the knowledge to use basic electrical components in constructing circuits.
4. An ability to understand the properties and applications of materials.

LIST OF EXPERIMENTS IN ENGINEERING PHYSICS LABORATORY:

1. Verification of Stefan's law.
2. Planck's constant (determination of Planck's constant using LED or photoelectric effect method).
3. Measurement of wavelength of a laser using diffraction grating.
4. Measurement of velocity of ultrasonic waves in liquids by using ultrasonic interferometer.
5. Determination of Fermi energy for a conductor.
6. Determination of dielectric constant by charging and discharging method.
7. The study of frequency response in series and parallel LCR circuits.
8. Black box experiment to identify passive components and estimate their values.
9. Determination of rigidity modulus of a wire by torsional pendulum method.
10. Determination of cubic crystal structures using diffractograms.
11. Photo diode characteristics.
12. Determination of Young's modulus of a metal strip by single cantilever method.
13. Electric resistivity of a semiconductor by four probe method.
14. Measurement of numerical aperture and attenuation in an optical fiber.
15. Determination of band gap for a semiconductor.

Note:

1. Ten experiments are to be conducted.
2. Candidate has to perform two experiments in the semester end examinations.

Reference Book:

1. H Sathya Sheelan, "Laboratory manual in applied physics", Ed3, New Age International, 2008.

Laboratory assessment:

- 1) Each laboratory subject is evaluated for 100 marks (50 CIE and 50 SEE).
- 2) Allocation of 50 Marks for CIE:
 - Performance and journal write-up: Marks for each experiment = 30 marks / No of proposed experiments.
 - One practical test for 20 marks (5 write-up, 10 conduction, calculation results etc., 5 viva-voce).
- 3) Allocation of 50 marks for SEE: 25% write-up, 50% conduction, calculations, result etc., 25% viva-voce.

UBE153L / UBE253L : BASIC ENGINEERING LABORATORY-I

1 CREDIT (0-0-2)

Course objectives :

1. To understand the concept of measurement and assembly of parts.
2. To understand the concept of welding and soldering.
3. To develop an understanding of related ergonomic principles fundamental to the workplace and conducting experiments to do the environmental analysis like industrial noise and industrial lighting and Measurement of Effect of Work on Human Body to optimize the integration of man and machine so as to improve the work rate and accuracy design.
4. To understand the working dynamics and structure of two wheeler.
5. Introduction to automotive machining process for reboring of engine cylinders.
6. To facilitate the UG students to learn about the methods of taking out basic field measurements such as distances and angles. This also includes, learning about the basic accessories such as chains, tapes and arrows used for taking out fundamental measurements.
7. To enable the students to learn about the different methods of testing the materials used for constructions.
8. To understand the basic measurement of cell and its separation for quantification of biomass.

Course outcomes :

1. The student will develop the the knowledge and skill of measurement and assembly of parts.
2. The student will develop the knowledge and skill of welding and soldering.
3. Ability to identify possible cause and effect relationships between component and system to match the abilities, needs, and limitations of people in order to improve productivity, safety, performance, and user happiness.
4. With technical background about two wheeler, effective utility covering a fuel efficiency, write quality and environmental aspects can be gained.
5. Exposure to automotive machining process regarding reboring of engine cylinder.
6. The students will acquire knowledge about the fundamental accessories used for taking basic measurements for civil engineering surveys.

7. The method and importance of testing of different construction materials will be understood by the students.
8. Ability to measure the cell
9. Ability to separate the biomass and its quantification.

LIST OF EXPERIMENTS IN BASIC ENGINEERING LABORATORY-I

1. Assembly of parts for different joints.
2. Welding and sheet metal soldering
3. Effect of work on Human body using Industrial Engineering Concepts.
4. Effect of noise & light on human efficiency in work environments.
5. Study on Petrol engine system
6. Study on Diesel engine system
7. Compressive strength of concrete cube.
8. Construction of a polygons using surveying instruments.
9. Measurement of cell using microscope.
10. Biomass separation using centrifugation.

Note:

All Ten experiments are to be conducted in a semester by each student.

UCH129C/UCH229C: ENGINEERING CHEMISTRY

4 CREDITS (4-0-0)

Course objectives :

1. To impart fundamental knowledge of materials chemistry and their engineering applications.
2. To impart the knowledge about chemical analysis with high degree of accuracy and precision for engineering applications.
3. To understand mechanism of corrosion and preventive methods along with modern metal finishing techniques for the development of modern engineering appliances.
4. To learn the significance of green chemistry, green synthesis, Nano materials and Nano devices for future technological developments.
5. To learn biofuels synthesis of biofuels, biorefineries etc, as alternative and ecofriendly practices..
6. To impart the knowledge about polymers, elastomers and conducting polymers for the need of modern society.

Course outcomes :

At the end of the course students will be able to;

1. Estimate the impurities present in water which creates awareness about water quality.
2. Understand various modes of corrosion and hence will be able to develop methods for preventions of corrosion which encourage the effective utilization of metals.
3. Gain the knowledge of eco friendly chemical synthesis, which in turn creates the awareness about renewable material source and importance of prevention of environmental pollution for the future.
4. Understand the importance of the materials in nanoscale and their properties, which will encourage them to think of new material world.
5. Encourage use of renewable material as fuel.
6. Gain the knowledge of replacement of conventional materials by polymers for various engineering applications.

UNIT – I

Principles of volumetric analysis :

06 Hours

Introduction, Fundamentals of volumetric analysis, Terminology - titration, equivalent point, indicators. Standard solution - concentration terms; Normality, Molarity, Mole fraction, PPM, percentage by weight. Requirements of primary standard substance. Types of titrations. Acid-base titration, acids-base indicator, Ostwald's theory of acid-base indicator. Action of indicator - Phenolphthalein & Methyl orange. Choice of acids - base

indicator, Titration curves -HCl v/s NaOH, CH₃COOH v/s NaOH & Na₂CO₃ v/s HCl Complexation titrations - Theory of EDTA complexation titration, estimation of Zn.

Water Technology :

07 Hours

Introduction, Natural sources of water - Impurities in water (Dissolved, suspended, colloidal and biological) Water analysis-Different constituents in water, Hardness - Definition, Types of hardness, Unit of hardness. Disadvantages of hard water; scales sludge formation, priming & foaming. Determination of hardness by EDTA method and numerical problems. Alkalinity-Definition, Determination by Dual indicator method (Phenolphthalein & Methyl orange), & numerical problems. Water pollution Introduction, Sewage, aerobic & anaerobic oxidation. BOD - Definition, Determination of BOD, Significance of BOD and numerical problems COD Definition, determination of COD, Significance of COD and numerical problems.

UNIT - II

Corrosion Science:

07 Hours

Introduction, Corrosion:-Definition, Types of corrosion-Chemical (Dry) and Electrochemical (Wet) corrosion, Theory of electrochemical corrosion by taking Iron as an example. Types of Electrochemical corrosion - Differential metal corrosion, Differential aeration corrosion. e.g. water line corrosion, Pitting corrosion, Stress corrosion e.g. Caustic embrittlement. Factors affecting the rate of corrosion; Related to metal & Related to environment.

Corrosion Control: Protective coatings – Inorganic coatings – (i) Anodizing – meaning, Anodizing of Al and applications (ii) Phosphating – process and applications. Metal coatings – (i) Galvanization (anodic coating) (ii) Tinning (cathodic coating) Corrosion inhibitors - Definition, Anodic inhibitors and cathodic inhibitors. Cathodic protection – Sacrificial anodic method and impressed voltage method.

Metal Finishing

06 Hours

Introduction, Technological importance of metal finishing. Factors governing electroplating- Polarization, Decomposition potential and Over voltage. Electroplating process:- Theory of electroplating - Definition, Principle components of an electroplating bath. Effects of plating variables on the nature of electro deposit. Determination of throwing power of plating bath by Haring Blum cell and numerical problems. Surface preparation Electroplating of Copper & Chromium and applications. Electroless plating:-Meaning, Distinction between electroplating and electroless plating. Surface preparation, Electroless plating of Copper on PCB & Nickel on Al and applications.

UNIT – III

Green Chemistry:

07 Hours

Introduction, Aims and Objectives, Major environmental pollutants, Basic principles, various green chemical approaches – Microwave synthesis, Biocatalysed reactions, Phase transfer catalysis. Alternative reaction conditions. Synthesis of typical organic compounds by conventional and green route: i) Adipic acid ii) Poly carbonates iii) Indigo iv) Disodium iminodiacetate. Atom economy – Synthesis of ethylene oxide & Synthesis of ethyl bromide. Industrial applications.

Nano Technology :

06 Hours

Introduction, Nanomaterials – meaning, properties, classification. Synthetic routes: Bottom up, Top down approaches. Synthesis of nanomaterials - Bottom up methods; Inert gas condensation, Precipitation method, Top down methods; High Pressure Torsion (HPT), Laser ablation synthesis. Characterization of Nano materials – SEM. Nano scale materials: Nano clusters, Nano wires , Carbon nano sheets & tubes, Dendrimers.

UNIT - IV

Bio Fuels :

06 Hours

Introduction, Limits of conventional fuel & Need for Biofuel. Green house gases, Photo synthesis for Biofuels, Types of biomass, energy need for biofuel production, Direct burning. Biomass, Production of biodiesel by transesterification, Acid catalysed reaction and Alkali catalysed reaction. Advantages, disadvantages of Biodiesel, Hydrogen economy, fuel cell technology eg: $\text{CH}_3\text{OH}-\text{O}_2$ fuel cell. Bio production of gases CH_4 and H_2 . Biorefinery Concept, Types of biorefinery, Co production of ethanol and other biofuels, biomass gasification.

Polymers :

07 Hours

Introduction, definitions, classification, polymerization, mechanism of polymerization. Free radical mechanism with polyethylene as an example, Methods of polymerization, Glass transition temperature, structure-property relationship, Synthesis properties and applications of Poly Vinyl Acetate, Nylon 6,10, Compounding of polymers.

Elastomers – Definition. Classification with example, Synthetic rubber - Synthesis, properties & applications of Silicon rubber, Vulcanization of Silicon rubber, Conducting polymers – Definition, Mechanism of conduction in polyacetylene and applications, Polymers blends & composites.

Total: 52 Hours

Text Books :

1. M. M. Uppal, Khanna “Engineering Chemistry”, Publishers, Sixth Edition, 2001
2. S. S. Dhara & S. S. Umare, “Engineering Chemistry”, S. Chand Tech. Pub. Delhi

Reference Books:

1. Engineering Chemistry by Gadag & Nityanand Shetty. I. K. International P.H. Dehli.
2. Engineering Chemistry by O. G. Palanna, Tata Mc. Graw Hill Education Pvt. Ltd.,
3. A Text Book of Engineering Chemistry-by Dr. P. L. Timmanagoudar & Dr. S. K. Patil, EBPB. Gadag
4. Environmental Chemistry with Green Chemistry, by Dr. A. K. Das, Books & Allied (P) Ltd, Kolkata, 2012.
5. Polymer Science by V. R. Gowariker, N. V. Viswanathan, Jayadev Sreedhar, New Age Int. Publication.
6. Introduction to Nanoscience and Nanotechnology by Gabor L. Hornyak, Harry F. Tibbals,
7. Nanotechnology by Manasi Karkare, I. K. International P.H. New Dehli.
8. Introduction to Bio fuels by David M. Mousdale
9. Bio fuels by Wim Soetaert Erick J. Vandamme
10. Vogel’s Test Book of quantitative Chemical Analysis revised by G. H.

Question paper pattern for SEE:

1. Total of **eight** questions with **two** from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than **four** sub divisions.
3. Any **five** full questions are to be answered choosing at least **one** from each unit.

4 CREDITS (4-0-0)**Course objectives :**

The course is intended to provide the knowledge about

1. The semiconductor theory, diode and transistor concepts.
2. The biasing concepts of transistor and VI characteristics of FET.
3. The knowledge of number system, Boolean algebra and basic logic circuits.
4. The knowledge on oscillators, communication system and general applications of electronics.

Course outcomes :

A student who successfully completes this course should be able to

1. Analyze diode and transistor circuits.
2. Distinguish transistor biasing methods and analyze FET characteristics.
3. Perform number system conversion, and design basic logic circuits.
4. Analyze and design oscillators.
5. Realize the necessity of communication systems and general applications of electronics.

UNIT-I**13 Hours**

Semiconductor Diodes: pn-Junction Diode, Characteristics and Parameters, Diode Approximations, DC Load Line Analysis, Temperature Effects. Diode Applications: Half Wave Rectification, Full Wave Rectification, Rectifier with Shunt Capacitor (qualitative analysis), Zener Diode and its Characteristics, Zener Diode as Voltage Regulator, DC Voltage Multipliers, and Diode Logic Gates. Bipolar Junction Transistors: Transistor Operation, Transistor Voltages and Currents, Amplification, Common-Base Characteristics, Common Emitter Characteristics and Common-Collector Characteristics.

UNIT-II**13 Hours**

BJT Biasing: The DC Load Line and Bias Point, Base Bias, Collector to Base Bias, Voltage Divider Bias, Comparison of Basic Bias Circuits. Amplifier: Decibels and Half Power Points, Single-Stage CE Amplifier. Field Effect Transistors: Junction Field Effect Transistors, JFET Characteristics, FET Amplification and MOSFETs.

UNIT-III**13 Hours**

Review of Number Systems: Introduction, Decimal, Binary, Octal and Hexadecimal Number Systems. Addition and Subtraction, Fractional Numbers, Binary Coded Decimal Numbers. Digital Logic: Boolean Algebra, Logic Gates (Excluding pulsed operation), Half Adder, Full Adder and Parallel Binary Adder.

UNIT-IV**13 Hours**

Oscillators: Concept of Feedback, Positive and Negative Feedback, Barkhausen Criterion for Oscillator, BJT Phase Shift Oscillator, Hartley, Colpitt's, Crystal Oscillators and (qualitative discussion only) Numerical Examples as Applicable.

Communication Systems and General Applications: Introduction to Communication System, Modulation, Need for Modulation, Communication Spectrum, AM, FM, (qualitative discussion only). Uninterrupted Power Supply (UPS), Microwave Oven, GSM Architecture.

Total 52 Hours**Text Books:**

1. David A. Bell, "Electronic Devices and Circuits", 4th Edition, PHI, 2006.
2. Floyd and Jan, "Digital Fundamentals", 8th Edition, Pearson, 2006.

Reference Books:

1. George Kennedy, "Electronic Communication Systems", 4th Edition, TMH, 2005
2. Jacob Millman, Christos C. Halkies, "Electronics Devices and Circuits", TMH, 2001.
3. A.P. Malvino, "Electronic Principles", TMH, 2003.
4. Annapurna Das and Sisir Das, "Microwave Engineering", TMH, 2000.
5. Yi-Bing-Lin and Imrich Chlamtac, "Wireless and Mobile Network Architecture", Wiley Publications, 2001.
6. M. D. Singh and K. B. Khanchandani, "Power Electronics", TMH, 2003

Question paper pattern for SEE:

1. Total of **eight** questions with **two** from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than **four** sub divisions.
3. Any **five** full questions are to be answered choosing at least one from each unit.

UCV146C/UCV246C: ENGINEERING MECHANICS

4 CREDITS (4-0-0)

Course objectives :

1. Students to understand the basic concepts of Engineering Mechanics
2. Ability to work from basic of Mechanics, the problem involving structures and its components at rest and in motion.
3. To utilize this knowledge to analyse any problems related to mechanics in a simple and logical member

Course outcomes :

1. It helps the students to develop an ability to apply the knowledge of the basic concepts and principles of mechanics.
2. It develops an ability to identify formulate and analyse structures subjected forces.
3. It helps to develop ability to use technical skills, modern Engineering tools necessary for Engineering practice and hence to form a basis for further study of subjects like mechanics of Materials structural analysis etc.

UNIT-I

Introduction to Engineering mechanics: 07 Hours

Particle, continuum, Rigid body and point force, laws of motion, Laws of parallelogram forces, polygon forces. Definition of force, classification of forces system, Resolution of forces composition of force, principle of transmissibility of forces. Resultant of coplanar concurrent force system. Lami's theorem, Equilibrium of a particle. Numerical problems.

Moment and couple: 06 Hours

Definition of moments, couple, moment of a couple, characteristics of a couple, equivalent force couple system, Varignon's principle, Resultant of coplanar non concurrent forces system. Numerical problems

UNIT-II

Support Reactions: 06 Hours

Types of beams, loadings and supports. Support reactions of statically determinate beams. Numerical problems.

Bending moment and shear forces in beams: 07 Hours

Introduction, shearing force and bending moment in beams. Relationship between load, shear force, and bending moment, Expression for shear force

and bending moment equations. SFD and BMD with salient values for cantilever, simply supported and Overhanging beams considering point loads, UDL, UVL and couple.

UNIT-III

Trusses: 06 Hours

Introduction, assumptions analysis by method of joints and method of sections. Numerical problems.

Friction: 07 Hours

Types of friction, Laws of static friction, limiting friction, Angle of friction, angle of repose, Impending motion on horizontal & inclined planes. Wedge friction, ladder friction, Numerical problems.

UNIT-IV

Centroid: 06 Hours

Locating centroid of a triangle, rectangle, circle, semi circle, quadrant of a circle by using method of integration centroid of simple built up sections. Numerical problems.

Moment of Inertia: 07 Hours

Moment of Inertia of a plane, polar moment of inertia, radius of Gyration, perpendicular axis theorem & parallel axis theorem. Moment of inertia of rectangular, circular, and triangular areas by method of integration. moment of inertia of composite sections. Numerical problems.

Total 52 Hours

Text Books:

1. Ferdinand P. Beer & E. Russel Johnston Jr. "Mechanics for Engineers (Statics)" 4th Edn, Tata Mc Graw Hill Publications, New Delhi, 1987.
2. K.V.Rao & G C Raju " Engg. Mechanics" Subhas Publications, Bangalore.

Reference Books:

1. S.S.Bhavikatti "Engineering Mechanics" New Age International Publishers, New Delhi.
2. Timoshenko "Engineering Mechanics" 4th Edn, Mc Graw Hill Publications New York, 1983.
3. Singer F.L. "Engineering Mechanics statics and dynamics" 3rd Edn.,

UME131C/UME231C: ENGINEERING GRAPHICS

2 CREDITS (2-0-0)

Course objectives :

- 1) To make the student to realize Engineering Graphics as the language of Engineers.
- 2) To study the objects of 1. Dimension 2 dimensions, 3 dimensions, from engineers perspective.
- 3) To study the lateral surface of the solids for the development of the object.
- 4) To study and understand to represent orthographic view of the object in the isometric view that can be understood by common man.

Course outcomes :

1. The student will realize the Engineering Graphics and its significance for Engineering Application.
2. The student is able to visualize different types of objects through Engineering Graphics.
3. The student is capable of imagining the objects in the universe.

UNIT-I

Orthographic Projections, Projection of points, lines : 06 Hours

Introduction, Definitions-Planes of projection, reference line and conventions employed, Projections of points in all the four quadrants[Examples on first quadrant only to be asked in CIE and SEE] Projections of straight lines (located in First quadrant/first angle only), True and apparent lengths, True and apparent inclinations to reference planes.

UNIT II

Orthographic Projections of Plane Surfaces : (First Angle Projection only) 07 Hours

Introductions, Definitions- Projection of plane Surfaces-Triangle, Square, Rectangle, Rhombus, Pentagon, Hexagon and Circle, Planes in different positions by change of position method only.

UNIT III

Projections of Solids (First angle projection only) 07 Hours

Introduction, Definitions, Projections of Solids, (Prisms, pyramids, Cones and Cylinders), resting on HP, axis/base inclined to HP only and profile views.

Developments of lateral surface of Solids :

Developments of lateral surface of Right regular Prisms, Pyramids, Cylinders

and Cones with base on HP and their frustums and truncations. (No problems on lateral surfaces of trays, tetrahedrons, spheres and Transition pieces etc).

UNIT IV

Isometric projections (Using Isometric Scale only) 06 Hours

Introduction, Isometric scale, Isometric projection of simple plane figures, Isometric projection of right regular Prisms, Pyramids, Cylinders, Cones, Spheres, cut spheres and combination of coaxial of two solids only.

Text Books :

1. N.D. Bhatt & V.M. Paschal, "Engineering Drawing", - 48th edition, 2005- Charotar Publishing House, Gujarat.
2. K. R. Gopalakrishna "Engineering Graphics", 32nd edition 2005- Subash Publishers Bangalore.

Reference Books :

1. Luzadder Warren J., Duff John M., "Fundamentals of Engineering Drawing with an Introduction to Interactive Computer Graphics for Design and Production" Eastern Economy Edition, 2005- Prentice- Hall of India Pvt. Ltd., New Delhi.
2. G. M. Sunag, B.K. Venkanna, Smt. S. B. Wadawadi, "Engineering Graphics", Sugama Publication Pvt.Ltd., 2004

Question Paper Pattern for SEE:

1. Total of **eight** Questions with **two** from each unit to be set uniformly covering the entire Syllabus.
2. Each question should not have more than **two** subdivisions.
3. Any **five** Full questions are to be answered choosing at least **one** from each unit.

UBT152C/UBT252C : ENVIRONMENTAL STUDIES
2 CREDITS (2-0-0)

Course objectives :

1. To understand basic aspects of environment and ecosystem.
2. To study the impacts of human activities on environment.
3. To study the natural resources.
4. To study the environmental pollution and its types, causes, impacts and environmental issues.
5. To know the waste management techniques.

Course outcomes :

1. Ability to understand basic aspects of environment.
2. Ability to understand impacts of human activities on nature.
3. Ability to recognize the natural resources and its uses.
4. Ability to understand the pollution and its effects on environment.
5. Ability to understand the waste management techniques.

Unit-I

Environment & Ecology: 06 Hours

Environmental segments, Ecosystem and classification of ecosystem.

Environmental impacts of human activities on:

Agriculture, Transportation, Industry, Mining, Urbanization, Environmental impact assessments (EIA) – Objectives, scope. Water Conservation.

Unit-II

Natural Resources: 07 Hours

Forest, Water, Mineral, Food and Land resources Biodiversity,

Energy:

Types and Sources of energy, Renewable and Non Renewable energy sources.

Renewable Energy:

Solar energy, wind energy, Hydropower, Tidal energy, Ocean thermal energy, Geo thermal energy, Biomass energy, Biogas, Biofuels, Hydrogen as fuel

Non Renewable Energy: Coal, Petroleum, Natural gas, Nuclear energy.

UNIT-III

Environmental Pollution: 07 Hours

Water pollution, Water quality standards, water borne diseases, Fluoride problem, Air pollution, Noise pollution.

Current Environmental Issues of concern:

Population growth, Green house Effect, Green house gases and Global Warming Climate change, ozone layer depletion, Acid rain, Fluoride problem in drinking water.

Unit-IV

Waste Management: 06 Hours

Solid waste management, source, classification, characteristics, collection, transportation- disposal, prevention and treatment methods, Hazardous waste management and handling rules, Bioremediation, Waste water treatment. Microbial Insecticides.

Environmental Protection:

Introduction, Functions of Government Agencies, Environment Protection and Acts.

Total: 26 Hours

Text Books :

1. Anush Kaushik and C.P.Kaushik "Environmental Science & Engineering" New Age International Publishers, New Delhi, 2010.
2. Benny Joseph "Environmental Studies" Tata McGraw Hill, 2005.

Reference Books :

1. P. Venugopal Rao "Principles of Environmental Science & Engineering" Prantice Hall of India, 2006.
2. Meenakshi "Environmental Science & Engineering" Prantice Hall of India, 2006.
3. S. K. Garg "Environmental Science & Ecological Studies" Khanna Publishers New Delhi, 2007.
4. D.L.Manjunath, "Environmental Studies" Pearson Education, 2007.
5. B. D. Singh, "Biotechnology Expanding Horizons" Kalyani Publishers, 2010

Question Paper Pattern for SEE:

1. Total of **eight** Questions with **two** from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than **four** subdivisions.
3. Any **five** Full questions are to be answered choosing at least **one** from each Unit.

UCH134L/UCH234L: ENGINEERING CHEMISTRY LABORATORY

1.5 CREDITS (0–0–3)

Course objectives :

1. To practice independent experimental skills and analytical ability.
2. To utilize appropriate instrumentation and techniques.

Course outcomes :

By the end the course the students should be able to:

1. Develop the skills to perform the experiments and analyze the results.
2. Get the solid base of chemical principles which will serve as the foundation to deal with more advanced and specific chemistry related problems for engineering applications.

PART – A

1. Determination of viscosity coefficient of a given liquid using Ostwald's Viscometer.
2. Potentiometric estimation of FAS by using standard $K_2Cr_2O_7$ solution.
3. Colorimetric estimation of copper.
4. Conductometric estimation of HCl & CH_3COOH in the acid mixture using standard NaOH.
5. Determination of pK_a of a weak acid using standard NaOH by pH meter.
6. Study of titration curve of Na_2CO_3 versus HCl using pH meter.

PART – B

1. Estimation of total hardness of water sample using standard solution of disodium salt of EDTA solution.
2. Determination of percentage of copper in brass by using standard sodium thiosulphate solution.
3. Determination of alkalinity of given water sample using standard Hydrochloric acid solution.
4. Determination of amount of CaO present in the given sample of cement solution by EDTA method.
5. Determination of water of hydration in Mohr's salt using standard $K_2Cr_2O_7$ solution.
6. Estimation of chloride in water by Mohr's method.

Text Books :

1. Laboratory manual in Engineering Chemistry - Sudharani , Dhanapatrai, Publishing Company.

2. Vogel's Text Book of Quantitative Chemical Analysis revised by G.H. Jeffery, J. Bassett, J. Mendham and R.C. Denny, 4th Edition.

Note:

1. Ten experiments are to be conducted.
2. Candidate has to perform two experiments in the semester end examinations.

Reference Books :

1. Practical Engineering Chemistry by Sunita & Ratan Pub: S.K.Kataria & Sons.
2. Principles of Physical Chemistry B. R. Puri, L. R. Sharma & M. S. Pathania & Co., 33rd Edn. 1992.
3. Engineering Chemistry by Jain & Jain, 15th Edn. Dhanapath rai pub. Co.

Laboratory assessment:

- 1) Each laboratory subject is evaluated for 100 marks (50 CIE and 50 SEE).
- 2) Allocation of 50 Marks for CIE:
 - Performance and journal write-up: Marks for each experiment = 30 marks / No of proposed experiments.
 - One practical test for 20 marks (5 write-up, 10 conduction, calculation results etc., 5 viva-voce).
- 3) Allocation of 50 marks for SEE: 20% write-up, 60% conduction, calculations, result etc., 20% viva-voce.

**UME150L/UME250L: COMPUTER AIDED ENGINEERING
DRAWING LABORATORY**

1.5 CREDITS (0–0–3)

Course objectives :

1. To study the computer applications in Engineering field.
2. To develop drawing skills using softwares.

Course outcomes :

1. The student is able to realize the importance of computing systems in Engineering.
2. The student is able to develop geometrical models like lines , planes, solids.

Projection of points :

Projection of points located in all four quadrants.

Projections straight lines :

Projection of lines located in first quadrant only, line parallel to both the planes, perpendicular to one plane and parallel to other, inclined to one plane and parallel to other, and inclined to both the planes. Determination of true length and true inclinations with principal planes.

Projection of planes :

Projection of planes - perpendicular to both the planes, parallel to one plane and perpendicular to other, inclined to one plane and perpendicular to other and inclined to both the planes.

Projection of solids :

Projection of solids (Prisms, Pyramids, Cones, and Cylinders), resting on HP, axis/base inclined to HP only and profile views. No problems on Tetrahedron

Development of solids:

Development of lateral surface of Prisms, Pyramids, Cones, and Cylinders cut by auxiliary inclined planes.

Isometric projections :

Isometric projections of Prisms, Pyramids, Cones, and Cylinders, combination of solids. (Maximum of two solids Co-Axial Only)

Note: Students are informed to make free hand sketch only in worksheet.

Laboratory Assessment: :

- (a) Each laboratory subject is evaluated for 100 marks (50 CIE and 50 SEE)
- (b) Allocation of 50 marks for CIE. (30 marks for term work [sketching and printouts from SOLID EDGE] & 20 marks for one practical test)
- (c) The SEE practical is conducted for 50 marks of three hour duration, five questions to be set from above syllabus. Student has to answer any three questions.

UBE154L/UBE254L: BASIC ENGINEERING LABORATORY-II

1 CREDIT (0--0--2)

Course objectives :

1. To give exposure to students basic functional hardware of the computer and word processing software like MS office (MS word, MS Power Point, MS excel).
2. To understand the importance and working of computer networks and web searching
3. To impart knowledge on electronic measurement/instrumentation.
4. To learn wiring, concept of power, energy and power factor.
5. To provide concept of diode as rectifier and transistor as an amplifier.

Course outcomes :

1. Able to identify the basic functional hardware of a digital desktop computer like mother board, hard disk, monitor, memory cards, various cables etc.
2. Able to create one word document which includes tables, insertion of pictures etc, one simple presentation and one simple sheet.
3. Able to share the resources over the network and use search engine
4. Ability to use temperature sensor for a given application
5. Ability to understand basics of single and two-way wiring, the concept of power, energy, and power factor, and the operating power factor of different domestic loads.
6. Able to analyze the rectifier and amplifier circuits.

LIST OF EXPERIMENTS IN BASIC ENGINEERING LABORATORY-II

1. Network setup and resource sharing.
2. Searching information through search engines.
3. Exposure to the office tools.
4. Exposure to the computer systems.
5. Temperature measurement using Resistance Temperature Detector (RTD).
6. Simulation of simple analog and digital electronic circuits.
7. Simple wiring Exercises.
8. Power measurement - Domestic appliances.
9. Full wave rectifier circuit without and with capacitor filter.
10. Frequency responses of single stage RC coupled common emitter amplifier.

Note:

All Ten experiments are to be conducted in a semester by each student.

UMA221C: ENGINEERING MATHEMATICS-II

4 CREDITS (4-0-0)

Course objectives :

To enable students to apply the knowledge of Mathematics in various engineering fields by making them.

1. To understand the concept of matrix theory and elementary transformations.
2. To recognise and solve the first and higher order differential equation
3. To understand solving of IVP and BVP arising in various Engineering problems using different analytical techniques.
4. To determine the velocity and acceleration of a moving particle in space.
5. To understand Laplace transform of elementary functions.

Course outcomes :

1. To apply the matrix techniques to solve linear system of equations.
2. To impart the knowledge of various analytical technique for solving initial and boundary value problem arising in various physical and Engineering problems.
3. To use curl and divergence of a vector valued functions in various applications.
4. To analyze position, velocity and acceleration in two or three dimensions using the calculus of vector valued functions.
5. To apply the Laplace transforms method to solve the IVP, BVP without finding the general solution of a given differential equation.

UNIT - I

Linear Algebra:

13 Hours

Rank of matrix, Echelon form, Fundamental theorem of linear system of equations (without proof), Gauss elimination method, Gauss seidel method, Eigen values and Eigen vectors.

Differential Equations:

Solution of first order and first degree differential equations. Linear and reducible to linear, Exact & reducible to exact forms. Applications – Orthogonal trajectories, Newton's law of cooling, flow of electricity, laws of decay and growth.

UNIT-II

Higher Order Differential Equations:

13 Hours

Preliminary Theory: Linear differential equations: Initial and boundary value problems. Homogeneous and non homogeneous equations, reduction of order,

homogenous linear equations with constant coefficients. Method of variation of parameters (second order only). Solutions of Legendre's and Cauchy's homogeneous linear equations.

UNIT-III

Vector Calculus:

13 Hours

Scalar point function and vector point function, derivative of a vector valued function, velocity and acceleration-problems. Gradient, divergence, curl, Laplacian, solenoidal and irrotational vectors - problems.

Vector Integration:

Line integrals, surface integrals and volume integrals. Green's theorem, Stoke's theorem, Gauss divergence theorem (without proof) - problems

UNIT-IV

Laplace Transforms:

13 Hours

Definition - Transforms of elementary functions. Derivatives and integrals of transforms. Periodic function, unit step function and unit impulse function – problems.

Inverse Laplace transforms :

Properties. Convolution theorem. Solutions of linear differential equations. Applications to Engineering problems.

Total 52 Hours

Text Books :

1. Dr. B.S. Grewal, “Higher Engineering Mathematics”, Khanna Publishers, New Delhi.
2. E. Kreyszig, “Advanced Engineering Mathematics”, vol-I, Edition:2014(John Wiley & Sons).

Reference Books :

1. Dennis G Zill and Warren S Wright “Advanced Engineering Mathematics” Jones and Bartlett Student Edition.
2. R.K,Jain and S R K Iyengar, “Advanced Engineering Mathematics”, Taylor & Francis, 22- May-2002.

Question paper pattern for SEE :

1. Total of **eight** questions with **two** from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than **four** subdivisions.
3. Any **five** full questions are to be answered choosing at least one from each unit.

UHS143K/UHS243K: ENGLISH
(Compulsory Subject)

I. Vocabulary:

1. One word substitution
2. Synonyms and Antonyms
3. Homonyms and Homophones
4. Idioms and Phrases
5. Confusing words

II. Grammar:

1. Parts of speech
2. Time and Tense
3. Active voice and Passive voice
4. Analysis of sentences: Simple, Compound and Complex
5. Punctuation

III. Composition:

1. Note Making
2. Essay Writing
3. Precise Writing
4. Letter Writing
5. E-mail Correspondance
6. Report Writing
7. Preparation of C.V/Resume/Bio-Data

IV. Conversation Skills (Listening and speaking):

Introducing, Greeting, Requesting, Inviting, leave Taking, Suggesting, Agreeing, Disagreeing, Complaining, Apologizing

V. Reading:

Skimming and Scanning through the Text

VI. Short Stories:

1. The Open Window - Saki
2. Kabuliwala - Rabindranath Tagore

Total 26 Hours

Reference Books :

1. Margaret M Maison, "ExamineyourEnglish", Orient Blackswan, 1964.
2. Sriraman T & Krishnaswamy N "Current English for Colleges", Laxmi Publications, 2012
3. Dr. L Adinarayana "Spoken English", Neelakamal publications Pvt.Lmt, 2006..
4. English Grammar and Composition., Wren & Martin., Revised by Dr. N. D. V. Prasad Rao
5. Delight and wisdom- An Anthology of Short Stories., Orient Blackswan., 2009

UHS144K / UHS244K : ಕನ್ನಡ ಮನಸು
(Compulsory Subject)

ಭಾಷೆ ಮತ್ತು ಬರಹ

1. ಯೋಜನೆ ಸಿದ್ಧ ಪಡಿಸುವುದು, ಯೋಜನೆಯ ಸಾರಾಂಶ ಬರೆಯುವುದು
2. ಪತ್ರ ಲೇಖನ
3. ಭಾಷೆ ಮತ್ತು ಬರಹ ಶುದ್ಧಿ - ಗಮನಕೊಡುವುದು ಒಂದು ಪುಟದ ಸೆಮಿನಾರ್ ಪೇಪರ್ ಸಿದ್ಧಪಡಿಸುವುದು
4. ಪುಷ್ಪರಗಳೆ - ಹರಿಹರ
5. ವಚನಗಳು - ಅಲ್ಲಮಪ್ರಭು, ಬಸವಣ್ಣ
6. ಕೀರ್ತನೆಗಳು - ಪುರಂದರದಾಸರು
7. ತತ್ವ ಪದಗಳು - ನಿಜಗುಣ ಶಿವಯೋಗಿ
8. ಶ್ರಾವಣ (ಕವನ) - ದ.ರಾ. ಬೇಂದ್ರೆ
9. ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗ - ಡಿ.ವಿ.ಜಿ. (ಹತ್ತು ಪದ್ಯಗಳು)
10. ನನ್ನ ದೇಹದ ಬೂದಿ - ದಿನಕರ ದೇಸಾಯಿ
11. ಬ್ಲೆನ್ ಹೀಂ ಕದನ - ಬಿ.ಎಂ.ಶ್ರೀ
12. ಜನಪದ ಹಾಡು
13. ಸರ್. ಎಮ್. ವಿಶ್ವೇಶ್ವರಯ್ಯ ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ (ವ್ಯಕ್ತಿ ಚಿತ್ರ) - ಎ.ಎನ್. ಮೂರ್ತಿರಾವ್
14. ಧನ್ವಂತರಿಯ ಚಿಕಿತ್ಸೆ (ಕಥೆ) - ಕುವೆಂಪು
15. ಜ್ಯೋತಿಷ್ಯ ಅರ್ಥಪೂರ್ಣವೋ ? ಅವೈಜ್ಞಾನಿಕವೋ - ಡಾ. ಎಚ್. ನರಸಿಂಹಯ್ಯ

Total 26 Hours

ಆಕರ ಗ್ರಂಥಗಳು

1. ಅಲ್ಲಮಪ್ರಭು ವಚನಗಳು : ಸಂ. ಡಾ. ವಿ.ವಿ. ಮಲ್ಲಾಪೂರ (ವಚನ ಸಂಪುಟ-2) ಕನ್ನಡ ಮತ್ತು ಸಂಸ್ಕೃತಿ ಇಲಾಖೆ, ಬೆಂಗಳೂರು
2. ಗರತಿಯ ಹಾಡು : ಸಂಪಾದಕರು - ಹಲಸಂಗಿ ಗೆಳೆಯರು
ಪ್ರಕಾಶಕರು - ಕನ್ನಡ ಸಾಹಿತ್ಯ ಪರಿಷತ್ತು, ಪಂಪಮಹಾಕವಿ ರಸ್ತೆ, ಚಾಮರಾಜಪೇಟೆ, ಬೆಂಗಳೂರು ಮರುಮುದ್ರಣ - 2002
3. ಡಿ.ವಿ.ಜಿ. ಕೃತಿ ಶ್ರೇಣಿ : ಸಂಪುಟ - 9, ಕಾವ್ಯ - 1
ಸಂಪಾದಕರು : ಡಾ. ಹಾ.ಮಾ. ನಾಯಕ
ಪ್ರಕಾಶಕರು : ಕನ್ನಡ ಮತ್ತು ಸಂಸ್ಕೃತಿ ನಿರ್ದೇಶನಾಲಯ, ನೃಪತುಂಗ ರಸ್ತೆ, ಬೆಂಗಳೂರು

UHS 145K/ UHS245K : KANNADA KALI
(Compulsory Subject)

- Lesson 1. Introducing each other-I
Personal Pronouns, Impersonal Pronouns, Reflexive Pronouns,
Reflexive Pronouns
- Lesson 2. Introducing each other-2
Empathetic Pronouns, Demonstrative pronouns, Indefinite
Pronouns
- Lesson 3. About Ramayana
Distributive Pronouns, Relative Pronouns, / which, where, when,
whose etc.
- Lesson 4. Enquiring about a room for rent
Qualitative and Quantitative Adjectives
- Lesson 5. Enquiring about the college.
Predicative forms, Locative Case
- Lesson 6. In the Vegetable Market
Dative Case, Defective Verbs
- Lesson 7. About Medical College
Numbers: ordinal /cardinal, Plurals, Markers
- Lesson 8. Plan for a Picnic
Imperative, Permissive and hortative
- Lesson 9. Conversation between a Doctor and a patient:
Verb –‘iru’, negation –‘illa’, potential forms, accusative case
- Lesson 10. In a Cloth Shop
Colour Adjectives, defective Verbs
- Lesson 11. Plan go to a movie
Comparative degree, non-past tense, instrumental and ablative case
- Lesson 12. About Brindavana Garden
Past tense, negation
- Lesson 13. Routine Activities of a Student
Simple Present, Present Continuous
- Lesson 14. Telephone Conversation
Past and Present Perfect, Past Continuous, and negations
- Lesson 15. About Beluru and Halebidu
Relative Participles, negations and Participle Nouns
- Lesson 16. Discussion on Examination and Future Plans
Simple and Negative Conditions
- Lesson 17. Karnataka (Lesson)
- Lesson 18. Kannada Bhashe (Lesson)
- Lesson 19. Tongue Twisters
- Lesson 20. Bekubedagalu
- Total 26 Hours**

Reference Books :

1. Lingadevaru Halemane, “**Kannada Kali**”.