CVM UNIVERSITY

FACULTY OF SCIENCE, SYLLABUS & COURSE STRUCTURE(B.Sc GENERAL & HONS)

B.Sc. SEMESTER – 1, SUBJECT : PHYSICS

Course Title – Basic Concepts of Physics

Course Code – UG01CPHY01

No. of Credits – 4, Contact hours per week – 4

Examination Duration – 3 hours

Marks distribution : Total Marks : 100(40 Internal + 60 External)

Unit – 1 : Sound Waves

Introduction to sound waves, Velocity of longitudinal waves in gaseous and solid medium(formula only), Calculation of velocity of sound in air: Newton's formula and Laplace's formula, Factors affecting velocity of sound in air, Effect of pressure, temperature, humidity and wind on velocity of sound in air, Kundt's tube, Applications of Kundt's tube. Ultrasonic Waves : Production of ultrasonic waves : Magnetostriction method and Piezo-electric method, Detection of ultrasonic waves, Properties of ultrasonic waves, Applications of ultrasonic waves.

Books :

1. "Engineering Physics" by R. K. Gaur and S. L. Gupta, Dhanpat Rai Publications, New Delhi
2. "Engineering Physics" by K. Rajagopal, PHI Learning pvt. Ltd., New Delhi

Unit – 2 : Elasticity

Introduction, Three types of elasticity, Work done per unit volume in elongation strain, Deformation of a cube-Bulk modulus, Modulus of rigidity, Young modulus, Relation connecting the elastic constants, Poisson's ratio, Limiting values of σ, Determination of Poisson's ratio for rubber, Factors affecting elasticity, Twisting couple on a cylinder (or wire) ,Torsional pendulum, Determination of η – Statical method (Horizontal twisting apparatus for a rod), Maxwell's vibrating needle method, Bending of beam, Bending moment, Cantilever, Numericals.

Books:

1. "Elements of Properties of matter" by D. S. Mathur S Chand publication
2. "Mechanics" by D. S. Mathur S Chand publication

Unit – 3 : Optics

Interferometry : Introduction to interference, Jamin's interferometer, Michelson's Interferometer; Types of fringes, white light fringes, Uses of Michelson's interferometer: measurement of wavelength of light of a monochromatic source, measurement of refractive index of a thin plate, Interference in thin film; introduction, interference due to reflected light, conditions for maxima and minima, **Resolving power of optical instruments** Resolving power, Rayleigh's criterion; limit of resolution, Resolving Power of Telescope, Resolving Power of Microscope (light microscope), Resolving Power of diffraction Grating, Resolving Power of prism spectroscope

Books:

1. "A textbook of OPTICS" by Dr. N. Subrahmanyam, Brij Lal (25th revised edition) S. Chand.
2. "A textbook of light" by D. N. Vasudeva, (10th Edition), Atma Ram & Sons, New Delhi

Unit – 4 : Network analysis, network theorems and bridges

Network analysis: Introduction, direct method, network reduction method, Kirchhoff's laws (KCL, KVL), network terminology, network analysis by mesh current method (two mesh network and three mesh network), network analysis by node-pair voltage (one node pair network and two node pair network)

Network theorems: Voltage divider theorem, superposition theorem, Thevenin's theorem, Norton's theorem, maximum power transfer theorem, numericals

Miscellaneous: RFID, Bar code reader, Telemetry, Data logger, (H. S. Kalsi, Electronic Instrumentation)

Book:

1. "Network Analysis" by M. E. Van Valkenburg, Third edition, PHI
2. "Electronic Instrumentation" by H. S. Kalsi

CVM UNIVERSITY

FACULTY OF SCIENCE, SYLLABUS & COURSE STRUCTURE(B.Sc GENERAL & HONS)

B.Sc. SEMESTER – 1, SUBJECT : PHYSICS

Course Title – Physics Practicals

Course Code – UG01CPHY02

No. of Credits – 2, Contact hours per week – 3, Examination Duration – 3 hours

Marks distribution : Total Marks : 100(40 Internal + 60 External)

Mechanics

1. Determination of Modulus of Rigidity of a steel rod using Statical method
2. Couple per unit twist of a wire using Torsional pendulum
3. Melds experiment
4. Young Modulus of a cantilever
5. Poisson's ratio for rubber
6. Determination of Modulus of Rigidity of a steel wire using Dynamical method

Electronics

1. Determination of frequency of ac current using Sonometer
2. Characteristics of PN junction diode(Forward & Reversed bias characteristics)
3. Evaluation of A.C. components for a Half wave rectifier
4. Evaluation of A.C. components for a Full wave rectifier
5. Conversion of galvanometer in to voltmeter
6. Conversion of galvanometer in to ammeter
7. Zener Diode characteristics

Optics and Numerical Analysis

1. Resolving power of a prism
2. Least square fitting for given linear data

CVM UNIVERSITY
B.Sc. (General & Honors)
SEMESTER -I
Core Course – Chemistry (theory)
GENERAL CHEMISTRY- I
UG01CCHE01

4 Credits, 4 periods per week
Total Learning Hours - 60

Unit-I ORGANIC CHEMISTRY

Alkane, Alkene, Alkyne, Cycloalkane & Spiro compounds:

IUPAC nomenclature of alkanes, cycloalkane, spiro alkane, alkenes and alkynes. Bayer strain theory, Preparation of alkane, Mechanism of halogenations of alkane, Orientation of halogenations: n-butane, isopentane and n-pentane.

Alkenes: Preparation from dehydrohalogenation of alkyl halide with Mechanism, dehydration of alcohol. The E2 mechanism, Evidence: Absence of hydrogen exchange, The E1 mechanism, Evidence accompanished by rearrangement, Electrophilic addition Mechanism, Electrophilic addition rearrangement, Mechanism of addition of halogen, Halohydrin formation, Free-radical addition, Hydroxylation, Ozonolysis. Alkynes: Preparation from dehydrohalogenation of alkyl halide, Reaction of metal acetylide with primary alkyl halides, Hydration of alkynes, Analysis of alkynes.

UNIT-II INORGANIC CHEMISTRY

Periodic Table And Periodic Properties: Brief introduction and types of elements, Shielding effect and effective nuclear charge, Factor affecting the magnitude of σ and Zeff and their variation in the periodic table, Slater's rule for calculation σ and Zeff.

Ionization Energy: Successive ionization energy, Factor affecting magnitude of Ionization Energy, Find out the order of second IE values of the element of second period, Variation of IE values in different element groups, Difference between Ionization potential and Electrode potential of a metal.

Electron Affinity: Relation between EA of X(g) atom and IE of X-(g) ion, EA2 represents energy required, Factor affecting the magnitude of electron affinity.

Electronegativity: Different methods used for calculating electronegativity (like Pauling, Mulliken, Allred-Rachow), Factor affecting the magnitude of electronegativity, Role of electronegativity in chemical behavior, Application of electronegativity. Numericals based on above topics.

UNIT- III PHYSICAL CHEMISTRY

Ionic Equilibria In Aqueous Solutions: Acids & Bases, Arrhenius theory of Acids and Bases, The Lowry – Bronsted Concept, Strength of Acids and Bases, The Lewis concept, pH Scale, Self Ionization of water, Hydrolysis, Buffer Solutions, Indicator, Sparingly Soluble Salts, Common ion effect, Selective Precipitation, Numericals based on above topics.

UNIT-IV ANALYTICAL CHEMISTRY

Titrimetric Methods in Analysis: Introduction, types of titrations, Definitions: Standard solutions, Equivalence Point, Indicators, End point, Titration General Aspects of: Primary standards, secondary standards, Desirable properties of standard solution. Volumetric calculations: Molarity, Normality, percentage concentration, parts per million, % V/V, % W/V solution.

Basic text and Reference Books :

1. Vogel, A.I., Textbook Quantitative Chemical Analysis, Prentice-Hall, 5th edition. 2. Day, R. A. and Underwood A. L., Quantitative Analysis 6th Edition.
3. Prakash S., Tuli, G. D., Basu, S. K., Madan R. D., Advance inorganic chemistry (Vol. - I).
4. Mahan, B.H. University Chemistry, 3rd Ed. Narosa. 5. Morrison, R. T. & Boyd, R. N., Organic chemistry (6th edition).
6. Cotton, F.A. & Wilkinson, G. Basic Inorganic Chemistry, Wiley.
7. Lee J. D., Concise Inorganic Chemistry (4th Edition).
8 IUPAC. Compendium of Chemical Terminology, 2nd ed. (the "Gold Book"). Compiled by A. D. McNaught and A. Wilkinson. Blackwell Scientific Publications, Oxford (1997). Online version (2019-) created by S. J. Chalk. ISBN 0-9678550-9-8.

CVM UNIVERSITY
B.Sc. (General & Honors)
SEMESTER -I
Core Course – Chemistry (practical)
GENERAL CHEMISTRY- I
UG01CCHE02

2 Credits, 4 periods per week
Total Learning Hours - 60

[A]Volumetric analysis of :
(1) Preparation and standardization of NaOH and HCl
(2) Succinic acid with NaOH
(3) Oxalic acid with NaOH
(4) Na_2CO_3 with HCl

[B] Organic Qualitative Analysis of single component:
Identification of Organic substance, detection of elements, Type of compound like aliphatic/aromatic, Nature (acidic/phenolic/basic/neutral), Functional group(s) analysis, and melting point, boiling point determination of the following compounds.

Benzoic acid, Salicylic acid, Cinnamic acid, α-naphthol, β-Naphthol, resorcinol, p-nitroaniline , m-nitroaniline, Acetanilide, Benzamide, Urea, Naphthalene, p-dichlorobenzene, m-dinitrobenzene, Acetone, Benzaldehyde, Methanol, Methyl acetate, Aniline, toluene, chloroform.

Reference Books:.
(1)‘Vogel’s Textbook of Quantitative Chemical analysis’ Revised by G. H. Jeffery, J. Bassett, J. Mendham & R. C. Denney, 5/E , ELBS (English Language Book Society) Longman
(2) ‘Analytical Chemistry’ by Dhruba Charan Dash, PHI Learning Private Ltd, New Delhi, 2011.
(3)Comprehensive Practical Organic Chemistry – Qualitative Analysis’ by V. K. Ahluwalia, Sunita Dhingra University Press (India) Private Limited, Hyderabad, First Indian Reprint 2010.
(4)‘Elementary Practical Organic Chemistry Part-2, Qualitative Organic Analysis’ by Arthur I. Vogel,-CBS Publishers & Distributers, New Delhi.(Second edition, reprint 2004)

CVM UNIVERSITY
FIRST YEAR B. Sc. (SEMESTER 1)
[For B.Sc. General & Honours]
PLANT & ANIMAL BIODIVERSITY
(Four Credit Course, Four hours per week)
(Effective from June – 2020)
(Total Marks-100, Internal-40 marks, External -60 marks)
UG01CBIO01 (T)

Unit -1 Plant biodiversity

Viruses- Properties, structure & symmetry, replication,TMV,bacteriophage
Bacteria-Classification based on morphology and No & arrangement of flagella
Vegetative, Asexual and Sexual Reproduction, Economic imp of bacteria
Algae- General characteristics of Algae, Life cycle of *Nostoc*, *Zygnema*, Economic importance of Algae
Fungi- General characteristics, Life cycle of *Mucor*, *Penicillium*, Economic importance, Economic importance of Fungi, General account of Lichen
Bryophytes - General characters, Life cycle of ***Riccia*** & *Funaria*
Pteridophytes - General characters, Life cycle of *Lycopodium*
Gymnospersm - General characters and life cycle of *Cycas*

Unit-2 Plant Morphology and taxonomy

Leaf morphology - Parts of Leaf, Simple Leaf, Compound leaf - types
Phyllotaxy and its types
Flower – 4 whorls, types of flower, Aestivation,Placentation,,
Inflorescence- Cymose and its types, Racemose and its types, Special Inflorescence
Angiosperms- General characters, Outline of Bentham and Hooker's system of classification
General characters and economic importance of Malvaceae, Fabaceae, Solanaceae

Unit-3 General Account of Non -Chordates

Outline classification of major non-chordate phyla upto class
(Protozoa-Hemichordata)
Nutrition in protozoa and locomotion in protozoa
Canal system in sponges,Types of nematocysts, Metamerism in annelida
Larval forms of crustacea, Mouth parts of insects, Excretion in arthropoda
Respiration in mollusca, Water vascular system

Unit-4 General Account of Chordates

Outline classification of Phylum Chordata upto class (Protochordata to Mammalia)
Origin of vertebrates, Scales in fishes, Golden age of reptiles – dinosaurs
Flight adaptations in birds, Digration in birds, Dentition in mammals-Adaptation of aquatic mammals, flying vertebrates

Refernce Books:

1. Text book of Botany – Diversity of Microbes and Cryptogams_ Singh,Pande and Jain
2. Morden Text Book Of Zoology Invertibrates_ R.L. Kotpal Invertibrate Zoology_ E.L. Jorden and P.S. Verma
3. Cell Biology_ P.S. Verma
4.Textbok of Invertibrate Zoology- G S Sandhu
5.Cell biology, Genetics, Molecular Biology, Evolution & Ecology- P.S. Verma and V.K. Agarwal
6.College Botany- Vol1- Gangulee, Das and Dutta
7.Taxonomy of Angiosperms
8.A text book of Angiosperms : B P Pandey
9.Cryptogamic Botany Vol. I : Smith G M
10.Algae : B R Vashistha
11.Introductory Mycology : Alexopolus C J s
12.Introduction to Fungi : DubeyH C
13.Bryophyta : Parihar N S
14.Pteridophyta : Parihar N S
15.A text book of Botany : A C Dutta
16.Invertebrate Zoology : Jordan and Verma

CVM UNIVERSITY
FIRST YEAR B. Sc. (SEMESTER 1)
[For B.Sc. General & Honours]

BIOLOGY PRACTICAL

(Four Credit Course, Four hours per week)
(Effective from June – 2020)
(Total Marks-100, Internal-40 marks, External -60 marks)
UG01CBIO02 (P)

1. Study of viruses with the help of Electron Micrograph/ Models TMV, Bacteriophage
2. Study of Bacteria with the help of permanent slides (PS)
3. Study of vegetative/ reproductive structure of Nostoc and Zygnema by temporary mounting and PS
4. Study of vegetative and reproductive structure of Mucor and Penicillium by temporary mounting and PS
5. Study of Lichens with the help of specimen and PS
6. Study of Riccia- Thallus morphology(gametophyte) ,Sporophyte (specimen and PS), Study of Funaria- Plant morphology(gametophyte& sporophyte), Mounting of Antheridia and Archigonia, CAPSULE L S (specimen/ PS)
7. Study of Lycopodium- Plant morphology, T S of Stem, strobilus structure (Specimen/ PS)
8. Study of Cycas-T S of Needle- double stain technique, Male cone, Microsporophyll, Coralloid root (Specimen/PS)
9. Study of Leaf- Parts of simple leaf, compound leaf and its types- Pinnate & Palmate compound
10. Studyof Phyllotaxy and its types: Alternate, Opposite, Whorled
11. Study of Inflorescence- Racemose & its types, Cymose & its types ,Study of Special types of Inflorescence- Hypanthodium, Cyathium, Verticillaster, Solitary- terminal and Axillary
12. Flower and its four whorls, Types of flowers based on position of ovary
13. Study of Family – Malvaceae
14. Study of Families –Fabaceae, Solanaceae
15. Study of life forms and classification of PROTOZOA, PORIFERA AND COELENTERATA (Amoeba, Paramoecium, Euglena, Leucosolenia, Hyalonema, Euspongia, Hydra, Physalia, Aurelia, Sea anemone) -study of sponge spicules and spongin fibers
16. Study of life forms and classification of PLATYHELMINTHES, NEMATHELMINTHES AND ANNELIDA (Planaria, Liver fluke, Hook worm, Ascaris, Earthworm, Nereis, Leech)
17. Study of life forms and classification of ARTHROPODA (Peripatus, Millipede, Silverfish, Grasshopper, Cockroach, Butterfly, Crab, Lobster, Spider)
18. Study of life forms and classification of MOLLUSCA, ECHINODERMATA AND HEMICHORDATA (Dentalium, Chiton, Pila, Unio, Octopus,Starfish,Brittle star, Feather star, Sea urchin,Sea cucumber, Balanoglossus)
19. Study of larval forms of Crustacea
20. Study of Mouth parts of Insects
21. Classification of PROTOCHORDATA, CYCLOSTOMATA, PISCES (Ascidia,Amphioxus, Lamprey, Shark, Electric Ray, Labeo Rohita, Exocoetus)
22. Classification of Amphibians and Reptiles (Salamander, Frog, Turtle, Calotes, Chameleon, Alligator, Rhacophorus,Draco, Flying snake)
23. Classification of Aves and Mammals (Pegion, Koel, Parrot, Shrew, Bat, Rabbit, Flying squireel)
24. Study of types of scales in fishes (Placoid, Cycloid, Ganoid and Ctenoid)
25. Study of Beak and feet adaptations in birds
26. Study of types of feathers