Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon

Department of Chemistry

TEACHING PLAN (2023-2024)

Subject: Physical Chemistry and Inorganic Chemistry

Paper No. CH - 101 and CH - 201 Class: F. Y. B. Sc

Name of the Teacher: Prof. Yogesh N. Khairnar/
Dr. G. N. Jethave Signature:

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Core Course-A-I CH -101** **Semester I** **Chapter 1: Atomic Structure (Part-I)** a) Atomic Models: Thomson Model, Rutherford's Nuclear Model b) Emission and Absorption Spectra: Line spectra and band spectra, line spectra of Hydrogen atom, c) Bohr Model for Hydrogen atom, explanation of line spectra of hydrogen atom, Limitations & Reasons for failure of Bohr Model d) Quantum Mechanical Model of atom: Dual behaviour of matter, Davisson–Germer experiment, Heisenberg's Uncertainty Principle, Orbitals and quantum numbers and their importance Ref. 1, 2 (Relevant pages)	Offline/ICT	06
2	**Chapter 2: Mathematical Preparation in Chemistry** a) Logarithm: Rules of Logarithm (without proof), Characteristic and Mantissa of Logarithm, Negative Logarithm, numerical based on applications of Logarithm in calculating pH with change of base of logarithm, antilogarithm. b) Graphical representation of equations: Rules for drawing graph co-ordinates etc., Equation of straight line, slope and intercept, plotting the graph from the given experimental data and numericals. c) Derivative: Significance, Rules of differentiation (without proof), Algebraic, Logarithmic and exponential functions and numerical. d) Integration: Significance, rules of integration (without proof), Integration with limit, Algebraic, Logarithmic and exponential functions and numerical. e) Numericals of each method related to Chemistry. Ref. 3, 4 (Relevant pages)	Offline/ICT	06
	Reference Books [1] Essentials of Physical Chemistry,B. S. Bahl, G. D. Tuli, Arun Bahl (S. Chand and Co Ltd.) (25th edition). [2] Elements of Physical Chemistry, S. Glasstone and D. Lewis (The Macmillan Press Ltd. (2^{nd} edition). [3] Principles of Physical Chemistry, S. H. Maron and C. F. Prutton (4th edition). [4] Principles of Physical Chemistry, B. R. Puri, L. R. Sharma, M.S. Pathaniya [5] Mathematical Preparation for Physical Chemistry,		

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
	Farrington Daniels, Mc Graw- Hill		
4	**Core Course-A-II CH: 201** **Semester II** **Chapter 1: Liquid State** Introduction, Surface tension of liquid, units of surface tension, factors affecting surface tension, determination of surface tension of liquids by single capillary method and stalagnometer method. Viscosity of liquid, units of viscosity, measurement of viscosity of liquid by Ostwald's method, related numerical. **Ref. 2, 3 (Relevant pages)**	Offline/ICT	06
5	**Chapter 2: Chemical Equilibrium** a) Introduction, reversible reaction, characteristics of chemical equilibrium, law of mass action, equilibrium constant: equilibrium law, equilibrium constant in terms of partial pressures, calculations involving Kp, liquid systems, heterogeneous equilibria. b) Le Chatelier's principle, effect of change in concentration, pressure, temperature, conditions for maximum yield in industrial processes, synthesis of ammonia (Haber process), related numerical.	Offline/ICT	06
6	**Chapter 3: Second Law of Thermodynamics** Introduction, Limitations of first law of thermodynamics, spontaneous and non spontaneous process with examples, Statements of second law of thermodynamics, entropy, entropy changes in isolated systems, entropy changes for systems only, entropy of mixing of gases, entropy changes in ideal gases and physical transformation, Numerical. **Ref.1 (Relevant pages)**	Offline/ICT	08
	Reference Books [1] Principles of Physical Chemistry, S. H. Maron and C. F. Prutton (4th edition). [2] Essentials of Physical Chemistry, B. S. Bahl, G. D.Tuli, Arun Bahl (S. Chand and Co Ltd.) (25^{th} edition). [3] Elements of Physical Chemistry, S. Glasstone and D. Lewis (The Macmillan Press Ltd. (2^{nd} edition).		

Feedback: Students are assessed by conducting internal test on topics

Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon
Department of Chemistry
TEACHING PLAN (2023-2024)
Subject: Organic and Inorganic Chemistry (Section B)

Paper No. CH: 102 and CH: 202 Class: F. Y. B. Sc

Name of the Teacher: Prof. Y. N. Khairnar/
Dr. G. N. Jethave/ Prof. C. P. Patil Signature:

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Core Course-A-I Semester – I CH: 102** **Chapter 1: Introduction to Organic Chemistry** Introduction, general properties of organic compounds, applications of organic compounds in everyday life. Benzene and its stability, Huckel's rule of aromaticity, nomenclature of derivatives of benzene (mono and disubstituted benzene only) Structural effects: Inductive effect, resonance, hyper conjugation, steric effect, electromeric effect Fission of covalent bond: homolytic and heterolytic fission, types of reagents: electrophiles and nucleophiles, types of organic reactions: addition, elimination, substitution and rearrangement reactions. **Ref. 1,2,3,4 (relevant pages)**	Offline/ICT	08
2	**Chapter 2: Hydrocarbons** **Alkanes:** Introduction, nomenclature (common and IUPAC system) Preparation of alkanes: by Wurtz reaction, by hydrogenation of alkenes. Reactions of alkanes: halogenation, combustion. **Alkenes:** Introduction, nomenclature (common and IUPAC system) Preparation of alkenes: by dehydration of alcohols, dehydrohalogenation of alkyl halides, Reactions of alkenes: Addition of halogen, hydrogen halide and hydration. **Alkynes:** Introduction, nomenclature (common and IUPAC system) Preparation of alkynes: by Double Dehydrohalogenation of vicinal and geminal dihalides, by alkylation of acetylene. Reactions: Addition of halogens, hydrogen halides, hydration. Ref. 1,2,3,4 (relevant pages)	Offline/ICT	08
3	**Chapter 3: Haloalkanes and haloarenes** **Haloalkanes:** Introduction, classification, nomenclature (common and IUPAC system) Monohalogen derivatives: Classification, methods of preparation- from alcohols (using HX, PX3, PX5, SOCl2). Reactions - with aqueous alkali, sodium alkoxide, alc.KCN, silver salt of acid, alc.ammonia, NaSH/ KSH, dehydrohalogenation, formation of Grignard's reagent. Dihalogen derivatives: preparation of vicinal and geminal dihalides, reactions: hydrolysis with aq. NaOH. **Haloarenes:** Introduction, nomenclature, reactions of haloarenes: nucleophilic substitution reactions with NaNH2/ KNH2, NaOH, NH3, CuCN, Ullman reaction.	Offline/ICT	10

	Ref. 1,2,3,4 (relevant pages)		
4	**Chapter 4: Alcohols, phenols and ethers Alcohols:** Introduction, classification, nomenclature (common and IUPAC system), methods of preparation: from Grignard's reagent (using aldehydes and Ketones), by reduction of aldehydes and ketones. Physical properties of alcohols. Reactions of alcohols: reaction with active metals, dehydration, oxidation. **Phenols:** Introduction, nomenclature, acidity of phenols, Preparation of phenol from benzene sulphonic acid, benzene diazonium chloride, Reactions of phenols: ester formation (acylation), formation of aryl ethers. **Ethers** - Introduction, classification, nomenclature (common and IUPAC system), methods of preparation: by Williamson's synthesis, by dehydration of alcohols, from diazomethane. Reactions of ethers: reaction with hot and cold HI, hydrolysis with dil. H2SO4. **Ref. 1,2,3,4 (relevant pages**	Offline/ICT	08
	Reference Books [1] Organic Chemistry - Francis A Carey (3rd Edition) [2] Organic Chemistry - Morrison and Boyd (6th Edition) [3] Organic Chemistry - Stanley H pine (5th Edition) [4] A Text Book of Organic Chemistry Arun Bahl and B S Bahl, S Chand publication.		
5	**Core Course-A-II Semester –II CH:202** **Chapter 1: Aldehydes and ketones** Introduction, structure of carbonyl group, nomenclature of aldehydes and ketones (common and IUPAC system) **Aliphatic Aldehydes:** Preparation of aliphatic aldehydes- by reduction of acid chlorides, from Grignard' reagent and HCN, from terminal geminal dihalides and from calcium salt of acids. **Aliphatic Ketones:** Preparation from Grignard's reagent and R-CN, from nonterminal geminal dihalides, from calcium salt of acids. **Reactions of aliphatic aldehydes & Ketones:** Reducing properties of aldehydes: reaction with Tollen's reagent and Fehling's solution, Clemmenson reduction, Wolff Kishner reduction, Aldol condensation, crossed Aldol, Cannizzaro reaction, crossed Cannizzaro reaction, addition of HCN, NaHSO3, addition of derivatives of ammonia (hydroxyl amine, phenyl hydrazine, 2,4 DNP, semicarbazide). **Aromatic aldehydes and ketones:** Preparation of benzaldehyde by Gatterman Kotch reaction, by oxidation of toluene. Reactions of benzaldehyde: addition of HCN, addition of Grignard's reagent, benzoin condensation. Preparation of acetophenone: by oxidation of ethyl benzene, by F C acylation. Reactions of acetophenone: addition of HCN, addition of Grignard's reagent, oxime formation. **Ref. 1,2,3,4 (relevant pages)**	Offline/ICT	12

6	**Chapter 2: Carboxylic acids and their derivatives** **Carboxylic acids:** Introduction, nomenclature (common and IUPAC system), preparation of carboxylic acids: by carbonation of Grignard's reagent, and by hydrolysis of nitriles. Physical properties of acids, acidity of carboxylic acids. Reactions of carboxylic acids: formation of salt (with NaOH, KOH, Na_2CO_3, $NaHCO_3$, NH_4OH and active metals), Hell- Volhard- Zelinsky reaction, formation of acid anhydrides. **Aromatic carboxylic acids**: Preparation of benzoic acid: by hydrolysis of phenyl cyanide and by carbonation of Grignard's reagent. Reactions of benzoic acid: formation of salt, benzoyl chloride, benzamide and reduction to benzyl alcohol. **Esters:** Preparation of esters- from alcohol & acid, alcohols & acid chloride, alkaline and acidic hydrolysis of esters. **Acid chlorides:** preparation of acid chlorides from carboxylic acids by using PCl_3, PCl_5, $SOCl_2$. Reactions of acid chlorides with benzene and with sodium salt of acids. **Amides –** Preparation of amides from acid and ammonia and from acid chloride and ammonia. Reactions of amides – hydrolysis and Hofmann rearrangement. **Ref. 1, 2, 3, 4 (relevant pages)**	Offline/ICT	10
7	**Chapter 3: Amines (L: 08, M: 12)** **Aliphatic amines**: Introduction, classification, nomenclature (common and IUPAC system), preparation of amines: by reduction of nitro alkanes, nitriles and oximes, by alkylation of primary and secondary amines, by reduction of isocyanides. Basicity of amines, reactions: action of nitrous acid, acylation, carbyl amine test, Hinsberg's test. **Aromatic amines** Preparation of aniline: from chlorobenzene and from nitrobenzene. Basicity of aromatic amines. Reactions: benzoylation, N- alkylation. Preparation of benzene diazonium chloride, reactions of benzene diazonium chloride: formation of iodobenzene, Sandmeyer reaction, azo coupling reaction: formation of methyl orange. **Ref. 1, 2, 3, 4 (relevant pages)**	Offline/ICT	8
	Reference Books 1. Organic Chemistry - Francis A Carey (3rd Edition) 2. Organic Chemistry - Morrison and Boyd (6th Edition) 3. Organic Chemistry - Stanley H pine (5th Edition) 4. A Text Book of Organic Chemistry- Arun Bahl and S Bahl, S Chand publication.		

Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon

Department of Chemistry

TEACHING PLAN (2021- 2022)

Subject: Physical and Inorganic Chemistry (Section A) CH: 101

Paper No. CH - 101 and CH - 201 Class: F.Y.B. Sc

Name of the Teacher: Prof. Y. N. Khairnar

Dr. G. N. Jethave

Signature:

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Core Course-A-1(Semester I)** **CH: 101 Inorganic Chemistry (Section A)** **Chapter 4: Periodic properties** **a) Atomic and ionic size** Definition and explanation of atomic radius, ionic radius, covalent radius and Van der Waal radius. Variation of atomic size along a period and a group. **b) Ionization energy** Definition and explanation, factors affecting ionisation energy. Variation of ionisation energy along a period and a group. Applications of I. E. to chemical behavior of an element. **c) Electron affinity** Definition and explanation, factors affecting electron affinity. Variation of electron affinity along a period and a group. Applications electron affinity to chemical behavior of an element. Difference between I.E. and E.A. **d) Electro negativity** Definition and explanation, factors affecting electro negativity. Variation of electro negativity along a period and a group. Pauling's electro negativity scale, Mullikan's approach of electro negativity, electro negativity and percent ionic character. **Ref.1, 2 (Relevant pages)**	Offline/ICT	08
2	**Chapter 5: S block element** Electronic configuration, variation in properties of S block elements: atomic radii, ionization energy, colour of flame, reducing property, metallic property. Complexes of alkali metals with salicylaldehyde, acetyl acetone, wrap around complexes with polydentate ligand such as crown ether and cryptate. Complexes of alkali metals such as beryllium oxalate ion, chlorophyll, complexes of Ca and Mg with EDTA. **Ref. 1, 2 (Relevant pages)**	Online / ICT	07
	Reference Books [1] Advanced inorganic chemistry volume 1 – Satyaprakash Tuli, Basu, Madan(S Chand publications) [2] Concise inorganic chemistry – J D Lee (5th edition)		

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
3	**Core Course-A-II CH: 201** **Semester II** **Chapter 4: Metals and metallurgy** Occurrence of metals, various steps involved in metallurgical processes, concentration of ore, calcinations, roasting, reduction to free metals, electrometallurgy, hydrometallurgy, refining of metals. **Ref.1, 2 (Relevant pages)**	ICT/Black board	07
4	**Chapter 5: P block elements** Electronic configurations of P block elements. Variation in properties: atomic radius, ionisation energy, electron affinity, electro negativity, metallic character, oxidation state, reactivity. Acidic and basic character of hydroxides of P block elements. Bonding and shapes of following molecules: Al2Br6, diamond and graphite, P4, S8, ClF3. **Ref.3, 4 (Relevant pages)**	ICT/Black board	08
	Reference books [1] Principles of Inorganic Chemistry – Puri, Sharma, Kalia [2] Theoretical Principles of Inorganic Chemistry – G S Manku [3] Advanced Inorganic Chemistry, Volume 1 – Satyaprakash Tuli, Basu, Madan (S Chand Publications) [4] Concise Inorganic Chemistry – J D Lee (5th edn)		

Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon

Department of Chemistry

TEACHING PLAN (2021-2022)

Subject: Core Course-A-1(Semester I)

Organic and Inorganic Chemistry (Section B)

Paper No. CH - 102 and CH - 202 Classes: F.Y.B. Sc

Name of the Teacher: Prof. Y. N. Khairnar/ Dr. G. N. Jethave Signature:

Sr.No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Core Course-A-1(Semester I) CH: 102** **Chapter 5: Ionic equilibria** Strong and weak acids and bases, degree of dissociation, dissociation constants of acids and bases, PH and POH, ionic product of water, numericals. Buffer solutions: Definition, types, Henderson equation, buffer action, buffer capacity, numericals, applications of buffer solutions. **Ref.1, 2, 3 (relevant pages)**	Online / ICT	06
2	**Chapter 6: VSEPR theory and shapes of covalent molecules** Sidgwick – Powell theory, VSEPR theory: assumptions, need of the theory, effect of lone pairs and electronegativity. Applications of VSEPR theory to explain a) Geometry of molecules containing bond pair of electrons: BeF_2, BF_3, CH_4, PF_5, SF_6, IF_7 b) Geometry of molecules containing lone pairs as well as bond pair of electrons: $SnCl_2$, NH_3, H_2O, SF_4, ClF_3, XeF_2, XeF_4, IF_5. Limitations of VSEPR theory. **Ref.1, 3, 4 (relevant pages)**.	Online / ICT	09
	Reference books [1] Advanced Inorganic Chemistry, Volume 1 – Satyaprakash Tuli, Basu, Madan (S Chand publications) [2] Analytical Chemistry – G D Christian (6th Edition) [3] Principles of Inorganic Chemistry – Puri, Sharma, Kalia [4] Concise Inorganic Chemistry – J D Lee (5th Edition)		
3	**Semester-II CH: 202** **Chapter 4: Volumetric analysis** Molecular weight, formula weight, equivalent weight, calculation of equivalent weight of acids, bases, oxidizing and reducing agents, units of concentration – molarity, normality, formality, molality and parts per million (ppm), numerical, standard solution, primary and secondary standards, titrant, analyte, milimoles and miliequivalents, equivalence point, end point. Measurement of volume, effect of temperature on volume, apparatus for precise measurement of volume : pipette, burette, volumetric flask, calibration of pipette, burette and volumetric flask. **Ref. 1, 2 (relevant pages)**	ICT/Black board	09

Sr.No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
4	**Chapter 5: Chemical bonding and structure** Attainment of stable configuration, types of bonds: a) ionic bond- NaCl and $CaCl_2$ b) Covalent bond (Lewis concept) H_2, Cl_2, HF, O_2 and N_2 c) Co ordinate bond- NH_4 and H_3N:, BF_3 d) metallic bond- free electron theory, limitations of Lewis concept. Theories of bonding: valence bond theory, Heitler- London theory and Pauling- Slater theory. Types of overlap: s-s, s-p and p-p overlap with examples like H_2, Cl_2, HF, O_2, N_2 Limitations of valence bond theory. **Ref. 3, 4, 5 (relevant pages)**	ICT/Black board	06
	Reference books 1. Analytical Chemistry – G D Christian (6th edn) 2. Vogel's Textbook of Quantitative Chemical Analysis 3. Advanced Inorganic Chemistry, Volume 1 – Satyaprakash Tuli, Basu, Madan(S Chand publications) 4. Principles of Inorganic Chemistry – Puri, Sharma, Kalia 5. Concise Inorganic Chemistry – J D Lee (5th edn)		

HEAD
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Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon

Department of Chemistry

TEACHING PLAN (2023-2024)

Subject: Physical and Inorganic Chemistry

Paper No. CH - 301 and CH - 401 Class: S. Y. B. Sc

Name of the Teacher: Prof. S. N. Jadhav/
Dr. B. P. Koli Signature:

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
	Semester I **1. Solutions** Introduction, Solubility, Factors affecting solubility, Types of solutions, Different way of expressing the concentration of solution , Ideal and non-ideal solutions, Raoults law and its limitation, The vapour pressure of actual liquid pairs the vapour pressure of ideal solution. Classification of binary solution of completely miscible liquids (Type-I, Type-II and Type- III) on the basis of Raoults law), Boiling point diagrams of miscible binary mixtures, Distillation of binary miscible solutions, Azeotropes, the fractionating column, Solubility of partially miscible liquid pairs, Phase diagram Phenol-water system, Tri ethyl amine-water and Nicotine-water system. **Ref.1: Pages 261-264,270-286,288-291** **Ref. 2, 3, 4 Relevant Pages**	Online/ ICT	10
2	**2.Colligative Properties** Introduction, lowering of vapour pressure of solvent, Calculation of molecular weight of solute from Lowering of vapour pressure of solvent. Boiling point elevation of solution, Calculation of molecular weight of solute from boiling point elevation of solution, Freezing point depression of solution, Calculation of molecular weight of solute from depression in Freezing point, Osmosis and osmotic pressure, Relation of osmotic pressure to vapour pressure, Van't – Hoff equation for osmotic pressure, Landberger's method for the determination of elevation of boiling point, Beckman's method for determination of depression in freezing point ,Berkley and Hearty's method, Solution of electrolyte, Colligative properties of electrolyte (Qualitative concept only), related numerical. **Ref.-1:- Pages 312-324, 325-330** **Ref. 2, 3, 4 Relevant Pages**	Online /ICT	10
3	**3. The d-block elements** Elements of first, second and third transition series, General characteristics of d-block elements a) Metallic character b) Molar volume and densities c) Atomic radii d) Ionic Radii e) Melting and boiling points f) Ionization Energies g) Reactivity h) Oxidation states i) Standard electrode potential j) Reducing Properties k) Colour l) Magnetic properties m) Catalytic Properties n) Tendency to form	Online / ICT	10

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
	complexes **Ref. 5-653-671, Ref. 6 -615 -624, Ref. 7-1128-1143**		
4	**Semester- II** **1. Electrochemistry** Introduction, Electromotive force and its measurements , Reversible and Irreversible Cells, Standard cell ,Cell reaction and EMF, convention regarding sign of EMF, Single electrode potential, Standard hydrogen and calomel reference electrodes, Calculation of single electrode potential, Calculation of cell EMF from single electrode potential, Thermodynamics and EMF, ΔG, ΔH,ΔS from EMF data, Thermodynamics of electrode potential (Nernst equation), Standard potential and equilibrium constant, Classification of electrodes, Related numerical. **Ref.-1:- Pages 481-497, Ref.-2:- Relevant Pages.** **Ref.-3:- Relevant Pages.**	ICT /Black-board	10
5	**2.Chemical Thermodynamics** Introduction, The Helmholtz free energy, ΔA for reactions, Gibb's free energy and, ΔG for reactions, Properties and significance of Gibb's free energy changes, Calculation of free energy changes, Fugacity and activity concepts, The reaction isotherm, Standard free energy change of formation, Criteria of equilibrium. Physical equilibria involving pure substances, Clapeyron equation and its use, Vapour pressure of liquid and variation of vapor pressure with temperature**,** Clausius - Clapeyron equation, and Different form of Clausius Clapeyron equation and are applications, Related numerical. **Ref.-1:- Pages 189-203, 206-213, 215-218** **Ref.-2:- Relevant Pages. Ref.-3:- Relevant Pages.** **Ref.-4:- Relevant Pages.**	ICT /Black-board	10
	3: Basic concepts of coordination chemistry(L-07, M-14 / 21) Double salts and coordination compounds, co-ordination complexes and complex ions, coordination number, Unidentate, bidentate and polydentate ligands, chelating ligand and chelates, physical methods used in study of complex, Nomenclature of coordination compounds. **Ref. - 5: Page Nos. 729-735, 738-741.** **Ref. -6: Relevant Pages.**	ICT /Black-board	07
	4: Conductors, Insulators & Semiconductors(L-03, M-07 / 09) General Properties of metals. Conductors, insulators and semiconductors. Intrinsic and extrinsic semiconductors. Applications of semiconductors. **Ref. 6 -121 – 144, Ref. 7-220-231, Ref. 8-175-179** **Ref. 9-259-264**	ICT /Black-board	03

Feedback: Students are assessed by conducting test on topics

Reference books for semester I

1. Principles of Physical Chemistry by S. H. Maron and C. F. Prutton (4th edition) 2015
2. Essentials of Physical Chemistry by B. S. Bahl, G. D. Tuli, ArunBahl, S. Chand (25th edn), Dec. 2010.
3. Elements of Physical Chemistry S. Glasstone and D. Lewis (Macmillan Press Ltd.) (2nd edn), 2014.
4. Physical Chemistry by Robert A. Alberty (John Willey and Sons) (7thedition) 1992
5. Concise Inorganic Chemistry by J.D.Lee.5th Edition. 2014
6. Principles of Inorganic Chemistry by Sharma, PuriKalia 30th edition Milestone Delhi. 2017
7. Advanced Inorganic Chemistry Volume - I, by Gurdeep Raj 23rd edition, Goel Publishing, House, Meerut. 2016

Reference books for semester II

1. Principles of Physical Chemistry, S. H. Maron and C. F. Prutton (4th edition) 2012
2. Essentials of Physical Chemistry, B. S. Bahl, G. D. Tuli, ArunBahl (S. Chand and Co Ltd.) (25th edition) 2010.
3. Elements of Physical Chemistry, S. Glasstone and D. Lewis (The Macmillan Press Ltd.) (2nd edition) 2014.
4. Physical Chemistry, Robert A. Alberty (John Willey and Sons) (7th edition) 1992.
5. Principals of Inorganic Chemistry by B.R.Puri, L.R. Sharma, K.C. Kalia, Milestone publishers and distributors. 2017.
6. Concise Inorganic Chemistry by J. D.Lee. 5th Edition. 2014.
7. Theoretical Principles of Inorganic chemistry by G.S.Manku Tata McGraw Hill edition.1982.
8. Principles of Inorganic Chemistry By Sharma, PuriKalia 30th edition Milestone Delhi. 2017.
9. Advanced Inorganic Chemistry Volume - I , by Gurdeep Raj 23rd edition , Goel Publishing House, Meerut. 2016

Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon
Department of Chemistry
TEACHING PLAN (2023-2024)
Subject: Organic and Inorganic Chemistry

Paper No. CH - 302 and CH - 402 Class: S. Y. B. Sc
Name of the Teacher: Prof. Y. N. Khairnar
Prof. C. P. Patil Signature:

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**1: Stereoisomerism** a) Isomerism, classification of isomerism, stereoisomerism, types of stereoisomerism. b) **Projection formulae** Fischer projection formula, Newman projection formula, Saw horse formula. c) **Optical isomerism** Optical activity, enantiomerism, chiral centre and chirality, elements of symmetry, dextrorotatory, laevorotatory, Configuration: R and S nomenclature system. d) **Geometrical isomerism** Geometrical isomers, condition for geometrical isomerism, nomenclature systems: Cis and Trans, E and Z, Syn and Anti. e) **Conformational isomerism** Conformational isomers, conformational isomerism in ethane and n- butane with energy profile diagrams. **f) Stereochemistry of Cyclohexane** Conformations of cyclohexane: chair and boat forms, axial and equatorial bonds in cyclohexane, factors affecting stability of conformations. Mono substituted cyclohexane. **(Use of models / ICT is expected for teaching this chapter)**	Online / ICT	12
2	**2: Heterocyclic and polycyclic aromatic compounds** **a) Five membered ring with one heteroatom** Introduction, preparation of furan, pyrrole and thiophene. Reactions: nitration, sulphonation, F C acylation, Reimer Tiemann reaction, catalytic hydrogenation. **b) Six membered ring with one heteroatom** Preparation of pyridine: from acrolein and from acetylene. Reactions: nitration, sulphonation, bromination, catalytic hydrogenation. **b) Polycyclic aromatic compounds** Introduction, structure of naphthalene, Haworth synthesis. Reactions: oxidation, reduction, nitration, halogenations, sulphonation, F C acylation.	Online / ICT	08
	3: Solvents, solutions Acids and Bases a) Donar and acceptor properties. b) Molten salts, solvents for electrochemical reactions, purity of solvents. c) Definition and approaches, solvent system concept, Lux-flood	Online / ICT	10

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
	concept, Lewis concept, Generalized Acid-base concepts. d) Differentiating and levelling solvents. e) Co-solvating agents. f) Hard and soft acids and bases: definitions, Pearson HSAB concept, theories of Hardness and softness, application and limitation of HSAB concepts.		
1	**Semester-II** **1: Synthetic Reagents** Introduction, active methylene group **a) Acetoacetic ester** Preparation of acetoacetic ester. Synthesis of- alkyl acetic acid, dialkyl acetic acid, succinic acid, adipic acid, ∝-β unsaturated acid, methyl ketone (butanone). **b) Malonic ester** Preparation of malonic ester. Synthesis of- alkyl acetic acid, dialkyl acetic acid, succinic acid, glutaric acid, β keto acid(acetoacetic acid), ∝-β unsaturated acid..	Black-board / ICT/	10
2	**2:Organometallic compounds** a) Nomenclature of organometallic compounds, carbon-metal bond in organometallic compounds. b)**Organolithium compounds** Preparation of organolithium compounds, Preparation of alcohols from organolithium compounds. c) **Organomagnesium compounds** Preparation of Grignard's reagent, reactions of Grignard's reagent with- esters, acid chlorides, with compounds containing active hydrogen. d) **Organocopper compounds** Preparation of organocopper compounds (Lithium dialkylcuprate) and synthesis of alkanes. e) **Organozinc compounds** Preparation of organozinc compounds, synthesis of cyclopropanes (Simmon Smith reaction), Reformatsky reaction.	Black-board / ICT/	10
	3. Molecular Orbital Theory (MOT) a) Molecular orbital method b) LCAO Method c) s-s, s-p, p-p, p-d and d-d combination of orbitals d) Non Bonding combination of orbitals e) Rules for linear combination of orbitals f) Molecular orbital treatment for Homo nuclear Diatomic species – H_2, He_2, He_2^+, B_2, N_2 ,O_2 , O_2^- and O_2^{--} g) Molecular orbital treatment for Hetero nuclear diatomic molecules –CO, NO, and HCl	Black-board / ICT/	10

Feedback: Students are assessed by conducting test on topics

Reference Books for semester I

1) Organic chemistry - Francis A Carey (3rd Edition) 2017.
2) Organic chemistry - Morrison and Boyd (6thEdition) 2018.
3) Stereochemistry of organic compounds- E L Eliel 2008.
4) Stereochemistry of organic compounds- P S Kalsi 2009.
5) Organic chemistry - Stanley H pine (5th Edition) 1987.
6) A Text book of Organic chemistry- ArunBahl and B S Bahl, S Chand publication, 2016.
7) A guide book to reaction mechanism in organic chemistry by Peter Sykes.5th Ed. 2003.
8) Heterocyclic compounds by Leo Packet. 2006.
9) Basic Inorganic chemistry 3rd edition by F.A. cotton, G. Wilkinson, Paul, Guss John Wiley and Sons. 2007.
10) Theoretical principals of Inorganic chemistry by G.S. Manku, Tata Mc. Graw Hill edition.
11) Advanced Inorganic chemistry by Gurudeep Raj., Vol. I, 23rd Edition, Goel publishing House Meerut.2015

Reference Books for semester II

1) Organic chemistry - Francis A Carey (3rd Edition) 2017
2) Organic chemistry - Morrison and Boyd (6thEdition) 2018
3)Stereochemistry of organic compounds- E L Eliel 2008
4)Stereochemistry of organic compounds- P S Kalsi 2009
5)Organic chemistry - Stanley H pine (5th Edition) 1987
6) A Text book of Organic chemistry- ArunBahl and B S Bahl, S Chand publication. 2016
7)A guide book to reaction mechanism in organic chemistry by Peter Sykes.5th Ed.2003
8) Heterocyclic compounds by Leo Packet. 2006
9) Concise Inorganic Chemistry By J. D. Lee, 5th edition 2014
10) Advanced Inorganic Chemistry Volume-I by SatyaPrakash, G.D. Tuli, S.K. Basu, R. D. Madan S. Chand & Company Ltd (2004)

Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon
Department of Chemistry
TEACHING PLAN (2023-2024)
Subject: **Basic Analytical Chemistry**

Paper No. **SEC-1 and SEC-2** Class: S.Y. B. Sc
Name of the Teacher: Dr. G. N. Jethave Signature:

Sr. No	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Semester- I (Analytical Chemistry)** **Chapter 1: Introduction to Analytical Chemistry** a) Introduction: Analytical chemistry, its interdisciplinary nature, importance of analytical chemistry, types of analysis: qualitative and quantitative analysis b) Concept of sampling, definition, procedure of sampling, types of sampling c) Accuracy, precision, significant figures, significance of zero, rounding off d) Errors: Definition, types and sources of errors, minimization of errors. e) Good laboratory practices: Material safety data sheet (MSDS), fire safety, Handling of chemicals. **Ref. 1, 2, 3, 4, 5 (Relevant pages)**	Online / ICT	08
2	**Chapter 2: Acid base titrations** a) Principle,Acid–base indicators, Henderson-Hasselbalch equation, transition range of indicators. b) Study of following acid base titrations with respect to: neutralization curve, selection of indicators and calculation of PH i) Strong acid versus strong base ii) Weak acid versus strong base c) Applications of acid base titrations. **Ref. 1, 2, 3, 4, 5 (Relevant pages)**	Online / ICT	08
3	**Chapter 3: Precipitation titrations** a) Principle, precipitation titration curve**,** use of indicators in detection of end point. b) Preparation of $AgNO_3$ solution, its standardisation by Mohr's method. c) Estimation of halides by Fajan's method d) Applications of precipitation titrations. **Ref. 1, 2, 3, 4, 5 (Relevant pages)**	Online / ICT	06
4	**Chapter 4: Chromatography** a) Definition, Introduction, advantages and disadvantages of chromatography. b) Principle of chromatography, classification of chromatography - partition, adsorption and ion exchange chromatography. c) Paper chromatography: principle, technique, Rf value, ascending and descending techniques, paper chromatographic separation of metal ions, applications. d) Thin layer chromatography (TLC): principle, technique and applications.	Online / ICT	08

Sr. No	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
	e) Ion exchange (Column) chromatography- cation and anion exchange resins, principle, technique and applications. **Ref. 1, 2, 3, 4, 5 (Relevant pages)**		
5	**Semester-II (Advanced Analytical Chemistry)** **Chapter 1: Redox titrations** a)Oxidation, reduction, redox reaction, oxidising agents, reducing agents, redox titrations. b) Titration of Ce (IV) versus Fe (II), nature of titration curve, calculation of emf during titration. c) Detection of end point- redox indicators, self indicator and starch indicator. d) Titrations involving iodine: Iodimetry and Iodometry. e) Determination of dissolved oxygen (DO) of a water sample. f) Applications of redox titrations. **Ref. 1, 2, 3, 4, 5 (Relevant pages)**	ICT/black board	10
6	**Chapter 2: Complexometric titrations** a) Complexes, ligands, types of ligands, chelates, chelating agents. b) Formation of complex, formation constant. c) Chelating agent EDTA, EDTA equilibria, EDTA titration curve. d) Detection of end point- use of indicators, principle involved in colour change of indicator, characteristics of metal ion indicators. e) Applications of complexometric titration with reference to analysis of soil: Estimation of calcium and magnesium ions by complexometric titrations. **Ref. 1, 2, 3, 4, 5 (Relevant pages)**	ICT/black board	08
7	**Chapter 3: Gravimetric analysis** a) Introduction, advantages of gravimetric analysis b) Solubility product (with problems), conditions for precipitation. c) Steps of gravimetric analysis: Preparation of solution, precipitation, digestion. Impurities in the precipitate: co-precipitation and post precipitation. Filtration, washing, drying or ignition, weighing d) Applications – estimation of Ba as $BaSO_4$, Ni as Ni-DMG, Pb as $PbCrO_4$ **Ref. 1, 2, 3, 4, 5 (Relevant pages)**	ICT/black board	12

Feedback: Students are assessed by conducting test & seminars on topics

Reference Books:-

1) Analytical chemistry – G D Christian (5th Edition). 2006
2) Quantitative chemical analysis- J Mendham, R C Denny, Barnes, Thomas 2009
3 Analytical chemistry- D A Skoog, D M West, F J Holler 1992
4) Vogel's text book of quantitative inorganic analysis- Bassett, Denney, Jeffrey 1989
5) Basic concepts of analytical chemistry- S M Khopkar

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Department of Chemistry

TEACHING PLAN (2023-2024)

Subject: Physical chemistry

Paper No. CH - 501 & CH - 601 Class: T. Y. B. Sc

Name of the Teacher: Prof. S. N. Jadhav Signature:

Sr.No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Semester- V** **UNIT-1. Basic Quantum Chemistry** Failures of Classical Mechanics, Origin of quantum mechanics, Particle aspect of radiation: Blackbody radiation, Photoelectric effect, Compton Effect, de Broglie's hypothesis: Matter waves, Heisenberg uncertainty principle, Application of Heisenberg's principle, Interpretation of wave function, Significance of ψ1 and ψ2, Normalization of wave function Operators and operator algebra, Eigen functions and Eigen values, various operators in quantum mechanics: Linear momentum, Kinetic energy and Total energy operator (only equations no derivations), Postulates of quantum mechanics. **Ref. 1: 3, 5-10, 12, 13, 30, 31, 36, 37, 79-84, 115-121** **Ref. 2: 3-9, 18, 27-29, 36-39, 43-48** **Ref. 4: 21, 24, 32-36, 38-44**	Blackboard / ICT/	11
2	**UNIT-2. Chemical Kinetics** The concept of reaction rates. Effect of temperature, Pressure, Catalyst and other factors on reaction rates. Order and molecularity of a reaction. Derivations of integrated rate equations for zero, first and second order reactions (both for equal and unequal initial concentrations of reactants) Half–life of a reaction, Pseudo order reactions, and General methods for determination of order of a reaction. Effect of temperature on reaction rate, Arrhenius equation (exponential and integrated form), Collision theory, Concept of activation energy and its calculation from Arrhenius equation, Related numerical. **Ref. 3: 732, 734-744, 751-759** **Ref. 4: 970-971, 975-978, 984, 988-990, 992, 993**	Blackboard / ICT/	11
3	**UNIT-3. Phase Equilibrium** Phases, Components and Degrees of freedom of a system, Criteria of phase equilibrium. Gibbs Phase rule and its thermodynamic derivation. Derivation of Clausius –Clapeyron equation and its importance in phase equilibria. Phase diagrams of one-component systems (water and sulphur) and two component systems involving eutectics, Congruent and Incongruent melting points (lead-silver, FeCl3-H2O only), Related Numerical. **Ref. 3: 697-714, 719-721** **Ref. 4: 605-607, 609-614, 616, 617, 623, 626, 627, 631, 632**	Blackboard / ICT/	11
4	**UNIT- 4. Electrochemical Cell** Introduction, overview of electrode processes, Faradaic and Non-Faradaic Processes, Introduction to electrical double layer, Factors affecting electrode reaction rate and current.	Blackboard / ICT/	12

Sr.No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
	Classification of electrochemical cell, EMF expression for chemical cell with and without transference, Liquid junction potential, Types of liquid junction potential, Minimization of liquid junction potential. Application of EMF measurement for pH using Hydrogen gas electrode, Quinhydrone electrode and Glass electrode, Related numerical. **Ref. 5: 1-4, 9, 10, 12-14, 23, 24, 64, 72, 73, 74** **Ref. 4: 807, 808, 811, 812, 816-818**		
5	**Semester-VI** **UNIT-1. Investigation of Molecular Structure** Introduction, Dipole Moment, Induced dipole moment, Electrical polarization of molecules. Orientation of dipole in an electric field, Debye equation. Method of determination of dipole moment, Vapour temperature method, Molecular structure and dipole moment Interaction of electromagnetic radiation with molecules, Various types of spectra Rotational, Vibration and Electronic energy levels; with principle and example of each type. Rotational spectroscopy: Rigid and non-rigid rotor diatomic molecule-Moment of inertia, Energy Levels, Selection rule, Intensities of spectral lines, Determination of bond lengths of diatomic and linear triatomic molecules, Isotopic substitution. Related numerical Page **11** of **70** **Ref. 1: 253-257, 259-261** **Ref. 3: 5-9, 33-46**	ICT/ Blackboard	11
6	**UNIT-2. Nuclear Chemistry** Introduction, Radioactive elements, Types of radioactive decay, Decay schemes, General characteristic of radioactive decay, Decay kinetics, Decay constant, Half-life period, Mean life, Units of radioactivity. Application of radioactivity – Radiochemical principle of tracer technique; Application of tracer technique – Chemical investigation reaction mechanism- esterification, hydrolysis, Oxidation - Oxidation of CO, Structure determination - PCl5 molecules, Thiosulphate ion, C- 14 dating and tritium dating, Medical applications- Thyroditis, Bone fracture Healing, Brain tumor location, Defects in Blood Circulation. Nuclear Fusion / Fission as source of energy with example Nuclear Pollution: Disposal of nuclear waste, nuclear disaster and its management with case study. Related numerical **Ref. 4: 118-125, 225, 247, 248, 373-378, 402, 403, 407-411** **Ref. 1: 103-105, 108-110, 113-115, 120-122, 136-138** **Ref 6: 87-94, 108-112** Ref.-2:-Page Nos.-731-755.	ICT/ Black-board	12

Sr.No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
7	**UNIT-3. Photochemistry** Laws of photochemistry, Quantum yield, Examples of low and high quantum yields, Consequence of light absorption by atoms and molecules, Jablonski diagram, Fluorescence, Phosphorescence, Quenching. Experimental setup for determination of quantum yield with actinometer as detector Photochemical gas reactions, Photolysis of ammonia, Combination of H2 and Cl2 reaction, Reaction between H2 and Br2, Photosensitized gas reaction, H2 and O2, H2 and CO, Chemiluminescence, Related numerical. **Ref. 1: 1045-1055** **Ref. 2: 1044, 1045, 1048, 1049, 1054, 1055, 1059-1061**	ICT/Black-board	11
8	**UNIT-4. Crystal Structure** Forms of solids. Symmetry elements, unit cells, crystal systems, Bravais lattice types and identification of lattice planes. Laws of Crystallography - Law of constancy of interfacial angles, Law of rational indices. Miller indices. X–Ray diffraction by crystals, Bragg's law and Bragg's method. Structures of NaCl, KCl and CsCl (qualitative treatment only). Defects in crystals: Shottkey and Frenkel defects. Liquid Crystal, Types and Applications. Related numerical **Ref. 1: 449-454, 456-463, 472-474** **Ref. 2: 1085-1087, 1099, 1100, 1104-1107, 1123, 1130, 1131**	ICT/Black-board/ Models	11

Feedback: Students are assessed by conducting test & seminars on topics

Reference Books:-

Semester V:

References and Suggested Readings

1. Quantum Chemistry, Donald A. McQuarie, , Viva student edition, Viva Books
2. Quantum Chemistry, 4th edition, R. K. Prasad, New Age international Publishers.
3. Essentials of Physical Chemistry, Arun Bahl, B. S. Bahl, G. D. Tuli, S., Multicolor edition, S. Chand Publication.
4. Principles of Physical Chemistry, 44th edition, Puri, Sharma and Pathaniya, Vishal Publishing Co.
5. Electrochemical Methods Fundamentals and Applications, 2nd edition, Allen J. Bard and Larry R. Faulkner, John Wiley & Sons.
6. Chemical Kinetics, 2nd edition, K. J. Laidler,
7. An Introduction to Electrochemistry, S. Glasstone, East-West Press

Semester VI:

1. Essentials of Physical Chemistry, Arun Bahl, B. S. Bahl, G. D. Tuli, S. Multicolor edition, S. Chand Publication.
2. Principles of Physical Chemistry, 44th edition, Puri, Sharma and Pathaniya, Vishal Publishing Co.
3. Fundamentals of Molecular Spectroscopy, 4th Edition, C. N. Banwell and E. M. McCash, Tata McGraw-Hill: New Delhi
4. Essentials of Nuclear Chemistry, Revised 4th Edition, H. J. Arnikar, New Age International Publishers.
5. Advance Physical Chemistry, Gurtu and Gurtu, Pragati Publication.
6. Environmental Pollution and Health, V. K. Ahluwalia, The Energy and Resources Institute (TERI), 2005.

Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon
Department of Chemistry
TEACHING PLAN (2023-2024)
Subject: Inorganic Chemistry

Paper No. CH - 502 & CH - 602 Class: T.Y. B. Sc
Name of the Teacher: Prof. Sagar U. Patil Signature:

Sr.No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Semester- V** **UNIT-1: Structure and Reactivity of Molecules** Valence Shell Electron Pair Repulsion Theory (VSEPR), Shapes of simple molecules and ions containing lone-and bond-pairs of electrons multiple bonding, prediction of shapes of irregular molecules and ions like - Sulphur tetra fluoride, Bromine trifluoride, Dichloroiodate (I) anion, Penta fluoro telluurate (IV) anion, Tetrachloroiodate (III) anion, Nitrogen dioxide, Phosphorus trihalides, Carbonyl fluoride, Summary of VSEPR rules Drawbacks of VSEPR theory. **Ref.1: 206-207** **Ref. 3: Relevant pages.**	Online/ ICT/	09
2	**UNIT 2: Modern Theories of Coordination Compound Part –A** Assumptions, Werner theory and isomerism, EAN, Stability of complex ion, Factors affecting stability of complex ion, Irving William series, Stabilization of unstable oxidation state, Stereochemistry of coordination compound with C.N. 4 and 6, Isomerism in coordination compounds. **Ref. - 1: 735-737, 742-745, 748--757. Ref. - 2: Relevant Pages.**	Online/ ICT/	09
3	**UNIT 3: Modern Theories of Coordination Compound Part –B** Assumptions of V.B.T., V.B. Theory as applied to structural and bonding in complexes of 3d series elements. Examples of square planar, Tetrahedral and Octahedral complexes, inner and outer orbital complexes, Magnetic properties of complexes of 3d series elements, limitations of V.B.T., Assumptions of CFT, Degeneracy of 'd' orbital's, Application of CFT to octahedral complexes, Weak and strong ligand field splitting, spectrochemical series. **Ref. 1: 759 - 766 Ref.2: Relevant Pages**	Online/ ICT/	09
4	**UNIT 4: Modern Theories of Coordination Compound Part –C** Definition of C.F.S.E., Calculation of C.F.S.E. in weak and strong field octahedral complexes, Evidences of C.F.S.E., Factor's affecting 10 Dq, CFT and magnetic properties, spin only magnetic moment equation, Electron occupancy in CFT, Application of CFT to tetrahedral a nd Calculation of C.F.S.E. in tetrahedral complexes. Tetragonal distortions from octahedral geometry, Jahn-Teller theorem Application of CFT to square planer complexes, Problems related to calculation of spin only magnetic moment for square planer, tetrahedral and octahedral complexes (for high spin and low spin complexes). **Ref.1: 766 -772, Ref.2: Relevant pages**	Online/ ICT/	09

Sr.No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
5	**UNIT 5: Modern Theories of Coordination Compound Part –D** Crystal field effects- Variation of lattice energies, enthalpies of hydration and crystal radii variations in halides of first and second row transition metal series and spinel structures, limitations of CFT, experimental evidences in support of metal ligand bond overlaps. ACFT, Assumptions of Molecular orbital theory, composition of ligand group orbitals, Molecular orbital treatment (Qualitative) of octahedral complexes (strong & weak field), Effect of pi-bonding, Charge transfer spectra, Comparison of VBT, CFT and MOT. **Ref. 1: 794-796,774-778 Ref. 2: Relevant Pages**	Online/ ICT/	09
6	**Semester-VI** **UNIT 1: Synthetic Methods of Nanomaterials** Introduction to Nano science, nanostructure and nanotechnology (basic idea), Size dependent properties of nanomaterials (basic idea) a) Semiconducting nanoparticles b) Metallic nanoparticles. Synthesis routes of nanomaterials: a) Bottom up approaches i) Chemical vapor deposition (CVD) ii) Spray pyrolysis iii) Sol gel process b) Top down approaches: mechanical alloying, Role of surfactant in shape and size control of nanomaterials **Ref:1: 602-604, 624, 653-655. Ref:2: 66-70,74-77, 79,85-87. Ref.3: 656-658, 707-712,721-724**	ICT/ Black-board	09
7	**UNIT 2: Inorganic Solids of Technological Importance** Inorganic pigments, Coloured solids**,** White and black pigments, Molecular materials and fullerides, Molecular material chemistry – One dimensional metals, Molecular magnets, Inorganic liquid crystals, Solid electrolytes (a) solid cationic electrolytes (b) solid anionic electrolytes. **Ref:- 1: 607-609,642-644,647-650.** **Ref.3: 661-664,696-699,703-707.**	ICT/ Black-board	09
8	**UNIT 3: Cement and Lime** Classification of cement, Ingredients and their role, Manufacture of cement and the setting process, Quick setting cements. Manufacture of lime and applications **Ref.4: Relevant pages Ref.5: Relevant pages**	ICT/ Black-board	12
9	**UNIT 4**: **Fertilizers** Plant Nutrients, Different types of fertilizers, need for fertilizers, requisite qualities of fertilizers, symptom of deficiency, Manufacture of following fertilizers:- Urea, Ammonium nitrate, Calcium ammonium nitrate, Ammonium phosphate, Super phosphates, Compound and Mixed fertilizers, Potassium chloride and Potassium sulphate. **Ref.5: Relevant pages Ref.6: Relevant pages**	ICT/ Black-board	09
10	**UNIT 5**: **Alloys** Classification of alloys, Ferrous and Non-ferrous alloys, Specific properties of elements in alloys, Manufacture of steel, Removal of silicon, decarburization, demagnetization and desulphurization. Composition and properties of different types of steels **Ref.7: Relevant pages Ref.8: Relevant pages**	ICT/ Black-board	09

Feedback: Students are assessed by conducting test & seminars on topics

Reference Books:-

Semester V:

1. Principle of Inorganic Chemistry, B. R. Puri, L. R. Sharma, K. C. Kalia, Milestone Publisher and distributor.
2. Concise Inorganic Chemistry, 5th Edition, J. D. Lee.
3. Inorganic Chemistry Principles of Structure and Reactivity, 4th Edition, James E. Huheey, Ellen A. Keiter. Richard L. Keitler.

Semester VI:

1. Inorganic Chemistry, 4th /5th edition, Shriver and Atkins
2. Textbook of Nano Science and technology, B. S. Murthy, P. Shankar, Badev Raj, B. B. Rath and James Murday, University Press III M, Metallurgy and Material Sciences.
3. Inorganic Chemistry, 6th Edition, Weller, Overton, Rourke & Armstrong.
4. Shriver Chemical Process Industry, 5th edition, George T. Austin.
5. Industrial Chemistry, 14th edition, B. K. Sharma, 2004.
6. Riegels Handbook of Industrial chemistry, 9th Edition, James A. Kent, CBS Publishers and Distributors.
7. Engineering Chemistry, S. S. Dara.
8. Engineering Chemistry, B. K. Sharma, Goel Publishing House, Meerut.
9. Engineering Chemistry, P. C. Jain and M. Jain Dhanpat Rai and Sons Delhi.

Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon

Department of Chemistry

TEACHING PLAN (2023-2024)

Subject: Organic Chemistry

Paper No. CH - 503 & CH – 603 Class: T.Y.B.Sc

Name of the Teacher: Prof. Y. N. Khairnar Signature:

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Semester- V** **UNIT 1. Nucleophilic Substitution at Saturated Carbon** SN1, SN2 and SNi reactions, Mechanism and stereochemistry, regioselectivity and stereo specificity of substitution reaction. Scope at saturated carbon, allylic carbon and vinylic carbon. Factors affecting rate of SN1, SN2 and SNi reactions (Effect of nature of substrate, nucleophile, leaving group and solvent).Neighboring group participation (norbornyl & norbornenyl systems), Non-classical carbocation's. **Ref:- 1: 328-359, 931-937. Ref:- 2: 293-369. Ref: - 3: 257-328.** **Ref: - 4: 179-200.**	Online/ ICT/	09
2	**UNIT 2. Electrophilic Addition to C=C** Introduction, Mechanism of electrophilic addition to C=C bond (Ad_{E_2} Mechanism)**,** addition of hydrogen halides, orientation of addition: Markownikoff's and Anti Markownikoff's addition (peroxide effect), stereochemistry, addition of halogens: experimental evidences for two step mechanism, mechanism of addition of bromine, factors affecting anti-stereoselectivity, effect of substituents on rate of addition, addition of hypohalous acids (HOX), Hydroxylation (Mechanism of formation of cis and trans 1,2-diols), Hydroboration- Oxidation (Formation of alcohol), Hydrogenation (Formation of alkane), Ozonolysis (formation of aldehydes & ketones). **Ref:- 1: 427-447.** **Ref:- 2: 734-742, 783-788.** **Ref: - 4: 323-360, 425-440**	Online/ ICT/	09
3	**UNIT 3. Nucleophilic Addition to C=O** Introduction, Structure of carbonyl group, reactivity of carbonyl group, Addition of Hydrogen cyanide, alcohols, thiols, water, ammonia derivatives. Aldol and Cannizzaro Reaction, Perkin reaction, Wittig reaction, Reformatski reactions, Reduction reactions using $NaBH_4$, $LiAlH_4$ with mechanism. **Ref:- 1: 222-239.** **Ref:- 2: 879-919.**	Online/ ICT/	09
4	**UNIT 4. Aromatic Substitution Reactions (Electrophilic substitution** Introduction, arenium ion mechanism, Effect of substituent group (Orientation, o/p directing and meta directing groups). Classification of substituent groups (activating and deactivating groups) Mechanism of: Nitration, Sulfonation, Halogenation, Friedal-Crafts reactions (alkylation and acylation), Diazo Coupling reactions, Ipso-substitution. **Nucleophilic substitution** Addition- elimination (SNAr), Elimination-addition (Benzyne) mechanism with evidences, Chichibabin reaction **Ref:- 1: 471-527. Ref:- 2: 501-521, 641-653. Ref: - 4: 517-545, 943-967.** Ref.2,4,5- Relevant Pages.	Online/ ICT/	09

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
5	**UNIT 5. Elimination Reactions:** Introduction, The reaction mechanisms: E1, E2, E1CB with evidences and factors affecting the reaction.E1 v/s E2 and Elimination v/s substitution. Anti and Syn elimination, Stereo electronic factors. Bredt's rule. Dehydrohalogenation, Dehalogenation, Dehydration, Hoffmann and Saytzeff's elimination, Pyrolytic elimination. **Ref**:- **1: 382-406. Ref:- 2 : 982-1010. Ref: -4 : 273-310.**	Online/ ICT/	09
6	**Semester-VI** **UNIT 1. A) Introduction to Spectroscopy** Introduction, meaning of spectroscopy, nature of electromagnetic radiation, wave length, frequency, energy, amplitude, wave number, and their relationship, different units of measurement of wavelength and frequency, different regions of electromagnetic radiations. Interaction of radiation with matter. Excitation of molecules with different energy levels, such as rotational, vibrational and electronic level. Types of spectroscopy, advantages of spectroscopic methods **Ref:- 2: 1-19. Ref:- 4 : 13-19.** **B) Mass spectroscopy** Basic theory, Nature of mass spectrum, Importance of molecular ion peak, isotopic peaks, base peak, nitrogen rule, rule of 13 for determination of empirical formula and molecular formula. **Ref:- 1: 170-186. Ref:- 2: 415-424. Ref:- 3 : 2-15. Ref:- 4 : 401-417**	ICT/ Black-board	09
7	**UNIT 2. Ultra Violet Spectroscopy** Introduction, nature of UV spectrum, Beer's law, absorption of UV radiation by organic molecule leading to different excitations. Terms used in UV Spectroscopy: Chromophore, Page **24** of **70** Auxochrome, Bathochromic shift (Red shift), hypsochromic shift (Blue shift), hyperchromic and hypochromic effect. Effect of conjugation on position of UV band. Calculation of λ-max by Woodward and Fisher rules: for dienes and enone system, Applications of UV Spectroscopy: Determination of structure, determination of stereo chemistry (cis and trans), problems. **Ref:1: 1-27. Ref:2: 9-53. Ref: 4: 367-398.**	ICT/ Black-board	09
	UNIT 3. Infra-red Spectroscopy Introduction, Principle of IR Spectroscopy, fundamental modes of vibrations (3N-6, 3N-5) Types of vibrations (Stretching and bending), Regions of IR Spectrum: functional group region, finger print region and aromatic region, Characteristic IR absorption of functional groups: Alkanes, alkenes, alkynes, alcohol, ethers, alkyl-halides, carbonyl compounds (- CHO, C=O, -COOR, -COOH), amines, amides and Aromatic Compounds and their substitution Patterns. Factors affecting IR absorption: Inductive effect, resonance effect, hydrogen bonding. Applications of IR Spectroscopy: determination of structure, chemical reaction and hydrogen bonding, Problems. **Ref:-1 : 28-57.** **Ref:- 2 : 65-154.** **Ref:- 3 : 71-109.** **Ref:- 4 : 26-93.**	ICT/ Black-board	09

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
	UNIT 4. NMR Spectroscopy Introduction, Principles of NMR Spectroscopy, Magnetic and nonmagnetic nuclei, Precessional motion of nuclei without mathematical details, Nuclear resonance, chemical shift, shielding, & deshielding effect. Measurement of chemical shift, delta and Tau-scales. TMS as reference and its advantages, peak area, integration, spin-spin coupling, coupling constants, *J*-value (Only first order coupling be discussed), problems. **Ref:- 1: 63-145. Ref:- 2 : 185-356. Ref:- 3 : 144-216.** **Ref:-4 : 108-160.**	ICT/ Black-board	09
	UNIT 5. Combined Problems Based on UV, IR, NMR & Mass Determination of structure of simple organic compounds on the basis of spectral data such as λ max values, IR frequencies, chemical shift (δ values), coupling constant, peak values provided to the students.	ICT/ Black-board	09

Feedback: Students are assessed by conducting test & seminars on topics

References:

Semester V:

1. Organic Chemistry, Second Edition. J. Clayden, N. Greeves & S. Warren and P. Wothers (Oxford).
2. Advanced Organic Chemistry-Reactions, Mechanisms and Structure, 5th Edition, Michael B. Smith, Jerry March.,Wiley-VCH, Weinheim, 2000,
3. Advanced Organic Chemistry Part A- Structure and Mechanisms, 3rd Edition, A. Carey and R.J. Sundberg. Springer US, Third Edition
4. Organic Chemistry, 6th Edition, R. T. Morrison and R. N. Boyd.
5. Web- Organic Chemistry Portal

Semester VI:

1. Spectroscopic Methods in Organic Chemistry, D. H. Williams & I. Fleming, 5th Ed.
2. Spectroscopy of Organic Compounds, P. S. Kalsi, New Age Int. Pub., 6th Ed., 2007
3. Spectrometric Identification of Organic Compounds, R. M. Silverstein and F. X. Webster , John Wiley and Sons Inc, 7th Edition.
4. Introduction to Spectroscopy, Donald L. Pavia, Gary M. Lampman, George S. Kriz and J. R. Vyvyan. Indian Edition. Cengage Learning; 5th edition (2015)

Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon

Department of Chemistry

TEACHING PLAN (2023-2024)

Subject: Industrial Chemistry

Paper No. CH - 504 & CH - 604 Class: T. Y. B. Sc

Name of the Teacher: Prof. G. N. Jethave Signature:

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Semester- V** **(Industrial Chemistry)** **UNIT 1: General Aspects of Industrial Chemistry** Introduction, Basic Requirements of Industrial Chemistry, Chemical Production, Raw Materials, Unit Process and Unit Operations, Quality Control, Quality Assurance, Process Control, Research and Development, Pollution Control, Human Resource, Safety Measures, Classification of Chemical Reactions, Batch and Continuous Process, Conversion, Selectivity, Yield, Copy Right Act, Patent Act and Trade Marks. Bureau of Indian Standards (BIS), International Organization for Standardization (ISO) **Ref.1: Chapter 2(26, 27, 31 to 36)** **Ref.4: Chapter 1 and 2 (Relevant Pages) Ref.6: Chapter 1, 2 and 3 (Relevant Pages)**	Online / ICT	09
2	**UNIT 2: Sugar Industry** Introduction, Sugar Industry in Maharashtra and India, Manufacture of Cane Sugar- [Refining (with flow sheet)], General Idea of Sulphitation and Carbonation, Concentration /Evaporation, Crystallization Separation of crystals. Grades, Baggase, Cellotex **Ref.3: Chapter 38 1208 to 1218 (Relevant Points Only)**	Online / ICT	09
3	**UNIT 3: Fermentation Industry** Introduction, Alcohol fermentation, Uses of alcohol, Theory underlying process of making alcohols beverages, Manufacture of Beer, Manufacture of Spirit, Alcohol from Cane Sugar Molasses, Theory of fractional distillation – Coffey'still, Rectified spirit, Absolute alcohol, Fusel oil, Proof spirit, Denatured alcohol. **Ref.2:578-596. Ref.3: Chapter 36, 1175-1190** **(Relevant Points Only)**	Online / ICT	09
4	**UNIT4: Petroleum Industry.** Occurrence, Petroleum producer countries in the world, Exploration Methods, Composition of Petroleum, Refining or Distillation of Petroleum, Anti-Knock Compounds, Octane number, Cetane number, Petrohol (their definitions only), Manufacture of Petrol or Gasoline by Bergius Method, Cracking process- Thermal, Catalytic, Hydro cracking. **Ref.1: 340 to 352, 356 to358 and 363 to 368.** **Ref.3: Chapter 4, 217 to 311 and Chapter 5, 312 to 342 (Relevant Points only)**	Online/ ICT	09
5	**UNIT 5: Industrial Organic Synthesis** Manufacture of methanol from synthesis gas, Isopropanol from propylene, Glycerol from propylene via allyl chloride, Acetone by catalytic dehydrogenation of isopropanol. (with flow sheet diagram), Unsaturated Hydrocarbon –preparation of Acetylene from	Online / ICT	09

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
	Natural gas (with flow sheet), Aromatic hydrocarbon- Preparation of toluene (with flow sheet) **Ref.3: Chapter 11, 439 to 451 and Chapter 14, 493 to 522 (Relevant Points Only).**		
6	**Semester-VI** **UNIT 1: Chemistry of Cosmetics** Introduction, Raw materials and general study including preparation and uses of the following: Hair dye, shampoo, suntan lotions, lipsticks, talcum powder, nails enamel, creams (cold and shaving creams). **Ref.: 6 Chapter -1, 1 to 34, Chapter -2, 36 to 100, Chapter -3, 104 to 145, Chapter - 4** **149 to 181 and Chapter- 9, 290 to 309. Relevant Points Only**	ICT/ Black-board	09
8	**UNIT 2: Chemistry of Perfumes** Essential oils A general study including properties, uses and importance in cosmetic industries with reference to Eugenol, Geraniol, sandalwood oil, eucalyptus, rose oil, 2-phenyl ethyl alcohol, Jasmone, Civetone, Muscone and antiperspirants and artificial flavours. **Ref. 3: Chapter 53, 1520 to1544 Relevant Points Only.** **Ref.6: Chapter 8, 272 to 289, Chapter 10, 310 to 344, Relevant Points Only.**	ICT/ Black-board	09
9	**UNIT 3: Pesticide Chemistry** General introduction to pesticides and their changing concepts (natural and synthetic), benefits and adverse effects of pesticides, structure activity relationship, synthesis and uses of representative pesticides in the following classes: Organochlorines (DDT, Gammexene,); Organophosphates (Malathion, Parathion); Anilides (Alachlor and Butachlor). **Ref.3: Chapter 41, 1280 to1318 Relevant Points Only. Ref.7: Chapter 11, 381 to 426 Relevant Points Only.**	ICT/ Black-board	09
10	**UNIT 4: Soap and Detergents** Soaps, Surfactants and its Importance, Raw Materials used in Soap Manufacture, Manufacture of Soaps (Continuous Process), Cleansing action of Soap, Classification of Soaps, Detergents, Principal group of Synthetic Detergents, Detergents builders and Additives, Comparison between Soap Detergent. **Ref.3: Chapter 39, 1219 to1251 and Chapter 40,1252 to1279 Relevant Points Only. Ref. 6: Chapter- 5, 123 to160**	ICT/ Black-board	09
11	**UNIT 5: Dyes, Drugs and Pharmaceuticals.** **(a) Dyes:** Introduction, properties of dyes, Otto Witts theory only, Classification of dyes according to their mode of application and Chemical Constitution. **Ref.3: Chapter 54, 1545 to1608 Relevant Points Only.** **UNIT 5: Dyes, Drugs and Pharmaceuticals.** **(a) Dyes:** Introduction, properties of dyes, Otto Witts theory only, Classification of dyes according to their mode of application and Chemical Constitution. **Ref.3: Chapter 54, 1545 to1608 Relevant Points Only.**	ICT/ Black-board	09

Feedback: Students are assessed by conducting test & seminars on topics

Reference Books:-

Semester V:

1. Principles of Industrial Chemistry, Chris A Clausen III and Guy Mattson, John Wiley and Sons, Inc. Somerset, 1978, New York.
2. Shreve's Chemical Process Industries, George T. Austin, 5th Edition, The McGraw-Hill, 1984, New York.
3. Industrial Chemistry, B. K. Sharma, 16th Edition, Goel Publishing House, Meerut,(U.P.) 2011, India.
4. Comprehensive Industrial Chemistry, P.G. More, 1stEdition, Pragati Prakashan, Meerut,(U.P.) 2010, India.
5. Chemistry and Technology of the Cosmetics and Toiletries Industry, D.F. Williams and W.H. Schmitt Blackie Academic &. Professional First edition 1992 Second edition 1996 © Chapman & Hall ISBN-13 :978-94-0 10-7194-9 e-ISBN-13:978-94-009-1555-8
6. Handbook of Industrial Chemistry Organic Chemicals, Mohammad Farhat AIi, Bassam M. El AIi, James G. Speight, The McGraw-Hill Companies, 2005, ISBN 0-07-141037-6

Semester VI:

1. Principles of Industrial Chemistry, Chris A Clausen III and Guy Mattson, John Wiley and Sons, Inc. Somerset, 1978, New York.
2. Shreve's Chemical Process Industries, George T. Austin, 5th Edition, The McGraw-Hill, 1984, New York.
3. Industrial Chemistry, B. K. Sharma, 16th Edition, Goel Publishing House, Meerut,(U.P.) 2011, India.
4. Comprehensive Industrial Chemistry, P.G. More, 1stEdition, Pragati Prakashan, Meerut,(U.P.) 2010, India.
5. Chemistry and Technology of the Cosmetics and Toiletries Industry, D.F. Williams and W.H. Schmitt Blackie Academic &. Professional First edition 1992 Second edition 1996 © Chapman & Hall ISBN-13 :978-94-0 10-7194-9 e-ISBN-13:978-94-009-1555-8
6. Handbook of Industrial Chemistry Organic Chemicals, Mohammad Farhat AIi, Bassam M. El AIi, James G. Speight, The McGraw-Hill Companies, 2005, ISBN 0-07-141037-6

Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon
Department of Chemistry
TEACHING PLAN (2023-2024)
Subject: Analytical Chemistry

Paper No. CH - 505 & CH - 605 Class: T.Y.B.Sc

Name of the Teacher: Dr. G. N. Jethave Signature:

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Semester- V** **(UNIT 1:-Spectrometry** Origin of spectra Interaction of electro-magnetic radiation with matter, Electro-magnetic Spectrum, The Absorption of Radiation, Solvents for Spectrometry, Quantitative Calculations, Beer's Law, Principles of instruments - Sources, Monochromators (prism, diffraction gratings, Optical filters), Cells, detectors, Slits Width, Single Beam Spectrometer, Spectrometric Errors, Deviation from Beer's Law - Chemical deviation, Instrumental deviation, Problems. **Ref.-1:- 398-401, 410-411, 413--435, 439-443. Ref. 2 -6:- Relevant Pages**	Online / ICT	09
2	**UNIT 2: Infrared Spectrometry** Infra red Spectrometry – Principles, Theory, Instrumentation, Source, monochromator, detectors, Single beam, Double beam, Types, Sampling Technique, Solvents, Spectrometric error, FTIR introduction, General applications. Page **35** of **70** **Ref.-2: 447 – 458, Ref.-4: 527-576**, **Ref. 2-6: Relevant Pages**	Online / ICT	09
3	**UNIT 3. A: Emission Spectrometry** Flame Emission Spectroscopy – Principles, Theory, Instrumentation, Experimental techniques, Interferences and applications , Advantages and disadvantage, Plasma Emission Spectrometry – Principles, Plasma as excitation source, inductively coupled Plasma source, ICP-AES Instrumentation, Applications. **Ref.-1: 462 – 467, Ref. 2-6: Relevant Pages** **B:-Atomic Absorption Spectrophotometry** Introduction, Principles, Advantages over FES, Instrumentation – Sources, Burners, Flames, Interferences – Spectral Interferences, Ionization Interferences, Refractory Compound Formation,Hallow cathode lamps, Physical Interferences, Use of Organic Solvents, Sample Preparation, Applications of AAS. Comparison of AAS with atomic emission methods **Ref.-1: 467 – 475, Ref. 2-6:Relevant Pages**	Online / ICT	09
4	**UNIT 4:-Potentiometry** Potentiometer, The Cell for Potential Measurements, Combination Electrode, Theory of Glass Membrane Potential, The Alkaline Error, The Acid Error, Standard Buffers, Ion-selective Electrodes - Glass Membrane Electrodes, Precipitate Electrodes, Solid-State Electrodes, Liquid-Liquid Electrodes, Plastic Membrane/Ionophore Electrodes, Coated Wire electrodes, Enzyme Electrodes. **Ref.-1: 312-313,316-325** , **Ref.-2 -6: Relevant Pages**	Online / ICT	09
5	**UNIT 5:-p^H metry** Introduction to pH meter, The Glass pH Electrode Principle,	Online / ICT	09

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
	Accuracy of pH Measurements, Measurements with the pH-meter, Making the pH Measurement, Fundamental limitations, Maintenance. **Ref.-8: 327-333** **Ref.-2 - 8: Relevant Pages**		
6	**Semester- VI** **UNIT 1:- Solvent Extraction** The Distribution Co-efficient, The Distribution Ratio, Percent Extracted, Solvent Extraction of Metals - Ion Association Complex and Metal Chelates, The Extraction Process, The Separation Efficiency of Metal Chelates, Analytical Separations, Multiple Batch Extractions, Countercurrent Distribution, Simple numerical problems on Percent Extracted and Multiple Extraction, Problems **Ref.1: 484 to 498.** **Ref. 2-6: Relevant Pages**	ICT/ Black-board	09
7	**UNIT 2:- High-Performance Liquid Chromatography** Introduction, Principles, Equipment for HPLC, Choice of Column Materials for HPLC, Application **Ref.1: 537 to 545** **Ref.2-6: Relevant Pages**	ICT/ Black-board	09
8	**UNIT 3:- Gas Chromatography** Introduction, Principles, Gas chromatography Columns, Gas Chromatography Detectors, Column Efficiency in Chromatography- Theoretical Plates, 1) Van Deemter Equation, 2) Capacity Factor and 3) Resolution, Problems **Ref.1: 522 to 528, 511 to 515** **Ref.2-6:- Relevant Pages**	ICT/ Black-board	09
9	**UNIT 4:- Ion Exchange Chromatography** Introduction, Cation Exchange Resins, Anion Exchange Resins, Cross-linkage, Effect of pH Separation of Amino Acids, Effect of Complexing Agents-Separation of Metal ions on Anion Exchange Columns, Applications of Ion Exchange Chromatography **Ref.1: 517 to 522** **Ref. 2-6: Relevant Pages** Ref. 2 Relevant pages. Ref. 3 Relevant pages. Ref. 4 Chapter 8 (Relevant pages.) Page No.144-194	ICT/ Black-board	09
10	**UNIT 5:-Thermal Methods** General Discussion, Thermogravimetry- Instruments for thermogravimetry, Applications of thermogravimetry, Differential Techniques- Differential Thermal Analysis (DTA) and Differential Scanning Calorimetry (DSC), Instruments for DTA and DSC, Experimental and Instrumental Factors, Applications of DTA and DSC, Problems **Ref.-6: 503 - 519** **Ref. 1-6: Relevant Pages**	ICT/ Black-board	09

Feedback: Students are assessed by conducting test & seminars on topics

Reference Books:-

Semester V:

1. Analytical Chemistry, G.D. Christian, 5th Edition.
2. Analytical Chemistry Principal- J. H. Kennedy. 2nd Edition (1990)
3. Analytical Chemistry, An Introduction, Skoog, West and Holler, 6 th Edition
4. Instrumental Method of Chemical Analysis, Chaitwal and Anand, 5th Edition.
5. Basic Concept of Analytical Chemistry, S.M. Khopkar
6. Instrumental Methods of Chemical Analysis- Willard, Merritt, Dean and Settle, 6th Edition
7. Introduction to Instrumental Analysis, R.D. Braun
8. Vogel's Textbook of Quantitative Chemical Analysis, J. Mendham, R. C. Denney, J. D. Barnes, M. J. K. Thomas, 6th Edition.

Semester VI:

1. Analytical chemistry, G.D. Christian, 5th Edition,
2. Instrumental Methods of Chemical Analysis, Chatwal and Anand
3. Basic Concept of Analytical Chemistry, S.M. Khopkar, 2nd edition,
4. Chemical Analysis by A. K. Shriwastawa, P. C. Jain, S. Chand and Company.
5. Quantitative Analytical Chemistry, James S. Fritz, George H.Schenk,5th Edition.
6. Vogel’s Text Book of Quantitative Chemical Analysis, J. Mandham, R.C.Denney, J. D. Barnes, M. Thomas, B. Shivashankar, 6th Edition.

Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon
Department of Chemistry
TEACHING PLAN (2023-2024)
Subject: Bio-Chemistry

Paper No. CH- 506 (A) Class: T. Y. B. Sc

Name of the Teacher: Dr. B. P. Koli Signature:

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Semester- V** **Unit 1. Carbohydrates** **a) Introduction**, definition, classification. **b) Monosaccharaides:** structure of glucose (open chain and ring structures). Kiliani Fischer synthesis of D-glucose. Reactions of glucose: oxidation with bromine water and nitric acid, reduction, acetylation, addition of HCN, NH_2OH and phenyl hydrazine, mutarotation. **c) Disaccharides:** structure of sucrose, lactose and maltose. **d) Polysaccharides:** storage polysaccharides, structure of starch, Structural polysaccharides, structure of cellulose. **Ref 1 and 2: Relevant pages**	Blackboad / ICT	09
2	**Unit 2. Amino Acids and Proteins** **a) Amino acids:** Introduction, structure of ammo acids, classification of amino acids, amphoteric nature of amino acids, reactions of amino acids: with FDNB and Dansyl chloride, formation of peptide bond **b) Proteins:** Introduction, classification of proteins: based on functions and based on shape, structure of proteins: primary, secondary, tertiary and quaternary structure). Study of some proteins: keratins and hemoglobin. Separation of amino acids and proteins by paper electrophoresis and dialysis **Ref 1 and 2: Relevant pages**	Online / ICT	09
3	**Unit 3. Enzymes and Lipids** **a) Enzymes:** Introduction, specificity of enzymes, classification, role of enzymes in biochemical reactions, Michaelis Menten equation (no derivation). Effect of substrate concentration, P_H and temperature on enzyme catalyzed reactions. Enzyme inhibitors: introduction and types. **b) Lipids:** Introduction, classification of lipids, fatty acids, nomenclature of fatty acids, triacyl glycerols, hydrogenation of oils, Saponification value and iodine value of oils, phospholipids and waxes. Ref 1 and 2- Relevant pages	Online / ICT	09
4	**Unit 4. Nucleic Acids and Energy Rich Compounds** a) **Nucleic acids**: Introduction, Components of nucleic acids: sugars, bases, nucleosides and nucleotides. Watson and Crick model of DNA, types of RNA (structure not expected) b) **Energy rich compounds**: Introduction, Pyrophosphates, acyl phosphates, enolic phosphates, thiol esters (structure, hydrolytic reaction and energetics). Energy carriers in biological redox systems: NAD^+ and FAD **Ref 1 and 2- Relevant pages**	Online / ICT	09
5	**Unit 5. Metabolism** Definition of metabolism,		

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
	a) Carbohydrate metabolism: Glycolysis: reactions involved and energetics, TCA cycle (Kreb cycle): Reactions involved and energetic **b) Amino acid Metabolism:** Transamination, deamination (by enzymes - glutamic dehydrogenase, ammonia lyases, deaminases and deamidases), decarboxylation **c) Lipid Metabolism:** β- oxidation of fatty acids, reactions involved in β –oxidation, energetics of β –oxidation of palmitic acid. **Ref 1 and 2- Relevant pages**	Online / ICT	09

Feedback: Students are assessed by conducting test on topics

References:

Semester V:

1. Outlines of Biochemistry, Conn and Stumpf (4thEdition)
2. Principles of Biochemistry, A. L. Lehninger (2nd Edition)

Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon
Department of Chemistry
TEACHING PLAN (2021-2022)
Subject: Polymer Chemistry

Paper No. CH – 606 (A) Class: T.Y.B.Sc

Name of the Teacher: : Dr. B. P. Koli Signature:

Sr.No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Semester-VI** **UNIT 1. Basic Concepts of Polymers** Introduction, brief history, monomers and polymers, degree of polymerization, functionality, linear, branched and cross linked polymers, homopolymers, Types of copolymers:- random, alternate, block and graft copolymers, Tacticity (stereochemistry) of polymers: isotactic, syndiotactic and atactic polymers. Classification of polymers:- based on a) origin- natural and synthetic polymers b) native backbone chain – organic and inorganic polymers c) thermal response – thermoplastic and thermo setting polymers d) ultimate form and use – plastic, elastomer, fibre and liquid resin, Degradation of polymers:- types of degradation: chain end and random degradations. **Ref. 1 and 2:** Relevant pages	ICT/ Black-board	09
2	**UNIT 2. Chemistry of Polymerization** Introduction, chain growth polymerization (initiation, propagation, termination, and kinetics): free radical polymerization, ionic (cationic and anionic) polymerizations, step growth polymerization (mechanism and kinetics), ring opening polymerization. **Ref. 1 and 2:** Relevant pages	ICT/ Black-board	09
3	**UNIT 3. Polymerization Techniques & Polymer Processing Techniques** Polymerization techniques: - Bulk polymerization, solution polymerization, suspension polymerization, emulsion polymerization, interfacial condensation polymerization. Polymer processing techniques:- Calendaring, die casting, film casting, and compression moulding. **Ref. 1 and 2:** Relevant pages	ICT/ Black-board	09
4	**UNIT 4. Study of Some Important Polymers** Preparation, properties and applications of - Polyethylene [PE], Polypropylene [PP], Poly(vinyl chloride) [PVC], Polystyrene [PS], Polyacrylonitrile [PAN], Polycarbonates [PC], Phenol-formaldehyde resins [PF], Epoxy resins, Polyester - Polyethyleneterephthalate[PET], Polyamides (Nylon-6 and Nylon-6,6), Poly(vinyl alcohol) [PVA], Poly(lactic acid) [PLA], Polyaniline, and Polybutadiene. **Ref. 1 and 2:** Relevant pages	ICT/ Black-board	09
5	**UNIT 5. Glass Transition Temperature (L-09, M-12)** Glass transition temperature:- Definition and explanation, factors affecting glass transition temperature, Glass transition temperature and molecular weight, Glass transition temperature and melting point, importance of glass transition temperature, determination of glass transition temperature by dilatometry.	ICT/ Black-board	09

Sr.No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
	Molecular weights of polymers:-types of molecular weights-number average molecular weight, weight average molecular weight, viscosity average molecular weight, sedimentation average molecular weight, and poly dispersity index. **Ref. 1 and 2:** Relevant pages		

Feedback: Students are assessed by conducting test on topics

References:

Semester VI

1. Polymer Science, V. R. Govarikar, N. V. Viswanathan, Jayadev Sreedhar, New Age International (P) Ltd., New Delhi, 1997.
2. Text books of Polymer Science, F. W. Billmeyer, John Wiley & Sons; 3rd edition, 1984.

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Department of Chemistry

TEACHING PLAN (2023-2024)

Subject: Advanced Physical Chemistry- I

Paper No. – CH - 411 Class: M.Sc. - I

Name of the Teacher: Ms. Shubhangi N. Jadhav Signature:

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Essentials of Quantum Chemistry** Recapitulation of basic concepts of quantum chemistry, Schrodinger equation, normalization with examples, Hermitian operator and its theorems, free particle, particle in one dimensional box and its application for excitation energies in linear conjugated systems, two and three dimensional box :wave function and probability density plots, degeneracy, energy equation for simple harmonic oscillator, rigid rotator, spherical polar coordinates. Hydrogen atom Schrodinger wave equation (derivation not expected), and related numerical. **Ref. 2,3,4,6**	Black-board / ICT	12
2	**Nuclear& Radiation Chemistry** Parent-daughter decay-growth relationships: daughter nucleus stable, general expression for activity of daughter, parent shorter and longer lived than daughter, parent and daughter of nearly same the same half life, secular and transient equilibrium. Applications of radioactivity: Szilard - Chalmer's reaction, Isotope dilution and neutron activation analysis and related numerical Radiation dosimetry: units of dose, Fricke and Ceric sulphate dosimeters, and conversion of measured dose values and related numerical. **Ref.5, 9**	Black-board / ICT	12
3	**Chemical Kinetics** Introduction, complex reactions, reactions approaching equilibrium (opposing reactions), consecutive elementary reactions (sequential reactions), parallel reactions and its kinetics, elucidation of mechanism of complex reactions: rate determining step of the reaction and steady state approximation, pre-equilibria, Michaelis-Menten mechanism of enzyme catalysis, chain reactions steps involved in chain reactions with suitable example and related numerical. Fast reactions, techniques for the study of fast reactions: flow methods and flash photolysis. **Ref:1, 6, 8, 12, 13**	Black-board / ICT	12
4	**Electrochemistry** Strong electrolytes, ionic strength, activity and activity coefficients of strong electrolytes, Debye Huckel theory of conductivity (derivations not expected), ionic atmosphere, relaxation and electrophoretic effects, DHO equation (mathematical derivation not expected), its validity and	Black-board /ICT	12

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
	deviations, Debye-Huckel theory of activity coefficients : Debye-Huckel limiting law (derivation expected), its testing and deviations. Transport number: definition and its relation to ionic mobility, Moving boundary and Hittorf's theoretical and experimental method and related numerical **Ref.1,6,7, 9**		
5	**Statistical Thermodynamics** Introduction, Concept of Boltzmann Ensemble, Thermodynamic probability, Sterling approximation, Boltzmann distribution law, partition function and its significance, energy and entropy in terms of partition function, separation of partition functions, translational partition function, translation energy and entropy from it, rotational partition function, rotational energy and entropy from it, vibrational partition function and related numerical. **Ref: 1,7, 9, 10, 11**	Black-board /ICT	12

References:

1. P.W. Atkins, J.D. Paula, Physical Chemistry, Oxford University Press
2. Donald McQuerry, Quantum Chemistry, Viva Books
3. R. K. Prasad, Quantum Chemistry, New Age International
4. I. Levine, Quantum Chemistry, Pearson Education
5. H. J. Arnikar, Essentials of Nuclear Chemistry
6. D. A. McQuerry & J. D. Simon, Physical Chemistry Molecular Approach, Viva Books
7. S. H. Maron & C. F. Prutton, Principles of Physical Chemistry, Oxford & IBH Publishing Co.
8. K.J. Laidler, (1965) Chemical Kinetics, Second Edition
9. B.R. Puri, L.R Sharma and M.S. Pathania (2007) Principles of Physical Chemistry (42ndEdition) , Vishal Publishing Co., Jalandhar
10. L.K Nash (1968)Elementary Statistical Thermodynamics, Addition-Wesley, Reading.
11. M. C. Gupta, (1990) Statistical Thermodynamics, Wiley Eastern Ltd.
12. A.A. Frost and R.G. Pearson, Kinetics and Mechanism, Second Edition.
13. G.L. Agrawal, Basic Chemical Kinetics, Tata McGraw-Hill Publishing Company Ltd., New Delhi.
14. Dr. L. S. Patil, Physical Chemistry I, Shree Book Co. Mumbai
15. Dr. L. S. Patil, Physical Chemistry II, Shree Book Co. Mumbai

Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon

Department of Chemistry

TEACHING PLAN (2023-2024)

Subject: Advanced Inorganic chemistry-I

Paper No. – CH – 416(A) Class: M.Sc. - I

Name of the Teacher: Mr. Sagar U. Patil Signature:

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Molecular Orbital Theory** a) Molecular term symbol for homonuclear diatomic molecules - H_2, B_2, C_2, N_2, O_2 and F_2 molecules, b) Linear tri-atomic molecules - BeH_2, CO_2 c) Trigonal planar molecule- BF3, d) Tetrahedral Molecule - CH4, e) Trigonal pyramidal molecule -NH3, f) Angular Tri-atomic molecules - H_2O, NO_2.	Black-board / ICT	12
2	**Molecular symmetry** Symmetry elements and operations, symmetry planes, reflections, inversion Centre, proper / improper axes of rotation, equivalent symmetry elements and atoms, symmetry elements and optical isomerism, Classification of point groups and procedure to determine the point group, with at least one example of each point group.	Black-board /ICT	12
3	**Organometallic compounds of transition metals** Organometallic compounds, molecule orbital theory and 18 electron rule, counting electrons in organometallic complexes, alkyl and aryl complexes, alkene complexes, Allyl and butadiene complexes, complexes containing delocalized cyclic system	Black-board /ICT	12
4	**Chemistry of non-transition elements** Hydrides-classification, electron deficient, precise and rich hydrides. Study of PH_3, SbH_3, AsH_3, Selenides, Tellurides. Synthesis, properties and structures of alkali and alkaline earth metal compounds, Synthesis and reactivity of inorganic polymer of Si and P.	Black-board /ICT	12
5	**Metal Clusters** Introduction, Metal clusters, Carbonyl clusters, Low nuclearity carbonyl clusters, High nuclearity carbonyl clusters (HNCC), Electron counting scheme of HNCC's, Halide type clusters	Black-board /ICT	12

References:–

1. J. E. Huheey, E. A. Keiter, R. L. Keiter, Inorganic Chemistry Principles of Structures and R eactivity, 4th edition, New York, NY: Harper Collins College Publishers, 1993.
2. J. D. Lee, Concise Inorganic Chemistry, 5thedn., Blackwell Science, London, 2006.
3. A. G. Sharpe, Inorganic chemistry, 3rd edition, ISBN 9788131706992, Pearson Education, 1981.
4. F.A. Cotton, Chemical Applications of Group Theory, ISBN: 978-0-471-51094-9, 1990.
5. D.F. Shrivers, P.W. Atkins and C.H. Langfor, Inorganic Chemistry, CH Langford, 1990.
6. B.R. Puri, L. R. Sharma, K. C. Kalia, Principles of Inorganic Chemistry, Shoban Lal Nagin Chand and Co., 2005.
7. H. B. Gray, Electrons and Chemical Bonding. W. A. Benjamin, Inc., New York, 1965.

8. H. J. Emeleus and A.G. Sharpe, Modern Aspects of Inorganic Chemistry, Universal Book S tall, New Delhi.
9. K. Lal, S.K. Agarwal, Advanced Inorganic Chemistry, Pragati Prakashan, Meerut, 2017.
10. G. S. Manku, Theoretical Principles of Inorganic Chemistry, Tata McGraw-Hill edition.
11. B. Douglas, D.H. Mc. Daniel, J.J. Alexander, Concepts and Models of Inorganic Chemistry, 2nd edition.
12. R. Sarkar, General and Inorganic Chemistry, Part one, New Central Book Agency, Kolkata.
13. P. K. Bhattacharya, Group Theory and its Chemical applications, Himalaya Publishing Ho use.
14. F. A. Cotton, G. Wilkinson, C. A. Murillo, M. Bochmann, Advance Inorganic Chemistry, Sixth Edition, John Wiley & Sons, Inc.

Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon

Department of Chemistry

TEACHING PLAN (2023-2024)

Subject: Advanced Organic Chemistry-I

Paper No. - CH - 413 Class: M.Sc. - I

Name of the Teacher: Ms. Quamrin N. Shaikh Signature:

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Reactive Intermediates and Concerted Reactions (Carbocations, Carbanions, Carbene, Nitrene, and Arynes)** Organic reactive intermediates and their structure, methods of generation, structure, stability and important reactions involving carbocations, carbanions, nitrenes, carbenes, arynes. Ref. 3. Page No. 165-186, 195-202 Ref. 4, 5, 6 Relevant pages	Black-board / ICT	10
2	**Nucleophilic Substitution reaction** **A. Aromatic nucleophilic substitution** SNAr, SN_1, Benzyne and SNR_1 reactions, effect of substrate structure, leaving group, solvent and attacking nucleophile. **B. The neighboring group mechanism** The neighboring group mechanism, neighboring group participation by π and σ bonds, anchimeric assistance. Non-classical carbocations, phenonium ions, norbornyl system. Ref. 2. Page No. 406-443. Ref. 3. Page No. 255-262, 265-272, 286-289, 298-320 Ref. 4, 5, 7, 8, 10 Relevant pages	Black-board / ICT	12
3	**Electrophilic Substitution reaction** a) Arenium ion mechanism, orientation and reactivity, energy profile diagram, ortho, para, ipso attack, orientation in other ring systems, six and five membered heterocycles with one hetero atom. b) Important reactions like Friedel crafts alkylation and acylation, nitration, halogenation, formylation, chloromethylation, sulphonation, diazo coupling. Ref. 1. Page No. 447-562 Ref. 2, 3, 4, 5, 7, 8 Relevant pages	Black-board /ICT	12
4	**Addition reaction** a) Addition to carbon-carbon multiple bonds and carbon heteroatom multiple bonds- Mechanism and stereochemical aspects of addition reaction involving electrophile. b) Structural effects and reactivity: Halogenations, Hydrohalogenation, Hydration, Hydroxylation, Hydroboration, Epoxidation, Carbene addition, Hydrogenation, Ozonolysis. Ref. 1. Page No. 517-557 Ref.3, 8, 9, 10 Relevant pages	Black-board/ ICT	10

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
5	**Elimination reaction** a) E_1, E_2, E_1CB mechanisms, Stereo chemistry of elimination, Elimination versus substitution, anti and syn elimination. b) Dehydrohalogenation, Dehalogenation, Dehydration, Hoffmann and Saytzeff's elimination, Pyrolytic elimination, decarboxylative elimination. Ref. 1. Page No. 466-501 Ref.3, 4, 8, 9, 10 Relevant pages	Black-board/ ICT	10
6	**Aromaticity** Huckle's rules. Aromatic and antiaromatic compounds up-to 18 carbon atoms. Homoaromatic compounds. Aromaticity of all benzenoid systems, heterocycles, azulenes, tropolones, fulvenes, sydnones, annulenes, aromatic ions and Fullerene (C_{60}) including NMR characteristics of aromatic systems. Ref. 3. Page No. 40-67 Ref. 5, 7, 9 Relevant pages	Black-board/ ICT	06

Reference books:-

1. Organic Chemistry – by J. Clayden, N. Greeves, S. Warren and P. Wothers (Oxford)
2. Advanced Organic Chemistry – by J. March (Latest Edition)
3. Advance Organic Chemistry (Part A) –by A. Carey and R.J. Sundherg
4. Stereochemistry of carbon compound-by E.L.Eliel
5. Guide book to Reaction Mechanism –Peter Sykes.
6. Organic Chemistry: A Brief Course by Robert C. Atkins , Francis A Carey
7. Stereochemistry of carbon compound-by E.L.Eliel
8. Stereochemistry of organic compound-by Nasipuri
9. Stereochemistry conformations and mechanism by P.S. Kalsi

Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon

Department of Chemistry

TEACHING PLAN (2023-2024)

Subject: Research Methodology for Sciences
Paper No. - RM-417 Class: M.Sc. - I

Name of the Teacher: QNS/ SUP/ GNJ Signature:

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Science and Scientific Research** What is Science? Characteristics of Science, Technology and techno-science, Meaning of Research, Characteristics and types of research, Importance of research activities, Principles of quality research work, Problems in research, Scientific attitude and temper, Qualities of good researcher, Scientific community, Non-science and Pseudoscience, Scientific realism. **Ref. 1: 1-24 and 49-54; Ref. 2: 1-71; Ref. 3: 1-21.**	Black-board/ ICT	12
2	**Design and Criteria of Scientific Research** Introduction, Research planning and design, Selection of research topic, Criteria for good research problem, Source of research Idea, Principles of good research, Criteria of good research, Guidelines for research skill and awareness, Research validity and reliability, Arte fact and bias in research. **Scientific methodology:** Rules and principles of scientific methods, Research methods versus methodology, Hypothesis and testing of hypothesis. Research ethics: Principles and values. Plagiarism: its types and how to avoid it. **Ref. 1: Pages: 1-24, 55-92 and 233-262; Ref. 3: 24-52.**	Black-board/ ICT	12
3	**Literature Survey** Literature review, Approaching the literature, Scholarly literature, Data provenance and evaluation, Intellectual property. **Sources of information:** Primary, Secondary, Tertiary sources, Patents, Journals (Print and e-journal),Type of Journals, Conference Proceedings. Journal Impact Factor, Citation index, h-index. **Understanding of literature:** Reading A Scientific Paper, Abstracts, Current titles, Reviews, Monographs, Books, Current contents, Cross referencing, Indian patent database. **Tools for Digital Literature Survey:** Scientific data bases, e-journals, INFLIBNET, Shod sindhu, Shodh ganga, Google/Google Scholar, Research Gate, PubMed, finding and citing Information. **Ref. 1: 148-180; Ref. 4: 299-317; Ref. 5: 1569-1603**	Black-board/ ICT	12

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
4	**Scientific Writing** Introduction to scientific writing, writing science laboratory Notebook. **Writing Research Paper:** Title, Abstracts, Keywords, Introduction, Material and Methods, Results and discussion, Conclusion, Acknowledgement, References and Supplementary data. Difference between research communication and Review article, Reply to Referee comments for science research paper. Preparation of Poster and Oral Presentation **Writing Proposals:** Research grant and its various components **Ref. 1: 180-229; Ref. 6: 29-43; Ref. 7: Relevant Pages**	Black-board/ ICT	12
5	**Advanced Scientific Tools and Laboratory Safety** **A) Advanced Tools:** Tools for citing and referencing: Mendeley, Zotero, Endnote etc. **Styles of referencing:** Referencing from reputed publishing houses National and International. **Online searching Databases**: *SciFinder, Scopus, Web of Science, ACM Digital Library, ProQuest Biological Sciences (All the databases only introduction).* **B) Laboratory Safety** Laboratory safety, Laboratory manual, Lab as a safe place: habits, Cause of accidents and What to do in case of an accident, Personal protective equipment, Emergency equipment for general purpose. Laboratory ventilation. **C) Introduction to Intellectual Property** Introduction, Role of IP in the economic and cultural developme of the Society, IP Governance, IP as a Global Indicator of Innov History of IP in India (Introduction: Patents, Copyrights and Rel Trademarks, Geographical Indications, Trade Secrets, Semicond Circuits and Layout Designs, Plant Varieties, Traditional Knowl Designs, Biodiversity Conservation). Categories of Intellectual I Conditions for Obtaining a Patent Protection. **Ref. 8, and9: Relevant Pages, Ref. 10: 1-44 and Relevant Pa** **Ref. 11 onwards: Relevant Pages and Links**	Black-board/ ICT	12

References:

1. Research Methodology for Scientific Research, K. Prathapan, I.K. International Pvt. Ltd., New Delhi – 110002, (2019).
2. Research Methodology: The Aims, Practices and Ethics of Science, Peter Pruzan, Springer International Publishing (2016).
3. Research Methodology: Methods and Techniques, 3rdedition, Kothari, C.R. Published by New Age International (P) Ltd., Publishers (2004).
4. Teaching to Avoid Plagiarism How To Promote Good Source, Diane Pecorari, Use-Open University Press (2013).
5. APPENDIX A: The Literature of Organic Chemistry March's Advanced Organic Chemistry: Reactions, Mechanisms, and Structure, Seventh Edition, by Michael B. Smith and Jerry March Copyright John Wiley & Sons, Inc. (2013).
6. Joaquín Isac-García, José A. Dobado, Francisco G. Calvo-Flores, Henar Martínez-García - Experimental Organic Chemistry laboratory manual, Academic Press (2016)
7. A Practical Guide to Scientific Writing in Chemistry Scientific Papers, Research Grants and Book Proposals Tyowua, A. T., CRC Press is an imprint of Taylor & Francis Group, LLC (2023).

8. Chemical Information for Chemists: A Primer, edited by Currano, J. N., Roth, D. L. Publisher The Royal Society of Chemistry (2014).
9. Handbook of Safety in Science Laboratories Education Bureau Kowloon Tong Education Services Centre, Hong Kong (2013).
10. Intellectual Property A Primer for Academia,Tewari, R., Bhardwaj, M.Publication Bureau, Panjab University, Chandigarh, © Panjab University, Chandigarh, ISBN: 81-85322-92-9, (2021).
11. A Manual for Referencing Styles in Research, M. H. Alvi (2016)

12. https://academic.oup.com/pages/authoring/books/preparing-your-manuscript/referencing-styles
13. https://revvitysignals.com/products/research/chemdraw
14. LaTeX Beginner's Guide, Stefan Kottwitz, Packt Publishing, http://static.latexstudio.net/wp-content/uploads/2015/03/LaTeX_Beginners_Guide.pdf
15. Falagas, M.E., Pitsouni, E.I., Malietzis, G.A. and Pappas, G. (2008), Comparison of PubMed, Scopus, Web of Science, and Google Scholar: strengths and weaknesses. The FASEB Journal, 22: 338-342. https://doi.org/10.1096/fj.07-9492LSF
16. Plagiarism, Citation and Referencing: Issues and Styles, A Manual for Referencing Styles in Research, Mohsin Hassan Alvi, DOI: 10.13140/RG.2.1.5149.6408 http://bit.ly/46nFwYi
17. Citation tools: Easing up the researchers' efforts, Dhiraj Kumar, Gyankosh: The Journal of Lib. & Info. Management Vol 4 No. 2 Jul-Dec, 2013
18. Citation Management:How to use citation managers such as EndNoteand Zotero.

URL:https://guides.lib.uchicago.edu/citationmanagement
19. https://pubs.acs.org/doi/full/10.1021/acsguide.40303
20. https://edu.rsc.org/resources/how-to-reference-using-the-rsc-style/1664.article
21. https://www.springer.com/gp/authors-editors/journal-author/journal-author-helpdesk/preparation/1276
22. https://service.elsevier.com/app/answers/detail/a_id/28224/supporthub/publishing/
23. EndNote: A comprehensive guide to the reference management software EndNote. URL: https://aut.ac.nz.libguides.com/endnote
24. Zotero: Learn how to use the reference management software Zotero. URL: https://aut.ac.nz.libguides.com/zotero
25. Mendeley: Learn how to use the reference management programme Mendeley. URL: https://aut.ac.nz.libguides.com/mendeley
26. Grammarly User Guide,

https://bpb-ap se2.wpmucdn.com/blogs.auckland.ac.nz/dist/3/316/files/2020/02/Grammarly-Manual-Feb-2020-1.pdf
27. Online Resources: Publishers, Chemical Societies, Electronic Journals etc.: https://www-jmg.ch.cam.ac.uk/data/c2k/cj/
28. https://scholar.google.com/
29. https://shodhganga.inflibnet.ac.in/
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Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon

Department of Chemistry

TEACHING PLAN (2023-2024)

Subject: Advanced Physical Chemistry- II

Paper No. – CH - 421 Class: M.Sc. - I

Name of the Teacher: Ms. Shubhangi N. Jadhav Signature

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Chemical Bonding** Variation principle approximation, LCAO-MO treatment of H_2^+molecular ion, importance of coulomb and exchange integrals, Born-Oppenheimer approximation and the approximated Hamiltonian, VBT to H_2 molecule (derivation not expected) Comparison between MOT and VBT, HMO theory and its application to ethylene and butadiene. **Ref. 2,3,4,5**	Black-board/ ICT	12
2	**Thermodynamics** Introduction, enthalpy of a system, molar heat capacities, relation between Cp and Cv, Joule-Thomson effect, third law of thermodynamics, concept and importance of absolute entropy, standard entropy and residual entropy, thermodynamic equation of state, partial molar quantity and its significance, partial molar volumes, chemical potential, Gibbs-Duhem equation, thermodynamics of mixing-Gibb's free energy of mixing, entropy of mixing, enthalpy of mixing and related numerical **Ref:1, 5, 6, 7, 8**	Black-board / ICT	12
3	**Infra-red Spectroscopy** Introduction, the vibrating diatomic molecule, the energy of a diatomic molecule, the simple harmonic oscillator, the anharmonic oscillator, the diatomic vibrating rotator: Born-Oppenheimer approximation, breakdown of Born-Oppenheimer approximation, the vibrations of polyatomic molecules, fundamental vibrations and the irsymmetry (water molecule and carbondioxide molecule) and related numerical. **Ref:1, 5, 6, 8, 9**	Black-board /ICT	12
4	**Raman and Electronic Spectroscopy** (a) Raman Spectroscopy: Introduction, Rayleigh and Raman scattering, quantum theory of Raman effect, classical theory of the Raman effect: Molecular polarizability, Raman activity of vibrations (water molecule and carbon dioxide molecule), rule of mutual exclusion. And related numericals. (b) Electronic spectroscopy: Electronic vibrational spectra, intensity of vibrational electronic spectra, Franck-Condon principle, rotational fine structure, Fortrat diagram,	Black-board / ICT	12

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
	dissociation energy, pre-dissociation. **Ref:1, 5, 6, 8, 9**		
5	**Surface Chemistry** Adsorption, Adsorption of gases by solid, Types of adsorption isotherm, Freundlich isotherm, Langmuir adsorption isotherm (derivation expected), BET theory, derivation of BET equation and its application to determine surface area of adsorbent, derivation of Gibbs adsorption isotherm **Ref:1, 5, 6, 8, 10**	Black-board / ICT	12

References:

1. Atkins, P.W.(1998) Physical Chemistry, ELBS.
2. Donald McQuerry, Quantum Chemistry, Viva Books
3. R.K. Prasad, Quantum Chemistry, New Age International
4. I. Levine, Quantum Chemistry, Pearson Education
5. D.A. McQuerry & J.D. Simon, Physical Chemistry Molecular Approach, VivaBooks
6. G. M. Barrow,.(2003) Physical Chemistry, International Student Edition.
7. Moore, W.J.(1998) Physical Chemistry, Orient Longman.
8. B.R. Puri, L.R. Sharma and M.S. Pathania (2007) Principles of Physical Chemistry (42ndEdition), Vishal Publishing Co., Jalandhar.
9. C. N. Banwell and McCash, E. M. (1996) Fundamentals of Molecular Spectroscopy, McGraw Hill International (UK).
10. B.S. Bahl, A. Bahl, G.D. Tuli (2005) Essentials of Physical Chemistry, Chand and CoLtd., NewDelhi.
11. Dr. L. S. Patil, Physical Chemistry I, Shree Book Co. Mumbai
12. Dr. L. S. Patil, Physical Chemistry II, Shree Book Co. Mumbai

Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon

Department of Chemistry

TEACHING PLAN (2023-2024)

Subject: Advanced Inorganic chemistry-II

Paper No.- CH – 426(A) Class: M.Sc.- I

Name of the Teacher: Mr. Sagar U. Patil Signature:

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**The Ionic Bond** Structures of ionic solids, radius ratio rules, calculation of limiting radius ratio Values of coordination no.3, 4, 6, close packing, classification of ionic structures – Ionic compounds of the type AX (ZnS, NaCl, CsCl), Ionic compounds of the type AX2 (CaF_2, TiO_2, SiO_2); Layer structures (CdI_2, [NiAs]) Structures containing polyatomic ions.	Black-board / ICT	12
2	**Electronic Spectra** Energy levels in an atom, coupling of orbital angular momenta, coupling of spin angular momenta, spin orbit coupling. Determining the ground state terms – Hund's rule, Hole formulation, Derivation of the terms for a P2 & P3 configuration, calculation of the number of microstates, Electronic spectra of transition metal complexes – Laporte 'orbital' selection rule, spin selection rule, splitting of electronic energy levels and spectroscopic states.	Black-board / ICT	12
3	**Reaction Mechanism In Transition Metal Complexes** Ligand substitution reaction, classification of mechanism, substitution of square planer complexes, nucleophilicity of entering group, shape of activated complexes, K1 pathway, substitution in octahedral complexes, rate law and their interpretation, activation of octahedral complexes, base hydrolysis, stereochemistry, isomerization reactions.	Black-board / ICT	12
4	**Catalysis** Catalysis, description of catalyst, properties of catalyst, types of catalyst, catalytic steps in organotransition metal catalyst, hydrogenation of alkenes, hydroformylation, Monsanto acetic acid synthesis, Wacker oxidation of alkenes, alkene polymerization, heterogeneous catalysis, nature of heterogeneous catalyst, examples of heterogeneous catalysts (hydrogenation, oxidation).	Black-board / ICT	12
5	**Preparation & Application of Complexes** Preparation of complexes, Application of complexes in analytical chemistry, complexometric titration, Application of complexes in metallurgy, Application of complexes in industry, Application of complexes in medical field. Presence of metal complexes in biological system (Haemoglobin, Chlorophyll, Vitamin B12)	Black-board / ICT	12

References:–

1) Inorganic Chemistry Principles of Structures and Reactivity, 4th edition; James E. Huheey, Ellen A. Keiter, Richard L. Keiter.
2) Concise Inorganic Chemistry, 5th edition J. D. Lee.
3) Inorganic chemistry, 3rd edition Alan G. Sharpe.
4) Chemical Applications of Group Theory, F.A. Cotton.
5) Inorganic Chemistry, Fourth Edition; Shriver & Atkins Intern.student edition.
6) Principles of Inorganic Chemistry; Late B.R. Puri, L.R. Sharma & K.C. Kalia.
7) Principles of Physical Chemistry; Late B.R. Puri, L.R. Sharma &Pathania.
8) Electrons and Chemical bonding By H.B. Gray.
9) Modern Aspects of Inorganic Chemistry, By H. J. Emeleus and A.G. Sharpe; Universal BookStall, New Delhi – 2.19
10) Advanced Inorganic Chemistry; Dr. S.K. Agarwala, Dr. Keemtilal, PragatiPrakashan, Meerut.
11) Theoretical Principles of Inorganic Chemistry, G.S. Manku , Tata McGraw-Hill Ed.
12) Concepts and Models of Inorganic Chemistry, 2nd edition, B. Douglas, D.H. Mc. Daniel, J.J.Alexander.
13) General &Inorg. Chem. (Part one), R. Sarkar, New Central Book Agency ; Kolkata.
14) Group Theory and its Chemical applications, P.K. Bhattacharya, Himalaya Publishing House.
15) Advance Inorganic Chemistry , Cotton &Wilkinson. 1
6) Concept and Applications of Group Theory, Dr. KishorArora, Anmol Publication Pvt. Ltd., New Delhi.
17) Modern Inorganic Chemistry by William Jolly, 2nd edition, Tata McGraw Hill Co.
18)Selected topics in inorganic chemistry – By Dr. W. U. Malik ,Dr. G. D. Tuli, Dr. R. D. Madan

Dr. A. G. D. Bendale Mahila Mahavidyalaya, Jalgaon
Department of Chemistry
TEACHING PLAN (2023-2024)

Subject: Advanced Organic chemistry- II

Paper No.- CH - 423 Class: M.Sc. - I

Name of the Teacher: Ms. Quamrin N. Shaikh Signature:

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
1	**Rearrangements:** Mechanisms of the following reactions with examples **Rearrangements to electron deficient carbon:** Pinacol-pinacolone, Wagner-Meerwein, Tiffeneau–Demjanov, Dienone–Phenol, Arndt-Eistert synthesis; **Rearrangements to electron deficient nitrogen:** Beckmann, Hofmann, Curtius, Schmidt and Lossen rearrangements; **Rearrangements to electron deficient oxygen:** Baeyer-Villiger, Hydro peroxide rearrangement and Dakin rearrangements; Neber rearrangement, Benzil-Benzilic acid and Favorskii rearrangements	Black-board / ICT	10
2	**Selective Name Reactions:** Aldol Condensation, Mannich reaction, Knoevenagel reaction, Stobbe Condensation, Dieckmann Condensation, Benzoin Condensation, Reimer-Tiemann reaction, Reformatsky reaction, Darzens reaction, Michael reaction, Henry reaction, Perkin reaction, Shapiro reaction, Bomford-Steven's reaction, Nef reaction, Baylis Hilman reaction, Cannizaro reaction, Barton reaction, Hofmann Loffler-Freytag reaction, Vilsmeir-Haack reaction	Black-board / ICT	10
3	**Reagents in Organic Synthesis:** **Oxidizing Agents:** General mechanism, selectivity, and important applications 1. Dehydrogenation of C-C bonds including aromatization of six membered rings using metal (Pt, Pd, Ni) and organic reagents (chloranil, DDQ). 2. Oxidation of alcohols to aldehydes and ketones: chromium reagents such as $K_2Cr_2O_7/H_2SO_4$, CrO_3-pyridine (Collin's reagent), PCC (Corey's reagent) and PDC, hypervalent iodine reagents (IBX, Dess-Martin periodinane). DMSO based reagents (Swern oxidation) and Oppenauer oxidation. 3. Oxidation involving C-C bonds cleavage: Glycols using HIO_4; cycloalkanones using CrO_3; carbon-carbon double bond using ozone, $KMnO_4$, CrO_3, $NaIO_4$ and OsO_4; aromatic rings using RuO_4 and $NaIO_4$. 4. Oxidation involving replacement of hydrogen by oxygen: oxidation of CH_2 to CO by SeO_2, Oxidation of aryl methanes by CrO_2Cl_2 (Etard oxidation). 5. Oxidation of aldehydes and ketones: with H_2O_2 (Dakin reaction), with peracid (Baeyer-Villiger oxidation).	Black-board/ ICT	10
4	**Reducing Agents:** General mechanism, selectivity, and important applications: 1. Reduction of CO to CH_2 in aldehydes and ketones - Clemmensen reduction, Wolff-Kishner reduction and Huang-Minlon modification. Ra-Ni desulfurization of thioketal 2. Metal hydride reduction: Boron reagents ($NaBH_4$, $NaCNBH_3$, Na $(OAc)_3BH$), aluminium reagents ($LiAlH_4$,	Black-board/ ICT	10

Sr. No.	Title of the chapter/ topic /sub-topic	Method of teaching	No of lectures
	DIBALH, Red Al, L and K selectrides). NH_2NH_2 (diimide reduction) and other non-metal-based agents including organic reducing agents (Hantzsch dihydropyridine). 3. Dissolving metal reductions: using Zn, Li, Na, and Mg under neutral and acidic conditions, Li/Na-liquid NH_3 mediated reduction (Birch reduction) of aromatic compounds and acetylenes		
5	**Stereochemistry** Stereochemical principles (stereoisomers, chirality, optical activity, enantiomers, diastereoisomers, epimer, anomer), R-S nomenclature, Meso Compounds, E-Z nomenclature, Threo and Erythro nomenclature. optical activity in biphenyls, spiranes, allenes, Racemic modification and racemization, optical purity, pro-stereoisomerism (Homomorphic, Homotopic, Heterotopic, enantiotropic, diastrophic-atoms, groups and faces), stereospecific and stereoselective reactions Conformational analysis of cyclic (cyclohexane, mono-substituted cyclohexane).	Black-board/ ICT	10
6	**Spectroscopy:** IR (Characteristic IR absorption of functional groups: Alkanes, alkenes, alkynes, alcohol, ethers, alkyl-halides, carbonyl compounds (-CHO, C=O, -COOR, -COOH), amines, amides and Aromatic Compounds) H_1 NMR (PMR: Fundamentals of PMR, factors affecting chemical shift, integration coupling (1_{st} order analysis). C_{13} NMR (chemical shift, chemical shift features of aliphatic, olefinic, alkyne, aromatic, hetero aromatic and carbonyl carbon, factors affecting chemical shifts), Mass-molecular ion peak, isotopic peaks, base peak, spectral fragmentation of Organic compounds. Instrumentation, Sample Preparation for UV, IR, NMR ($_1$H and $_{13}$C), Mass Spectrometry. **Joint problems based on UV, IR, NMR ($_1$H and $_{13}$C),**	Black-board / ICT	10

References:

1. S. H. Pine – Organic Chemistry, 5th Edition, McGraw-Hill.
2. P. S. Kalsi – Organic Reactions and Their Mechanisms
3. J. Clayden, N. Greeves, S. Warren – Organic Chemistry, II_{nd} Edition, Oxford University Press.
4. Peter Sykes-A Guidebook to Mechanism in Organic Chemistry
5. W Carruthers and Iain Coldham – Modern Methods of Organic Synthesis
6. P. S. Kalsi –Stereochemistry: Conformation and Mechanism, 8th Edition, New Age International.
7. F. A. Carey, R. J. Sundberg – Advanced Organic Chemistry Part-B: Reactions and Synthesis, 5th Edition, Springer.
8. D. Nasi Puri – Stereochemistry of Organic Compounds: Principles and Applications, Revised 2ndEdition, New Age International.
9. E. L. Eliel – Stereochemistry of Carbon Compounds, McGraw-Hill.
10. P. S. Kalsi – Spectroscopy of Organic Compounds, 6th Edition, New Age International.
11. D. L. Pavia, G. M. Lampman, G. S. Kriz, J. R. Vyvyan – Introduction to Spectroscopy.
12. R. M. Silverstein, F. X. Webster – Spectrometric Identification of Org. Compounds.

HEAD
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TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher: **Mrs. S. P. Phegade**

Subject: **Electronics** Class: **F.Y.B.Sc.**

Title of Paper: **ELECTRONICS-DSC 1 A: Network Analysis**

Paper: **Paper – I (Semester – I)**

Sr. No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Unit 1: Basic Circuit Components** Resistors: Introduction of resistor, Resistive circuits: Series circuit, characteristics of series circuit, series voltage divider, open and short in series circuit, Parallel circuit, laws of parallel circuit, open and short in parallel circuit, series-parallel circuits Inductors: Self and mutual inductance, Inductance in series and parallel Capacitors: Principles of capacitance, capacitors in series and parallel Transformers –Step-up and Step-down Transformers, Turn-Ratio, Voltage and Current Ratio. Types of Transformer (introduction only) Relays and Switches- Electromagnetic Relay, Relay as Switch, Concept of Pole and Throw, Types of Switches – SPST, SPDT, DPST and DPDT **References : Book 3,4** **Feedback : Home Assignments**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	8Hrs 16 Marks
2	**Unit 2: Circuit Analysis** Concept of Voltage and Current Sources. Kirchhoff's Current Law, Kirchhoff's Voltage Law. Mesh Analysis. Node Analysis. Star and Delta networks, Star-Delta Conversion. Problems based on KCL, KVL and Problem on Star-Delta conversion. **References : Book 1,2** **Feedback: Internal Test 1**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	7Hrs 14 Marks
3	**Unit 3: Network Theorems** Principal of Duality. Superposition Theorem. Thevenin's Theorem. Norton's Theorem. Reciprocity Theorem. Maximum Power Transfer Theorem. Problems based on these theorems. **References : Book 2,3,5**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	7Hrs 14 Marks

4	**Unit 4: AC Fundamentals** Types of Alternating Waveforms, Basic AC Generator, Definitions of Cycle, Time Period, Frequency and Amplitude, Characteristics of a Sine Wave, Audio and Radio Frequencies, Different Values of Sinusoidal Voltage and Current, Phase of an AC ,Phase Difference, Vector Representation of an Alternating Quantity, AC through pure resistance , inductance and capacitance. Concept of Reactance and Impedance, RL, RC and RLC circuits, Passive RC filters (Low pass, high pass and band pass filters). Series and parallel resonance (8 hour, 16 Marks) **References : Book 3,4** **Feedback: Internal Test 2**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	8Hrs 16Marks

Reference Books:

1. Electric Circuits, S. A. Nasar, Schaum's outline series, Tata McGraw Hill (2004)
2. Electrical Circuits, M. Nahvi and J. Edminister, Schaum's Outline Series, Tata McGraw Hill (2005)
3. Electrical Circuits, K.A. Smith and R.E. Alley (2014) Cambridge University Press · Network, Lines and Fields, J.D.Ryder, Prentice Hall of India.
4. Electrical Circuit Analysis, Mahadevan and Chitra, PHI Learning.
5. Alternating Current Fundamentals, Stephen Herman et.al.

Signature

Head

Signature of the Teacher

Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon.

TEACHING PLAN

(Year 2023-24)

Faculty of SCIENCE & TECHNOLOGY

Name of the Teacher: **Mrs. S. P. Phegade**

Subject: **Electronics** Class: **F.Y.B.Sc.**

Title of Paper: **ELECTRONICS-DSC 1 B: Analog Electronics**

Paper: **Paper – I (Semester – II)**

Sr. No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Unit 1: Junction Diode** PN junction diode –formation/construction, Formation of Depletion Layer, forward and reverse biasing, Diode Equation and I-V characteristics. Idea of static and dynamic resistance, Zener diode-I-V characteristics, Zener and avalanche breakdown, Reverse saturation current. **References : Book 3,4** **Feedback : Home Assignments**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	8Hrs 15 Marks
2	**Unit 2: Applications of Junction Diodes** Rectifiers- Half wave rectifier, Full wave rectifiers (center tapped and bridge), circuit diagrams, working and waveforms, PIV, ripple factor and efficiency (Derivation not expected). Comparison of rectifiers, Filter-Shunt capacitor filter, its role in power supply, output waveform, and working. Zener diode as a voltage regulator, Problems on Zener regulator **References : Book 1,2** **Feedback: Internal Test 1**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	8Hrs 15 Marks
3	**Unit III: Bipolar Junction Transistor** Construction and operation of BJT (NPN and PNP), CB, CE and CC configuration, characteristics of transistor in CE and CB configurations, h parameter definitions for CE, Regions of operation (active, cut off and saturation), Current gains α and β, Relations between α and β, Need of dc biasing, Biasing methods, dc load line and Q point. **References : Book 2,3,5,7**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	8Hrs 15 Marks

4	**Unit 4: Unipolar Devices** JFET. Construction, working and I-V characteristics (output and transfer), Pinch off voltage. JFET as an amplifier, Concept of MOSFET, UJT, basic construction, working, equivalent circuit and I-V characteristics. UJT as a relaxation oscillator. **References : Book 3,4,6** **Feedback: Internal Test 2**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	6Hrs 15Marks

Reference Books:

1. Electronic Devices and Circuits, David A. Bell, 5th Edition (2015), Oxford University Press.
2. Electronic Circuits: Discrete and Integrated, D.L. Schilling et. al. , Tata McGraw Hill
3. Microelectronic circuits, A.S. Sedra, K.C. Smith, A.N. Chandorkar, (2014), 6th Edn., Oxford University Press.
4. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
5. J. J. Cathey, 2000 Solved Problems in Electronics, Schaum's outline Series, Tata McGraw Hill (1991)
6. Basic Electronics, Bernod Grob, McGra-Hill, India.
7. Applied Electronics, R. S. Sedha; S. Chand and Company, New Delhi.

Signature

Head

Signature of the Teacher

Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon.

TEACHING PLAN

(Year 2023-24)

Faculty of SCIENCE & TECHNOLOGY

Name of the Teacher : **Mr. N. K. Ingle**

Subject: **Electronics** Class: **F.Y.B.Sc. Sem I**

Title of Paper: **ELE-102: Basics of Digital Electronics**

Paper: **Paper – II (Semester – I)**

Sr. No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Unit 1: Number System and Codes:** Introduction, Concept of Radix, Number Systems: Decimal Number System, Binary Number System, Octal Number System, Hexadecimal Number System, Base conversion, Codes: BCD Code, Excess-3 Code, ASCII code. **References : Book 3,4** **Feedback : Home Assignments**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	8Hrs 16 Marks
2	**Unit 2: Logic Gates:** Concept of Positive and Negative Logic, Basic Gates (Symbol and Truth table): OR Gate, AND Gate, NOT Gate, Derived Gates: NAND gate, NOR Gates, EX-OR Gate, EX-NOR Gate, NAND and NOR as Universal Logic Gates, Applications of XOR gate: Controlled inverter, Parity Tester **References : Book 1,2** **Feedback: Internal Test 1**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	6Hrs 12 Marks
3	**Unit 3: Binary Arithmetic and Boolean algebra** **Binary Arithmetic:** Addition and Subtraction, 1's Complement, 2's Complement of binary number, Binary Subtraction: Using 1's Compliment & 2's Complement, Half adder and Full Adder, Basic Laws of Boolean Algebra, De Morgan's Theorems, Simplifications of Boolean expression (Numerical) **References : Book 2,3,5**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	8Hrs 16 Marks
4	**Unit 4: Combinational logic Circuits:** Introduction, Standard representation of Canonical forms: Sum of Product (SOP), Product of Sum (POS), Minterms and Maxterms, Conversion between SOP and POS Karnaugh Map (K Map) Simplification: K map structure, Plotting K map, Representation of Boolean expression using K map (Grouping-Pair, Quad and Octet, overlapping and rolling), Don't care condition, Minimization of SOP expression (Up to 4 variables) Numerical based on above topics (8 hour, 16 Marks) **References : Book 3,4** **Feedback: Internal Test 2**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	8Hrs 16Marks

Reference Books:

1. Digital Principles and Applications, A.P. Malvino, D.P.Leach and Saha, 7th Ed., (2011)
2. Tata McGraw Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, (2009) PHI Learning Pvt. Ltd.
3. Digital Circuits and systems, Venugopal, (2011) Tata McGraw Hill.
4. Digital Fundamentals, Thomas L. Flyod, , Pearson Education Asia (1994)
5. Digital Principles, R. L. Tokheim, Schaum's Outline Series, Tata McGraw- Hill (1994)

Signature

Head

Signature of the Teacher

Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon.

TEACHING PLAN

(Year 2023-24)

Faculty of SCIENCE & TECHNOLOGY

Name of the Teacher : **Mr. N. K. Ingle**

Subject: **Electronics** Class: **F.Y.B.Sc. Sem II**

Title of Paper: **ELE-202: Digital Circuits**

Paper: **Paper – II (Semester – II)**

Sr. No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Unit 1: Data Processing circuits** Idea of Multiplexing and DeMultiplexing, Multiplexer: 2 to 1, 4 to 1, DeMultiplexer: 1 of 2, 1 of 4, IC's of Multiplexer and Demultiplexer, Decoder: BCD to decimal decoder, Encoder: Decimal to BCD encoder using OR-gates. **References : Book 3,4** **Feedback : Home Assignments**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	6Hrs 12 Marks
2	**Unit 2: Flip-Flops** Introduction to sequential logic circuit, Comparison of Combinational and Sequential logic circuits, 1-bit memory cell, RS-FF using NAND and NOR gates, Clocked RS - FF, D- FF, JK - FF, Level and Edge triggered FF, PRESET and CLR, Race around condition, Master Slave J-K FF, T FF, Difference between latch and flip flop **References : Book 1,2** **Feedback: Internal Test 1**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	8Hrs 16 Marks
3	**Unit 3: Shift Register** Introduction to Shift Register, Classification of Register and Types of Registers: Serial in Serial out (SISO), Serial in Parallel out (SIPO), Parallel in Serial out (PISO), Parallel in Parallel out (PIPO), Universal shift register, Applications of Shift Register, Ring counter. **References : Book 2,3,5**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	6Hrs 12 Marks
4	**Unit 4: Counters** Concept of counter, Asynchronous counter (3-bit), Decade counter, Synchronous counter (3- bit), Comparison between Synchronous and Asynchronous counter, Down counter, Up-Down counter. **References : Book 3,4**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	5Hrs 10Marks

5	**Unit-5: Data Converters** Introduction, Need of ADC and DAC, Types of converters, Digital to analog converters (DAC): weighted resistor type and R-2R ladder type converter. Drawbacks of weighted resistor type DAC, Binary or R-2R type D to A convertor, Analog to Digital Converter: Simultaneous or Parallel ADC, Successive approximation type ADC. **References : Book 3,4** **Feedback: Internal Test 2**	Theory - Class Room Black Board Teaching & Demonstration in Laboratory	5Hrs 10Marks

Reference Books:

1. Digital principles and applications - A. P. Malvino & D. P. Leach
2. Modem digital electronics - R. P. Jain
3. Digital Electronics - William Gothman
4. Digital fundamentals (3rd Edition)- Thomas Floyd
5. Digital Systems: Principles and Applications, R.J.Tocci, N.S.Widmer, (2001) PHI Learning.

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Head Signature of the Teacher

Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon.

TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher: **Dr. L. S. Patil**

Subject: **Electronics** Class: **S.Y.B.Sc. Sem III**

Title of Paper: **ELE-301: Analog Circuits and Applications** **Paper - I**

Sr. No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Unit 1: Single Stage Amplifier: (08M)** Classification of Amplifier, Single stage Common Emitter Amplifier and its design, Tuned Amplifier, Distortion and noise in amplifier. **References :** Book 1,2,4 **Feedback:** Seminars	Theory Lectures and Practical Demo	**04H**
2	**Unit 2: Multistage Transistor Amplifiers: (17M)** Introduction, Block diagram of multistage transistor amplifier, Application of multistage amplifier, Block Diagram of PA system, Explanation of terms - gain, frequency response, decibel gain, Bandwidth. Two stage RC-coupled transistor amplifiers and their design, two stage transformers coupled transistor amplifier, two stage Direct Coupled Amplifier. **References :** Book 1,2,3 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**07H**
3	**Unit 3: Transistor Power Amplifier: (12M)** Difference between voltage and power amplifiers, Block diagram of a practical power amplifier, Classification of power amplifier, Principle of push pull amplifier, Class B Push Pull Power Amplifier operation, cross over distortion, conversion efficiency, heat sinks. **References :** Book 1,2, **Feedback:** Discussion	Theory Lectures and Practical Demo	**06H**
4	**Unit 4: Feedback: (14M)** Concept of feedback, types of feedback, Topologies of feedback, Effect of negative feedback on gain, non linear distortion, Band width, Noise, Input and output impedance, (derivations are not expected). Emitter follower – operation, characteristics and applications. **References :** Book 2,3 **Feedback:** Internal Test 2	Theory Lectures and Practical Demo	**06H**
5	**Unit 5: Transistorized Oscillator (14M)** Tank Circuit, Bark Hausen criterion, Oscillator types, Phase Shift Oscillator, Hartley Oscillator, Colpitts Oscillator, Crystal	Theory Lectures and Practical Demo	**07H**

	Oscillator, (working, advantages & disadvantages), RF oscillator. **References :** Book 2,3,4 **Feedback:** Discussion		

Reference:

1. Principles of Electronics - V. K. Mehta
2. Electronic Principles - A. P. Malvino
3. Basic Electronics & Linear Circuits - N. N. Bhargava
4. Integrated Electronics- Millman Halkias

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TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher: **Mr. N. K. Ingle**

Subject: **Electronics** Class: **S.Y.B.Sc. Sem III**

Title of Paper: **ELE-302: Microprocessors and Applications** **Paper – II**

Sr. No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Unit 1: Fundamentals of Microcomputer** Simple Microcomputer Architecture, Input/output Devices, Address bus, Data bus, Control bus, Data storage (idea of RAM and ROM). Computer memory, Memory Interfacing, Memory Map. High level language, Low level language, Assembler, Compiler**. (8 Marks)** **References :** Book 1,2 **Feedback:** Seminars	Theory Lectures and Practical Demo	**04H**
2	**Unit 2: Architecture of 8085 Microprocessor.** Features of 8085, Block diagram, function of each block, Registers, ALU, Stack memory, Stack Pointer, Program counter, Concept of Interrupt, Hardware interrupts. Pin-out diagram of 8085, function of each pin, Data and address buses, De-multiplexing the Bus AD7-AD0, Timing states (T-state), Machine Cycle, Instruction cycle. Timing diagram for Read and write operation (MOV A,M and MOV M,A**) (16 Marks)** **References :** Book 1,2, **Feedback:** Discussion	Theory Lectures and Practical Demo	**08H**
3	**Unit 3: Instruction set of 8085 Microprocessor.** Study of addressing mode for 8085:-Implied Addressing, Register Addressing, Immediate Addressing, Direct Addressing, Register Indirect Addressing, Instruction set: Data transfer instructions, Arithmetic Instructions, Logical Instructions, Branching Instructions, Stack, I/O and Machine Control Instructions. **(16 Marks)** **References :** Book 1,2,3 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**08H**
4	**Unit 4: Assembly Language Programming.** Assembly Language Format, Arithmetic Programs: - 8-bit addition, 8-bit subtraction, Decimal addition and subtraction of two 8-bit numbers, 8-multiplication, one's and two's complement of 16-bit numbers, find largest and smallest Number from a series of given number. Code Conversion Programs: Hex to ASCII conversion, BCD to binary	Theory Lectures and Practical Demo	**06H**

	conversion**.(12 Marks)** **References :** Book 3 **Feedback:** Tutorial		
5	**Unit 5: Microprocessor and Interfacing Applications** Intel 8255 pin diagram, block diagram, Control word format, modes of operation, Bit Set/Reset mode , DAC (IC 1408) and ADC (IC 0801) and their Interfacing with 8085**.(8 Marks)** **References :** Book 1,2 **Feedback:** Internal Test 2	Theory Lectures and Practical Demo,	**04H**

Reference:

1. Hall D.V.,"Microprocessor and Interfacing-Porgramming and Hardware" 2nd Ed., Tata McGraw-Hill Publishing Company Limited, 2008
2. Gaonkar R.S., "Microprocessor Architecture, Programming and Applications", 5th Ed., Penram International,2007.
3. 8080A/8085 Assembly Language Programming by Lance A. Leventhal

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TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher: **Dr. L. S. Patil**

Subject: **Electronics** Class: **S.Y.B.Sc. Sem IV**

Title of Paper: **ELE-401: Analog Communication** **Paper - I**

Sr. No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Unit 1: Basics of Electronic communication:** Importance of Electronic communication, Types of Signals- Analog signal, Digital signal & base band signal (Definition only), Block diagram of an electronic communication system. Types of electronic communications-Simplex, half and full duplex, Brief idea of frequency allocation for radio communication system in India (TRAI). Electromagnetic communication spectrum, band designations and usage, Concept of Noise, signal-to-noise(S/N) ratio. **(12 Marks)** **References :** Book 1,2,4 **Feedback:** Seminars	Theory Lectures and Practical Demo	**06H**
2	**Unit-2 Amplitude Modulation:** Basics of modulation, Need of modulation, Types: Amplitude Modulation (AM), Angle modulation (Frequency and Pulse Modulation), Amplitude Modulation: Mathematical representation of AM wave and its meaning, Modulation index, frequency spectrum, power relations, Concept of side bands(DSB-SC, SSB-TC, SSB-SC,VSB) modulation, Transistorized AM Modulator(Emitter modulator), Advantages, disadvantages and applications of AM, Block diagram of AM Transmitter and its operation, AM Super heterodyne receiver- Block diagram and it's working with waveforms, Demodulation- AM Diode detector. **(20 Marks)** **References :** Book 1,2,3,5 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**10H**
3	**Unit 3: Angle Modulation:** Basic concept of angle modulation, Frequency Modulation (FM)-modulation index and frequency spectrum, equivalence between FM and PM, Comparison of AM and FM, Advantages, disadvantages and applications of FM, Generation of FM using VCO, FM detector (Ratio detector). **(16 Marks)** **References :** Book 1,2,3,7 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**08H**

4	**Unit 4: Analog Pulse Modulation:** Introduction, Need and Advantages of pulse Modulation, Basic Principles of PAM, PWM and PPM modulation, Multiplexing: introduction of FDM and TDM. **(12 Marks)** **References :** Book 1,2,8 **Feedback:** Internal Test 2	Theory Lectures and Practical Demo	**06H**

Reference:

1. Electronic Communications, D. Roddy and J. Coolen, Pearson Education, India.
2. Advanced Electronics Communication Systems- Tomasi, 6th edition, Prentice Hall.
3. Modern Digital and Analog Communication Systems, B.P. Lathi, 4th Edition, 2011, Oxford University Press.
4. Electronic Communication systems, G. Kennedy, 3rd Edn., 1999, Tata McGrawHill.
5. Principles of Electronic communication systems – Frenzel, 3rd edition, McGrawHill
6. Communication Systems, S. Haykin, 2006, Wiley India
7. Electronic Communication system, Blake, Cengage, 5thedition.
8. Wireless communications, Andrea Goldsmith, 2015, Cambridge University Press

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Signature of the Teacher

Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon.

TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher : **Mr. N. K. Ingle**

Subject: **Electronics** Class: **S.Y.B.Sc. Sem IV**

Title of Paper: **ELE-402: LINEAR INTEGRATED CIRCUITS & APPLICATIONS** Paper: **Paper - II**

Sr. No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Unit 1: Differential Amplifier: (08M)** Introduction, CMRR, differential amplifier configurations (mention types with circuit diagram only), Emitter coupled differential amplifier, differential amplifier with constant current source. **References :** Book 1,2 **Feedback:** Seminars	Theory Lectures and Practical Demo	**4Hrs**
2	**Unit 2: Operational Amplifier: (16M)** Block diagram, Schematic symbol, Pin diagram (IC 741), Parameters: - Input impedance, output impedance, input offset voltage, open loop voltage gain, input bias current, slew rate. (Definitions only) Concept of offset Null arrangements Ideal characteristics of an Op-Amp, practical characteristics of an Op-Amp, inverting amplifier, concept of virtual ground, noninverting amplifier, voltage follower. **References :** Book 1,2,3 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**8Hrs**
3	**Unit 3: Applications of Op-Amp: (16M)** Op- Amp as Adder, Subtractor, Differentiator, integrator, Instrumentation amplifier with three Op-Amps, voltage to current converter with floating load and grounded load, Log amplifier using diode. **References :** Book 1,2 **Feedback:** Tutorial	Theory Lectures and Practical Demo	**8Hrs**
4	**Unit 4: Active filters and Comparators: (10M)** Classification of filter, Active filters – Advantages, limitations and types, first order low pass and high pass active filters (Derivation of gain and designing), Basic comparator, Sample and Hold Circuit, Basic peak detector. References : Book 1,2 **Feedback:** Seminars	Theory Lectures and Practical Demo	**5Hrs**
5	**Unit 5: Waveform generators (05P, 10M)** Timer IC-555 and its application - Pin diagram, Functional block diagram, Concept of multivibrator, Astable Multivibrator – Operation and its applications (Free running ramp generator), Monostable Multivibrator – Operation and its applications	Theory Lectures and Practical Demo	**5Hrs**

	(frequency divider), Bistable Multivibrator– Operation, Voltage controlled Oscillator (VCO). **References :** Book 1,2,3 **Feedback:** Internal Test 2		

Reference Books:

1. Operational Amplifier - G. B. Clayton
2. Operational Amplifier and Linear Integrated Circuits - R. A. Gaikwad
3. Integrated Circuits - K. R. Botkar

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Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon.

TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher : **Mrs. S. P. Phegade**

Subject: **Electronics** Class: **S.Y.B.Sc. Sem III**

Title of Paper: **ELE-304: Electrical Circuits and Network Skills** Paper: **Paper - III**

Sr. No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Unit 1: Electrical Drawing and Symbols** Circuit Symbols of all Electronics devices, Electrical Equipment, Blueprint – Only definition, Reading of Circuit Schematic (3 hour, 6 Marks) **References :** Book 1,2 **Feedback:** Seminars	Theory Lectures and Practical Demo	**3Hrs**
2	**Unit 2: Basic Electricity Principles and Devices** Voltage, Current, Resistance, Power, Ohm's Law, Series-parallal circuits, AC and DC supply, Use of multimeter, voltmeter and ammeter in measurement. Resistor, capacitor and Inductor (Only different Types of each), Series and parallel combinations of R, C and L , power meter(6 hour, 12 Marks) **References :** Book 1,2,3 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**6Hrs**
3	**Unit 3: Generators, Motors and Transformers** AC generator – working principle and diagram, Single phase and three phase motor- working principal and construction(Design), Step up and Step down transformer-working principal and construction. (8 hour, 16 Marks) **References :** Book 1,2 **Feedback:** Tutorial	Theory Lectures and Practical Demo	**8Hrs**
4	**Unit 4: Electrical Wiring** Different types of Conductors and cables – Solid and Stranded, Different types of electrical joints, Insulation-classification, Rubber Elastomers Insulation, Cable Tray, Soldering material, flux, Procedure, Technique, Breadboard, Preparation of Extension board- wiring diagram of two, three pin plug and switch. (8 hour, 16 Marks) **References :** Book 1,2,4 **Feedback:** Seminars	Theory Lectures and Practical Demo	**8Hrs**
5	**Unit 5: Electrical Protection** Types of Relays (Solid state, Reed, Electromagnetic), Fuse – role, current rating, voltage rating, cartridge fuse and SMD	Theory Lectures and Practical Demo	**5Hrs**

	fuse (Only diagrams), Circuit breakers (MCB) – Principle, and Advantages MCB over fuse Grounding and Isolation. Concept of earthing.(5 hour, 10 Marks) **References :** Book 1,2,3 **Feedback:** Internal Test 2		

Reference Books:

1. Cables and Wiring by John Cadick Delmar publishers Chapter 4
2. Basic Electronics: Solid State by B.L. Theraja
3. A text book of Electrical Technology Vol-II A.C. and D.C. Machines by B. L. Theraja, S.Chand
4. Modern Electronic Equipment: Troubleshooting, Repair and Maintenance by R. S. Khandpur, Tata McGraw Hill Publishing Company Limited

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Signature of the Teacher

Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon.

TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher : **Mr. N. K. Ingle**

Subject: **Electronics** Class: **S.Y.B.Sc. Sem IV**

Title of Paper: **ELE-404: Computational Techniques in Electronics** Paper: **Paper - III**

Sr. No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Unit 1: Algorithms and Flowchart** Algorithm: Definition, properties and development, examples, Flowchart: Concept of flowchart, symbols, guidelines, types, examples (02 Hours, 04 Marks) **References :** Book 1,2 **Feedback:** Seminars	Theory Lectures and Practical Demo	**2Hrs**
2	**Unit 2: Fundamentals of C** Basic structure of C program, Character set, C tokens, Keywords and Identifiers, Constraints, Variables, Data Types, Declaration of variables, Assigning values to variables, Operators - arithmetic, relational, logical, assignment, increment and decrement, conditional, bitwise, special operators, Evaluation of Arithmetic expressions, Operator precedence and Associativity, I/O statements: Reading and writing a single character, Standard and Formatted Input and Output statements, Preprocessor Directives, Simple programming exercises (04 Hours, 08 Marks) **References :** Book 1,2,3 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**4Hrs**
3	**Unit 3: Decision making, Branching and Looping** Statements – if, if-else, Nesting of if-else, else-if Ladder, switch, break, ?: Operator, goto, Entry and Exit controlled loops, Statements – while, do-while, for, Features of for loops, Nesting of for loops, Jumping out of a loop, Skipping a part of a loop - Use of continue statement, Simple programming exercises (02 hour, 4 Marks) **References :** Book 1,2 **Feedback:** Tutorial	Theory Lectures and Practical Demo	**2Hrs**
4	**Unit 4: Arrays and User Defined Functions** One-dimensional array – Declaration and Initialization, Introduction to two and multi -dimensional arrays, Simple programming exercises. Need for user defined functions, Form of C functions, Return values and their types, Calling a function, Category of Functions, Use of keyword –void, Recursion, Functions with arrays, ANSI C function definition	Theory Lectures and Practical Demo	**5Hrs**

	and declaration, Simple programming exercises (5 hour, 10 Marks) **References :** Book 1,2 **Feedback:** Seminars		
5	**Unit 5: Numerical Techniques using C language** Roots of Equations: Bisection method, Problems Based on these methods. Numerical Integration: Trapezoidal Rule, Simpson's 1/3rd Rule, Problems Numerical Differentiation: Runge Kutta Method, Problems System of Linear Equations: Gauss Elimination Method, Problems. Numerical Simulation of Simple Circuits RC, RL and RLC circuits using differential and integral methods, Loop current analysis using Gauss Elimination Method, Average and RMS value of current using integral methods.(14 hour, 34 Marks) **References :** Book 1,2,3 **Feedback:** Internal Test 2	Theory Lectures and Practical Demo	**17Hrs**

Reference Books:

1. Yashavant Kanetkar, Let Us C , BPB Publications
2. Programming in ANSI C, Balagurusamy, 2nd edition, TMH.
3. Introduction to Numerical Analysis", S. S. Sastry, Prentice Hall India.

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Signature of the Teacher

Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon.

TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher: **Mrs. S. P. Phegde** Subject: **Electronics**

Class: **T.Y.B.Sc. Sem V**

Title of Paper: **ELE- 501: Semiconductor Electronics** Paper: **Paper – I**

Unit	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Crystal Structure:** Classification of solids: Single crystal, Poly crystal, Amorphous, Lattice, Basis and Crystal Structure, Translational Vectors, Unit cell, Primitive cell, Primitive Translational Vectors for SC, BCC and FCC, Co-ordination number, Atomic radii, Packing for SC, BCC and FCC structure, Miller indices **References :** Book 1,2,3 **Feedback:** Seminars	Theory Lectures and Practical Demo	09 H 12 M
2	**Semiconductor Basics:** Bonding forces in solids, Energy bands, Energy bands in Metals, Semiconductors and Insulators, Variation of energy bands with alloy, Concept of Effective mass, Fermi level, Acceptor, Donor, Intrinsic and Extrinsic Semiconductor, Semiconductor material (Elemental and Compound), Direct and Indirect band gap semiconductors, Degenerate and Non-degenerate semiconductors. **References :** Book 1,2,3 **Feedback:** Seminars	Theory Lectures and Practical Demo	09 H 12 M
3	**Carrier Transport Phenomenon:** Density of states, Carrier concentration, Electron-hole concentration at equilibrium, Dependence of Fermi level on temperature and doping concentration, Carrier drift, Mobility, Resistivity, Conductivity, Hall effect. **References :** Book 1,2,3 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	09 H 12 M
4	**P-N Junction:** Fabrication of P-N Junction: Mention different methods of fabrication, Diffusion method. Equilibrium conditions: contact potential, space charge at junction, forward and reverse bias junction: Qualitative description of current flow at a junction, Reverse-bias break-down: Zener and avalanche breakdown. **References :** Book 1,4,5	Theory Lectures and Practical Demo	09 H 12 M

	Feedback: Tutorials		
5	**Integrated Circuits (IC) Fabrication:** Introduction and classification of ICs, Advantages and disadvantages of ICs over discrete components, Manufacturing process of monolithic ICs: Lithography, Etching, Diffusion and Metallization, Fabrication of discrete devices: Monolithic fabrication of BJT, Passive Components-Integrated circuit Resistor, Capacitor. **References :** Book 5,6 **Feedback:** Internal Test 2	Theory Lectures and Practical Demo	09 H 12 M

Reference Books:

1. Charles Kittle, 'Introduction to Solid State Physics', John Wiley and Sons.
2. Ben G. Streetman and Sanjay Kumar Banergee, 'Solid State Electronic Devices', PHI Publication.
3. S O Kasap, 'Principle of Electronic Materials and Devices', Tata McGraw Hill Education.
4. S. M. Sze and Kwok K. Ng, 'Physics of Semiconductor Devices', Wiley Student Edition.
5. D. Roy Choudhury&Sahil B. Jain, 'Linear Integrated Circuits', New Age International Publisher.
6. U. A. Bakshi, A. P. Godse, A. V. Bakshi, 'Linear Integrated Circuits', Technical Publications.
7. Neil H. E. Weste, David Harris and Ayan Banergee, 'CMOS VLSI Design', Pearson Education.

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Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon.

TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher: **Mrs. S. Phegade** Subject: **Electronics**

Class: **T.Y.B.Sc. Sem VI**

Title of Paper: **ELE – 601 Power Electronics** Paper: **Paper - I**

Unit No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Power Devices:** Need for Semiconductor Power Devices, Power Diodes, Enhancement of Reverse Blocking Capacity, Introduction to Family of Thyristors. Basic Structure, symbol, working, I-V Characteristics, Applications of SCR, DIAC and TRIAC. Ratings: Latching Current, Holding Current, dv/dt & di/dt rating, I2t rating, surge current rating. List of applications of SCR **References :** Book 1,2,3 **Feedback:** Seminars	Theory Lectures and Practical Demo	**12 H, 14 M**
2	**Switching circuits for SCR** Methods of Triggering: Gate triggering, Voltage triggering, Thermal triggering and Radiation triggering, Triggering of SCR using UJT, Triggering of SCR using BJT. Turn off circuits- Natural & Forced Commutation, types of forced commutation (all classes). **References :** Book 1,2,7 **Feedback:** Seminars	Theory Lectures and Practical Demo	**8 H, 12 M**
3	**Controlled Rectifiers** Single Phase Circuits: Thyristor half wave Rectifier (Resistive load), Thyristor half wave Rectifier (Inductive load), Thyristor Full Converter (Resistive load), Thyristor Full Converter (Inductive load). **References :** Book 1,2,3 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**7 H, 10 M**
4	**Inverters and Converters** Inverters - Introduction, Industrial applications, types of inverters, Single Phase Bridge inverter, Single Phase Centre Tapped Inverter, Series Inverter. Converters (choppers) - Introduction, Principle of Step down Chopper (variable frequency and constant frequency control), Step up chopper, Chopper Classification, Chopper Configurations. **References :** Book 1,2,8 **Feedback:** Tutorials	Theory Lectures and Practical Demo	**10 H, 12 M**

5	**Applications of SCR and High frequency heating** **Applications of SCR -** Uninterruptible power supplies, over voltage protection, simple battery charger, fan regulator using DIAC and TRIAC. High frequency heating applications - **Induction heating –** principle, application as induction heater **Dielectric Heating –** principle, application in sterilization **References :** Book 5,6,7 **Feedback:** Internal Test 2	Theory Lectures and Practical Demo	**8 H, 12 M**

Reference Books:

1. "A Text Book on Power Electronics", H.C. Rai, Galgotia Publication,
2. "Power Electronics" H.C. Rai, Galgotia Publication
3. "Industrial Electronics" G. K. Mithal, Khanna Publishers
4. "Thyristor & Their Applications", M. Ramamoorty, EWP.
5. Principles of Electric Machines and Power Electronics, 3rd Edition

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Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon.

TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher: **Dr. L.S Patil** Subject: **Electronics**

Class: **T.Y.B.Sc. Sem V**

Title of Paper: **ELE 502: Advanced Digital System Design using VHDL** Paper: **Paper - II**

Unit	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Introduction to VHDL** Introduction, library, entity, architecture, modeling style, concurrent and sequential statements, identifier, data object and data types, attributes. **References :** Book 1,2,3 **Feedback:** Seminars	Theory Lectures and Practical Demo	**05H, 10M**
2	**Combinational Logic Circuits** Introduction to combinational circuits, Revision of K-Map, Combinational logic examples (half and full adder, full subtractor, four bit binary adder, multiplexer and demultiplexers, any combinational circuits up to 3 input) Ref. 1. (N. G. Palan) VHDL Programming: half and full adder, full subractor, four bit binary adder, multiplexer and demultiplexers Idea of seven segment display (Common anode, common cathode) and designing of BCD to seven segment decoder. Ref. 1 (N. G. Palan) **References :** Book 1,2,3 **Feedback:** Seminars	Theory Lectures and Practical Demo	**12H, 14M**
3	**Flip Flop Circuits** Introduction to R-S, J-K, T and D flip flops, Excitation table of flip flops, flip flop conversions: R-S to J-K, S-R to T, J-K to D and T to D VHDL Programming: Flip flops S-R, D, J-K, J-K master Slave and T Applications of Flip flops, Ref. 2 (A. Anand kumar) **References :** Book 1,2,3 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**14H, 18M**
4	**Sequential Logic Design** State table, state diagram, state equation and state reduction in sequential logic design, Brief revision of counters: Design of Asynchronous counters - Design of Mod-6 counter using T flip flop, Design of Mod-10 counter using T flip flop VHDL Programming: Mod-6 asynchronous counter Design of Synchronous counters- Design of synchronous 3 bit up-down counter using J-K flip flop, Design of synchronous 3 bit up counter, Design of synchronous 3 bit down counter, Design of synchronous Mod-10 bit up-down	Theory Lectures and Practical Demo	**14H, 18M**

	counter using T flip flop, Design of synchronous modulo 6 Grey code counter. **VHDL Programming: 3 bit up-down counter.** **References :** Book 1,2,3 **Feedback:** Tutorials		

Reference Books:

1. "VHDL Primer", J. Bhaskar, Pearson Prentice Hall India
2. "VHDL Programming by Example", Douglas L Perry, McGraw Hill Professional.
3. "Digital Electronics and Logic Design", N. G. Palan, Technova Publications, Pune.
4. "Fundamentals of Digital Circuits" A. Anand Kumar, PHI Publication
5. "Digital Design", M. Morris Mano, Michael D. Ciletti, Pearson India
6. "Digital Logic and Computer Design", M Morris Mano, Prentice Hall India
7. "Modern Digital Electronics", R. P. Jain, Tata McGraw Hill Publishing.
8. "Digital Circuits and Design", S. Shalivahanan, Vikas Publishing House

Signature

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Signature of the Teacher

Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon.

TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher: **Mrs. S. P. Phegade** Subject: **Electronics**

Class: **T.Y.B.Sc. Sem VI**

Title of Paper: **ELE 602: Consumer Electronics** Paper: **Paper - II**

Unit No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Audio System** Microphone: Characteristics of microphone, different types of microphone, Electret & carbon microphones (principle, construction, working and characteristics). Special Microphones: Lavalier microphone, Tie-clip microphone, Radio microphone and Noise cancelling microphone. Loudspeaker: Characteristics of Loudspeaker, Horn type, Multiway speaker system (Woofers & Tweeters). P.A. System: Need and Use, Block diagram of P.A. system, Requirements of PA system, typical P.A. Installation planning (P.A. system for a public meeting in Public Park and P.A. System for an auditorium having large capacity) **References :** Book 1,2,3 **Feedback:** Seminars	Theory Lectures and Practical Demo	**10H, 14M**
2	**Digital Television and Video** Introduction to Liquid Crystal Display, Plasma, LED and OLED Screen Televisions, Basic block diagram of LCD and LED Television and their comparison. Concept of HD TV, smart TV, closed circuit TV. Introduction of Direct to home satellite TV (D2H), Block diagram of D2H TV system, Cable TV system, Personal Video Recorders (PVRs), Video on Demand. **References :** Book 1,2,4 **Feedback:** Seminars	Theory Lectures and Practical Demo	**10H, 14M**
3	**Office Appliances** Computer System (Block Diagram, function of each block), Scanners, Barcode reader, Printers, Photocopier (Xerox Machine)- block diagram, features and specification. Multifunction units (Print, Scan, fax, and copy). **References :** Book 1,2,5 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**08H, 10M**
4	**Modern Home Appliances** Microwave Oven – Principle of Operation, Block Diagram, Safety instructions -Care and Cleaning, features and	Theory Lectures and Practical Demo	**17H, 22M**

	specifications Washing Machine - Principle of Operation, fuzzy logic, Washing machine with fuzzy logic, Block Diagram, features and specifications. Remote Control: Operating Principle, Block Diagram, Operation and features. Electronic Weighing Systems - Operating principle, Block diagram, features. Home security system, Introduction of Air conditioners (AC), Components of AC, Types of AC, Water Purifier. **References :** Book 1,2,3 **Feedback:** Tutorials		

Reference Books:

1. Consumer Electronics by R. P. Bali, Pearson Education (2008)
2. Audio and Video systems by R. G. Gupta, Tata McGraw Hill (2004)
3. Consumer Electronics by J. S. Chitode, Technical Publication Pune
4. Electronic and Electrical Servicing Consumer and Commercial Electronics, by Ian Sinclair & John Dunton.

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TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher: **Mr. N. K. Ingle** Subject: **Electronics**

Class: **T.Y.B.Sc. Sem V**

Title of Paper: **ELE 503: Advanced Microprocessor** Paper: **Paper - III**

Unit	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**The Processor 8086** Register organization of 8086, Architecture, Pin diagram and its functions, Signal Descriptions of 8086, Physical memory organization, General bus operation, I/O addressing Capability, activities, concept of stack. Minimum and Maximum mode 8086, System Bus Timing. **References :** Book 1,2,3 **Feedback:** Seminars	Theory Lectures and Practical Demo	**10H, 14M**
2	**8086 Instruction Set** Machine language instruction formats, Addressing mode of 8086, Instruction set of 8086:- Data Copy / Transfer Instructions, Arithmetic and Logical Instructions, Branch Instructions, Loop Instructions, Machine control Instructions, Flag Manipulation Instructions, Shift and Rotate Instructions, String Instructions. **References :** Book 1,2,5 **Feedback:** Seminars	Theory Lectures and Practical Demo	**10H, 12M**
3	**Assembler Directives and Operator** Data Definition and Storage Allocation, Structures, Records, Assigning Names to Expressions, Segment Definition, Program Termination, Alignment Directives, Value-Returning Attribute Operators. **References :** Book 1,2,4 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**10H, 10M**
4	**Programming of 8086** Simple assembly language program, Loop program and String processing program. **References :** Book 1,2,3 **Feedback:** Tutorials	Theory Lectures and Practical Demo	**08H, 12M**
5	**Intel 80386 & Pentium Operators** Key features of Intel 80386 – internal architecture of 80386 - operating modes - paging mechanism, Pentium processor – its features **References :** Book 1,2,4	Theory Lectures and Practical Demo	**07H, 12M**

	Feedback: Internal Test 2		

Reference Books:

1. "Advanced microprocessor and peripherals (Architecture Programming and Interfacing)",A.K. Ray, K. M. Bhurchandi, TMH Publication.
2. "Microprocessor system: 8086/8088 family Architecture Programming and design)", Yu Cheng Liu and G.A.Gibson, PHI Publication.
3. "Microprocessor and Interfacing", D. Hall 1995, TMH Publication.
4. "The 8088 and 8086 microprocessor (Programming, Interfacing, Software, Hardware and applications)", Walter A. Triebel, Autarsingh.
5. "Microprocessor and Interfacing Techniques", A. P. Godse. D. A. Godse, Technical Publication, Pune.

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TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher: **Mr. N. K. Ingle** Subject: **Electronics**

Class: **T.Y.B.Sc. Sem VI**

Title of Paper: **ELE 603: Microprocessor Interfacing Techniques** Paper: **Paper - III**

Unit No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Special Architectural Features and Related Programming:** Interrupts and interrupt service routines, interrupt cycle of 8086, NMI and maskable Interrupt, interrupt Programming, Macros. Programming using Dos Interrupt: INT 21H (Function 01H, 02H, 09H, 4CH, 10H). **References :** Book 1,2,3 **Feedback:** Seminars	Theory Lectures and Practical Demo	**11H, 15M**
2	**I/O Programming and Interfacing** Fundamental I/O Considerations, Programmed I/O, Interrupt I/O, Interfacing in I/O, Mapped I/O, Interfacing in Memory Mapped I/O, DMA Controller IC 8257- its features, block diagram and interfacing with 8086 **References :** Book 1,2,4 **Feedback:** Seminars	Theory Lectures and Practical Demo	**11H, 14M**
3	**Basic & Special Programmable Peripheral devices and their Interfacing:** Block diagram of ADC -0808 and its interfacing, DAC 0800 interfacing, Stepper motor interfacing. Programmable Interval Timer 8253 – Internal block diagram, operating mode of 8253 **References :** Book 1,2,4 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**12H, 16M**
4	**Communication Interface Peripheral** Serial Communication interface, Asynchronous and synchronous communication, Parallel communication interface, Programmable communication interface 8251- Internal Architecture and operating modes **References :** Book 1,2,3 **Feedback:** Tutorials	Theory Lectures and Practical Demo	**11H, 15M**

Reference Books:

1. "Advanced microprocessor and peripherals (Architecture Programming and Interfacing)",A. K. Ray, K. M. Bhurchandi, TMH Publication.
2. "Microprocessor system: 8086/8088 family Architecture Programming and design)", Yu Cheng Liu and G.A.Gibson, PHI Publication.
3. "Microprocessor and Interfacing", D. Hall 1995, TMH Publication.

4. “The 8088 and 8086 microprocessor (Programming, Interfacing, Software, Hardware and applications)”, Walter A. Triebel, Autarsingh.
5. “Microprocessor and Interfacing Techniques”, A. P. Godse. D. A. Godse, Technical Publication, Pune.

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TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher: **Mr. N. K. Ingle** Subject: **Electronics**

Class: **T.Y.B.Sc. Sem V**

Title of Paper: **ELE – 504: Electronic Instrumentation** Paper: **Paper - IV**

Unit No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Basic Measurement Concepts** Measurement systems, Fundamental elements of measurement system, Static and Dynamic characteristics, Accuracy and Precision, Sensitivity, Linearity, Resolution, Repeatability; Errors such as Gross error, Systematic error, Absolute and Relative error, Random error **References :** Book 1,2,7 **Feedback:** Seminars	Theory Lectures and Practical Demo	**8H, 10M**
2	**Transducers and sensors:** Classification of transducers, Basic requirement/ characteristics of transducers, active & passive transducers, Resistive (Potentiometer, Strain gauge– Working Principle and applications), Capacitive (Variable Area Type – Variable Air Gap type – Variable Permittivity type), Inductive (LVDT) and piezoelectric transducers **References :** Book 1,2,3 **Feedback:** Seminars	Theory Lectures and Practical Demo	**8H, 10M**
3	**Signal generators and Oscilloscopes** Signal Generators: Introduction, Block diagram of standard signal generator, AF sine and square wave generator, Function generator, Square and Pulse generator, Sweep generator, Frequency synthesizer. **Cathode Ray Oscilloscopes (CRO)-**block diagram, front panel controls, and measurement of amplitude, frequency and phase. Dual trace and dual beam CRO. **References :** Book 1,2,5 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**12H, 16M**
4	**Digital Measuring Instruments** Digital Storage Oscilloscope (DSO)-Block diagram, advantages and applications. Digital Multimeter (DMM)-Block diagram and working, Digital Frequency Meter (DFM)-Working principle, Block diagram, measurement of frequency and time. **References :** Book 1,2,4 **Feedback:** Tutorials	Theory Lectures and Practical Demo	**9H, 14M**

5	**Data Acquisition System and Data logger** **DAS:** Introduction, general block diagram of DAS, Single channel and multi-channel DAS, PC based data acquisition, ADC and DAC, Typical on board DAQ card, Representation of analog signals in the digital domain, Resolution and sampling frequency, Multiplexing of analog inputs, Single-ended and differential inputs, Different strategies for sampling of multi-channel analog inputs. Concept of universal DAQ card. **Data Loggers:** Characteristics of data loggers, Block diagram and basic operation of data logger. **References :** Book 1,2,8 **Feedback:** Internal Test 2	Theory Lectures and Practical Demo	**8H, 10M**

Reference Books:

1. Albert D. Helfrick and William D. Cooper, "Modern Electronic Instrumentation and Measurement Techniques", Pearson / Prentice Hall of India, 2007.
2. B.C. Nakra and K.K. Choudhry, "Instrumentation, Measurement and Analysis", 2nd Edition, TMH, 2004.
3. H.S. Kalsi, "Electronics Instrumentation", Tata McGraw Hill, 2012
4. A. K. Sawhney, "A Course in Electrical & Electronic Measurements & Instrumentation", Dhanpat Rai and Co, 2004.
5. Joseph J. Carr, "Elements of Electronics Instrumentation and Measurement", Pearson India
6. Alan. S. Morris, "Principles of Measurements and Instrumentation", 2nd Edition, Prentice Hall of India 2003
7. David A. Bell, "Electronic Instrumentation and Measurements", Prentice Hall of India Pvt. Ltd, 2003.
8. James W. Dally, William F. Riley, Kenneth G. McConnell, "Instrumentation for Engineering Measurements", 2nd Edition, John Wiley, 2003

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Signature of the Teacher

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TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher: **Dr. L. S. Patil** Subject: **Electronics**

Class: **T.Y.B.Sc. Sem VI**

Title of Paper: **ELE 604: Computer Network** Paper: **Paper - IV**

Unit No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Fundamentals of Computer Network** 1.1.Needs, uses of Computer Network, Applications of Computer, Network, Benefits of Computer Network: Sharing of Information, Sharing Resources, Centralized Management of resources, backing up of data. 1.2.Classification of Networks: Geographical Classification, Classification Based on Transmission Technology, Classification Based on Network Relationships 1.3.Basics of network computing models: per-to-peer, client server, distributed Network Operating System (NOS): its types, features and applications. **References :** Book 1,2,3 **Feedback:** Seminars	Theory Lectures and Practical Demo	**08 H, 10 M**
2	**Network Components and Topologies:** 2.1.Basic Components of Computer Network: Cables. Host, Communication Subnet. NJC. 2.2.Network Devices and their role: Repeaters, Hub, Bridge, Switches, Router 2.3.Network Topologies: Concept Significance, Bus, Star, Ring, Tree, Mesh **References :** Book 1,2,5 **Feedback:** Seminars	Theory Lectures and Practical Demo	**08 H, 10 M**
3	**Reference Models for Computer Networks:** 3.1.Protocol Hierarchies-Layered Approach 3.2.Interfaces, Services, Protocols and Packets 3.3.Design issues for layering. 3.4.OSI reference Model: layers and their functions. 3.5.TCP/JP Protocol: Layers and their functions 3.6.OSI Model Vs.TCP/IP **References :** Book 1,2,6 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**10 H, 12 M**
4	**TCP/IP Protocol Suite:** 4.1.Host-to-Network Layer Protocols: SLIP ,PPP 4.2.Internet Layer Protocols: IP, ARP,RARP,ICMP. 4.3.Transport Layer Protocols: TCP, UDP. 4.4.Application Layer Protocols: FTP, HTTP, SMTP,	Theory Lectures and Practical Demo	**08 H, 10 M**

	TELNET, DNS, BOOTP, DHCP **References :** Book 1,2,3 **Feedback:** Tutorials		
5	**Wireless LANS & Virtual Circuit Networks** 5.1.Introduction, 5.2.Wireless LANS: IEEE 802.11 project, 5.3.Bluetooth, Zigbee. 5.4.Connecting devices and Virtual LANS. **References :** Book 5,6,7	Theory Lectures and Practical Demo	**05 H, 08 M**
6	**Introduction and Cloud Computing Technology:** 6.1.Shift from distributed computing to cloud computing; 6.2.Principles and characteristics of cloud computing- IaaS, PaaS, SaaS; 6.3.Service oriented computing and cloud environment, 6.4.Client systems, Networks, Server systems and security from services perspectives, 6.5.Accessing the cloud with platforms and applications; cloud storage. **References :** Book 1,6 **Feedback:** Internal Test 2	Theory Lectures and Practical Demo	**06 H, 10 M**

Reference Books:

1. Computer networks : Tanenbumb, Andrew S. PHI learning New Delhi
2. TCP/Ip Protocol Suit : Forouzm Behrouz A. McGrawHill ,New Delhi,2006
3. Data Communication and networking :Forouzm Behrouz A. McGrawHill,New Delhi 2006
4. Data Communication and networks : Godbole ,Achyut McGrawHill ,New Delhi 2006
5. Computer network Topdown approach : Korus Pearson
6. Cloud Computing – A Practical Approach, Anthony T. Velte, Toby J. Velte and Robert E, TMH 2010.
7. Cloud Computing – Web based Applications: Michael Miller, Pearson Publishing, 2011.

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Signature of the Teacher

Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon.

TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher: **Dr. L. S. Patil** Subject: **Electronics**

Class: **T.Y.B.Sc. Sem V**

Title of Paper: **ELE- 505 : Medical Electronics** Paper: **Paper - V**

Unit No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Bioelectric signals and Physiological transducers:** Cell characteristics, Bio-electric potential: Origin, Resting and action potential, depolarization and repolarisation, propagation of action potentials, ECG, EEG and EMG waveforms with typical characteristics. Electrodes: Types, Electrodes used for ECG, EEG and EMG. Selection of physiological transducers, Physiological transducers: Pressure, Temperature, photoelectric & ultrasound Transducers. Measurement in Respiratory system: Physiology of respiratory system, Measurement of breathing **mechanics, Humidifiers, Nebulizers Aspirators.** **References :** Book 1,2,3 **Feedback:** Seminars	Theory Lectures and Practical Demo	**12 H 10 M**
2	**Basic recording systems** Block diagram of ECG, isolated preamplifier, ECG leads, effects of artifacts on ECG recordings, Multichannel ECG machine, Block diagram of EEG machine, 10-20 electrode placement system for EEG, and Evoked potential, Working of EMG with block diagram. **References :** Book 1,2,3 **Feedback:** Seminars	Theory Lectures and Practical Demo	**07 H 12 M**
3	**Therapeutic Equipment** Cardiac pacemakers- external and implantable pacemakers and programmable pacemaker. Defibrillator-internal and external, AC and DC defibrillators, block diagram of microprocessor based defibrillator. Diathermy- types, schematic of microwave diathermy unit, Surgical diathermy – principle, working of solid state surgical diathermy machine. Laser- different types of lasers and their applications in medicine, Ventilators- Working, microprocessor based ventilator, high-frequency ventilator. **References :** Book 8,9,10 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**10 H, 15 M**
4	**Bio Amplifier** Need for bio-amplifier - single ended bio-amplifier, differential bio-amplifier – right leg driven ECG amplifier.	Theory Lectures and Practical Demo	**08 H, 14 M**

	Band pass filtering, isolation amplifiers – transformer and optical isolation - isolated DC amplifier and AC carrier amplifier, Chopper amplifier, Power line interference. **References :** Book 1,2,10 **Feedback:** Tutorials		
5	**Unit- 5: Biochemical sensors and Patient safety** Biochemical sensors - pH, pO2 and pCO2, Blood glucose sensors - Blood gas analyzers, colorimeter, flame photometer, spectrophotometer, blood cell counter, auto analyzer (simplified schematic description). Patient safety - Physiological effects of electric current, micro and macro shock- preventive measures, Precaution, safety codes for electro medical equipment, Electric safety analyzer, E-waste- Sources and disposal. **References :** Book 5,6,7,11 **Feedback:** Internal Test 2	Theory Lectures and Practical Demo	**08 H, 09 M**

Reference Books:

1. John G. Webster, "Medical Instrumentation Application and Design", John Wiley and sons, New York, 2004.
2. Khandpur R.S, "Handbook of Biomedical Instrumentation", Tata McGraw-Hill, New Delhi, 2003.
3. Joseph J. Carr& John M. Brown, "Introduction to Biomedical Equipment Technology", Pearson.
4. Shakti Chatterjee, "Textbook of Biomedical Instrumentation System", Cengage Learning.
5. Bertil Jacobson & John G. Webster- Medicine and clinical Engineering, PHI.
6. Prof. S. K. Venkata Ram- Bio-Medical Electronics and Instrumentation, Galgotia Publications
7. Principals of Biomedical Electronics and Biomedical Instrumentation, C Raja Rao, University Press
8. Introduction to Biomedical Engineering, Michal Domach, Pearson Education
9. Introduction to Biomedical Instrumentation –Mandeep Singh, PHI Learning
10. Principles of Medical Electronics and biomedical Instrumentation- S.K. Guha, University Press India Ltd.
11. Biomedical Instrumentation –Dr. M. Arumugam

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Signature of the Teacher

Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon.

TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher: **Mr. N. K. Ingle** Subject: **Electronics**

Class: **T.Y.B.Sc. Sem VI**

Title of Paper: **ELE 605: Embedded Systems** Paper: **Paper - V**

Unit No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Introduction to Embedded System (06M)** Introduction to Embedded Systems, Stand-alone and real-time embedded systems. Requirements of embedded systems, Components of embedded system. Programming languages and tools. Embedded operating system. Embedded system Application examples **References :** Book 1,2,3 **Feedback:** Seminars	Theory Lectures and Practical Demo	**06H, 06M**
2	**Timer and Counter Programming** Single bit Programming, Timer modes, Programming the timers in various modes (Mode 1 and Mode2), Counter Programming. To generate delay of milliseconds & square wave. **References :** Book 1,2,6 **Feedback:** Seminars	Theory Lectures and Practical Demo	**10H, 14M**
3	**Serial Port Programming** Basic of serial communication (Serial Vs Parallel data Transfer, Simplex, Duplex), Serial port of 8051, Baud rate in 8051, Programming the 8051 to transfer and to receive data serially, Importance of TI and RI flags, Baud rate doubling. **References :** Book 1,2,6 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**11H, 15M**
4	**Interrupts Programming** Interrupts in 8051, enabling and disabling the interrupts, Programming timer interrupts, Programming external hardware interrupts, Level and edge triggered interrupts. **References :** Book 1,5,6 **Feedback:** Tutorials	Theory Lectures and Practical Demo	**08H, 10M**
5	**Unit 5: 8051 Interfacing** Interfacing of 8255 to 8051 & programming Introduction, Interfacing-keyboard (matrix), Displays (seven segment & LCD), Stepper motor, ADC, DAC (Sine wave & Square wave), Temperature Sensor (LM 35). Analog Comparator, Serial Peripheral Interface (SPI), Two Wire Interface (TWI) / I2C bus	Theory Lectures and Practical Demo	**10H, 15M**

	References : Book 5,6 **Feedback:** Internal Test 2		

Reference Books:

1. "Introduction to Embedded System", Shibu K V, Tata McGraw Hill.
2. "Embedded Systems" Rajkamal, Tata McGraw Hill.
3. The 8051 Microcontroller and Embedded Systems", Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin McKinlay, Pearson Education.
4. "The 8051 Microcontroller Architecture, Programming, & Applications", Kenneth J. Ayala, Penram International.
5. "The 8051Microcontroller and Embedded System using Assembly and C", K. J. Ayala, D. V. Gadre, Cengage Learning, Indian Edition.
6. "Programming and Customizing the 8051, Microcontroller", Myke Predko, Tata McGraw Hill.

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TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher: **Mrs. S. P. Phegade** Subject: **Electronics**

Class: **T.Y.B.Sc. Sem V**

Title of Paper: **ELE-506(B): Basics of Fiber Optic Communication** Paper: **Paper - VI**

Unit No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Introduction to Optical Fiber Communication System:** Introduction to optical fiber, general optical fiber system, advantages, disadvantages, and applications of optical fiber communication, optical fiber waveguides, Ray theory: Total Internal Reflection, Acceptance Angle, Numerical Aperture, Optical Fibers: fiber materials, fiber optic cables. Step index-single mode fibers, Graded index-Single mode fibers, Step index-Multimode fibers and Graded index-Multimode fibers. **References :** Book 1,2,3 **Feedback:** Seminars	Theory Lectures and Practical Demo	**09 H 12 M**
2	**Transmission Characteristics of Optical Fiber:** Attenuation, absorption, scattering losses, bending losses, core and cladding losses, signal dispersion, intra modal dispersion, material dispersion, waveguide dispersion, polarization mode dispersion, intermodal dispersion, dispersion optimization of single mode fiber, characteristics of single mode fiber, R-I Profile and cutoff wave length, mode field diameter. **References :** Book 1,2,4 **Feedback:** Seminars	Theory Lectures and Practical Demo	**10 H 13 M**
3	**Optical Sources and Detectors:** Types of Optical Sources, Characteristics of optical sources required for OFC system, LED's :Structure, Planer LED, Dome LED, LASER diodes: Types of Photo detectors, characteristics features of Photo detector required for OFC system, Photo diodes (Physical Principle, PIN and avalanche Photodiode), comparison of different photo detectors. **References :** Book 1,2,3 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**08 H 11 M**
4	**Fiber Couplers and Connectors:** Fiber alignment, mechanical misalignment, lensing scheme for coupling improvement. Fiber Splices, Types: fusion, mechanical. Fiber connectors, Principle of good connector design. Types: SC, ST, MT-RJ, Butt Joint connectors, Commercial connectors (student expected to know only names of these	Theory Lectures and Practical Demo	**08 H 12 M**

	connectors) **References :** Book 1,2,4 **Feedback:** Tutorials		
5	**Optical Receiver and Transmitter:** Introduction to Optical Receiver and Transmitter, Block diagrams with basic elements, working operation, sensitivity of receiver, quantum limit, eye diagrams, coherent detection, burst mode receiver operation, Analog receivers, Optical transmitter specifications, spectral line-width and extinction ratio. Simple point to point link and it's design considerations. **References :** Book 1,2,3 **Feedback:** Internal Test 2	Theory Lectures and Practical Demo	**10 H** **12 M**

Reference Books:

1. Gerd Keiser, 'Optical Fiber Communication', 4th Ed., Mc-Graw Hill, 2008.
2. John M. Senior, 'Optical Fiber Communications',3rd edition, 2007, Pearson Education.
3. Govind P. Agarwal,' Fiber-Optic Communications Systems', 4th edition, A John Wiley & Sons, Inc., Publication.
4. Joseph C Palais,' Fiber Optic Communication', 4th Edition, Pearson Education.
5. V.S. Bagad,'Optical Fiber Communication System', Technical Publication, Pune.

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TEACHING PLAN

(Year 2023-24)

Faculty of Science & Technology

Name of the Teacher: **Dr. L. S. Patil** Subject: **Electronics**

Class: **T.Y.B.Sc. Sem VI**

Title of Paper: **ELE-606 (B) Antennas and Wave propagation** Paper: **Paper - VI**

Unit No.	Nature of Activity/ Title of Chapter/ Topic/ Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
1	**Electrostatics** Electric Field, electric flux, Field lines, Gauss' Law (integral form, for an internal & external point), application of Gauss' Law (field due to spherically symmetric charge distribution), Introduction to electrostatic potential, electrostatic energy, relation between electric field and electrostatic potential, electrostatic Energy. **References :** Book 1,2,3 **Feedback:** Seminars	Theory Lectures and Practical Demo	**10H, 12M**
2	**Boundary Value Problems in Electrostatic Field** Poisson's and Laplace Equation, solution of Laplace's equation in rectangular coordinate, Laplace's equation in spherical polar coordinates, electrostatic potential energy, simple boundary value problem, electrostatic images, point charge and conducting sphere. **References :** Book 1,2,5 **Feedback:** Seminars	Theory Lectures and Practical Demo	**06H, 10M**
3	**Magnetostatics:** Introduction, electric current, Steddy current, Ohm's law, electrical conductivity, calculation of resistance, current density, magnetic induction, force on a current element Amper's force law, Lorentz force and force on a current, Biot-Savart's law, simple applications. resistance and radiated power **References :** Book 1,2,6 **Feedback:** Internal Test 1	Theory Lectures and Practical Demo	**08H, 10M**
4	**Electromagnetic Induction** Electromotive force, Faraday's Law of electromagnetic induction, Inductance Energy in magnetic field , Lenz law, integral and differential form of Faraday's law, equation of continuity, displacement current, Maxwell's Equations (differential form), derivation of Maxwell's equations, Maxwell's equation in integral form and its derivation, Maxwell's equation in free space, linear isotropic media and varying fields, energy in electromagnetic fields: Poynting theorem. **References :** Book 1,2,3	Theory Lectures and Practical Demo	**11H, 16M**

	Feedback: Tutorials		
5	**Electromagnetic Wave and its Propagation** Physical significance of wave equations for free space conditions and plane electromagnetic waves in free space (Cover figure of EM wave and E-H parameter on the basis of last equation, No derivation expected), plane electromagnetic wave propagation in isotropic dielectric (non conducting media), polarization of electromagnetic wave, reflection and refraction of EM wave at non conducting boundaries. **References :** Book 5,6,7 **Feedback:** Internal Test 2	Theory Lectures and Practical Demo	**10H, 12M**

Reference Books:

1. Constatine A. Balanis. (2012) Antenna theory : Analysis and Design,3rd Edition, John Wiley & Sons
2. Sisir K Das & Annapurna Das.(2013)Antenna and wave propagation ,1st Edition, Tata Mcgraw Hill Publication
3. G. Kennedy.(1999) Electronic Communication systems,3rd Edition, Tata Mcgraw Hill Publication
4. Willian C. Y. Lee.(1986) Mobile communications design fundamentals, Willey Series in Telecommunication
5. R. L. Yadava.(2011)Antenna and wave propagation, 1st Edition, PHI Learning Private Limited.
6. G.S.N Raju.(2004)Antennas and Wave Propagation, 1st Edition, Pearson Education

Signature

Head

Signature of the Teacher

Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon
(Academic Year- 2023-24)
Faculty of Humanities

Subject: - History **Class: F.Y.B.A.**
Title of Paper: - History of Indian Freedom Movement (AD.1857-AD.1905)
Name of the Teacher: Dr. D. D. Kinge

Paper: - (HIS-G-101-A) **Total Period 60** **Credits 03**

Ch. No.	Title of Chapter / Topic / Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
	Semester – I		
1.	**Rise and Growth of British Power in India.**	Lecture	**Credits :01, Marks:20**
	A) Rise OF British Power in India – Brief Survey	Lecture	10
	B) Revolt of 1857 i) Causes ii) Consequences	Lecture	5 5
2.	**Social & Religious Reformer**	Lecture	**Credits :01, Marks:20**
	i) Raja Ram Mohan Roy	Lecture	3
	ii) Swami Dayanand Saraswati	Lecture	**3**
	iii) Swami Vivekanand	Lecture	**3**
	iv) Mahatma Jotiba Phule & Savitribai Phule	Lecture	**4**
	v) Rajashree Chhatrapati Shahu Maharaj	Lecture	**3**
	vi) Dr. Babasaheb Ambedkar	Lecture	**4**
3.	**Indian National Congress.**	Lecture	**Credits :01, Marks:20**
	i) Foundation of Indian National Congress : Its origin and objectives	Lecture	**4**
	ii) Achievements of the Indian National Congress (1885-1905)	Lecture	**4**
	iii) Moderate Group a) Surendranath Banerjee b) Firojshah Mehata c) Dadabhai Nauroji d) Mahadev Govind Ranade e) Gopal Krishna Gokhale.	Lecture	**8**
	iv) Partition of Bengal.	Lecture	**4**

Title of Paper: - History of Indian Freedom Movement (AD.1857-AD.1905)
Paper: - (HIS-G-201-A)

Ch. No..	Title of Chapter / Topic / Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
	Semester – II		
1.	**The Rise of the Extremists & Revolutionary Movements.**	Lecture	**Credits :01, Marks:20**
	A) Extremists Era i) Lokmanya Tilak	Lecture	8
	ii) Surat Congress -1907	Lecture	4
	iii) Home Rule Movement -1916	Lecture	8
	B) Revolutionary Movements i) Abhinav Bharat	Lecture	5
	ii) Anushilan Samiti	Lecture	5
	iii) Gadar Party	Lecture	5
	iv) Hindustan Socialist Republican Association.	Lecture	5
2.	**Mahatma Gandhi & Freedom Movement (Credits :01, Marks:20)**	Lecture	**Credits :01, Marks:20**
	i) Non – Co-operation Movement : Causes & Consequences	Lecture	
	ii) Civil Disobedience Movement.	Lecture	
	iii) Quit India Movement.	Lecture	
	iv) Subhashchandra Bose & Aazad Hind Fauz.	Lecture	
3.	Partition **& Independence of India (Credits :01, Marks:20)**	Lecture	**Credits :01, Marks:20**
	i) Cripps Mission, Wavell Plan,	Lecture	**4**
	Cabinet Mission,	Lecture	**3**

	Mountbatten Plan & Indian Independence Act – 1947.	Lecture	**4**
	ii) Muslim League & Partition of India.	Lecture	**4**
	iii) Features of the Indian Constitution.	Lecture	**5**

1. **Bipinchandra** – Indias Struggle for Independence
2. **Sarkar Sumit**- Modern India-1885-1947
3. **Mahajan V.D**.- Modern Indian History
4. **Bipin Chandra & others** - Freedom Struggle
5. **Shanta Kothekar –** Adhunik Bharatacha Itihas
7. **Grovar & Belhekar-** Adhinik Bharatacha Itihas

Head of the Department

Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon
(Academic Year- 2023-24)
FACULTY OF: Humanities

Subject : - History **Class: S.Y.B.A.**

Title of Paper : - History of the Marathas (A.D.1605-1750 A.D.)

Name of the Teacher :- Prof. D.D. Kinge

Paper : - DSC-HIS-231

Sr. No.	Nature of Activity / Title of Chapter / Topic / Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
	Semester – III		
1.	**Rise of Maratha Power** a) Causes b) Role of Shahaji Raje Bhosle and Jijabai	**Lecture**	09 06
2	**Shivaji Maharaja's Relation with Various dynasty** **a) Shivaji's Relation with the Adilshahi** i. Javali Incident ii. Afzalkhan Episode iii. Siddi Jauhar and expedition to Panhala	**Lecture**	02 01 02
	b) Shivaji's Relation with the Mughals i. Invasion of Shaistekhan ii. First Invasion of Surat iii. Expedition of Mirza Raje Jaysing & Treaty of Purandar iv. Visit to Agra and Escape	**Lecture**	02 02 02 02
	c) Karnataka Expedition		02
3.	**Shivaji's Administration** i.Coronations ii. Civil Administration iii. Military Administration iv. Judicial Administration v. Religious Policy	**Lecture**	03 03 03 03 03

Sr. No.	Nature of Activity / Title of Chapter / Topic / Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
Semester – VI			
1.	**Chhatrapati Sambhaji** a. Achivements of Sambhaji b. Chhatrapati Sambhajis Relation with Mughal, Siddi, Portuguese, British	**Lecture**	 07 08
2.	**Marathas War of Independence** a. Contribution of Rajaram Maharaj, Maharani Tarabai,Santaji Ghorpade, and Dhanaji Jadhav b. Significance of Marathas War of Independence	**Lecture**	 10 05
3.	**Chhatrapati Shahu Maharaj and Rise of Peshwas** **Balaji Vishwanath** a. **Bajirao - I (Peshwa)** Achivement of North and Saouth b. **Balaji Bajirao** Achivement of North and Saouth	**Lecture**	 03 06 06

1. **J. N. Sarkar** – Shivaji and his Times 1630-1760
2. **Jaysingrao Pawar** – Shivaji V Shivkal
3. **Chitanis K.N**. -. Medieval Indian Ideas and Institutions
4. **Kulkarni and Khare** – Marathyancha Itihas Vol. 1,2,& 3
5. **A. R. Kulkarni** – Shivkalin Maharashtra

Head of the Department

Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon
(Academic Year- 2023-24)

Faculty of Humanities

Subject: - History **Class: T.Y.B.A.**

Title of Paper:- History of Modern Europe (1781-1945)

Name of the Teacher: Prof. D. D. Kinge

Paper:- DSC 1

Sr. No.	Nature of Activity / Title of Chapter / Topic / Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
	Semester – V		
1.	**Unit. 1: Liberation and Rise and Growth Democracy.** A) Rise and Growth of Democracy in Britain B) The French Revolution 1789 : Causes The French Revolution 1789 : Consequences	**Lecture**	05 05 05
2.	**Unit. 2 : Industrial Revolution and Imperialism.** A) Industrial Revolution - Causes Industrial Revolution - Effects B) Imperialism of England (Britain)	**Lecture**	04 04 07
3.	**Unit. 3 : Rise of Nationalism.** A)Nationalism in Italy B) Nationalism in Germany C) Balcun Nationalism	**Lecture**	06 05 04

Sr. No.	Nature of Activity / Title of Chapter / Topic / Sub-topic	Method of Teaching to be Employed	No. of Lectures Involved
	Semester – VI		
1.	**Unit. 1: First World War** A) Background / Causes Effects B) Russian Revolution - Causes Russian Revolution- Effects C) Legue of Nation	**Lecture**	03 03 03 03 03
2.	Unit. 2 :Rise of Dictatorship A) Italy B) Germany C) Kemal Pasha and Modernization of Turksthan	**Lecture**	05 05 05
3.	Unit. 3 : Second World War A) Causes B) Effects C) United Nation Organization	**Lecture**	05 05 05

1 . N. S. Dixit, Adhunik Europe
2 . Y. N . Kadam, Adhunik Europecha Itihas (1789-1945)
3 .Thomson David, World History: 1914-1968, Oxford 1969.
4 .Vaidya Suman, Adhunik Jag, bhag 1, 2& 3

Head of the Department

Dr. Annasaheb G. D. Bendale Mahila Mahavidyalaya, Jalgaon

(Academic Year- 2023-24)

Faculty of Humanities

Subject: - History **Class: T.Y.B.A.**

Title of Paper:- Making of Contemporary India

Name of the Teacher: Prof. D. D. Kinge

Paper:- GE 1 A HIS 355

Sr. No.	Nature of Activity / Title of Chapter / Topic / Sub-topic	Method of Teaching	No. of Lectures Involved
	Semester – V		
1.	**Unit. 1: Making India** a. Framing of Indian Constitution-Indian Constitution-Basic Features b. Consolidation of India : Role of Sardar Vallabhbhai Patel	Lecture	7 8
2.	**Unit. 2 : Political Development** a. Pandit Jawaharlal Nehru to Indira Gandhi ; Achievements of Pandit Nehru (1952-1964), Achievements of Indira Gandhi b. Emergency : J.P.Movement and Janata Rule under Morarji Desai c. Moving toward 21 Century : Rajiv Gandhi, Atal Bihari Vajpai, Dr.Manmohan Singh, Narendra Modi	Lecture	4 5 6
3.	**Unit. 3 : Economic Development** a. Five years plan b. Economic Reforms since 1991 and LPG	Lecture	8 7

Sr. No.	Nature of Activity / Title of Chapter / Topic / Sub-topic	Method of Teaching	No. of Lectures Involved
	Semester – VI		
1.	**Unit 1. Social Justice** a. Tribal Movements b. Dalit Movements c. Women Movements	**Lecture**	5 5 5
2.	**Unit 2. Major Challenges** a. Communalism b. Regional Tensions c. Naxalism	**Lecture**	5 5 5
3.	**Unit 3. Education and Science** a. Progress in the field of Education b. Nuclear Policy c. Development Space Science	**Lecture**	5 5 5

1 . **Bipinchandra,** India after Indipendance
2. **Vaidya Suman**, Adhunik Bharat, bhag 1, 2& 3
3 . **S. J. Patil, Sunil Amrutkar**, Samkalin bharat

Head of the Department

Dr .Annasaheb G.D. Bendale Mahila Mahavidyala, Jalgaon.

Department of Commerce & Management

Teaching Plan 2023-24

Subject:- Business & Tax Law **Class:- S.Y.B.Com.**

Subject Teacher:- Sayalee K. Patil **Semester:- III & 1V**

Sem-III

Sr.no.	Topic	Methodology	Lecture No.
1	**UNIT 1. Indian Contract Act 1872** 1.1 Meaning and Definitions (Offer, Acceptance, Consideration, Contract) 1.2 kinds Of Contract 1.3 Essential of Contract 1.4 Performance and Discharge of Contract 1.5 Breach of Contract	Lecture Methods & ITC	10
2	**UNIT 2. Indian Sale of Goods Act, 1930** 2.1 Introduction and Definition 2.2 Formation of Contracts of sale 2.3 Conditions and Warranties 2.4 Right of Unpaid Seller against the Goods 2.5 Performance of Contract of Sale	Lecture Methods & ITC	10
3	**UNIT 3. Negotiable Instruments Act, 1881** 3.1 Definition and Characteristics of Promissory Note, Bill of Exchange And Cheque. 3.2 Holder and Holder in Due course, Privileges of Holder in Due course 3.3 Crossing and Endorsement of Negotiable Instrument 3.4 Dishonour N.I., Notice Of Dishonour, Dishonour Of Cheque And Its Effects. 3.5 Highlights of Negotiable Instrument (Amendment) Bill 2017	Lecture Methods & ITC	10
4	**UNIT 4. Foreign Trade (Regulation and Development Act: 1992** 4.1 Introduction of Act 4.2 Silent features of Act 4.3 Importance of Act 4.4 Present Scenario of Indian Foreign Trade policy 4.5 Elementary study of Indian Foreign Trade Policy 2015-2020	Lecture Methods & ITC	10
5	**UNIT 5. Information Technology Act – 2000** 5.1Meaning, Objective, Scope of The Act 5.2 Digital Signature & Electronic Governance. 5.3 Granting Digital Signature Certificate 5.4	Lecture Methods & ITC	10

	Offences & Penalties, Adjudication 5.5 Cyber Crime and Cyber Security		
6	**UNIT 6. The Patent Act --2002** 6.1 Meaning, Objective &Important Definition 6.2 Invention, Not Patentable Invention 6.3 Application for Patents and Process 6.4 Grants of Patent and Rights of Patent Holder 6.5 Patent Office and Power of Controller	Lecture Methods & ITC	10

1 .Business Law &Mgt. By Bulchandani, Published By Himalaya Publication Bombay(2006).

2 .Business Regulatory FrameworkBy S.N. &S.K. Maheshwari, Published ByHimalaya Publication Bombay (2006).

3.Business Law –By KuchalM.C .-Published By VikasPublishing House ,New Delhi

4.Business Law –By Kapoor .N.D. -Published By Sultan Chand And Sons New Delhi

5 .Consumer Protection Act – By Niraj Kumar

6.Mercantile Law Including Industrial Law –By Jahangi r .M.J Sethana -Published ByLakhaniBook Depot – Mumbai

7 यवसाय ि◌नयामक कायदे -डॉ.पी.आर. कुलकण, व ि◌हवरेकर ि◌वा बुस – औरंगाबाद

8 यापार ि◌वषयकवऔधोगीककायदे– बी.डी.जोशी.-नर'( )काशन पुणे

9 भारतीय यापार आिण औधोगीककायदे– डॉ.भा-करदेशमुख,प'ढारकर– ि◌पंपळापुरे)काशन नागपूर

Signature of the Lecturer

SEM IV

Sr.no.	Topic	Methodology	Lecture No.
1	**UNIT 1. The Indian Partnership Act, 1932.** 1.1 Introduction, Important Definition 1.2 Preparation of Partnership Deed 1.3 Effects of Non-Registration 1.4 Rights, Duties and Responsibilities Of Partners 1.5 Dissolution of A Partnership	Lecture Methods & ITC	10
2	**UNIT 2. The Factories Act, 1948** 2.1 Meaning, Objectives and Important Definitions 2.2 The Inspecting Staff – Inspectors and His Powers –Certifying Surgeon 2.3 Approval, Licensing and Registration of Factories 2.4 Provision R	Lecture Methods & ITC	10
3	**UNIT 3. The Industrial Dispute Act, 1947** 3.1 Meaning and Definitions –Industrial Dispute, La yoff , Lockout ,Retrenchment 3.2 Machinery for Prevention and Settlement of Industrial Dispute 3.3 Strikes and Lock- Outs 3.4 Lay Off and Retrenchment 3.5Compensation to Workmen In Case Of Closing Down Of Undertaking.	Lecture Methods & ITC	10
4	**UNIT 4. Consumer Protection Act – 1986** 4.1 Introduction, Objective of the Act 4.2 Rights of Consumers 4.3 Consumers Protection Council – Central –State- District 4.4 Consumer Dispute Redressal Agencies 5.5 Introduction of Consumer Protection Bill 2018 and its features	Lecture Methods & ITC	10
5	**UNIT 5. Environment Protection Act – 1986** 5.1 Meaning, Objectives & Scope of the Act 5.2 Power of Central Government to Protect &Improve Environment 5.3 Location of Industries, Process &Operations. 5.4 Offences & Penalties as Regards to the Environmental Protection Act.	Lecture Methods & ITC	10

6	**UNIT 6. Goods & Service Tax Act, 2017 (GST)** 6.1 Introduction to Goods & Service Tax (GST) 6.2 Objectives & Scope of GST 6.3 Merits and Demerits of GST 6.4 Concept of GST and one country one tax 6.5 Types of GST 6.6 Registration under GST	Lecture Methods & ITC	10

1. Business Law &Mgt. By Bulchandani, Published By Himalaya Publication Bombay (2006).
2. Business Regulatory Framework By S.N. &S.K. Maheshwari, Published By Himalaya Publication Bombay (2006).
3. Business Law –By Kuchal M.C.-Published By Vikas Publishing House ,New Delhi
4. Business Law –By Kapoor .N.D. -Published By Sultan Chand And Sons New Delhi
5. Mercantile Law Including Industrial Law –By Jahangir .M.J Sethana -Published ByLakhani Book Depot –Mumbai
6. India GST for Beginners (2nd Edition, June 2017) (Paperback) by JayaramHiregange and Deepak Rao,publisher White Falcon Publishing
7. GST Made Easy-Answer to All Your Queries on GST (Paperback) by CA ArpitHaldia, publisher TAXMANN
8. Goods and Services Tax - Laws, Concepts & Impact Analysis (Paperback) by Dr.SanjivAgarwal and CA SanjeevMalhotra, publisher Bloomsbury Publishing India Pvt. Ltd.New Delhi 110070
9. यवसायिनयामककायदे -डॉ.पी.आर. कुलकण, विहवरेकरिवाबुस – औरंगाबाद
10. यापारिवषयकवऔधोगीककायदे– बी.डी.जोशी.-नर'()काशनपुणे
11. भारतीययापारआिणऔधोगीककायदे– डॉ.भा-करदेशमखु,प'ढारकर– िपंपळापुरे)काशननागपरू

Signature of the Lecturer