Sri Ramakrishna College of Arts and Science
(Autonomous)
(Formerly S.N.R. Sons College)
(Affiliated to Bharathiar University)
(Re-Accredited with 'A' Grade by NAAC)
(An ISO 9001:2008 Certified Institution)
Nava India, Coimbatore-641 006. Tamil Nadu, India.

"Scheme of Examination along with Distribution of Marks and Credits"

CBCS & OBE PATTERN

UNDER GRADUATE PROGRAMMES

BSc Degree Course

(For the students admitted during the academic year 2016 - 2017 and onwards)

Part	Study Components and Course Title	CIA	Comprehensive Exam		Comprehensive Exam Total	Total	Credit
			Online	Descriptive Theory			
Semester - I							
I	Language-I 16T01 Tamil - I / 16H01 Hindi - I / 16F01French - I / 16M01 Malayalam - I	30	-	-	70	100	3
II	16E01 English-I	30	-	-	70	100	3
III	16CH101 CORE I - General Chemistry - I	30	20	50	70	100	4
III	16CH102 Core Practical - I Volumetric Analysis Practical	30	-	-	70	100	3
III	16CH103 Allied I - Biochemistry	30	20	50	70	100	3
III	16CH104 Allied Practical - I Biochemistry Practical	30	-	-	70	100	2
IV	16ES01Environmental Studies #	100	-	-	-	100**	1#
IV	16CPE01PACE - I @	-	-	-	100	100**	1@

IV	16CHJC1JOC - I $	-	-	-	-	-	1$
Semester -II							
I	Language-II 16T02 Tamil -2 / 16H02 Hindi - 2 / 16F02 French - 2 / 16M02 Malayalam - 2	30	-	-	70	100	3
II	16E02 English-II	30	-	-	70	100	3
III	16CH201CORE II - General Chemistry -II	30	20	50	70	100	4
III	16CH202 CORE III - Introduction to Nano Chemistry	30	20	50	70	100	4
III	16CH203 Core Practical - II Inorganic Qualitative Analysis	30	-	-	70	100	3
III	16CH204 Allied II - Mathematics	30	20	50	70	100	3
IV	16VE01 Value Education #	100	-	-	-	100**	1#
IV	16CPE02 PACE - II @	-	-	-	100	100**	1@
IV	16CHJC2 JOC - II $	-	-	-	-	-	1$
Semester III							
III	16CH301 CORE IV - General Chemistry - III	30	20	50	70	100	4
III	16CH302 CORE V - Inorganic Chemistry - I	30	20	50	70	100	5
III	16CH303 Core Practical – III Organic Qualitative Analysis	30	-	-	70	100	3
III	16CH304 Allied III - Physics	30	20	50	70	100	3
III	16CH305 Allied Practical - II Physics Practical	15	-	-	35	50	2
III	OPEN ELECTIVE - I	30	20	50	70	100	3
III	16CH306 Skill based Subject : 1 Polymer Chemistry	30	20	50	70	100	3
IV	16BCT01 Basic Tamil I / 16ADT01 Advanced Tamil I #	100	-	-	-	100**	1$
IV	16CPE03 PACE – III @	-	-	-	100	100**	1@

IV	16CHJC3 JOC – III $	-	-	-	-	-	1$
Semester IV							
III	16CH401 CORE VI - Inorganic Chemistry - II	30	20	50	70	100	5
III	16CH402 CORE VII - Analytical Chemistry	30	20	50	70	100	4
III	16CH403 Core Practical - IV Applied Chemistry Practical I	30	-	-	70	100	3
III	Elective – I	30	20	50	70	100	4
III	16CSC07 Allied IV - Computer Programming	30	20	50	70	100	3
III	16CSC08 Allied Practical- III Computer Programming Lab	15	-	-	35	50	2
III	16CH406 Skill based Subject : 2 Textile Chemistry	30	20	50	70	100	3
IV	16BCT02 Basic Tamil II / 16ADT02 Advanced Tamil II#	100	-	-	-	100**	1$
IV	16CPE04 PACE - IV @	-	-	-	100	100**	2@
IV	16CHJC4 JOC - IV $	-	-	-	-	-	1$
Semester V							
III	16CH501 CORE VIII - Organic Chemistry - I	30	20	50	70	100	5
III	16CH502 CORE IX - Physical Chemistry - I	30	20	50	70	100	5
III	16CH503 Core Practical V – Physical Chemistry Experiments	15	-	-	35	50	2
III	16CH504 Core Practical VI - Gravimetric Analysis	15	-	-	35	50	2
III	OPEN ELECTIVE –II	30	20	50	70	100	3
III	16CH505 Skill based Subject : 3 Pharmaceutical Chemistry	30	20	50	70	100	3
IV	16CPE05 PACE – V @	-	-	-	100	100**	2@
IV	16CHJC5 JOC – V $	-	-	-	-	-	1$
Semester VI							
III	16CH601 CORE X -	30	20	50	70	100	5

	Organic Chemistry - II						
III	16CH602 CORE XI - Physical Chemistry - II	30	20	50	70	100	5
III	16CH603 CORE XII - Spectroscopy	30	20	50	70	100	4
III	16CH604 CORE XIII - Project with viva- voce	30	-	-	70	100	4
III	Elective –II	30	20	50	70	100	4
III	16CH605 Skill based Subject : 4 Dye chemistry	30	20	50	70	100	3
V	Extension Activities NSS/NCC/SPORTS/YRC/SIS #	100	-	-	-	100**	1

$ Extra credit courses for the candidates who opted other languages in Part – I and JOC.
# No Comprehensive Examinations. Only Continuous Internal Assessment (CIA).
@ No Continuous Internal Assessment (CIA). Only Comprehensive Examinations.
** Marks will not be included in CGPA calculations.

List of Elective papers (Can choose any one of the paper as electives)		
Elective – I	A	**16CHE01** - Technology of Dyeing of Natural Fibers.
	B	**16CHE02** - Applied Chemistry
	C	**16CHE03** - Agricultural Chemistry
Elective – II	A	**16CHE04** - Chemistry for Everyday Life
	B	**16CHE05** - Industrial Chemistry
	C	**16CHE06** - Medicinal Chemistry

List of Open Elective papers offered by the dept.	
Open Elective – I	**16CHI01** - Chemistry in Changing Life Style

Open Elective – II	**16CHI02** - Food and Water Chemistry

Summary							
Part	Subject	Papers	Credit	Total credits	Papers	marks	Total marks
Part I	Languages	2	3	6	2	100	200
Part II	English	2	3	6	2	100	200
Part III	Core	19	74	92	19	1800	2400
	Allied	7	18		7	600	
	OPEN ELECTIVES	2	3	6	2	100	200
	Electives	2	4	8	2	100	200
	Skill Based	4	3	12	4	100	400
							3600
Part IV	Lang.	2	1	2$	2	100	200**
	PACE	3	1	3@	5	100	500**
		2	2	4@			
	EVS & VE	2	1	2#	2	100	200**
	JOC	5	1	5$	-	-	-
Part V	@ Extension	1	1	1	1	100	100**
	Total			140			

$ - Extra credit courses

**-NOT INCLUDED IN TOTAL MARKS

Note: Total credits may vary between140 – 145.

Syllabus Coordinator
(Dr. T. SASIKALA)

Chairman - Board of Studies
(Dr. T. SASIKALA)

16CH501 CORE - VIII: ORGANIC CHEMISTRY - I

Semester	V
Credit	5
Paper type	Core
Max. Marks	CIA: 30 CE: 70 TOT =100

COURSE OBJECTIVES

- To understand the stereochemistry of organic compounds, conformation, geometric and optical isomerism.
- To learn and understand the chemistry of phenols and amine compounds.
- To learn and practice the molecular rearrangements and the reaction mechanisms.

UNIT- I CONFORMATIONAL ANALYSIS 14

Conformational Analysis-introduction of terms-conformers- dihedral angle, torsional strain, conformational analysis of ethylene glycol and chlorohydrin including energy diagrams-conformers of cyclohexane (chair, boat and skew boat forms)-axial and equatorial bonds-ring flipping showing axial equatorial interconversions-conformers of mono and disubstituted cyclohexanes-1:2 and 1:3 interactions.

UNIT- II ISOMERISM AND STEREOCHEMISTRY 13

Definition-Classification - Optical and Geometrical isomerism - Optical isomerism – Optical activity-Optical and Specific rotations-conditions for optical activity-asymmetric center-Chirality- achiral molecules-meaning of (+) and (-) and D and L notations

Elements of symmetry - Projection formulae-Fischer, and Newman projection formulae-Notation of optical isomers- Cahn- Ingold –Prelog rules- R-S notations for optical isomers with one and two asymmetric Carbon atoms- erythro and threo representations-Racemization-chiral synthesis –Walden inversion –Optical isomerism in cyclic compounds-Optical isomerism in nature.

UNIT - III PHENOLS 13

Monohydric phenols – cresols- preparation & properties –mechanism – alkylation, esterification, Nitration, Sulphonation, Halogenation - coupling with diazonium salts – Kolbe – Schmidt, Reimer – Tiemann reactions.

Dihydric phenols- Resorcinol, catechol and Quinol- preparation & properties.
Trihydric phenols – Pyrogallol and phloroglucinol- preparation, Houben-Hoesch reaction

UNIT-IV AMINES 13

Amines- Nomenclature - Preparation and properties of aliphatic and aromatic primary, secondary and tertiary amines – Separation(Hoffman method and Hinsberg method)and comparison of their basicity – Ring substitution, diazotization and coupling reaction of aromatic amines - Diazomethane and diazoacetic ester – Preparation, structure and their synthetic applications.

UNIT-V MOLECULAR REARRANGMENTS 13

Classification- Mechanism of Pinacol, Pinacolone, Beckmann, Claisen, Cope, Hoffmann, Curtius, Lossen, Schmidt and Benzil – Benzilic acid Rearrangements.

COURSE OUTCOMES

- Able to elucidate the structure of some simple compounds.
- Able to establish the stereochemistry of organic compounds.
- Able to synthesize the organic compounds like amines and phenols.
- Able to identify the suitable reagents and derive the mechanisms of some important organic reactions.

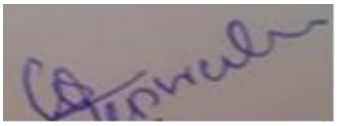
Total Periods: 66

TEXT BOOKS

1. B.S. Bahl and Arun Bahl, *Advanced Organic Chemistry*, 1st ed. New Delhi: S.Chand & Company Pvt, Ltd, 2016. (Unit-III to Unit-V)
2. P.S. Kalsi, *Stereochemistry, Conformation and Mechanism*, 9th ed. New Delhi: New Age International Publishers, 2017. (Unit-I & Unit-II)

REFERENCE BOOKS

1. S.M. Mukherji, S.P. Singh, R.P. Kapoor and R. Dass, *Organic Chemistry*, *Vol.1*, 2nd ed. New Delhi: New Age International Pvt. Ltd., 2015.
2. Bhupinder Mehta and Manju Mehta, *Organic Chemistry*, 2nd ed. New Delhi: Ashok K. Ghosh, PHI learning Pvt Ltd., 2015.
3. Robert Thornton Morrison and Robert Neilson Boyd, *Organic Chemistry*, 6thed, New Delhi: Dorling Kindersley Pvt. Ltd., 2005.
4. M.K. Jain and S.C. Sharma, *Modern Organic chemistry*, 4th ed. Jalandhar: Vishal Publishing Co., 2016.



Verified by Course Coordinator
Mrs.K.P.GREESHMA

Approved by BOS Chairman
Dr.T.SASIKALA

16CH502 CORE - IX: PHYSICAL CHEMISTRY - I

COURSE OBJECTIVES

- To understand the basic concept of phase rule, rate laws and derive rate equation.
- To gain knowledge about the theoretical aspects of reaction rates and their mechanism.
- To know the kinetics of photochemical reactions.
- To understand the theory of catalysis.

Semester	V
Credit	5
Paper type	Core
Max. Marks	CIA: 30 CE : 70 TOT =100

UNIT-I PHASE RULE **14**

Definition- Definition of phase, components and degree of freedom- Derivation of phase rule-reduced phase rule-application of phase rule - to one component system-phase diagram of water system- Application of phase rule to two component system- Pb-Ag system- Pattinsons Process - Limitations and Applications of Phase rule.

UNIT-II PHOTOCHEMISTRY **13**

Photochemical reaction- Difference between photochemical and thermochemical reactions-Laws of Absorption- Laws of photochemistry- Grothus- Droper's law -Stark-Einstein law of photochemical equivalence- photochemical and thermal chain reaction-H_2/Br_2 reaction. Quantum yield of photochemical reaction- photosensitized reaction-photophysical process, Jablonski diagram- Florescence, phosphorescence and chemiluminescence.

UNIT-III CHEMICAL KINETICS **13**

Empirical laws and experimental aspects-rate law, stoichiometry, order and Molecularity of a reaction, setting up of solving simple differential equation for First, second, third and zero order reactions. Expressions for half-life period of first, second, third and zero order reaction-methods of determination of order of a reaction.

UNIT-IV THEORIES OF REACTION RATES **13**

Theoretical aspects: Effect of temperature on rate constant-Activation energy, collision theory of reaction rate and its limitation-theory of absolute reaction rate (ARRT) - comparison of collision theory with the absolute reaction rate theory-Lindemann theory of unimolecular reactions.

UNIT-V CATALYSIS **13**

Types- Homogeneous catalysis- Heterogeneous catalysis-characteristics of catalytic reaction-promoters-catalytic poisoning-Auto catalysis-Negative catalysis-Activation energy and catalysis-Theories of catalysis-Intermediate compound formation theory and Adsorption theory-hydrogenation of ethylene in presence of Nickel- Acid- base catalysis-Enzyme catalysis- Mechanism of enzyme catalysis- Industrial applications of catalyst.

COURSE OUTCOMES

- Ability to apply the phase rule concept in industries.
- Ability to identify the materials used in different light emitting devices.
- Ability to derive the expression of rate equation.
- Ability to apply the suitable catalyst in different industries.

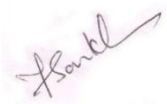
Total Periods: 66

TEXT BOOKS

1. B. R. Puri, L.R. Sharma and M.S. Pathania, *Principles of Physical Chemistry,* 4th ed. New Delhi: Vishal Publishing Co., 2018. (Unit-I to Unit-III)
2. Arun Bahl, B.S. Bahl and G. D. Tuli, *Essentials of Physical Chemistry*, Revised ed. New Delhi; S. Chand & Sons Publishing, 2016. (Unit-IV to Unit-V)

REFERENCE BOOKS

1. P.L. Soni, O. P. Dharmarha and U.N. Dash, *Textbook of Physical Chemistry*, Revised Edition, New Delhi: S Chand & Sons, 2016.
2. P.C. Jain and Monika Jain, *Engineering Chemistry*, 16th ed. New Delhi: Dhanpat Rai Publishing Co., 2006.



Verified by Course Coordinator
Dr.T.SASIKALA

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Dr.T.SASIKALA

16CH503 CORE PRACTICAL - V: PHYSICAL CHEMISTRY EXPERIMENTS

Semester	V
Credit	2
Paper type	Core Practical
Max. Marks	CIA : 15 CE : 35 TOT =50

COURSE OBJECTIVES

- To learn the fundamentals of conductometric and potentiometric titrations.
- To understand the method of determination of critical solution temperature, transition temperature and rate constant.
- To apply phase rule to different systems.

1. **KINETICS**

   a) Determination of rate constant – Acid catalysed hydrolysis of an ester (methyl acetate)

   b) Iodination of acetone - zero order kinetics.

   c) Rate constant for the reaction between persulphate – KI

2. Molecular weight determination – Rast method.

3. **HETEROGENEOUS EQUILIBRIUM**

   a) Effect of impurity on CST of phenol – water system and determination of concentration of sodium chloride.

   b) Determination of transition temperature of hydrated salts: sodium thiosulphate, sodium acetate, strontium chloride.

4. **PHASE RULE**

   Simple Eutectic system: Naphthalene-Biphenyl, Naphthalene-Diphenylamine.

5. **ELECTROCHEMISTRY**

   a) Conductometry – All three types

      i) Determination of cell constant

      ii) Equivalent conductance of strong electrolyte.

      iii) Conductometric titration- acid base titration

   b) Potentiometry

      i) Potentiometric titration – acid-base titration, redox titration.

COURSE OUTCOMES

- Ability to calculate the rate constants of various types of chemical recations.
- Ability to conduct experiments, analyze data and interpret results in kinetic study.
- Ability to work effectively in the field of chemical industry.
- Ability to use electrochemical instruments in various industries.

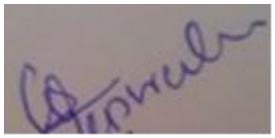
Total Periods: 33

TEXT BOOKS

1. V. Venkateswaran, R.Veeraswamy and A.R. Kulandaivelu, *Basic Principles of Practical Chemistry*, 2nd ed. New Delhi: Sultan Chand and Sons, 1997.

REFERENCE BOOKS

1. G. Svehla, *Vogel's Qualitative Inorganic Analysis*, 7thed. Hyderabad: Orient Longman Ltd., 2014.
2. B Vishwanathan and P.S. Raghavan, *Practical Physical Chemistry*, 1st ed. New Delhi: Viva Books Pvt. Ltd., 2009.



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16CH504 CORE PRACTICAL - VI: GRAVIMETRIC ANALYSIS

Semester	V
Credit	2
Paper type	Core Practical
Max. Marks	CIA : 15 CE : 35 TOT =50

COURSE OBJECTIVES

- To get a good exposure to the gravimetric analysis in chemistry.
- To enable them to apply concepts related to chemistry in their careers.
- To apply such analysis in their scientific area of interests.
- To gain knowledge about the preparation of some industrially important chemical compounds.

GRAVIMETRIC ESTIMATIONS

1. Estimation of Barium as Barium Sulphate
2. Estimation of Barium as Barium chromate
3. Estimation of Lead as Lead chromate
4. Estimation of Calcium as Calcium oxalate monohydrate
5. Estimation of Sulphate as Barium Sulphate
6. Estimation of Nickel as Nickel DMG

ORGANIC PREPARATIONS

1. Bromination-preparation of p-bromoacetanilide from Acetanilide
2. Nitration-preparation of m-dinitrobenzene from nitrobenzene
3. Ester Hydrolysis-preparation of salicylic acid from methyl salicylate
4. Oxidation-preparation of benzoic acid from benzaldehyde

COURSE OUTCOMES

- Able to acquire the quantitative skills in gravimetric analysis and in organic preparations.
- Able to plan experimental projects and execute them.

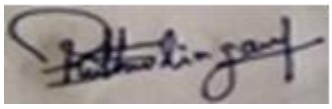
Total Periods: 33

TEXT BOOKS

1. V. Venkateswaran, R.Veeraswamy and A.R. Kulandaivelu, *Basic Principles of Practical Chemistry*, 2nd ed. New Delhi: Sultan Chand and Sons, 1997.

REFERENCE BOOKS

1. G. Svehla, *Vogel's Qualitative Inorganic Analysis*, 7th ed. Hyderabad: Orient Longman Ltd., 2014.
2. A. O.Thomas, *Practical Chemistry*, 8th ed. Kannur: Scientific Book Centre, 2000.



Verified by Course Coordinator
Dr.S.MUTHULINGAM

Approved by BOS Chairman
Dr.T.SASIKALA

16CHI02 OPEN ELECTIVE: II FOOD AND WATER CHEMISTRY

COURSE OBJECTIVES

- To get good exposure to the basic concepts of food and water chemistry.
- To enable them to apply concepts related to food and water chemistry in their career.

Semester	V
Credit	3
Paper type	Open Elective
Max. Marks	CIA : 30 CE : 70 TOT =100

UNIT-I HARDNESS OF WATER 9

Introduction-characteristics-types of water-hardness of water- Alkalinity- Expression and unit of hardness of water- Estimation of hardness of water by EDTA – Estimation of Alkalinity.

UNIT-II WATER TREATMENT 9

Demineralization process-Desalination by reverse osmosis -Domestic water treatment- Screnning- Sedimentation-Coagulation-Aeration- Sand filtration-Disinfection methods- Chlorination- Ozonation- UV treatment.

UNIT-III FOOD SOURCES AND VITAMINS 9

Vitamins- Sources, requirement deficiency diseases of A, C, D, K, E1 and B6.
Food Sources- Sources of foods- types- advantages and disadvantages- constituents of foods- carbohydrate, protein, fats and, oils, colours, flavours and natural toxicants.

UNIT-IV FOOD PRESERVATION AND PROCESSING 9

Food spoilage, causes of food spoilage, types of Food spoilage, food preservation and processing by heating- sterilisation and pasteurization.

UNIT-V FOOD POISONING AND ADULTERATION 9

Food poisoning-Sources- causes and remedy- Adulteration- intentional, unintentional – commom adulterants in food- Causes and remedies for acidity, gastritis, indigestion and constipation.

COURSE OUTCOMES

- Able to analyze the characteristics properties of water and water treatment methods.
- Able to identify the biologically important constituents of food and vitamins in our daily life.
- Able to have clear idea about food poisoning and food adulteration.

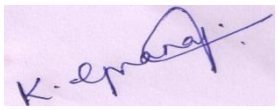
Total Periods: 45

TEXT BOOKS

1. P.C. Jain and Monika Jain, *Engineering Chemistry*, 16th ed. New Delhi : Dhanpat Rai Publishing Co., 2006. (Unit-I to Unit-II)
2. B. Sivasankar, *Food Processing and Preservation*, 1st ed. New Delhi: PHI Learning Pvt. Ltd., 2013. (Unit-III to Unit-IV)
3. B. Sri lakshmi, *Food Processing and Preservation*, 3rd ed. New Delhi: New age International Publishers Pvt. Ltd, 2003. (Unit-V)

REFERENCE BOOKS

1. P.J.Fellows, *Food processing Technology: Principles and practice*, 2nded. Cambridge: Woodhead Publishing Ltd., 2005.
2. R.Paul Singh and D.R Heldman, *Introduction to Food Engineering,* 3rd ed. London: Academic press, 2004.



Verified by Course Coordinator
Dr.K.GNANA PRIYA

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Dr.T.SASIKALA

16CH505 SKILL BASED SUBJECT: 3 - PHARMACEUTICAL CHEMISTRY

Semester	V
Credit	3
Paper type	Skill based
Max. Marks	CIA : 30 CE : 70 TOT =100

COURSE OBJECTIVES

- To know about the common diseases and cure terms of pharmacology.
- To understand the mechanism of drug and its action
- To get a clear idea about antibiotics
- To get an idea about medicinal plants, its availability and uses.

UNIT-I **9**

Definition of the terms-drug-pharmacophore, pharmacodynamics, pharmacopoea, pharmacology, bacteria, virus, fungus, actinomycetes, metabolites, antimetabolites, LD50, ED50. Therapeutic index.

UNIT-II

Analgesics-definition and actions-narcotic and non-narcotic-morphine, Heroin. Antipyretic analgesics-salicylic acid derivatives-methyl salicylate, aspirin

UNIT-III **9**

Anaesthetics-definition-classification-local and general- volatile, nitrous oxide, ether, chloroform, uses and disadvantages – nonvolatile – intravenous - thiopental sodium, -local anaesthetics –cocaine and benzocaine. Antianaemic drugs-iron, vitamin B12 and folic acid-mode of action.

UNIT –IV

Sulphonamides-mechanism and action of sulpha drugs- preparation and uses of sulphadiazine, sulphapyridine. Antibiotics-Definition-classification as broad and narrow spectrum, Antibiotics-penicillin, ampicillin, structure and mode of action only (no structural elucidation, preparation, assay)

UNIT-V **9**

Diabetics- Hypoglycemic agents-sulphonyl urea, biguanides. AIDS-causes, prevention and control.

Indian medicinal plants and uses-tulasi, kilanelli, mango, semparuthi, adadodai and thoothuvalai.

COURSE OUTCOMES

- Able to differentiate terminology used in pharmaceutical industries.
- Able to gain knowledge about the mechanism of drugs.
- Ability to identify the medicinal plants and apply it in practical life.

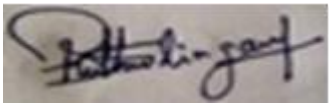
Total Periods: 45

TEXT BOOKS

1. G.R. Chatwal, *Pharmaceutical Chemistry-Inorganic, Vol.1,* 4th ed. Mumbai: Himalaya Publishing House, 2018. (Unit-I to Unit-II)
2. G.R. Chatwal, *Pharmaceutical Chemistry-Inorganic Vol.2,4th* ed. Mumbai: Himalaya Publishing House, 2018. (Unit-III to Unit-V)

REFERENCE BOOKS

1. S. Lakshmi, *Pharmaceutical Chemistry*, 2nd ed. New Delhi: S.Chand & Sons, 2004.
2. V.K. Ahluwalia and Madhu Chopra, *Medicinal Chemistry*, 1st ed. New Delhi: Ane Books, 2008.
3. P. Parimoo, *A Text Book of Medicinal Chemistry*, 1st ed. New Delhi :CBS Publishers, 2006
4. Mohammed Ali, *Text book of Pharmaceutical chemistry*, 1st ed. New Delhi: CBS Publishers and Distributors, 2018.



Verified by Course Coordinator
Dr.S.MUTHULINGAM

Approved by BOS Chairman
Dr.T.SASIKALA

PERSONALITY, APTITUDE AND CAREER ENHANCEMENT (PACE – V)

Subject Code: 16CPE05

Common to all the UG streams admitted from AY 2016-17

Semester	III
Credit	1
Paper Type	Skill based
Max. Marks	Online test : 50 Viva-Voce : 50 TOT = 100

COURSE OBJECTIVES

To introduce students,

- To recap concepts learnt in PACE 3 & 4 and introduce adequate soft skills required for the business environment to the students.
- To introduce concepts on Creativity and Time Utilization Management.
- To give extensive exercises on Quantitative Aptitude, Reasoning Aptitude & Verbal Aptitude, by inculcating all the company-specific papers those are required to participate effectively in the Placement Process.
- To introduce higher level concepts on Personal Effectiveness Skills and Resume Building.
- To reiterate the importance of Impression Management and its effectiveness

UNIT - I: QUANTITATIVE ABILITY – COMPANY SPECIFIC

Number System – Divisibility rules, Unit digit, BODMAS, HCF and LCM. Averages AP and GP – Percentage – Increase and decrease concepts. Profit and Loss – Interest Calculation – Simple interest and Compound interest. Time Speed Distance – Problems on Trains, Boats and Stream, races. Time and Work – Pipes and cistern. Permutation and Combination – Probability – Ratio Proportion, Problems on ages. Mixtures and Solutions – Alligation.

UNIT - II: REASONING ABILITY – COMPANY SPECIFIC

Data Arrangements – Linear and Circular arrangement. Data Interpretation – Alpha and Numeric series – Odd man out. Coding and Decoding. Venn diagram – Set language properties – Syllogism – Data Sufficiency – Applications of quantitative ability concept. Clocks and Calendars.

UNIT - III: VERBAL ABILITY – COMPANY SPECIFIC

Vocabulary – Etymology, Root words, verbal analogy. Reading – Reading Comprehension, Jumbled Paragraphs and Jumbled Essays. Application of Grammar concepts – Sentence Construction, Sentence Improvisation. Critical Reasoning – Statement/Argument – Premises, Inference, Conclusion, Strengthening and Weakening of arguments.

UNIT - IV: GROUP DISCUSSION SKILLS

Lateral Thinking – Out of Box thinking, Creative Problem-solving, Practical Application. Anger Management – Causes of Anger, Channelizing Anger, Effective Anger management – Stress Management – Causes of Stress, Importance of Eustress, Steps to effective Stress Management. Quizzes related to current affairs.

UNIT - V: INTERVIEW SKILLS

Impression Management – Psychology behind Professionalism, Powerful impressions. Handling Common Questions in Interviews. Ethics and Integrity vs Psychometric test.
Time Utilization Management – Methods and Strategies. Reviews – Resume Building, Goal-setting and Personality.

COURSE OUTCOMES

On the successful completion of PACE 5, the students would be able to

- Utilize time, being creative and have more insight on business environment.
- Equip themselves adequate skill-set that are required to participate effectively in the Placement Process.
- Develop Personal Effectiveness Skills and Resume Building.
- Make use of impression management in-terms of participating effectively in interviews.

Instruction Hours per Week: 40

REFERENCES

1. Developing Communication Skills by Krishna Mohan & Meera Banerji
2. Verbal Ability and Reading Comprehension by Arun sharma
3. Word Power Made Easy by Norman Lewis
4. High School English Grammar by Wren and Martin
5. Art of Social Media by Guy Kawasaki
6. A Modern Approach to Verbal and Nonverbal Reasoning by Dr. R. S. Aggarwal
7. A Modern A Modern Approach to Verbal by Dr. R. S. Aggarwal
8. A Modern Approach to Nonverbal Reasoning by Dr. R. S. Aggarwal
9. A Practical Course in Spoken English by J.K.Gangal
10. Effective English Communication for you by V.Shamala

Verified by Course Coordinator
Dr.A.Arun Rajkumar

Approved by Chairman - BOS
Dr.A.Arun Rajkumar

16CH601 CORE – X: ORGANIC CHEMISTRY – II

Semester	VI
Credit	5
Paper type	Core
Max. Marks	CIA : 30 CE : 70 TOT =100

COURSE OBJECTIVES

- To understand the reaction mechanisms of carbonyl compounds.
- To get a clear idea about heterocyclic compounds and their nomenclature.
- To get a good exposure about alkaloids and terpenoids in phytochemistry.

UNIT-I REACTIVITY OF CARBONYL COMPOUNDS 14

Reaction mechanisms: Nucleoplilic addition of gridnard reagent, NH_3, primary amine- aldol condensation, Cannizaro reaction, Perkin reaction, Knoevanagal reaction, claisen-Schmidt reaction, Benzoin condensation, Haloform reaction and Reformatsky reaction.

UNIT-II CARBONYL REDUCTION AND ACTIVE METHYLENE COMPOUNDS 13

Reaction with $LiAlH_4$ and NaBH4- Clemmensen reduction, Wolff kishner reduction, MPV reduction- reducing properties of carbonyl compounds.

Dicarboxylic acids- preparation, synthetic application -Malonic acid and acetoacetic ester, Tautomerism in acetoacetic ester.

UNIT –III HETEROCYCLIC COMPOUNDS 13

Nomenclature-Five membered rings-Preparation and properties of Pyrrole, Furan, thiophene and its derivatives –Furan, Furfural, Tetrahydrofuran.

Six membered Rings- Preparation of Pyridine, Piperidine, quinolone and indole.

UNIT -IV ALKALOIDS 13

Classification, isolation, structural elucidation and biological importance- piperine, Quinine, Nicotine coniine and Atropine.

UNIT -V TERPENOIDS 13

Isoprene rule- Classification- isolation, structural elucidation and biological importance -Camphor, Citral, α-pinene and α-terpinol.

COURSE OUTCOMES

- Able to explore the reactivity of carbonyl compounds
- Able to identify the reducing agents used in various chemical industries.
- Able to elucidate and isolate the natural products used in pharma industries.

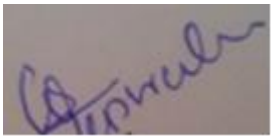
Total Periods: 66

TEXT BOOKS

1. B.S. Bahl and Arun Bahl, *Advanced Organic Chemistry*, 1st ed. New Delhi: S. Chand & Company Pvt, Ltd, 2016.(Unit-III to Unit-V)
2. P.S. Kalsi, Stereochemistry, *Conformation and Mechanism*, 9th ed. New Delhi: New Age International Publishers, 2017. (Unit-I to Unit-II)

REFERENCE BOOKS

1.S.M. Mukherji, S.P. Singh, R.P. Kapooran and R. Dass, *Organic Chemistry*, Vol.1, 2nd ed. New Delhi: New Age International Pvt. Ltd., 2015.
2. Bhupinder Mehta and Manju Mehta, *Organic Chemistry*, 2nded. New Delhi: Ashok K.Ghosh, PHI learning Pvt Ltd., 2015.
3. Robert Thornton Morrison and Robert Neilson Boyd, *Organic Chemistry*, 6thed, New Delhi: Dorling Kindersley Pvt. Ltd., 2005.
4. M.K. Jain and S.C.Sharma, *Modern Organic chemistry*, 4th ed. Jalandhar: Vishal Publishing Co., 2016.



Verified by Course Coordinator
Mrs.K.P.GREESHMA

Approved by BOS Chairman
Dr.T.SASIKALA

16CH602 CORE - XI: PHYSICAL CHEMISTRY – II

Semester	VI
Credit	5
Paper type	Core
Max. Marks	CIA : 30 CE : 70 TOT =100

COURSE OBJECTIVES

- To understand the theory of chemical equilibrium and electrical conductance.
- To understand the significance of second law of thermodynamics.
- To understand the concepts and the types of solutions.
- To learn about the basics of solid state chemistry.

UNIT-I CHEMICAL EQUILIBRIUM 14

Law of mass action - equilibrium constant- relation between k_p and k_c- thermodynamic treatment of law of mass action-Van't Hoff reaction isotherm and temperature dependence of equilibrium constant. Study of heterogeneous equilibrium- factors that change the state of equilibrium- Le-Chatlier's principle and its application to chemical and physical equilibrium.

UNIT-II ELECTROLYTIC CONDUCTANCE 13

Electrolytic conductance - conductivity cell-Measurement of conductivity in electrolytic solution- variation of equivalent conductance with dilution. Migration of ions - Konlrausch law-statement and application. Arrhenius theory of electrolytic dissociation- Ostwalds dilution law and its limitations. Theory of strong electrolytes-Debye-Huckel Onsager theory (elementary treatment only) - Debye- Falkenhagen effect and Wien effect- Transport numbers.

UNIT-III INTRODUCTION TO SECOND LAW OF THERMODYNAMICS 13

Introduction- spontaneous and non-spontaneous reaction - statement of second law- Entropy as a state function-Carnot's cycle- entropy changes in isothermal expansion of an ideal gas, Helmholtz and Gibbs free energies- Maxwell's relation-Criteria of spontaneity- Gibbs Helmholtz equation.

UNIT-IV SOLUTIONS 13

Solution-definition, types, methods to express concentration-Gas-liquid system - Henry's law, liquid system-ideal and non-ideal solution - Raoult's law-Azeotropic mixtures. Dilute solution: Colligative properties-Lowering of vapour pressure- elevation of boiling point-relation to lowering of vapor pressure- calculation of molar mass-measurement by Beckmann's method-Osmotic pressure- Measurement by Berkley and Hartley's method.

UNIT-V SOLID STATE 13

Amorphous and crystalline solid-laws of crystallography-law of constancy of interfacial angles- law of constancy of symmetry-law of rationality of indices-space lattice and unit cell-miller indices-seven crystallographic system- Bravai's lattice-spacing of lattice plane in simple cubic, Body centered cubic lattice and Face centered cubic lattice of NaCl, KCl and CsCl.

COURSE OUTCOMES

- Ability to apply the concepts of various factors influencing chemical equilibrium and electrolytic conductance.
- Ability to analyze working principle and manufacturing process of engine used in varies industries.
- Ability to differentiate types of solution and its colligative properties.
- Ability to elucidate the structure of crystals using laws of crystallography.

Total Periods: 66

TEXT BOOKS

1. B. R. Puri, L.R. Sharma and M.S. Pathania, *Principles of Physical Chemistry,* 4th ed. New Delhi: Vishal Publishing Co., 2018. (Unit-I to Unit-V)
2. Arun Bahl, B.S. Bahl and G. D. Tuli, *Essentials of Physical Chemistry*, Revised 8th ed. New Delhi; S. Chand & Sons Publishing, 2016. (Unit-I to Unit-V)

REFERENCE BOOKS

1. P.L. Soni, O.P. Dharmarha and U.N. Dash, *Textbook of Physical Chemistry*, Revised ed., New Delhi: S Chand & Sons, 2016.
2. P.C. Jain and Monika Jain, *Engineering Chemistry*, 16th ed. New Delhi : Dhanpat Rai Publishing Co., 2006.
3. Physical Chemistry; Robert A Alberty and Robert J Silbey, 1st ed. New Delhi :John Wiley and Sons,1995.

Verified by Course Coordinator
Dr.T.SASIKALA

Approved by BOS Chairman
Dr.T.SASIKALA

16CH603 CORE - XII: SPECTROSCOPY

Semester	VI
Credit	4
Paper type	Core
Max. Marks	CIA : 30 CE : 70 TOT =100

COURSE OBJECTIVES

- To understand the basic concepts of spectroscopic techniques and to solve the structures from the spectra.
- To study in detail about UV-VIS, IR, Raman NMR and Mass spectroscopic techniques.
- To develop problem solving skills from various type of spectra.

UNIT – I UV-VISIBLE SPECTROSCOPY 12

Definition of spectrum and its interaction with matter – Types - absorption and emission spectra. Molecular spectroscopy-Electromagnetic radiation, quantization of different types of energies in molecules (translational, rotational and electronic)

UV-Visible spectroscopy-Types of electronic transitions. Beer's- Lambert's law- Optical Density - chromophore, auxochrome, bathochromic and hypsochromic shifts Instrumentation, Frank-condon's principle, calculation of λmax using Woodward Fieser rule for dienes (problems)- Applications.

UNIT-II IR SPECTROSCOPY 12

IR spectroscopy - principles-modes of vibration of diatomic, triatomic linear (CO_2) and nonlinear Tri atomic molecules (H_2O)-stretching and bending vibrations-selection rules. Expression for vibrational frequency (derivation not needed), Factors affecting vibrational frequency -instrumentation-sampling techniques –identification of functional groups(Aldehydes, ketones, ester, amides, carbonyl compounds-problems)- fingerprint region, H-bonding (inter and intra molecular) .

UNIT-III RAMAN SPECTROSCOPY 12

Raman spectroscopy-condition-Rayleigh and Raman scattering, Stokes and antistoke lines – Instrumentation. Difference between Raman and IR Spectroscopy - Mutual exclusion principle (CO_2 and N_2O).

ESR spectroscopy-theory of ESR, instrumentation, origin of hyperfine spilitting – ESR spectrum of CH_3 free radical and Benzene.

UNIT-IV ^{1}H NMR SPECTROSCOPY 12

Theory of NMR - Relaxation process – instrumentation – Advantages of using FT NMR – Chemical shift – TMS as standard – solvents used – predicting number of signals (simple compounds only)-Factors affecting chemical shift- shielding and deshielding - spin-spin coupling - NMR spectrum of Ethanol, n-propyl bromide and Toluene (problems).

UNIT-V MASS SPECTROMETRY **12**

Mass spectrometry- Basic principles- instrumentation- molecular ion peak, base peak, metastable peak, isotopic peak- their uses. Nitrogen rule - ring rule-fragmentation. Interpretation of mass spectra of simple organic compounds such as Acetone, Anisole, Benzaldehyde and Ethyl acetate.

(10% of problems may be included)

COURSE OUTCOMES

- Able to predict the structure of the compounds using UV & IR Spectra.
- Able to interpret and analyze data of chemical compounds used in industrial field.
- Able to develop domain knowledge on fundamental concepts in spectroscopy.

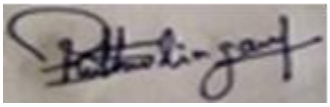
Total Periods: 60

TEXT BOOKS

1. P.S. Kalsi, *Spectroscopy of Organic compounds*, 7th ed. New Delhi: New Age International Publishers, 2016. (Unit-I to Unit-V)
2. Y.R. Sharma, *Elementary Organic Spectroscopy*, Revised ed. New Delhi: S.Chand & Co., 2017. (Unit-I to Unit-V)

REFERENCE BOOKS

1. William Kemp, *Organic Spectroscopy*, 3rd ed. New York: Palgrave, 2012.
2. C. Banwell and E.M. McCash, Fundamentals of Molecular Spectroscopy, 4th ed. New York: Tata Mc Graw Hill Education India Pvt Ltd., 2016.
3. Jag Mohan, *Organic Spectroscopy*, 2nd ed. Narosa Publishing House, and 2009.
4. R.M. Silverstein, F.X. Webster, *Spectrometric Identification of Organic Compounds*, 6th ed. Singapore: John Wiley Publications, 2009.



Verified by Course Coordinator
Dr.S.MUTHULINGAM

Approved by BOS Chairman
Dr.T.SASIKALA

16CHE04 ELECTIVE-II: CHEMISTRY FOR EVERYDAY LIFE

Semester	VI
Credit	4
Paper type	Elective
Max. Marks	CIA : 30 CE : 70 TOT =100

COURSE OBJECTIVES

- To make the students to get exposed to day to day chemistry related materials.
- To gain knowledge on processing of milk and milk products.
- To get a clear idea of special diets for diseases and drugs.
- To get an idea about medicinal plants, its availability and uses.

UNIT – I CHEMISTRY IN DAY-TO-DAY LIFE 9

Dry Cleaning of Clothes, Versatile Bleaching Agents. Environmental Pollution by Volatile Organic Solvents / Compounds (VOCs). Lubricants; Definition, function of lubricants and properties. Examples, classification of lubrication, additives for lubricating oils, synthetic lubricants, greases and solid lubricants.

UNIT – II MILK AND MILK PRODUCTS 9

Milk, Changes at Room Temperature, Methods of Routine Examination of Milk. Classification of bacteria, acid products, peptonizing organisms, fat splitters, pathogens. Milk Products – Butter, Cheese, Fermented Milk, Curd, Yoghurt, Abnormal Changes in Milk and Milk Spoilage, Preservation of Milk and Milk Products.

UNIT – III BLOOD AND HEMATOLOGICAL AGENTS 9

Composition of blood, blood grouping and matching, role of blood as oxygen carrier, blood pressure, coagulation of blood. Determination of blood urea (using urease method only).
Drugs: Cardiovascular drugs, action, dosage and examples of cardiac glycosides, antiarrhythemic drugs, antihypertension drugs and vascodialator.

UNIT – IV SPECIAL DIETS FOR SPECIFIC DISEASES 9

Peptic ulcer, diabetes, mellines, infective hepatitis, heart disease and hypertension.

UNIT – V INDIAN MEDICINAL PLANTS 9

Medicinal properties and uses of Hibiscus Rosasinesis, adathoda vasica, Ocimum sanchum, Mangifera Indica, Azadirachtra Indica, Phyllantum Niruri, Solatum Trolbafum.

COURSE OUTCOMES

- Able to create awareness about applications of chemistry in daily life.
- Able to identify the medicinal plants and apply it in practical life.
- Able to suggest suitable diet plan for various life style diseases.

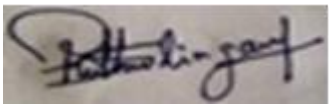
Total Periods: 45

TEXT BOOKS

1. G.R. Chatwal, *Pharmaceutical Chemistry-Inorganic, Vol.1,* 4th ed. Mumbai: Himalaya Publishing House, 2018. (Unit-III to Unit-V)
2. G.R. Chatwal, *Pharmaceutical Chemistry-Inorganic Vol.2,* 4th ed. Mumbai: Himalaya Publishing House, 2018. (Unit-III to Unit-V)
3. P.C. Jain and Monika Jain, *Engineering Chemistry*, 16th ed. New Delhi: Dhanpat Rai Publishing Co., 2006. (Unit-I)
4. Sukumar De, *Outlines of Diary Technology*, 1st ed. UK: Oxford Publishers, 2001. (Unit-II)

REFERENCE BOOKS

1. S. Lakshmi, *Pharmaceutical Chemistry*, 2 nd ed. New Delhi: S. Chand & Sons, 1998.
2. N. Murugesan, *A Text book of Pharmacology*, 6 th ed. Chennai: Sathya Publishers, 2004.



Verified by Course Coordinator
Dr.S.MUTHULINGAM

Approved by BOS Chairman
Dr.T.SASIKALA

16CHE05 ELECTIVE – II: INDUSTRIAL CHEMISTRY

Semester	VI
Credit	4
Paper type	Elective
Max. Marks	CIA : 30 CE : 70 TOT =100

COURSE OBJECTIVES

- To enable the students to understand the various types of fertilizers.
- To learn manufacturing process of cement, sugar, glass and chemical explosives.
- To gain knowledge about the importance of iron and steel industry.

UNIT – I FERTILIZERS 12

Micro and macro nutrients and their role - NPK fertilizers and their functions. Preparation - properties – uses of – Nitrogenous fertilizers (Urea, ammonium nitrate, calcium ammonium nitrate) – Phosphorous fertilizers (super phosphate, triple super phosphate) Pottash fertilizers (KCl, KNO_3, K_2SO_4).

UNIT – II CEMENT & GLASS 12

Cement: Manufacture – Wet Process and Dry process, types, analysis of major constituents, setting of cement, reinforced concrete.

Glass: Composition and manufacture of glass .Types of glasses- optical glass, coloured glasses and lead glass.

UNIT – III SUGAR INDUSTRY 12

Manufacture of crystalline sugar- Extraction of the juice- clarification of juice-two step and one step process-crystallization of syrup-curing of sugar-double centrifuging-treatment of molasses-testing and estimation of sugar-utilization of bagasse-industrial spirit-absolute alcohol.

UNIT - IV CHEMICAL EXPLOSIVES 12

Preparation and chemistry of lead azide, nitroglycerine, nitrocellulose, TNT, RDX, Dynamite, cordite, picric acid, gunpowder, introduction to rocket propellants.

Leather Industry: Curing, preservation and tanning of hides and skins, process of dehairing and dyeing.Treatment of tannery effluents.

UNIT - V IRON AND STEEL INDUSTRY 12

Iron-carbon alloy system-function of carbon in steels and its classification- heat treatment of steel – Annealing-Tempering-Normalizing-hardening-cold rolling of steel-alloy steel-need for alloying-special alloying metals like Ni, Cr, Mn, V and Co.

COURSE OUTCOMES

- Ability to suggest suitable fertilizers used in agro-industry.
- Ability to create awareness about chemicals used in explosives and processing techniques in leather industry.
- Ability to analyse different types of industrial materials and their applications.

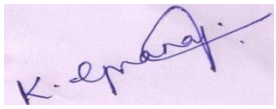
Total Periods: 60

TEXT BOOKS

1. P.C Jain and M. Jain, *Engineering chemistry*, 16th ed. New Delhi: Dhanpat Rai Publishing Company Pvt., 2017. (Unit-II to Unit-V)
2. B.K. Sharma, *Industrial Chemistry*, 16th ed. Meerut: Goel Publishing House, 2011. (U nit-I to Unit-V)

REFERENCE BOOKS

1. P. Kamaraj, R. Jeyalakshmi and V. Narayanan, *Chemistry in Engineering and Technology*, 1st ed. Chennai: sudhandhira Publications, 2001.
2. J.C. Kuriakose and J.Rajaram, *Chemistry in Engineering and Technology*, *Vol.1 and Vol.2*, New Delhi: Tata Mc Graw hill Publications Co. Ltd., 1996.



Verified by Course Coordinator
Dr.K.GNANA PRIYA

Approved by BOS Chairman
Dr.T.SASIKALA

16CHE06 ELECTIVE-II: MEDICINAL CHEMISTRY

Semester	V
Credit	4
Paper type	Elective
Max. Marks	CIA : 30 CE : 70 TOT =100

COURSE OBJECTIVES

- The student is able to learn about disinfectants and antiseptics.
- To understand important drugs and the mode of actions.
- To know about the basics of drugs, the common diseases and their remedies.

UNIT I INTRODUCTION **12**

Common diseases – infective diseases – insect – borne, air – borne and water-borne – hereditary diseases – Terminology – drug, pharmacology, antimetabolites, absorption of drugs – factors affecting absorption –therapeutic index (Basic concepts only).

UNIT II DRUGS **12**

Classification of drugs– biological chemical (Structure not required) Drug receptors and biological responses– factors affecting metabolism of drugs. (Basic concepts only). Pharmacologically active constituents in plants, Indian medicinal plants – tulsi, neem, keezhanelli – their importance

UNIT III CHEMOTHERAPY **12**

Drugs based on physiological action, definition and two examples each of anesthetics-General and local – analgesics – narcotic and synthetic – Antipyretics and anti-inflammatory agents –antibiotics – Penicillin, Streptomycin, Antivirals, AIDS – symptoms, prevention, treatment –Cancer (Structure not required).

UNIT IV COMMON BODY AILMENTS **12**

Diabetes – Causes, hyper and hypoglycemic drugs – Blood pressure – Sistolic &Diastolic Hypertensive drugs – Cardiovascular drugs – depressants and stimulants –Lipid rofile – HDL, LDL cholesterol lipid lowering drugs. (Structure not required).

UNIT V HEALTH PROMOTING DRUGS **12**

Vitamins A,B, C, D, E and K micronutrients – Na, K, Ca, Cu, Zn and I, Medicinally important inorganic compounds of Al, P, As, Hg and Fe, Examples and applications, Agents for kidney function (Aminohippuric acid). Agents for liver function (Sulpho bromophthalein), antioxidants, treatment of ulcer and skin diseases. (Structure not required).

COURSE OUTCOMES

- Able to enumerate an introduction to chemistry of drugs and some common diseases.
- Able to elucidate of the mode of action in drugs and basic idea about chemotherapy.
- Able to synthesis the important health promoting drugs.

Total Periods: 60

TEXT BOOKS

1. Alfred Burger, *Medicinal Chemistry,* 6th ed. New York:Wiley – Interscience Publication, 2003. (Unit-I to Unit-V)
2. N. Murugesan, *A Text book of Pharmacology*, 6th ed. Chennai: Sathya Publishers, 2004. (Unit-I to Unit-V)
3. Bentley and Drivers, *A Text book of Pharmaceutical Chemistry*, 14th ed. Chennai: Oxford university Press, 1996. (Unit-I to Unit-V)

REFERENCE BOOKS

1.G.R. Chatwal, *Pharmaceutical Chemistry-Inorganic (Vol.1),* 4thed. Mumbai: Himalaya Publishing House, 2018.
2.G.R. Chatwal, *Pharmaceutical Chemistry-Inorganic (Vol. 2),* 4thed. Mumbai: Himalaya Publishing House, 2018.

Verified by Course Coordinator
Dr.T.SASIKALA

Approved by BOS Chairman
Dr.T.SASIKALA

16CH605 SKILLED BASED COURSE 4: DYE CHEMISTRY

Semester	VI
Credit	4
Paper type	Skill Based
Max. Marks	CIA : 30 CE : 70 TOT =100

COURSE OBJECTIVES

- To understand the importance of dyes and their classification.
- To learn the various mechanisms and techniques of dyeing.
- To develop a sound knowledge on fundamental concepts in dye chemistry.

UNIT-I **13**

Colour and constitution- Relationship of colour observed –to wave length of light absorbed-Terms used in colour chemistry- Chromophores, Auxochromes, Bathochromic shift, Hypsochromic shift. Colour of a substance- Quinonoid theory and molecular orbital approach.

UNIT-II **14**

Classification of dyes-chemical dyes- basic dyes. Classification according to their applications-Acid dyes- Basic dyes. Azoic dyes, mordant dyes, vat dyes, sulphur dyes, Disperse dyes, Nitro dyes and Nitroso dyes-process of dyeing (simple treatment) Azo dyes-Principles governing azo coupling-mechanism to diazotization- Coupling with amines, coupling with phenols- Classification according to the number of azo group and application-Tautomerism in azo dyes.

UNIT-III **12**

Synthesis, reactions and applications of Di and Triphenyl methane dyes-phthalein dyes-xanthen dyes-acridine dyes-sulphur dyes.Phthalocyanines-Cynanines dyes. Malachite green, pararosanilne, crystal violet

UNIT-IV **8**

Azine, oxazine and Triazine Dyes. Synthesis and applications of quinonoid dyes including vat dyes based on anthraquinone.

UNIT-V **13**

Pigments-requirements of a pigment: Typical Organic and Inorganic pigments-application and their uses in paints. Reaction of dyes with fibres and water- Fluorescent brightening agents. Application of dyes in other areas-medicine, chemical analysis, cosmetics, colouring agents, food and beverages.

COURSE OUTCOMES

- Able to differentiate the terms and definitions in dye chemistry and use of popularly used dye chemicals.
- Able to identify various synthetically important reactions with a view to appreciate their scope, limitations and potential use in synthetic sequences.
- Able to enumerate suitable reaction sequences to achieve the synthesis of target molecules.

Total Periods: 60

TEXT BOOKS

1. V.A. Shenai, *Technology of Textile Processing Vol.2, Chemistry of Dyes and Principle of dyeing*, 3rd ed. Bombay: Sevak Publication, 1973. (Unit-I to Unit-V)
2. V.A. Shenai, *Technology of Textile Processing Vol.1, Technology*, 3rd ed. Bombay: Sevak Publication, 1991. (Unit-I to Unit-V)

REFERENCE BOOKS

1. K.Venkatraman, *The Chemistry of Synthetic Dyes -Vol. 1 & 2*, 1st ed. London: Academic Press, 1990.
2. David.R.Waring and Geoffrey Hallas, *The Chemistry and Application of Dyes*, SDC,1990

Verified by Course Coordinator
Dr.K.GNANA PRIYA

Approved by BOS Chairman
Dr.T.SASIKALA