



B.Sc. CHEMISTRY
SYLLABUS
Semester I & II
Effective from June 2013

Kadi Sarva Vishwavidyalaya, Gandhinagar

B. Sc. Chemistry

Course Description: This course is designed to enable students to acquire understanding of fundamentals of Chemistry. The course provides practical training on chemical processes to extract useful knowledge in the areas of Inorganic, organic, analytical, industrial chemistry etc. for upcoming industries and institutes. It also provides opportunities for developing new chemical products and techniques for the benefit of society.

COURSE STRUCTURE:

Year	Semester	Paper	Paper Name	Marks	Practical	Total Marks
B.Sc I	I	CCH-101	FUNDAMENTALS OF CHEMISTRY-I	100	50	150
	II	CCH-201	FUNDAMENTALS OF CHEMISTRY-II	100	50	150
B.Sc II	III	CCH-301		100	50	150
		CCH-302		100	50	150
	IV	CCH-401		100	50	150
		CCH-402		100	50	150
B.Sc III	V	CCH-501		100	50	150
		CCH-502		100	50	150
		CCH-503		100	50	150
		CCH-504		100	50	150
	VI	CCH-601		100	50	150
		CCH-602		100	50	150
		CCH-603		100	50	150
		CCH-604		100	50	150

Semester I

Part/Class	Subject code	Study components	Instructions Hrs / week	Examination			Credit	
				Internal	University Exam	Total		
Sem-I B.Sc. (Biology Group)		Semester I						
	CCH-101	Fundamentals of Chemistry-I	4	30	70	100	4	
	PCH-101	Chemistry Practicals-I	4		50	50	2	
	CPH-101	Introduction to General Physics	4	30	70	100	4	
	PPH-101	Physics practical- I	4		50	50	2	
	CBI-101	Fundamentals of Botany - I	4	30	70	100	4	
	PBI-101	Botany practical-I	4		50	50	2	
	FCG-101	Basic English-I	2	15	35	50	2	
	EGC-101	Communication Skills -I	2		50	50	2	
	ECH-101	A Agricultural Chemistry	2		50	50	2	
		B Petroleum and Polymers						
				30	105	495	600	24

Part/Class	Subject code	Study components	Instructions Hrs / week	Examination			Credit
				Internal	University Exam	Total	
Sem-I B.Sc. (Maths Group)		Semester I					
	CCH-101	Fundamentals of Chemistry-I	4	30	70	100	4
	PCH-101	Chemistry Practicals-I	4		50	50	2
	CPH-101	Introduction to general physics	4	30	70	100	4
	PPH-101	Physics practical I	4		50	50	2
	CMAT-101	Mathematics 101	6	45	105	150	6
	FCG-101	Basic English-I	2	15	35	50	2
	EGC-101	Communication Skills -1	2		50	50	2
	ECH-101	A Agricultural Chemistry	2		50	50	2
		B Petroleum and Polymers					
				28	120	480	600

CCH-101 FUNDAMENTALS OF CHEMISTRY-1

RATIONALE: This course is designed to enable students to acquire basic understanding of the Chemical world, its origin and structure to help the potential application of the unexplored and unidentified chemicals in the industry.

LEARNING OUTCOMES:

- Understand the concept of origin of chemistry.
- Develop an understanding of the chemical systems around us.
- Gain knowledge about the structure, function and applications of various chemicals.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of Mid Term examinations for 30 marks and End Term Examination conducted by University examination for 70 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CCH- 101	Fundamentals of Chemistry-1	4	48	30	70	100

COURSE CONTENT

Unit 1: (a) Chemical Bonding <ul style="list-style-type: none">• Valence bond theory & its application• Directional characteristics of covalent bond• Various types of hybridization and shape of simple inorganic molecules• V.S.E.P.R. theory for NH₃, H₂O• M.O. Theory-Energy level diagram for homo nucleus diatomic molecules (N₂ and O₂) and hetero diatomic molecule (CO and NO) (b) F-Block Elements <ul style="list-style-type: none">• Lanthanide electronic configuration, Oxidation state• Lanthanide contraction, Effect of lanthanide contraction• Separation method<ol style="list-style-type: none">(1) Solvent extraction methods(2) Ion Exchange Method	Number of lectures: 12 Weightage: 35%
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------

Unit 2**Number of lectures: 12****Weightage: 35%****(a) Structure And Properties**

Factors affecting to the properties of organic molecule

- Intramolecular forces (dipol-dipol interaction, vander waals forces)
- Electromeric effect
- Inductive effect
- Resonance effect(draw resonating structures of Nitro benzene, Chlorobenzen, Phenoxide ion, Anillinium ion, Acetate ion)
- Hyper conjugation (o,p-directing effect of Alkyl group, Stability of Carbonium ion and Free radicals)

(b) Reaction Mechanism

- Fission of Co-Valent bond (With atleast one example of each intermediates)
- Types of reagents.
- Types of organic reaction with mechanism.
- Substitution reactions (Nucleophilic & Electrophilic)
- Addition reactions (Nucleophilic & Electrophilic)
- Elimination reactions (E₁ & E₂)

Unit 3**Number of lectures: 12****Weightage: 15%****Thermodynamics**

- Thermodynamics (only introduction)
- System and surrounding- work & heat, state function, thermodynamic process, internal energy, enthalpy, free energy, maximum work function.
- First law of thermodynamics
- Heat capacity, specific and molar heat capacity, heat capacity at constant volume and pressure and their relationship
- Work done in adiabatic and isothermal reversible expansion of an ideal gas.
- Second law of thermodynamics
- Carnot cycle and its efficiency
- Concept of entropy ; entropy change for an ideal gas under different conditions, entropy change for mixture of ideal gases
- Gibbs-Helmholtz equation Numericals

Unit 4**Number of lectures: 12****Weightage: 15%****Analytical Chemistry**

- Introduction to Analytical Chemistry
- Classification of Classical and Electro analytical Techniques.
- Literature of Analytical Chemistry (Names of Author and Publishers for Any Ten Books, Journals and Reviews)

- Criterion for Selection of analytical Techniques.
- Analytical Data Treatment
Error, Types of errors, Accuracy and Precision.
Statistical Terms :Mode, Average, Median, Deviation,
Average Deviation, Relative Average Deviation, Standard Deviation & Coefficient of variance.
Q-Test for the rejection of result and related numericals

REFERENCES:

1. 'Concise Inorganic Chemistry' J.D.Lee, 5 th edn.
2. Text book of Organic Chemistry, Arun Bahal, S.Chand.
3. Principal of Physical Chemistry by Puri, Sharma, Pathania.
4. Analytical Chemistry, Garry D.Christain.

INSTRUCTION STRATEGIES

1. Interactions with the students to understand the level of students
2. Explaining & Discussing the major terminologies related to Microbiology
3. Teaching the topics included in the syllabus with the help of teaching aids like OHP, LCD (Power point presentation), Notes, Question Banks, References and Reprints / Copy of Articles, Models, Diagrams
4. Assistance in solving of questions from our question bank.

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	35	12
Unit 2	35	12
Unit 3	15	12
Unit 4	15	12
Total	100	48

Semester I
Practical- PCH 101

RATIONALE: This course is designed to enable students to acquire on hand basic understanding of the chemical world, its origin and structure to help the potential application of the unexplored and unidentified compounds in the industry. These practicals make the students capable and competent to work in chemistry related industries.

LEARNING OUTCOMES:

- Understand the concept of origin of chemistry.
- Develop an understanding of the chemical properties of compounds.
- Gain knowledge about the structure, function and applications of the chemicals compounds.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. General viva-voce will be conducted to analyze the knowledge of the student.

Subject Code	Subject Title	Credits	Practical		Total Marks
			Hrs.	Max Marks	
PCH- 101	Chemistry Practical- 1	2	6 (6 hrs & 1 Day)	50	50

LIST OF EXPERIMENTS

1. Inorganic Chemistry

Semi micro Analysis:-

- Cation analysis; separation and identification of ions from group I, II, III-A, III-B, IV, V-A, V-B.
- Anion analysis like Cl⁻, Br⁻, I⁻, NO₃⁻, NO₂⁻, SO₄²⁻, SO₃²⁻, S²⁻, CO₃²⁻, CrO₄²⁻ (Water Soluble and insoluble).
- Candidate should perform the analysis of at least 10 compounds.

2. Standardization

- 1) Preparation of standard solution of succinic acid and standardization of NaOH/KOH solution.
- 2) Preparation of standard solution of Na₂S₂O₃ and standardization of I₂ solution.
- 3) Preparation of standard solution of EDTA and estimation of Ca⁺²/Mg⁺² in CaCl₂/MgCl₂ solution.
- 4) Preparation of standard solution of Oxalic acid and standardization of KMnO₄ solution.
- 5) Preparation of standard solution of K₂Cr₂O₇ and standardization of FeSO₄ solution.

3. Demonstrations

- Preparation of standard stock solution by w/v method and their different dilutions.
- Preparation of standard stock solution of HCl by v/v method and their different dilutions.

INSTRUCTION STRATEGIES

1. Explanation of Principles, protocols, expected result trends, handling of instruments and equipments, precautions and safety measures in class and demonstration of important steps.
2. Monitoring of the students performing the experiments.
3. Evaluation of results of each experiment.

Semester II

Part/Class	Subject code	Study components	Instructions Hrs / week	Examination			Credit
				Internal	University Exam	Total	
Sem-II B.Sc. Biology group		Semester II					
	CCH-201	Fundamentals of Chemistry-II	4	30	70	100	4
	PCH-201	Chemistry Practicals-II	4		50	50	2
	CPH-201	Fundamental of Physics	4	30	70	100	4
	PPH-201	Physics practical II	4		50	50	2
	CBI-201	Fundamentals of Botany- II	4	30	70	100	4
	PBI-201	Botany Practical-II	4		50	50	2
	FCG-201	Basic English-II	2	15	35	50	2
	EGC-201	Communication Skills-II	2		50	50	2
	ECH-201	A Medicinal Chemistry	2		50	50	2
		B Nano chemistry					
				30	105	495	600

Part/Class	Subject code	Study components	Instructions Hrs / week	Examination			Credit
				Internal	University Exam	Total	
Sem-II B.Sc. (Maths group)		Semester II					
	CCH-201	Fundamentals of Chemistry-II	4	30	70	100	4
	PCH-201	Chemistry Practicals-II	4		50	50	2
	CPH-201	Fundamental of Physics	4	30	70	100	4
	PPH-201	Physics practical II	4		50	50	2
	CMAT-201	Mathematics II	6	45	105	150	6
	FCG-201	Basic English-II	2	15	35	50	2
	EGC-201	Communication Skills-II	2		50	50	2
	ECH-201	A Medicinal Chemistry	2		50	50	2
		B Nanochemistry and Environmental Chemistry					
				28	120	480	600

CCH 201- Fundamentals of Chemistry- II

RATIONALE: This course is designed to enable students to acquire basic understanding of the chemical technology.

LEARNING OUTCOMES:

- Understand the concept of chemical sciences.
- Develop an understanding of the chemicals and its effects.
- Gain knowledge about the chemistry existing in and around the society.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of Mid Term examinations for 30 marks and End Term Examination conducted by University examination for 70 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
CCH- 201	Fundamentals of Chemistry II	4	48	30	70	100

COURSE CONTENT

<p>Unit 1:</p> <p>(a) Coordination Compounds</p> <ul style="list-style-type: none">• Definition• Nomenclature of Complex.• Werner's theory and its experimental verification.• Concept of Effective Atomic Numbers (E.A.N.) for Coordination Compounds.• Limitations of Valence bond theory of transition metal Complexes.• An Elementary idea of (C.F.T.) Crystal field splitting of d-orbital in Oh and Td.• Factors affecting to the crystal field splitting.• Application of common complexes & chelates. <p>(b) Actinide.</p> <ul style="list-style-type: none">• Electronic Configuration.• Oxidation state.• Synthesis of Plutonium	<p>Number of lectures: 12</p> <p>Weightage: 35%</p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------

Unit 2**Number of lectures: 12**

Stereo Chemistry Of Organic Compounds

Weightage: 35%**Introduction of Stereo Isomers;****• Optical isomerism :**

General, Discussion of elements of symmetry, Molecular chirality, Enantiomers, Optical activity, Properties of enantiomers, Chiral and achiral molecules with two stereogenic centers, Diastereomers, Threo and Erythro diastereomers, Meso compounds.

• Geometrical isomerism:

Definition and general discussion of geometric isomers, General methods of structure determination (physical methods), E-Z nomenclature (Simple illustration should be given).

• Conformational isomerism:

Definition, Conformational analysis of ethane, n-butane with rotational and torsional diagram, Conformation of cyclo hexane, Axial and equatorial bonds, Newmann projection, Show horse formula, Fisher & flying wedge formula, Difference between conformation and

- configuration.

Unit 3**Number of lectures: 12****Weightage: 15%****(a) Chemical Kinetics**

- Introduction of following terms.
- Rate of reaction, Order of reaction, Molecularity.
- Rate equation for second order reaction. (a=b) & (a b).
- Characteristics of second order reaction.
- Rate equation for third order reaction.
- Characteristics of third order reaction.
- Numerical.

(b) Nuclear Chemistry

- Concept of Nuclear particle.
- Definition of Isotopes, Isotones, Isobars, Isomers.
- Packing fraction.
- Nuclear binding energy.
- Nuclear coulomb barrier.
- Rate of ratio active disintegration, half life period, Average life period.
- Rutharford & Sodi's law (Group transfer law)
- Numerical.

Unit 4**Number of lectures: 12****Weightage: 15%****Principle, Mechanism and Applications of,**

- Acid-Base Titrations (Only strong acid Vs strong Base).
- Redox Titrations (Only Fe(II) vs KMnO_4)
- Complexo metric Titrations (Only $\text{Ca}^{+2}/\text{Mg}^{+2}$ vs EDTA)
- Precipitation Titrations (Only Cl^- vs AgNO_3).

- Related Numericals. quaternary ammonium compounds, aldehydes and gaseous chemosterilizers.
- Evaluation of antimicrobial potency of disinfectants and antiseptics- Tube dilution, Agar diffusion. Phenol coefficient.

REFERENCES:

1. 'Concise Inorganic Chemistry' J.D.Lee, 5 th edn.
2. Text book of Organic Chemistry, Arun Bahal, S.Chand.
3. Principal of Physical Chemistry by Puri, Sharma, Pathania.
4. Analytical Chemistry, Garry D.Christain

INSTRUCTION STRATEGIES

1. Interactions with the students to understand the level of students
2. Explaining & Discussing the major terminologies related to Microbiology
3. Teaching the topics included in the syllabus with the help of teaching aids like OHP, LCD (Power point presentation), Notes, Question Banks, References and Reprints / Copy of Articles, Models, Diagrams
4. Assistance in solving of questions from our question bank.

TEACHING AND EXAMINATION

UNIT	Examination Scheme %Weightage	Teaching Scheme No. of Lecture
Unit 1	35	12
Unit 2	35	12
Unit 3	15	12
Unit 4	15	12
Total	100	48

Semester II
Practical- PCH 201

RATIONALE: This course is designed to enable students to acquire on hand basic understanding of the chemical world, its origin and structure to help the potential application of the unexplored and unidentified compounds in the industry. These practicals make the students capable and competent to work in chemistry related industries.

LEARNING OUTCOMES:

- Understand the concept of origin of chemistry.
- Develop an understanding of the chemical properties of compounds.
- Gain knowledge about the structure, function and applications of the chemicals compounds.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. General viva-voce will be conducted to analyze the knowledge of the student.

Subject Code	Subject Title	Credits	Practical		Total Marks
			Hrs.	Max Marks	
PCH- 201	Chemistry Practical II	2	6 (6 hrs & 1 Day)	50	50

LIST OF EXPERIMENTS LIST OF EXPERIMENTS

1. Organic Chemistry

1) Identification of an organic compound through the functional group analysis, Determination of melting point and boiling point, Preparation of suitable derivative.

2) Candidate should perform the analysis of at least 10 compounds.

List of compounds

Acids:

Benzoic acid, Cinnamic acid, Phthalic acid, Oxalic acid, Succinic acid.

Phenols:

α -Naphthol, β - Naphthol.

Bases:

p-Toludine, Diphenylamine, Aniline, Methyl aniline.

Neutrals:

Naphthalene, Anthracene, Acetamide, Benzamide, Acetanilide, m-Dinitrobenzene, Urea, Thiourea, Toluene, Acetone, Benzaldehyde, Methyl acetate, Ethyl acetate, Ethanol, 1-Propanol, Glycerol, Chloroform, Carbon tetrachloride, Chlorobenzene, Nitrobenzene.

2. Volumetric Titrations

1) To determine the strength of NaOH and Na₂CO₃ present in the solution mixture of NaOH & Na₂CO₃ and to find out their percentage composition.

2) To determine the strength of NaHCO_3 and Na_2CO_3 present in the solution mixture of NaHCO_3 & Na_2CO_3 and to find out their percentage composition.

3) To determine the Normality, gram/liter and molarities of $\text{H}_2\text{C}_2\text{O}_4$, $2\text{H}_2\text{O}$ and H_2SO_4 present in the solution mixture of $\text{H}_2\text{C}_2\text{O}_4$, $2\text{H}_2\text{O}$ & H_2SO_4 by using X N NaOH and Y N KMnO_4 solutions.

4) To determine the Normality, gram/liter and molarity of $\text{H}_2\text{C}_2\text{O}_4$, $2\text{H}_2\text{O}$ and $\text{K}_2\text{C}_2\text{O}_4$ present in the solution mixture of $\text{H}_2\text{C}_2\text{O}_4$, $2\text{H}_2\text{O}$ & $\text{K}_2\text{C}_2\text{O}_4$ by using X N NaOH and Y N KMnO_4 solutions.

5) To determine the amount of Ca^{+2} and Mg^{+2} ion by EDTA solution from the mixture solution of CaCl_2 and MgCl_2 .

3. Demonstrations

- Melting point and Boiling point of an organic compound.
- Calibration of burette and Pipette.

INSTRUCTION STRATEGIES

1. Explanation of Principles, protocols, expected result trends, handling of instruments and equipments, precautions and safety measures in class and demonstration of important steps.
2. Monitoring of the students performing the experiments.
3. Evaluation of results of each experiment.

INSTRUCTION STRATEGIES

1. Explanation of Principles, protocols, expected result trends, handling of instruments and equipments, precautions and safety measures in class and demonstration of important steps.
2. Monitoring of the students performing the experiments.
3. Evaluation of results of each experiment.

ELECTIVE PAPERS
Semester I
ECH-101- A AGRICULTURAL CHEMISTRY

RATIONALE: This course is designed to enable students to acquire basic understanding of the Chemical world, its origin and structure to help the potential application of the unexplored and unidentified chemicals in the industry.

LEARNING OUTCOMES:

- Understand the concept of origin of chemistry.
- Develop an understanding of the chemical systems around us.
- Gain knowledge about the structure, function and applications of various chemicals.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of End Term Examination conducted by University examination for 50 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
ECH- 101-A	Agricultural Chemistry	2	24	-	50	50

COURSE CONTENT

Number of lectures: 12
Weightage: 50%

Unit : 1 FERTILIZERS

- Plant Nutrients, Major Nutrients, Minor Nutrients, Trace Nutrients
- Definition of Fertilizer
- Classification of Fertilizer
- Synthesis of N Containing Fertilizer i.e. $(\text{NH}_4)_2\text{SO}_4$, $\text{Ca}(\text{CN})_2$, and Urea
- Synthesis of P Containing Fertilizer i.e. Super Phosphate, Tripal Super Phosphate
- Mix Fertilizer

Number of lectures: 12
Weightage: 50

Unit : 2 INSECTICIDE

- Introduction
- Inorganic Insecticide
- Organic Insecticide
- Natural or Plant Insecticide
- Synthesis of DDT, BHC,

References

1. Industrial Chemistry by B.K.Sharma.
2. A source book of Agricultural chemistry by Charles Albert Browne
3. Methods in Agricultural chemical analysis – A practical Handbook by N.T.Faithfull

ECH-101- B Petroleum and polymers

RATIONALE: This course is designed to enable students to acquire basic understanding of the Chemical world, its origin and structure to help the potential application of the unexplored and unidentified chemicals in the industry.

LEARNING OUTCOMES:

- Understand the concept of origin of chemistry.
- Develop an understanding of the chemical systems around us.
- Gain knowledge about the structure, function and applications of various petro and polymeric chemicals.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of End Term Examination conducted by University examination for 50 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
ECH- 101-B	Petroleum and polymers	2	24	00	50	50

COURSE CONTENT

Number of lectures: 12
Weightage: 50%

Unit : 1 Polymers and polymerization

- Introduction of polymers
- Classification of polymers
- Synthesis of Nylon, Terylene, Nylo-6, Teflon
- Synthesis of polymer plastics (any three)

Number of lectures: 12
Weightage: 50%

Unit : 2 Petroleum and petrochemicals

- Introduction to petroleum
- Process of petroleum extraction (Fractional Distillation Tower)
- Cracking and reforming processss
- Application of petrochemicals

References

1. Industrial Chemistry by B.K.Sharma.
2. Principles of polymer chemistry by Paul J. Flory
3. Introductory polymer chemistry by Gauri shankarMisra

Semester II Elective Papers

ECH-201 – A Medicinal Chemistry

RATIONALE: This course is designed to enable students to acquire basic understanding of the Chemical world, its origin and structure to help the potential application of the unexplored and unidentified chemicals in the industry.

LEARNING OUTCOMES:

- Understand the concept of origin of chemistry.
- Develop an understanding of the chemical systems around us.
- Gain knowledge about the structure, function and applications of various chemicals.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of End Term Examination conducted by University examination for 50 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
ECH- 201-A	Medicinal Chemistry	2	24	00	50	50

COURSE CONTENT

Number of lectures: 12

Weightage: 50%

Unit : 1 Introduction To Drugs

- Introduction of drugs.
- History of medicinal chemistry.
- Classification of drugs.
- General importance of drugs.
- Drug Design

Number of lectures: 12

Weightage: 50%

Unit : 2 Anti-Malarial Drugs

- Introduction and History.
- Life cycle of Plasmodium.
- Natural anti-malarial drugs : Role of activity side in quinine structure
- Classification of anti-malarial drugs.
- Synthesis of Quinoline derivatives : 8-Amino quinoline derivatives; (Plasmoquine & Pamaquine).

References

1. Medicinal Chemistry by A. kar
2. Burger's medicinal chemistry
3. Foye's Principles of Medicinal Chemistry by David Williams

ECH-201 – B Nanochemistry

RATIONALE: This course is designed to enable students to acquire basic understanding of the Chemical world, its origin and structure to help the potential application of the unexplored and unidentified chemicals in the nano industry.

LEARNING OUTCOMES:

- Understand the concept of origin of chemistry.
- Develop an understanding of the chemical systems around us.
- Gain knowledge about the structure, function and applications of various chemicals.

TEACHING AND EVALUATION SCHEME: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of End Term Examination conducted by University examination for 50 marks.

Subject Code	Subject Title	Credits	Theory			Total Marks
			Hrs.	Max Marks		
				Mid Term	End Term	
ECH- 201-B	Nano chemistry	2	24	00	50	50

COURSE CONTENT

Number of lectures: 12
Weightage: 50%

Unit : 1 Nanoscience and nanotechnology

- Defination of Nanoscience and nanotechnology
- Approches of nanotechnology
- Up-Down
- Bottom-Up
- Various methods for syn thesis of nanoparticles
- Applications of nmanoparticles

Number of lectures: 12
Weightage: 50%

Unit : 2 NanoScience and its wonders

- History of nanoscience
- Future of Nanotechnology

References

1. Nano chemistry by Kenneth J. Klabunde
2. Nanomaterials and Nanochemistry by Catherine and Philippe