


Bloom's Taxonomy Levels: 1. Remember 2. Understand 3. Application 4. Analysis 5. Evaluation 6. Creation

Programme Name: F S BE-II (Chemical Engineering)


	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Applied Chemistry	Academic Year	2020-21	
BE II (Chemical Engineering): Regular Programme				
Year	II	Core / Elective / Foundation ACH1301: Organic Chemistry	Credits / Hours per week	04
Semester	I	Year of Introduction: Year of Syllabus Revision: 2014	Maximum Marks / Grade	100
Mode of Transaction		Lectures and Tutorials		
Course Outcome (CO) ACH1301				
CO1 To learn some important Unit Processes in organic synthesis.				
CO2 To study the stereoisomerism and understanding of optical and geometrical isomers with respect to their role in organic compound applications.				
CO3 To understand the fundamentals of Spectroscopy and importance of UV-Vis, Infrared and Nuclear magnetic resonance spectroscopy in organic chemistry.				
CO4 To study the chemistry of aliphatic compounds. The synthesis and chemical reactions of polyhydric alcohol and carboxylic acids based compounds with respect to their use as Organic intermediates.				
CO5 To learn the structure, stability, preparation and reactions involving reactive methylene group compounds.				
CO6 To study the structure, preparations, and reactions of Aromatic compounds i.e. Benzene and it's homologous for its industrial importance.				
CO7 To learn the importance and chemistry of Polycyclic aromatic hydrocarbons and five and six-membered heterocyclic compounds with one hetero atom.				

Unit No.	Topic/Unit	Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional (R)/ Global (G) development needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV) and Professional Ethics (PE)
1.	Unit Chemical Process: Sulphonation, Nitration, Reduction and Halogenation	07	14	2,3,5	CO1	PSO1 PSO3 PSO5	Emp	G	ES
2.	Stereo- Chemistry: Optical Isomerism, Racemization, Walden- Inversion, Geometrical Isomerism	06	13	1,3,5	CO2	PSO1			
3.	Spectroscopy: Introduction to UV, IR and NMR Spectroscopy with examples.	07	14	2,4,5,6	CO3	PSO1 PSO5			
4.	Chemistry of Aliphatic Compound: Dihydric and trihydric alcohol, Preparation, Properties, and uses.	05	10	1,2,3	CO4	PSO1 PSO6			
5.	Dicarboxylic Acid: Preparation, properties and uses	05	10	1,2	CO4	PSO1 PSO6			
6.	Reactive Methylene group containing Compounds: AcetoAcetic Ester, Malonic Ester etc., Preparation and their application in Organic Synthesis	05	10	2,3,4	CO5	PSO1 PSO6			
7.	Chemistry of Aromatic Compounds: Benzene and its homologous, Preparation and properties, Electrophilic aromatic substitution reaction with mechanism, Aryl Halides,	07	14	1,2,5	CO6	PSO1 PSO6			

	Neucleophilic aromatic Substitution with mechanism.								
8.	Polymer Hydrocarbons :- Naphthalene, Preparation and Properties, Heterocyclic Compounds, their importance, furan, Thiophene, Pyrrole, and Pyridine, Preparation and Properties.	06	13	1,2,3	CO7	PSO1 PSO6			
Reference Books:									
1.	Text book of organic chemistry Vol. I - I. L. Finar (6 th edition, Pearson Education, From Book Vistas, New Delhi, India) 2010 & Vol. II - I. L. Finar (6 th edition, Pearson, India) 2011.								
2.	Organic Reactions, Stereochemistry and Mechanism: P.S. Kalsi (4 th edition, New Age International Private Ltd) 2017.								
3.	Heterocyclic Chemistry: J. A. Joule & K. Mills, (4 th edition, Chapman & Hall) 1995.								
4.	Organic chemistry - R. T. Morrison and R. N. Boyd (7 th edition, Pearson) 2010.								
5.	Organic chemistry - O. P. Agrawal (4 th edition, Goel Publishing House) 2000.								
6.	Polymer Science by V. Gowariker (2 nd edition, New Age International Limited, New Delhi)2015								
7.	Text book of organic chemistry: A.Bahl and B.S. Bahl (22 nd edition, S.Chand Publications, New Delhi)2016								


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Programme Name: F S BE-II (Chemical Engineering)


	The Maharaja Sayajirao University of Baroda		Academic Year		2020-21					
Faculty Technology and Engineering										
Department of Applied Chemistry										
BE II (Chemical Engineering): Regular Programme										
Year	II	Core / Elective / Foundation ACH1301L: Organic Chemistry Termwork/Practical/Viva	Credits / Hours per week				02			
Semester	I	Year of Introduction: Year of Syllabus Revision: 2014	Maximum Marks / Grade				50			
Mode of Transaction		Practicals								
Course Outcome (CO) ACH1301L										
CO1 To learn the concepts of qualitative analysis for identification of organic compounds.										
CO2 To understand and estimate the organic compounds using unit reactions in laboratory approaches.										
CO3 To study and perform the various unit processes in lab experiments for synthesis of organic compounds.										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employa	Relevance to Local	Relation to Gender

							bility (Emp)/ Entrepre neurship (Ent)/ Skill Develop ment (SD)	(L)/ National (N)/ Regional (R)/Glob al (G) develop mental needs	(G), Environ ment and Sustaina bility (ES), Human Values (HV)and Professio nal Ethics (PE)
1.	Identification of following organic compounds in binary mixture qualitatively (Any Three). <ul style="list-style-type: none"> i. Urea ii. Thiourea iii. Benzoic acid iv. Cinnamic acid v. P-hydroxy benzoic acid vi. Aniline vii. P-Toluidine viii. Beta Naphthol ix. O-Nitrophenol x. Benzaldehyde xi. Acetone xii. Ethyl acetate xiii. Naphthalene xiv. Acetanilide xv. M-Dinitrobenzene 	12	52	1,2,5	CO1	PSO1	Emp	G	HV
2.	Estimation of phenol and aniline by bromination, ester and amide	06	24	2,4,5	CO2	PSO1			
4.	Laboratory preparation of the following organic compounds <ul style="list-style-type: none"> i. p-Nitro aniline from acetanilide ii. Cinnamic acid from malonic aid 	06	24	1,2,5	CO3	PSO1			

	iii. Aspirin from acetanilide								
	iv. Dibenzal acetone from benzaldehyde								
Reference Books:									
1.	Practical organic chemistry by Vogel								
2.	Identification of organic compounds by R C Shah (Local publications)								

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Applied Chemistry		Academic Year					2020-21		
BE-I (Textile Processing): Regular Programme										
Year	I	Core / Elective / Foundation ACH 1302L: Chemistry - II -TW/Practical/Viva	Credits / Hours per week					02		
Semester	II	Year of Syllabus Revision: 2009	Maximum Marks / Grade					50		
Mode of Transaction		Term work, Practical and Viva								
Course Outcome (CO) ACH 1302L CO1 To calculate the strength and normality of an unknown analyte by performing a redox titration.										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Element s of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional (R)/Global (G) development needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV)and Professional Ethics (PE)


1.	To determine the strengths and normalities of KMnO_4 and $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ solutions using a standard solution of Oxalic acid.	03	13	1,2,4	CO1	PSO1	Emp	G	HV
2.	To determine the strengths and normalities of KMnO_4 and $\text{FeSO}_4(\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$ solutions using a standard solution of Oxalic acid.	03	13	1,2,4	CO1	PSO1			
3.	To determine the strengths and normalities of KMnO_4 and H_2O_2 solutions using a standard solution of Oxalic acid.	03	12	1,2,4	CO1	PSO1			
4.	To determine the strengths and normalities of KMnO_4 and NaNO_2 solutions using a standard solution of Oxalic acid.	03	13	1,2,4	CO1	PSO1			
5.	To determine the strength and normality of I_2 solution against a standard solution of $\text{Na}_2\text{S}_2\text{O}_3$.	03	12	1,2,4	CO1	PSO1			
6.	To determine the strengths and normalities of I_2 and $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ solutions using a standard solution of $\text{Na}_2\text{S}_2\text{O}_3$.	03	13	1,2,4	CO1	PSO1			
7.	To determine the strengths and normalities of I_2 and Na_3AsO_3 solutions using a standard solution of $\text{Na}_2\text{S}_2\text{O}_3$.	03	12	1,2,4	CO1	PSO1			
8.	To determine the strength and normality of CaOCl_2 solution against a standard solution of $\text{Na}_2\text{S}_2\text{O}_3$.	03	12	1,2,4	CO1	PSO1			
Reference Books:									
1.	Vogel's Textbook of Quantitative Chemical Analysis -J. Mendham, R. C. Denney, J. D. Barnes and M. J. K. Thomas, (6 th edition, Prentice Hall) 2000.								

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Applied Chemistry		Academic Year			2019-20												
BE (Textile Processing): Regular Programme																			
Year		II		Core / Elective / Foundation ACH 1302: Chemistry - II			Credits / Hours per week		04										
Semester		I		Year of Syllabus Revision: 2009			Maximum Marks / Grade		100										
Mode of Transaction			Lectures and Tutorials																
Course Outcome (CO) ACH 1302																			
<p>CO1 To study the types and characteristic of the different types of chemical bonds Conformation and Stereochemistry of some organic compounds. To study the physical properties and molecular structures and chemical reactivity. Dynamics and nature of Ionic Reaction.</p> <p>CO2 To study the reaction energies and equilibrium, reaction rates and Transition State Theory.</p> <p>CO3 To study the Reactive Organic Intermediates in Organic Reaction- Formation, Stability and Applications.</p> <p>CO4 To study the Nucleophilic Substitution. Nucleophilic Addition. Elimination Reaction. Electrophonic Addition at Multiple Bonds. Electrophonic Substitution in Aromatic Compounds. Heterocyclic Compounds. Molecular Rearrangements. Oxidation and Reduction. Radical Reaction. Polymerization Reaction. Literature of Organic Chemistry.</p>																			
<table border="1"> <thead> <tr> <th>Unit No.</th> <th>Topic/Unit</th> <th>Contact Hours</th> <th>Weightage (%)</th> <th>BT Level</th> <th>CO</th> <th>PSO</th> <th>Elements of Employability (Emp)/ Entrepreneurship</th> <th>Relevance to Local (L)/ National (N)/ Regional</th> <th>Relation to Gender (G), Environment and Sustainability</th> </tr> </thead> </table>										Unit No.	Topic/Unit	Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship	Relevance to Local (L)/ National (N)/ Regional	Relation to Gender (G), Environment and Sustainability
Unit No.	Topic/Unit	Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship	Relevance to Local (L)/ National (N)/ Regional	Relation to Gender (G), Environment and Sustainability										

							(Ent)/ Skill Develop ment (SD)	(R)/Glob al (G) develop mental needs	bility (ES), Human Values (HV)and Professio nal Ethics (PE)
1.	Characteristic of the Chemical Bonds. Conjugated Bonds. Shapes of Molecules Conformation and Stereochemistry. Physical Properties and Molecular Structures. Chemical Reactivity and Molecular Structure. Dynamics of Organic Reaction – Nature of Ionic Reaction.	16	30	1,2,3,4	CO1	PSO1	Emp	G	ES, HV
2.	Reaction Energies and Equilibrium, Reaction Rates and Transition State Theory, Laboratory Study of Reaction.	08	20	1,2	CO2	PSO1			
3.	Intermediates in Organic Reaction- Their Formation, Stability Reaction.	12	25	1,2,3	CO3	PSO1			
4.	Nucleophilic Substitution. Nucleophilic Addition. Elimination Reaction. Electrophonic Addition at Multiple Bonds. Electrophonic Substitution in Aromatic Compounds. Heterocyclic Compounds. Molecular Rearrangements. Oxidation and Reduction. Radical Reaction. Polymerization Reaction. Literature of Organic Chemistry.	12	25	2,3,4	CO4	PSO1			
Reference Books:									


1.	Engineering Chemistry: Jain and Jain , Dhanpatrai Publishing House
2.	Industrial Chemistry: B. K. Sharma, Goel Publishing House
3.	Essentials of Physical Chemistry: B. S. Bahl, A. Bahl and G. D. Tuli; S Chand & Co.
4.	Organic Chemistry: Morrison and Boyd, Prentice-Hall of India Ltd. New Delhi.
5.	Textbook of Organic Chemistry for B.Sc. Students: P. L. Soni.

SS BE-I (Metallurgy) Applied Chemistry

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Applied Chemistry	Academic Year	2020-21	
BE-II (Chemical Engineering): Regular Programme				
Year	I	Core / Elective / Foundation ACH1401: Physical Chemistry	Credits / Hours per week	04
Semester	II	Year of Syllabus Revision: 2009	Maximum Marks / Grade	100
Mode of Transaction		Lectures and Tutorials		
Course Outcome (CO) ACH1401				
CO1 Introduction to physical properties of Liquids ,their determination methods and uses in chemical constitution of compounds.				
CO2 To learn about the basics of phase equilibrium in their application in one and two component system.				
CO3 To learn about process of Adsorption and various Adsorption Isotherms, Applications , Distribution laws with applications.				
CO4 To understand the Laws of Photochemistry , various photo-physical processes and to calculate quantum efficiency				
CO5 To learn about the Electrode Potential, Galvanic cell and construction of fuel cell.				
CO6 To understand about Colloidal systems and their applications.				
CO7 To learn about Macromolecules and various techniques in spectroscopy and their applications				

Unit No.	Topic/Unit	Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional (R)/ Global (G) developmental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV) and Professional Ethics (PE)
1.	Properties of liquids and solutions, viscosity, surface tension, molecular refractivity, optical rotation, dipole moment, molecular structure and chemical constitution.	07	14	1, 2,3,4	CO1	PSO1	Emp	G	ES
2.	The Phase rule, One and Two component systems.	05	11	1,2,3	CO2	PSO1			
3.	Distribution law, applications of distribution law, Adsorption, Langmuir's theory of adsorption, Adsorption Isotherms.	05	11	1,2,3	CO3	PSO1			
4.	Photochemistry, Photo excitation of molecules, Laws of photochemistry, consequences of light absorption, fluorescence and phosphorescence, Jablonski diagram	07	14	1,2	CO4	PSO1			
5.	Electrochemistry, EMF, voltaic cell, single electrode potentials, concentration cells, oxidation-reduction potentials, standard electrodes, Fuel cells.	07	14	1,2,3	CO5	PSO1			
6.	Colloidal State, Classification of colloids, determination of colloidal dimensions, Emulsions, sols and gels.	05	11	1,2,3	CO6	PSO1			
7.	Macromolecules, Classification, Molecular weight of polymers, poly-dispersity, determination of molecular weights, solution behaviour of macromolecules, various of gyration.	07	14	4, 5	CO7	PSO1			

8.	Spectroscopic methods of analysis, UV-Vis and infrared spectroscopy (Theory, Instrumentation and Applications)	05	11	1,2,3,5	CO7	PSO1 PSO5			
Reference Books:									
1.	Principles of Physical Chemistry, B. R. Puri, L R. Sharma, M. S. Pathania, 36 th Ed., Shoban Lal Nagin Chand &Co.								
2.	The Elements of Physical Chemistry, P. Atkins, 3 rd Ed., Oxford University Press.								
3.	Essentials of Physical Chemistry, B.S.Bahl and G D Tuli, 2006, Reprint, S Chand &Co.								

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Applied Chemistry		Academic Year				2020-21			
BE-I (Metallurgy): Regular Programme										
Year	I	Core / Elective / Foundation ACH1201L: Applied Chemistry- TW/Practical/Viva	Credits / Hours per week				02			
Semester	II	Year of Syllabus Revision: 2009	Maximum Marks / Grade				50			
Mode of Transaction		Term work, Practical and Viva								
Course Outcome (CO) ACH1201L CO1 To determine the strength and normality of an unknown analyte by performing a redox titration.										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Element s of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional (R)/Global (G) develop mental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV)and Professional Ethics


									(PE)
1.	To determine the strengths and normalities of KMnO_4 and $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ solutions using a standard solution of Oxalic acid.	03	13	1,2,4	CO1	PSO1	Emp	G	HV
2.	To determine the strengths and normalities of KMnO_4 and $\text{FeSO}_4(\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$ solutions using a standard solution of Oxalic acid.	03	13	1,2,4	CO1	PSO1			
3.	To determine the strengths and normalities of KMnO_4 and H_2O_2 solutions using a standard solution of Oxalic acid.	03	12	1,2,4	CO1	PSO1			
4.	To determine the strengths and normalities of KMnO_4 and NaNO_2 solutions using a standard solution of Oxalic acid.	03	13	1,2,4	CO1	PSO1			
5.	To determine the strength and normality of I_2 solution against a standard solution of $\text{Na}_2\text{S}_2\text{O}_3$.	03	12	1,2,4	CO1	PSO1			
6.	To determine the strengths and normalities of I_2 and $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ solutions using a standard solution of $\text{Na}_2\text{S}_2\text{O}_3$.	03	13	1,2,4	CO1	PSO1			
7.	To determine the strengths and normalities of I_2 and Na_3AsO_3 solutions using a standard solution of $\text{Na}_2\text{S}_2\text{O}_3$.	03	12	1,2,4	CO1	PSO1			
8.	To determine the strength and normality of CaOCl_2 solution against a standard solution of $\text{Na}_2\text{S}_2\text{O}_3$.	03	12	1,2,4	CO1	PSO1			
Reference Books:									
1.	Vogel's Textbook of Quantitative Chemical Analysis -J. Mendham, R. C. Denney, J. D. Barnes and M. J. K. Thomas, (6 th edition, Prentice Hall) 2000.								

							neurship (Ent)/ Skill Develop ment (SD)	Regional (R)/Glob al (G) develop mental needs	Sustaina bility (ES), Human Values (HV)and Professio nal Ethics (PE)
1.	Catalysis: Types of Catalysis, Main characteristics and theories of Catalysis, Heterogeneous and Homogeneous Catalytic reactions with examples, Catalyst poison, Promoters , Inhibitors.	06	13	1, 2,3,	CO1	PSO1	Emp	G	ES
2.	Phase Studies : Two component System, Classification Application of Phase rule in two and three component systems.	05	12	1,2,3	CO2	PSO1			
3.	Adsorption: Types of Adsorption, Freundlich and Langmuir Isotherms, BET theory of multimolecular layer, Applications of Adsorption.	05	12	1,2,3	CO3	PSO1			
4.	Acid- Base indicators: Suitable choice of indicators, Theory of Indicators, Debye and Huckel theory of strong electrolytes.	06	12	1,2	CO4	PSO1			
5.	Thermodynamics-I: Basic concepts of heat work and energy, Equations of state, heat capacities.	06	12	1,2	CO5	PSO1			
6.	Thermodynamics-II: Properties of thermodynamic, Statistical treatment of heat capacity and entropy, Free energy and chemical potentials. Fugacity and Activity. The equilibrium constant and free energy charges in chemical Reaction.	07	14	1,2,3	CO5	PSO1			
7.	Chemical Kinetics - Principles of chemical kinetics, rate equations for simple and complex reactions, theory of	07	14	1,2,3	CO6	PSO1			

	reaction, rates, chain reactions ,Heterogeneous reactions.								
8.	Photochemistry- Lambert and Beer law, The law of photochemical equivalence and its applications.	06	12	2,4,5	CO7	PSO1			
Reference Books:									
1.	Engineering Chemistry: Jain and Jain, Dhanpat Rai Publishing House								
2.	Industrial Chemistry: B. K. Sharma, Goel Publishing House								
3.	Essentials of Physical Chemistry: B. S. Bahl, A. Bahl and G. D. Tuli; S Chand & Co.								

Bloom's Taxonomy Levels: 1. Remember 2. Understand 3. Application 4. Analysis 5. Evaluation 6. Creation

Programme Name: S S BE-II (Textile Technology)

 सत्यं शिवं सुन्दरम्	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Applied Chemistry	Academic Year	2020-21	
FS BE II (Chemical Engineering): Regular Programme				
Year	II	Core / Elective / Foundation ACH1404: Applied Chemistry	Credits / Hours per week	04
Semester	I	Year of Introduction: Year of Syllabus Revision: 2009	Maximum Marks / Grade	100
Mode of Transaction		Lectures and Tutorials		
Course Outcome (CO) ACH1404 CO1 To learn about the bonding, molecular structure, reactivity and classes of organic compounds. CO2 To study the stereoisomerism and understanding of optical and geometrical isomers with respect to their role in organic compound applications. CO3 To study the chemistry of aliphatic and aromatic compounds. The synthesis and chemical reactions of alcohol, aldehyde, ketone and carboxylic acids based compounds with applications. CO4 To learn the concepts of monomers, polymer formation and polymerization techniques. CO5 To study the structure, preparations, and reactions of benzene and it's homologous for its industrial importance. CO6 To study the structure, preparations, and reactions of aromatic phenol, nitro, and sulphur containing compounds. CO7 To learn the importance and chemistry of heterocyclic compounds and their role in dye-stuffs				

Unit No.	Topic/Unit	Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional (R)/ Global (G) developmental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV) and Professional Ethics (PE)
1.	Structure and Reactivity: Atomic orbitals, hybridization, orbital representation of methane, ethane, ethene, ethyne and benzene; polarity of bonds – inductive, resonance and steric effects and their influence on acidity and basicity of organic compounds. <i>Chemistry of Alkanes, Alkenes and Alkynes:</i> Conformations, Preparations, mechanism and reactions	07	14	2,3,5	CO1	PSO1	Emp	G	HV
2.	Stereochemistry: Isomerism, Structural isomerism, Stereoisomerism, Geometrical isomerism, Optical isomerism, Chirality, Optical activity of Lactic acid, Tartaric acid, Racemization, Walden-Inversion, diastereomers, Meso compounds, Nomenclature- R, S and E, Z systems	06	13	1,3,5	CO2	PSO1			
3.	Alcohols : Comparative study of dehydration, oxidation, substitution and esterification of 1°, 2° and 3° alcohols. Aliphatic Aldehydes and Ketones : Nucleophilic addition reactions, aldol condensation, Cannizzaro reaction, oxidation and reduction, Haloform reaction. Aliphatic Carboxylic Acids : Preparation and reactions of mono- and di-carboxylic acids.	07	14	2,4,5,6	CO3	PSO1			
4.	Polymers and Polymerization: Types of polymers and polymerisation process, Addition polymers, stereocontrolled polymers, condensation polymers, radical, ionic and coordination, Mechanism of polymerisation.	05	10	1,2,3	CO4	PSO1			

5.	Benzene and its homologous- Preparation, properties and uses of Benzene, Electrophilic aromatic substitution reaction with mechanism, Aryl halide- Preparation, properties and uses, Nucleophilic aromatic substitution reaction with mechanism	05	10	1,2	CO5	PSO1			
6.	Aromatic Aldehydes and Ketones : Preparation and important reactions of benzaldehyde and acetophenone. Carboxylic Acids and their Derivatives: General preparation and reactions. Comparative acidity of carboxylic and sulphonic acids. General chemistry of acid chlorides, acid anhydrides, amides and esters	06	13	2,3,4	CO3	PSO1			
7.	Phenols: Preparations and reactions. Relative acidity of phenol, alcohol and carboxylic acid. Reimer-Tiemann and Kolbe reactions. Nitrogen Containing Compounds: Nitrobenzene and its reduction products. Comparative basicity of aliphatic and aromatic amines. Hinsberg test for amines. Diazonium salts: Preparation and synthetic applications. Organosulphur Compounds: Introduction, synthesis and reactions of thiols and sulphonic acids.	07	14	1,2,5	CO6	PSO1			
8.	Heterocyclic Compounds : Synthesis and reactions, aromatic character of furan, pyrrole, thiophene and pyridine, indole, quinoline and isoquinoline. Dye Stuffs: Colour in relation to structure, modern views, synthesis of malachite green, fluorescein and methyl orange. Structure and synthesis of indigo and alizarin.	05	10	1,2,3	CO7	PSO1			


Reference Books:

1.	Textbook of Organic Chemistry: Finar, I.L.
2.	Organic Chemistry: Morrison and Boyd, Prentice-Hall of India Ltd. New Delhi.
3.	Organic Chemistry: Mukherjee, S.M., Singh, S.P. and Kapoor, R.P.
4.	Text book of Organic Chemistry for B.Sc. Students: Soni, P.L.
5.	Textbook of Organic Chemistry : Bahl and Bahl

6.	Practical Organic Chemistry: Vogel
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Bloom's Taxonomy Levels: 1. Remember 2. Understand 3. Application 4. Analysis 5. Evaluation 6. Creation


Programme Name: S S BE-II (Textile Technology)

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Applied Chemistry	Academic Year	2020-21							
FS BE II (Chemical Engineering): Regular Programme										
Year	II	Core / Elective / Foundation ACH1404L: Applied Chemistry Termwork, Practical and Viva	Credits / Hours per week					02		
Semester	I	Year of Introduction: Year of Syllabus Revision: 2009	Maximum Marks / Grade					50		
Mode of Transaction		Term work, Practical and Viva								
Course Outcome (CO) ACH1404L CO1 To study and perform the various unit processes in lab experiments for synthesis of organic compounds. CO2 To learn the concepts of qualitative analysis for identification of organic compounds.										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship	Relevance to Local (L)/ National (N)/ Regional	Relation to Gender (G), Environment and Sustainable

							(Ent)/ Skill Develop ment (SD)	(R)/Glob al (G) develop mental needs	bility (ES), Human Values (HV)and Professio nal Ethics (PE)
1.	<u>Laboratory preparation of the following organic compounds</u>						Emp	G	HV
	m-Dinitrobenzene	03	12	1,3,5	CO1	PSO1			
	Acetanilide	03	12	1,3,5	CO1	PSO1			
	Tribromophenol	03	12	1,3,5	CO1	PSO1			
	Sulphanilamide	03	12	1,3,5	CO1	PSO1			
2.	Identification of simple organic compounds qualitatively						Emp	G	HV
	i. Urea ii. Thiourea iii. Benzoic acid iv. Cinnamic acid v. P-hydroxy benzoic acid vi. Aniline vii. P-Toluidine viii. Beta Naphthol ix. O-Nitrophenol x. Benzaldehyde xi. Acetone xii. Ethyl acetate xiii. Naphthalene xiv. Acetanilide xv. M-Dinitrobenzene	12	52	1,2,5	CO2	PSO1			

Reference Books:	
1.	Practical Organic Chemistry: Vogel
2.	Identification of Organic Compounds : R C Shah



		The Maharaja Sayajirao University of Baroda		Academic Year					2020-21		
		Faculty Technology and Engineering									
		Department of Applied Chemistry									
BE-II (Chemical Engineering): Regular Programme											
Year	I	Core / Elective / Foundation ACH1401L: Physical Chemistry - TW/Practical/Viva		Credits / Hours per week					02		
Semester	II	Year of Syllabus Revision: 2009		Maximum Marks / Grade					50		
Mode of Transaction		Term work, Practical and Viva									
Course Outcome (CO) ACH1401L											
CO1 To understand hydrolysis and strength of strong acids.											
CO2 To understand adsorption phenomena of an organic acid on charcoal.											
CO3 To learn about molecular condition by performing a partitioning experiment.											
CO4 To understand heat of solution and kinetics of the reaction.											
Unit No.	Topic/Unit			Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Develop	Relevance to Local (L)/ National (N)/ Regional (R)/ Global (G)	Relation to Gender (G), Environment and Sustainability (ES), Human

							ment (SD)	develop mental needs	Values (HV)and Professio nal Ethics (PE)
1.	To investigate the hydrolysis of and ester in presence of acid (HCl).	02	10	1,2,4	CO1	PSO4	Emp	G	HV
2.	To determine the relative strength of two acids HCl and H ₂ SO ₄ .	02	10	1,2,4	CO1	PSO4			
3.	To determine the relative strength of two acids HCl and Urea-HCl.	04	16	1,2,4	CO1	PSO4			
4.	To study the adsorption of the given organic acid on charcoal.	04	16	1,2,4	CO2	PSO4			
5.	To determine the molecular condition of benzoic acid in kerosene by the method of partition coefficient.	04	16	1,2,4	CO3	PSO4			
6.	To determine the Heat of Solution of a given organic monobasic acid (Benzoic or Salicylic Acid).	04	16	1,2,4	CO4	PSO4			
7.	Investigate the reaction between potassium per sulphate and Potassium Iodide.	04	16	1,2,4	CO4	PSO4			
Reference Books:									
1.	Elements of Physical Chemistry- Puri, Sharma and Pathania								