B.L.D.E.Association's

S.B.Arts and K.C.P. Science College Vijayapur

PG DEPARTMENT OF CHEMISTRY

Programme Outcomes (POS) , Programme Specific Outcomes(PSOs) and Course Outcomes (Cos)

B.L.D.E. Association's

S.B. Arts and K.C.P Science College Bijapur

Post Graduate Department of Chemistry

POS 20119-2020

Subject: Physical Chemistry

PO1: In advance elementary/ fundamental knowledge.

PO2 : Critical thinking, scientific methods to design, carry out analytical the results of experiments and get awareness of the impact of chemistry on environment, society,etc. .

PO3:Higher education, competitive, Reputed Research laboratory .

PO4: Industrial application.

PSO1-to develop strong and compete knowledge in theoretical and practical chemistry.

PSO2-Able to explain Theory, Principle, Postulates, Methods, explaining instrumentation, Derivation, calculations and to calculate the physical and electrochemical parameters

PSO3: To recognize the various laws and theories and solving numerical problems.

PSO4: To develope various technical and analytical skills through laboratory training.

POS5: To create awareness the importance. And impact of chemistry on environment.

Ist Semester

Subject : Physical Chemistry-1

CO1: Fundamental laws of quantum chemistry and comparative between classical and quantum Theory.

CO2: Laws and principle of photoelectric, Compton and de Broglie hypothesis .

CO3: Basic postulates of quantum mechanics.

CO4: To understand the Schrödinger's equation, Physical significance and characteristics of wave function.

CO5: Review of basic principles of thermodynamics.

CO6: Derivation of the Various Thermodynamic parameters.

CO8: To study of basic principle and equation of conductance.

CO9: To understand and derivation of Debye Huckel Onsager equation .

CO10: To understand the basic principle of batteries.

PSO1: To determine the strength, equivalent conductance of some electrolytes.

CO11: To understand the Basic concepts polymers and their types

CO12: To understand the fundamentals of nanoscience and methods tofabrication of nanoparticles

PCO1: Analysis of binary mixture of two miscible liquids by viscometry and the relation between viscosity of solution and electrical conductivity
PCO2: Potentiometric titration of halides in a mixture of Cl-, Br- and I- with AgNO3
PCO3: Titration of phosphoric acid solution with NaOH using quinhydrone electrode by Potentiometrically
PCO4: Precipitation titration of BaCl2 vs Na2SO4 by conductometrically
PCO5: Precipitation titration of KCl vs AgNO3 by conductometrically
PCO6: Verification of Beers lamberts law by colarimetric method and calculation of molar extinction coefficient (molar absorption co-efficient)

COURSE : Physical Chemistry (Theory & Practical) **Subject: Physical Chemistry**

Course Outcomes	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	1	2	2	-	-
CO2	1	2	2	3	3	02		
CO3	-	2	1	3	3	3	3	1
CO4	-	3	1	-	3	3	3	1
CO5	2	2	-	-	3	3	3	-
CO6	1	3	2	1	3	3	3	-
CO7	2	3	1	3	3	3	3	-
CO8	-	3	1	1	3	3	3	--
CO9	-	3	1	1	3	3	3	--
CO10	-	3	1	1	3	3	3	--
CO11	2	2	-	3	-	-	-	3

COURSE : M.Sc Ist Semester (Practical) **Subject:Physical Chemistry**

Course Outcomes	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5
PCO1	2	2	-	3	-	-	-	3
PCO2	2	2	-	3	-	-	-	3
PCO3	2	2	-	3	-	-	-	3
PCO5	2	2	-	3	-	-	-	3
PCO5	2	2	-	3	-	-	-	3
PCO5	2	2	-	2	-	-	-	3

II semester

Subject : Physical Chemistry-II

CO1: To understand the basic concept of statistical thermodynamics.

CO2: To know the applicative part of the Maxwell Boltzmann stastics, Bose-Einstein statistics, Fermi-direc statistics.

CO3: Derive the all partition function and there concept .

CO4: To know the simple harmonic oscillator in classical mechanics and quantum mechanics.

CO5: To study the applicative part of the quantum mechanics.

CO6: To study the chemical kinetics and methods of fast and slow reactions.

CO7: To know the energy relationship and equations.

CO8: Fundamental laws and basic concept of photochemistry and photodegradation.

CO9: A review of laws of photochemistry. Physical process and properties and reaction of Photo catalyst.

PCO1: Kinetics of acid catalyzed of hydrolysis of methyl acetyl and determination of energy activation.

PCO2: To determine the concentration of H_2SO_4, CH_3COOH and $CuSO_4$ in a given solution by conductometry

PCO3: To compare the strength of the weak acid by conductance method (CH_3COOH and HCOOH)

PCO4: To determination of enthalpy of solution of KNO_3 by solubility method

COURSE : M.Sc II Semester (Theory) **Subject: Physical Chemistry**

Course Outcomes	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	-	3	3	3	-
CO2	1	3	2	2	3	3	3	-
CO3	3	2	3	3	3	3	3	-
CO4	-	3	-	-	3	3	3	-
CO5	1	3	1	-	3	3	3	-
CO6	2	3	2	2	3	3	3	-
CO7	-	3	1	3	3	3	3	-
CO8	1	3	2	3	3	3	3	--
CO9	2	3	2	2	3	3	3	--

COURSE : M.Sc II Semester (Practical) **Subject :Physical Chemistry**

Course Outcomes	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5
PCO1	2	2	-	3	-	-	-	3
PCO2	2	2	-	3	-	-	-	3
PCO3	2	2	-	3	-	-	-	3
PCO4	2	2	-	3	-	-	-	3

III SEM

Subject : Physical Chemistry-III

CO1: To understand the basic concept of Surface chemistry.

CO2: To study the Basic principles of catalysis and determine rate of reaction by complex mechansms.

CO3: To study the Fundamentals and importance of material chemistry,

CO4: To study the Methods of preparation nanoparticle by using various methods.

CO5: To derive the I^{st} and II^{nd} opposing reactions of rate of chemical kinetics.

CO6: To study the reaction and mechanism to derive the mathematical treatment.

CO7: To study the applicative aspect of polymers and dendrimers .

CO8: To study the fabrication polymer, shape and object of polymers.

PCO1: Verify the degree of DeBye-Huckel and Onsagar equivalent conductance for

electrolytes (NaCl, HCl) and determine the constantPCO2: To determination of properties of liquids.

PCO2: To study the hydrolysis of methyl acetate catalysed by hydrochloric solution by equimolar solution of Urea-HCl solution and hence determine the degree of hydrolysis of salt

PCO3: To determine the molecular weight of high polymer PVA from viscosity measurements
PCO4: To investigate the reaction between K2S2O8 and KI by colarimetric method

PCO5: Determination of heat of solution of benzoic acid by solubility method

PCO6: To determine the COD in the given water sample

COURSE : M.Sc IIIrd Semester (Theory) Subject: Physical Chemistry

Course Outcomes	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	3	2	-	3	3	3	-
CO2	1	2	3	3	3	3	3	-
CO3	1	2	2	3	3	3	3	-
CO4	-	2	2	3	3	3	3	-
CO5	3	2	2	1	3	3	3	-
CO6	3	1	2	3	3	3	3	-
CO7	1	2	2	3	3	3	3	-
CO8	-	1	2	3	3	3	3	--

COURSE : M.Sc III Semester (Practical) Subject : physical Chemistry

Course Outcomes	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5
PCO1	2	2	-	2	2	2	3	3
PCO2	2	2	-	3	-	-	-	3
PCO3	2	2	-	3	-	-	-	3
PCO4	2	2	-	3	-	-	-	3

IV SEM

Subject: Physical Chemistry-IV

CO1: To study the applicative part of the superconductors of various process

CO2: To understand the fundamentals of magnetochemistry.

CO3: Basic concept of Partial molar properties.

CO4: To study the law, principle, properties, derivation, equation and process of partial molar properties.

CO5: To study the detailed study of atomic spectra and atomic structure.

CO6:To study the space quantization of some effects.

CO7:To study the applicative part of electrochemistry and electroplating.

CO8: To know the summery of corrosion and plating.

PCO1: Determine the molecular radius of glycerol by viscosity method.

PCO2: To determine the molar refraction of methylacetate, ethylacetate, n-hexane and CCl4 and hence to calculate the refraction of C, H and Cl atom.

PCO3: Equivalent conductance of infinite dilution of weak electrolyte (CH3COOH) by kohlraurch's law.

PCO4: To verify beer's lambertz law for Cu-NH3 complex and hence to determine the unknown Cu ion concentration in a given solution.

COURSE : M.Sc IV Semester (Theory) **Subject: Physical Chemistry**

Course Outcomes	**PO1**	**PO2**	**PO3**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	-	-	3	3	3	3	3	-
CO2	-	1	3	3	3	3	3	-
CO3	2	3	1	3	3	3	3	-
CO4	1	2	2	3	3	3	3	-
CO5	1	2	2	1	3	3	3	-
CO6	2	1	2	2	3	3	3	-
CO7	1	2	3	3	3	3	3	-
CO8	-	1	2	3	3	3	3	--

COURSE : M.Sc IV Semester (Practical) **Subject: Physical Chemistry**

Course Outcomes	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5
PCO1	2	2	-	2	2	-	-	3
PCO2	2	2	-	3	-	-	-	3
PCO3	2	2	-	3	-	-	-	3
PCO4								

Principal,
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Mapping of Course Outcomes with Programme Outcomes and Programme Specific Outcomes

EVALUATION MAPPING

THEORY:

Marks Distribution : 1. Internal Assessment = 20 marks

2. University Examination = 80 marks

Sl No	Parameter	Percentage (%)
1	Knowledge	20
2	Understanding	25
3	Numericals	10
4	Descriptive	45

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Practical Examination

Marks Distribution : 1. Internal Assessment = 10 marks
2. University Examination = 40 marks

Class : M.Sc I Semester

Sl No	Parameter	Percentage
1	Accuracy	63
2	Technique / Systematic Percentage	13
3	Record Book	12
4	Viva - Voce	12

Class : M.Sc II Semester

Sl No	Parameter	Percentage
1.	Preliminary and Solubility	12.5
2.	Melting Point/Boiling Point	7.5
3.	Elements Detection	10
4.	Functional Group	10
5.	Identification and Structure	10
6.	Preparation of Derivative	10
7.	MP of Derivative	7.5
8.	Technique and Presentation	7.5
9.	Viva –Voce	12.5
10.	Jouranl	12.5

Class : M.Sc III Semester

Sl No	Parameter	Percentage
1	Accuracy	45
2	Calculation/Graph	22.5
3	Technique / Systematic Percentage	7.5
4	Record Book	12.5
5	Viva - Voce	12.5

Class : M.Sc IV Semester

Sl No	Parameter	Percentage
1	Preliminar	20
2	Positive radical	30
3	Negative radicals	25
4	Journal	12.5
	Viva-voce	12.5

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