BANKURA ZILLA SARADAMANI MAHILA MAHAVIDYAPITH
DEPARTMENT OF CHEMISTRY
Programme Outcome, Programme Specific Outcome and Course Outcome
For B.Sc. Honours (CBCS Pattern) in Chemistry
2021-2022

Department of Chemistry		After successful completion of three year degree program in Chemistry a student should be able to;
PO	**Programme Outcomes**	**Description**
PO 1	**Sound domain knowledge**	Acquiring sound knowledge of chemical concepts and emerging issues in chemical science.
PO2	**Academic and Scientific Endeavour**	To help the students in developing academic and scientific endeavour by fostering and nurturing the young talent for proper scientific pursuit.
PO3	**Creative and Practical Ability to analyse and deal with data**	Analysis of experimental data and their representation in the form of graphs and plots. Use of statistics as a means to express complicated chemical data.
PO4	**Familiarity with Recent Developments in a Particular Field**	Should be able to apply modern theories and approaches to explain all spatial phenomena and relate nature with human inter relations
PO5	**Environmental Awareness**	Impact of environmental changes on human and how it can be explained at a global and regional perspective.
PO 6	**Laboratory Skill**	The students are exposed to modern equipments in the Laboratory where they get hands-on training which help them to succeed at any entry-level position in chemical industry.
PSO	**Programme Specific Outcomes**	**Description**
PSO 1	**Critical appreciation of the Subject.**	Acquiring sound knowledge on the fundamentals of Physico-chemical concepts and applying them in practical and professional situations.
PSO 2	**Academic and Scientific Endeavour.**	To help the students in developing, Cultivating and demonstrating the art of science learning and teaching by fostering and nurturing the young talent for proper scientific pursuit.
PSO 3	**Scientific Attitude**	Developing the right scientific temper compatible with creative impulse.
PSO 4	**Technical Skill Development**	Creating updated knowledge on research methodology and developing skills in the application oriented Chemistry.

PSO 5	**Environmental Consciousness**	Impact of environmental changes on human and its reflection on society.
PSO 6	**Communication Skill**	Classroom discussions, student seminar ,written assignments, debates etc. help students to develop effective communication skill which will aid them to enhance employability.
PSO 7	**Personality Development**	Personality development skills are likely to help students in their professional and personal lives thus making them responsible and sincere citizens of the socie√ty.
PSO 8	**Spirit of Team Work**	Encouraging students to co-ordinate with one another in a team environment rather than trying to excel individually.
PSO 9	**Basic Human Values**	Study of various texts and mutual interaction among the students inside and outside the class room help the learners to understand human behavioural science.
<u>Course Outcomes B. Sc Chemistry (Honours Semester-I)</u>		
Course		Outcomes After completion of these courses students should be able
CC-1 Organic Chemistry I		CO-1. To learn about bonding and physical properties of organic molecules CO-2. To learn general treatment of reaction mechanism CO-3. To learn stereochemistry of organic molecules CO-4. To learn separation techniques, determination of boiling point and identification of organic compounds
CC-2 Physical Chemistry I		CO-5. To learn properties and behaviors of gaseous state CO-6. To learn chemical thermodynamics and its application CO-7. To learn kinetics of chemical reactions CO-8. To study kinetics of chemical reactions experimentally and determination of pH and solubility product
<u>Course Outcomes B. Sc Chemistry (Honours Semester-II)</u>		
Course		Outcomes After completion of these courses students should be able
CC-3 Inorganic Chemistry-I		CO-9. To learn about extranuclear structures of atoms CO-10. To learn chemical periodicity CO-11. To learn about acid base reactions, redox reactions and precipitation reactions CO-12. To learn redox titrations

	(experimentally)
CC-4 Organic Chemistry-II	CO-13. To learn stereochemistry of organic molecules CO-14. To learn general treatment of reaction mechanism CO-15. To learn substitution and elimination reactions in organic chemistry CO-16. To prepare organic compounds, purify them and to determine melting point
Course Outcomes B. Sc Chemistry (Honours Semester-III)	
Course	Outcomes After completion of these courses students should be able
CC-5 Physical Chemistry-II	CO-17. To learn about transport process CO-18. To learn application of thermodynamics in chemistry CO-19. To learn about basic quantum mechanics CO-20. To determine viscosity, partition coefficient, equilibrium constant and to perform conductometric experiments
CC-6 Inorganic Chemistry-II	CO-21. To learn chemical bonding CO-22. To learn radioactivity and nuclear structure CO-23. To learn about iodometric and iodimetric titrations experimentally
CC-7 Organic Chemistry-III	CO-24. To learn about chemistry of alkenes and alkynes CO-25. To learn aromatic substitutions CO-26. To learn about carbonyl compounds and organometallic reagents CO-27. To detect special elements and functional groups in organic compounds and to prepare suitable derivatives
SEC-1 Basic Analytical Chemistry	CO-28. To learn about fundamental mathematical procedure and their applications in chemistry CO-29. To learn computer programming for statistical analysis CO-30. To handle numeric data Co-31. To learn about application of basic analytical procedures in chemistry
Course Outcomes B. Sc Chemistry (Honours Semester-IV)	
Course	Outcomes After completion of these courses students should be able

CC-8 Physical Chemistry-III	CO-32. To learn about transport process CO-33. To learn application of thermodynamics in chemistry CO-34. To learn about basic quantum mechanics CO-35. To determine viscosity, partition coefficient, equilibrium constant and to perform conductometric experiments
CC-9 Inorganic Chemistry	CO-36. To learn about general principle of metallurgy CO-37. To learn about chemistry of s and p block elements and also on inorganic polymers CO-3. To learn about basic coordination chemistry CO-38. To studies complexometric titration and inorganic preparation of complex salts
CC-10 Organic Chemistry	CO-39. To studies about nitrogen compounds and various types of name reactions CO-40 To know about the rearrangement reaction and stereochemical feachers of aliphatic and aromatic compounds CO-41. To studies retrosynthesis analysis, ring synthesis, asymmetric synthessis CO-42. To learn about UV, IR and NMR spectroscopy CO-43 To learn about the estimation of organic compounds experimentally
SEC-2 Pharmaceutical Chemistry	CO-44. To learn about pharmaceuticals chemistry including drugs CO-45. To study about fermentation
Course Outcomes B. Sc Chemistry (Honours Semester-V)	
Course	Outcomes After completion of these courses students should be able
CC-11Inorganic Chemistry IV	CO-46. To learn about VBT and CFT, magnetic, colour properties of coordination compounds CO-47. To study coordination chemistry CO-48. To have idea about 3d, 4d and 5d elements in term of electronic configuration, oxidation states, redox properties, coordination chemistry. CO-49. To learn about the chemistry of transitions metal and lanthanoids and actinoids

CC-12 Organic Chemistry V	CO-50. To learn about heterocyclic compounds and poly nuclear aromatic compounds CO-51. To study about alicyclic ompounds CO-52 To understand about pericyclic reactions CO-53. To know about the amino acids and proteins CO-54 To learn about nuclic acids
DSE-1 Advanced Physical Chemistry	CO-55. To learn about Crystal Structure CO-56. To learn about statistical thermodynamics CO-57. To study about Specific heat of solid, 3rd law and Adiabatic demagnetization CO-58. To know about Computer Programming based on numerical methods
DSE-2 Green Chemistry	CO-59. To know about the principles of Green Chemistry and Designing a chemical synthesis CO-60. To study some examples of Green Synthesis/ Reactions CO-61. To learn about Future Trends in Green Chemistry
Course Outcomes B. Sc Chemistry (Honours Semester-VI)	
DSE -3 Analytical Methods in Chemistry	CO-62: Understand the fundamental principles of qualitative and quantitative analysis. CO-63: Apply classical methods like volumetric and gravimetric analysis. CO-64: Utilize instrumental techniques like spectroscopy (UV-Vis, IR, AAS, etc.), chromatography (HPLC, GC), and electrochemical methods. CO-65: Interpret experimental data and draw meaningful conclusions. CO-66: Develop practical skills in using analytical instruments and software. CO-67: Understand the importance of quality control and quality assurance in analytical chemistry. CO-68: Apply analytical techniques to solve real-world problems in various fields.
DSE -4 Polymer Chemistry	CO-69. State the basic concept of polymer. CO-70. Relate Tm, Tg and its significance. CO-71. Apply the Polymerization techniques andPolymer CO-72. Differentiate Natural and synthetic rubbers. CO-73. Distinguish Thermoplastic and thermosetting resins.
CC-13 Inorganic Chemistry V	CO-74. Study different inorganic chemistry of different biological process such as role of different elements biological system, oxygen transport, activity of enzymes, proteins, nitrogen fixation, Photosynthesis etc. CO-75. Gain knowledge of organometallic compounds,

	their use in catalysis. CO-76. Reaction kinetics and mechanism of reactions of coordination compounds. CO-77. Learn qualitative analysis mixture of inorganic salt mixture and determine their composition.
CC-14 Physical Chemistry IV	CO-78. Study different spectroscopic properties (UV, rotational, vibrational) of molecule to explain different molecular properties. CO-79 To analyze different physicochemical behaviour of chemical compounds in respect of their interaction with light. CO-80.Learn to measure physicochemical data (absorbance, molar extinction coefficient, pH of buffer, CMC etc.) of some compounds and also their interaction with biomolecules using UV, IR spectrophotometer.

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Course Outcomes B. Sc Chemistry Generic Elective and Programme (Semester-I)	
Course	Outcomes After completion of these courses students should be able
GE-1/C-1A	CO-1. To learn about extranuclear structures of atoms CO-2. To learn chemical periodicity CO-3. To learn about acid base reactions, redox reactions and precipitation reactions CO-4. To learn redox reactions CO-5. To learn about fundamental features of organic chemistry CO-6. To learn about stereochemistry CO-7. To study about nucleophilic substitution and elimination reactions CO-8. To learn fundamentals features of alkanes, alkenes and alkynes
Course Outcomes B. Sc Chemistry Generic Elective and Programme (Semester-II)	
Course	Outcomes After completion of these courses students should be able

GE-2 /C-1B	CO-9. To learn about features of gaseous states CO-10. To learn properties of liquids CO-11. To learn about properties of solids CO-12. To learn kinetics of chemical reactions CO-13. To learn about chemical bonding and molecular structures CO-14. To learn about comparative study of p- block elements CO-15. To study about determination of physical and chemical parameters experimentally CO-16. To learn qualitative semimicro inorganic analysis
Course Outcomes B. Sc Chemistry Generic Elective and Programme (Semester-III)	
Course	Outcomes After completion of these courses students should be able
GE-3 /C-1C	CO-17. To learn about chemical thermodynamics and its application CO-18. To learn equilibrium for chemical reactions CO-19. To learn about equilibrium in ionic solutions CO-20. To learn aromatic hydrocarbon CO-21. To learn about organometallic compounds CO-22. To learn about aryl halides CO-23. To study about alcohols, phenols, ethers and carbonyl compounds CO-24. To learn determination of pH of various solutions CO-25. To identify pure organic compounds
SEC-1 Basic Analytical Chemistry	CO-26. To learn about fundamental mathematical procedure and their applications in chemistry CO-27. To learn computer programming for statistical analysis CO-28. To handle numeric data Co-29. To learn about application of basic analytical procedures in chemistry
Course Outcomes B. Sc Chemistry Generic Elective and Programme (Semester-IV)	
Course	Outcomes After completion of these courses students should be able
GE-4 /CC-1D	CO-30. To learn about the Carboxylic Acids and Their Derivatives CO-31. To study about Amines and Diazonium Salts CO-32. To learn amino acids CO-33 To learn about aromatic nitro compounds. CO-34. To learn carbohydrate chemistry CO-35. To learn about general group trends in periodic table CO-36. To study Lanthanides and actinides CO-37. To learn Coordination chemistry CO-38. To study about Industrial chemistry CO-39. To study Error Analysis and Computer Applications

SEC-2 Pharmaceutical Chemistry	CO-40. To learn about pharmaceuticals chemistry including drugs CO-41. To study about fermentation
Course Outcomes B. Sc Chemistry Programme (Semester-V)	
DSE-1A Green Chemistry	CO-42. To know about the principles of Green Chemistry and Designing a chemical synthesis CO-43. To study some examples of Green Synthesis/ Reactions CO-44. To learn about Future Trends in Green Chemistry
SEC-3 IT Skill for Chemists	CO-45. To know about Uncertainty in experimental techniques and measurement. CO-46. To study Algebraic operations, Differential calculus and Numerical integration. CO-47. To know about basics of Computer programming CO-48. Acquire Practical Knowledge on Handling numeric data, Numeric modelling and tatistical analysis.
Course Outcomes B. Sc Chemistry Programme (Semester-VI)	
DSE-1B Polymer Chemistry	CO-49. State the basic concept of polymer. CO-50. Relate Tm, Tg and its significance. CO-51. Apply the Polymerization techniques andPolymer CO-52. Differentiate Natural and synthetic rubbers. CO-53. Distinguish Thermoplastic and thermosetting resins.
SEC-4 Analytical Chemical Biochemistry	CO-54. To learn the basic concept of carbohydrates, protein, enzymes, lipids etc. CO-55. To acquire knowledge about the diagnostic approach of blood and urine analysis. CO-56. To gather hands on laboratory experience about estimation of carbohydrates, lipids and proteins. CO-57. To acquire hands on experience on isolation of protein, determination of cholesterol and nucleic acids etc. CO-58. To develop basic knowledge about data handling using MS Word, MS Excel and MS PowerPoint.