**DINABANDHU MAHAVIDYALAYA**

**COURSE OUTCOME (NEP SEM-I, SEM-II, SEM 111, SEM IV)**

**Minor Course in Chemistry**

**DEPARTMENT OF CHEMISTRY**

**B.Sc. Program Outcome:**

After completion of the B.Sc. Degree program, the students will be able to

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| **PO No.** | **Program Outcome** | **Cognitive Level** |
| **PO 1** | Recognize the scientific concepts and tempers that can be advantageous for society, as scientific advancements have the potential to foster rapid growth within nations or communities. | **R** |
| **PO 2** | Understand scientific knowledge and engage in sharing dialogues with fellow stakeholders; raise awareness about the ethical and sustainable use of resources. | **U** |
| **PO 3** | Comprehend and implement environmental considerations and sustainable development as fundamental interdisciplinary priorities. | **U, Ap** |
| **PO 4** | Develop the capability to conduct experiments, analyze, and interpret precise outcomes, thereby acquiring problem-solving skills and engaging in critical, autonomous, and innovative thought processes. | **An, E, C** |
| **PO 5** | Acquire proficiency to apply and generate innovative ideas, granting a competitive edge for pursuing advanced studies either domestically or internationally, as well as for securing positions in academia, research, or industry. | **Ap, E** |
| **PO 6** | Utilize the comprehensive understanding of applied subjects to cultivate professional and employable skills, enabling students to build careers and venture into entrepreneurship across various domains. | **C** |

 R= remembering, U = understanding, Ap = applying, An = analyzing, E = evaluating, and C = creating

**B.Sc. Program Specific Outcome:**

After completion of the B.Sc. Degree program, the students will be able to

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| **PSO No.** | **Program Specific Outcome** | **Cognitive Level** |
|  **PS01** | Students will have clear understanding about the importance of sustainable development by identifying green chemical reaction routes and reduce the use of waste as well as toxic chemicals.  | **R,U** |
| **PS02** | Students pursuing this course will inculcate spirit of originality and novelty necessary for scientific research and hence adopt scientific method of analyzing problems in an innovative way. | **An** |
| **PS03** | The course will give good opportunity to students for getting jobs not only in academics field but also in industries as they will be acquiring knowledge about characterizing and analyzing chemical compounds.  | **An** |
| **PS04** | Students will confidently handle modern instruments, evaluate data, and follow safety protocols while handling toxic, explosive chemicals, will show proficiency as team player and also make development outside the scientific community. | **E** |
| **PS05** | Develop skills required to apply in Glass industry, Cement Industry, Polymer Industry, use potentiometer, conductometer, pH meter, being trained about the adverse effect of corrosive chemicals. | **Ap, C** |
| **PSO6** | The well-being of future generations being a priority, the students are expected to adhere by methods which can create a pollution-free planet by adopting environmentally friendly approach in all frontiers of life. | **C** |

 R= remembering, U = understanding, Ap = applying, An = analyzing, E = evaluating, and C = creating

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| **SEMESTER -I** |
| **Course name** | **Minor** |
| **Course Code** | **CEMMIN101T and CEMMIN101P** |
| **Credits** | **5 (Theory-03, Practicals-02)** |
| **Marks** | **100** |

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| **After completion of these course students should be able to** |
|  |  | Bloom Taxonomy | PO addressed | PSO addressed |
| **CO-1** | Learn about Atomic Structure by implementing on various principles and limitations. | **Ap** | **PO3** | **PSO5** |
| **CO-2** | Understand about the chemical periodicity of the elements as well as HSAB principle. | **U** | **PO2** | **PSO1** |
| **CO-3** | Develop some fundamental concept about radioactivity/y and plan the preparation & reaction of alkanes, alkenes and alkynes utilizing various reagents | **An,Ap** | **PO4** | **PSO2** |
| **CO-4** | Acquire in depth knowledge about kinetic theory of gases, viscosity of gas and liquids, surface tension, etc. | **E** | **PO5** | **PSO4** |
| **CO-5** | Develop idea about preparation of standard solutions, determination of viscosity, surface tension and identify pure single solid and liquid organic compound. | **An, C** | **PO4, PO5** | **PSO3, PSO6** |

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| **SEMESTER -II** |
| **Course name** | **Minor** |
| **Course Code** | **CEMMIN202T and CEMMIN202P** |
| **Credits** | **5 (Theory-03, Practicals-02)** |
| **Marks** | **100** |

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| **After completion of these course students should be able to** |
|  |  | Bloom Taxonomy | PO addressed | PSO addressed |
| **CO-1** | Design the shapes of some inorganic molecules and ions on the basis of VSEPR and balance the redox reactions using oxidation number. |  **An** | **PO4** | **PSO2,PSO3** |
| **CO-2** | Able to discuss symmetry, stereoisomerism, conformation, optical and geometrical isomerism, E and Z and R, S nomenclature, mechanism and stereochemistry of SN1, SN2, E1 and E2 reactions.  | **Ap** | **PO5** | **PSO5** |
| **CO-3** | Retrieve the concept of heat, work, internal energy and statement of first law of thermodynamics, enthalpy and entropy. | **R** | **PO1** | **PSO1** |
| **CO-4** | Understand thermodynamic conditions for equilibrium and monitor shifting of equilibrium due to change in external parameters. | **U, E** | **PO2,PO3** | **PSO1, PSO4** |
| **CO-5** | Estimate inorganic metal ions, solubility product of salt and detect special element and functional group in an unknown organic compound. |  **C** | **PO6** | **PSO6** |

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| **SEMESTER -III** |
| **Course name** | **Minor** |
| **Course Code** | **CEMMIN303T and CEMMIN303P** |
| **Credits** | **5 (Theory-03, Practicals-02)** |
| **Marks** | **100** |

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| **After completion of these course students should be able to** |
|  |  | Bloom Taxonomy | PO addressed | PSO addressed |
| **CO-1** | Acquire in-depth knowledge about radioactivity assessing various Nuclear models and Nuclear reactions | **E** | **PO5** | **PSO4** |
| **CO-2** | Gain perspective about Bonding and anti-bonding MO and construct Molecular Orbital of homonuclear diatomic molecules | **C** | **PO6** | **PSO6** |
| **CO-3** | Understand synthesis, general properties of Alcohols, Ethers, Carbonyls and implement on related reactions. | **U, Ap** | **PO3** | **PSO1, PSO5** |
| **CO-4** | Acquire in-depth knowledge about kinetics by recalling rate laws and explain Arrhenius equation and Transition State theory. | **R** | **PO1** | **PSO1** |
| **CO-5** | Estimate various reaction mixture and determine heat of solution. |  **An** | **PO4** | **PSO2, PSO3** |

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| **SEMESTER -IV** |
| **Course name** | **Minor** |
| **Course Code** | **CEMMIN404T and CEMMIN404P** |
| **Credits** | **5 (Theory-03, Practicals-02)** |
| **Marks** | **100** |

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| **After completion of these course students should be able to** |
|  |  | Bloom Taxonomy | PO addressed | PSO addressed |
| **CO-1** | Compare different properties of p-block elements in terms of common oxidation state, electronic configuration, etc. | **U** | **PO2** | **PSO1** |
| **CO-2** | Devise synthesis of Carboxylic acid and their derivatives and amines and implement on related reactions. | **C, Ap** | **PO3, PO5** | **PSO5** |
| **CO-3** | Have clear idea about thermodynamic conditions for equilibrium and monitor shifting of equilibrium due to change in external parameters. | **E** | **PO4** | **PSO4** |
| **CO-4** | Predict solubility product and pH of sparingly soluble salts | **E** | **PO5** | **PSO4** |
| **CO-5** | Focus on the concept of total hardness of water, estimation of Vitamin C and solubility product through practical work. | **An** | **PO4** | **PSO2, PSO3** |