<table>
<tr><td>Level</td><td colspan="6">Level - 03</td></tr>
<tr><td>Course Synopsis Course Code</td><td colspan="6">CYU3300</td></tr>
<tr><td>Course Title</td><td colspan="6">Basic Principles of Chemistry I</td></tr>
<tr><td>Credit value</td><td colspan="6">03</td></tr>
<tr><td>Core/Optional</td><td colspan="6">Core</td></tr>
<tr><td>Prerequisites</td><td colspan="6">Pass in Chemistry in A/L or Foundation Certificate Course in Science</td></tr>
<tr><td rowspan="2">Hourly breakdown</td><td colspan="2">Theory</td><td>Practical hours</td><td>Independent Learning</td><td>Assessments</td><td>Total hrs</td></tr>
<tr><td>25 Sessions x 02 hrs

=50 hrs</td><td>CDS 1x8 hrs) + DS 2x4 hrs + RDS 1x4 hrs = 20 hrs</td><td>N/A</td><td>25 Sessions x 03hrs + 3 hrs on-line = 78 hrs</td><td>CAT 2 x 1 hrs = 02 hrs</td><td>150 hrs</td></tr>
<tr><td>Course Aim/s.</td><td colspan="6">Develop an understanding of the models for structure of atom, and Perform simple calculations related to them (in relation to H atom, develop an ability to describe the nature of a scientific model through study of various models of the atom, develop an ability to describe the principles in filling up of electrons in atoms, develop an understanding of identify elements of different blocks of the periodic table, discuss trends of important parameters and relate electronic configuration to reactivity, develop an understanding to relate unit cells of different ionic lattices to radius ratio, calculate lattice energy of ionic solids and compare theoretical and calculated lattice energies, develop an understanding to explain the theories of bonding of covalent molecules and describe their strengths and weaknesses, develop an understanding to explain properties of covalent bonds based on polarity, use dipole moment to predict structure and explain covalent character in ionic solids, develop an understanding to explain physical properties in terms of the intermolecular forces between molecules, develop an ability to categorize organic reactions into elimination addition, substitution and rearrangement reactions, develop an understanding to categorize organic reactions as acid base reactions and identify the acid and base, develop an ability to explain the reactivity of alkanes, alkenes and alkynes in relation to their structure and nature of bonding, develop an ability to explain the reactivity of alkyl halides, alcohols, ethers, epoxides, aldehydes and ketones, carboxylic acids and their derivatives and amines in relation to the functional group present and identify the relationship among the above compounds via preparative methods and chemical reactions.</td></tr>
<tr><td>PLOs addressed by course</td><td colspan="6">PLO1: Knowledge: Explain the fundamental, principles and broader knowledge pertaining to the chosen science disciplines offered for the BSc degree.
PLO2: Practical Knowledge and Application. Acquire competency in practical skills and the necessary knowledge to appropriately use these skills.
PLO3: Communication: Communicate reliably, efficiently and effectively to present information, ideas and concepts to the scientific community as well as to the wider society.
PLO4: Individual Work, Team Work and Leadership: Function effectively as an individual, and as a team member, sharing work and experiences, leading and managing assigned tasks to completion on time, demonstrating leadership to address situations in diverse and multi-disciplinary environments in day to day life.
PLO5: Creativity and Problem Solving: Identify problems and argue out and analyze such problems using qualitative and/or quantitative practical approaches in scientific methodology to provide valid conclusions</td></tr>
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	PLO6: **Adaptability and Flexibility:** Develop appropriate strategies to adapt to changing environments. PLO8: **Vision for Life:** Identify where one wants to be and develop long term goals maintaining competency to conduct scientific investigations and proceed to undertake further studies. PLO9**: Lifelong Learning**: Foresee new trends and recognize their impact, and update knowledge and develop new skills to meet future changes and challenges.
Course Learning Outcomes (CLO)	The students should be able to: **CLO 1**: Describe the models for structure of atom, and Perform simple calculations related to them (in relation to H atom).(PLO 01,02, 04, 05, 06) **CLO 2:** Describe the nature of a scientific model through study of various models of the atom. (PLO 01) **CLO 3:** Describe the principles in filling up of electrons in atoms. (PLO 01) **CLO 4:**Identify elements of different blocks of the periodic table, discuss trends of important parameters and relate electronic configuration to reactivity. (PLO 01, PLO 03, PLO 06) **CLO 5:** Relate unit cells of different ionic lattices to radius ratio, calculate lattice energy of ionic solids and compare theoretical and calculated lattice energies. (PLO 01, 02, 03, 04, 05, 06, 07,08) **CLO 6:** Explain the theories of bonding of covalent molecules and describe their strengths and weaknesses.(PLO 01) **CLO 7:** Explain properties of covalent bonds based on polarity, use dipole moment to predict structure and explain covalent character in ionic solids. (PLO 01, 06,08) **CLO 8:** Explain physical properties in terms of the intermolecular forces between molecules. (PLO 01) **CLO 9:** Categorize organic reactions into elimination addition, substitution and rearrangement reactions. (PLO 01) **CLO 10:** Categorize organic reactions as acid base reactions and identify the acid and base. (PLO 01, PLO 03, PLO 06, PLO 08) **CLO 11:** Explain the reactivity of alkanes, alkenes and alkynes in relation to their structure and nature of bonding. (PLO 01) **CLO 12:** Explain the reactivity of alkyl halides, alcohols, ethers, epoxides, aldehydes and ketones, carboxylic acids and their derivatives and amines in relation to the functional group present and identify the relationship among the above compounds via preparative methods and chemical reactions. (PLO 01, 03)
Content **(Main topics, sub topics)**	**Models of atomic structure and modern periodic table** Development of models for the atomic structure, Wave nature and particle nature, The Bohr model of hydrogen atoms, The quantum mechanical model of the atom, The shapes of atomic orbitals, Electronic configuration of atoms, Modern periodic table, s and p block elements, d and f block elements **Structure and Bonding in chemical compounds** Chemical bonds, ionic bonding, covalent bonding – Lewis theory and VSEPR theory, Valence bond approach to bonding, Molecular orbital theory, Resonance, Inter molecular attractive forces **Chemistry of some hydrocarbons, halohydrocarbons and oxygenated oxygenated organic compounds** Organic reactions, Acids and Bases in organic chemistry, Alkanes, Alkenes, Reactions of alkenes, Alkynes, Chemistry of alkyl halides, Chemistry of alcohols
Teaching Learning methods (TL)	Self-learning: • Instructional material (IL) • Online activities (OL) Compulsory contact sessions: • Compulsory day-school (CDS) • Assessments: MCQs (MCQ), structured essay (SEQ) Non-compulsory contact sessions: • Day school (DS)

Assessment strategy	Overall Continuous Assessment Mark (OCAM): 40%	Final Assessment: 60%
	Continuous Assessment (CA); (60% Best NBT + 40% Other NBT) (02 hrs)	Final Evaluation Theory: 100% (02 hrs)
Recommended Readings:	1. Ebbing D., Gammon S. D, (2012), *General Chemistry*; 10th edition; Brooks Cole publisher 2. Uma land U. B., Bellama T. M., (1996),*General Chemistry*, 2nd edition 3. Atkins P. W, Beran J. A, (1992), *General Chemistry*, 2nd edition 4. Brown E., Lemay H. E, Bursten B. E. (2015), *Chemistry: The Central Science*, 13th edition 5. Lee J. D. (1998), *Concise Inorganic Chemistry*, 5th edition	