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| Lecture Plan                                                                                                                                                                                                                                                                                           |                    |                    |
| Name of the college: Govt. college of Arts Sci. and Com. Sanquelim                                                                                                                                                                                                                                     |                    |                    |
| Name of Faculty: Ms. Varsha K. Sail                                                                                                                                                                                                                                                                    | Subject: Chemistry |                    |
| Paper code: CHC-100 Fundamentals of Chemistry                                                                                                                                                                                                                                                          | Program: FY BSc    | Division: A        |
| Academic year: 2025- 2026                                                                                                                                                                                                                                                                              | Semester: I        | Total Lectures: 15 |
| <b>Course Objectives:</b> <i>At the end of the course the student will be able to understand</i> <ul style="list-style-type: none"> <li>-different theories proposed for progression of understanding of Atomic structure</li> <li>-The theories of bonding in ionic and covalent compounds</li> </ul> |                    |                    |
| <b>Expected Course Outcome:</b> Students attain thorough understanding about the progression in atomic structure                                                                                                                                                                                       |                    |                    |
| <b>Student Learning Outcome:</b> Students are swept through different theories of Atomic structure, with detailed understanding of facts in quantum theory                                                                                                                                             |                    |                    |
|                                                                                                                                                                                                                                                                                                        |                    |                    |

| Month | Lecture From | Lecture To | No. of lectures allotted | Topic, Subtopic to be covered                                                                                                                | Exercise/ Assignment | ICT Tools                                  | Reference books                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------|--------------|------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| June  | 23/06/25     | 28/06/25   | 15                       | <b>Fundamentals of Inorganic Chemistry</b><br><b>Atomic Structure:</b><br>Introduction to Different theory, significance of Rutherford model |                      | Smart board, PPT and chalk and black board | Lee, J.D. <i>Concise Inorganic Chemistry</i> ELBS, 1991.<br>2. Cotton, F.A., Wilkinson, G. & Gaus, P.L. <i>Basic Inorganic Chemistry</i> , 3rd ed., Wiley.<br>3. Douglas, B.E., McDaniel, D.H. & Alexander, J.J. <i>Concepts and Models in Inorganic Chemistry</i> , John Wiley & Sons.<br>4. Huheey, J.E., Keiter, E.A., Keiter, R.L. & Medhi, O.K. <i>Inorganic Chemistry: Principles of Structure and Reactivity</i> , Pearson Education India, 2006. |
| July  | 30/07/25     | 5/7/25     |                          | Review of: Bohr's theory and its limitations                                                                                                 |                      |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

|        |         |         |  |                                                                                               |  |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------|---------|---------|--|-----------------------------------------------------------------------------------------------|--|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        | 7/7/25  | 12/7/25 |  | dual behaviour of matter and radiation, de Broglie's relation,                                |  | Smart board, PPT and chalk and black board | Lee, J.D. <i>Concise Inorganic Chemistry</i> ELBS, 1991.<br>2. Cotton, F.A., Wilkinson, G. & Gaus, P.L. <i>Basic Inorganic Chemistry</i> , 3rd ed., Wiley.<br>3. Douglas, B.E., McDaniel, D.H. & Alexander, J.J. <i>Concepts and Models in Inorganic Chemistry</i> , John Wiley & Sons.<br>4. Huheey, J.E., Keiter, E.A., Keiter, R.L. & Medhi, O.K. <i>Inorganic Chemistry: Principles of Structure and Reactivity</i> , Pearson Education India, 2006. |
|        | 14/7/25 | 19/7/25 |  | Heisenberg Uncertainty principle.                                                             |  |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|        | 21/7/25 | 26/7/25 |  | Hydrogen atom spectra. Need of a new approach to atomic structure.                            |  |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|        | 28/7/25 | 2/8/25  |  | Introduction to Schrodinger equation ( <b>equation not to be derived</b> ) and wave function. |  |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| August | 4/8/25  | 9/8/25  |  | Radial and angular parts of the hydrogenic                                                    |  |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

|           |         |         |  |                                                                                                                                  |                                                  |  |  |
|-----------|---------|---------|--|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--|--|
|           |         |         |  | wave functions (atomic orbitals) and their variations for 1s, 2s, 2p, 3s, 3p and 3d orbitals (Only graphical representation)     |                                                  |  |  |
|           | 11/8/25 | 16/8/25 |  | . Radial and angular nodes and their significance.                                                                               |                                                  |  |  |
|           | 18/8/25 | 23/8/25 |  | Radial distribution functions and the concept of the most Probable distance with special reference to 1s and 2s atomic orbitals. |                                                  |  |  |
|           | 25/8/25 | 30/8/25 |  | C/L Ganesh vacation                                                                                                              |                                                  |  |  |
| September | 1/9/25  | 6/9/25  |  | Quantum numbers and their significance, Discovery of spin, spin quantum number (s)                                               |                                                  |  |  |
|           | 8/9/25  | 13/9/25 |  | and magnetic spin quantum number (ms)..                                                                                          | Draw diagram of all orbital – radial and angular |  |  |
|           | 1/9/25  | 6/9/25  |  |                                                                                                                                  |                                                  |  |  |
|           | 15/9/25 | 20/9/25 |  | Shapes of s, p and d atomic orbitals, nodal planes.                                                                              |                                                  |  |  |

|  |          |          |  |                                                                                                                                                                |                                                             |  |  |
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|  |          |          |  |                                                                                                                                                                |                                                             |  |  |
|  | 22/9/25  | 27/9/25  |  | Rules for filling electrons in various orbitals, electronic configurations of the atoms.                                                                       | Write electronic configuration of all elements from H to Zn |  |  |
|  | 29/9/25  | 4/10/25  |  | Stability of half-filled and completely filled orbitals, concept of exchange energy. Relative energies of atomic orbitals, Anomalous electronic configurations |                                                             |  |  |
|  | 6/10/25  | 11/10/25 |  | Problems, Revision                                                                                                                                             |                                                             |  |  |
|  | 13/10/25 | 18/10/25 |  |                                                                                                                                                                |                                                             |  |  |
|  |          |          |  |                                                                                                                                                                |                                                             |  |  |

**\* Assessment Rubrics**

| Component | Max Marks |
|-----------|-----------|
| ISA 1     | 2.5       |
| ISA 2     | 2.5       |
| ISA       | 2.5       |
| Practical |           |
| Project   |           |

|          |    |
|----------|----|
| Semester |    |
| End Exam | 20 |