

**BRAC University**

**Department of Mathematics & Natural Sciences**

**Course Title: Introduction to Chemistry (CHE 101)**

**Fall 2019**

**Lecturer: Dr. Zayed Bin Zakir Shawon**

**Tentative Lecture Schedule**

The dates and topics may change with the progress of classes. Hence, regular attendance is essential.

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| **Lecture No.** | **Topics to be covered** | |
| **Lecture 1** | 1.1Introduction;  1.2structure of atom,  1.3isotopes, isobar & isotones | |
| **Lecture 2** | 2.1Rutherford’s atomic theory,  2.2Bohr’s atomic theory,  2.3spectrum | |
| **Lecture 3** | 3.1 Different quantum numbers,  3.2orbit and orbital,  3.3electronic configurations | |
| **Lecture 4** | 4.1 Molecular events,  4.2 elementary and  4.3 composite reaction,  4.4 potential energy diagram,  4.5 reaction mechanism |
| **Lecture 5** | 5.1 Rate and rate law,  5.2 factors influencing the  5.3 reaction rate |
| **Lecture 6** | 6.1 Chemical bond: ionic bond  6.2 Covalent bond |
| **Lecture 7** | 7.1 Chemical bond:  7.2co-ordination bond  7.3. hydrogen bond |
| **Lecture 8** | 8.1 H bond and importance of H bond  8.2 Metallic bond and Important metallic property |
| **Lecture 9** | 9.1 Molecular geometry  9.2 Example of molecular geometry  9.3 structure of some molecules like water, ammonia etc |
| **Lecture 10** | 10.1 Hybridization  10.2 importance of hybridization  10.3 types of hybridization  10.4 compounds with different hybridization |
| **Lecture 11** | 11.1 Characteristics of periodic table,  11.2classification of elements,  11.3periodic laws,  11.4position of hydrogen & inert gases |
| **Lecture 12** | 12.1Importance of H atom,  12.2reactivity of different elements and reactions, 12.3diagonal relationship of elements,  12.4halogen compounds |
| **Lecture 13** | **Midterm examination** |
| **Lecture 14** | 14.1 Basic concept about acid-base reactions  14.2 titration  14.3 titration curves  14.4 indicators |
| **Lecture 15-17** | 15.1 Buffer solutions and  15.2 buffer capacity, mechanism,  16.1Henderson-Hassel Balch equation,  16.2 mathematical problems solve problems solve  17.1 strength of acids  17.2 pH calculation |
| **Lecture 18** | 18.1 Basic concept about oxidation and reduction reactions  18.2 properties of oxidation agent  18.3 reducing agent properties  18.4 calculation methodology of oxidation numbers |
| **Lecture 19** | 19.1 Environments and its chemistry,  19.2 environmental Pollution and Its sources,  19.3 types of environmental pollution and their effects  19.4 Heavy metals and their pollution effects |
| **Lecture 20** | 20.1 Atmospheric Chemistry,  20.2 Aerosols,  20.3 influence of CFC gases,  20.4 creation of ozone hole,  20.5 green house effects |