ENSC-105 BASIC CHEMISTRY (03 Credit Hrs)

PRE-REQUISITE: F.Sc. or equivalent

LEARNING OUTCOMES

- The students will be able to have an understanding of periodic laws and atomic properties.
- The students will be able to learn basic concepts of chemical bonding and strength of acids and bases.
- The students will have an understanding of buffers application in pharmaceutical industries and environment.
- The students will learn chemistry of functional groups in organic compounds and their role in environment.

CONTENTS

Unit-1: Introduction to Periodic Table

1.1 Periodic law
1.2 Metals
1.3 Non-metals
1.4 Periodic trends of atomic properties (Electronegativity, Electro positivity, Ionization potential, Electron affinity)

Unit- II: Chemical Bonding

2.1. Ionic
2.2. Covalent
2.3. Coordinate covalent bonding
2.4. Lattice Energy

Unit-III: Acid and Base strengths

3.1. Strong and weak acids and bases
3.2. PH
3.3. Buffers, Selected applications of Buffers in pharmaceutical industries and environment.
3.4. Water Hardness

Unit-IV : Organic Chemistry

4.1. General Chemistry of functional groups of organic compounds and pollutants
4.2. Alcohols
4.3. Carbonyls
4.4. Esters
4.5. Carboxylic acids
4.6. Amines
4.7. Aromatic compounds
4.8. Ethers
4.9. Amino acids & Proteins
4.10. Carbohydrates

TEACHING – LEARNING STRATEGIES

- Lecture based examination
- Presentation/seminars
- Class discussion
- Quizzes

ASSIGNMENTS – TYPE AND NUMBER WITH CALENDAR

It is continuous assessment. The weightage of Assignments will be 25% before and after midterm assessment. It includes:

- classroom participation,
- attendance, assignments and presentation,
- homework
- attitude and behavior,
- hands-on-activities,
- short tests, quizzes etc.

ASSESSMENT AND EXAMINATIONS:

Sr. No.	Elements	Weightage	Details
1.	Mid Term Assessment	35%	It takes place at the mid-point of the semester
2.	Formative Assessment	25%	It is continuous assessment. It includes: classroom participation, attendance, assignments and presentation, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc.
3.	Final Assessment	40%	It takes place at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.

RECOMMENDED TEXT BOOKS / SUGGESTED READINGS

1. Petrucci, R. H. (2017). *General chemistry: principles and modern applications.* Pearson.
2. Schwarzenbach, R. P., Gschwend, P. M., & Imboden, D. M. (2016). *Environmental organic chemistry*. John Wiley & Sons.
3. Ucko, D. A. (2013). *Basics for chemistry.* Elsevier.
4. Silberberg, M. (2012). *Principles of general chemistry*. McGraw-Hill Education.
5. Nilsson, A., Pettersson, L. G., & Norskov, J. (Eds.). (2011). *Chemical bonding at surfaces and interfaces.* Elsevier.
6. Myers, R. (2003). *The basics of chemistry*. Greenwood Publishing Group.