

1. PROGRAMME AIMS AND RATIONALE

The main objective of the new BSc Chemistry Programme is to improve scientific and technological researches which are in conformity with the goals of UR, 2020 Government vision. By studying this programme, students will not only acquire the fundamental skills necessary to be professional chemist, but also the transferable skills of generalist in sciences, computing, report writing and data analysis. This programme prepares graduates to be high-calibre researcher chemists with a thorough knowledge of both chemistry and related technologies. Many are employed each year in research and quality control institutions, brewery, lemonade, food, paint, texture, essential oils, natural compounds, medicinal plants and all other chemical industries. They are also employed in as diverse as environmental control and protection. Due to the high knowledge they have in Chemistry, BSc chemists can also employed in the area of national education after completing a module on pedagogy. The University of Rwanda BSc chemistry can be summarized as follows: The first two years are common. From the third year to fourth year, students chose between three options, Organic Chemistry, Biochemistry and Environmental Chemistry, which one they want to follow with. With organic chemistry, students principally acquire notions on traditional and innovative synthetic chemistry, with the objective to design, prepare, and evaluate biological active compounds. They also learn different physico-chemical methods of separation, identification and analysis in order to be able to control quality of different chemical mixtures, foods and so on. In Biochemistry, students will develop knowledge on a wide range of scientific topics, including stem cell research, genetic research, immunology, pharmacology, forensics, cancer research, environmental science and food science while in Environmental chemistry, students acquire notions for control and protecting Environment. They learn not only different methods for water, air and soil quality analysis, but also discuss on the causes of Environmental degradation and propose solutions to limit them.

2. PROGRAMME LEARNING OUTCOMES

Knowledge and Understanding;

At the end of the programme students should be able to demonstrate knowledge and understanding of:

1. English as tool of communication and research
2. Major aspects of chemical terminology, nomenclature, chemical reactions and convention units
3. The theory of quantum mechanics and their application to description of the structure and properties of atoms and molecules
4. The principles of thermodynamics, kinetics and their application in chemistry
5. The synthesis and properties of transition metal complexes including ligand design
6. The structures and properties of solid state materials
7. Stereochemistry, functional groups and reactions in organic molecules

8. Properties and utilities of macromolecules
9. Techniques of chemical separation, chemical analysis and structure elucidation, including spectroscopy
10. The properties of natural, heterocyclic and organometallic compounds
11. Living organism, characterization and its needs
12. Environmental friendly use and protection
13. Pure and human Sciences
14. Different methods of sampling, data analysis and data use
15. Innovative spirit for job creation

Cognitive/Intellectual skills/Application of Knowledge

At the end of the programme students should be able to:

16. Use English language in research, writing and communication
17. Apply chemical knowledge and skills to find solution to the problems raised by society
18. Identify pertinent topics of research and write proposal for research funds
19. Proceed to further studies in specialised areas of chemistry
20. Conduct a research in either organic, biochemistry or environmental chemistry as well and under minimum supervision
21. Establish a link between all life sciences and its complementarity

Communication/ICT/Numeracy/Analytic Techniques/Practical Skills

At the end of the programme students should be able to:

22. Use a range of software to present a scientific research topics
23. Communicate in a well structured and coherent form to various audiences
24. Analyse different chemical samples and well discuss results obtained
25. Work in the analytic and synthesis chemistry laboratories as well
26. Report on the chemical quality of samples
27. Use other life science to well understand chemistry phenomena