



- المعايير الأكاديمية المرجعية (NARS) لبرنامج الكيمياء الحيوية - الكيمياء (مزوج التخصص)

### **General Attributes of the graduates of basic sciences programs:**

The graduate of any program in basic sciences should be able to:

1. Recognize the role of basic sciences in the development of society.
2. Develop scientific approaches that meet community needs considering economic, environmental, social, ethical, and safety requirements.
3. Utilize scientific facts and theories to analyze and interpret data of various sources.
4. Collect, analyze, and present data using appropriate formats and techniques and use information technology relevant to the field efficiently.
5. Participate effectively as a member in a team, recognize and respect the views and opinions of the other members, and be flexible for adaptation to work conditions.
6. Develop the skills and attitude necessary for lifelong and independent learning and participate effectively in research activities.
7. Deal with scientific data and communicate about specific subjects appropriately in Arabic, English or other languages.

**In addition to the general attributes of the graduate of faculties of Sciences, the graduate of the Biochemistry / Chemistry program should be able to:**

1. Demonstrate wide background knowledge related to the different branches of chemistry / biochemistry.

2. Acquire the knowledge and experience of principles and procedures employed in standard chemical and biochemical analyses using specialized laboratory techniques.
3. Review and evaluate quality control processes, safety regulations, manage risks and organize time to finish jobs.
4. Plan and conduct experimental work, critically evaluate the outcomes, review and report on practice.
5. Demonstrate knowledge, from an integrated point of view, of theories, facts, concepts and essentials of chemistry and biochemistry.
6. Recognize the relationship and interactions among chemistry, biochemistry and the environment and abide by the legislations and ethics related to the environment preservation and human health and welfare.
7. Apply theories and concepts of mathematics and statistics to understand the underlying mechanisms of the essential chemical and biochemical processes.

**Knowledge and Understanding:**

Graduates of biochemistry- chemistry program must be able to demonstrate knowledge and understanding of:

1. Demonstrate knowledge and comprehension of the theories, facts, concepts, fundamentals and techniques related to the fields of chemistry and biochemistry.
2. Acquire the essential knowledge in mathematics, physics, biology, statistics and other collateral subjects in order to understand the advanced and contemporary topics of chemistry and biochemistry.
3. Exhibit familiarity with the principles and procedures used in chemical analyses as well as in characterization and structural investigation of compounds.

4. Characterize the chemical nature and behavior of the functional groups in different types of molecules.
5. Appreciate the concepts of bio-diversity and maintaining of natural resources.

### **Intellectual Skills**

1. Discuss subject- related theories and assess their concepts and principles.
2. Analyze, evaluate and interpret qualitative and quantitative scientific data relevant to the various subjects of chemistry and biochemistry.
3. Develop lines of argument and appropriate judgment in accordance with scientific theories and concepts in the area of study.
4. Postulate and deduce mechanisms and procedures to handle scientific problems and choose optimum solutions for chemical and biochemical problems based on critical thinking.
5. Construct several related and integrated information to confirm, make evidence and test hypotheses.
6. Analyze and interpret quantitative data relevant to the fields of chemistry and biochemistry in graphs, figures, tables, equations, and other sources of information.

### **Practical and Professional Skills**

1. Plan and conduct investigations using appropriate techniques relevant to the fields of chemistry and biochemistry and write structural reports on the data in accordance with the standard scientific guidelines.
2. Solve problems related to the fields of chemistry and biochemistry using a range of formats and approaches and employ appropriate techniques and tools in accordance with scientific ethics.

3. Handle chemical materials safely and conduct risk assessments taking into account their physical and chemical properties to avoid hazards associated with their use.
4. Employ standard laboratory instruments, procedures, and techniques used in the chemical and biochemical investigations.
5. Apply mathematical and computational tools to analyze and interpret experimental data in terms of theories relevant to chemistry and biochemistry.
6. Read, scrutinize, and evaluate the validity and relevance of literature in a critical thinking approach.
7. Consider variations inherent in dealing with biological materials such as sample size, accuracy, precision and calibration.

### **General Skills**

1. Use information and communication technology effectively.
2. Identify roles and responsibilities, delegate tasks, and set clear guidelines and performance indicators.
3. Think independently and solve problems on scientific basis.
4. Work in a team effectively, manage time, collaborate and communicate with others positively.
5. Address the community linked problems with considerable attention to the community ethics and traditions.
6. Acquire self - and lifelong learning.
7. Deal with property rights legally and ethically.
8. Exhibit the sense of beauty and neatness.

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