هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

# Course Specifications

| | |
|---|---|
| **Course Title:** | **Biochemistry** |
| **Course Code:** | **CHEM 204** |
| **Program:** | **Bachelor in Biology** |
| **Department:** | **Chemistry** |
| **College:** | **College of Science** |
| **Institution:** | **Jazan University (JU)** |

## Table of Contents

## A. Course Identification

| |
|---|
| **1. Credit hours:** 3**h** |
| **2. Course type**<br>**a.** University ☐ College ☐ Department √ Others ☐<br>**b.** Required √ Elective ☐ |
| **3. Level/year at which this course is offered: L 4, Year 2** |
| **4. Pre-requisites for this course** (if any)**:**<br>Organic Chemistry Chem 203 for biology students |
| **5. Co-requisites for this course** (if any)**:**<br>**Non** |

**6. Mode of Instruction** (mark all that apply)

| No | Mode of Instruction | Contact Hours | Percentage |
|---|---|---|---|
| 1 | **Traditional classroom and lab** | 30 and 30 | 100% |
| 2 | **Blended** | | |
| 3 | **E-learning** | | |
| 4 | **Distance learning** | | |
| 5 | **Other** | | |

**7. Contact Hours** (based on academic semester)

| No | Activity | Contact Hours |
|---|---|---|
| 1 | **Lecture** | 30 |
| 2 | **Laboratory/Studio** | 30 |
| 3 | **Tutorial** | 0 |
| 4 | **Others** (specify) | 0 |
| | **Total** | 60 |

## B. Course Objectives and Learning Outcomes

### 1. Course Description

| Course Title | Course Number | Contact Hours (CH) | | Credit unit (CU) | Year | Level | Pre-requisite |
|---|---|---|---|---|---|---|---|
| | | Lec. | Prac. | | | | |
| Biochemistry | 204 CHEM | 2 | 2 | 3 | Second | 4th | CHEM 203 |

**Course objectives:** They are to identify the following.

1- Biological compounds, their functional groups and bioactivity

2- Biosynthesis methods of different biological compounds

3- Chemical reactions and its composition and their metabolism

**Syllabus: A-Theoretical contents**

1- Definition and classification of carbohydrates, lipids, amino acids, proteins, nitrogenous bases and nucleic acids.

2- The composition and functions of carbohydrates, lipids, amino acids, proteins, nitrogenous bases and nucleic acids in living cells

3- Translation and transcription of nucleic acids

4- Enzymes and their role in stimulating cellular reactions - enzymatic accompaniments - power generation and transmission in the cell and factors affecting enzymatic reactions

5- The biosynthesis of some biological molecules.

**Syllabus: B-Practical contents**

-Qualitative determination and quantitative estimation of some biological compounds belonging to carbohydrates (mono, di and polysaccharides), proteins and amino acids.

- some chemical properties of lipids and fatty acids

*See attachment

### 2. Course Main Objective

This course aims to provide students with the basic knowledge about the main classes of biomolecules, their composition, properties, functions and their transformations in cells

### 3. Course Learning Outcomes

| | CLOs | |
|---|---|---|
| 1 | **Knowledge and Understanding**<br>Upon completion of the course, student will be able to: | |
| 1.1 | Demonstrate knowledge and understanding in biochemistry related to biology students including the identification, classification and properties of biological compounds. (I) | |
| 1.2 | Describe the essential facts, principles and theories related to biochemistry and evaluate the level of different biological metabolites in biological fluids. (I) | |
| 2 | **Skills :** | |
| 2.1 | Demonstrate critical thinking ability to differentiate and compare between biological compounds and different factors affecting biological and enzymatic reactions (I) | |
| 2.2 | Apply their experimental basics and skills to use laboratory equipment, modern instructions, and classical techniques to perform experiments of biochemistry (I) | |
| 2.3 | Examine and follow proper procedures and regulations for safe handling, use, and disposal of chemicals (P) | |
| 3 | **Values:** | |
| 3.1 | Working in team work collaborate with other colleagues (I) | |

## C. Course Content

| No | List of Topics | Contact Hours |
|---|---|---|

| | | |
|---|---|---|
| 1 | Carbohydrates | 8 |
| 2 | Proteins and amino acids | 8 |
| 3 | Lipids and fatty acids | 6 |
| 4 | Enzymes | 4 |
| 5 | Nucleic acids | 4 |
| ... | Laboratory part | 30 |
| **Total** | | 60 |

## D. Teaching and Assessment

### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

| Code | Course Learning Outcomes | Teaching Strategies | Assessment Methods |
|---|---|---|---|
| **1.0** | **Knowledge and Understanding** | | |
| 1.1 | Demonstrate knowledge and understanding in biochemistry related to biology students including the identification, classification and properties of biological compounds.(I) | Lectures, directed reading, group discussion and assignments | MCQ and short answer questions |
| 1.2 | Describe the essential facts, principles and theories related to biochemistry and evaluate the level of different biological metabolites in biological fluids. (I) | Lectures, directed reading, group discussion and assignments | MCQ and short answer questions |
| **2.0** | **Skills** | | |
| 2.1 | Demonstrate critical thinking ability to differentiate and compare between biological compounds and different factors affecting biological and enzymatic reactions (I) | Lectures, directed reading, group discussion and assignments | Written, questions, problems and class discussions |
| 2.2 | Apply their experimental basics and skills to use laboratory equipment, modern instructions, and classical techniques to perform experiments of biochemistry (I) | Lab work, group work | Practical sheet and final exam |
| 2.3 | Examine and follow proper procedures and regulations for safe handling, use, and disposal of chemicals (P) | Lab work | MCQ safety exam |
| **3.0** | **Values** | | |
| 3.1 | Working in team work collaborate with other colleagues (I) | Group work and reports | Practical, Presentation and research |

### 2. Assessment Tasks for Students

| # | Assessment task* | Week Due | Percentage of Total Assessment Score |
|---|---|---|---|
| **1** | Quiz | 5 | 2% |
| **2** | Home work | 7 | 1% |
| **3** | Med Term Exam | 10 | 15% |
| **4** | Home work | 12 | 1% |
| **5** | Quiz | 13 | 1% |
| **6** | Quiz in Safety | 14 | 0% |
| **7** | Practical work | 15 | 30% |
| **8** | Final Exam | 16 | 50% |

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

## E. Student Academic Counseling and Support

**Arrangements for availability of faculty and teaching staff for individual student**

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|---|
| **consultations and academic advice:**<br>Student Academic Counseling:<br>Members of staff will be available for academic counseling on daily basis for at 4h/day during office hours. |

## F. Learning Resources and Facilities

### 1.Learning Resources

| | |
|---|---|
| **Required Textbooks** | Lehninger, principales of biochemistry, fourth edition. David L. Nelson Michafi M. Cox |
| **Essential References Materials** | Biochemistry, Donald Voet, Wiley; 3rd edition (2004). |
| **Electronic Materials** | https://chem.libretexts.org/Special:Search?qid=&fpid=230&fpth=&query=biochemistry&type=wiki, |
| **Other Learning Materials** | www.wikipedia.org/<br>http://www.wpi.edu/Academics/Depts/Chemistry/Courses/General/ |

### 2. Facilities Required

| Item | Resources |
|---|---|
| **Accommodation**<br>(Classrooms, laboratories, demonstration rooms/labs, etc.) | 1 Lecture room (s) for each group of 25 students.<br>One Laboratory for each group of 15 students. |
| **Technology Resources**<br>(AV, data show, Smart Board, software, etc.) | AV, data show, Smart Board, software, etc.) |
| **Other Resources**<br>(Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list) | Microscopes, Balances, and glassware |

## G. Course Quality Evaluation

| Evaluation Areas/Issues | Evaluators | Evaluation Methods |
|---|---|---|
| Effectiveness of Teaching and Assessment | Student | Likert-type Survey (CES)<br>Indirect |
| Extent of achievement of course learning outcomes | Instructor &<br>Course coordinator | Class room evaluation<br>(direct & indirect) |
| Quality of learning resources | Program coordinator | Indirect |
| Exam Quality assessment | Assessment committee | Indirect |

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
**Assessment Methods** (Direct, Indirect)

## H. Specification Approval Data

| | |
|---|---|
| **Council / Committee** | |
| **Reference No.** | |
| **Date** | |