**Ministry of Higher Education and Scientific Research**
**Scientific Supervision and Scientific Evaluation Apparatus**
**Directorate of Quality Assurance and Academic Accreditation**
**Accreditation Department**

# Academic Program and Course Description Guide

**2024**

# Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

## Concepts and terminology:

**Academic Program Description:** The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

**Course Description:** Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

**Program Vision:** An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

**Program Mission:** Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

**Program Objectives:** They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

**Curriculum Structure:** All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

**Learning Outcomes:** A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

**Teaching and learning strategies:** They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

## Academic Program Description Form

**University Name**: **Tikrit University**

**Faculty/Institute**: **College of Medicine**

**Scientific Department**: **chemistry and Biochemistry**

**Academic or Professional Program Name**: **Bachelor of Medicine and General Surgery**

**Final Certificate Name**: **Bachelor of Medicine and General Surgery**

**Academic System**: **yearly system**

**Description Preparation Date**: **1/11/2023**

**File Completion Date**: **14/02/2024**

**Signature**:
**Head of Department Name**:

**Date**:

**Signature**:
**Scientific Associate Name**:

**Date**:

**The file is checked by**:

**Department of Quality Assurance and University Performance**

**Director of the Quality Assurance and University Performance Department**:

**Date**:

**Signature**:

**Approval of the Dean**

| 1. **Program Vision** |
| --- |
| The College of Medicine seeks to be one of the leading higher education institutions at Tikrit University in the field of modern education and scientific research through its scientific, research and administrative activities. It also works to provide an integrated path for its students and professors to make them active and creative in serving society in the fields of medicine and general surgery. |

| 2. **Program Mission** |
| --- |
| Working to prepare and graduate leading scientific and leadership competencies in the field of medicine and its sciences and to develop the balance of knowledge in the field of scientific research to serve the local, regional and international community, as well as training and refining the minds of students scientifically and cognitively, and emphasizing social and cultural values and responding to the requirements of the local market. |

| 3. **Program Objectives** |
| --- |
| 1. Embodying the vision, mission and goals of Tikrit University, and applying the best educational practices with a focus on ensuring and enhancing quality and performance.<br>2. Preparing specialized cadres capable of serving the community and preparing for the preparation of future specializations. |

3. Spreading the culture of human diversity in society, transferring knowledge and skills in the field of medicine, writing academic research, and creative scientific achievement through student- and teaching-focused activities.
4. The college seeks to conclude scientific and cultural cooperation agreements with corresponding colleges and corresponding departments in different colleges to achieve best practices in the fields of education and learning.
5. Focusing on the educational and moral aspects of all its members and spreading the spirit of dedication, tolerance, commitment and work to serve the nation.
6. Paying attention to intellectual and cultural construction through openness to the experiences of other countries in the fields of medicine and general surgery. Focusing on the educational and moral aspect of the student and instilling a spirit of dedication, tolerance and commitment.

## 4. Program Accreditation

Does the program have program accreditation? And from which agency?

## 5. Other external influences

Is there a sponsor for the program?

## 6. Program Structure

| Program Structure | Number of Courses | Credit hours | Percentage | Reviews* |
|---|---|---|---|---|
| Institution Requirements | Biochemistry | 2 hours Theoretical | | |
| College Requirements | | | | |

| | | | | |
|---|---|---|---|---|
| **Department Requirements** | | | | |
| **Summer Training** | | | | |
| **Other** | | | | |

* This can include notes whether the course is basic or optional.

## 7. Program Description

| Year/Level | Course Code | Course Name | Credit Hours | |
|---|---|---|---|---|
| | | | **theoretical** | **practical** |
| **2023\2024** | | **biochemistry** | **2** | **3** |

## 8. Expected learning outcomes of the program

| | |
|---|---|
| **Knowledge** | |
| Learning Outcomes 1 | Introducing students to chemistry and its relationship to the body, its organs, metabolic processes, and understanding the reactions that occur |
| **Skills** | |
| Learning Outcomes 2 | Expanding laboratory work skills |
| Learning Outcomes 3 | Expanding the skill of biochemical analysis |
| **Ethics** | |
| Learning Outcomes 4 | Teaching students to analyze scientific ideas and knowledge in the field of biochemistry |
| Learning Outcomes 5 | Developing students' skills in the field of pathological analyses |

## 9. Teaching and Learning Strategies

1-Explaining the scientific material by presenting metabolic diagrams and chemical reactions.

2- Conduct daily tests, either on paper or during lectures by asking questions to students.

| |
|---|
| 3- Linking scientific knowledge with students' ideas to facilitate understanding of the scientific material. |

| 10. Evaluation methods |
|---|
| Weekly, monthly, daily exams and the end of the year exam. |

## 11. Faculty

**Faculty Members**

| Academic Rank | Specialization | | Special Requirements/Skills (if applicable) | | Number of the teaching staff | |
|---|---|---|---|---|---|---|
| | General | Special | | | Staff | Lecturer |
| | | | | | | |

| Professional Development |
|---|
| **Mentoring new faculty members** |
| Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level. |
| **Professional development of faculty members** |
| Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc. |

| 12. Acceptance Criterion |
|---|
| **(Setting regulations related to enrollment in the college or institute, whether central admission or others)** |

| 13. **The most important sources of information about the program** |
| --- |
| Richard A. Harvey and Denise R. Ferrier, Lippincott's Illustrated Reviews: Biochemistry, Copyright © (2011) Lippincott Williams & Wilkins, a Wolters Kluwer business |

| 14. Program Development Plan |
| --- |
| Using modern technologies, devices and methods in education to facilitate understanding of information and develop skills among students |

| Program Skills Outline | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Required program Learning outcomes | | | | | | | | | | | |
| Year/Level | Course Code | Course Name | Basic or optional | Knowledge | | | | Skills | | | | Ethics | | | |
| | | | | A1 | A2 | A3 | A4 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 |
| 2023\2024 | | Biochemistry | Basic | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | |

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

# Course Description Form

| |
|---|
| 1. Course Name: |
| Biochemisty |
| 2. Course Code: |
| |
| 3. Semester / Year: |
| yearly |
| 4. Description Preparation Date: |
| 14/ 02/ 2024 |
| 5. Available Attendance Forms: |
| Attendance system only |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 50 theoretical hours in year. 2 hours per week |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Prof.Dr.Firas Shawqi Algburi<br>Email: dr.firas.shawki@tu.edu.iq |
| 8. Course Objectives |

| Course Objectives | 1 – Providing studen s wit<br>2– Teaching students to us |
|---|---|

## 9. Teaching and Learning Strategies

| Strategy | 1- Educational strategy, collaborative concept planning.<br>2- Brainstorming education strategy.<br>3- Education Strategy Notes Series |
|---|---|

## 10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method |
|---|---|---|---|---|
| 1 | | | -Introduction to biochemistry; pH concept & acid base balance<br>-Chemistry safety<br>-Carboxylic acid& Alcohol and Aldehyde & Ketone | |
| 2 | | | -Carbohydrates | |
| 3 | | | -Carbohydrates metabolism 1 | |
| 4 | | | -Carbohydrates metabolism 2 | |
| 5 | | | -Lipid | |
| 6 | | | -Lipid metabolism 1 | |
| 7 | | | -Lipid metabolism 2 | |
| 8 | | | -protein | |
| 9 | | | -Protein metabolism 1 | |

| | | | | |
|---|---|---|---|---|
| 10<br>11<br>12<br>13<br>14<br>15<br>16<br>17<br>18<br>19<br>20<br>21<br>22<br>23<br>24 | | | -Protein metabolism 2<br>-Bone mineral<br>-Calcium turnover and parathyroid hormone<br>-Vit. D metabolism<br>-immunoglobulin<br>-Ag-Ab reaction<br>-compliment<br>-Metabolism of RBC<br>-HB structure<br>-Iron metabolism and TIBC<br>-Biochemical events in clotting process<br>-Biochemical changes in leukaemia<br>-Neurotransmitters<br>-Chemical carcinogens<br>-Energy requirement<br>-Lipoprotein | |
| 11. Course Evaluation | | | | |
| Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc | | | | |
| 12. Learning and Teaching Resources | | | | |
| Required textbooks (curric books, if any) | | | **Richard A. Harvey** and **Denise R. Ferrier**, **Lippincott's Illustrated Reviews: Biochemistry, Copyright © (2011)** | |

| | | |
|---|---|---|
| | **Lippincott Williams & Wilkins, a Wolters Kluwer business** | |
| Main references (sources) | | |
| Recommended books and references (scientific journals, reports…) | **Lehninger PRINCIPLES OF BIOCHEMISTRY, Fourth Edition** | |
| Electronic References, Websites | https://ifeet.org/files/-Richard A. Harvey, Denise R. Ferrier- Biochemistry.p | https://mis.kp.ac.rw/admin/admin_panel/kp_lms/files/digital/Co e%20%20David%20L.%20Nelson,%20Michael%20M.%20Cox.pdf |

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followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

## Academic Program Description Form

**University Name**: **Tikrit University**
**Faculty/Institute**: **College of Medicine**
**Scientific Department**: **chemistry and Biochemistry**
**Academic or Professional Program Name**: **Bachelor of Medicine and General Surgery**
**Final Certificate Name**: **Bachelor of Medicine and General Surgery**
**Academic System**: **yearly system**
**Description Preparation Date**: **01/10/2023**
**File Completion Date**: **01/05/2024**

**Signature**:
**Head of Department Name**:

**Date**:

**Signature**:
**Scientific Associate Name**:

**Date**:

**The file is checked by**:
**Department of Quality Assurance and University Performance**
**Director of the Quality Assurance and University Performance Department**:
**Date**:
**Signature**:

**Approval of the Dean**

## 1. Program Vision

The College of Medicine seeks to be one of the leading higher education institutions at Tikrit University in the field of modern education and scientific research through its scientific, research and administrative activities. It also works to provide an integrated path for its students and professors to make them active and creative in serving society in the fields of medicine and general surgery.

## 2. Program Mission

Working to prepare and graduate leading scientific and leadership competencies in the field of medicine and its sciences and to develop the balance of knowledge in the field of scientific research to serve the local, regional and international community, as well as training and refining the minds of students scientifically and cognitively, and emphasizing social and cultural values and responding to the requirements of the local market.

## 3. Program Objectives

1. Embodying the vision, mission and goals of Tikrit University, and applying the best educational practices with a focus on ensuring and enhancing quality and performance.
2. Preparing specialized cadres capable of serving the community and preparing for the preparation of future specializations.
3. Spreading the culture of human diversity in society, transferring knowledge and skills in the field of medicine, writing academic research, and creative scientific achievement through student- and teaching-focused activities.
4. The college seeks to conclude scientific and cultural cooperation agreements with corresponding colleges and corresponding departments in different colleges to achieve best practices in the fields of education and learning.

5. Focusing on the educational and moral aspects of all its members and spreading the spirit of dedication, tolerance, commitment and work to serve the nation.

6. Paying attention to intellectual and cultural construction through openness to the experiences of other countries in the fields of medicine and general surgery.

7. Developing graduates' cognitive and practical skills. Developing academic and research competence scientifically and practically.

8. Holding various seminars and advertisements for medical and health awareness about various diseases, prevention and diagnosis, especially communicable diseases.

## 4. Program Accreditation

Does the program have program accreditation? And from which agency?

## 5. Other external influences

The program is positively affected by a number of external influences, such as the directives of the Ministry of Higher Education and Scientific Research and the Ministry of Health, as well as the existence of twinning with local and international universities and the requirements of the labor market.

## 6. Program Structure

| Program Structure | Number of Courses | Credit hours | Percentage | Reviews* |
|---|---|---|---|---|
| **Institution Requirements** | **Biochemistry** | **3 hours Practical** | | |
| **College Requirements** | | | | |
| **Department Requirements** | | | | |

| | | | | |
|---|---|---|---|---|
| **Summer Training** | | | | |
| **Other** | | | | |

* This can include notes whether the course is basic or optional.

## 7. Program Description

| Year/Level | Course Code | Course Name | Credit Hours | |
|---|---|---|---|---|
| | | | theoretical | practical |
| 2023\2024 | | biochemistry | 2 | 3 |

## 8. Expected learning outcomes of the program

| | |
|---|---|
| **Knowledge** | |
| Learning Outcomes 1 | Introducing the student to clinical biochemistry and its relationship to diseases that occur in the body, and understanding the changes that occur after contracting the disease. |
| **Skills** | |
| Learning Outcomes 2 | Expanding laboratory work skills: Introducing the student to taught about the types of pathological analyzes and their relationship to diagnosing diseases. They are then taught about how to conduct these analyzes correctly in the laboratory, and they are also taught about the types of errors that occur in the laboratory and their impact on diagnosing disease. |
| Learning Outcomes 3 | Expanding the skill of biochemical analysis |
| **Ethics** | |
| Learning Outcomes 4 | Teaching students to analyze scientific ideas and knowledge in the field of biochemistry |
| Learning Outcomes 5 | Developing students' skills in the field of pathological analyses |

## 9. Teaching and Learning Strategies

1-1- Explaining the scientific material by presenting diagrams and chemical reactions and applying their procedures practically.

2- Conduct daily tests, either on paper or during lectures by asking questions to

students.

3- Linking scientific knowledge with students' ideas to facilitate understanding of the scientific material.

## 10. Evaluation methods

Weekly, monthly, daily exams and the end of the year exam.

## 11. Faculty

### Faculty Members

| Academic Rank | Specialization | | Special Requirements/Skills (if applicable) | | Number of the teaching staff | |
|---|---|---|---|---|---|---|
| | General | Special | | | Staff | Lecturer |
| | | | | | | |

### Professional Development

**Mentoring new faculty members**

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

**Professional development of faculty members**

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

## 12. Acceptance Criterion

**(Setting regulations related to enrollment in the college or institute, whether central admission or others)**

| 13. **The most important sources of information about the program** |
| --- |
| William J. Marshall: Clinical Biochemistry,Metabolic And Clinical Aspects |

| 14. Program Development Plan |
| --- |
| Using modern technologies, devices and methods in education to facilitate understanding of information and develop skills among students |

| Program Skills Outline | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Required program Learning outcomes | | | | | | | | | | | | |
| Year/Level | Course Code | Course Name | Basic or optional | Knowledge | | | | Skills | | | | Ethics | | | | |
| | | | | A1 | A2 | A3 | A4 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 | |
| 2023\2024 | | Biochemistry | Basic | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | |

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

# Course Description Form

| |
|---|
| 1. Course Name: |
| Biochemisty |
| 2. Course Code: |
| |
| 3. Semester / Year: |
| yearly |
| 4. Description Preparation Date: |
| 14/ 01/ 2024 |
| 5. Available Attendance Forms: |
| Attendance system only |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 75 practical hours in year. 3 hours per week |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Lec. Omeed Akbar Ali<br>Email: omeed.aa@tu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | **1 – Providing students with** |

| | |
|---|---|
| | 2- Teaching students to use |

## 9. Teaching and Learning Strategies

| | |
|---|---|
| **Strategy** | 1- Educational strategy, collaborative concept planning.<br>2- Brainstorming education strategy.<br>3- Education Strategy Notes Series |

## 10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method |
|---|---|---|---|---|
| 1 | | | ELISA (enzyme linked immune sorbent assay) test<br>Radio immune assay | |
| 2 | | | **Thyroid function test**<br>Serum cortisol test | |
| 3 | | | **Cardiac enzymes**<br>LDH Test<br>AST Test<br>CK Test<br>Ketone bodies Test | |
| 4 | | | **Liver function test**<br>Total serum bilirubin Test<br>GPT TEST | |
| 5 | | | **Renal function test** | |

| | | | | |
|---|---|---|---|---|
| 6<br><br><br><br>7<br><br><br>8 | | | s. urea Test<br>Serum creatinine Test<br>Creatinine clearance test<br>**C.S.F**<br>C.S.F protein Test<br>C.S.F. glucose Test<br>C.S.F physical properties Test<br>Potassium determination method<br>Sodium determination method<br>Vit. C Test<br>Vit. K Test<br>ALP Test<br>ACP Test | |
| 11. Course Evaluation | | | | |
| Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc | | | | |
| 12. Learning and Teaching Resources | | | | |
| Required textbooks (curricu books, if any) | | | **William J. Marshall: Clinical Biochemistry, Metabolic And Clinical Aspects** | |
| Main references (sources) | | | | |
| Recommended books and references (scientific | | | **Clinical Biochemistry, Third Edition** | |

| | | |
|---|---|---|
| journals, reports…) | | |
| Electronic References, Websites | https://books.google.iq/books?hl=ar&lr=&id=2FkXAwAAQBAJ&oi=fnd&pg=PI<br>dq=William+J.+Marshall:+Clinical+Biochemistry,+Metabolic+And+Clinical+Asp<br>s&ots=AOQrIUW0jF&sig=nxUlViuDSZkkvUgEwQPr6VTLAzE&redir_esc=y#v=o<br>page&q=William%20J.%20Marshall%3A%20Clinical%20Biochemistry%2C%2<br>Metabolic%20And%20Clinical%20Aspects&f=false | |

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**Academic System**: **yearly system**
**Description Preparation Date**: **1/10/2023**
**File Completion Date**: **14/02/2024**

**Signature**:
**Prof.Dr. Entedhar Rifaat Sarhat**
**Head of Department Name**:

**Date**:

**Signature**:
**Scientific Associate Name**:

**Date**:

**The file is checked by**:
**Department of Quality Assurance and University Performance**
**Director of the Quality Assurance and University Performance Department**:
**Date**:
**Signature**:

**Approval of the Dean**

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4. The college seeks to conclude scientific and cultural cooperation agreements with corresponding colleges and corresponding departments in different colleges to achieve best practices in the fields of education and learning.
5. Focusing on the educational and moral aspects of all its members and spreading the spirit of dedication, tolerance, commitment and work to serve the nation.
6. Paying attention to intellectual and cultural construction through openness to the experiences of other countries in the fields of medicine and general surgery. Focusing on the educational and moral aspect of the student and instilling a spirit of dedication, tolerance and commitment.

## 4. Program Accreditation

Does the program have program accreditation? And from which agency?

## 5. Other external influences

Is there a sponsor for the program?

## 6. Program Structure

| Program Structure | Number of Courses | Credit hours | Percentage | Reviews* |
|---|---|---|---|---|
| Institution Requirements | Biochemistry | 2 hours Theoretical | | |
| College Requirements | | | | |
| Department Requirements | | | | |
| Summer Training | | | | |

| | | | | |
|---|---|---|---|---|
| **Other** | | | | |

* This can include notes whether the course is basic or optional.

## 7. Program Description

| Year/Level | Course Code | Course Name | Credit Hours | |
|---|---|---|---|---|
| | | | theoretical | practical |
| 2023\2024 | | biochemistry | 2 | 3 |

## 8. Expected learning outcomes of the program

| | |
|---|---|
| **Knowledge** | |
| Learning Outcomes 1 | Introducing students to chemistry and its relationship to the body, its organs, metabolic processes, and understanding the reactions that occur |
| **Skills** | |
| Learning Outcomes 2 | Expanding laboratory work skills |
| Learning Outcomes 3 | Expanding the skill of biochemical analysis |
| **Ethics** | |
| Learning Outcomes 4 | Teaching students to analyze scientific ideas and knowledge in the field of biochemistry |
| Learning Outcomes 5 | Developing students' skills in the field of pathological analyses |

## 9. Teaching and Learning Strategies

1-Explaining the scientific material by presenting metabolic diagrams and chemical reactions.

2- Conduct daily tests, either on paper or during lectures by asking questions to students.

3- Linking scientific knowledge with students' ideas to facilitate understanding of the scientific material.

## 10. Evaluation methods

Weekly, monthly, daily exams and the end of the year exam.

## 11. Faculty

### Faculty Members

| Academic Rank | Specialization | | Special Requirements/Skills (if applicable) | | Number of the teaching staff | |
|---|---|---|---|---|---|---|
| | General | Special | | | Staff | Lecturer |
| | | | | | | |

### Professional Development

**Mentoring new faculty members**

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

**Professional development of faculty members**

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

## 12. Acceptance Criterion

**(Setting regulations related to enrollment in the college or institute, whether central admission or others)**

## 13. The most important sources of information about the program

| |
|---|
| Richard A. Harvey and Denise R. Ferrier, Lippincott's Illustrated Reviews: Biochemistry, Copyright © (2011) Lippincott Williams & Wilkins, a Wolters Kluwer business |

| 14. Program Development Plan |
|---|
| Using modern technologies, devices and methods in education to facilitate understanding of information and develop skills among students |

| Program Skills Outline | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Required program Learning outcomes | | | | | | | | | | | |
| Year/Level | Course Code | Course Name | Basic or optional | Knowledge | | | | Skills | | | | Ethics | | | |
| | | | | A1 | A2 | A3 | A4 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 |
| 2023\2024 | | Biochemistry | Basic | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
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- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

# Course Description Form

| |
|---|
| 1. Course Name: |
| Biochemisty |
| 2. Course Code: |
| |
| 3. Semester / Year: |
| yearly |
| 4. Description Preparation Date: |
| 14/ 02/ 2024 |
| 5. Available Attendance Forms: |
| Attendance system only |
| 6. Number of Credit Hours (Total) / Number of Units (Total) |
| 50 theoretical hours in year. 2 hours per week |
| 7. Course administrator's name (mention all, if more than one name) |
| Name: Prof. dr. Entedhar Rifaat Sarhat<br>Email: entedharr@tu.edu.iq |
| 8. Course Objectives |

| | |
|---|---|
| **Course Objectives** | **1 – Providing students with in forma**<br>**2– Teaching students to use chemic** |

| 9. Teaching and Learning Strategies | |
|---|---|
| **Strategy** | 1- Educational strategy, collaborative concept planning.<br>2- Brainstorming education strategy.<br>3- Education Strategy Notes Series |

10. Course Structure

| Week | Hours | Required Learning Outcomes | Unit or subject name | Learning method |
|---|---|---|---|---|
| 1<br>2<br>3<br>4<br>6<br>7 | | | **A. Enzymes of the GIT system(Biochemistry)**<br>1. List the GIT enzymes<br>2. Describe how the GIT enzymes get activated<br>3. Understand the role of GIT enzymes in the process of digestion<br>4. Discuss the clinical significance of these enzymes including lactase deficiency<br>**B. Metabolic processes in the liver including ethanol metabolism and its side effects (Biochemistry)**<br>1. Describe the role of liver in ethanol metabolism<br>- Alcohol dehydrogenase enzyme<br>- Aldehyde dehydrogenase enzyme | Theoretical lectures.<br>- Practical applications.<br>- How to solve problems.<br>- Classroom interaction and exchange of opinions between the student and the teacher to raise learning difficulties and discuss their solution. |

| | | | | |
|---|---|---|---|---|
| 8<br><br>9<br><br><br><br>10<br><br>11<br><br><br><br>12<br><br>13<br><br><br><br>14<br><br><br>15 | | | - Microsomal ethanol oxidizing system (MEOS)<br>2. Understand the effects of alcohol and its metabolic products on body organs<br>**C. Liver function tests**<br>1. List the most common used liver function tests<br>2. Describe the clinical significance of each of these tests<br>**D. Metabolic disease of liver**<br>a. Describe glycogen storage diseases<br>b. Describe inherited disorders of bilirubin metabolism<br>c. Discuss alpha-1 antitrypsin deficiency and its role in liver disorders<br>d. Lysosomal storage diseases<br>e. Hepatolenticular degeneration (Wilson's disease)<br>**E. Introduction to endocrinology I**<br>1. Understand the nature of hormones.<br>2. Describe hormone biosynthesis, secretion and transport.<br>3. Understand targeting delivery and response of hormones.<br>4. Understand hormonal interactions (systemic, cellular, synergistic and inhibitory).<br>**F. Signal transduction, 2nd messengers and Receptors** | |

| | | | | |
|---|---|---|---|---|
| 16<br>17<br>18<br>19<br>20<br>21<br>22<br>23 | | | 1. Describe the structure of cell membrane receptors and intracellular receptors for different hormones<br>2. Identify different types of second messengers<br>3. List the intracellular actions of all 2nd messengers<br>4. Understand the mechanism of 2nd messenger actions including PIP2 turnover (Ca+2/protein kinase C systems) diacylglycerol (DAG) and NO<br>**G. Mechanism of hormone actions**<br>a. Describe the mechanism of action of peptide hormones<br>b. Describe the mechanism of action of amino acid derivatives hormone<br>c. Describe the mechanism of action of cholesterol derivatives hormone<br>d. Describe the mechanism of action of fatty acid hormone derivatives<br>**H. Biochemical aspects of thyroid hormones metabolism**<br>a. Describe thyroid hormone biosynthesis: monoiodotyrosines, diiodotyrosines, T3, T4 and reverse T3. | |

| | | | | |
|---|---|---|---|---|
| | | | b. Describe metabolism of iodide and iodine.<br>c. Discuss the role of peroxidase, iodinase, coupling, protease, dehalogenase and thyroglobulin.<br>d. Discuss thyroid stimulating hormone action via cAMP.<br>e. Describe the regulation of thyroid stimulating hormone by thyroid releasing hormone and T4, T3, somatostatin and dopamine.<br>f. Discuss T4 and T3 transport<br>I. Hormonal control of calcium PO4metabolism I<br>a. Discuss absorption, metabolism and excretion of calcium and phosphate.<br>b. Discuss the role of vitamin D in calcium and phosphate absorption<br>c. Outline the effect of calcium ion concentration on the regulation of the active form of vitamin D levels<br>d. List the major physiological effects of PTH<br>b. 5. Discuss the regulation of PTH secretion<br>**J. Hormonal control of calcium metabolism II**<br>a. Structure of calcitonin<br>b. List the major physiological actions of calcitonin<br>c. Discuss the regulation of calcitonin secretion | |

| | | | | |
|---|---|---|---|---|
| | | | d. Compare between PTH and calcitonin as regulators of calcium levels.<br>**K. Integrated metabolism and hormonal regulation**<br>a. Describe the metabolic picture in the well-fed state and during starvation in various tissues (liver, brain, muscle and adipose tissues).<br>b. Describe the regulation of glycogen metabolism, glycolysis, hexose<br>c. monophosphate, gluconeogenesis ,lipid and amino acid metabolism by insulin/counter-regulatory hormones ratio.<br>**L. Steroidogenesis**<br>**a.** Describe the biosynthesis of steroid hormones.<br>**b.** Describe the role of cytochromes P-450 in steroidogenesis.<br>**c.** Describe defects and consequences of congenital adrenal hyperplasia.<br>**M. Biochemical Principles of Laboratory Techniques used for the measurement of hormones**<br>a. List the most important lab methods used for laboratory measurement of hormones Radio Immuno Assay (RIA) | |

| | | | | |
|---|---|---|---|---|
| | | | Enzyme-Linked Immunosorbent Assay (ELISA), Fluorescence Polarization Immuno Assay (FPIA),<br>b. Chemiluminescence enzyme immunoassay (CLIA)<br>c. 2. Understand the principles underlying the techniques used in hormone measurement.<br>**A. Biochemistry of Bone and connective tissue and bone metabolism**<br>a. Describe the biochemical structure of bone tissue, the collagen matrix and the hydroxyapatite cement.<br>b. List bone matrix proteins and describe their function.<br>c. Describe the Composition of calcified tissues, calcification in bones<br>d. and teeth and formation of hydroxyapatite.<br>e. Understand the role of alkaline phosphatase, calcium and hosphate<br>f. and vitamin D: 1,25-Dihydroxy-vit-D in bone formation and remodeling.<br>g. Review calcium and phosphate homeostasis.<br>**A. Metabolic disorders and clinical biochemistry of muscle and bone** | |

| | | | | |
|---|---|---|---|---|
| | | | a. Discuss the markers for bone formation and Resorption and their clinical<br>b. use in diagnosis Describe the molecular basis of:<br>a. Duchene Muscular Dystrophy.<br>b. Glycogen storage diseases of muscle<br>c. Muscle Mitochondrial diseases.<br>d. Describe the molecular basis of Osteogenesis imperfecta and Ehlar<br>c. Danlos syndromes<br>**B. Metabolism of neurotransmitters**<br>a. Discuss the synthesis and degradation of gamma-amino-butyric acid (GABA)<br>b. Discuss the synthesis and degradation of dopamine, epinephrine and nor-epinephrine<br>c. Discuss the formation and catabolism of serotonin<br>d. Discuss the glutamate metabolism<br>e. Understand the brain peptides as neurotransmitters<br>**C. Role of kidney in acid base balance.**<br>a. Discuss urea and creatinine metabolism<br>b. Understand the role of kidney in the regulation of hydrogen ions | |

| | | | | |
|---|---|---|---|---|
| | | | c. and bicarbonate buffer system.<br>d. Discuss amino acids absorption by the kidney and their disorders.<br>**D.** Renal fuction<br>**E.** Body water and elctrolytes | |
| 3. Course Evaluation | | | | |
| Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc | | | | |
| 4. Learning and Teaching Resources | | | | |
| Required textbooks (curric books, if any) | | | 1. CLINICAL BIOCHEMISTRY & METABOLIC MEDICINE: Martin Andrew Crook B<br>2. TEXTBOOK OF BIOCHEMISTRY For Medical Students. DM VASUDEVAN | |
| Main references (sources) | | | | |
| Recommended books and references (scientific journals, reports…) | | | **1.** Clinical Chemistry. William J. Marshall . | |

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|---|---|---|
| Electronic References, Websites | https://ifeet.org/files/-Richard A. Harvey, Denise R. Ferrier- Biochemistry.p | https://mis.kp.ac.rw/admin/admin_panel/kp_lms/files/digital/Co e%20%20David%20L.%20Nelson,%20Michael%20M.%20Cox.pdf |