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| --- |
| **Course Title**: **Clinical Biochemistry 1** |
| **Course Code**: **CLS 232** |
| **Program**: Bachelor of Clinical laboratory Science |
| **Department**: **Clinical laboratory Science Department** |
| **College**: **College of Nursing - Al-Dawadmi Campus** |
| **Institution**: **Shaqra University** |
| **Version**: Template 2023\_TP153\_ 1 |
| **Last Revision Date**: …………………….. |

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# **A. General information about the course:**

**1. Course Identification**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1. Credit hours: 3 ( 2 + 1) | | | | | | |
|  | | | | | | |
| 2. Course type | | | | | | |
| A. | University | College | Department | | Track | Others |
| B. | Required | | | Elective | | |
| 3. Level/year at which this course is offered: ( level 1 / first year) | | | | | | |
| 4. Course general Description: | | | | | | |
| The course provides the students with the basic knowledge of the chemical structures and functions of biomolecules including carbohydrates, fats, proteins and nucleic acids as well as the different types of enzymes, hormones, vitamins and minerals. Emphasis is placed on the molecular structure and its relationship with the biological function. | | | | | | |
| 5. Pre-requirements for this course (if any): | | | | | | |
| NA | | | | | | |
| 6. Co-requisites for this course (if any): | | | | | | |
| NA | | | | | | |
| 7. Course Main Objective(s): | | | | | | |
| This course aims to initiate the student with understanding of the biological and chemical properties of biomolecules which would contribute to the prevention, diagnosis, prognosis and monitoring of health and disease states in humans.  The general objectives of the course are:   * 1. To compare and contrast the basic differences between carbohydrates, lipids, proteins and nucleic acids.   2. To explain the specific characteristics of enzymes, hormones, vitamins and minerals.   3. To provide an explanation of the relationship between the nature and biological activities of nucleic acids with emphasis on the immense impact of that information on the medical field.   4. To know how can contribute the clinical laboratories to assess the health status of individuals | | | | | | |

**2. Teaching mode** (mark all that apply)

| **No** | **Mode of Instruction** | **Contact Hours** | **Percentage** |
| --- | --- | --- | --- |
| 1 | Traditional classroom |  |  |
| 2 | E-learning |  |  |
| 3 | Hybrid   * Traditional classroom * E-learning | 30 | 100 |
| 4 | Distance learning |  |  |

**3. Contact Hours** (based on the academic semester)

|  |  |  |
| --- | --- | --- |
| **No** | **Activity** | **Contact Hours** |
|  | **Lectures** | 30 |
|  | **Laboratory/Studio** |  |
|  | **Field** |  |
|  | **Tutorial** |  |
|  | **Others (specify)** |  |
| **Total** | | 30 |

# **B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods**

| **Code** | **Course Learning Outcomes** | **Code of CLOs aligned with program** | **Teaching Strategies** | **Assessment Methods** |
| --- | --- | --- | --- | --- |
| **1.0** | **Knowledge and understanding** | | | |
| 1.1 | Recognize the basic differences between carbohydrates, lipids and proteins. | K1 | Presentations  Group discussion  Online activities | Writing exam  Quizzes  Assignments  Discussion |
| 1.2 | Familiarize students with the specific characteristics of enzymes, hormones, vitamins and minerals | K2 | Presentations  Group discussion  Online activities | Writing exam  Quizzes  Assignments  Discussion |
| **2.0** | **Skills** | | | |
| 2.1 | Explain the mechanisms involved in the biochemical events and changes. | S1 | Practical activities in laboratory  Problem based learning  Group discussion  Video viewing  Presentations | Writing exam  Quizzes  Assignments  Discussion |
| 2.2 | Interpret results and identify consistent and inconsistent elements. | S2 | Practical activities in laboratory  Video viewing  Problem based learning  Presentations  Group discussion | Writing exam  Quizzes  Assignments  Discussion |
| **3.0** | **Values, autonomy, and responsibility** | | | |
| 3.1 | promote **life-long learning** | V1 | Tasks with specific time limit  Encourage the students to get-involved  in extracurricular activities and clubs  related to clinical laboratories sciences | Observation of student behavior. (Rubrics evaluation)  Oral presentation (Rubrics evaluation |
| 3.2 | Communicate appropriately with patient, family, and interdisciplinary team members. | V2 | Creating opportunities for team  members to collaborate on projects  and tasks  Encouraging team members to share  their knowledge and expertise with  each other’s  Promoting a culture of open  communications and respect among  team members | Observation of student behavior. (Rubrics evaluation)  Oral presentation (Rubrics evaluation |
| 3.3 | promote **team work** | V3 | Creating opportunities for team  members to collaborate on projects  and tasks  Encouraging team members to share  their knowledge and expertise with  each other’s  Promoting a culture of open  communications and respect among  team members | Observation of student behavior. (Rubrics evaluation)  Oral presentation (Rubrics evaluation |

# **C. Course Content**

|  |  |  |
| --- | --- | --- |
| No | List of Topics | Contact Hours |
|  | Introduction to the course and its content | 2 |
|  | **Biochemical Perspective to Medicine** | 2 |
|  | **Subcellular Organelles and Cell Membranes** | 2 |
|  | **Amino Acids: Structure and Properties** | 2 |
|  | **Proteins: Structure and Function** | 2 |
|  | **Enzymology: General Concepts and Enzyme Kinetics** | 2 |
|  | Midterm Examination | 2 |
|  | Midterm Examination | 2 |
|  | **Chemistry of Carbohydrates (part 1(** | 2 |
|  | **Chemistry of Carbohydrates (part 2(** | 2 |
|  | **Chemistry of Lipids** | 2 |
|  | **Chemistry of Nucleic acids** | 2 |
|  | Hormones (definition, types, sources & functions | 2 |
|  | Vitamins | 2 |
|  | Minerals | 2 |
|  | Revision | 2 |
|  | Final Examination | 2 |
|  | Final Examination | 2 |
|  | Final Examination | 2 |
| Total | | 30 |

# **D. Students Assessment Activities**

| No | Assessment Activities \* | Assessment timing  (in week no) | Percentage of Total Assessment Score |
| --- | --- | --- | --- |
|  | Quizzes | Throughout the course duration | 10 % |
|  | Assignments | Throughout the course duration | 10% |
|  | Theoretical midterm Exam | 7 and 8th week | 30% |
|  | Final Theoretical Exam | 18-19 th week | 50 % |
|  | Total |  | 100% |

\*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

# E. Learning Resources and Facilities

## 1. References and Learning Resources

|  |  |
| --- | --- |
| Essential References | **Harper’s illustrated Biochemistry (25th-edition).** Robert K. Murray, Daryl K. Granner, Peter A. Mayes, and Victor W. Rodwell.  **Biochemistry (Lippincott's Illustrated Reviews Series):** [Richard A. Harvey](http://www.amazon.com/s/ref=ntt_athr_dp_sr_1?_encoding=UTF8&field-author=Richard%20A.%20Harvey&search-alias=books&sort=relevancerank) , [Denise R. Ferrier](http://www.amazon.com/Denise-R.-Ferrier/e/B001ILHIA0/ref=ntt_athr_dp_pel_2), fifth Edition , July 12, 2020, ISBN-13: 978-1608314126  **Lehninger Principles of Biochemistry** : [Albert Lehninger](http://www.amazon.com/s/ref=ntt_athr_dp_sr_1/182-7275388-8721846?_encoding=UTF8&field-author=Albert%20Lehninger&search-alias=books&sort=relevancerank), David L. Nelson, Michael M.Cox Fifth Edition , June 15, 2018, ISBN-13: 978-1429224161 |
| Supportive References | * **ADVANCES IN BIOCHEMICAL ENGINEERING**: <http://www.springer.com/series/10> * **BIOCHEMICAL JOURNAL**: <http://www.biochemj.org/bj/default.htm> * **TRENDS IN BIOCHEMICAL SCIENCES:** <http://www.sciencedirect.com/science/journal/09680004> * **CHEMBIOCHEM Journal**: <http://www3.interscience.wiley.com/journal/72510898/home> * **International journal of biochemistry and Molecular biology**: [http://www. IJBMB.org](http://www.biochemj.org/bj/default.htm) (IJBMB, ISSN 2152-4114)   **Note: Any additional and/or up-to-date references will be mentioned in the ongoing lectures during the semester.** |
| Electronic Materials | [www.lms-su.com](http://www.lms-su.com) |
| Other Learning Materials |  |

## 2. Required Facilities and equipment

| Items | Resources |
| --- | --- |
| facilities  (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.) | Classrooms, laboratories |
| Technology equipment  (Projector, smart board, software) | Projector, software and Computer and microphone in lecture rooms |
| Other equipment  (depending on the nature of the specialty) |  |

# F. Assessment of Course Quality

| Assessment Areas/Issues | Assessor | Assessment Methods |
| --- | --- | --- |
| Effectiveness of teaching | Students  Program Leaders | Surveys + reports |
| Effectiveness of students' assessment | Teaching staff | Course evaluation Surveys |
| Quality of learning resources | Teaching staff and students | Surveys + Course report |
| The extent to which CLOs have been achieved | Head of the Department  Quality Committee  Peer Reviewer | CLOs analysis report |
| Other |  |  |

**Assessor (**Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

**Assessment Methods** (Direct, Indirect)

# **G. Specification Approval**

|  |  |
| --- | --- |
| **Council /COMMittee** | College of Nursing Council- Al-Dawadmi Campus |
| **Reference No.** |  |
| **Date** |  |