|  |  |
| --- | --- |
| **Course Title:** | Biochemistry-1 |
| **Course Code:** | **2-كمص208** |
| **Program:** | **Pharmacy** |
| **Department:** | **Biochemistry** |
| **College:** | **Pharmacy** |
| **Institution:** | **Najran University** |

- Interactive lectures using data show(power point presentation)

- Home assignments.

- Group discussion

- Direct student contact at office.

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# A. Course Identification

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1. Credit hours:** | | | | **(1+1) 2** | | | | | | | | | | | | |
| **2. Course type** | | | | | | | | | | | | | | | | |
| **a.** | University | |  | | College | | |  | Department | | | | **√** | Others |  |  |
| **b.** | | Required | | | | **√** | Elective | | |  |  | | | | | |
| **3. Level/year at which this course is offered:** | | | | | | | | | | | | **3rd semester – second year** | | | | |
| **4. Pre-requisites for this course** (if any)**: No** | | | | | | | | | | | | | | | | |
| **5. Co-requisites for this course** (if any)**: No** | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | |

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

| **No** | **Mode of Instruction** | **Contact Hours** | **Percentage** |
| --- | --- | --- | --- |
| **1** | **Traditional classroom** | (15+30) 45 | 100% |
| **2** | **Blended** |  |  |
| **3** | **E-learning** |  |  |
| **4** | **Correspondence** |  |  |
| **5** | **Other** |  |  |

**7. Actual Learning Hours** (based on academic semester)

|  |  |  |
| --- | --- | --- |
| **No** | **Activity** | **Learning Hours** |
| **Contact Hours** | | |
| **1** | **Lecture** | 15 |
| **2** | **Laboratory/Studio** | 30 |
| **3** | **Tutorial** |  |
| **4** | **Others** (specify) (Theory & practical exams) | 7 |
|  | **Total** | 52 |
| **Other Learning Hours\*** | | |
| **1** | **Study** |  |
| **2** | **Assignments** | 3 |
| **3** | **Library** | 30 |
| **4** | **Projects/Research Essays/Theses** |  |
| **5** | **Others** (specify) |  |
|  | **Total** | 33 |

**\*** The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

# B. Course Objectives and Learning Outcomes

|  |
| --- |
| 1. Course Description The basic concept of biochemistry including classification and reactions of organic compounds, stereochemistry, water and pH. Structure and functions of biomolecules in living matter. It contrasts the simplicity of the building blocks of macromolecules (amino acids, monosaccharides, fatty acids and purine and pyrimidine bases) with the enormous variety and adaptability of the different macromolecules they form (proteins, carbohydrates, lipids and nucleic acids). It highlights the nature of the electronic and molecular structure of macromolecules and their interactions within the cellular environment. Role of vitamins and minerals in biochemical processes. |
|  |
| 2. Course Main Objective |
| 1. Provide basic knowledge of biochemistry for better understanding of biochemical bases of medicine. 2. Provide an introduction to the principles of biochemistry that gives the students a command of its concepts. 3. Provide basic knowledge of the chemical properties of the major classes of biological molecules which contribute to the life of the cell. 4. Provide basic knowledge of PH and buffers role in reactions regulation. 5. Provide basic knowledge of enzymes and their in body reactions and activities regulation 6. Describe the role of vitamins and minerals in biochemical processes. 7. Describe the basic structure of DNA and RNA and their role in the cells. |

## 3. Course Learning Outcomes

| **CLOs** | | **Aligned****PLOs** |
| --- | --- | --- |
| 1 | **Knowledge:** |  |
| 1.1 | Define the concept of Biochemistry and its relationship to medicine. | K 1 |
| 1.2 | Describes the important functions and structures of different biomolecules carbohydrates, lipids and amino acids, proteins, vitamins, nucleic acids, vitamins and their associated clinical correlations. | K 1 |
| 1.3 | Describe the chemical structure of major Biomolecules. | K 1 |
| 1.4 | Correlates between the different Biomolecules and clinical diseases and evaluate some laboratory results& their clinical significance. | K 1 |
| **2** | **Skills :** |  |
| 2.1 | Evaluate different laboratory tests regarding specific clinical conditions. | S 1 |
| 2.2 | Handle effectively laboratory tubes, samples, equipments, and the test results. | S 1 |
| **3** | **Competence:** |  |
| 3.1 | Behave ethically and professionally with colleagues and the teaching staff. |  |

# C. Course Content

|  |  |  |
| --- | --- | --- |
| **No** | **List of theoretical Topics** | **Contact Hours** |
| 1 | Introduction to Biochemistry and Medicine | 1 |
| 2 | Water and PH | 1 |
| 3 | Carbohydrates of physiological significance | 1 |
| 4 | Carbohydrates of physiological significance | 1 |
| 5 | Lipids of physiological significance | 1 |
| 6 | Lipids of physiological significance | 1 |
| 7 | Amino acids | 1 |
| 8 | Proteins | 1 |
| 9 | Proteins | 1 |
| 10 | Chemistry of nucleotides | 1 |
| 11 | Chemistry of Nucleic acids | 1 |
| 12 | Enzymes, Mechanism of action, Kinetics. ,regulation activity | 1 |
| 13 | Enzymes, Mechanism of action, Kinetics. ,regulation activity | 1 |
| 14 | Vitamins | 1 |
| 15 | Minerals | 1 |
| **Total** | | 15 |
|  |  |  |
| **No** | **List of practical Topics** | **Contact Hours** |
| 1 | Laboratory safety | 2 |
| 2 | Correct use and handling of glass ware and devices | 2 |
| 3 | PH & buffers | 2 |
| 4 | PH & buffers | 2 |
| 5 | Carbohydrates identification, classification,…. Hydrolysis | 2 |
| 6 | Carbohydrates identification, classification,…. Hydrolysis | 2 |
| 7 | Carbohydrates identification, classification,…. Hydrolysis | 2 |
| 8 | Lipids solubility, saturation, …. Selective reactions | 2 |
| 9 | Lipids solubility, saturation, …. Selective reactions | 2 |
| 10 | Amino acids | 2 |
| 11 | Amino acids | 2 |
| 12 | Amino acids | 2 |
| 13 | Proteins | 2 |
| 14 | Proteins | 2 |
| 15 | Enzymes | 2 |
| **Total** | | 30 |

# 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** | | |
| 1.1 | Define the concept of Biochemistry and its relationship to medicine. | - Interactive lectures using data show(power point presentation)  - Home assignments.  - Group discussion  - Direct student contact at office. | - MCQs  - Short questions |
| 1.2 | Describes the important functions and structures of different biomolecules carbohydrates, lipids and amino acids, proteins, vitamins, nucleic acids, vitamins and their associated clinical correlations. | - Interactive lectures using data show(power point presentation)  - Home assignments.  - Group discussion  - Direct student contact at office. | - MCQs  - Short questions |
| 1.3 | Describe the chemical structure of major Biomolecules. | - Interactive lectures using data show(power point presentation)  - Home assignments.  - Group discussion  - Direct student contact at office. | - MCQs  - Short questions |
| 1.4 | Correlates between the different Biomolecules and clinical diseases and evaluate some laboratory results& their clinical significance. | - Interactive lectures using data show(power point presentation)  - Home assignments.  - Group discussion  - Direct student contact at office.  - Practical sessions. | - MCQs  - Short questions  - Practical exam  -Log book |
| **2.0** | **Skills :** | | |
| 2.1 | Evaluate different laboratory tests regarding specific clinical conditions. | -Practical sessions.  -Home assignments.  -Group discussion | - Practical exam  - Short questions  -Log book |
| 2.2 | Handle effectively laboratory tubes, samples, equipments, and the test results. | -Practical sessions.  -Home assignments.  -Group discussion | - Practical exam  - Short questions  -Log book |
| **3.0** | **Competence** | | |
| 3.1 | Behave ethically and professionally with colleagues and the teaching staff. | -Practical sessions.  -Self learning  -Group discussion | - Practical exam  - Short questions  -Continuous assessments.  -Log book |

## 2. Assessment Tasks for Students

| **#** | **Assessment task\*** | **Week Due** | **Percentage of Total Assessment Score** |
| --- | --- | --- | --- |
| **1** | Quarterly exam 1 | 7th | 15 |
| **2** | Quarterly exam 2 | 11th | 15 |
| **3** | Oral practical exam | 12th | 5 |
| **4** | Quiz | 13th | 5 |
| **5** | Logbook | 15th | 5 |
| **6** | Final practical exam. | 15th | 15 |
| **7** | Final theoretical exam | 17th | 40 |
| **8** | Total marks |  | 100 |

**\*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 consultations and academic advice :** |
| - Availability of teaching staff for consultations and advice.  - Academic hours will be determined and addressed on home pages of the staff members on Najran university web site as blow:   |  |  | | --- | --- | | Day | Time | | **Sunday** | 1pm – 2 pm | | **Monday** | 2 pm – 3 pm | | **Tuesday** |  | | **Wednesday** | 10am – 12 pm | | **Thursday** |  | |

# F. Learning Resources and Facilities

## 1.Learning Resources

|  |  |
| --- | --- |
| **Required Textbooks** |  |
| **Essential References Materials** | 1. Lippincott’s Reviews of Biochemistry, 5th edition by Champe PC, Harvey RA, Ferrier DR, Lippincott William & Wilkins London, 2008 2. Harper's Illustrated Biochemistry: 28th Edition by Murray RK, Granner DK, Mayes PA, Rodwell VW, McGraw-Hill companies New York, 2009 |
| **Electronic Materials** | <http://www-medlib.med.utah.edu/NetBiochem/NetWelco.htm>  BioChemLinks;  <http://biochemlinks.com/bclinks/bclinks.cfm>  On-line courses;  <http://web.indstate.edu/thcme/mwking/home.html>  <http://www.biology.arizona.edu/biochemistry/biochemistry.html>    <http://www.rpi.edu/dept/bcbp/molbiochem/MBWeb/mb1/MB1index.html>  **Saudi digital library** (Science direct, Blackboard, etc.) |
| **Other Learning Materials** | 1. Text book of Biochemistry with Clinical Correlations 6th Edition, Devlin TM Ed,Wiley –Liss New York 2006. 2. Lehninger, Nelson and Cox Principles of Biochemistry 5th ed. W.H. Freeman and Co. ­NY 2008. 3. Stryer, L. (Berg, Tymoczko and Stryer) Biochemistry 6th **ed. W.H. Freeman Co., NY 2007.** |

## 2. Facilities Required

| **Item** | **Resources** |
| --- | --- |
| **Accommodation**  (Classrooms, laboratories, demonstration rooms/labs, etc.) | Lecture rooms and laboratories are already available |
| **Technology Resources**  (AV, data show, Smart Board, software, etc.) | Computers and multimedia are already available |
| **Other Resources**  (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list) | -Library supplied with reference text books, electronic resources.  - All practical instruments, devices, glass ware, chemicals ….etc. are already available. |

# G. Course Quality Evaluation

| **Evaluation**  **Areas/Issues** | **Evaluators** | **Evaluation Methods** |
| --- | --- | --- |
| Quarterly evaluation feedback. | Course organizer | Exams (direct) |
| Completion of course evaluation questionnaire by each student. | Quality unit | Questionnaire (indirect) |
| End of term discussion between the teacher and the students regarding what went well and what could have gone better. | Course coordinator | Seminar and exams (direct) |
| Observations from colleagues | Department | Observations sheet (indirect) |
| Class observation by supervisors. | Course organizer | Observations sheet(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** | Department of biochemistry |
| **Reference No.** |  |
| **Date** |  |