



Course Specification

— (Bachelor)

Course Title: **Biochemistry-1**

Course Code: **PHCH 208**

Program: **Pharmaceutical Sciences**

Department: **Pharmacology**

College: **Pharmacy**

Institution: **Najran University**

Version: **Version-1**

Last Revision Date: **21/08/2024**



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A. General information about the course:

1. Course Identification

1. Credit hours: (2 (1+1))

2. Course type

A. ☐ University ☐ College ☐ Department ☐ Track ☒ Program
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (3rd level/second year)

4. Course general Description:

The basic concept of biochemistry includes 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.

5. Pre-requirements for this course (if any):

None

6. Co-requisites for this course (if any):

None

7. Course Main Objective(s):

By the end of this course, the student should be able to:

- Provide basic knowledge of biochemistry for better understanding of biochemical bases of medicine.
- Introduce the principles of biochemistry that gives the students a command of its concepts.
- Provide basic knowledge of the chemical properties of the major classes of biological molecules which contribute to the life of the cell.
- Provide basic knowledge of PH and buffers role in reactions regulation.
- Provide basic knowledge of enzymes and their in-body reactions and activities regulation
- Describe the role of vitamins and minerals in biochemical processes.
- Describe the basic structure of DNA and RNA and their role in the cells.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%
2	E-learning	-	-



No	Mode of Instruction	Contact Hours	Percentage
3	Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning 	-	-
4	Distance learning	-	-

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	15
2.	Laboratory/Studio	30
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	-
Total		45

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

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Students after completion this course will be able to: Describes the important functions and structures of different biomolecules carbohydrates, lipids and amino acids, proteins, vitamins, nucleic acids, vitamins and their associated clinical correlations, the different Biomolecules and clinical diseases and evaluate some laboratory results& their clinical significance.	K1	Lectures	Written exams with multiple choice questions (MCQs) and short-answer questions (Quizzes, Mid-term and Final exams)
2.0	Skills			



Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	Evaluate different biological molecules of carbohydrates, fats and proteins, enzymes, vitamins and minerals regarding specific clinical conditions.	S1	Lectures Laboratory work multimedia instruction	Written exams Practical Exams Assignment
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate leadership, skills, in addition to accountability, confidence, and independent thinking to respond to routine or unanticipated circumstances.	V1	Lectures Practice sessions Small group discussion	Observation card

C. Course Content

No	List of Topics (Theory)	Contact Hours
1.	Introduction to Biochemistry	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.	Fat soluble Vitamins	1
15.	Water soluble Vitamins	1
Total		15





No	List of Topics (Practical)	Contact Hours
1.	Laboratory safety	2
2.	Correct use and handling of glass ware and devices	2
3.	PH and its measurement	2
4.	Buffer systems and PH adjustment	2
5.	Carbohydrates: Monosaccharides identification	2
6.	Carbohydrates: Oligosaccharides identification	2
7.	Carbohydrates: Polysaccharides identification.	2
8.	Lipids properties (Physical and chemical) and detection	2
9.	Fatty acids solubility, saturation, and Selective reactions	2
10.	Amino acids properties	2
11.	Amino acids classification and detection	2
12.	Amino acids chemical properties and reactions	2
13.	Proteins properties (Physical and chemical)	2
14.	Proteins classification and detection	2
15.	Enzymes detection and specific enzymatic reactions.	2
Total		30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz	5 th week	10%
2.	Midterm Exam	8 th week	20 %
3.	Practical Quiz	9 th week	5%
4.	Assignment	14th Week	10%
5.	Students Observation card	Per semester	5%
6.	Final Practical Exam	16 th week	10%
8.	Final Theoretical Exam	17 th week	40%

*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	Lippincott's Reviews of Biochemistry, 5th edition by Champe PC, Harvey RA, Ferrier DR, Lippincott William & Wilkins London, 2008
Supportive References	Harper's Illustrated Biochemistry: 28th Edition by Murray RK, Granner DK, Mayes PA, Rodwell VW, McGraw-Hill companies New York, 2009





Electronic Materials	<ol style="list-style-type: none"> 1. http://www-medlib.med.utah.edu/NetBiochem/NetWelco.htm 2. BioChemLinks; http://biochemlinks.com/bclinks/bclinks.cfm 3. Online illustrated courses <ol style="list-style-type: none"> 1) http://web.indstate.edu/thcme/mwking/home.html 2) http://www.biology.arizona.edu/biochemistry/biochemistry.html 3) http://www.rpi.edu/dept/bcbp/molbiochem/MBWeb/mb1/MB1index.html
Other Learning Materials	<ol style="list-style-type: none"> 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.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	<ol style="list-style-type: none"> 1. Suitable lecture room equipped with data show and internet and sufficient number of seats. 2. Suitable laboratories equipped with health and safety tools, internet, and enough seats. 3. Blackboard collaborative system for e-learning in NU.
Technology equipment (projector, smart board, software)	<ol style="list-style-type: none"> 1. Data show. 2. Computers. 3. Internet and Wifi- access
Other equipment (depending on the nature of the specialty)	<ol style="list-style-type: none"> 1. Library supplied with reference textbooks, electronic resources. 2. All practical instruments, devices, glass ware, chemicalsetc. to be available.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Head of departments and students	Direct Indirect (Questionnaires)
Effectiveness of Students' assessment	Department Faculty members and department council	Direct Direct
Quality of learning resources	Students Department faculty member	Indirect (Questionnaires) Direct
The extent to which CLOs have been achieved	Students	Questionnaires (Indirect)
Other	-	-

G. Specification Approval

COUNCIL /COMMITTEE	PHARMACOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	14460217-1071-00001
DATE	21/08/2024

