



T-104
2022

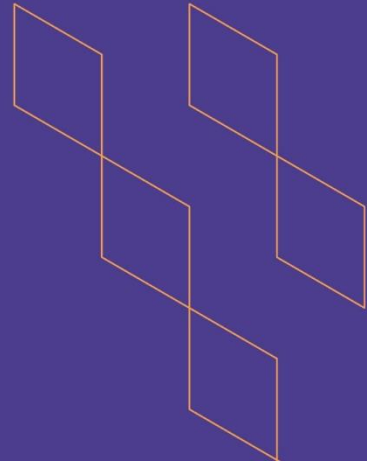
Course Specification





T-104
2022

Course Specification



Course Title: Biochemistry
Course Code: 243 PHL-3
Program: Pharmaceutical Sciences
Department: Pharmacology
College: Pharmacy
Institution: Najran University
Version: Version-1
Last Revision Date: 24/12/2023 H



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A. General information about the course:

Course Identification

1. Credit hours: 3 (3+0)

2. Course type

a. University ☐ College ☒ Department ☐ Track ☐ Others ☐

b. Required ☒ Elective ☐

3. Level/year at which this course is offered:

3rd level/second year

4. Course general Description

The course covers 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). In addition to studying the metabolic pathways of carbohydrates, lipids, amino acids, nucleotides and their abnormalities regarding health and disease state.

5. Pre-requirements for this course (if any): Requirements of health colleges track

6. Co- requirements for this course (if any): None

7. Course Main Objective(s)

Students after completion this course will be:

- Provide an introduction to the principles of biochemistry that gives the students the basic knowledge about the chemical properties of the major classes of biological molecules which contribute to the life of the cell.
- Provide basic knowledge of enzymes and their role 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 cells.
- Understand basic metabolic pathways regarding carbohydrates, lipids, protein, and nucleotides.
- Understand the basic metabolic abnormalities of the macromolecules mentioned above and their relationships to health and disease state.

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	45	100%
2.	E-learning	-	-
3.	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 	-	-
4.	Distance learning	-	-

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	-
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 CLOs 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. State the purpose of the metabolic pathways, the molecule (s) interrupting the pathway and product (s) of the pathway, cofactors involved, the cellular location of the pathway and how pathways interact with each other.	K1	Lectures	Theoretical exams
2.0	Skills			
2.1	Differentiate between the structures of different biological molecules, carbohydrates, lipids, proteins and vitamins and role of each in the body.	S1	Lectures	Theoretical exams



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.2	Recognize the different metabolic pathways of carbohydrates, lipids, amino acids and nucleic acids and correlate between these pathways and the clinical conditions.	S1	Lectures	Theoretical exams Practical Exams
...				
3.0	Values, autonomy, and responsibility			
3.1	Work independently, professionally, and communicate clearly by verbal and written means.	V2	Lectures TBL	Observation card TBL
3.2	Professional use of computer in preparing reports, assignments and oral presentations and to be skilled in the use of electronic library and internet resources for self-directed learning.	V3	Self-directed learning	Assignment
...				

C. Course Content

No	List of Topics	Contact Hours
	Theory:	
1.	Introduction to Biochemistry, stereochemistry, and Pharmacy	1
2.	Water and PH	1
3.	Carbohydrates of physiological significance	2
4.	Carbohydrates of physiological significance	2
5.	Lipids of physiological significance	2
6.	Lipids of physiological significance	2
7.	Amino acids	2
8.	Proteins primary structures	1
9.	Proteins secondary and tertiary structures	1
10.	Chemistry of nucleotides	1
11.	Chemistry of Nucleic acids	2
12.	Enzymes, Mechanism of action, Kinetics. ,regulation activity	2
13.	Enzymes, Mechanism of action, Kinetics. ,regulation activity	2
14.	Vitamins	2





15.	Minerals	1
16.	Introduction to Metabolism	1
17.	Citric acid cycle and Electron transport chain.	2
18.	Glycolysis	2
19.	The Pentose Phosphate Pathway & Other Pathways of Hexose Metabolism	2
20.	Gluconeogenesis & Control of the Blood Glucose	1
21.	Glycogen metabolism	2
22.	Lipids digestion and absorption	1
23.	Fatty acid synthesis	1
24.	Fatty acids oxidation and Ketogenesis	2
25.	Cholesterol metabolism	1
26.	Lipids transport and lipoproteins	1
27.	Digestion and absorption of proteins	1
28.	Catabolism of amino acids and transamination	1
29.	Urea cycle	1
30.	Heme metabolism& jaundice	1
31.	Metabolism of xenobiotics	1
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz-1	5 th week	10%
2.	Midterm Exam	7-8 th week	20 %
3.	TBL	7 th week	5%
4.	Quiz-2	9 th week	10%
5.	Student Activity/Assignment/Presentation	14th Week	10%
6.	Students Observation card	Per semester	5%
7.	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. Pub Med 2. Science direct. 3. BioChemLinks; http://biochemlinks.com/bclinks/bclinks.cfm 4. www.dlaf.nu.edu.sa
Other Learning Materials	-Text book of Biochemistry with Clinical Correlations 6th Edition, Devlin TM Ed,Wiley –Liss New York 2006.



- Lehninger, Nelson and Cox Principles of Biochemistry 5th ed. W.H. Freeman and Co. -NY 2008.
- Stryer, L. (Berg, Tymoczko and Stryer) Biochemistry 6th ed.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	1. Suitable lecture room equipped with data show and internet and sufficient number of seats. 2. Blackboard collaborative system for e-learning in NU.
Technology equipment (projector, smart board, software)	1. Data show. 2. Computer software listed above. 3. Internet and Wifi- access
Other equipment (depending on the nature of the specialty)	Library supplied with reference text books, electronic resources.

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		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	PHARMACOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	COUNCIL NO. 5, 1445-1446 H
DATE	24/12/2023

