

Course Syllabus

1	Course title	Nutritional Biochemistry	
2	Course number	602981	
3	Credit hours	3	
	Contact hours (theory, practical)	3	
4	Prerequisites/corequisites	None	
5	Program title	Ph.D. in Animal Production	
6	Program code	602	
7	Awarding institution	University of Jordan	
8	School	Agriculture	
9	Department	Animal Production	
10	Course level	Graduate Level (Doctor of Philosophy)	
11	Year of study and semester (s)	(Second Year / First Semester)	
12	Other department (s) involved in teaching the course	(Doctor of Philosophy)	
13	Main teaching language	English	
14	Delivery method	Face to face learning	
15	Online platforms(s)	<input type="checkbox"/> Moodle <input type="checkbox"/> Microsoft Teams	
16	Issuing/Revision Date	10/10/2021	

17 Course Coordinator:

Name: Dr. Mohammad Jalal

Contact hours: Dependent on Semester Schedule

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**18 Other instructors****19 Course Description:****As stated in the approved study plan.**

This course will focus on the energy of metabolism, the structure and metabolism of proteins, carbohydrates and lipids and the integration of metabolic systems, enzymes, kinetics and mechanism of action. Also covered are bioenergetics, biochemistry of extracellular and intracellular communication and special topics.

20 Course aims and outcomes: Aims:

1. To review the biological system of energy metabolism.
2. To study the chemical/biochemical properties and metabolic pathways of carbohydrates, lipids, and proteins and how to integrate metabolism.
3. To examine the regulatory mechanisms of macronutrient metabolism and associated signaling pathways.

B- Students Learning Outcomes (SLOs):

Upon successful completion of this course, students will be able to:

Program SLOs	SLO (1)	SLO (2)	SLO (3)	SLO (4)	SLO (5)	SLO (6)	SLO (7)	SLO (8)	SLO (9)	SLO (10)	SLO (11)
SLOs of the course											
1. Enhance the understanding of nutrient metabolism, its regulation, and its relationship with whole body	X	X	X				X	X	X		
2. Develop abilities to critically evaluate and integrate the scientific literature.		X	X	X			X	X		X	X
3. Facilitate interactions and discussion among students from in the classroom environment to look at problems from different perspectives.			X	X				X	X		
4. Apply knowledge gained by presenting a professional presentation in a course-related topic.	X	X		X	X	X			X	X	X
5. Acquire the capability to write a review article for refereed scientific journal.		X		X	X	X	X	X		X	

1. Demonstrate a depth understanding of different disciplines within animal production such as nutrition, physiology, management, breeding, and animal health, and animal biotechnology, and apply this acquired knowledge under commercial and field conditions.

2. Develop research skills and demonstrate knowledge of research methodologies and evidence-based decision making.

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3. Implement basic agricultural concepts acquired when working in public and/or private sector, research institutions, multinational corporations, and regional and international agricultural entities.

4. Utilize critical thinking to analyze and tackle problems encountered when working in the livestock industry

21. Topic Outline and Schedule:

Week	Lecture	Topic	Intended Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous/ Asynchronous Lecturing	Evaluation Methods	Resources
1	1.1	Bioenergetics and Overview of Metabolism	See the students learning outcomes (SLOs) table	Face to Face	Microsoft Teams	Synchronous	Home work, Quizzes, and Exams	Check Reference Section
	1.2	Bioenergetics and Overview of Metabolism		Face to Face		Synchronous		Check Reference Section
	1.3	Bioenergetics and Overview of Metabolism		Face to Face		Synchronous		Check Reference Section
2	2.1	Glycolysis		Face to Face		Synchronous		Check Reference Section
	2.2	Glycolysis		Face to Face		Synchronous		Check Reference Section
	2.3	Glycolysis		Face to Face		Synchronous		Check Reference Section
3	3.1	Gluconeogenesis		Face to Face		Synchronous		Check Reference Section
	3.2	Gluconeogene		Face to Face		Synchronous		Check

		sis					Home work, Quizzes, and Exams	Reference Section
	3.3	Gluconeogenesis		Face to Face		Synchronous		Check Reference Section
4	4.1	Pentose Phosphate Pathway		Face to Face		Synchronous		Check Reference Section
	4.2	Pentose Phosphate Pathway		Face to Face		Synchronous		Check Reference Section
	4.3	Pentose Phosphate Pathway		Face to Face		Synchronous		Check Reference Section
5	5.1	Metabolic Regulation of Glycolytic Pathways	See the students learning outcomes (SLOs) table	Face to Face		Synchronous		Check Reference Section
	5.2	Metabolic Regulation of Glycolytic Pathways		Face to Face		Synchronous		Check Reference Section
	5.3	Metabolic Regulation of Glycolytic Pathways		Face to Face		Synchronous		Check Reference Section
6	6.1	Citric Acid Cycle		Face to Face/		Synchronous		Check Reference Section

							Section
	6.2	Citric Acid Cycle		Face to Face/		Synchronous	Check Reference Section
	6.3	Citric Acid Cycle		Face to Face		Synchronous	Check Reference Section
7	7.1	Oxidative Phosphorylation		Face to Face		Synchronous	Check Reference Section
	7.2	Oxidative Phosphorylation		Face to Face		Synchronous	Check Reference Section
	7.3	Oxidative Phosphorylation		Face to Face		Synchronous	Check Reference Section
8	8.1	Fat Catabolism		Face to Face		Synchronous	Check Reference Section
	8.2	Fat Catabolism		Face to Face		Synchronous	Check Reference Section
	8.3	Fat Catabolism		Face to Face	Microsoft Teams	Synchronous	Check Reference Section
9	9.1	Fat Catabolism	Face to Face	Synchronous		Check Referen	

							ce Section
	9.2	Lipid Biosynthesis		Face to Face		Synchronous	Check Referen ce Section
	9.3	Lipid Biosynthesis		Face to Face		Synchronous	Check Referen ce Section
	10.1	Lipid Biosynthesis		Face to Face		Synchronous	Check Referen ce Section
10	10.2	Amino Acid Catabolism		Face to Face		Synchronous	Check Referen ce Section
	10.3	Amino Acid Catabolism		Face to Face		Synchronous	Check Referen ce Section
	11.1	Amino Acid Catabolism		Face to Face		Synchronous	Check Referen ce Section
11	11.2	Amino Acid Catabolism		Face to Face		Synchronous	Check Referen ce Section
	11.3	Urea Cycle		Face to Face		Synchronous	Check Referen ce Section
12	12.1	Urea Cycle		Face to Face		Synchronous	Check

							Referen ce Section
	12.2	Nitrogen Metabolism in Birds		Face to Face		Synchronous	Check Referen ce Section
	12.3	Nitrogen Metabolism in Birds		Face to Face		Synchronous	Check Referen ce Section
13	13.1	Amino Acid Biosynthesis		Face to Face		Synchronous	Check Referen ce Section
	13.2	Amino Acid Biosynthesis		Face to Face		Synchronous	Check Referen ce Section
	13.3	Amino Acid Biosynthesis		Face to Face		Synchronous	Check Referen ce Section
14	14.1	Amino Acid Biosynthesis		Face to Face		Synchronous	Check Referen ce Section
	14.2	Hormonal Regulation and Integration of Metabolism		Face to Face		Synchronous	Check Referen ce Section
	14.3	Hormonal Regulation and Integration of Metabolism	See the students learning	Face to Face		Synchronous	Check Referen ce Section

15	15.1	Hormonal Regulation and Integration of Metabolism		Face to Face		Synchronous		Check Reference Section	
	15.2	Biochemistry of extracellular and intracellular communication		Face to Face		Synchronous			
	15.3	Biochemistry of extracellular and intracellular communication		Face to Face		Synchronous			Home work, Quizzes, and Exams
				Face to Face		Synchronous			

22 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Midterm Exam	30 %	All topics up to Oxidative Phosphorylation	See the students learning outcomes (SLOs) table	6/12/2021	Face to Face
Homework Assignment	5 %	All Class Material		Weekly	Face to Face
Student Presentations	5 %	All Class Material		Biweekly	Face to Face
Term Paper	20 %	Selected		Throughout	Face to Face



		Metabolism Topics from outside Class Material		Semester with deadline date 16/1/2022	
Final Exam	40 %	Class Material not Covered in Midterm EXam		To be determined later	Face to Face

23 Course Requirements

(e.g: students should have a computer, internet connection, webcam, account on a specific software/platform...etc):

24 Course Policies:

A- Attendance policies: Absence from lectures shall not exceed 15%. Students are expected to attend all lectures but if a student is absent from class, it is their responsibility to get the material that was missed.

B- Absences from exams and submitting assignments on time:

Make-up exams will be given to students with acceptable excuses-- all effort must be made to contact the instructor if a student will not make exam on time. Exams must be made up within 3 days of the scheduled exam. An acceptable excuse will be reviewed on a case by case basis. Students that do not show up for a test without previous discussion with the instructor will receive a zero for that test- the instructor will not try to contact the student—it is the students responsibility to know when the exams are and show up for the exams and also reschedule with the instructor prior to the exam if necessary.

C- Health and safety procedures:

Follow required and established safety and healthy standards.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

Zero tolerance policy for any form of academic dishonesty and application of University of Jordan



student code of conduct regarding any form of academic dishonesty

E- Grading policy:

Midterm Exam 30%

Homework Assignments 5%

Student Presentations 5%

Term Paper 20%

Final Exam 40%

F- Available university services that support achievement in the course:

E-learning website and Microsoft Teams

25 References:

A- Required book(s), assigned reading and audio-visuals:

Lehninger Principles of Biochemistry, 7th Edition (2018)

By: David L. Nelson and Michael M. Cox

B- Recommended books, materials, and media:

1. Biochemistry, 9th Edition (2019) by Lubert Stryer. W.H. Freeman, USA.
2. Molecular Nutrition (2003), by J. Zemplini and H. Daniel. CABI Publishing, UK.
3. Various refereed journals in the field of biochemistry



26 Additional information:

None

Name of Course Coordinator: Dr. Mohammad Jalal Signature: ----- Date: -----
Head of Curriculum Committee/Department: ----- Signature: ----- ---
Head of Department: ----- Signature: ----- -
Head of Curriculum Committee/Faculty: ----- Signature: ----- -
Dean: ----- Signature: -----