

Course Syllabus

1	Course title	Enzymes in Food Processing
2	Course number	603911
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4	Prerequisites/corequisites	X (Graduate Level).
5	Program title	Ph.D. Food Science and Technology
6	Program code	032
7	Awarding institution	University of Jordan
8	School	Agriculture
9	Department	Nutrition and Food Technology
10	Level of course	Graduate
11	Year of study and semester (s)	Spring 2020
12	Final Qualification	Ph.D.
13	Other department (s) involved in teaching the course	X
14	Language of Instruction	English
15	Date of production/revision	Jan./2020

16. Course Coordinator: Dr. Ayed S. Amr

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17. Other instructors:

None

18. Course Description:

The course deals with the general kinetic principles governing enzyme behavior. It also covers the sources of food enzymes, their immobilization, Assay & various forms. General characteristics and occurrence of carbohydrate enzymes, lipases, and proteases as well as oxido-reductases are covered. Application of enzymes in the baking and milling industries, as well as starch and syrup industry , dairy industry and fruit and vegetable processing is discussed . Finally the course studies the legal and health aspects of enzyme utilization. It also covers the use of enzymes in food analysis and some aspects of enzymes and bioengineering.

19. Course aims and outcomes:

A- Aims:

After completing the course, the student is expected to:

- 1- Become familiar with the theoretical aspects of enzymology especially their kinetics and types of inhibition.
- 2- Become familiar with enzyme terminology .
- 3- Understand the classes of enzymes with special reference to food enzymes.
- 4- Be able to conduct an enzyme assay.
- 5- Be able to extract an enzyme from its natural sources..
- 6- Understand the roles of enzymes in the processing of the different food commodities.
- 7- Become familiar with the technology of enzyme immobilization.
- 8- Solve some food processing problems using enzymes.
- 9- Learn how to design an experiment in the area of enzymology .

B- Intended Learning Outcomes (ILOs): Successful completion of the course should lead to the following outcomes:

A. A- Knowledge and Understanding: Student is expected to

- A1-** Explain the theoretical aspects of food enzymology.
- A2-** Explain the kinetic principles of enzymology.

A3- Appreciates the importance of enzymes in food processing.

B. Intellectual Analytical and Cognitive Skills: Student is expected to

- B1-** Solve problems on enzyme kinetics.
- B2-** Recognizes the different types of inhibition..
- B3-** Identifies the sources of enzymes, their units and nomenclature.
- B4-** Explains the effect of the different factors on enzyme activity.
- B5-** Get familiar with the different enzyme classes.

C. Subject- Specific Skills: Students is expected to

- C1-** Choose the proper enzyme for the different food processes.
- C2-** Solve food related problems using enzymes.
- C3-** Use enzymes in the production of some foods.

D. Transferable Key Skills: Students is expected to
D1- Know how to immobilize enzymes. .
D2- Know how to use enzymes as indicators and quality Control..
D3- Know how to isolate and purify enzymes.

20. Topic Outline and Schedule:

Topic	Lecture	Instructor	Achieved ILOs	Evaluation Methods	Reference
Enzymes, Definition of terms, and specificity	1	Amr	A1	Group discussion.	1
Chemical kinetics, zero and first order reactions	2	Amr	A2	Group discussion.	1
Second order reaction. catalysis, effect of temperature on enzyme activity.	3,4	Amr	A2,A3	Group discussion.	1,2
Effect of different conditions on activity.	5,6,7,8	Amr	B1,B2,B4	Group Discussion	1,2
Enzyme units , quantitative assay& nomenclature.	9,10, 11	Amr	B3	Group Discussion	1
Carbohydrases, Proteases and Lipases.	12,13,14, 15,16,17	Amr	B5	Group Discussion	2
Enzymes in the processing of the different commodities.	18,19,20, 21,22,23, 24,25,26.	Amr	C1,C2,C3	Group Discussion, Term paper, Midterm.	2
Enzymes in Food Quality Control.	27	Amr	D2	Group Discussion,	2
Commercial Enzyme Production	28	Amr	D3	Group Discussion,	2
Immobilization and Detoxifying	29-31	Amr	D1	Group Discussion, Project. Final.	2

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:
 Lectures, Group discussions, Term paper, Project, Midterm and Final Exams. Term papers and projects are presented by the students.

22. Evaluation Methods and Course Requirements:

As shown in table.

23. Course Policies:

A- Attendance policies: Attendance is taken in the beginning of every lecture.

B- Absences from exams and handing in assignments on time: Subject to university rules and regulations.

C- Health and safety procedures: Subject to University Regulations.

D- Honesty policy regarding cheating, plagiarism, misbehavior: Subject to university regulations.

E- Grading policy: Midterm(30%), Term paper, quizzes, assignments and Project(30%), Final (40%).

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

24. Required equipment: (Facilities, Tools, Labs, Training....)

Lecture Hall, Computer Lab.

25. References:

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

1-Nelson, D. and Cox, M.2008. Lehninger Principles of Biochemistry. Fifth Edition. Worth, New York.

2-Tilak Nagodawithana, and Gerald Reed. 1993.ENZYMES IN FOOD PROCESSING. Elsevier Publishing Company.

Recommended books, materials, and media:

Tucker, G.,and Woods. 1991. Enzymes in Food processing. Blackie, London

26. Additional information:

- Concerns or complaints should be expressed in the first instance to the module lecturer; if no resolution is forthcoming, then the issue should be brought to the attention of the module coordinator (for multiple sections) who will take the concerns to the module representative meeting. Thereafter, problems are dealt with by the Department Chair and if still unresolved the Dean and then ultimately the Vice President. For final complaints, there will be a committee to review grading the final exam.
- For more details on University regulations please visit:
<http://www.ju.edu.jo/rules/index.htm>



Name of Course Coordinator: Ayed Amr -Signature:

Date: June/2020.

Head of curriculum committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of curriculum committee/Faculty: ----- Signature: -----

Dean: ----- -Signature: -----