



Faculty: Science
Department: Biotechnology and Genetic Engineering

Module Syllabus

Module Name: Biosensors

Module Number: 240475

Level: 4th year

Credit Hours: 3

Prerequisite / Co-Requisite: 240345

Lecturer (Dr. Raed Kanan, Assistant Professor)

Office Number: 819

Office Hours: see schedule at office

Phone: +962-2-6300200

Ext: 341

E-mail: Raedk32@yahoo.com, rkanan@philadelphia.edu.jo

Module Coordinator:

Aims (Module Purpose):

This module is an advanced course that is a selective requirement for the department. It is based on lectures and it focuses on different types of biosensors and their use in diagnostic and application in biosafety. A basic emphasis on the design and structure of commonly used biosensors using interactive and analysis procedures

Teaching Methods:

Lectures and online tutorials.

Learning Outcomes:

Specify individual learning outcomes you expect students to achieve during the module, using appropriate action verbs (define, demonstrate, analyze, compute, explain design, ... etc.) to begin each statement.

At the end of this module, student will be able to:

* Explain the importance of biosensors

* Understanding of the structure, function, and uses of different types of biosensors in diagnosis and commercial application

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*Demonstrate the ability to apply knowledge of usability of such devices in the biotechnology field and deriving the right information from the analysis of these devices including quality control.

Contribution to Program Learning Outcomes:

This course should add more knowledge and intellectual skills to the students in modern medical Genetics

Module Outline:

Week	Date	Subject
(1)		Introduction to biosensors
(2)		Redox-Hydrogel based biosensors
(3)		Hybridization of oligonucleotide sensitive electrodes
(4)		Screen Printing for biosensors
(5)		Kinetic modeling for biosensors
(6)		Kinetic modeling for biosensors 2
(7)		First Exam
(8)		Bio-, Chemi- and ECL for fiber optic biosensors
(9)		Determination of metal ions by biosensors
(10)		Fluoresce based biosensors
(11)		Fluoresce based biosensors 2
(12)		Second exam
(13)		Protein engineering for biosensors
(14)		Protein engineering for biosensors 2
(15)		Protein engineering for biosensors 3
(16)		Final exam

Modes of Assessment:

Modes of Assessment:	Score	Date
First Exam	25%	On board
Second Exam	25%	On board
Final Exam (Comprehensive; written, verbal, hand-ins, ... etc.)	50%	On board

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** Make-up exams will be offered for valid reasons only with consent of the Dean. Make-up exams may be different from regular exams in content and format.*

Attendance Policy:

Lecture attendance is mandatory. Student is allowed maximally 15% absentia of the total module hours.

More than this percentage, student with an excuse will be drawn from the module. Otherwise, student will be deprived from the module with zero mark assigned.

Expected Workload

On average you should expect to spend at least (4) hours per week on this module.

Text Book(s) and Supporting Materials:

Text book(s):

Title: "Biosensors; a practical approach",
Author(s)/Editor(s): Cooper J., and Cass T.
Publisher: Oxford University Press
ISBN: 0 19 963846 4, second edition, , 2004

In addition to the above, the students will be provided with handouts by the lecturer.

References:

Students will be expected to give the same attention to these references as given to the Module textbook(s)

Website(s):

http://www-biol.paisley.ac.uk/marco/enzyme_electrode/Chapter1/START.HTM