Syllabus

BIOTECHNOLOGY FOR AGRICULTURAL CROP PRODUCTION - 73902

Last update 07-11-2016

HU Credits: 2

Degree/Cycle: 2nd degree (Master)

Responsible Department: field and vegetable crops-international prog.

Academic year: 0

Semester: 1st Semester

Teaching Languages: English

Campus: Rehovot

Course/Module Coordinator: Prof. Arie Altman

Coordinator Email: arie.altman@mail.huji.ac.il

Coordinator Office Hours: Mondays during the semester (27/10/2014-30/1/2015). Building H (Plant Sciences), ground floor

Teaching Staff:
Course/Module description:

BIOTECHNOLOGY FOR AGRICULTURAL CROPS:
The course will deal with the basic principles and selected applications of biotechnology for agricultural crops, emphasizing the need for a different type of agriculture, in order to support the increasing needs for food (quantity and quality) facing climatic changes as well as increased abiotic and biotic stress conditions. The basic aspects of the major biotechnological tools and solutions will be evaluated.

Course/Module aims:
1. To expose the students to the basic scientific evidence and technical aspects of the different disciplines of agricultural biotechnologies (mainly for plants and crops).
2. To clarify the major scientific, ecological and sociological aspects of biotechnology in agriculture and food production.
3. To discuss the general issues and interrelationships of science, agriculture and human well-being.

Learning outcomes - On successful completion of this module, students should be able to:
1. To describe the major basic biotechnologies related to agricultural production.
2. To explain the major practical biotechnologies aimed at solving agriculture and food production problems.
3. To evaluate the achieved progress, the possible risks and future needs of agricultural biotechnologies.
4. To examine the ecological, sociological and ethical issues associated with genetically-modified (GM) plants and their products.

Attendance requirements(%):
80%

Teaching arrangement and method of instruction: ❑ Formal lectures will consist about 2/3 of the course
❑ About 1/3 of the time will be devoted to free discussions on selected topics (from the list of required and suggested reading, and others).

Course/Module Content:
1. Background to general biotechnology: introductory remarks;
Agricultural biotechnologies and breeding - global perspectives and trends; Limitations of traditional agriculture in meeting land, environmental and economic constraints.

2. Micropropagation and in vitro production of pathogen-free plants.

3. Germplasm storage, conservation of plant genetic resources.

4. Introduction to asexual (somatic) cell genetics: protoplasts, haploids and selection.


6. Molecular breeding for plant abiotic stress tolerance (drought, salinity etc.).

7. Molecular breeding for plant pest control (viruses, insects, herbicides).

8. Biotechnology of crop yield and quality traits: flowering, ripening, color, scent, plant architecture.


10. Discussion and Concluding Remarks.

**Required Reading:**


4. Crop Biotech Update (weekly electronic update)- selected

5. Selected chapters and/or paragraphs from the above book (1- an electronic
version is available in the library).

Additional Reading Material:
This book is available in an electronic version in the library. Please consult Nurit (or the library) how to access it.
(2010 - St. Louis, USA. 2014 - Melbourne, Australia).
(a PDF of this and another one is in the course file).

Other general books are also available. In addition, other references and representative research publications of various topics will be mentioned and added here.

Course/Module evaluation:
End of year written/oral examination 50 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 50 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information:
A final written exam will be given after the end of the course (short answers to questions on the various topics which were discussed) - will consist 50% of the final course grade.

In addition, selected topics will be offered to students, on which they'll have to write a final term papers (about 5-8 printed pages - instructions will be given at a later date). This part will consist 50% for the final course grade.