



**The Hebrew University of Jerusalem**

The Robert H. Smith Faculty of Agriculture, Food & Environment

The Division for External Studies

Miri Ben-Haim, Director

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January 5, 2009

## **BIOTECHNOLOGY IN AGRICULTURE IN A WORLD OF GLOBAL ENVIRONMENTAL CHANGES**

**February 17 – March 18, 2009**

### **OBJECTIVES**

The course is aimed at training participants from developing countries in order to promote the use of new biotechnological techniques in modern agricultural production. The environment is changing and this important parameter will be a central component of this course.

Our anticipation is that participants will gain important knowledge which they will be able to transmit and apply for the good of their society. The course promotes in-group contacts and foresees that these contacts will lead to research cooperation between the participants, their respective countries and the researchers at our Faculty.

Today's challenges are various and contradictory. Increased agricultural yields are needed in order to feed a growing population, negative environmental impacts must be minimized, and production has to adapt to a rapidly- and ever-varying environment stemming from climatic change. New technologies and new approaches, such as improved crops through genetic engineering and genomic-assisted breeding and the use of recycled wastewater, are being developed at our Faculty in order to address these challenges. Our aim is to provide the participants with the necessary tools to develop and pursue ways of dealing with increased product demand, with the requirement for reduced negative impact and with significant environmental changes such as desertification, water shortages, salt stress and crop diseases.



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## **COURSE OF STUDIES**

### **TOPICS OF STUDY**

The topics will reflect societal research needs and the research interests of our Faculty. They will be organized around central themes relevant to today's agricultural challenges and where biotechnology can make a difference:

#### **1. Principles in biotechnology**

- Introduction to agrobiotechnology
- Molecular Biology: basics and hands-on practice
- Bioinformatics: basics and computer lab
- Genomics
- Molecular markers based plant breeding
- Microbial ecology in agricultural biotechnology

#### **2. Agriculture in a changing climate: global warming, desertification**

- Ecophysiology and ecology of plants, land use under climate change
- Soils under climate change
- The changing map of crop diseases

#### **3. From waste to value: water recycling as an essential agricultural resource**

- Water treatment: approaches and technologies
- Wastewater microbiology and soil functioning
- Recycling water in aquaculture
- Economics of wastewater recycling

#### **4. Agriculture under stress**

- Plant responses to salinity and desiccation
- Microbial inoculation: improving plant growth under optimal conditions

#### **5. Plant protection**

- Early detection of plant diseases
- Evolving diseases, evolving technologies
- Enhancing defense plant responses with agricultural practices
- Biotechnology-based pest control



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### CONFERENCE

**The Otto Warburg Minerva Center for Agricultural Biotechnology** (on campus) will be holding an international conference from **February 23-26, 2009** in the subject of Bioenergy: Harnessing Plant Metabolism. All accepted participants will participate in the conference as part of the course requirements. For more details, you can visit the Website: <http://departments.agri.huji.ac.il/biotech/symposium.htm>

### STUDY CONDITIONS

- Classes will be held at the Faculty's Rehovot campus, where there are laboratories, advanced research equipment and the Central Library of Agricultural Science. Laboratory sessions will be incorporated in the course, relevant to subjects studied.
- Around-the-clock computer access will be provided, and computers will be used extensively.
- Basic instruction will be given to achieve the required level of proficiency in PowerPoint for preparation of a final project.
- Scientific material and homework will be assigned and graded.
- Professional field trips will be held.
- Full attendance is required.

### COURSE COMPLETION

Each participant will prepare a final project, which will be reviewed and graded. It should apply knowledge acquired during the course to a topic in agricultural biotechnology. Participants are advised to bring with them digitalized data relevant to their countries.

On completion of the course and fulfillment of its requirements, participants will receive certificates, which will be accredited by many universities.



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### REQUIREMENTS

Candidates interested in attending this program require:

- M.Sc. degree or above in biology or agriculture from a recognized university. (A detailed record of studies and copies of degrees must be included with application forms.)
- Documentation of academic studies conducted in English OR a TOEFL score of at least 89 on the internet-based scale OR an internationally recognized equivalent. (The language of instruction is English. Therefore, participants whose native tongue isn't English, must furnish proof of proficiency in this language.)
- Basic knowledge in molecular biology.
- Professional experience in the field is recommended.
- An official certificate of good health.
- Letters of recommendation are required from the candidate's place of work or university.

### COST AND APPLICATION

The **cost** of this 30-day course is \$3,970 (not including air-fare).

Some **scholarships** are available from MASHAV (see below) to cover the fee for study. The scholarship covers tuition, board, lodging and travel in Israel required for the purposes of the program of studies. The scholarship **does not include** travel costs to and from the home countries or incidental expenses.

**Application forms** may be obtained from the nearest Israeli diplomatic or consular representative or can also be downloaded from the Internet site of the Foreign Ministry of Israel, MASHAV Study Programs. Their address is: <http://www.mfa.gov.il>

Completed applications (**2 copies**) **MUST** be sent directly to the Israeli representative in your country immediately. In addition, please send a copy of the forms to the Faculty by e-mail to [friedj@agri.huji.ac.il](mailto:friedj@agri.huji.ac.il) .



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### ADDITIONAL DETAILS FOR PARTICIPANTS

- **ACCOMMODATIONS:** Single bedroom accommodation in a shared apartment will be provided in our fully equipped guest-house on campus. Meals will be provided. Both laundry (on campus) and dry cleaning (in town) are at the participant's expense.
- **WEATHER:** The weather in Israel during the winter months is varied, approximately 5-20°C. There may be some days where light clothing is appropriate but it might also rain and be quite cool during this season. Participants are requested to bring clothes suitable for outdoor activities, including a warm jacket and comfortable walking shoes. We also recommend that you bring some light sweaters, long-sleeved shirts, a raincoat and an umbrella.
- **INSURANCE:** Participants are insured for medical care during their stay in Israel. This does not include pre-existing conditions and /or major dental care. Personal belongings are not insured, and are the responsibility of each individual.
- Participants who take regular **MEDICATION** are requested to bring enough medicine for the duration of the course. Participants who wear **GLASSES** are advised to bring a spare pair.
- We recommend that **HAND LUGGAGE** include basic toiletries and a change of clothes for the first day or so. These should be carried separately in case of delay in baggage delivery.
- Participants will not receive any allowance or pocket money. Please bring some money for **SMALL EXPENSES**.
- **AIRPORT TRANSPORTATION:** Those accepted to the course will supply flight details to their local Israeli representative, to be forwarded to us. Upon arrival in Israel, the participant will pick up his/her luggage. After passing through customs, the participant will enter the arrivals terminal and walk towards the right. Near the car rental counters, you will see a "TOURBUS" counter. This is a special taxi service, which has a list of expected arrivals. Go to the counter and tell them your name, country and that you're attending a course at the Faculty. You will be taken to the Faculty of Agriculture, Rehovot, free of charge. This service is pre-paid.

**PLEASE DO NOT**

**TAKE ANY OTHER FORM OF TRANSPORTATION**



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## **PARTICIPATING INSTITUTIONS**

This 30-day course is truly a joint venture. Involved in its implementation are:

- Academics: under the auspices of the Hebrew University of Jerusalem's Robert H. Smith Faculty of Agriculture, Food & Environment. Academic Coordinator: Prof. Edouard Jurkevitch
- Administration: by the Faculty's Division for External Studies in cooperation with the Division for International Cooperation of the Ministry for Foreign Affairs (MASHAV).

### **MASHAV**

Israel's Center for International Cooperation, known as **MASHAV** in its Hebrew acronym, was founded in 1958 as part of the Ministry of Foreign Affairs. It is responsible for initiating and implementing Israel's development-cooperation program worldwide. MASHAV aims at transferring the expertise and technologies, which have assisted Israel in its own path to development, to other countries. Today, Israel cooperates with almost 140 countries, providing training in Israel and abroad, operating on-site demonstration projects and building medical infrastructures in partner countries. MASHAV is active in fields ranging from agriculture to medicine and from community development to entrepreneurship.

### **THE HEBREW UNIVERSITY OF JERUSALEM**

The Hebrew University of Jerusalem was opened in 1925, preceding the establishment of the State of Israel by over two decades. The University was designed to be a world class institution of higher learning and research. Today, the Hebrew University comprises 7 faculties, 15 schools, some 60 research centers, and a present student body of about 24,000 and a tenured-track faculty of some 1,500. One third of its enrollment is at the M.Sc. and Ph.D. level.



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### **THE ROBERT H. SMITH FACULTY OF AGRICULTURE, FOOD & ENVIRONMENT**

The Hebrew University's Robert H. Smith Faculty of Agriculture, Food & Environment was established in 1942 in Rehovot, a city at a distance of some 55 km (35 miles) from the main campus of the University in Jerusalem. The site was chosen due to considerations of climate and soil conditions. It is the only agricultural institution of higher education in Israel offering university degrees.

Agricultural Biotechnology is taught at the Faculty at both undergraduate and postgraduate levels. The Faculty's high level of research is known worldwide. A vast range of individual and group research activities takes place, with an interdisciplinary approach encouraged by various research centers. This course will be conducted in cooperation with **The Otto Warburg Center for Agricultural Biotechnology**, established at the Faculty in 1984. The Center is geared to conducting research programs both within the Faculty and with scientists in similar fields all over the world.

The Faculty's **Division for External Studies** was established in 1986. One of its aims is to expose academic graduates from abroad to post-graduate programs, giving them insight into the achievements and research of Israel in general (and of the Faculty in particular), expanding their knowledge in specific fields and creating opportunities for international cooperation.

### **COMMUNICATION**

Further information relating to the subject matter of the course may be obtained from:

Division for External Studies

Robert H. Smith Faculty of Agriculture, Food & Environment

P.O. Box 12

Rehovot, Israel 76100

Tel. 972-8-9489509, or 972-8-9489511

Fax. 972-8-9470171

Web-site (being up-dated): <http://www.agri.huji.ac.il/external/international.html>

Director: Ms. Miri Ben-Haim

**Program Administrator: Ms. Joyce Fried**

**E-mail address: [friedj@agri.huji.ac.il](mailto:friedj@agri.huji.ac.il)**