COURSE OUTLINE

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	AGRICULTURE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	AGR_807	**SEMESTER OF STUDIES**	8th
COURSE TITLE	Special Topics on Plant Breeding		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	3	
Laboratory exercises	2	
Total	5	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (4).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	specialised general knowledge, skills development
PREREQUISITE COURSES:	Typically, there are no prerequisite courses. Students must have basic knowledge of Plant Breeding and Agricultural Experimentation.
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBPAGE (URL)	

2. LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The course aims at introducing the students to advanced breeding methods especially for resistance in biotic and abiotic stress and for improving selected important crops.

By completing this course, the students are expected to have achieved the following skills and capabilities.:

- Comprehensive and detailed understanding of breeding for resistance to diseases and specific plant pests
- To design and implement advanced plant breeding schemes for resistance to drought, cold and other abiotic stress.
- To design and implement advanced plant breeding schemes for specific crops such as eggplant tomato, wheat, corn etc.
- Based on knowing the principle and effect of plant breeding methods predict the outcome and breeding success for resistance on biotic and abiotic stress and in specific crops.
- The ability to recognize the experimental rationale of plant breeding for specific traits and cops as they

are described in peer-reviewed research articles and books.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Teamwork	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Generally, by the end of this course the student will, furthermore, have develop the following general abilities (from the list above):

Searching, analysis and synthesis of facts and information, as well as using the necessary technologies
Decision making
Working independently
Production of new research ideas
Promotion of free, creative and inductive thinking

3. SYLLABUS

1. Resistance to Diseases: Plant self-defense organization. Defense mechanisms. Factors affecting the expression of resistance.
2. Plant Breeding schemes to increase resistance. Genetic engineering and biotechnological methods for disease resistance.
3. Resistance to abiotic stress: Drought, increased salinity, nutrient deficiency
4. Resistance to abiotic stress: low / high temperatures. Genetic engineering and biotechnological methods for resistance to abiotic stress.
5. Tomato breeding. Breeding objectives. Breeding methods and tools. Economic importance
6. Pepper and eggplant breeding. Breeding objectives. Breeding methods and tools. Economic importance.
7. Cucurbit breeding. Breeding objectives. Breeding methods and tools. Economic importance.
8. Breeding aromatic and medicinal plants. Breeding objectives. Breeding methods and tools. Economic importance.
9. Breeding Wheat. Breeding objectives. Methods and tools. Economic importance. Wheat species, varieties and hybrid species.
10. Barley breeding. Objectives, methods and tools. Economic importance. Barley varieties.
11. Maize breeding. Varieties, hybrid cultivars. Breeding objectives, yield, adaptation, quality.
12. Breeding potato. Breeding methods and objectives.
13. Breeding Cotton. Breeding objectives and methods. Breeding for disease resistance and for fiber yield.

Laboratory Exercises
Case studies in:

- Breeding tomato
- Breeding cucurbits
- Breeding aromatic and medicinal plants
- Breeding wheat
- Breeding maize
- Breeding potato

4. TEACHING AND LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Face to face lectures.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES
Use of ICT in teaching, laboratory education, communication with students</td><td>Use of Information and Communication Technologies (ICTs) (e.g. Microsoft PowerPoint) in teaching. The contents of the course of each chapter are uploaded on the internet, that the students can freely download using a password which is provided to them at the beginning of the course.</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.

Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures (3 contact hours per week x 13 weeks)</td><td>39</td></tr>
<tr><td>Laboratory exercises (2 contact hours per week x 6 weeks)</td><td>12</td></tr>
<tr><td>Hours for private study of the student, preparation and attendance mid-term or/and final examinations.</td><td>74</td></tr>
<tr><td>Total number of hours for the Course (25 hours of workload per ECTS credit)</td><td>125 hours (total student workload)</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other.

Specifically, defined evaluation criteria are given, and if and where they are accessible to students.</td><td>Final mandatory written examination, full length questions and / or multiple-choice questions, as well as questions based on the laboratory work. Minimum pass grade= 5, scale 0-10.

All the above are taking place in Greek.</td></tr>
</table>

5. ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*

1. George Acquaah. Principles of Plant genetics and Breeding. Wiley-Blackwell; 2 edition (October 1, 2012)
2. Jack Brown, Peter D.S. Caligari, Hugo A. Campos. Plant Breeding. Blackwell Publishing Ltd, 2014R.
3. E. Niks, J. E. Parlevliet, P. Lindhout, Y. Bai. Breeding Crops with Resistance to Diseases and Pests. Wageningen Academic Publishers, 2011.

- *Related academic journals:*

Crop Science
Molecular Breeding
Euphytica
Industrial Crops and Products
Frontiers in Plant Science