

<b>Course title</b>	<b>Introduction to Botany</b>				
<b>Course code</b>	<b>GALA1105</b>				
<b>Course type</b>	<b>Lectures and practical application in the lab.</b>				
<b>Level</b>	Higher Diploma				
<b>Year / Semester</b>	1 <sup>st</sup> Year / 1 <sup>st</sup> Semester				
<b>Teacher's name</b>	Christina Christodoulou				
<b>ECTS</b>	6	<b>Lectures / week</b>	2	<b>Laboratories / week</b>	2
<b>Course purpose and objectives</b>	The course “ <b>Introduction to Botany</b> ” starts with the external and internal morphology of plants and continues with the physiology of plants. The goal of the course is to familiarise the students with the basic concepts of Botany, the characteristics of living and non-living organisms and the internal functions of the life of plants. In short, the course aims to help the students become aware of the structures and mechanisms that plants develop so to cope with the stress caused by the external environment.				
<b>Learning outcomes</b>	<p>Upon completion of the course, students are expected to:</p> <p><b>Theoretical Learning Outcomes:</b></p> <ol style="list-style-type: none"> <li><b>Explain</b> the characteristic features of living and non-living organisms and their properties, as well as their various processes (e.g. photosynthesis) and mechanisms (e.g. respiration)</li> <li><b>State</b> the basic features of plant organisms and the main categories of plants</li> <li><b>Distinguish</b> the cells, tissues, organs of plants and recognise the structure of the cell</li> </ol> <p><b>Practical Learning Outcomes:</b></p> <ol style="list-style-type: none"> <li><b>Experiment</b> with plants and <b>draw conclusions</b> regarding phototropism, photoperiodism, heredity and the production of new species</li> <li><b>Examine</b> mechanisms and structures that plants develop through their evolution to cope and survive under the influence of the external environment</li> </ol>				
<b>Prerequisites</b>		<b>Required</b>			
<b>Course content</b>	<p><b>Week 1</b></p> <p><b>Lecture</b></p> <ul style="list-style-type: none"> <li>Living and non-living organisms, properties</li> <li>Features of plant organisms</li> <li>Categories of plants</li> </ul> <p><b>Laboratory Practice:</b></p> <ul style="list-style-type: none"> <li>Laboratory rules and safety – Short test on health and safety rules</li> <li>Familiarity with laboratory equipment (utensils, chemical reagents and their safe handling)</li> </ul> <p><b>Week 2 Morphology - Plant cytology</b></p>				

### **Lecture**

- Cell
- Prokaryotic and eukaryotic
- Structure and functions of a plant cell
- Chloroplasts
- Animal and plant cell
- Cell membrane
- Core structure
- Microtubules

### **Laboratory Practice:**

- Introduction to Microscopy and macroscopic examination of different Plants
- The plant cell (Microscopic Observation).
- Identification of main groups of plant organisms (Lower plants, Gymnosperms, Angiosperms)-(Macro and Microscopic Observation).

### **Week 3-4: Histology and Organography**

#### **Lecture**

- Tissue and categories
- Meristomata
- Stem tissues
- Types of parenchyma
- Aerenchyma
- Supportive tissue
- Type of tissue ducts
- Monocotyledons and dicotyledons
- Organography: root types

#### **Laboratory Practice:**

- Histology of plants (Microscopic Observation).
- Organography of plants (Leaf, Stem, Root) – (Macro and Microscopic Observation).

### **Week 5-6: Organography of plants and mode of reproduction**

#### **Lecture**

- Organography of plants
- Reproductive organs of plants
- Fruit and sperm, fertilisation
- Abnormalities of the biological cycle and race

#### **Laboratory Practice:**

- Reproductive organs of plants - (Macro and Microscopic Observation).
- Fruit and sperm – (Macro and Microscopic Observation).

### **Week 7: Plant Physiology (PART 1)**

#### **Lecture**

- Plant living and behaviour conditions
- Change of matter in plants
- The cell as an osmotic system

#### **Laboratory:**

- Osmosis- (Experimental Exercise on potato cubes)

**Week 8: Plant Physiology (PART 2)**

**Lecture**

- Intake – secretion – movement of substances
- Nutrient salts
- Photosynthesis

**Laboratory Practice:**

- Respiration and Water Stress- Wilting Point- (Experimental Exercise in legumes/ aromatic plants).

**Week 9: Respiration in Plants and Hormones**

**Lecture**

- Composition of organic substances
- Respiration – breathing mechanism
- Nutrition of heterophytic plants

**Week 10: Plant Growth and Formation**

**Lecture**

- Physiology of growth and movement
- Differentiation and formation of plants
- Periodicity

**Week 11: Plant Genetics**

**Lecture**

- Growth and Development
- Heredity
- Mutations, production of new species

**Week 12: Plant Growth Mechanisms (**

**Lecture**

- Plant mechanism for coping with environmental stresses (e.g. sun deprivation, overheat, cold, drought, herbivore )

**Course Breakdown**

Week 1	Living and non-living organisms, plant features, plant categories. Lab safety and equipment.  Practice includes lab rules test and intro to equipment.	Lecture and Laboratory Practice
Week 2	Plant cytology: cell types, structures, functions; intro to microscopy; observation of plant cells and groups  Practice with microscopes and identifying plant groups.	Lecture and Laboratory Practice
Weeks 3–4	Histology and Organography: plant tissues, tissue types, monocots vs dicots, root types. Practice through macro/microscopic observations.	Lecture and Laboratory Practice

	Weeks 5–6	Plant organography (continued), reproductive structures, fertilisation, biological cycles  Practice includes observing reproductive structures and processes.	Lecture and Laboratory Practice
	Week 7	Plant Physiology (Part 1): behaviour, osmosis, matter exchange.  Practice with potato cube osmosis experiment.	Lecture and Laboratory Practice
	Week 8	Plant Physiology (Part 2): photosynthesis, substance transport.  Practice includes respiration and wilting experiments.	Lecture and Laboratory Practice
	Week 9	Respiration and Hormones: plant respiration, heterotrophic nutrition.	Lecture
	Week 10	Plant Growth and Formation: physiological and periodic changes.	Lecture
	Week 11	Plant Genetics: heredity, mutations, species development.	Lecture
	Week 12	Stress Mechanisms: adaptation to environmental stresses.	Lecture
<b>Teaching methodology</b>	<p><b>Theoretical Instruction:</b> The lectures will be delivered through an interactive, student-centered approach, encouraging active participation. Each session will begin with a brief introduction to the theoretical concepts, followed by in-depth discussions of key principles. Visual aids, including slides and videos will be used to enhance understanding and stimulate critical thinking. Students will be encouraged to engage with the material through group discussions and problem-solving activities.</p> <p><b>Practical Instruction:</b> The practical sessions are designed to reinforce theoretical knowledge through hands-on learning, observation, and experimentation. Students engage in laboratory-based activities that include familiarisation with lab safety protocols and equipment use, microscopic and macroscopic observation of plant cells, tissues, organs, and reproductive structures, guided lab work led by the instructor, with opportunities for independent observation and recording of results and more. These sessions aim to build technical skills, critical thinking, and scientific inquiry by directly connecting practice with theoretical content covered in lectures.</p>		
<b>Bibliography</b>	<p><b>Greek Bibliography</b></p> <ul style="list-style-type: none"> <li>Μποζαμπαλίδης, Α. (2017). Βοτανική: Μορφολογία και ανατομία φυτών. [<i>Botany: Morphology and anatomy of plants</i>]. 2<sup>η</sup> Έκδοση. University Studio Press. ISBN 978-960-12-2208-0.</li> <li>Campbell, Neil A. (2013). Βιολογία : Μορφή και λειτουργία στα φυτά - Μορφή και λειτουργία στα ζώα - Οικολογία <i>Ενοτητα: Μορφή και λειτουργία στα φυτά</i> (Πανεπιστημιακή βιβλιοθήκη θετικών επιστημών / Βιολογία). Πανεπιστημιακές Εκδόσεις Κρήτης. ISBN: 9789605243289</li> <li>Μανέτας, Ι., Γραμματικόπουλος, Γ., Πετροπούλου, Γ., &amp; Ψαράς, Γ. (2015). Εργαστηριακές ασκήσεις φυσιολογίας φυτών [Laboratory Guide]. Kallipos, Open Academic Editions. <a href="https://hdl.handle.net/11419/2693">https://hdl.handle.net/11419/2693</a></li> <li>Ριζοπούλου, Σ., Γεωργίου, Κ., Θάνος, Κ., Μελετίου, Χ., Μαρία, Σ., και Ρούσης, Α. (2015). Εργαστηριακές ασκήσεις φυσιολογίας φυτών [Laboratory Guide]. Kallipos, Open Academic Editions. <a href="https://hdl.handle.net/11419/5137">https://hdl.handle.net/11419/5137</a></li> </ul>		

	<ul style="list-style-type: none"> <li>• Καραμπουνιώτης, Γ., Σάββας, Δ. D. (2021). Παράγοντες καταπόνησης των φυτών στο θερμοκήπιο [Postgraduate textbook]. Kallipos, Open Academic Editions.</li> <li>• Taiz, L., Zeiger, E., και Moller, I. M. (2017). Φυσιολογία και ανάπτυξη φυτών. [Physiology and growth in plants]. Utopia. ISBN 9786185173166.</li> </ul> <p><b>English Bibliography</b></p> <ul style="list-style-type: none"> <li>• Esha Rami (2020). Plant Stress Physiology. Ashland : Delve Publishing. 2020. ISBN: 9781774078518. EBSCOHost</li> <li>• Tajinder, Kaur, Saroj, Arora (2021). Environmental Stress Physiology of Plants and Crop Productivity. Sharjah, UAE : Bentham Science Publishers Ltd. 2021. ISBN: 9781681087917. EBSCOHost</li> <li>• Bell, A. D., and Bryan, A. (2014). <i>Plant form: An illustrated guide to flowering plant morphology</i>. 3<sup>rd</sup> Edition. Timber Press. ISBN: 9780881928501</li> <li>• Punj, S., and Haryana, N. (2012). <i>Abiotic Stress: New Research</i>. New York: Nova Science Publishers. ISBN: 9781619421974. <b>EBSCOHost</b>.</li> <li>• Öpik, H., Rolfe, S. A., Willis, A. J. and Street, H. E. (2005). <i>The Physiology of Flowering Plants</i>. 4<sup>th</sup> Edition. Cambridge: Cambridge University Press. ISBN: 9780521662512. <b>EBSCOHost</b>.</li> </ul>
<p><b>Assessment</b></p>	<ul style="list-style-type: none"> <li>• Attendance and course participation: 10%</li> <li>• Individual assignments/reports related to the nature of the Practical/Lab training: 40%</li> <li>• Final Written Examination: 50%</li> </ul> <p>Student performance in this course will be evaluated through a combination of continuous and summative assessments. Attendance and active participation in class will contribute <b>10%</b> to the final grade, reflecting the importance of consistent engagement. A <b>portfolio of individual lab reports</b> compiled from the various practical sessions will account for <b>40%</b>, assessing students' ability to document their work systematically, demonstrate applied skills, and reflect on their learning throughout the semester. The <b>final written examination</b>, weighted at <b>50%</b>, will include both closed-ended questions (e.g., multiple-choice, matching, true/false) and open-ended questions (e.g., short-answer, essay-type, case studies). The examination will have a duration of <b>two academic periods</b> and will evaluate students' overall understanding of the course content, their ability to synthesize theoretical and practical knowledge, and their critical thinking skills.</p> <p>Student performance is evaluated on a <b>scale of 0 to 100</b>, with a <b>minimum overall passing grade of 60</b>. The final grade is calculated as a <b>weighted average</b> of the assessment components described above.</p>
<p><b>Language</b></p>	<p>Greek or English</p>