

## COURSE OUTLINE

### (1) GENERAL

<b>SCHOOL</b>	School of Agricultural Sciences		
<b>ACADEMIC UNIT</b>	Biosystems & Agricultural Engineering		
<b>LEVEL OF STUDIES</b>	Undergraduate		
<b>COURSE CODE</b>	BAE_803	<b>SEMESTER</b>	8 <sup>th</sup>
<b>COURSE TITLE</b>	<b>AGRICULTURAL MECHANICS</b>		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <i>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</i>	<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>	
<b>Lectures</b>	3		
Tutorials	2		
Laboratory			
<b>TOTAL</b>	<b>5</b>	<b>5</b>	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	General Background Specialised general knowledge		
<b>PREREQUISITE COURSES:</b>	There are no prerequisite courses.		
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	Greek .-For Erasmus students in English		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	Yes		
<b>COURSE WEBSITE (URL)</b>			

### (2) LEARNING OUTCOMES

<p><b>Learning outcomes</b></p> <p><i>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.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> <li>• <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i></li> <li>• <i>Descriptors for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i></li> <li>• <i>Guidelines for writing Learning Outcomes</i></li> </ul>		
<p>The student who successfully completes the course will have the ability to recognize and analyze basic machine elements for connecting objects, analyze simple mechanical constructions of rotary movement and identify critical operating and wear positions of mechanisms. You will acquire skills related to the recognition and operation of mechanisms related to agricultural machinery and mechanisms for cutting plant materials</p>		
<p><b>General Competences</b></p> <p><i>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?</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>  <i>Adapting to new situations</i>  <i>Decision-making</i>  <i>Working independently</i>  <i>Team work</i>  <i>Working in an international environment</i>  <i>Working in an interdisciplinary environment</i>  <i>Production of new research ideas</i> </td> <td style="width: 50%; vertical-align: top;"> <i>Project planning and management</i>  <i>Respect for difference and multiculturalism</i>  <i>Respect for the natural environment</i>  <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>  <i>Criticism and self-criticism</i>  <i>Production of free, creative and inductive thinking</i>            .....  <i>Others...</i>            .....         </td> </tr> </table>	<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i> <i>Adapting to new situations</i> <i>Decision-making</i> <i>Working independently</i> <i>Team work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Production of new research ideas</i>	<i>Project planning and management</i> <i>Respect for difference and multiculturalism</i> <i>Respect for the natural environment</i> <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i> <i>Criticism and self-criticism</i> <i>Production of free, creative and inductive thinking</i> ..... <i>Others...</i> .....
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At the end of this course the student will have further developed the following skills (general abilities):

- Ability to demonstrate knowledge and understanding of concepts and applications related to the circular economy.
- Ability to use management tools that increase productivity and annual farm income) prevalent in EU countries.
- Study skills needed for continued professional development.
- Ability to interact with others on problems of an interdisciplinary nature.

More generally, upon completion of this course the student will have further developed the following general competencies (from the list above):

Search, analysis and synthesis of data and information, also using the necessary technologies  
*Search, analysis and synthesis of data and information, using the necessary technologies*  
*Adaptation to new situations*  
*Decision making*  
*Autonomous work*  
*Teamwork*  
*Respect for the natural environment*  
*Exercise criticism and self-criticism*

### (3) SYLLABUS

- Metal fatigue or dynamic stress on machine components, operating conditions machine data, cost and life time, life curve, failure curve.
- Connection elements, non-detachable connections, vibrations, calculation of vibrations, welds, detachable connections, bolting, drive screws, degree of efficiency of drive screw, wedges - multi-splines, elements of rotary movement.
- Drive components, belts, chains, springs, gears, planetary gears gear systems, transmission with crosses, gear ratio, mechanisms transmission, hydraulic transmission, hydraulic motors, hydraulic fluids transmissions, categories and types of hydraulic valves
- Transmission of motion by friction.
- Components of rotary motion, shafts, spindles, critical spindle speed, loose couplings or clutches, bearings, sliding bearings, cross calculation bearings, rolling bearings, construction and types, calculation of rolling bearings, lubrication bearings
- Cams, bearings, reducers, technical measurements, tolerances - joints
- Mechanisms, four bond level basic mechanisms, chain of mechanisms, planetary mechanisms
- Mechanisms of cutting plant materials, cutting process, basic forces during cutting, factors affecting energy and power demand

### (4) TEACHING and LEARNING METHODS - EVALUATION

<b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i>	Face to face deliveries.	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i>	<ul style="list-style-type: none"> <li>• Use of ICT (power point) in Teaching</li> <li>• Use of ICT (power point) in Laboratory Training</li> <li>• Use of ICT in Communication with students (Learning process support through the electronic platform e-class).</li> </ul>	
<b>TEACHING METHODS</b> <i>The manner and methods of teaching are described in detail.</i> <i>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.</i>	<b>Activity</b>	<b>Semester workload</b>
	Lectures	39
	Tutorials	20
	Project work	21
	Study hours and preparation for the laboratory exercises and the final examination	45
	Course total	<b>125</b>

<p>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</p>	
<p style="text-align: center;"><b>STUDENT PERFORMANCE EVALUATION</b></p> <p><i>Description of the evaluation procedure</i>  <i>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</i>  <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>.</p> <p>2. The main assessment criteria focus on understanding and correlating the knowledge that students gain from the course with other knowledge. Particular emphasis is placed on whether they have developed the ability to apply this knowledge to crop selection and to assess the impact of these changes on the environment. Emphasis is also placed on demonstrating critical ability and justifying the choices they make in each problem.</p> <p>3. Evaluation is dynamic. It mainly involves problem solving. is done orally or in writing or with a combination of the two, with or without pre-examination on the basic principles of the course, with or without exculpatory advances and with other test or inventive methods, depending on the composition of the dynamics and the needs of the audience.</p> <p>4. The above are done in the Greek language. For foreign language students (eg Erasmus students) conducted in English</p>

### (5) RECOMMENDED LITERATURE in Greek

*Suggested bibliography:*

- 1. ΣΤΟΙΧΕΙΑ ΜΗΧΑΝΩΝ Ι, ΑΝΔΡΕΑΣ ΧΡ. ΓΙΑΝΝΟΠΟΥΛΟΣ, Έκδοση 2η, Εκδότης ΓΚΟΤΣΗΣ ΚΩΝ/ΝΟΣ & ΣΙΑ Ε.Ε., ΠΑΤΡΑ 2017.
- 2. ΣΤΟΙΧΕΙΑ ΜΗΧΑΝΩΝ, ΠΑΠΑΔΟΠΟΥΛΟΣ ΧΡΗΣΤΟΣ, Έκδοση 3η, ΕΚΔΟΣΕΙΣ Α. ΤΖΙΟΛΑ & ΥΙΟΙ Α.Ε., ΘΕΣΣΑΛΟΝΙΚΗ 2017-.

