

General Information	
Academic subject	Agricultural Mechanics and Mechanization
Degree course	Agricultural Technologies and Science
Curriculum	all
ECTS credits	6
Compulsory attendance	NO
Language	Italian

Subject teacher	Name Surname	Mail address	SSD
	Alessandro Leone	alessandro.leone@uniba.it	AGR09

ECTS credits details			ETCs
Basic teaching activities	4 ECTS Lectures	2 ECTS classroom or field exercises	

Class schedule	
Period	First semester
Year	2020-2021
Type of class	Lectures, class and field exercises, site visits

Time management	
Hours	150
In-class study hours	60
Out-of-class study hours	90

Academic calendar	
Class begins	12/10/20
Class ends	22/01/21

Syllabus	
Prerequisites/requirements	
Expected learning outcomes (according to Dublin Descriptors) (it is recommended that they are congruent with the learning outcomes contained in A4a, A4b, A4c tables of the SUA-CdS)	<p><i>Knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Advanced knowledge of the main agricultural machines and mechanical implements and the main agricultural mechanization concepts.</li> </ul> <p><i>Applying knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Knowledge and ability to understand the constructive and functional aspects of the agricultural motor machines and implements.</li> </ul> <p><i>Making informed judgements and choices</i></p> <ul style="list-style-type: none"> <li>○ Ability to evaluate and choose agricultural machines and its inclusion in the different farms, in agreement with the environment and the operators' health.</li> </ul> <p><i>Communicating knowledge and understanding</i></p> <ul style="list-style-type: none"> <li>○ Ability to explain and motivate the choices made in the field of agricultural mechanization.</li> </ul> <p><i>Capacities to continue learning</i></p> <ul style="list-style-type: none"> <li>○ Ability to learn the operation of different agricultural machines based on the knowledge gained during the course.</li> </ul> <p>The results of the expected learning, in term of knowledge and ability, are listed in the Annex A of the Didactic Regulation of the Bachelor Course (expressed by the European descriptors of the study title).</p>
Contents	<p>Presentation of the course and brief history of the agricultural mechanization</p> <ul style="list-style-type: none"> <li>• Introduction: the disciplines of agricultural mechanics and agricultural mechanization</li> <li>• machine, general equation and machine performance, classifications of machines (simple machines, complex machines and electric machines)</li> <li>• Force resisting</li> <li>• Fuel energies and general characteristics</li> <li>• Mechanical and hydraulic transmissions</li> <li>• Pumps, fans and compressors</li> <li>• Tractor:</li> </ul>

	<ul style="list-style-type: none"> <li>- supporting structure,</li> <li>- endothermic engine: (operating principle, constituent parts, Otto 4T and 2T thermal cycle, Diesel 4T thermal cycles. Emission classes of engines, EGR, DOC, DPF and SCR devices.</li> <li>- transmission: clutch engagement, mechanical synchronized transmission, semi powershift, full powershift, DCT - dual-clutch transmission, differential gear, final reductions</li> <li>- propulsion and support wheel, tyres for driving wheels and for steering wheels, slip, rolling resistance, traction power.</li> <li>- braking and steering components,</li> <li>- trailing coupling, mounting coupling.</li> <li>- power take-off (PTO) and cardan shaft</li> <li>• Dynamic balance of the tractor</li> <li>• Soil tillage machines: operation, tillage data and selection criteria of the different types of machines according to special, main, maturation and cultivation tillage operations</li> <li>• Machines for conservative agriculture</li> </ul> <p>Machines for the pest control: classification. Liquid pesticide treatments. Methods for breaking up the thin liquid sheet. Methods for carrying the droplets to the target. Technology of the sprayer machines working by means: a) liquid pressure, air-assisted; b) pneumatic atomizing of the mixture; c) centrifugal forces. Adjustments, choice methods, operational data.</p> <ul style="list-style-type: none"> <li>• Sowing and transplanting machines: types, operation, processing data and selection criteria</li> <li>• Spreaders machines: types, operation, processing data and selection criteria</li> <li>• Combine harvesters, olive harvester, grape harvester</li> <li>• Precision agriculture machines: main concepts</li> </ul> <p>Working times. Working capacity of agricultural machinery. Labor productivity in agriculture.</p>
<b>Course program</b>	
Bibliography	<ul style="list-style-type: none"> <li>- Bodria – G. Pellizzi – P. Piccarolo. Meccanica e Meccanizzazione Agricola. Edagricole, Bologna</li> <li>- M.Lazzari - F.Mazzetto Meccanica &amp; Meccanizzazione dei processi produttivi agricoli. REDA, Torino 2016</li> </ul>
Notes	<b>The texts are reference both for theoretical and practical aspects.</b>
Teaching methods	The course topics will be explained by using Power Point presentations.
Assessment methods (indicate at least the type written, oral, other)	<p>A partial check is planned for students on going with the course year in which the teaching is carried out. This check consists of an oral test pertinent to topics developed during the theoretical lessons and exercise carried out until the date of the check. The outcome of this check contributes to the evaluation of the final attainment and is valid for one academic year. The evaluation of the students' accomplishment is expressed by a vote of thirty. The partial check is passed with a vote of at least 18/30.</p> <p>The final exam consists of an oral test concerning the topics developed during the theoretical and practice lessons. The evaluation of the students' accomplishment is expressed by a vote of thirty. The final exam is passed with a vote of at least 18/30.</p> <p>For students who were undergone the partial check, the final evaluation is expressed by the average of the votes obtained in the two oral tests. A first class degree can be attributed in the case of top vote (30/30).</p> <p>The oral examinations are public.</p> <p>The evaluation of the student's attainment is in agreement with pre-established criteria, as detailed in Annex A of the Academic Regulations for the Agricultural Technologies and Science Degree Course.</p>
Evaluation criteria (Explain for each expected learning outcome what a student has to know, or is able to	<ul style="list-style-type: none"> <li>• <i>Knowledge and comprehension ability</i> <ul style="list-style-type: none"> <li>○ The knowledge and understanding of the concepts concerning the agricultural machines explained during the Course will be the basic</li> </ul> </li> </ul>

<p>do, and how many levels of achievement there are.</p>	<p>elements for the student's assessment.</p> <ul style="list-style-type: none"> <li>• <i>Knowledge and applied comprehension ability</i> <ul style="list-style-type: none"> <li>○ The student's ability to understand the constructive and functional aspects of the agricultural motor machines and implements.</li> </ul> </li> <li>• <i>Autonomy of judgement</i> <ul style="list-style-type: none"> <li>○ The student's ability to choose agricultural machines and its inclusion in the different farms, accordingly to the environment and the operators' health, will be another essential element of evaluation.</li> </ul> </li> <li>• <i>Communication skills</i> <ul style="list-style-type: none"> <li>○ The student's ability to explain and motivate the choices made in the field of agricultural mechanization.</li> </ul> </li> <li>• <i>Learning ability</i> <ul style="list-style-type: none"> <li>○ The student's ability to learn the operation of different agricultural machines on the basis of the knowledge gained during the Course will finally highlight the highest level of learning.</li> </ul> </li> </ul>
<p>Further information</p>	<p><b>Visiting hours:</b> Monday-Friday from 10.00 to 12.00 by appointment</p>

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