

COURSE OF STUDY *Land and Environmental Science and Technology (L25)*
ACADEMIC YEAR 2023-2024

ACADEMIC SUBJECT *Mechanization for sustainable land management (I.C. Agro-forestry mechanization and work safety)*

General information	
Year of the course	<i>III year</i>
Academic calendar (starting and ending date)	<i>first semester (October 16th – February 09th, 2024)</i>
Credits (CFU/ETCS):	6
SSD	<i>Agricultural mechanics (AGR 09)</i>
Language	<i>Italian</i>
Mode of attendance	<i>No Compulsory</i>

Professor/ Lecturer	
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Department and address	<i>DIP. DISSPA – Università degli Studi di Bari</i>
Virtual room	<i>Microsoft Teams: code onz9w2i</i>
Office Hours (and modalities: e.g., by appointment, on line, etc.)	<i>Monday to Friday by appointment</i>

Work schedule			
Hours			
Total	Lectures	Hands-on (laboratory, workshops, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
150	32	28	90
CFU/ETCS			
6	5	1	

Learning Objectives	The student will acquire knowledge and skills on the constructive and functional aspects of the machines used for the land and landscape management.
Course prerequisites	Knowledge of mathematics and physics.

Teaching strategie	Lectures will be presented through PC assisted tools (PowerPoint, video). Field and laboratory classes, reading of regulations will be experienced. Lecture notes and educational supplies will be provided by means of online platforms.
Expected learning outcomes in terms of	
Knowledge and understanding on:	<ul style="list-style-type: none"> • Knowledge of the main driving and agricultural machines; • Knowledge of the main machines used for the land and landscape.
Applying knowledge and understanding on:	<ul style="list-style-type: none"> • Knowledge and ability to understand the constructive and functional aspects of the machines used for the land and landscape management • Ability to critically evaluate the implications and results of the mechanization choices made for the interventions to be carried out.

Soft skills	<ul style="list-style-type: none"> • Making informed judgments and choices: <ul style="list-style-type: none"> ○ Ability to carry out an evaluation on the technical efficiency of the machines used, in order to correctly mechanize the work site; transfer the knowledge necessary to adapt the work, the environment and the working conditions to the human being responsible for carrying out the work itself. ○ Ability to identify the problems and their solutions. • Communicating knowledge and understanding: <ul style="list-style-type: none"> ○ Use of appropriate technical-scientific language and ability to communicate with technicians of equal and different backgrounds. ○ Ability to illustrate the technical-functional characteristics of the machines and their methods of use. • Capacities to continue learning: <ul style="list-style-type: none"> ○ Ability to deepen and update knowledge related to the machines used for the mechanization of the land and landscape.
Syllabus	
Content knowledge	<ul style="list-style-type: none"> • Introduction to mechanization and history; Mechanization needs; Mechanization and technological innovation; Mechanization and rationalization; Levels, models and development trends in mechanization. • Physical quantities of fundamental importance for mechanics and mechanization; The concept of machine, driving machine, operating machine, classifications; General equation and efficiency of machines. • Fuel energies and general characteristics; Notes on mechanical, hydraulic, electric and pneumatic transmissions; Passive resistances, the concept of adherence and slippage; loss of stability and control limit, soil compaction. • Endothermic engines: construction description and operation; The tractor and its use: load-bearing structure, transmission, propulsion and support organs, braking organs, management organs, connection elements to the operating machines; The power take-off and the cardan shaft. Navigation systems via satellites; Semi-automatic driving systems; Sensors applied to machines. Elements of isobus infrastructure. • Operating machines for felling and preparation: The chainsaw and accessory equipment; concentration and logging machines: winches, rice fields, gullies, trailers; Cableways and cable cranes: general information, steel ropes, trolleys, winches and accessories, sizing; other operating machines: Transplanters, brush cutters, debarkers, chippers. Combined forestry machines: Harvester, processor, feller, skidder. • Work organization: The elementary stages of work, work capacity and productivity; Technical and economic choice criteria. Sizing and verification of the machines used in the main cultivation operations and / or site inspections
Texts and readings	<ul style="list-style-type: none"> • Lessons note. • Lazzari M., Mazzetto F. Meccanica e meccanizzazione dei processi produttivi agricoli – REDA. • Pellizzi G.: Meccanica Agraria, vol. 1 – Edagricole • Pellizzi G.: Meccanica Agraria, vol. 2 – Edagricole • Hippoliti G.: Appunti di meccanizzazione forestale. Firenze. Studio Editoriale Fiorentino.

Notes, additional materials	<ul style="list-style-type: none"> • Notes; • Scientific papers; • Baldini S.: Guida all'uso della motosega. Edagricole
Repository	All teaching material will be available to students on web platforms (class Teams).

Assessment	
Assessment methods	<p>The exam consists of an oral test on the topics developed during the lectures and practice as reported in the Didactic Regulations of the Degree Course.</p> <p>The student's learning is assessed on the basis of pre-established criteria, as detailed in the Didactic Regulations of the Degree Course.</p> <p>For students who have taken the exoneration test, the assessment of the profit exam is expressed as the average between the mark given on the exoneration and the exam.</p> <p>The exam for foreign students can be done in English.</p>
Assessment criteria	<ul style="list-style-type: none"> • Knowledge and understanding <ul style="list-style-type: none"> ○ Knowledge of the basic elements of driving and operating machines for the land and landscape management • Applying knowledge and understanding <ul style="list-style-type: none"> ○ Knowledge of the construction and functional aspects of the driving and operating machines for the plant, maintenance and use of the land and landscape. • Autonomy of judgment <ul style="list-style-type: none"> ○ Ability to express oneself correctly and critically on solutions for an optimized and efficient work site. • Communicating knowledge and understanding <ul style="list-style-type: none"> ○ Ability to express oneself with an appropriate technical language • Communication skills <ul style="list-style-type: none"> ○ The student will be evaluated considering the use of appropriate technical language. • Capacities to continue learning <ul style="list-style-type: none"> ○ Ability to deepen and update on the issues of driving and operating machines for the land and landscape management.
Final exam and grading criteria	<p>The assessment of the student's preparation is based on predetermined criteria in accordance with the Didactic Regulations of the Master's Degree Course. The Examination Committee has a score ranging from a minimum of 18 to a maximum of 30 points for a positive assessment of the student's performance. By unanimous vote of its members, the Board may award honours in cases where the final mark is 30.</p>
Further information	
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