UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze Agrarie, Alimentari e Forestali
ACADEMIC YEAR	2019/2020
MASTER'S DEGREE (MSC)	FORESTRY AND AGRO-ENVIRONMENTAL SCIENCE AND TECHNOLOGY
SUBJECT	NATURALISTIC ENGINEERING TECHNIQUES
TYPE OF EDUCATIONAL ACTIVITY	D
AMBIT	20758-A scelta dello studente
CODE	11561
SCIENTIFIC SECTOR(S)	AGR/08
HEAD PROFESSOR(S)	FERRO VITO Professore Ordinario Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	3
INDIVIDUAL STUDY (Hrs)	51
COURSE ACTIVITY (Hrs)	24
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	1
TERM (SEMESTER)	1° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**FERRO VITO** Monday 11:00 13:00 Dipartimento SAAF, Edificio 4, ingresso E, primo piano, stanza 141 Wednesday 11:00 13:00 Dipartimento SAAF, Edificio 4, ingresso E, primo piano, stanza 141 Friday 11:00 13:00 Dipartimento SAAF, Edificio 4, ingresso E, primo piano, stanza 141

DOCENTE: Prof. VITO FERRO

PREREQUISITES	A basic knowledge of Hydraulics, Hydrology and Stream Restoration is required.
LEARNING OUTCOMES	KNOWLEDGE AND UNDERSTANDING: Knowledge of the fundamentals useful for designing stream restoration works by bioengineering techniques. Capability of understanding scientific books and using this knowledge to solve practical cases. APPLYING KNOWLEDGE AND UNDERSTANDING: Capability to apply the learned knowledge for designing stream restoration works by bioengineering techniques. MAKING JUDGEMENT: Capability to establish the best solution of stream restoration by bioengineering technques, taking into account the environmental constraints. Critical ability in the choice of the method which is appropriate to solve the examined cases. COMMUNICATION: Ability to present the selected solution for a stream restoration case using verbal and written tools, using the nomenclature of the discipline and understandable to a no-skilled stakeholder. LIFELONG LEARNING SKILLS: Achievement of a learning method to be used for obtaining a self-knowledge update by reading scientific papers or attending to master courses and specialist workshops.
ASSESSMENT METHODS	Verbal exam. The exam is based on the presentation of the case study of stream restoration by bioengineering techniques developed during the Course. The student will be evaluated taking into account the obtained level of knowledge, the ability of applying knowledge and understanding to the case study developed during the course. The assessment of the exam will take into account the ability of the student to use both the scientific-technical language and a language understandable to a no-skilled stakeholder. The evaluation (minimum grade is 18 and maximum is 30 cum laude) is stated using the following scheme: 1) Knowledge of the topics, capability to apply the learned knowledge, capability to analize the studied problem, ability to present the topic is judged sufficient (18-21) 2) Knowledge of the topics, capability to apply the learned knowledge, capability to analize the studied problem, ability to present the topic is judged fair (22-25) 3) Knowledge of the topics, capability to apply the learned knowledge, capability to analize the studied problem, ability to present the topic is judged good-high (26-28) 4) Knowledge of the topics, capability to apply the learned knowledge, capability to analize the studied problem, ability to present the topic is judged high-advanced (29-30 cum laude)
EDUCATIONAL OBJECTIVES	The aim of the Course is introducing the knowledge and the ability required for designing stream restoration works by bioengineering techniques.
TEACHING METHODS	Lessons. Numerical and design applications at a case study.
SUGGESTED BIBLIOGRAPHY	FERRO V. (2006). La sistemazione dei bacini idrografici – seconda edizione. Ed. McGraw-Hill, Milano, 848 pp.

SYLLABUS

Hrs	Frontal teaching
1	Aims of the Course and its subdivision. Introducing the case study of stream restoration works by bioengineering techniques.
1	The hydrological study useful for stream restoration design by bioengineering techniques.
2	Stream restoration by block ramps.
2	River restoration by rocks. Calculating the stability of rocks placed on the bed and the banks of a river.
1	Evaluating flow resistance in vegetated streams and channels.
2	Stream restoration of the river banks by bioengineering techniques.

Hrs	Practice
15	Designing, for a case study, of stream restoration works by bioengineering techniques.