1. Research application on forest logging and wood technology

Rodolfo Picchio 6 CFU (48 ore), teaching module: Research application on forest logging
Angela Lo Monaco 3 CFU (24 ore), teaching module: Research application on wood technology

SSD AGR/06

Credits 9 (6+3)

I sem 2018-2019

Rodolfo Picchio 6 CFU (48 h), teaching module: Research application in forest logging
The students will acquire main concepts and practices of research application in forest logging within the context of managing forest resources and ecosystems sustainability. The students will be able to study the forestry utilization process and explain interactions between logging, roads and transport systems, both in close-to nature forest as in plantation forest. Again the students will acquire main concepts to assess and synthesize environmental and economic aspects to determine and describe appropriate technologies and mitigating measures to apply reduced impact logging.
The main content
Cost-efficiency and sustainable forest operation through a reduced impact of forest harvesting means appropriate planning and high capacity to evaluate forest harvesting operations.
The course consists of 3 topics:
Topic 1: applied technology in logging operation and wood transportation
Topic 2: good practice guidelines for logging operation studies
Topic 3: main concepts, methodologies and instruments to evaluate and synthesize environmental aspects of the forest logging

The examination consists of an oral presentation of a case study chosen by the student. The case study structure should include: the description of the logging site, including also the aims of the logging operation, the identification of the wood products, the identification of the logging system, the technical and economic analysis and the evaluation of the environmental impacts.
Students will be evaluated on the ability and the knowledge acquired through the course and on the capacity to apply appropriate methodologies of analysis to the case study.
The course will consist of frontal lectures and laboratory activities (decision analysis based on spreadsheet models) during which student could analyze technical and operational issues of forest operation. Some field trips and practical activities are planned in the forests near Viterbo.

The content of the course is not fully covered by a single text book. The teaching materials is based on: (i) lecture notes, (ii) Scientific papers provided during the lectures, (iii) Technical books (COST Action FP-0902 - WG 2 Operations research and measurement methodologies, GOOD PRACTICE GUIDELINES FOR BIOMASS PRODUCTION STUDIES, 52 pp.; International Poplar Commission Thematic Papers, FIELD HANDBOOK - POPLAR HARVESTING, 60pp.; FORESTRY TRAINING CENTRE INC, COURSE IN REDUCED-IMPACT LOGGING, 137 pp.)
The lecturing material will be available on Tuscia University Moodle Platform

Angela Lo Monaco 3 CFU (24 h), teaching module: Research application in wood technology

The students will acquire the main concepts and practices of research application into formation and properties of wood under different growth conditions. Students will understand wood as formed during growth as a biological material and its transformation, preservation for different arts, crafts and industrial uses and purposes, taking into account production in forest and in plantation. Student will have have the opportunity to develop and broaden their knowledge and understanding of wood as one of the principle outputs of (Net) Primary Production from Forests, employable for mid- and long-term human use. The course will offer opportunities to identify different wood qualities and properties of wood.
Main content
WOOD FORMATION: Formation and Structure of Wood - Macroscopic characteristics of wood – Microscopic characteristics of wood - Wood Quality - Biological Deterioration of Wood
WOOD PROPERTIES: Physical - Chemical - Mechanical

The course consists in frontal lectures and in laboratory activities.
The examination consists of an oral presentation about laboratory or field activities, which are part of the course and subject to evaluation, aimed to ascertain abilities and knowledge acquired. Grade is assigned taking into account the ability to apply the theoretical concepts acquired through the course, the capacity for analysis, synthesis and interdisciplinary links, as well as the use of technical language.

The teaching materials is based on: (i) lecture notes, (ii) Scientific papers provided during the lectures, (iii) Books (-George Tsoumis - Science and technology of wood Structure, Properties, Utilization Chapman & Hall New York, NY (1991) ISBN 0-412-07851-1; -Forest Products Laboratory. Wood handbook - Wood as an engineering material. General Technical Report (2010) FPL-GTR-190. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory. 508 p. This publication is available on line at www.fpl.fs.fed.us - Rowell RM ed. Hanbook WOOD CHEMISTRY AND WOOD COMPOSITES Taylor & Francis (2005) ISBN 0-8493-1588-3 p. 475).
Students are encouraged to look for topics on freely chosen texts.
The lecturing material will be available on Tuscia University Moodle Platform