COURSE: Building Materials + Laboratory  
ACADEMIC YEAR: 2019-2020  
TYPE OF EDUCATIONAL ACTIVITY: Characteristic  
TEACHER: Milena Marroccoli (3 ECTS) and Antonio Telesca (3 ECTS)  
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Language: Italian  
ECTS: 6  
n. of hours: 60  
Campus: Potenza  
School of Engineering:  
Program: Professional Course in Building and Land Management Techniques  
Semester: I

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The aim of the course is to give the students the main basics related to structure, properties and technological applications of selected materials, belonging to metals, ceramics, polymers and composites, suitable for different applications in the construction field. Achieving this knowledge will allow them the most advantageous and correct use of these materials.

**Knowledge and ability to understand**
At the end of the course the student will obtain the knowledge needed in order to understand the correlations between atomic structure, microstructure, macrostructure and operational behavior of the materials usually employed in the construction sector.

**Ability to use knowledge and understanding**
At the end of the course the student will be able to develop a range of professionalizing skills that will allow him to choose the most suitable material to be used in a particular exposure environment.

**Autonomy of judgment**
After passing the exam, the student will have acquired the necessary tools to interpret the experimental tests carried out on construction materials, foreseeing and analysing in a critical way their behaviour during the implementation. Moreover, thanks to the obtained knowledge, the student will be able to consult and enrich the scientific literature on the topic and to understand and apply the technical standards related to building materials.

**Communicative abilities**
The student will be able to hold a conversations about the choice and the implementation of building materials that are more suitable for a particular employment and also have less impact on the environment, proposing autonomous solutions and ideas also to interlocutors not expert in the field.

**Ability to learn**
The student will be aware of the need to be constantly and independently updated in order to maintain a high level of preparation and competence.

PRE-REQUIREMENTS

None

SYLLABUS

Strengthening a Metal: solid solution hardening, precipitate and dispersion strengthening, cold work-hardening, the dislocation yield strength. Increasing the ductility by annealing  
**Notes on mechanical properties.** Stresses and strains. Linear and non linear Elasticity. Anelastic

**Notes on thermal properties.** Heat capacity. Thermal expansion. Thermal conductivity. Thermal stresses.


Building steels.


**Polymers.** Thermoplastics and thermosetting polymers. Manufacturing process, structure, properties and application fields

**Composites.** Manufacturing process, structure, properties and application fields. Mechanical characteristics under different conditions.

**Laboratory activity.** Evaluation of physical and mechanical characteristics of cementitious pastes and mortars

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**TEACHING METHODS**
Theoretical lessons, Classroom tutorials, Laboratory tutorials.

**EVALUATION METHODS**
Written examination.

**TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL**
Notes from lectures
G. Frigione, N. Mairo – Materiali per l’edilizia, Ulrico Hoepli Editore.
W. D. Callister, D. G. Rethwisch - Materiali per l’ingegneria civile e industriale, Edizioni Edises

**INTERACTION WITH STUDENTS**
Wednesday 3-5 pm. Other appointments can be arranged with students by e-mail.

**EXAMINATION SESSIONS (FORECAST)**
2020 Year
4/2; 20/3; 8/5; 12/6; 2/7; 17/9; 6/11; 11/12

**SEMINARS BY EXTERNAL EXPERTS**

**FURTHER INFORMATION**

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1 Subject to possible changes: check the web site of the Teacher or the Department/School for updates.