UNIVERSITÀ DI PISA

MATERIAL TECHNOLOGY AND APPLIED CHEMISTRY

PATRIZIA CINELLI

Anno accademico	2019/20
CdS	ARCHITECTURE AND BUILDING ENGINEERING
Codice	467II
CFU	6

Moduli	Settore/i	Tipo	Ore	Docente/i
TECNOLOGIA DEI MATERIALI E CHIMICA APPLICATA	ING-IND/22	LEZIONI	72	PATRIZIA CINELLI FRANCESCA SIGNORI

Learning outcomes

Knowledge
Students are expected to acquire: some knowledge of general and applied chemistry, nomenclature, acid-base, stechiometry and oxidation, base concepts on organic chemistry some knowledege on solid state of materials knowledge on metals processing, state diagrams, processing and properties of metalas in particualr of steels Knowledge on concrete, gypsum, lime, hydration, porosity and mix design Some knowledge on polymers, wood, glass, ceramic Some knowledege on corrosion and preservation

Assessment criteria of knowledge
- The student will be assessed on his/her demonstrated ability to handle the concepts and the knowledge acquired in the course. -In the written exam (3 hours, 2 problems, 4 questions, 2 open theory questions), the student must demonstrate his/her ability to solve the problems based on the knowledege acquired on metals, evaluation of mechanical properties aimed at the selection of the right component to be used in a construction project. Similarly one written problem is always focues on mix desing or similar topics aimed at assessing a proper knowledege on beton, concrete and material to be used in construction. - During the oral the student must be able to demonstrate his/her knowledge of the course material and be able to discuss the reading matter thoughtfully and to apply them to practical examples. In particular to plan the use of the different materials for application in construction, taking in consideration the properties of the materials and the requiremnt of the project, also related to the environment where the construction has to be build. - The student must demonstrate the knowledege of the main topics of the course and the ability to use those for managing a project and eventually making the selection of the materials to be used in a project of construction.
Methods:

- Final oral exam
- Final written exam

Further information:
Evaluation is based on the results achieved in the final written and oral exam.

Teaching methods

Delivery: face to face
Learning activities:

- attending lectures
- participation in seminar

Attendance: Advised
Teaching methods:

- Lectures
- Seminar

Syllabus

The principles and knowledge of chemistry necessary to handle the materials (metals, concrets etc) used in construction. Basic chemistry, atoms, atomic bonds, nomenclature, salts, metal oxide and anhydride, theory of acid and base, oxidation reactions. Solid state of materials, unit cells, defects and theory of plasticity. Metals, production, processing, state diagrams, metals miscibility in alloys, steel, alluminium, titanium etc corrosion, preservation. Beton, production of concretes, different types of concrete, gypsum, lime, reaction with water, types and quality of inert, porosity. Application in Mix design. Other materials used in construction and architecture: polymers-plastic, wood, ceramic, glass.

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Bibliography

Luca Bertolini, Materiali da Costruzione, Vol I e II, Città Studi Edizione. Copy of the slides presented at the lectures. Further bibliography will be indicated during the course

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