

BASIC INFORMATIONS

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| LECTURERS | Ferenc Nemoda and László Győrök | |
| TOPIC | Physical and mechanical and weather resisting properties of building materials. Principals of investigation of materials and products. Evaluation of test results. Statistical methods. Classification and grade of materials and products. Standardized requirements. Conditions of storage and delivery and conservation. Requirements for acceptance. Detailed study of concrete and its components, such as binding materials and aggregates and admixtures and additives. Standardized designation of concrete and cement. Concrete mix design. Preparation of concrete. Properties and investigation of concrete in fresh and hardened state. Destructive and non-destructive investigation methods of hardened concrete. | |
| LECTURE (WEEKLY) | 1 x 2 hours (90') | 4 credits |
| CONSULTATION, PRACTICE | 1 x 2 hours (90') | |
| EXAM /TESTS /TASK | 1 / 3 / - | |

GOAL OF THE SEMESTER:

- Acquirement of basic properties and investigation methods of building materials in general. Increasing knowledge and experience about concrete and its components. Carrying out standardized experiments and tests.
- To increase knowledge from literature below:
 - Geoffrey D. Taylor: Materials in Construction (Principles, Practice and Performance)
 - Geoffrey D. Taylor: Materials in Construction (An Introduction)
 - Shan Somayaji: Civil Engineering Materials
 - P. C. Varghese: Building Materials
 - Michael S. Mamlouk - John P. Zaniewski: Materials for Civil and Construction Engineer
 - Edward Allen - Joseph Iano: Fundamentals of Building Construction (Materials and Methods)
 - Ken Ward-Harvey: Fundamental Building Materials

OUTLINE FOR THE SEMESTER

| WEEK | LECTURE | CONSULTATION | DEADLINE |
|------|---|---|------------------------|
| 1 | Introduction. Physical and mechanical properties of building materials. | General information about practices in laboratory. Handing out assignments. Physical properties of building materials I. Experiments. Equipment for measuring length and changes of length. | |
| 2 | Mechanical and weather resisting properties of building materials. | Physical properties of building materials II. Experiments. Measuring density, specific density, compactness, porosity, water absorption. | |
| 3 | Building materials and chemistry I. (Inorganic chemistry.) | Statistical evaluation of experimental results. Test 1 st about physical measures and properties at consultation. | Test 1 st . |
| 4 | Classification of hydraulic and non-hydraulic binders: cement, gypsum, lime, bitumen. Production, properties, marks. Investigation methods. | Investigation of binders. Determination of characteristics of cement and gypsum. | |
| 5 | Aggregates for concrete. Types, production, properties, classification, investigation methods. | Investigation of aggregates I. Test of grain distribution of construction sand, grain. | |
| 6 | Improving characteristics of aggregates for concrete. Admixtures for concrete, effects of admixtures. | Investigation of aggregates II. Measuring content of slurry. Example for improving characteristics of aggregates. | |
| 7 | Building materials and chemistry II. (Chemistry of building materials.) | Test 2 nd about binders, aggregates and admixture. | Test 2 nd . |
| 8 | Bank holiday. | Bank holiday. | |
| 9 | Classification, mark and standardized designation of normal concrete. | Practice of concrete mix design I. | |
| 10 | Special concrete technologies. | Practice of concrete mix design II. | |
| 11 | Properties of concrete in fresh state. Preparation of concrete from selection of components till curing. Transporting concrete. | Creating concrete. Consistency tests of fresh concrete. | |

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| 12 | Physical and mechanical properties of concrete in hardened state. | Investigation of hardened concrete with destructive and non-destructive methods. Evaluation of test results. | |
| 13 | Building materials and chemistry III. (Polymeric chemistry.) | Test 3 rd about design, creating and properties of concrete. | Test 3 rd . |
| 14 | Types and marking of mortars and plasters. Characteristics of fresh and dried mortars and plasters. Monolithic and premixed mortars and plasters. Mixing and application. Failures. Summary of the semester. | Consistency tests of mortars and plasters. | |
| 15 | Exam. | Supplement of any test, if needed. | Exam |

TASK / EXAM

| | DESCRIPTION | TO HAND IN | SCORE |
|-------------|--|------------------------|-------------------|
| FIRST TEST | About physical measures and properties at consultation. | Test 1 st . | 0-10 points |
| SECOND TEST | About binders, aggregates and admixture. | Test 2 nd . | 0-20 points |
| THIRD TEST | About design, creating and properties of concrete. | Test 3 rd . | 0-20 points |
| EXAM | Written exam on the subjects what have been taught over the lectures and practices of the semester. At the exam there is a need to write short and prompt answers. | | 0-50 points |
| TOTAL | | | 100 points |

EVALUATION

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|-------------------|-----------------------|-------------------------|-----------------|---------------------|
| 0 – 50 points | 51 – 62 points | 63 – 75 points | 76 – 87 points | 88 – 100 points |
| 1 - FAILED | 2 - SUFFICIENT | 3 - SATISFACTORY | 4 - GOOD | 5 - EXCELENT |

