

Materials science

Every week 15.00 – 16.30, C019

DR. ADÉL LEN

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FTP://WITCH.PMMF.HU:2001/TANSZEKI_ANYAGOK/EPITOMERNOK_TANSZEK/LEN_ADEL/MATERIALSSCIENCE/

1. week - Orientation

Week	Topic of lecture
Week 1	Course description. Orientation. Students task presentation
Week 2	Introduction. From quarks to atoms. Electron structure.
Week 3	Atomic structure. Periodic table. Elements. Chemical bonding. Relation between chemical bonding and macroscopic characteristics of the materials
Week 4	Solid, liquid and gas phases. Amorphous and crystalline structure.
Week 5	Real crystals, crystallographic defects
Week 6	Solid construction materials
Week 7	Materials study (Destructive and non-destructive methods)
Week 8	National feast day
Week 9	Free week
Week 10	Scanning electron microscopy
Week 11	Scanning electron microscopy in practice
Week 12	Novel materials in construction
Week 13	Practical work – students tasks 1
Week 14	Practical work – students tasks 2
Week 15	Practical work – students tasks 3

Exam, grading, attendance

- Exam
 - each student will have a task to complete during the semester
 - the task consists of an English language scientific article, a Case Study, that has to be read, studied, understood, and presented in the class
 - the task involves personal work and study, it has several objectives:
 - the student has to learn how to understand the description of a problem, and the solution
 - the student has to get used to individual research using different type of resources, such as printed bibliography or internet
 - the student has to get used to formulate his own opinion about a scientific statement
 - the student needs to learn to present and explain a theme, a subject, and to answer to questions related to it
 - Power Point Presentation of 10-12 minutes: 6-8 slides, that needs to be sent to the len.adel@mik.pte.hu previously

Exam, grading, attendance

- Grading: 90 points as follows:
 - 50 points: content – how the student understood the topic
 - 20 points: additional information, explanation of terms, methods
 - 20 points: presentation: logic of the presentation, how well is explained

Exam, grading, attendance

- Attendance
 - 70% of attendance is compulsory, in case of absence from more than 30% of the total number of lesson will be grounds for failing the class
 - maximum 10 points can be gathered for presence

Bibliography

William D. Callister Jr.: Material Science and Engineering, John Wiley and Sons, Inc., 2007, New York

J. W. Morris Jr.: A Survey of Materials Science, Department of Material Science and Engineering, Berkley, 2007

Student tasks

CASE STUDIES IN CONSTRUCTION MATERIALS
– open access

<http://www.sciencedirect.com/science/journal/22145095?sdc=1>



CONSTRUCTION AND BUILDING MATERIALS
- not open access

<https://www.journals.elsevier.com/construction-and-building-materials>

