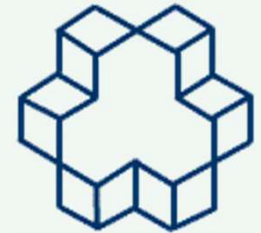




Company Logo

K. N. Toosi University of Technology

Faculty of Materials Science and Engineering



Selection of Engineering Materials

First Session

(Topics, References and Evaluation)

Reza Eslami-Farsani



Course Description



One of the conditions for being a skillful engineer in the field of materials science and engineering is the ability to select the appropriate engineering materials. In this course, the students can learn how or why to select the engineering materials. Also, they can learn about the importance of materials selection in the engineering applications, important factors in materials selection and the rule of mechanical properties. As well as, the introducing steels, cast iron, aluminum alloys, ceramics, polymers and composites are in the topics which are discussed in this course.

Topics



- ✓ Introduction of the main engineering materials
- ✓ Introduction of selection of materials
- ✓ The importance of materials selection in engineering applications
- ✓ Principles of materials selection
- ✓ Selection of materials based on the criteria of materials properties and different applications
- ✓ Introduction of carbon steels
- ✓ Introduction of alloy steels
- ✓ Introduction of cast irons
- ✓ Introduction of aluminum alloys
- ✓ Introduction of polymers
- ✓ Introduction of ceramics
- ✓ Introduction of composites
- ✓ Ashby diagrams

References



- 1- M. F. Ashby, **Materials: Engineering, Science, Processing and Design**, Elsevier.
- 2- J. W. Martin, **Materials for Engineering**, Woodhead.
- 3- N. P. Cheremisinoff, Noyes, **Materials Selection Deskbook**, Noyes,
- 4- M. P. Groover, **Fundamentals of Modern Manufacturing Materials, Processes, and Systems**, John Wiley & Sons.
- 5- M. Kutz, **Handbook of Materials Selection**, John Wiley & Sons.
- 6- C. A. Harper, **Handbook of Materials for Product Design**, Mc Graw-Hill.

Course Outline



Course Unit: 3

Course Type: Theoretical

Duration: 1 semester (16 weeks)

Course Hours: 3 hours lecture per week

Course Evaluation (from 20):

- Midterm: 3 Points
- PowerPoint Presentation (Seminar-1, Individual presentation): 2.5 Points
- PowerPoint Presentation (Seminar-2, Group presentation-2 people): 2.5 Points
- Final Exam: 12 Points

Title of Seminar 1: Selection of Materials for Different Applications (For Example, Spring, Ship, Bike, etc.)

Title of Seminar 2: Introduction of Materials Selection Software

How to Deliver the Documents?



- PowerPoint files (in non-slide show mode) should be email until the final exam.
- ✓ Students prepare their PowerPoint file based on the template
- ✓ The name of PowerPoint files should only include the name of the student and the research topic (for example: Eslami- Key to Steel)

How to Contact Me?



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