

SCHEDULE

UNIVERSITY OF NYÍREGYHÁZA
Institute of Engineering and Agricultural Sciences

**Materials Science and Production
Technology I.**

neptun code: BAI0090

2023/2024 autumn semester

Professional Pilot (SH Scholarship)

term grade

credit: 4

The Semester:

No. of weeks: **14**

Lectures:

2 per weeks

lecturer: **Dr. Imre Beszeda**

Labs:

2 per weeks,

lab supervisor: **Péter Kósa** and **Dr. Imre Beszeda**

In-class tests:

2

Date of in-class tests:

40th and **46th** calendar weeks

Lab test reports:

test reports specified after each lab measurements

deadline of submission:

48th calendar week

Requirements:

- 2 in-class tests test with a minimum passing rate of 51%.
- Regular participation in laboratory measurements.
- Successful completion of lab measurements.
- Adequate knowledge and use of basic measuring instruments.

Type of assessment and evaluation:

- 2 in-class tests: 75 %
- 10 test reports: 25 %
- total: 100 %

Nyíregyháza, 25.08.2023.

done by:

checked by:

Dr. Imre Beszeda
lecturer

Dr. Ferenc Szigeti
head of institute

| week | Lecture | | | Lab | | |
|------|--|----------|--------|--|-------|--------|
| | topic | lectures | date | topic | Labs | date |
| 36. | Requirements. Testing methods. Mechanical tests. Characteristics of materials. | 1-2 | 08.09. | Basic concepts of metrology. Length gauges. Vernier scale editing. | 1-2 | 08.09. |
| 37. | Material structure testing methods and defect finding tests. | 3-4 | 15.09. | Micrometer types, operating principles. Completing a measurement task. | 3-4 | 15.09. |
| 38. | Basic concepts of materials. Metals and alloys. Types of chemical bonds. The concept of material, classification of materials. Structure of crystalline materials. | 5-6 | 22.09. | Gauges. Bore measuring tools. Carrying out an independent measurement task. Surface roughness measurement. Special measuring devices and procedures. | 5-6 | 22.09. |
| 39. | Transformation processes. Phase diagrams. Iron-carbon phase diagrams, transformations and microstructures of iron-carbon alloys. | 7-8 | 29.09. | Angle measurement. Indirect taper measurement. Check threads. Completing a measurement task. | 7-8 | 29.09. |
| 40. | Iron and steel production. Production of non-ferrous metals. 1st in-class test | 9-10 | 06.10. | Size and shape tolerances. Measuring blocks. Completing a measurement task. | 9-10 | 06.10. |
| 41. | Heat treatments. Annealing. Process annealing. Full annealing. | 11-12 | 13.10. | Measuring the tooth thickness of gears. | 11-12 | 13.10. |
| 42. | Hardening. Toughness-enhancing heat treatments. Diffusion heat treatment processes. | 13-14 | 20.10. | Presentation and programming of a 3D coordinate measuring machine. Measurements on a 3D measuring machine. Completing a measurement task. | 13-14 | 20.10. |
| 43. | Surface hardening: carburizing, boriding, nitriding, etc. and materials. Classification system of steels and non-ferrous metals. | 15-16 | 27.10. | Position tolerances. Presentation of a laser uniaxiality meter. | 15-16 | 27.10. |
| 44. | Tool steels. | 17-18 | 03.11. | Surface roughness. Completing a measurement task. | 17-18 | 03.11. |
| 45. | Structural steels. Materials used for the production of welded structures. Heat treatments of welded joints. | 19-20 | 10.11. | Measurement uncertainty. Selection of measuring device. Completing a measurement task. | 19-20 | 10.11. |
| 46. | Composites. Main characteristics of lubricants. 2nd in-class test | 21-22 | 17.11. | Non-destructive material tests. Use of an X-ray digital image plate scanner, evaluation of the recording. | 21-22 | 17.11. |
| 47. | Practical examples related to the semester: Heat treatments related to welding and other technologies. | 23-24 | 24.11. | Destructive material tests. | 23-24 | 24.11. |
| 48. | Selection of materials. Inspection and testing of materials and products. | 25-26 | 01.12. | Metallographic tests. | 25-26 | 01.12. |
| 49. | Summary | 27-28 | 08.12. | Summary | 27-28 | 08.12. |