Course title: **Materials Science and Engineering**	**Neptun code:** **GEMTT501-a**
Course coordinator: **Dr. János Lukács, Full Professor, CSc (PhD)**	
type and number of lesson: **lectures, 28 hours/ semester**	
method of accountability: **colloquium**	
curriculum location of the subject: autumn / **spring**	
pre-study conditions: **N/A**	
The task and purpose of the subject:	
systematic presentation of the structural materials and their characteristics; description of the properties and application possibilities of the structural materials; introduction to advanced and engineered materials, special materials structures	
Course description:	
Classification and evolution of structural materials: metals, polymers, ceramics and composites. Requirements for structural materials, characteristics of structural materials, connections among requirements and properties. Influencing factors on the behaviour of structural materials. Application possibilities and characteristics of the structural materials, reliability of their material properties. Correlations and interactions among the materials characteristics and the product properties. Special requirements: advanced and engineered materials, special materials structures. Basic trends of the materials development.	
Required literature:	
1. M. F. Ashby: Materials Selction in Mechanical Design. Elsewier Butterworth-Heinemann, 2005. ISBN: 9780750661683. 2. G. E. Dieter (ed.): ASM Handbook, Volume 20: Materials Selection and Design. ASM International, Materials Park, OH, 1997. ISBN: 978-0-87170-386-6. 3. J. Grosch et al.: Schadenskunde im Maschinenbau – Charakteristische Schadensursachen – Analyse und Aussagen von Schadensfällen. Expert Verlag, Ehlingen bei Böblingen, 2017. ISBN: 978-3-8169-3172-0.	
Recommended literature:	
1. N. Fonstein: Advanced High Strength Sheet Steels – Physical Metallurgy, Design, Processing, and Properties. Springer International Publishing, Switzerland, 2015. ISBN: 978-3-319-19164-5. 2. R. Rana, S. B. Singh (eds.): Automotive Steels – Design, Metallurgy, Processing and Applications. Elsevier Ltd., 2017. ISBN: 978-0-08-100638-2 3. SAE Fatigue Design Handbook (AE-22). Society of Automotive Engineers, Warrendale, 1997. ISBN: 978-1-56091-917-9.	