Course title: CNC forming machines	**Neptun code: GESGT419**

Course coordinator: Dr. György Hegedűs, associate professor, PhD

type and number of lesson: **lecture/**seminar/practical lesson/consultation, **2** / week or semester

method of accountability: **colloquium**

curriculum location of the subject: **autumn**

pre-study conditions:

The task and purpose of the subject:

Overview of the operation of forming machine tools.

Course description:

Introduction, applications. Cutting technology of flat plates. Types of plate shears and their structural design. Parallel control of cylinders of hydraulic plate shears. Disc rear bumper systems. Plate serial cutting (nibbling) machines. Processing principles, machine structures, main units. Automatic material supply. Component programming. Plate edge bending machines. Processing principles. Structural design of edge bending machines, tooling. Rear disc bumper systems. New trends and solutions. Parts production operation. Oscillating plate bending machines. Plate rolling technology and equipment. Intaglio and metal printing technology and machines. Profile and pipe bending machines. Radial machining with high energy density. Flame cutting and its mechanical equipment. Plasma cutting and its machines. Laser sheet cutting machines. The laser and its different types. Laser cutting methods. Laser plate processing machines. Robotic processing. Water jet machining and its machines.

Required literature:

1. H. Tschaetsch: *Metal Forming Practise*, Springer Berlin, Heidelberg, 2006. doi: https://doi.org/10.1007/3-540-33217-0.
2. L. Bian, N. Shamsaei, and J. M. Usher: *Laser-based additive manufacturing of metal parts: modeling, optimization, and control of mechanical properties*, Boca Raton, Florida: CRC Press, 2018.
3. M. Brandt: *Laser additive manufacturing: materials, design, technologies, and applications*, Amsterdam; Boston: The Textile Institute, Elsevier/Woodhead Publishing, Woodhead Publishing Is An Imprint Of Elsevier, 2017.

Recommended literature:

1. Kakandikar Ganesh Marotrao, A. Agrawal, and D. Ravi Kumar: *Metal Forming Processes*, CRC Press, 2022.