

**Tárgy neve:** Digital manufacturing

**Tárgyfelelős neve:** Andó Mátyás

**Tárgyfelelős tudományos fokozata:** PhD, Habil, egyetemi docens

**Tárgyfelelős MAB szerinti akkreditációs státusza:** AT

**Az oktatás célja angolul:**

**a) knowledge**

- In order to carry out their later professional work students need to know the basics and systems of production. Short-term industrial transformation requires expertise in the field of digitized manufacturing. Where it is necessary to talk about the impact of digitalization on industry, the evolution of systems, their applicability in industrial areas, and their integration into technical systems.
- They have a comprehensive knowledge about the information technology possibilities of industrial transformation and their applicability into efficient manufacturing systems.
- They are familiar with the principles of business, organizational and corporate procedure, information, data, software and technical-technological architectures as well as with the methods of describing and designing these architectures.
- They are aware of the vital basics of organization and management, quality assurance and controlling, which enable them to carry out leadership and management duties related to their specialization.
- They are familiar with the currently used manufacturing technologies, and well known the meaning of Industry 4.0, and IT systems for manufacturing such as CIM / MES / ERP. They already learnt about the basics of sensors and actuators design and usage in a modern company field.

**b) skills and abilities**

- They are able to formalize complex IT tasks, to identify and study their theoretical and practical background and then to solve them.
- They are able to initiate collaboration and work in a team as well as on projects with IT or other professionals.
- They are familiar with IT professional vocabulary, which enables them to express themselves at a high level, both orally and in writing, in their mother tongue and (at least) in English; i.e. they are able to participate in discussions and debates, to write reports, to work with, understand and utilize scientific and technical literature (e.g. professional books, chapters, articles etc.).
- They are able to professionally use scientific and technical information sources to obtain knowledge necessary for solving a problem, and to critically interpret and evaluate it.
- Under professional guidance, they are able to carry out scientific research on their own, and to prepare for further studies at postgraduate level.

**c) attitude**

- They follow professional and technological developments in their IT field.
- They are committed to critical feedback and evaluation based on self-examination.
- They are committed to lifelong learning, and they are open to acquiring new IT competencies.
- They accept and make their co-workers apply the ethical principles of work and organizational culture as well as those of IT scientific research.
- They share their knowledge and consider it important to disseminate professional IT results.
- They are open to proactive collaboration with IT and other professionals.

**d) autonomy and responsibility**

- They take responsibility for their professional decisions made in their IT-related activities.
- They undertake to meet deadlines and to have deadlines met.
- They bear responsibility for their own work as well as for the work of their colleagues they work together with in a project.

**Az oktatás tartalma angolul:**

The goal of the course is to give understanding for the students the fundamental concepts of the industrial automation, especially the different control methods.

- History and basic of manufacturing technology, Industry 4.0, FMS systems
- Productions Lifecycle Management (based on CAD systems)
- Sensors and Actuators (Field solutions), modern data collecting and transfer solutions
- MES (CIM) and ERP systems
- Cyber - Physical systems and Digital Twin
- Fine programming in production
- Agility for development
- Plant Discrete Event Simulation

**A számonkérés és értékelés rendszere angolul:**

practical course mark

**Idegen nyelven történő indítás esetén az adott idegen nyelvű irodalom:**

- Shimon Y. Nof: Handbook of Automation, Springer-Verlag Berlin, Heidelberg, 2009. ISBN: 978-3-540-78830-0
- August-Wilhelm Scheer: Business Process Engineering, Springer-Verlag Berlin, Heidelberg, 1994 ISBN-13:978-3-642-79144-4
- Jose M. Framinan - Rainer Leisten Rubén Ruiz García.: Manufacturing Scheduling Systems, Springer-Verlag London, 2014, ISBN 978-1-4471-6271-1
- Guy L. Curry-Richard M. Feldman: Manufacturing Systems Modeling and Analysis, Springer-Verlag Berlin, Heidelberg, 2011, 1994 ISBN 978-3-642-16617-4
- Sabina Jeschke - Christian Brecher - Houbing Song - Danda B. Rawat: Industrial Internet of Things - Cybermanufacturing Systems, Springer-Verlag Berlin, Heidelberg, 2017, ISBN 978-3-319-42558-0