



## FINAL EXAMINATION MANUFACTURING TECHNOLOGIES III AND IV

### Manufacturing Technologies III

1. Describe the water cutting technology! List the advantages of the application in production and introduce related products!
2. Describe the laser cutting technology! List the advantages of the application in production and introduce related products!
3. Describe the EDM technologies! List the advantages of the application in production and introduce related products!
4. Describe the injection molding technology! List the advantages of the application in production and introduce related products!
5. Describe the composite production technologies! List the advantages of the application and introduce related products!
6. Describe the thermoforming, molding, and the technology of calendering in case of plastics! List the advantages of the applications and introduce related products!
7. Describe the technology of powder metallurgy! List the advantages of the application and introduce related products!
8. Describe generally the rapid prototyping technologies and the history of the development! Please introduce the SLA, SLS 3DP and Polyjet technology!
9. Describe and introduce the development of technologies through FDM and DMLS (DMP / LDM) technologies! Describe how rapid prototyping affects other manufacturing technologies.
10. Describe the production, insertion and soldering technology of printed circuit boards.
11. Describe the surface treatment technologies! When and why do we use this technology?
12. Describe the properties of adhesives and the curing mechanism! What are the typical uses of adhesives in industrial practice and what type of adhesives do we use?

### Manufacturing Technologies IV

1. Explain the causes why Industry 4.0 (I4.0) concept has been introduced! What are its general characteristics, what are the main trends behind this concept?
2. Describe the general structure, type and layout possibilities of the FMS systems.
3. Introduce the situation and basics of Robotics! What are the typical robot types and what development trends (e.g. cobots) characterize this sector!
4. Describe the technical development of the effectors! What humanoid gripping systems have been developed, and what are the theoretical approaches to robot programming?
5. Explain the logistics (automated warehouses, AGVs, JIT) and management supporting modern production technologies! (Lean, 5S, TPM)
6. Introduce the tasks and possibilities of MES / CIM systems in production environment!
7. Explain the essence of fine programming. What are the main rules? Demonstrate it via an example.

8. Sensors, data transfer in the field of production technology.
9. Bigdata and Data mining: Define these concepts! What are the core problems? How to deal with them?
10. IT security: from the basics to protecting our virtual production system.
11. Application of agility and scrum framework in technical development.