In effect from: 2017/18 II. semester	**Advanced Manufacturing BMEGEGTMW01**	

Orientation topics for final exam

The topics listed below may not be the same as the actual questions of the final exam. However, the topics comprise a guideline: they show a recommended systemisation of the subject's curriculum. Topics include the learning material of lectures, practises and laboratories (if there was any).

1. Principle of the reverse engineering processes, digitalization methods and equipment. Reverse engineering application in the medical Industry.
2. Product cycle life. The role of the Rapid prototyping, Rapid tooling and Direct manufacturing in the life cycle.
3. Rapid prototyping and Rapid tooling process steps and the rapid methods application in the tool production.
4. Characterize and describe the layered manufacturing methods.
5. Extrusion and stretch blow molding processes, solutions. Blow molding tool design aspects. Mold manufacturing process alternatives.
6. Main characters of the injection molding process. Determination of the parting line (curve) and surface. Designing rules for 3-plates mold tools.
7. Characterize the „feature" based parametrical solid modelling systems. Describe the feature application in the tool path planning and NC programming.
8. Tool path generation process steps in CAM system. CAM strategies and solutions.
9. NC program creation (post-processing), program testing and machining simulation in CAM systems.
10. Outline a mold cavity and core machining strategies (roughing and finishing) and the tool path generation process using CAM system.
11. Characterize the metal removing strategies in CAM systems. Roughing (layered), rest roughing,(layered), pre-finishing (Z-finish), finishing (Z-finish, parallel), rest finishing.
12. Laser beam machining processes. Workability of materials by laser beam. Cutting and welding by laser beam. Laser marking methods.
13. Basic assumptions, concepts and the method of Material Requirements Planning (MRP). Illustration of MRP through a simple example.
14. The problem of lot-sizing, alternative lot-sizing methods, the determination of the Economic Order Quantity (EOQ) formula.
15. Definition of a basic aggregated production and capacity planning problem in terms of linear program. Illustration of the solution method through a simple example.

16. Fine surface finishing: machining with fixed abrasive grains (honing, flex-hone, superfinishing). Methods, kinematics, types of machined part geometries, typical constructions of tool and machine tool. Appliance.
17. Fine surface finishing: machining with loose abrasive grains (lapping, polishing / buffing, sand polishing). Methods, kinematics, types of machined part geometries, typical constructions of tool and machine tool. Appliance.
18. Basic technologies, machines and tools for manufacturing of spur and helical gears. Bonus: basic geometry of non-circular gears.
19. Electrical discharge machining process. Machinability of different workpiece materials. Material removal by electrical spark.
20. Die sinking EDM machining. Electrode materials. Electrical Discharge Milling.
21. Wire Electrical Discharge Machining process.
22. Fundamentals of hard cutting. Mechanism of chip removal. Cutting forces. Cutting tools for hard cutting.

Updated at: 1. June 2018