SYLLABUS

Approved,
DEAN
Prof. dr. eng. Gilbert-Rainer GILLICH

1. Program Data

1.1. Institution of Higher Education	**Babeș-Bolyai University**
1.2. Faculty	**Faculty of Engineering**
1.3. Department	**Department of Engineering Science**
1.4. Field of Study	**Mechanical Engineering**
1.5. Course of Study	**Master**
1.6. Study Programme	**Product Design Engineering**

2. Discipline Data

2.1. Discipline Name	**Computer Aided Technology**						
2.2. Course Coordinator	Assoc. Prof. Dr. Eng. Călin-Octavian Micloșină						
2.3.1. Seminary Coordinator							
2.3.2. Laboratory Coordinator							
2.3.3. Project Coordinator	Assoc. Prof. Dr. Eng. Călin-Octavian Micloșină						
2.4. Year of Study	I	2.5. Semester	1	2.6. Evaluation Time	E	2.7. Discipline Regime	Cmp.

3. Estimated Total Time (hours per semester of teaching activities)

3.1. Number of Hours per Week	**4**	from which: 3.2. Course	**2**	3.3. project	**2**
3.4. Total Hours from the Curriculum Plan	**56**	from which: 3.5. Course	**28**	3.6. project	**28**
Time Fund Distribution - hours					**94**
Study of Handbook, Course Materials, Bibliography & Notes					**28**
Additional Documentation in Library, on Special E-learning Platforms & in the Field					**15**
Preparation of seminaries/laboratories/ projects, topics, reports, portfolios & essays					**42**
Mentoring					**7**
Examination					**2**
Other Activities					

3.7. Total Time of Individual Study	**94**
3.8. Total Hours per Semester	**150**
3.9. Number of Credits	**6**

4. Pre-condition (where is the case)

4.1. of Curriculum	• Technical Drawing and Infographics (or equivalent denominations).
4.2. of Competences	• Capacities to accomplish and interpretation of execution and assembly drawings; • Ability of using a computer aided design / modeling program.

5. Condition (where is the case)

5.1. of Course Progress	• Access to internet / room equipped with PC, videoprojector.
5.2.1. of Seminary Progress	•
5.2.2. of Laboratory Progress	• Access to internet / room equipped with PC, videoprojector; • Used software: SolidWorks.
5.2.3. of Project Progress	•

6. Acquired Specific Competences

Professional Competences	• PC1: Conceiving and design of mechanical systems; • PC2: Use of computer-aided techniques to the analysis and manufacturing of mechanical components. • PC4: Using, development and implementation of methods and procedures for managing product manufacturing flows.
Transversal Competences	• TC1: Communication skills, written and oral, in the field of science • TC2: Using of information and communication technology; • TC3: Interrelationship, teamwork and management skills.

7. Discipline Objectives (coming out from the Checklist of Acquired Specific Competences)

7.1. General Objective of Discipline	• Acquiring skills of computer-aided technological design mode by using a CAD-CAM environment.
7.2. Specific Objectives	• Acquiring skills of geometrical modeling and simulation of processing in a CAD-CAM environment; • Acquiring skills to generate files containing APT or NC codes for processing on numerically controlled machine tools.

8. Content

8.1. Course	Teaching methods	Observation
1. Computer Integrated Manufacturing (CIM). 1.1. Basic notions. 1.2. The structure of C.I.M. system	Lecture, explanation, dialogue.	2 hours
1.3. Computer aided design in the conceiving and development of mechanical products. **2. SolidWorks environment.** 2.1. General aspects regarding the use of SolidWorks modules	Lecture, explanation, dialogue.	2 hours
3. Obtaining of 3D models in the SolidWorks environment. 3.1. The *Sketch* module	Lecture, explanation, dialogue.	2 hours
3.2. The *Features* module.	Lecture, explanation, dialogue.	2 hours
3.3. The *Assembly* module.	Lecture, explanation, dialogue.	2 hours
3.4. Creating parts and assembly technical drawings based on 3D models.	Lecture, explanation, dialogue.	2 hours
4. Computer aided simulation of processing in the SolidWorks environment. 4.1. The *SolidWorks CAM* module.. 4.2.1. Basic notions. 4.2.2. Computer aided simulation of turning processing.	Lecture, explanation, dialogue.	2 hours
4.2. Computer aided simulation of turning processing.	Lecture, explanation, dialogue.	2 hours
4.3. Computer aided simulation of drilling processing.	Lecture, explanation, dialogue.	2 hours
4.4. Computer aided simulation of milling processing.	Lecture, explanation, dialogue.	2 hours
4.5. Generating the files containing APT or NC codes.	Lecture, explanation, dialogue.	2 hours

Bibliography

1. Bi Z., Wang X.: "Computer Aided Design and Manufacturing", Wiley & Sons Ltd., 2020; https://onlinelibrary-wiley-com.am.e-nformation.ro/doi/book/10.1002/9781119667889
2. Nedelcu, .D.: „Proiectare şi simulare numerică cu SolidWorks" (Digital Prototyping and Numerical Simulation with SolidWorks), Eurostampa Publishing House, Timişoara, 2011;
3. **Micloşină, C.-O.:** "Bazele proiectării asistate de calculator" (Basics of Computer Aided Design), Eftimie Murgu Publishing House, Reşiţa, 2018;
4. **Micloşină, C.-O.**: "Proiectare tehnologică asistată a componentelor mecanice", (Computer Aided Technology of Mechanical Components), course support in electronic format;
5. ***: https://help.solidworks.com.

8.2.1. Seminary	Teaching methods	Observation
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Bibliography

8.2.2. Laboratory	Teaching methods	Observation
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Bibliography

8.2.3. Project	Teaching methods	Observation
1. Theme of the project.	Problematization, conversation, demonstration	2 hours / Room B.1.3
2. Design of part processing technology. Constructive-functional analysis of the part. Designing the technological itinerary.	Problematization, conversation, demonstration	2 hours / Room B.1.3
3. Calculation of turning regime parameters.	Problematization, conversation, demonstration	2 hours / Room B.1.3
4. Calculation of drilling regime parameters. Calculation of milling regime parameters.	Problematization, conversation, demonstration	2 hours / Room B.1.3
5. Geometric modeling of the stock and of the part.	Problematization, conversation, demonstration	2 hours / Room B.1.3
6. Obtaining the technical drawing of the part.	Problematization, conversation, demonstration	2 hours / Room B.1.3
7. Generating the files containing the NC code for processing on numerical control machine tools.	Problematization, conversation, demonstration	2 hours / Room B.1.3
8. Computer aided simulation of turning processing.	Problematization, conversation, demonstration	4 hours / Room B.1.3
9. Computer aided simulation of drilling processing.	Problematization, conversation, demonstration	2 hours / Room B.1.3
10. Computer aided simulation of milling processing.	Problematization, conversation, demonstration	2 hours / Room B.1.3
11. Generating the files containing the NC code for processing on numerical control machine tools.	Problematization, conversation, demonstration	2 hours / Room B.1.3
12. Systematization of the developed materials and completion of the project.	Problematization, conversation, demonstration	2 hours / Room B.1.3
13. Project presentation.	Conversation	2 hours / Room B.1.3

Bibliography

1. Bi Z., Wang X.: "Computer Aided Design and Manufacturing", Wiley & Sons Ltd., 2020; https://onlinelibrary-wiley-com.am.e-nformation.ro/doi/book/10.1002/9781119667889
2. Nedelcu, .D.: „Proiectare şi simulare numerică cu SolidWorks" (Digital Prototyping and Numerical Simulation with SolidWorks), Eurostampa Publishing House, Timişoara, 2011;
3. **Micloşină, C.-O.:** "Bazele proiectării asistate de calculator" (Basics of Computer Aided Design), Eftimie Murgu Publishing House, Reşiţa, 2018;
4. **Micloşină, C.-O.**: "Proiectare tehnologică asistată a componentelor mecanice", (Computer Aided Technology of Mechanical Components), course support in electronic format;
5. Popovici, G.: "Tehnologia construcţiilor de maşini. Proiectarea tehnologică" (Machine Building Technology. Technological Design), Didactic and Pedagogic Publishing House, Bucureşti, 2010;
6. ***: https://help.solidworks.com.

9. Corroborating Discipline's Contents with the Expectation of the Epistemic Community Representatives, the Professional Associations and the Employers' Representatives from the Programme Corresponding Field

- They have been established with the main employers by previous discussions at the study programme substantiation.

10. Evaluation

Type of activity	10.1. Evaluation criteria	10.2. Evaluation methods	10.3. Weight from the final grade
10.4. Course	Debates participation	Number of interventions	10 %
	Acquired knowledge level	Written exam of grid type	60 %
10.5.1. Seminary	Activity / implication		
	Gained competence level		
10.5.2. Laboratory	Activity / implication		
	Gained competence level in practice		
10.5.3. Project	Readiness in phrasing the project stages	Number of interventions	15 %
	Project quality	Oral presentation of the project	15 %
10.6. Performance Minimum Standard			
• Completion of applicative activities with the minimum grade of 5. • Completion of exam by the minimum grade of 5. Remark: In the case of overdue students, the course / project completed activity is recognized from the previous year.			

Completion Date	Course Coordinator's Signature	Laboratory / Project Coordinator's Signature
05.05.2022	Assoc. prof. dr. eng. Călin-Octavian Micloşină	Assoc. prof. dr. eng. Călin-Octavian Micloşină
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Department Endorsement Date

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Chief of Department Signature
Lect. dr. phys. Cornel Haţiegan

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