

SYLLABUS ¹

THIS COURSE UNIT IS TAUGHT IN ROMANIAN LANGUAGE

1. Information about the program

1.1 Higher education institution	Universitatea Politehnica Timișoara
1.2 Faculty ² / Department ³	Mecanică / Ingineria Materialelor și Fabricației
1.3 Chair	—
1.4 Field of study (name/code ⁴)	Industrial Engineering / 20.70.10 (HG185/2018 and HG 158/2018)
1.5 Study cycle	Master
1.6 Study program (name/code/qualification)	Inginerie Integrată (Integrated Engineering)

2. Information about discipline

2.1 Name of discipline/The educational classe ⁵	Design for Manufacturing and Assembly						
2.2 Coordinator (holder) of course activities	S.L. dr. ing. TURC Cristian-Gheorghe						
2.3 Coordinator (holder) of applied activities ⁶	S.L. dr. ing. TURC Cristian-Gheorghe						
2.4 Year of study ⁷	1	2.5 Semester	1	2.6 Type of evaluation	E	2.7 Type of discipline ⁸	DA

3. Total estimated time (direct activities (fully assisted), partially assisted activities and unassisted activities⁹)

3.1 Number of hours fully assisted/week	3 ,of which:	3.2 course	1,5	3.3 seminar/laboratory/project	1,5
3.1* Total number of hours fully assisted/sem.	42 ,of which:	3.2* course	21	3.3* seminar/laboratory/project	21
3.4 Number of hours partially assisted/week	3 ,of which:	3.5 project, research	3	3.6 training	3.7 hours designing M.A. dizertation
3.4* Number of hours pasrtially assisted/ semester	42 ,of which:	3.5* project of research	42	3.6* training	3.7* hours designing M.A. dizertation
3.8 Number of hours of unassisted activities/ week	2,43 ,of which:	Additional documentation in the library, on specialized electronic platforms, and on the field			0,2
		Study using a manual, course materials, bibliography and lecture notes			1,5
		Preparation of seminars/ laboratories, homework, assignments, portfolios, and essays			0,7
3.8* Total number of hours of unasssited asctivities/ semester	34 ,of which:	Additional documentation in the library, on specialized electronic platforms, and on the field			3
		Study using a manual, course materials, bibliography and lecture notes			21
		Preparation of seminars/ laboratories, homework, assignments, portfolios, and essays			10
3.9 Total hrs./week ¹⁰	8,43				
3.9* Total hrs./semester	118				
3.10 No. of credits	6				

4. Prerequisites (where applicable)

4.1 Curriculum	<ul style="list-style-type: none"> Preferably, a graduate of a bachelor's degree program in the field of study: Industrial Engineering, Mechanical Engineering or Engineering and
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¹ The form corresponds to the Syllabus promoted by OMECTS 5703/18.12.2011 (Annex 3), updated based on the Specific Standards ARACIS of December 2016.

² The name of the faculty which manages the educational curriculum to which the discipline belongs

³ The name of the department entrusted with the discipline, and to which the course coordinator/holder belongs.

⁴ Fill in the code provided in HG no. 376/18.05.2016 or in HG similars annually updated.

⁵ The educational classes of disciplines (ARACIS – specific standards, art./paragraph 4.1.2.a) are: fundamental disciplines, field disciplines, majoring/specialization disciplines.

⁶ The applied activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).

⁷ The year of study to which the discipline is provided in the curriculum .

⁸ The types of disciplines (ARACIS – specific standards, art./paragraph 4.1.2.a) are: extended knowledge discipline / advanced knowledge discipline and synthetic discipline (DA / DCAV and DS) or art./paragraph 4.1.2 b) complementary discipline (DC)).

⁹ Within UPT, the number of hours from 3.1*, 3.2*,...,3.9* are obtained by multiplying by 14 (weeks) the number of hours from 3.1, 3.2,...., 3.9.

¹⁰ The total number of hours/week is obtained by summing up the number of hours from 3.1, 3.4 și 3.8.

	Management
4.2 Competencies	<ul style="list-style-type: none"> • Preferably, engineering skills developed through specific disciplines of mechanical engineering on mechanical processing processes, plastic injection, die casting, tolerances and technical measurements, assembly technologies.

5. Conditions (where applicable)

5.1 of the course	<ul style="list-style-type: none"> • 115 SPM Building
5.2 to conduct practical activities	<ul style="list-style-type: none"> • 106 SPM Bulding

6. Specific competencies acquired through this discipline

Specific competencies	<ul style="list-style-type: none"> • C2.3. Application of optimization, simulation and modeling methods in the analysis of technological manufacturing processes and in the rapid development of products • C2.5. Development of projects that require optimization, simulation and modeling • C4.1. Identification of design methods for product structure, shape and materials of component parts to reduce manufacturing and assembly costs • C4.2. Explaining and interpreting new conception and design solutions • C4.4. Evaluation of costs and processing times of different shapes of parts using different product design variants • C4.5. Development of case studies on the redesign of some industrial products and analysis of the increase of economic efficiency • From the G1 grid of competences, for the Integrated Engineering master's program.
Professional competencies ascribed to the specific competencies	<ul style="list-style-type: none"> • C2. Development of applications for modeling, simulation, analysis and optimization of materials, products and manufacturing processes • C4. Conception and design of products for competitive manufacturing • From the G1 grid of competences, for the Integrated Engineering master's program.
Transversal competencies ascribed to the specific competencies	<ul style="list-style-type: none"> • CT1. Applying the values and ethics of the engineering profession and responsible execution of complex professional tasks in conditions of professional autonomy and independence; promoting logical, convergent and divergent reasoning, practical applicability, evaluation and self-evaluation in decision making • CT2. Carrying out activities with the exercise of specific roles of teamwork on different hierarchical levels and with the assumption of leadership roles; promoting the spirit of initiative, dialogue, cooperation, positive attitude and respect for others, diversity and multiculturalism and the continuous improvement of one's activity. • From the G1 grid of competences, for the Integrated Engineering master's program.

7. Objectives of the discipline (based on the grid of specific competencies acquired)

7.1 The general objective of the discipline	<ul style="list-style-type: none"> • Training skills in modeling, simulation, analysis and optimization of products and related manufacturing processes in the context of increasing economic competitiveness
7.2 Specific objectives	<ul style="list-style-type: none"> • Learning methods of optimization, simulation and modeling in the analysis of technological processes for manufacturing specific products • Learning methods for calculating and optimizing the cost of parts made by various manufacturing processes • Acquiring product design principles in order to increase economic competitiveness

8. Content

8.1 Course	Number of hours	Teaching methods
Considerations regarding the design for manufacturing paradigm	2	Lecture, presentation, demonstration, explanation, exemplification, debate, conversation, case study, problematization, Debate, use of ICT
Calculation of the cost of injected parts	6	
Design of plastic products obtained by injection	4	
Calculation of the cost of pressure die castings	4	
Design of the products obtained by pressure die casting	3	
Product design for assembly	2	

		techniques, video animation.

Bibliography¹¹

1. Cristian-Gheorghe Turc, Conceptia pentru fabricatie, curs, format electronic (CD)
2. Harry Cather, Richard Morris, Mathew Philip and Chris Rose, Design Engineering, 2001 Elsevier Ltd., ISBN-13: 978-0-7506-5211-7
3. Corrado Poli, Design for Manufacturing, Butterworth-Heinemann Elsevier Ltd, Oxford, 2001, ISBN-13: 978-0-7506-7341-9
4. K. G. Swift, J. D. Booker, Process Selection. From Design to Manufacture, 2003 Elsevier Ltd., ISBN-13: 978-0-7506-5437-1
5. Tudor Iclanzan, Tehnologia prelucrării materialelor plastice și compozite, Editura Politehnica Timisoara, 2006, ISBN 973-625-372-4
6. Beno Benhabib, Manufacturing: design, production, automation and integration, New York Marcel Dekker, 2003, ISBN: 0824742737

8.2 Applied activities¹²

	Number of hours	Teaching methods
Project theme: Conception / reconception of a product obtained by injection or die casting	2	Presentation, explanation, exemplification, demonstration, case study.
Product shape analysis and technological implications	2	
Estimating the cost of the necessary equipment	6	
Estimating the cost of operating the equipment	4	
Estimating the cost of materials	2	
Estimation of the cost of the manufactured product	1	
Formulation of product design changes	1	
Estimating the cost of the redesigned product	2	
Estimating the economic efficiency of product reconception	1	

Bibliography¹³

1. Cristian-Gheorghe Turc, Conceptia pentru fabricatie, curs, format electronic (CD)
2. Corrado Poli, Design for Manufacturing, Butterworth-Heinemann Elsevier Ltd, Oxford, 2001, ISBN-13: 978-0-7506-7341-9
3. K. G. Swift, J. D. Booker, Process Selection. From Design to Manufacture, 2003 Elsevier Ltd., ISBN-13: 978-0-7506-5437-1
4. Tudor Iclanzan, Tehnologia prelucrării materialelor plastice și compozite, Editura Politehnica Timisoara, 2006, ISBN 973-625-372-4

9. Coroboration of the content of the discipline with the expectations of the main representatives of the epistemic community, professional associations and employers in the field afferent to the program

- Through the topics approached, this discipline is of great interest in both academia and industry.
- Periodically, during the contacts with the industrial environment, the opinion of the representatives of the industrial units regarding the preferences regarding the knowledge and the qualities appreciated in the selection for employment is requested.
- These opinions are discussed in board meetings of the field of Industrial Engineering and, based on the conclusions, the curricula and / or the content of some disciplines are modified to meet the requirements of the industrial environment.

¹¹ At least one title must belong to the department staff teaching the discipline, and at least one title must refer to a relevant work for the discipline, a national and international work that can be found in the UPT Library.

¹² The types of applied activities are those mentioned in 5. If the discipline contains more types of applied activities then they are marked, consecutively, in the table below. The type of activity will be marked distinctively under the form: „Seminar:”, „Laboratory:”, „Project:” and/or „Practice/Training:”.

¹³ At least one title must belong to the staff teaching the discipline.

10. Evaluation

Type of activity	10.1 Evaluation criteria ¹⁴	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Grade 5 is given for knowledge of 50% of each exam subject, and grade 10 for knowledge of 100% of each exam subject.	Summative evaluation through a written paper, which consists of a theoretical topic developed in extenso, and a series of questions with short answers.	2/3
10.5 Applied activities	S:		
	L:		
	P: Grade 5 is awarded for the correct resolution of 50% of the project content, and grade 10 for the correct resolution of 100% of the project.	Summative evaluation of the content of the realized project	1/3
	Pr:		
	Tc-R¹⁵:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified ¹⁶)			
<ul style="list-style-type: none"> The graduation of the discipline requires the knowledge of a minimum volume of knowledge of 50% of the total volume of knowledge taught. The verification of the minimum volume of knowledge is done by summative evaluation. 			

Date of completion

Course coordinator
(signature)

Coordinator of applied activities
(signature)

Head of Department
(signature)

Date of approval in the Faculty
Council ¹⁷

Dean
(signature)

¹⁴ The Syllabus must contain the evaluation method of the discipline, specifying the criteria, the methods and the forms of evaluation, as well as mentioning the share attached to these within the final mark. The evaluation criteria must correspond to all activities stipulated in the curriculum (course, seminar, laboratory, project), as well as to the methods of continuous assessment (homework, essays etc.)

¹⁵ Tc-R= Homework-Reports

¹⁶ For this point turn to "Ghid de completare a Fișei disciplinei" found at: http://univagora.ro/m/filer_public/2012/10/21/ghid_de_completare_fisa_disciplinei.pdf

¹⁷ The approval is preceded by discussing the study program's board's point of view with regards to the syllabus.