

SYLLABUS ¹

1. Information about the program

1.1 Higher education institution	Politehnica University Timisoara
1.2 Faculty ² / Department ³	Management in Production and Transportation / Management
1.3 Chair	—
1.4 Field of study (name/code ⁴)	Engineering and Management / 207010
1.5 Study cycle	Master
1.6 Study program (name/code/qualification)	Quality and Competitiveness Engineering and Management / 207010

2. Information about discipline

2.1 Name of discipline	Methods and Tools for Quality Engineering						
2.2 Coordinator (holder) of course activities	Lecturer Sabina Potra, Ph.D , Eng.						
2.3 Coordinator (holder) of applied activities ⁵	Lecturer Sabina Potra, Ph.D , Eng.						
2.4 Year of study ⁶	1	2.5 Semester	1	2.6 Type of evaluation	E	2.7 Type of discipline	DA

3. Total estimated time (direct activities (fully assisted), partially assisted activities and unassisted activities ⁷)

3.1 Number of hours fully assisted/week	3 ,of which:	3.2 course	2	3.3 seminar/laboratory/project	1
3.1* Total number of hours fully assisted/sem.	42 ,of which:	3.2* course	28	3.3* seminar/laboratory/project	14
3.4 Number of hours partially assisted/week	,of which:	3.5 project, research		3.6 training	3.7 hours designing M.A. dizertation
3.4* Number of hours pasrtially assisted/ semester	,of which:	3.5* project of research		3.6* training	3.7* hours designing M.A. dizertation
3.8 Number of hours of unassisted activities/ week	2,5 ,of which:	Additional documentation in the library, on specialized electronic platforms, and on the field			0,5
		Study using a manual, course materials, bibliography and lecture notes			1
		Preparation of seminars/ laboratories, homework, assignments, portfolios, and essays			1
3.8* Total number of hours of unasssited asctivities/ semester	35 ,of which:	Additional documentation in the library, on specialized electronic platforms, and on the field			7
		Study using a manual, course materials, bibliography and lecture notes			14
		Preparation of seminars/ laboratories, homework, assignments, portfolios, and essays			14
3.9 Total hrs./week ⁸	5,5				
3.9* Total hrs./semester	77				
3.10 No. of credits	5				

4. Prerequisites (where applicable)

4.1 Curriculum	•
4.2 Competencies	•

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

⁶ The year of study to which the discipline is provided in the curriculum .

⁷ 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. The information from 3.1, 3.4 și 3.8 are keys of verification used by ARACIS under the form: (3.1)+(3.4) ≥ 28 hrs./week and (3.9) ≤ 40 hrs./week.

⁸ The total number of hours/week is obtained by summing up the number of hours from 3.1, 3.4 și 3.8.

5. Conditions (where applicable)

5.1 of the course	<ul style="list-style-type: none"> Support materials: projector, whiteboard
5.2 to conduct practical activities	<ul style="list-style-type: none"> Classroom, Whiteboard

6. Specific competencies acquired through this discipline

Specific competencies	<ul style="list-style-type: none"> Understanding quality engineering concepts for an appropriate process analysis and improvement both individually and in teams.
Professional competencies ascribed to the specific competencies	<ul style="list-style-type: none"> C1. The correct and appropriate application of the adequate theoretical and practical notions of the domain and specialization knowledge. C2. Statistical computing competences and use of quality and competitiveness specific tools to analyze, process and interpret information from engineering and management systems. C3. Addressing engineering and managerial issues specific to quality and competitiveness in a creative, efficient and effective way C4. Critical and constructive analysis to improve projects, processes, engineering and managerial systems.
Transversal competencies ascribed to the specific competencies	<ul style="list-style-type: none"> CT1. Development of analytical, synthetic, comparative and critical thinking, adaptability and communication ability in different situations and conditions. CT2. Identifying roles and responsibilities in an interdisciplinary team and applying relationship and collaboration techniques within the team, demonstrating initiative spirit and innovative capabilities in physical and virtual environments.

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"> To synthesize and present candidates the basic quality management concepts and to help them apply those theoretical terms and tools into process improvement projects.
7.2 Specific objectives	<ul style="list-style-type: none"> Understanding the foundations for quality management: TQM and Six Sigma methodologies Explaining steps needed for process control Use of quality engineering tools for process improvement

8. Content

8.1 Course	Number of hours	Teaching methods
1. Introduction to Quality Engineering (Definition of Quality Engineering and Pioneers – Juran and Deming)	2	Lecture with PowerPoint presentation, discussion and examples
2. Introduction to Quality Engineering (TQM and Six Sigma models)	2	
3. Process Control (Quantify Process variation)	2	
4. Process Control (Quality Audits)	4	
5. Continuous improvement (Define the Problem)	2	
6. Continuous improvement (Collect data and measurements)	4	
7. Continuous improvement (Analysis of root causes)	4	

8. Continuous improvement (Determination of possible solutions)	4	
9. Continuous improvement (Implementation of solution)	2	
10. Continuous improvement (Control and best practices)	2	

Bibliography ⁹ 1. Pyzdek T. and Keller P. – The handbook for Quality Management. A Complete Guide to Operational Excellence, Second edition Mc Graw Hill, New York, 2013

2. Knowles G. – Quality Management, Graeme Knowles & Ventus Publishing Aps, 2011

3. Kenneth R. – Project quality management: why, what and how, J. Ross Publishing inc., 2005

4. Allen T.T. – Introduction to engineering statistics and six sigma: statistical quality control and design of experiments and systems, Springer-Verlag London Limited, USA, 2006

5. Taguchi G., Chowdhury S. and Wu Y. - Taguchi's Quality Engineering handbook, John Wiley & Sons Inc., New Jersey, 2005

8.2 Applied activities ¹⁰	Number of hours	Teaching methods
1. Quality Audit	2	Discussions, questions and specific case studies
2. Problem solving (Define the Problem – Team Chart Worksheet, Flowchart, problem definition and goal statement)	2	
3. Problem solving (Measure – Check sheet Formats, Pareto diagram, Stratification diagram, Run chart, Histogram)	2	
4. Problem solving (Analysis – Cause & Effect diagram, 5 Ws, Affinity diagram)	2	
5. Problem solving (Determination of possible solutions – Triz 40 inventive principles, Brainstorming, 6 Thinking Hats, Selection Matrix, Ranking ideas Worksheet, PUGH Matrix)	2	
6. Problem solving (Implementation of solution – Gantt chart, FMEA)	2	
7. Problem solving (Control and lessons Learned – Best practice, performance evaluation, Training)	2	

⁹ 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.

¹⁰ 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:“.

Bibliography ¹¹ 1. Pyzdek T. and Keller P. – The handbook for Quality Management. A Complete Guide to Operational Excellence, Second edition Mc Graw Hill, New York, 2013

2. Kenneth R. – Project quality management: why, what and how, J. Ross Publishing inc., 2005

3. Borrer C.M. – The Certified Quality Engineering Handbook, third Edition, ASQ Quality Press, Milwaukee, Wisconsin, 2009

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

- The majority of employers in the field need a specialist in quality engineering for continuous improvement purposes. The knowledge and specific competencies in this domain helps quality engineers/managers/directors in career development and cost control/performance improvement.

10. Evaluation

Type of activity	10.1 Evaluation criteria ¹²	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Solving theoretical subjects related to courses	Written evaluation	50%
10.5 Applied activities	S: Solving the problems related to seminars	Presentation of personal and team solutions and answering questions	50%
	L:		
	P:		
	Pr:		
	Tc-R¹³:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified ¹⁴)			
<ul style="list-style-type: none"> • The correct use of discussed concepts and solving specific problems of medium complexity 			

Date of completion

Course coordinator
(signature)

Coordinator of applied activities
(signature)

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Head of Department
(signature)

Date of approval in the Faculty
Council ¹⁵

Dean
(signature)

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¹¹ At least one title must belong to the staff teaching the discipline.

¹² 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.)

¹³ Tc-R= Homework-Reports

¹⁴ For this point turn to "Ghidului de completare a Fișei disciplinei" found at: http://univagora.ro/m/filer_public/2012/10/21/ghid_de_completare_fisa_disciplinei.pdf

¹⁵ The approval is preceded by discussing the study program's board's point of view with redgards to the syllabus.