COURSE SYLLABUS

1. Program information

1.1. Institution	Petroleum-Gas University of Ploieşti
1.2. Faculty	Petroleum Refining and Petrochemistry
1.3. Department	Petroleum Processing and Environmental Engineering
1.4. Field of study	Chemical engineering
1.5. Study cycle	Full time
1.6. Study program	Chemical Engineering for Refineries and Petrochemistry

2. Course information

2.1. Course title	Process modeling, simulation and optimization		
2.2. Course coordinator	Fendu Elena Mirela		
2.3. Laboratory / seminar coordinator	Nicolae Marilena		
2.4. Project coordinator	-		
2.5. Year of study	1		
2.6. Semester *	II		
2.7. Evaluation type	Exam		
2.8. Course type - formative category **	DD	2.8. Type of subject matter ***	C

* the semester number is in accordance with the curriculum;

** fundamental = DF; domain = DD; speciality = DS; complementary = DC; thoroughgoing = DA; synthesis = DSI.

*** compulsory = C; optional = O; elective = E

3. Total estimated time (teaching hours per semester)

3.1. Number of hours perweek	4	of which: 3.2. course	2	3.3. Seminars/laboratories	2	3.4 Project	-
3.5Total hours from curriculum	56	of which: 3.6. course	28	3.7Seminars/laboratories	28	3.8 Project	-

3.9 Time distribution	hours
Study of textbook, course support, bibliography and notes	10
Further reading in the library, on online platforms and fieldwork	14
Preparing seminars / laboratories, homework, portfolios and essays	4
Tutoring	3
Examinations	3
Other activities	

3.10. Total hours of individual study	34
3.11. Total hours per semester	90
3.12 Number of credits	5

4. Prerequisites (where applicable)

4.1. of curriculum	➢ Numerical Methods, Computer Programming, Mass Transfer Processes
4.2. of skills	➢ Thermodynamic calculations

5. Requirements (where applicable)

5.1. of course	Projector, screen, computer
5.2. of seminars/laboratory	Computers with PRO/II Software process simulation program

6. Specific competences

Professional competences	➢ Description, analysis and advanced utilization of engineering concepts and fundamental theories in petroleum refining. ➢ Equipment, process and plant design. ➢ Modeling, simulation and design of chemical processes.
Cross-curriculum competences	➢ Documentation, information and scientific literature research. ➢ Independent and autonyms achievement of individual professional tasks. ➢ Advanced knowledge of computer, internet and specific chemical engineering software. ➢ Management organization and planning of professional teams and organizations.

7. Course objectives (based on the competence grid)

7.1. General objective	➢ Acquiring skills in the field of chemical process simulation and optimization
7.2. Specific objectives	➢ The ability to perform calculations in the chemical process simulation ➢ The ability to evaluate, explain and interpret processes that are optimized

8. Contents

8.1. Course	Time	Teaching methods	Comments
Modeling and simulation of unit processes	10	Course material made available in the form of slides, books in PDF format - Interactive Teaching using Power Point, PRO / II Simulator Software - Questions and periodic tests	
Modeling and simulation of distillation columns	5		
Convergence	3		
Simulation of recycling processes	3		
Display the results and their interpretation	2		
Optimization methods	5		
Bibliography 1. Seider. Seader, Lewin, Process Design Principles – John Wiley & Sons, Inc., 1999 2. Douglas, Conceptual Design of Process Engineering, McGraw Hill, 1988 3. Bohîlţea, Cursaru, D., Elemente de modelare şi optimizare a proceselor chimice, MatrixRom, 2009.			
8.2. Seminar / laboratory	Time	Teaching methods	Comments
Modeling and simulation of unit processes	10		

Modeling and simulation of distillation columns	5		
Convergence	3		
Simulation of recycling processes	3		
Display the results and their interpretation	2		
Chemical process optimization	5		
Bibliography 1. *, PRO/II Manuals 2. Bohîlţea, Cursaru, D., Elemente de modelare şi optimizare a proceselor chimice, MatrixRom, 2009.			

8.3. Project	Time	Teaching methods	Comments
Bibliography			

9. Correlation of the course contents with the demands of the epistemic community representatives, professional associations and representative employers in the field of the program

- The course syllabus was developed in cooperation with representatives of engineering companies in Ploiești and Bucharest that have hired graduates of similar master programs.

10. Evaluation

Activity	10.1. Evaluation criteria	10.2. Evaluation methods	10.3. Percentage of final grade
10.4. Course	Presence	Presence	10%
	Quality and quantity of accumulated knowledge	Practical exam, computer applications	60%
10.5. Seminar / laboratory /	Quality and quantity of accumulated knowledge	Presence The accuracy of laboratory works The accuracy of homework's	30%
10.6 Project			
10.7. Minimum performance standard			
➢ Simulation and optimization of a chemical process.			