

COURSE DESCRIPTION FORM	
Course Code and Title	KMP562-RISK ASSESSMENT
Course Semester	2
Catalog Content	Hazard analysis and risk assessment in chemical processes. Hazard analysis techniques. Risk analysis techniques. Risk assessment methods. Preliminary hazard analysis, Fault Tree Analysis, Event Tree Analysis, Failure Mode and Effects Analysis, Hazard and Operability Analysis, Layers of Protection Analysis, Hazardous equipment identification. The probability of an accident. Accident root cause investigation. Individual and social risk. Risk Maps.
Main Textbook	<ul style="list-style-type: none"> • Arendt, J.S., Lorenzo, D.K., Evaluating Process Safety in the Chemical Industry: A User's Guide to Quantitative Risk Analysis, 2000.
Supplementary Textbooks	<ul style="list-style-type: none"> • Guidelines for Risk Based Process Safety, Guidelines for Risk Based Process Safety, Wiley, 2007. • Ericson, C., A., Hazard Analysis Techniques for System Safety, 2nd ed., Wiley, 2015. • Guidelines for Chemical Process Quantitative Risk Analysis, CCPS, 2nd ed., 1995.
Course Credits (ECTS)	6
Pre-Requisites And Co-Requisites	-
Type of the Course	Compulsory
Language of Instruction	Turkish
Object and Target of the Course	<ul style="list-style-type: none"> • To teach the risk assessment approach for chemical processes. • To teach the approach to identify and control process-specific risks.
Course Learning Outcomes	<ul style="list-style-type: none"> • Expresses risk management in chemical processes. • Plans actions for occupational safety and process safety in chemical processes.
Mode of Delivery	Lecture, Question & Answer, Demonstration
Weekly Schedule	<p>1st Week Hazard Analysis, Risk Analysis and Risk Assessment Concepts and Application Approach to Chemical Processes</p> <p>2nd Week Hazard Analysis Methods - HAZAN, HAZID, ETA, FTA, BOW-TIE</p> <p>3rd Week Hazard Analysis Methods - ETA, FTA, BOW-TIE-Case Study</p> <p>4th Week Failure Mode and Effects Analysis - FMEA and FMEA Case Study</p>

	5 th Week	Hazard and Operability Analysis - HAZOP		
	6 th Week	Hazard and Operability Analysis - HAZOP Case Study		
	7 th Week	Layers of Protection Analysis-Midterm		
	8 th Week	Layers of Protection Analysis - LOPA-Case Study		
	9 th Week	Index Methods in Risk Assessment - Dow Fire Explosion Index, etc.		
	10 th Week	Hazardous and Critical Equipment Identification		
	11 th Week	Accident Root Cause Investigation		
	12 th Week	Accident Root Cause Investigation		
	13 th Week	Accident Probability		
	14 th Week	Individual and Social Risk. Risk Maps		
	15 th Week	Final Exam		
Educative Activities	Theoretical Study Hours of Course Per Week : 3			
	Practical Study Hours of Course Per Week : -			
	Reading : -			
	Searching in Internet and Library : 5			
	Material Design and Application : -			
	Preparing Reports : 3			
	Preparing Presentations : 2			
	Presentations : 1			
	Midterms and Studying for Midterms : 5			
Final and Studying for Final : 2				
Assesment Criteria		Quantity	Total Contribution (%)	
	Midterms	1	20	

	Assignments	2	10						
	Applications	-	-						
	Projects	3	30						
	Practices	-	-						
	Quizzes	-	-						
	Contribution of In-term Studies to Overall Grade		60						
	Contribution of Final Examination to Overall Grade	1	40						
	Attendance	-							
Workload of the Course	Activity	Total Number of Weeks	Duration (Weekly Hour)	Total Period Workload					
	Weekly Theoretical Course Hours	14	3	42					
	Weekly Practical Course Hours	-	-	-					
	Reading Tasks	-	-	-					
	Searching in Internet and Library	14	5	70					
	Material Design and Application	-	-	-					
	Preparing Reports	3	3	9					
	Preparing Presentations	3	2	6					
	Presentations	3	1	3					
	Midterms and Studying for Midterms	1	5	5					
	Final and Studying for Final	2	2	4					
	Other	-	-	-					
	Total Workload			139					
	Total Workload / 25			5,56					
	Course Credits (ECTS)			6					
	Course's Contribution to Program	No	Program Learning Outcomes			1	2	3	4

	1	Developing undergraduate level competencies and deepening their knowledge to apply in the field of process safety					X
	2	Understanding the undergraduate competencies and the interaction between the competencies gained in this program and the disciplines related to process safety					X
	3	Using the expert level theoretical and applied knowledge acquired in the field of process safety				X	
	4	Developing the competencies gained at the undergraduate level and integrating the information gained in the field of process safety with the information from the relevant disciplines and creating new knowledge				X	
	5	Solving process safety problems using scientific research methods					X
	6	Independently conducting studies that require expertise in the field of process safety				X	
	7	Developing new approaches to complex problems encountered in applications in the field of process safety		X			
	8	Taking responsibility and generating solutions for complex problems encountered in applications in the field of process safety					X
	9	Taking initiative in environments that require resolution of problems related to process safety		X			
	10	Critically evaluating the information acquired about process safety and directing learning				X	
	11	Ability to systematically transfer the developments and own studies in the field of process safety in written, oral and visual forms					X

	12	Developing social relations and the set of values that direct these relationships with a critical approach and transforming them when necessary			X		
	13	Establishes oral and written communication using a foreign language (European Language Portfolio B2 level)	X				
	14	Uses computer software at the level required by the process safety field					X
	15	Uses advanced information and communication technologies at the level required by the field of process safety					X
	16	Collecting, interpreting, finalizing the data on process safety, applying and sharing them with respect to ethical values				X	
	17	Developing different perspectives on process safety issues, setting policies, making plans and evaluating the results within the framework of quality			X		
	18	Internalizing the knowledge gained in the field of process safety with the competencies gained at the undergraduate level, turning it into skills and using it in interdisciplinary studies					X
Name of Lecturer(s) and Contact Information		Faculty Members of the Chemical Engineering Department					