

<b>Course number and name</b>	END 414 / Maintenance Management
<b>Credits, contact hours, categorization of credits</b>	3 credits / 42 hours / Engineering topic
<b>Instructor or course coordinator</b>	Murat BASKAK
<b>Text book and other supplemental materials</b>	<ul style="list-style-type: none"> <li>• Baskak, M., Satoğlu, Ş.I. (2014), “Total Productive Maintenance”, İstanbul Üniversitesi Açık ve Uzaktan Eğitim Fakültesi, Course Book</li> <li>• Köksal, M. (2007), “<i>Maintenance Planning</i>”, Seçkin Publisher., 1. Edition, İstanbul.</li> <li>• O’Connor, P.D., Kleyner, A. (2012), <i>Practical Reliability Engineering</i>. Wiley, 5<sup>th</sup> Edition.</li> <li>• EÜAŞ General Directorate (2007), “<i>Basic Approaches in Maintenance Management Report</i>”, Ankara</li> <li>• Kirazlılar, B. (2007), <i>Industrial Maintenance: Fundamentals of Predictive and Preventive Maintenance</i>, Birsen Press, İstanbul.</li> <li>• Ebeling, C.E., (2005). <i>An Introduction to Reliability and Maintainability Engineering</i>, Waveland Press.</li> </ul>

<b>Course information</b>	
<b>Content</b>	Introduction of Basic Measures: Time Between Failures, Repair Time, Reliability, Failure Rate. Classification of Maintenance Activities, Analysis of Maintenance-Repair Systems, Determination of Maintenance Requirements of a Firm/Shop, Repair, Periodic Maintenance, Predictive Maintenance, Determination of the Most Suitable Maintenance Period, Maintenance and Repair Costs, Productive and Total Productive Maintenance (TPM), Computer Integrated Maintenance Planning.
<b>Prerequisites</b>	END 252 Theory of Probability
<b>Type</b>	Selected elective

<b>Course learning outcomes</b>
<p>Students who pass the course will:</p> <ol style="list-style-type: none"> <li>I. Learn about the types of maintenance operations</li> <li>II. Analyze the actual situation of the company before applying a new maintenance system.</li> <li>III. Determine the maintenance type according to the requirements of the system</li> <li>IV. Decide to implement whether to apply periodic or predictive maintenance activity</li> <li>V. Determine the most appropriate maintenance period</li> <li>VI. To understand the philosophy of productive and total productive maintenance activities</li> <li>VII. Calculate the total effectiveness of workshops not only machines</li> <li>VIII. Apply his/her programming ability to maintenance-repairing activities</li> <li>IX. Apply modern mathematical methods to maintenance-repairing activities.</li> </ol>

<b>Student outcomes</b>	<b>Level of contribution</b>
SO1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	Partial
SO2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	Little
SO3. An ability to communicate effectively with a range of audiences.	Little
SO4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	Partial
SO5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	Little
SO6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	Partial
SO7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	Little

<b>Week</b>	<b>Topics</b>	<b>Learning outcome(s)</b>
1	Basic Terminology, General Information About Maintenance, Maintenance-Repair Policies, Basic Measures	I
2	Collecting Information About Maintenance Activities, Analysis of Scheduled Maintenance Applications, Operation Breaks, Maintenance Activities, and Maintenance Periods	I, II, III
3	Analysis of Replacement Parts Supply System and Usage Catalogs, Organizational Structure of the Maintenance Function, Evaluation of Maintenance Activities, Maintenance-Repair Communication Systems	II, III
4	Scheduled Maintenance Concept, Bathtub Curve, Maintenance Costs and Economic Maintenance Level, Selection of the Best Maintenance Type, Periodic Maintenance	II, III, IV
5	Industrial Practice Examples of Periodic Maintenance	II, VI
6	Predictive Maintenance Phases, Organization of Predictive Maintenance Application, Economic Benefits of Predictive Maintenance	II, III, IV
7	Industrial Practice Examples of Predictive Maintenance	II, VI
8	Productive Maintenance Concept, Aims and Methods, Errors Caused by the Equipment, the Operator, and the Material	II, III, IV
9	Definition of Total Productive Maintenance, Total Productive Maintenance Activities	II, III, IV
10	Overall Equipment Efficiency, Industrial Practice Examples of TPM	VI, VII
11	Modern Maintenance Techniques, Queuing Theory, Replacement Decisions	V, IX
12	Computer-Aided Maintenance Management	VIII
13	Project Presentations	VI
14	Project Presentations	VI