

„DŽEMAL BIJEDIĆ“ UNIVERSITY OF MOSTAR FACULTY OF MECHANICAL ENGINEERING Renewable energy sources			
Course name:	Maintenance of energy plants		Course code: 0000
Cycle level, year, semester	Master degree		2nd. academic year. / winter
Course teacher:	Assoc.prof. Emir Nezirić		
Contact:	Room: O007 E-mail: emir.nezirc@unmo.ba Tel.:+38736571258		
Student workload in hours:	Lectures weekly: 2 hours	Excercises weekly: 2 hours	Total: (30+30)
Number of ECTS credits:	ECTS: 6		
Base qualification:	Master study level		
Course status:	Mandatory		
Preconditions for Course:	-		
Limitations for Course:	None		
ECTS explanation:	60 in class (lectures, auditory excercises, labratory excercises) / 25 = 2,4 ECTS 30 hours of seminar paper / 25 = 1,2 ECTS 60 hours of self-paced reading / 25 = 2,4 ECTS TOTAL = 6 ECTS		
Course goal:	Getting acquainted with the procedures for planning maintenance of energy plants, technical procedures in maintenance, control, and monitoring the efficiency of systems.		
Description of the general and specific competences (knowledge and skills) / learning outcomes:	Upon successful completion of this course, students will be equipped to independently prepare the organization and implementation of maintenance processes and manage maintenance costs of energy systems. Students will be able to determine the system status based on collected data, identifying all elements describing system efficiency. They will also be capable of recognizing and applying proper maintenance concepts to various energy systems, applying techniques for diagnosing energy systems, planning spare parts and their replacement. Additionally, they will define the organizational structure of maintenance for energy plants and assess the success of maintenance.		
Course contents:	1. Introduction: Definition of failure, definition of system maintenance, basic maintenance philosophies, temporal depiction of system status. 2. Elements of efficiency: Reliability of energy plants, availability of energy plants, functional fitness. Probability of occurrence of operational states and failures, mean time between failures, other parameters for assessing system efficiency. 3. Corrective maintenance, advantages and disadvantages, analysis of corrective maintenance processes, monitoring variables describing corrective maintenance. 4. Preventive maintenance, prerequisites for implementing preventive maintenance, metrics and models of preventive maintenance. 5. Condition-based maintenance, predictive maintenance, function. 6. Reliability-centered maintenance (RCM), objectives and principles, components of RCM, condition monitoring techniques and failure prediction. 7. Technical diagnostics of energy systems, measurement techniques of parameters in energy systems and their analysis and presentation, reporting after technical diagnostics procedures. 8. Vibration diagnostics of rotating machinery in energy plants, basic vibration quantities, vibration measurement, vibration measurement systems, vibration analysis, assessment of the condition of rotating machinery. 9. Management of spare parts and materials in maintenance of energy plants. Division of spare parts and materials, spare parts planning, spare parts storage, specificities of some spare parts of energy plants. 10. Tribology, mechanisms of gradual material wear: abrasion, adhesion, erosion, corrosion, cavitation. Methods for reducing the effects of material wear through lubrication, filtration, protection. Basic lubrication procedures, classification of lubricants. 11. Assembly and disassembly procedures in maintenance of energy plants, technologies applicable in the assembly and disassembly of system elements.		

Form of teaching:	Lectures, auditory excercises, laboratory excercises, office hours
Other student obligations:	Seminar paper
Items of Assesment:	Laboratory practical excercises / seminar paper – 30% Partial exams 2x35 – 70%
Base literature and references:	1. Dr. Slavko Sebastijanović – Dr. Džemo Tufekdžić: „ODRŽAVANJE“ Univerzitet u Tuzli, Mašinski fakultet, 1998. 2. Niko Majdančić: „STRATEGIJA ODRŽAVANJA I INFORMACIONI SISTEMI“, Strojarski fakultet, Slavonski brod 1999, 3. J. Todorović: „EFEKTIVNOST SISTEMA U MAŠINSTVU“, Beograd 1981. 4. B.S. Dhillon: „Engineering Maintenance : A Modern Approach“, CRC Press, Boca Raton (FL), 2002.
Course quality measurement:	Anonymous survey