AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Elementary Nanotechnology and Nanometrology								
Course Code	MME517		Couse Level	Second Cycle (Master's Degree)					
ECTS Credit	8	Workload	195 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	The aim of this course is to inform students about nanotechnology and nanometrology								
Course Content	In this course, new methods in the field of nanotechnology will be studied on.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Experiment, Discussion, Case Study, Project Based Study, Individual Study								
Name of Lecturer(s)									

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	15
Final Examination	1	60
Quiz	4	15
Assignment	5	5
Term Assignment	1	5

Recommended or Required Reading	
1	Charles P. Poole Jr., Frank J. Owens, “Introduction to Nanotechnology”, Wiley
2	Whitehouse D.J., “Handbook of Surface and Nanometrology”, Institute of Physics, Bristol, (published in 1994), 2003, ISBN: 0
3	Taniguchi N.: On the basic concept of nanotechnology. – In: Proc. Int. Conf. Prod. Eng. Tokyo, 1974, part 2, Tokyo: JSP4, 18
4	Whitehouse D.J.: Nanotechnology instrumentation. – Measurement + Control, 24 1991, No 2, 37
5	Binnig H., Rohrer H.: Scanning tunneling microscopy. – Helv. Phys. Acta, 55, 1982, 726

Week	Weekly Detailed Course Contents	
1	Theoretical	Workpiece accuracy and technical product specification
2	Theoretical	Metrology in precision engineering
3	Theoretical	Development and state-of-the-art in precision engineering
4	Theoretical	Precision machining production techniques
5	Theoretical	Precision machining production techniques
6	Theoretical	Precision machining limits and measurement sensitivities
7	Theoretical	Developments and requirements on instrumentation in nanotechnology
8	Intermediate Exam	Midterm Exam
9	Theoretical	Instrumentation in nanotechnology
10	Theoretical	Stylus Contact Instruments and Optical Methods
11	Theoretical	Stylus Contact Instruments and Optical Methods
12	Theoretical	Scanning tunneling and atomic force microscopy
13	Theoretical	Building things with atoms
14	Theoretical	One atom-at-a-time construction of things
15	Theoretical	Atom manipulation
16	Final Exam	Final Exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	16	2	4	96
Assignment	5	0	3	15
Term Project	1	15	10	25
Quiz	4	4	1	20
Midterm Examination	1	15	2	17

Final Examination	1	20	2	22
			Total Workload (Hours)	195
			[Total Workload (Hours) / 25*] = **ECTS**	8
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	To be able to acquire the Nanotechnology
2	To be able to acquire Nanometrology
3	To be able to learn the importance for present and future of nanotechnology
4	To be able to learn the application fields of nanotechnology
5	To be able to understand the effects of nanotechnology on the future of life.

Programme Outcomes *(Mechanical Engineering Master's Without Thesis)*	
1	To be able to access wide and deep information with scientific researches in the field of Engineering, evaluate, interpret and implement the knowledge gained in his/her field of study
2	To be able to complete and implement “limited or incomplete data” by using the scientific methods
3	To be able to consolidate engineering problems, develop proper method(s) to solve and apply the innovative solutions to them
4	To be able to develop new and original ideas and method(s), to develop new innovative solutions at design of system, component or process
5	To be able to gain comprehensive information on modern techniques, methods and their borders which are being applied to engineering
6	To be able to design and apply analytical, modeling and experimental based research, analyze and interpret the faced complex issues during the design and apply process
7	To be able to gain high level ability to define the required information and data
8	To be able to work in multi-disciplinary teams and to take responsibility to define approaches for complex situations
9	To be able to transfer of the process and results of studies at national and international environments systematic and clear verbal or written
10	To be able to become aware of social, scientific and ethical values guarding adequacy at all professional activities and at the stage of data collection, interpretation, and announcement
11	To be able to become aware of new and developing application of profession and ability to analyze and study on those applications
12	To be able to gain ability to interpret engineering application’s social and environmental dimensions and it’s compliance with the social environment

Contribution of Learning Outcomes to Programme Outcomes *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

	L1	L2	L3	L4	L5
P1	4	5	3	5	3
P2	4	4	3	4	3
P3	4	3	5	5	3
P4	3	4	5	4	3
P5	5	3	5	4	4
P6	4	5	4	4	3
P7	3	4	3	5	4
P8	4	3	5	5	3
P9	3	5	5	4	3
P10	5	4	5	4	4
P11	4	3	4	4	3
P12	4	5	3	5	3