AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Advanced Mechanical Vibrations								
Course Code	MME607		Couse Level	Third Cycle (Doctorate Degree)					
ECTS Credit	9	Workload	227 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	The aim of this course is to introduce the cutting tool design and chip formation fundamentals. Cutting tool design, cutting tool materials, tool geometry, mechanics of metal cutting and chip formation, chip removing cutting forces, force measurement and calculation, finishing surfaces, surface roughness and measurement of surface roughness, Processing tool geometry on the properties, selection of tool selection and tool holder.								
Course Content	The aim of this course is to introduce the cutting tool design and chip formation fundamentals. Cutting tool design, cutting tool materials, tool geometry, mechanics of metal cutting and chip formation, chip removing cutting forces, force measurement and calculation, finishing surfaces, surface roughness and measurement of surface roughness, Processing tool geometry on the properties, selection of tool selection and tool holder.								
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)									

Prerequisites & Co-requisities	
Language Requisite	Yes

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	20
Final Examination	1	50
Term Assignment	3	30

Recommended or Required Reading	
1	1. Metal Machining, Theory and Applications, T.H.C Childs, K.Maekawa, T.Obikawa, Y.Yamane.
2	2. Modern Talaşlı İmalatın Esasları, Cemal Çakır, Nobel Yayın.
3	3. DeGarmo, E.P., Black, J.T., Kohser, R.A., 1997. “Materials and Processes in Manufacturing”, Prentice-Hall, 8th. Edition, ISBN: 0-13-261371-9.
4	4. Bhushan, B., Gupta, B.K., “Handbook of Tribology-Materials, Coatings and Surface Treatments“ McGraw-Hill, INC.
5	5. Talaş Kaldırma Prensipleri 1-2 , Yusuf Şahin, Nobel Yayın.

Week	Weekly Detailed Course Contents	
1	Theoretical	Materials technology.
2	Theoretical	Mechanical behavior of materials.
3	Theoretical	Overview of machining technology.
4	Theoretical	Cutting tool production, Powder Metallurgy.
5	Theoretical	Tool materials.
6	Theoretical	Coatings applied to cutting tools.
7	Theoretical	Tool geometry.
8	Intermediate Exam	Midterm Exam
9	Theoretical	Effects of tool geometry on the cutting.
10	Theoretical	Chip formation fundamentals.
11	Theoretical	Chip formation mechanics.
12	Theoretical	Chip formation theories.
13	Theoretical	Relationship between material properties – machinability and evaluation of machinability, machinability tests, and measurement.
14	Theoretical	Relationship between material properties – machinability and evaluation of machinability, machinability tests, and measurement

15	Theoretical	Relationship between material properties – machinability and evaluation of machinability, machinability tests, and measurement
16	Final Exam	Final Exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	6	3	126
Term Project	3	15	4	57
Midterm Examination	1	20	1	21
Final Examination	1	20	3	23
			Total Workload (Hours)	227
			[Total Workload (Hours) / 25*] = **ECTS**	9
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	Explain the modeling assumptions
2	Calculate the natural frequency and vibration response
3	Compute the steady and transient response
4	Formulate equations of motion for a discrete multi-degree of freedom system.
5	Solve the eigenproblem
6	Explain what a vibration severity

Programme Outcomes *(Mechanical Engineering (English) Doctorate)*	
1	1. In Mathematics, natural sciences and mechanical engineering, department has the sufficient infrastructure; the ability to use the theoretical and practical information for engineering solutions
2	2. The ability to identify, define, and solve the formula for complex engineering problems; the ability to select and apply for the appropriate analytical methods and modelling techniques
3	3. To meet desired needs of a system, system component, or process, analysing and designing skill under realistic constraints; in this respect, the ability to apply the methods of modern design
4	4. The ability to use and choose modern techniques and tools for required engineering applications and; the ability to use information technology effectively
5	5. The ability to design the experiment, collect the data for the experiment and interpret to analysing results
6	6. The ability to use computer software and hardware information, access to information and other information sources
7	7. The ability to work individually and with multidisciplinary teams effectively, taking responsibility self-confidence for complex situations
8	8. The ability to communicate with foreign colleagues by having high level of foreign language knowledge in the field of engineering
9	9. Monitoring the science and technology developments and the ability to renew itself with innovative ideas constantly
10	10. Professional and ethical responsibility awareness
11	11. Having an adequate information and awareness in the subjects of occupational safety, occupational health, social security rights, quality control and management issues of environmental protection
12	12. The ability to appreciate the effects of engineering solutions and applications in universal and social dimensions
13	13. The ability to be enlightened to the experts or non-expert audience groups on the issues related with engineering problems and solutions written and oral
14	14. The ability to have adequate knowledge and skills in the project development and application, manage the activities planning, including the projects to the employees having the responsibility of the project by increasing vocational awareness

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

	L1	L2	L3	L4	L5	L6
P1	5	4	5	3	4	5
P2	5	4	5	3	5	4
P3	4	4	5	3	5	4
P4	4	4	5	3	5	5
P5	4	3	5	4	4	5
P6	3	3	4	4	4	5
P7	3	3	4	5	4	3
P8	5	5	4	5	5	3

P9	5	5	3	5	5	3
P10	5	5	3	3	5	4
P11	3	3	4	4	4	5
P12	4	4	4	5	4	4
P13	4	4	3	5	5	5
P14	5	5	5	4	5	4