T.R. ESKİSEHİR OSMANGAZI UNIVERSITY
FACULTY OF ENGINEERING AND ARCHITECTURE
DEPARTMENT OF MECHANICAL ENGINEERING
COURSE INFORMATION FORM

SEMESTER	Fall

COURSE CODE	151815356-151835356	COURSE NAME	MECHANISM DESIGN

SEMESTER	WEEKLY COURSE PERIOD					COURSE OF	
	Theory	Practice	Laboratory	Credit	ECTS	TYPE	LANGUAGE
Fall	3	0	0	3	5	COMPULSORY (X) ELECTIVE ( )	English

COURSE CATAGORY

Basic Science	Basic Engineering	Mechanical Engineering [if it contains considerable design, mark with (√)]	Social Science
	√	√	

ASSESSMENT CRITERIA

	Evaluation Type	Quantity	%
MID-TERM	Mid-Term	1	40
	Quiz	10	10
	Homework		
	Project		
	Report		
	Others (………)		
FINAL EXAM		1	50

PREREQUIEITE(S)	
COURSE DESCRIPTION	Basic kinematic approaches to mechanisms, common problems faced in design and analysis of mechanisms, position-velocity and acceleration analyses of linkages, gear and cam mechanisms.
COURSE OBJECTIVES	To prepare students for the machine dynamics course, to teach students the design and synthesis techniques of mechanisms in a kınematıcal vıew
ADDITIVE OF COURSE TO APPLY PROFESSIONAL EDUATION	To provide the base for design and synthesis of mechanisms and machines
COURSE OUTCOMES	By completing this class, the students will be able to: 1) learn about the types of mechanism (linkage, gear, cam etc.), application areas, 2) gain knowledge on power transmission and conversion methods and their selective characteristics, 3) calculate mechanical advantage and efficiency of a mechanism or machine, 4) analyze the kinematics of a linkage, gear trains and cam mechanisms, 5) determine position, velocity and acceleration variation throughout the range of mechanism motion, 6) design a mechanism producing the desired motion, 7) Knowledge on synthesizing a mechanism.
TEXTBOOK	Kinematics and Dynamics of Machinery, R.L. Norton, McGraw-Hill
OTHER REFERENCES	1) Mechanism Design: Analysis and Synthesis, Arthur G. Erdman, George N. Sandor 2) Mekanizma Tekniği, Eres Söylemez, Birsen Yayınevi

TOOLS AND EQUIPMENTS REQUIRED	Ruler, protractor, pencil compass and standart (non- programmable) calculator are devices allowed for use during the exams.

COURSE SYLLABUS

WEEK	TOPICS
1	Introduction: definitions, various types of mechanisms; design and synthesis
2	Mechanism terminology; kinematic diagrams; inversion; Grashof law; Power & losses
3	Mechanical efficiency and advantage, transmission angle; Cam-follower and gear types; degree of freedom (joints and mechanisms, Kutzbach-Gruebler's equation)
4	Answered questions; function, path and motion generation, Freudenstein equation,
5	Instant center of rotation; differential kinematics for mechanism analysis
6	Applications: answered questions
7	Applications: answered questions
8	Midterm exam
9	Midterm exam
10	Gears and gear mechanisms
11	Applications: answered questions
12	Cam-follower mechanisms (classification, basic terms, inversion principle)
13	SVAJ diagrams; Answered questions
14	Answered questions
15,16	Final Exam

NO	PROGRAM OUTCOMES	3	2	1
1	Sufficient knowledge of engineering subjects related with mathematics, science and Mechanical Engineering; an ability to apply theoretical and practical knowledge on solving and modeling of Mechanical Engineering problems.	X		
2	Ability to determine, define, formulate and solve complex Mechanical Engineering problems; for that purpose an ability to select and use convenient analytical and experimental methods.			X
3	Ability to design a complex system, a component and/or an engineering process under real life constrains or conditions, defined by environmental, economic and political problems; for that purpose an ability to apply modern design methods.	X		
4	Ability to develop, select and use modern methods and tools required for Mechanical Engineering applications; ability to effective use of information technologies.			X
5	In order to investigate Mechanical Engineering problems; ability to set up and conduct experiments and ability to analyze and interpretation of experimental results.			X
6	Ability to work effectively in inner or multi-disciplinary teams; proficiency of interdependence.			X
7	Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language.		X	
8	Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement.		X	
9	Understanding of professional and ethical issues and taking responsibility			X
10	Awareness of project, risk and change management; awareness of entrepreneurship, innovativeness and sustainable development.		X	
11	Knowledge of actual problems and effects of engineering applications on health, environment and security in global and social scale; an awareness of juridical results of engineering solutions.			X

1: None. **2**: Partial contribution. **3**: Complete contribution.

Prepared by: Prof. Dr. Naci Zafer   **Date:** 13.11.2017

Signature(s):