MECH 3355 – Kinematics and Dynamics of Mechanical Systems

Instructor Contact Information

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Course Pre-requisites, Co-requisites and/or Other Restrictions

Pre-requisite(s):	ENGR 2300 – Linear Algebra for Engineers MATH 2420 – Differential Equations with Applications MECH 2330 – Dynamics ENGR 3300 – Advanced Engineering Mathematics
Co-requisite(s):	None
Other Restriction(s):	None

Course Description and Learning Outcomes

Description:

Lecture course. Motion and interaction of machine elements and mechanisms. Kinematics, statics, and dynamics are applied for analysis and design of the parts of machines such as planar mechanisms, cams and gears.

Learning Outcomes:

- 1. Students will be able to compute the position, velocity and acceleration of mechanisms.
- 2. Students will be able to obtain the static and dynamic forces and torques of mechanisms.
- 3. Students will be able to design cams using design requirements and constraints.
- 4. Students will be able to identify and quantify the specifications and trade-offs for the selection and application of gears using design requirements and constraints.

Topics Covered:

- 1. (1 Week) Introduction to mechanisms (definitions, DOF, mobility)
- 2. (6 Weeks) Position, velocity and acceleration analysis of planar mechanisms
- 3. (2 Weeks) Statics for mechanisms and mechanical components
- 4. (2 Weeks) Dynamics for mechanisms and mechanical components
- 5. (2 Weeks) Analysis and design of cams
- 6. (2 Weeks) Analysis and design of gears

Texbooks and Materials

Required:

<u>Theory of Machines and Mechanisms, 4th Ed.</u> by John J. Uicker, Gordon R. Pennock and Joseph E. Shigley ISBN-13: 978-0195371239

Grading Policy

Final grades will be evaluated as follows:

Assignments	25%
Exam 1	25%
Exam 2	25%
Final Exam (Comprehensive)	25%

Final letter grades will be assigned according to the following ranges. This guideline is subject to change at the discretion of the instructor.

A+	97 ≤ x	C+	77 ≤ x < 80
А	93 ≤ x < 97	С	73 ≤ x < 77
A-	90 ≤ x < 93	C-	70 ≤ x < 73
B+	87 ≤ x < 90	D+	67 ≤ x < 70
В	83 ≤ x < 87	D	63 ≤ x < 67
B-	80 ≤ x < 83	D-	60 ≤ x < 63
		F	60 > x

Course and Instructor Policy

Email

Email must be sent from your UTD email account to UTD email address of the instructor or TA. Please allow 24-36 hours for a response during the week.

Lecture

No use of cell phones, iPods, laptops or other devices is allowed in class. Talking during lectures is disruptive to those around you and is not allowed.

Assignments and Projects

The assignments and project must be submitted to the instructor at the beginning of class on the day it is due or by the time indicated by the instructor. If the assignment is not submitted by that time, **25%** of the total grade will be lost and an additional **25%** will be lost for each day it is late.

Make-up Exams

Make-up exams will only be given with instructor approval which must be granted **before** the exam date or under unusual circumstances. If an exam is missed due to illness, the student must produce a note from his or her doctor which states the student was unable to attend the exam and include the phone number for the doctor's office.

Rules for Exams

- 1. Whenever possible, an empty seat should be left between each student during an exam.
- 2. Only a pencil, eraser, straightedge, one 8.5"x11" formula sheet (front and back) and the required textbook are allowed. If you have purchased an eBook, only the application required to view your book is allowed to be open in your computer. Other materials such as lecture slides, notebooks and backpacks must be placed at the front of the room or under your chair. You may not open your bag inside the room once the exam has begun.

- 3. Exam materials will be passed out at the beginning of class or as soon as all extraneous materials are placed in the front of the room or under your chair.
- 4. Turn-off your cell phone.
- 5. If late to an exam, remove any necessary materials (pencil, etc.) from your bag before entering the room. Quietly enter the room and wait for further instructions.

Academic Dishonesty

Academic dishonesty will not be tolerated and will result in a grade of **F** in this course.

University Policies

Please refer to the following website to obtain university information regarding:

- Student Conduct and Discipline
- Academic Integrity
- Copyright Information
- Email Use
- Class Attendance
- Withdrawal from Class
- Student Grievance Procedures
- Incomplete Grade Policy
- Disability Services
- Religious Holy Days
- Avoiding Plagiarism

http://go.utdallas.edu/syllabus-policies

These descriptions are subject to change at the discretion of the instructor.