

New Jersey Institute of Technology
Department of Engineering Technology
MET 314 Dynamics of Machinery

COURSE NUMBER	MET 314
COURSE NAME	Dynamics of Machinery
COURSE STRUCTURE	2-2-3 (lecture hr/wk - lab hr/wk – course credits)
COURSE COORDINATOR/ INSTRUCTOR	Dr. A Sengupta /See Department
COURSE DESCRIPTION	Acquaints students with motion and forces in machines. Topics include velocity and accelerations in linkages, gears, cam and gear trains, static and dynamic forces, and torques in linkages.
PREREQUISITE(S)	MET 236
COREQUISITE(S)	None
REQUIRED, ELECTIVE OR SELECTED ELECTIVE	Required
REQUIRED MATERIALS	See Instructor Syllabus
COMPUTER USAGE	Microsoft Office/AutoCAD (limited use) / PTC Creo
COURSE LEARNING OUTCOMES	By the end of the course students should be able to: <ol style="list-style-type: none">1. Analyze motion of points on a four-bar linkage, and forces due to inertial loading.2. Determine contact ratio and interference on spur gears.3. Determine drive train ratios.4. Measure speed of rotating machinery components.
CLASS TOPICS	Introduction, Mechanisms and Machines, Motion in Machinery, Velocity Analysis -Analytical and Graphical methods, Acceleration Analysis, Static Forces on Mechanism, Spur Gears- Contact Ratio and Interference, Drive Trains. Project: Designing a successful moving mechanism.
STUDENT OUTCOMES	The Course Learning Outcomes support the achievement of the following MET Student Outcomes and TAC of ABET Criterion 9 requirements: Student outcome b - an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;

New Jersey Institute of Technology
Department of Engineering Technology
MET 314 Dynamics of Machinery

Related CLO – 1

Student outcome c - an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;

Related CLO – 4, 5

Student outcome e - an ability to function effectively as a member or leader on a technical team

Related CLO – 4,5

Student outcome f - an ability to identify, analyze, and solve broadly-defined engineering technology problems

Related CLO – 2, 3

Student Outcome g - an ability to communicate effectively regarding broadly-defined engineering technology activities

Related CLO – 4, 5

Student Outcome l - technical expertise in dynamics, fluid mechanics, and thermodynamics

Related CLO – 1-3

Student Outcome l - technical expertise having added technical depth in mechanical design, solid mechanics, and electro-mechanical devices and controls

Related CLO – 4, 5

GRADING POLICY

Homework, Attendance and Class Participation	10 %
Tests (2 @ 20% ea.)	40 %
Laboratory and Project	15%
Final Exam	35%

ACADEMIC INTEGRITY

NJIT has a zero-tolerance policy regarding cheating of any kind and student behavior that is disruptive to a learning environment. Any incidents will be immediately reported to the Dean of Students. In the cases the Honor Code violations are detected, the punishments range from a minimum of failure in the course plus disciplinary probation up to expulsion from NJIT with notations on students' permanent record. Avoid situations where honorable

New Jersey Institute of Technology
Department of Engineering Technology
MET 314 Dynamics of Machinery

behavior could be misinterpreted. For more information on the honor code, go to <http://www.njit.edu/academics/honorcode.php>

STUDENT BEHAVIOR

See Individual Instructor Policies, which can include:

- No eating or drinking is allowed at the lectures, recitations, workshops, and laboratories.
- Cellular phones must be turned off during the class hours – if you are expecting an emergency call, leave it on vibrate.
- No headphones can be worn in class.
- Unless the professor allows the use during lecture, laptops should be closed during lecture.

**MODIFICATION TO
COURSE**

The Course Outline may be modified at the discretion of the instructor or in the event of extenuating circumstances. Students will be notified in class of any changes to the Course outline.

New Jersey Institute of Technology
Department of Engineering Technology
MET 314 Dynamics of Machinery

Week# / Date	Topics
1	Introduction Mechanisms and Machines
2	Motion in Machinery
3	Velocity Analysis (Analytical/Graphical method)
4	Velocity Analysis (Analytical/Graphical method)
5	Lab. # 1 Oscilloscope Midterm #1
6	Acceleration Analysis (Analytical/Graphical Method)
7	Acceleration Analysis – Continued Lab #1 Due
8	Static Forces on Mechanism Midterm #2
9	Dynamic Forces on Mechanism
10	Spur Gears-Contact Ratio - Interference
11	Cont'd Lab. # 2 Speed Measurements
12	Drive Trains
13	Cont'd Lab #2 Due
14	Review (Project Due)
15	FINAL EXAM