

Course Administration

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LECTURE HOURS: Monday, Wednesday, Friday (10:40-11:35am), 152 Light Engineering
RECITATIONS: Wednesday (9:35am-10:30am), 181 Earth and Space Science
Thrusday (12:50pm-1:45pm), Physics P117

OFFICE HOURS: Monday and Wednesday (2:00pm-3:30pm)
or by appointment.

REQUIRED TEXT: Vector Mechanics for Engineers: Dynamics 8th ed by Beer and
Johnston,
McGraw Hill, ISBN 0072976985 (both Statics and Dynamics) or
0073212202 (Dynamics only).

PREREQUISITE: MEC 260 (Strictly enforced)

HOMEWORK: About one homework assignment per week. Each homework is due one
week after it is assigned.
• Each homework must be turned in at the beginning of the class on
the specified due date in order to be considered as on time.
• Late homework will receive half credit before the solutions are posted
and will not be accepted after that.

EXAMS: 2 Midterms (Friday, 10/19 and Friday, 11/16)
1 Final Exam (11:00am-1:30pm, Friday, 12/21)
• All exams will be scheduled in class, unless otherwise stated
• No makeup exam unless arranged prior to the exam.

GRADING:

Homework 20%
2 Exams @ 20% each 40%
Final (comprehensive) 40%

BLACKBOARD: All homework assignments and solutions will be posted on the
Blackboard course account (http://blackboard.sunysb.edu). For problems
logging in, go to the helpdesk in the Main Library SINC Site or the
Union SINC Site, you can also call: 631-632-9602 or e-mail:
helpme@ie.sunysb.edu

I use email and blackboard exclusively to communicate with you off
class. It is your responsibility to make sure that your email id is a current
one on the blackboard system. I suggest that you use a university email
id for this class; it is free and official. I am not responsible for the emails
not delivered to your commercially available email accounts.
ACADEMIC HONESTY: The campus policies on academic honesty are available on the Web (http://naples.cc.sunysb.edu/CAS/njc.nsf/pages/info). Academic dishonesty is an extremely serious offense and will not be tolerated in any form. Academic dishonesty in general is the presentation of intellectual work that is not originally yours. Examples include, but are not limited to, copying or plagiarizing class assignments including homework, reports, designs, computer programs, graphics, and other submitted materials; copying or otherwise communicating answers on exams with other students; bringing unapproved aids, either in physical (written) or electronic form to an exam; obtaining copies of an exam prior to its administration, etc. Academic dishonesty violates both the ethical and moral standards of the Engineering profession and all infractions related to academic dishonesty will be prosecuted to the fullest via the CEAS CASA committee. For you, the honest student, academic dishonesty results in lower class curves, hence a depression in your GPA and class standing, while cheapening the degree you earn.

SPECIAL NOTE ON ADA: If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room 128, (631) 632-6748. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential. Students requiring emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information, go to the following web site http://www.ehs.sunysb.edu/fire/disabilities/asp.
Course Overview

Major topics of this course include particle kinematics in Cartesian, normal-tangential and radial-transverse coordinates, and particle kinetics, including application of Newton’s Second Law, the work-change in kinetic energy principal and impulse-momentum principal; rigid body kinematics and two-dimensional rigid body kinetics, emphasizing planar motion, work-change in kinetic energy and impulse momentum; three-dimensional kinetics of rigid bodies (time permitting); and simple vibrations.

The prerequisite for this course is Engineering Statics (MEC 260). The course builds upon the basic static principals presented in MEC 260 extended to dynamic analysis.

List of Topics

Particle Kinematics
The motion (position, velocity and acceleration) for bodies idealized as point masses. The motion of particles is analyzed in Cartesian, normal-tangential and radial-transverse system of coordinates. Relative motion and the special mechanical engineering problem of pulleys are addressed.

Particle Kinetics
The analysis of Newton’s 2nd Law of Motion is applied to particles in Cartesian, normal-tangential and radial-transverse system of coordinates. Newton’s 2nd Law of Motion is used to develop the Work-Change in Kinetic Energy and Impulse-Change in Momentum forms dynamic of analysis. The Work-Change in Kinetic Energy principal is used to analyze the special case of the conservation of energy. The Impulse-Change in Momentum principal is used to analyze impact problems (conservation of momentum).

Rigid Body Planar Kinematics
The motion of a rigid body is developed to solve problems that include translation, rotation and general plane motion. The principals of rigid-body, planar motion are applied to basic machine elements (links, gears, etc.).

Rigid Body Planar Kinetics
Newton’s 2nd Law of Motion and the rate of change of angular momentum is applied to planar motion of rigid bodies, translation and rotation. Extending these equations of motion to Work-Change in Kinetic Energy and Impulse-Change in Momentum of rigid-bodies is covered.

Three-Dimensional Rigid Body Kinetics
Newton’s 2nd Law of Motion is applied to three-dimensional rigid body motion.

Vibrations
The setting up and solution of the resulting differential equations for simple vibrations problems is presented.

List of Course Specific ABET Outcomes

(a) Apply knowledge of mathematics, science, and engineering to mechanical engineering ... (10)
The students must apply their knowledge of vector algebra, simple linear algebra, calculus and analytical geometry.

(c) Identify, formulate, and solve engineering problems. (10)

Homework assignments and examinations provide the student with the opportunity to apply engineering dynamic methods to analyze the motion on particles and rigid bodies.