

# MEC 262 Engineering Dynamics

## Spring 2017

**Instructor:** Dr. Vivek Yadav  
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**Lecture:** TuTh 8:30 AM – 9:50 AM at FREY HALL 100

**Recitations:** R01- Mo 4:00PM - 4:53PM, MELVILLE LBR W 4540;  
R02- Mo 1:00PM - 1:53PM, EARTH & SPACE 131;  
R03- We 4:00PM - 4:53PM, MELVILLE LBR W 4540.

**Office Hours:** MoWe 2:00PM - 3:00PM, or by appointment

**TAs:** Anshul Lodha [anshul.lodha@stonybrook.edu](mailto:anshul.lodha@stonybrook.edu),  
Owen Hinds [owen.hinds@stonybrook.edu](mailto:owen.hinds@stonybrook.edu)

**Course Topics:** Vectorial kinematics of particles in space, orthogonal coordinate systems. Relative and constrained motions of particles. Dynamics of particles and the systems of particles, equations of motion, energy and momentum methods. Collisions. Two- and Three dimensional kinematics and dynamics of rigid bodies. Moving frames and relative motion. Free, forced, and damped vibrations of particles and rigid bodies.

**Textbook:** Engineering Mechanics: Dynamics, 2nd Edition by Gary Gray, Francesco Costanzo, Michael Plesha, McGraw-Hill.

### Grading:

Homework assignments: 20% (Two lowest scores dropped)

Exam 1: 20%

Exam 2: 20%

Exam 3 (Final): 40%

Extra credits/Bonus: 5% (in-class quizzes, attendance, class participation, etc)

<b>Grading Scale:</b>	$92 \leq A \leq 100$	$74 \leq C+ < 78$
	$88 \leq A- < 92$	$70 \leq C < 74$
	$85 \leq B+ < 88$	$67 \leq C- < 70$
	$81 \leq B < 85$	$64 \leq D+ < 67$
	$78 \leq B- < 81$	$60 \leq D < 64$

### Exams:

All exams are closed book and closed notes. You may bring one 8.5×11 inch sheet with handwritten notes.

### Homework:

1. Homework will be assigned weekly and will be due in one week at the start of the class
2. Late homework will not be accepted.
3. All homework assignments are individual, unless otherwise specified.
4. Homework problems should be neat, professional and well organized.
5. Homework will be accepted only during class or via blackboard.
6. Please put your handwritten homework on the professor's desk before the lecture starts or submit a scanned copy via blackboard.
7. IMPORTANT: NO ASSIGNMENT SUBMITTED AFTER THE SUBMISSION DEADLINE WILL BE GRADED.

**Communication:**

I will be using online Blackboard system for managing contents and communication related to this class. You can access Blackboard at: <http://blackboard.stonybrook.edu>. Use your NetID and password to log in. Your NetID is different from your Stony Brook ID number. If you are not familiar with Blackboard system or have a question related to it, see the Student Guide at <http://it.stonybrook.edu/services/blackboard/blackboard-students>.

**Fundamentals:**

From your pre-requisite classes, you should have acquired a working knowledge of

1. Basic Trigonometry (sines, cosines, basic trigonometry formula, etc.) and Geometry
2. Vector Calculus (differentiating and integrating vector functions) and Vector Algebra (adding two vectors, Dot and Cross products, etc.)
3. Free Body Diagram (FBD)
4. Differential and Integral Calculus

**Course Outlines:**

1. Introduction to Dynamics
2. Particle Kinematics
3. Force and Acceleration Methods for Particles
4. Energy Methods for Particles
5. Momentum Methods for Particles
6. Planar Rigid Body Kinematics
7. Newton-Euler Equations for Planar Rigid Body Motion
8. Energy and Momentum Methods for Rigid Bodies
9. Mechanical Vibrations
10. Three-Dimensional Dynamics of Rigid Bodies

**Calculator Policy:**

Effective Spring, 2009 only the following calculators will be permitted to be used on all midterm and final exams in the Department of Mechanical Engineering. There will be no exceptions. This list of calculators is identical to that allowed for the National Council for Examiners for Engineering and Surveying (NCEES) Fundamentals of Engineering (FE) exam that many of you will take in your senior year as well as the Professional Engineering (PE) exam that you may take several years from now.

**NCEES Allowed calculators as of Nov 2011:**

- Casio: All fx-115 models. Any Casio calculator must contain fx-115 in its model name.
- Hewlett Packard: The HP 33s and HP 35s models, but no others.
- Texas Instruments: All TI-30X and TI-36X models. Any Texas Instruments calculator must contain either TI-30X or TI-36X in its model name.

The NCEES policy on calculators can be found here:

[http://www.ncees.org/Exams/Examday\\_policies/Calculator\\_policy.php](http://www.ncees.org/Exams/Examday_policies/Calculator_policy.php)

**Academic Conduct and Integrity:**

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary>

**Americans with Disabilities Act:**

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Disability Support Services at (631) 632-6748 or <http://studentaffairs.stonybrook.edu/dss/>. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website:

<http://www.sunysb.edu/ehs/fire/disabilities.shtml>

**Critical Incident Management:**

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students; ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.

**Academic Success and Tutoring Center (ASTC):**

The ASTC provides free academic support services for all undergraduate students, including one-on-one tutoring, small group tutoring, academic success coaching, and public speaking seminars. Learn more about these services and additional campus resources at [www.stonybrook.edu/tutoring](http://www.stonybrook.edu/tutoring).

**Laptops, smartphones, tablets:**

Electronic devices should only be used during class for class purposes (e.g. taking notes, research, Blackboard, eTextbook, etc). Facebook, email, texting, or accessing other forms of media that are not part of the seminar should wait until after class.