

**MCEN 2043 Dynamics**  
**Spring 2015 (January-May 2015)**  
**updated on January 16, 2015**

**Lecture:** MWF 10:00-10:50am. **Room:** ECCR 1B40.

**Instructor:** Rong Long (office: ECME 273)      Email: Rong.Long@colorado.edu  
Office hours: 3-5pm Tuesdays & 1-3pm Thursdays (ECME 273) or by appointment

**TA:** Hao Chen      Email: hao.chen-1@colorado.edu  
Didier Muvandimwe      Email: Didier.Muvandimwe@colorado.edu  
Office hours: 3-5pm Wednesdays (ECME 137B)  
2-4pm Fridays (ECME 137A)

**Textbook:** “*Engineering Mechanics: Dynamics*” by Hibbeler RC, Pearson, **13<sup>th</sup> Edition**.

**Course description:**

Covers dynamic behavior of particle systems and rigid bodies; 2-D and 3-D kinematics and kinetics; impulse, momentum, potential, and kinetic energy; and work, collision, and vibration. Formerly MCEN 3043. Restricted to students with 27-180 credits (Sophomores/Juniors/Seniors) Mechanical or Environmental Engineering majors only.

**Prerequisites:** MCEN 2023 or CVEN 2121 (minimum grade C-).

**Examinations:**

Midterm Exam 1:      7-9pm Feb. 23 (DUAN G1B20)

Midterm Exam 2:      7-9pm Apr. 2 (DUAN G1B20)

Final Exam:      7:30-10pm May 3 (ECCR 1B40 unless otherwise noticed)

- A self-prepared letter sized formula sheet is allowed in the exams (can write on both sides).
- Sample exam problems will be provided before the midterm and final exams.
- If you miss any of the midterm exams for a valid reason, the weight of the midterm exam will be added to the final exam. “Make-up” tests will NOT be provided.

**Assignments:**

Assignments should be handed by 4pm on the due date in class, to TAs, or to Dr. Long’s office (slide under the door if closed). Late assignments will NOT be accepted.

- 12 assignments in total. The lowest 2 assignment scores will be dropped in the final grade.
- Assignments should be written in an organized and legible manner. Include enough details to demonstrate your understanding of course material, and box the final answers.

**Grading:**

- Assignments (Best 10 of 12)      15%
- Midterm Exam1      25%
- Midterm Exam2      25%
- Final Exam      35%

All assignments and exams will be recorded as a percentage grade and the total will be converted to a letter grade and will follow a distribution.

**Online Resources:**

Lecture notes, assignment solutions, sample exams and exam solutions will be available on Desire 2 Learn (D2L).

**Tentative Lecture Schedule:**

| Lecture dates  | Topic  | Chapters   | Assignments (Due Date)                                       |
|--|--|------------|--|
| <b>Jan. 12</b>                                       | Introduction   | --         | ----   |
| <b>Jan. 14, 16, 21, 23, 26, 28, 30</b>               | Particle Kinematics<br><b>Jan. 19:</b> holiday, no class | 12.1-12.10 | Assign.1 ( <b>Jan. 30</b> )<br>Assign.2 ( <b>Feb. 6</b> )    |
| <b>Feb. 2, 4, 6,</b>                                 | Particle Kinetics  | 13.1-13.6  | Assign.3 ( <b>Feb. 13</b> )<br>Assign.4 ( <b>Feb. 20</b> )   |
| <b>Feb. 9, 11, 13</b>                                | Work and Energy (Particle)                               | 14.1-14.6  | Assign.5 ( <b>Feb. 27</b> )                                  |
| <b>Feb. 16, 18</b>                                   | Impulse and Momentum (Particle)                          | 15.1-15.3  | ----   |
| <b>Feb. 20</b>                                       | Review for Midterm 1                                     | --         | ----   |
| <b>Feb. 23</b>                                       | Impulse and Momentum (Particle)                          | 15.4       | Assign.6 ( <b>Mar. 6</b> )                                   |
| <b>Feb. 25, 27</b><br><b>Mar. 2, 4, 6, 9, 11, 13</b> | Rigid Body Kinematics (2D)                               | 16.1-16.8  | Assign.7: ( <b>Mar. 13</b> )<br>Assign.8: ( <b>Mar. 20</b> ) |
| <b>Mar. 16, 18, 20</b>                               | Rigid Body Kinetics (2D)                                 | 17.1-17.4  | Assign.9: ( <b>Apr. 10</b> )                                 |
| <b>Mar. 23, 25, 27</b>                               | Spring Break   | No classes | ----   |
| <b>Mar. 30, Apr. 1</b>                               | Review for Midterm 2 and Help Session (by TAs)           | --         | ----   |
| <b>Apr. 3</b>  | Class cancelled due to travel of Dr. Long                | No class   | ----   |
| <b>Apr. 6, 8</b>                                     | Rigid Body Kinetics (2D)                                 | 17.5       | Assign.10: ( <b>Apr. 17</b> )                                |
| <b>Apr. 10, 13, 15</b>                               | Work and Energy (Rigid Body)                             | 18.1-18.5  | Assign.11: ( <b>Apr. 24</b> )                                |
| <b>Apr. 17, 20, 22, 24, 27</b>                       | Impulse and Momentum (Rigid Body)                        | 19.1-19.4  | Assign.12: ( <b>May 1</b> )                                  |
| <b>Apr. 29</b>                                       | Introduction to Vibration                                | 22.1-22.2  | ----   |
| <b>May 1</b>   | Review for Final Exam                                    | --         | ----   |

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