

**Instructor:** Xiaohua Li  
**Office:** NTDP F101G  
**Phone:** 940-369-8020  
**Email:** xiaohua.li@unt.edu  
**Lecture Time:** Tu & Th 11:30 a.m.-12:50 p.m. room B158 (section .003)  
Tu & Th 1:00 p.m.-2:20 p.m. room D215 (section .001)

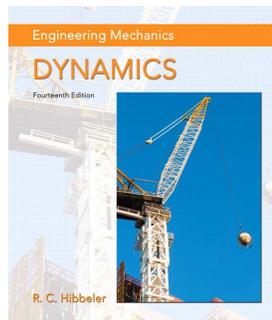
**Instructor Office Hours:** Open Office Policy; MWF 1:00pm-2:00pm or by appointment

**TA Office Hours:** TBD; will be posted in blackboard later

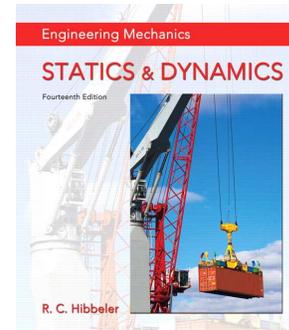
**Required Textbook:** Engineering Mechanics: Dynamics, 14<sup>th</sup> Edition,  
Pearson, 2015 R.C. Hibbeler  
ISBN-13: 978-0133915389

Or

Engineering Mechanics: Statics & Dynamics (14th Edition)  
Pearson, 2016 R.C. Hibbeler  
ISBN-13: 978-0133915426



or



### Course Description:

3 hours. Basic theory of engineering mechanics, using calculus, involving the motion of particles, rigid bodies, and systems of particles; Newton's Laws; work and energy relationships; principles of impulse and momentum; application of kinetics and kinematics to the solution of engineering problems.

Prerequisite(s): MATH 1720 and ENGR 2301 (or MEEN 2301).

### Course Learning Outcomes (CLO):

Upon successful completion of this course, students will:

1. Express dynamic quantities as vectors in terms of Cartesian components, polar coordinates, and Normal-tangential coordinates.
2. Compute mass moments of inertia for systems of particles and rigid bodies.
3. Solve kinematic problems involving rectilinear and curvilinear motion of particles.
4. Solve kinetic problems involving a system of particles using Newton's Second Law.
5. Apply the principles of work and energy and conservation of energy to the solution of engineering problems involving particles and systems of particles.

6. Apply the principles of impulse and momentum and conservation of momentum to the solution of engineering problems involving particles and systems of particles.
7. Solve kinematic problems involving the translation and rotation of a rigid body.
8. Solve kinematic problems involving general planar of rigid bodies.

**ABET Student Learning Outcomes (SO)**

- a Ability to apply mathematics, science and engineering principles.
- b Ability to design and conduct experiments, analyze and interpret data.
- c Ability to design a system, component, or process to meet desired needs.
- d Ability to function on multidisciplinary teams.
- e Ability to identify, formulate and solve engineering problems.
- f Understanding of professional and ethical responsibility.
- g Ability to communicate effectively.
- h The broad education necessary to understand the impact of engineering solutions in a global and societal context.
- i Recognition of the need for and an ability to engage in life-long learning.
- j Knowledge of contemporary issues.
- k Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

CLO	ABET Student Outcomes (SO)										
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
1	X		X		X						
2	X		X		X						
3	X		X		X						
4	X		X		X						
5	X		X		X						
6	X		X		X						
7	X		X		X						
8	X		X		X						

**Grades:** Weighting of HW/Quiz/Exam and Letter Grades for Overall Performance

Homework (10; all of them)	10%	≥ 90%	A
Quizzes (highest 3 out of 5)	10%	80-89.9%	B
Exam 1 (Ch 12 & 13)	25%	70-79.9%	C
Exam 2 (Ch 14 & 15)	25%	60-69.9%	D
Final/Exam 3 (Ch 16)	25%	< 60%	F
<u>Attendance (5 out of 6)</u>	<u>5%</u>		
Total	100%		

**Calculator Policy:**

The use of a calculator is required and allowed on all homework, exams and quizzes. Calculators with graphing capabilities will be allowed in the course for homework and

quizzes. However, only calculators currently allowed in the Fundamentals of Engineering (FE) and Professional Engineering (PE) exams will be allowed in ALL EXAMS (Exam #1, Exam #2 and Exam #3/final exam). **NO other calculators will be approved for exams.** Please refer to the National Council of Examiners for Engineering and Surveying (NCEES) calculator policy for the list of acceptable calculators.

**Casio:** All **fx-115** and **fx-991** models (Any Casio calculator must have “fx-115” or “fx-991” 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 have “TI-30X” or “TI-36X” in its model name.)

### **Homework Policy:**

1. “Homework Day”: Thursday. the day new homework will be assigned (HW assignment will be posted in Blackboard) and previous homework will be collected;
2. Homework should be turned in on the due day before the lecture starts. **NO late homework will be collected. Exceptions:** medical emergence (student and important ones), transportation/traffic emergency; religious holidays/duty, jury duty and military duty. **Documentary evidences** must be submitted.
3. Definition of “**late**”: when class is over and instructor steps outside the classroom, homework turned in thereafter will be considered as “**late**” and will not be collected.
4. Solutions to Homework will be posted in Blackboard after 11 am Friday
5. Having no textbook is not a valid excuse for not doing homework. It is the student’s responsibility to acquire textbook for his/her study
6. Homework can be turned in earlier than the due day
7. Homework dropped in the instructor’s departmental mailbox will NOT be collected
8. Homework slid through the door into the instructor’s office will NOT be collected
9. Homework dropped in the “homework dropbox” in front of the department door will NOT be collected
10. Homework turned in other than the due day or outside classroom must be turned in to instructor either IN PERSON or through EMAIL.
11. If homework is turned in through email, it should be scanned (or pictured by a smart phone), legible, and emailed to instructor before the class ends (**for 1:00-2:20 class, 2:20pm; for 11:30-12:50 class, 12:50 pm**)
12. Homework should be stapled; instructor or TA will not be responsible for lost loose homework
13. Homework solutions from the students that appear to be the same or copied from a peer will not be graded. You can work with classmates if you have questions or problems, but you are responsible for your own work!

### **Format of Homework:**

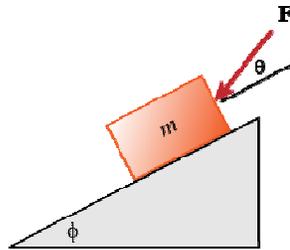
**(1) Use engineering paper only**

**(2) Only solve one problem per page of engineering paper.** You may extend that problem into another page but then should begin the next problem on a new page if you require

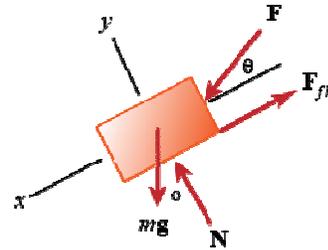
more room. If more than one page is needed for a solution you should number each page and the first page should be marked with a “continued on next page” note on the bottom.

- (3) Done in pencil, no ink.
- (4) No cross outs, use an eraser.
- (5) Homework set number, name, date, course number, and page number(s) on the top of the page.
- (6) **Free-body diagrams (FBD)** – Draw a neat FBD that includes arrows with arrowheads, necessary dimensions, and parameters needed to solve the problem

**Example:**



Problem Statement



F.B.D

- (7) **Solution** – provide all the details so that anybody can easily follow your solutions and problem-solving approach. All intermediate values should be identified with the variable name and units (e.g.,  $F_1=50\text{ N}$ ;  $X_c = 2.1\text{ m}$  ).
- (8) **Answer** – the **Final Answer** at the end of the problem should be identified with the **variable name, include units, and inside a box**. Include an arrow (from the far right side of the page) pointing to each final answer.

**Example:**

$$F_1 = 50\text{ N}$$

$$X_c = 2.1\text{ m}$$



**Exam Policy:**

- (1) Exams are closed book and closed notes with approved formula sheets only
- (2) Formula sheets: Use the formula sheets provided only, NOTHING ELSE.
- (3) Calculator: ONLY FE exam approved calculator models allowed
  - Casio: All fx-115 and fx-991 models;
  - Hewlett Packard: The HP 33s and HP 35s models;
  - Texas Instruments: All TI-30X and TI-36X models;
- (4) Using ANY unauthorized/unapproved materials during the exam is prohibited and considered as cheating.
- (5) Exchanging (either borrowing or giving) ANYTHING without the approval from the proctor, including but not limited to, calculators/scratch papers/formula sheets/thermodynamics tables/writing tools during the exam between/among students is prohibited and considered as cheating.

- (6) Using cell PHONE for WHATEVER purpose during the exam is prohibited and considered as cheating.
- (7) Using Internet through any device during the exam is prohibited and considered as cheating.
- (8) Peeking, talking or discussing (either by oral/written/sign language) between/among students during the exam is prohibited and considered as cheating.
- (9) Using any type of earpiece/earbuds/earphone/Bluetooth/Stereo Headset (except with doctor's prescription/notes) during the exam is prohibited and considered as cheating.
- (10) Using any type of smart glasses (except with doctor's prescription/notes) during the exam is prohibited and considered as cheating.
- (11) Using any type of smart watches during the exam is prohibited and considered as cheating.
- (12) Cheating will result in SCORE ZERO in the exam
- (13) Cheating will be reported to Department, College and University
- (14) There will be NO make-up exam. Exceptions: medical emergency (student and important ones), transportation/traffic emergency; religious holidays/duty, jury duty and military duty. Documentary evidences must be submitted.
- (15) Makeup exam should be scheduled within one week after the regular exam date.

**Disability Accommodations:** If you need academic accommodations for disability you must have document which verifies the disability and makes you eligible for accommodations, then you can schedule an appointment with the instructor to make appropriate arrangements.

**Academic Dishonesty:**

There is a zero-tolerance policy. Cheating of whatsoever will result in an automatic 'F' in this course and the matter will be turned over to the appropriate student disciplinary committee.

**Professionalism:**

One of the goals of this course is to teach students about professionalism, including the standards and expected behavior of your chosen profession. With this in mind, students are expected to demonstrate a behavior consistent with the conduct of an individual practicing in the engineering profession. Students are expected to: (1) come prepared for class; (2) respect faculty and peers; (3) demonstrate responsibility and accountability for your own actions; (4) sensitivity and appreciation for diverse cultures, backgrounds, and life experiences; (5) offer and accepts constructive criticism in a productive manner; (6) demonstrate an attitude that fosters professional behavior among peers and faculty; (7) be punctual to class meetings; (8) maintain a good work ethic and integrity; and (9) recognize the classroom as a professional workplace.

**Classroom Inclusivity Statement**

I consider this classroom to be a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.

### **IMPORTANT EXAM DATES**

**Exam #1** (tentative; depends on when chapter 13 is finished; Covers Ch 12 & 13):  
**Oct.3<sup>rd</sup>, 2017, Tuesday**

**Exam #2** (tentative; depends on when chapter 15 is finished; Covers Ch 14 & 15):  
**Nov.2<sup>nd</sup>, 2017, Thursday**

**Exam #3** (UNT official final exam schedule, **Covers Ch 16**):  
**For section .001 (1:00 p.m.-2:20 p.m. class):**  
**Thursday, December 14, 10:30 a.m. - 12:30 p.m.**  
**For section .003 (11:30 a.m.-12:50 p.m. class):**  
**Tuesday, December 12, 10:30 a.m. - 12:30 p.m.**

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### **UNT Official Academic Calendar: Fall 2017**

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<b>Date</b>	<b>Event</b>
August 28, 2017	First Class Day (Monday)
September 4, 2017	Labor Day (no classes; university closed)
November 23-26, 2017	Thanksgiving Break (no classes; university closed)
December 6-7, 2017	Pre-finals Days
December 7, 2017	Last Class Day
December 8, 2017	Reading Day (no classes)
December 9-15, 2017	Finals
December 23, 2017 - January 1, 2017	Winter Break (no classes; university closed)

#### **Important event:**

**Engineering & Computer Science Internship & Career Fair**

**Thursday, October 5, 2017**

**11am-3pm**

**Discovery Park**

## MEEN 2302.001/.003 Mechanics II (Dynamics)

### Schedule Overview

(Please note the schedule may change based on the needs during the semester)

Week	Date	Lecture Topics
#1	Aug.28 <sup>th</sup> - Sept.1 <sup>st</sup>	Overview of syllabus
		Ch.12.1-12.2: Rectilinear Motion
#2	Sept.4 <sup>th</sup> – Sept.8 <sup>th</sup>	Ch.12.4-12.5: General Curvilinear Motion
		Ch.12.7: Curvilinear Motion: Normal and Tangential components
#3	Sept.11 <sup>th</sup> – Sept.15 <sup>th</sup>	Ch.12.8: Curvilinear Motion: cylindrical/polar components
		Ch.12.8: Curvilinear Motion: cylindrical/polar components
#4	Sept.18 <sup>th</sup> – Sept.22 <sup>nd</sup>	Ch.13.1-13.4 Equation of Motion: Rectangular Coordinates
		Ch.13.5 Equation of Motion: Normal and Tangential Coordinates
#5	Sept.25 <sup>th</sup> – Sept.29 <sup>th</sup>	Ch.13.6 Equation of Motion: Normal and Tangential Coordinates
		Review session
#6	Oct.2 <sup>nd</sup> – Oct.6 <sup>th</sup>	<b>Oct. 3rd, Tuesday, Exam #1: covers Ch 12 and 13</b>
		Oct. 5 <sup>th</sup> , Thursday, Engineering Career Fair 10am-3pm. No Class. Please show up for the event! Dress up and bring your resume
#7	Oct. 9 <sup>th</sup> – Oct.13 <sup>th</sup>	Ch.14.1-14.3 Work, Energy and Principle of Work and Energy
		Ch.14.4-14.6 Conservation of Energy
#8	Oct. 16 <sup>th</sup> – Oct.20 <sup>th</sup>	Ch.15.1-Ch.15.2 Impulse and Momentum
		Ch.15.3 Conservation of linear Momentum for a System of Particles
#9	Oct. 23 <sup>rd</sup> – Oct.27 <sup>th</sup>	Ch.15.3 Conservation of linear Momentum: continue
		Ch.15.3 Conservation of Angular Momentum
#10	Oct.30 <sup>th</sup> – Nov.3 <sup>rd</sup>	Review session
		<b>Nov. 2<sup>nd</sup>, Thursday, Exam #2: covers Ch 14 and 15</b>
#11	Nov.6 <sup>th</sup> – Nov.10 <sup>th</sup>	Ch.16.1-16.2 Planar Motion of a Rigid Body; Translation;
		Ch.16.4: Absolute Motion analysis
#12	Nov 13 <sup>th</sup> – Nov.17 <sup>th</sup>	Ch.16.5: Relative motion Analysis: Velocity; Base point method
		Ch.16.5: Relative motion Analysis: Velocity; Base point method
#13	Nov.20 <sup>th</sup> – Nov.24 <sup>th</sup>	Ch.16.5: Relative motion Analysis: Velocity; Instantaneous center
		Thanksgiving Holidays. University Closed. NO class/lecture
#14	Nov.27 <sup>th</sup> – Dec. 1 <sup>st</sup>	Ch.16.5: Relative motion Analysis: Acceleration
		Ch.16.5: Relative motion Analysis: Acceleration;
#15	Dec. 4 <sup>th</sup> – Dec. 8 <sup>th</sup>	Ch.16.5: Relative motion Analysis: Comprehensive
		Review session
		December 6-7, pre-final days (no new materials; review)
		Dec 7 <sup>th</sup> Thursday; last class day Dec 8 <sup>th</sup> Friday; Reading day (No class)
#16	Dec. 11 <sup>th</sup> – Dec. 15 <sup>th</sup>	Exam #3 (Final): Ch 16 only For section .001 (1:00 p.m.-2:20 p.m. class): Thursday, December 14, 10:30 a.m. - 12:30 p.m. For section .003 (11:30 a.m.-12:50 p.m. class): Tuesday, December 12, 10:30 a.m. - 12:30 p.m.

Document History: Dr. Xiaohua Li, Prepared on 8/25/2017

## Fall 2017 Final Exams - Discovery Park

<http://registrar.unt.edu/exams/final-exam-schedule/fall>

**Pre-finals days** are Wednesday, December 6 - Thursday, December 7. Reading Day is December 8 and no classes will meet.

\* **Evening Classes:** have their final exams on the earliest usual class time this week. Classes with start times 4:00 p.m. and later are considered evening classes.

<b>Saturday, December 9</b>	
<i>This class...</i>	<i>Has a final exam at this time...</i>
All Saturday classes & All INET Classes with On Campus Finals	Contact Department
MWF 10:30 a.m.	8:00 a.m. - 10:00 a.m.
MWF 1:30 p.m.	10:30 a.m. - 12:30 p.m.
MWF 4:30 p.m.	1:30 p.m. - 3:30 p.m.
F 2:30 p.m. - 5:20 p.m.	1:30 p.m. - 3:30 p.m.
<b>Monday, December 11</b>	
<i>This class...</i>	<i>Has a final exam at this time...</i>
MWF 8:30 a.m.	8:00 a.m. - 10:00 a.m.
MWF 11:30 a.m.	10:30 a.m. - 12:30 p.m.
MWF 2:30 p.m.	1:30 p.m. - 3:30 p.m.
M 2:30 - 5:20 p.m.	1:30 p.m. - 3:30 p.m.
MW 2:30 p.m.- 3:50 p.m.	1:30 p.m. - 3:30 p.m.
<b>Tuesday, December 12</b>	
<i>This class...</i>	<i>Has a final exam at this time...</i>
TR 8:30 a.m.	8:00 a.m. - 10:00 a.m.
<b>TR 11:30 a.m.</b>	<b>10:30 a.m. - 12:30 p.m.</b>
TR 2:30 p.m.	1:30 p.m. - 3:30 p.m.
T 2:30 p.m. - 5:20 p.m.	1:30 p.m. - 3:30 p.m.
<b>Wednesday, December 13</b>	
<i>This class...</i>	<i>Has a final exam at this time...</i>
MWF 9:30 a.m.	8:00 a.m. - 10:00 a.m.
MWF 12:30 p.m.	10:30 a.m. - 12:30 p.m.
W 2:30 p.m. - 5:20 p.m.	1:30 p.m. - 3:30 p.m.
MWF 3:30 p.m.	1:30 p.m. - 3:30 p.m.
MW 4:00 p.m. - 5:20PM	1:30 p.m. - 3:30 p.m.
<b>Thursday, December 14</b>	
<i>This class...</i>	<i>Has a final exam at this time...</i>
TR 10:00 a.m.	8:00 a.m. - 10:00 a.m.
<b>TR 1:00 p.m.</b>	<b>10:30 a.m. - 12:30 p.m.</b>
R 2:30 p.m. - 5:20 p.m.	1:30 p.m. - 3:30 p.m.
TR 4:00 p.m.	1:30 p.m. - 3:30 p.m.