

ENGR 2302.001/.002**Dynamics****Fall 2021**

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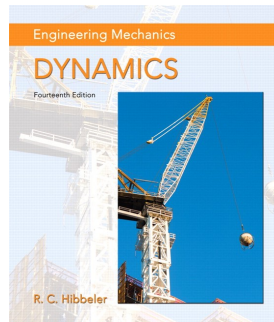
Lecture Time: MW 11:30 a.m.-12:50 p.m. (80 mins) room B190 (section .002)
 TuTR 01:00 p.m.-02:20 p.m. (80 mins) room D215 (section .001)

Office Hours: Open Office Policy; or by appointment

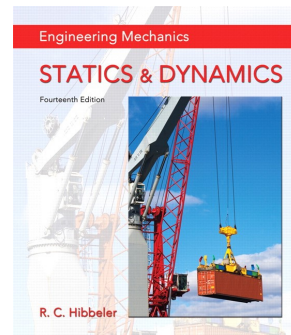
Required Textbook: Engineering Mechanics: Dynamics, 14th Edition,
 Pearson, 2015 R.C. Hibbeler
 ISBN-13: 978-0133915389

Or

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



or



Course Description: This is a required core course in MET program

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 MEEN 2301 (or ENGR 2301).

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

Homework (total 10; all of them)	10%	≥ 90%	A
Quizzes (total 8; drop the lowest 3)	10%	80-89.9%	B
Exam 1 (Ch 12)	25%	70-79.9%	C
Exam 2 (Ch 13&14)	25%	60-69.9%	D
Final/Exam 3 (Ch 15&16)	25%	< 60%	F
<u>Attendance (5 out of 6)</u>	5%		
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”: the day new homework will be assigned (HW assignment will be posted in Canvas) and previous homework will be collected;
For MW 11:30 a.m.-12:50 p.m. (80 mins) class: **Monday**
For TuTR 01:00 p.m.-02:20 p.m. (80 mins) class: **Tuesday**
2. Homework should be turned in before the deadline through canvas (12:50 pm for MW class and 2:20pm for TuTh class). **NO late homework will be collected, accepted or graded.** (Canvas window will be automatically closed)

Exceptions: refer to UNT Policies 06.039.

An absence may be excused for the following reasons:

- ❖ religious holy day, including travel for that purpose;
- ❖ active military service, including travel for that purpose;
- ❖ participation in an official university function;
- ❖ illness or other extenuating circumstances;
- ❖ pregnancy and parenting under Title IX; and
- ❖ when the University is officially closed.

Procedure: Please request accommodations/exceptions through UNT “Dean of Students Office”

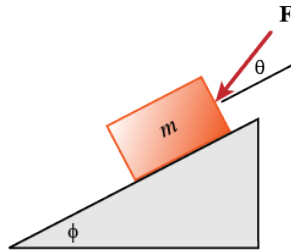
3. Solutions to Homework Assignments will be available in Canvas after HW has been collected.
4. Having no textbook is not a valid excuse for not doing homework. It is the student’s responsibility to acquire textbook for his/her study
5. All homework assignments should be turned in through Canvas. There will be a window/link in canvas open for submitting HW.
6. 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:

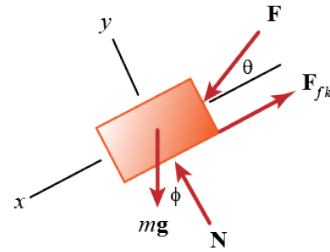
- (1) Use engineering paper only (noncompliance: 10 points off; cumulative)
- (2) Only solve one problem per page of engineering paper (noncompliance: 10 points off; cumulative). You may extend that problem into another page but then should begin the next problem on a new page if you require more room. 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. (noncompliance: 10 points off; cumulative)
- (4) No cross outs, use an eraser. (noncompliance: 10 points off; cumulative)
- (5) Free-body diagrams (FBD) – WHEN NECESSARY/NEEDED, Draw a neat FBD that includes arrows with arrowheads, necessary dimensions, and parameters needed to solve the problem

(noncompliance: problem/HW will NOT be graded; no points will be honored)

Example:



Problem Statement



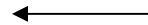
F.B.D

- (6) **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., $F_1=50\text{ N}$; $X_c = 2.1\text{ m}$). (noncompliance: 10 points off; cumulative)
- (7) **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.

(noncompliance: 10 points off; cumulative)

Example:

$F_1 = 50\text{ N}$



Exam and Quiz Policy:

- (1) Exams and quizzes will be announced in advance; Exams are closed book and closed notes with approved formula sheets only
- (2) Formula sheets: Use the formula sheets provided only, NOTHING ELSE. Do not write/mark anything on the formula sheets provided so they could be reused;
- (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 the Department, College and University
- (14) There will be NO make-up exam.
 - Exceptions:** refer to UNT Policies 06.039.
 - Procedure for Exceptions:** Please request accommodations/exceptions through UNT "Dean of Students Office"
- (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.

MET Program Educational Objectives

The educational objectives of the Mechanical Engineering Technology program are to produce graduates who will:

- Graduates are expected to perform all functions assigned to a Mechanical Engineering Technologist in the following areas of mechanical engineering practice including mechanical, thermal, and fluid systems design, materials and manufacturing processes,
- Graduates are expected to demonstrate an ability to define, formulate, and solve mechanical engineering problems through the application of competent technical and ethical capabilities.
- Graduates are expected to exercise communication and teamwork skills, demonstrate an appreciation of local and global social values, and display an understanding of the social, technical, and environmental implications of technology.
- Graduates are expected to demonstrate continued professional advancement through life-long learning opportunities, in-service training, and engagement with professional organizations.

ABET Student Outcomes

- An ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the discipline. (ABET 1)
- An ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline. (ABET 2)
- An ability to apply written, oral, and graphical communication in broadly-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature. (ABET 3)
- An ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes. (ABET 4)
- An ability to function effectively as a member as well as a leader on technical teams. (ABET 5)

IMPORTANT EXAM DATES

Exam #1 (tentative; depends on when chapter 13 is finished; Covers Ch 12 & 13):
Monday, **Sep.20, 2021**
Tuesday, **Sep.21, 2021**

Exam #2 (tentative; depends on when chapter 15 is finished; Covers Ch 14 & 15):
Monday, **Oct.18, 2021**
Tuesday, **Oct.19, 2021**

Exam #3 (UNT official final exam schedule; **Covers Ch 16**):
For MW 11:30-12:50pm class, Final is on Monday, Dec-6; 10:30-12:30
For TuTR 1:00-2:20pm class, Final is on Thursday, Dec-9;10:30-12:30

UNT Official Academic Calendar: Fall 2021

August 23, 2021	First Class Day (Monday)
September 6, 2021	Labor Day (no classes; university closed)
November 25-26, 2021	Thanksgiving Break (no classes; university closed)
December 1-2, 2021	Pre-finals Days
December 2, 2021	Last Class Day
December 3, 2021	Reading Day (no classes)
December 4-10, 2021	Finals
December 24, 2021 - January 1, 2022	Winter Break (no classes; university closed)

ENGR 2302.001/.002 Dynamics

Schedule Overview

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

Week	Date	Lecture Topics
#1	Aug.23 - Aug.27	Overview of syllabus
		Ch.12.1-12.2: Rectilinear Motion; Ch.12.4-12.5: General Curvilinear Motion
#2	Aug.30– Sept.3	Ch.12.7: Curvilinear Motion: Normal and Tangential components
		Ch.12.7: Curvilinear Motion: Normal and Tangential components
#3	Sept.6- Sept.10	Ch.13.1-13.4 Equation of Motion: Rectangular Coordinates
		Ch.13.1-13.4 Equation of Motion: Rectangular Coordinates
#4	Sept.13- Sept.17	Ch.13.5 Equation of Motion: Normal and Tangential Coordinates
		Ch.13.5 Equation of Motion: Normal and Tangential Coordinates
#5	Sept.20- Sept.24	Exam 1
		Ch.14.1-14.3 Work, Energy and Principle of Work and Energy
#6	Sept.27- Oct.1	Ch.14.1-14.3 Work, Energy and Principle of Work and Energy
		Ch.14.4-14.6 Conservation of Energy
#7	Oct. 4- Oct.8	Ch.15.1-Ch.15.2 Impulse and Momentum
		Ch.15.3 Conservation of linear Momentum for a System of Particles
#8	Oct. 11- Oct.15	Ch.15.5/6/7 Angular Momentum; Conservation of Angular Momentum
		Ch.15.5/6/7 Angular Momentum; Conservation of Angular Momentum
#9	Oct. 18- Oct.22	Exam 2
		Ch.16.1-16.2 Planar Motion of a Rigid Body; Translation;
#10	Oct.25- Oct.29	Ch.16.1-16.2 Planar Motion of a Rigid Body; Translation;
		Ch.16.3 Rotation about fixed axis
#11	Nov.1- Nov.5	Ch.16.4: Absolute Motion analysis
		Ch.16.4: Absolute Motion analysis
#12	Nov 8- Nov.12	Ch.16.5: Relative motion Analysis: Velocity; Base point method
		Ch.16.5: Relative motion Analysis: Velocity; Base point method
#13	Nov.17- Nov.19	Ch.16.6: Relative motion Analysis: Velocity; Instantaneous center
		Ch.16.6: Relative motion Analysis: Velocity; Instantaneous center
#14	Nov.22- Nov. 26	Ch.16.7: Relative motion Analysis: Acceleration
		Ch.16.7: Relative motion Analysis: Acceleration
#15	Nov. 29- Dec. 3	Review/HW session
		Review/HW session
#16	Dec. 4- Dec. 10 (Exam Week)	For MW 11:30-12:50pm class, Final is on Monday, Dec-6; 10:30-12:30
		For TuTR 1:00-2:20pm class, Final is on Thursday, Dec-9; 10:30-12:30

Fall 2021 Final Exams - Discovery Park

Pre-finals days are Wednesday, December 1 - Thursday, December 2.

Reading Day is December 4 and no classes will meet.

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

Monday, December 6	
<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.

Thursday, December 9	
<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.
TR 1:00 p.m.	10:30 a.m. - 12:30 p.m.
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.