

UNIVERSITY OF NORTH TEXAS – Department of Mechanical Engineering
MEEN 3130 / MEET 3650 **Machine Elements/Design of Mechanical Components**
SYLLABUS Spring 2022 3 Credit hours

Instructor: Dr. Hassan Qandil (hassan.qandil@unt.edu)

Office Hours: By appointment via Zoom.

Lectures & TuTh 10:00AM - 11:20AM (MEEN3130-002) NTDP F175

Locations: TuTh 12:30PM - 01:50PM (MEEN3130-001 / MEET3650-001) NTDP F175

Teaching Assistant: TBD

TA Office Hours: By appointment via Zoom.

Prerequisite(s): Passing the following with a “C” or better:

- 1) ENGR 2332 Mechanics III, Stress Analysis (implies 2301 statics).
- 2) ENGR 1304 Engineering Graphics.

Catalog Course Description: Applications of the principles of mechanics and mechanics of materials to machine design. The elements of machines are analyzed in terms of their dynamic behavior. Selection and sizing of machine elements. Students use the finite element technique for the analysis of machines and their counterparts.

Required Text: “Shigley's Mechanical Engineering Design”, 11th, Budynas, McGraw Hill. ISBN13: 9780073398211

Optional Resources:

- 1) “Machine Elements”, 3rd Ed., Schmid, CRC Press.
- 2) “Mechanical Design of Machine Elements and Machines”, 2nd, Collins, Wiley.
- 3) “Machine Design – An Integrated Approach”, 5th Ed., Norton, Pearson.

ABET OUTCOMES: MEEN 3130/ MEET 3650 addresses several ABET outcomes, including applying knowledge of mathematics, engineering and science as well as identifying, formulating and solving engineering problems. Upon successful course completion:

- 1) Learn the process for machine design.
- 2) Application of mechanics of materials into stable designs.
- 3) Determine failure and deformation mode of a design.
- 4) Apply static and dynamic failure theories in design analysis
- 5) Apply principals of mechanics, materials, stress analysis, statics, and dynamics to machine sizing.
- 6) Select appropriate dimensions and size of machine elements.

CALCULATORS: Only those permitted on (FE) exam. No graphing calculators.

- 1) Hewlett Packard—HP 33s and HP 35s models, but no others.
- 2) Casio—All fx-115 & fx-991 models. Must contain fx-115 or fx-991 in its model name.
- 3) Texas Instruments: All TI-30X and TI-36X models. Any TI calculator must contain either TI-30X or TI-36X in its model name.

GRADES: Standard grading scale used: 90/80/70/60. Re-grade request must be made in class the day returned. No re-grade requests after class dismissed. Entire exam will be re-graded, which may result in lower score than originally assigned. **Make-ups are NOT allowed** only exception being University excused absences with documentation provided.

Attendance 5% **Taken In-class** (Extra credit for lecture participation)
 Homework 20% **Online PDF submissions**, problem solving / critical thinking
 Quizzes 20% **In-class**, problem solving, like home practice
 Mid Term 25% **In-class**, reading comprehension / multiple choice / qualitative
 Final Exam 30% **In-class**, reading comprehension / multiple choice / qualitative
Extra Credit is available through Exams and Quizzes, and OPTIONAL FEA Project

TENTATIVE LECTURE SCHEDULE

Week	Dates	Chapter	Topic	Quiz
1	Jan. 18 th – Jan. 21 st	3	Introduction / Loads	
2	Jan. 24 th – Jan. 28 th	3	Load and Stress	
3	Jan. 31 st – Feb. 4 th	4	Deflection and Stiffness	
4	Feb. 7 th – Feb. 11 th	5	Static Failures	1
5	Feb. 14 th – Feb. 18 th	5	Static Failures	
6	Feb. 21 st – Feb. 25 th	6	Fatigue Failure	
7	Feb. 28 th – Mar. 4 th	6	Fatigue Failure	2
8	Mar. 7 th – Mar. 11 th	7	Shaft Design	
Midterm (Th, Mar 10th) (In-class. same class time per section) (Ch: 3,4,5,6)				
9	Mar. 14 th – Mar. 18 th	SPRING BREAK		
10	Mar. 21 st – Mar. 25 th	7	Shaft Design	
11	Mar. 28 th – Apr. 1 st	11/12	Bearing Design	
12	Apr. 4 th – Apr. 8 th	11/12	Bearing Design	3
13	Apr. 11 th – Apr. 15 th	11/12	Bearing Design	
14	Apr. 18 th – Apr. 22 nd	13	Gear Design	4
15	Apr. 25 th – Apr. 29 th	14/15	Gear Design	
16	May. 2 nd – May. 6 th	-	FEA Introduction	
Final (Ch: 7,11,12,13,14,15)				
Thursday May-12 (08:00AM - 10:00AM) (MEEN3130-002) NTDP F175				
Thursday May-12 (10:30AM - 12:30PM) (MEEN3130-001 / MEET3650-001) NTDP F175				

COURSE POLICY: **Course delivery method is in-person.** All course announcements, lecture notes, recorded material and assignments will be posted on the MEEN 3130 / MEET 3650 Canvas courses. **Students are expected to have access to the textbook on their own.**

HOMEWORK: All **Homework submissions are online** through CANVAS and in a PDF format. **NO LATE SUBMISSIONS ALLOWED** except for students with UNT-approved excuse.

EXAMS: All **quizzes and exams will be in-class**. If needed due to COVID-19 emergency regulations, exams may transition to CANVAS format using a LockDown browser and Respondus Monitor, which required that the student have access to a webcam and a microphone. For more details, refer to the following link: <https://clear.unt.edu/supported-technologies/respondus-lockdown-browser> (Links to an external site.)

FACE COVERINGS: UNT encourages everyone to wear a face covering when indoors, regardless of vaccination status, to protect yourself and others from COVID infection, as recommended by current CDC guidelines. Face covering guidelines could change based on community health conditions.

ATTENDANCE: Students are expected to attend class meetings regularly and to abide by the attendance policy established for the course. It is important that you communicate with the professor and the instructional team prior to being absent, so you, the professor, and the instructional team can discuss and mitigate the impact of the absence on your attainment of course learning goals. Please inform the professor and instructional team if you are unable to attend class meetings because you are ill, in mindfulness of the health and safety of everyone in our community.

If you experience any symptoms of COVID-19 (<https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>) please seek medical attention from the Student Health and Wellness Center (940-565-2333 or askSHWC@unt.edu) or your health care provider PRIOR to coming to campus. UNT also requires you to contact the UNT COVID Team at COVID@unt.edu for guidance on actions to take due to symptoms, pending or positive test results, or potential exposure.

[IF NEEDED] COURSE MATERIALS FOR REMOTE INSTRUCTION: Remote instruction may be necessary if community health conditions change or you need to self-isolate or quarantine due to COVID-19. Students will need access to a webcam and microphone to participate in fully remote portions of the class. Information on how to be successful in a remote learning environment can be found at <https://online.unt.edu/learn>

ACADEMIC INTEGRITY STANDARDS AND SANCTIONS FOR VIOLATIONS: According to UNT Policy 06.003, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University. Academic dishonesty will not be tolerated and will result in zero assignment score and reported to Office of Academic Integrity. No exceptions. Having any calculator not on the approved list is a violation of Academic Integrity.

ADA Policy: UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request

accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website (<https://disability.unt.edu/>).

STUDENT PERCEPTIONS OF TEACHING EFFECTIVENESS (SPOT) Course participates in SPOT evaluations (<http://spot.unt.edu/> or email spot@unt.edu).

RETENTION OF STUDENT RECORDS Course follows Family Educational Rights and Privacy Act (FERPA) laws and UNT Policy 10.10, Records Management and Retention.

SYLLABUS CHANGES Instructor reserves right change syllabus. Any changes announced in class and posted to CANVAS with an accompanying email to student's UNT email address.

ACCEPTABLE BEHAVIOR: Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The University's expectations for student conduct apply to all instructional forums, including University and electronic classroom, labs, discussion groups, field trips, etc. To learn more, visit UNT's Code of Student Conduct (<https://deanofstudents.unt.edu/conduct>).

ACCESS TO INFORMATION - EAGLE CONNECT: Students' access point for business and academic services at UNT is located at: my.unt.edu. All official communication from the University will be delivered to a student's Eagle Connect account. For more information, please visit the website that explains Eagle Connect and how to forward e-mail Eagle Connect (<https://it.unt.edu/eagleconnect>).