

## MEET 4050 – Mechanical Design Fall 2025

### Instructor Information:

Name: R. C. “Chow” Yalamanchili, PhD, PE

Email: [rattaya.yalamanchili@unt.edu](mailto:rattaya.yalamanchili@unt.edu)

Phone: (940) 369-7510 (Work)

(281) 841-9621 (Mobile) (to be used in an emergency only)

### About me & Teaching Philosophy:



**Office:** F101N.1 (Discovery Park)

### Office Hours:

Tuesday: 3:00 PM to 6:00 PM

Thursday: 1:00 PM to 3:00 PM

or by appointment

### NOTE:

- I strongly encourage you to take advantage of office hours—they're a great opportunity to ask questions, clarify concepts, seek feedback, or simply talk through ideas. Whether you're on track or feeling stuck, I'm here to help.
- I maintain an **open-door policy** whenever possible. If my door is open and I'm not in a meeting, feel free to stop by, no appointment is needed.
- If I'm ever unavailable during scheduled office hours due to unforeseen circumstances, I'll do my best to inform you in advance and make alternate arrangements to meet.
- Don't wait until things feel overwhelming, office hours are here for your benefit. Your growth matters, and I truly want to see you succeed.

### Class Schedule:

**Lecture:** Friday 8:30 AM to 10:20 AM, Room - F175 Discovery Park

**Laboratory:** Friday 10:30 AM to 1:20 PM, Room - F187 Discovery Park

### Course Description:

Elements, principles, and graphic representation techniques of the design process. Design methodology and process in applied engineering design. Design problem identification, refinement, and analysis in the development of machines.

**Pre-requisites:** *MEET 3650, Senior standing and completion of all 3000-level engineering technology courses.*

### **Course Learning Outcomes:**

By the end of the course, you be able to:

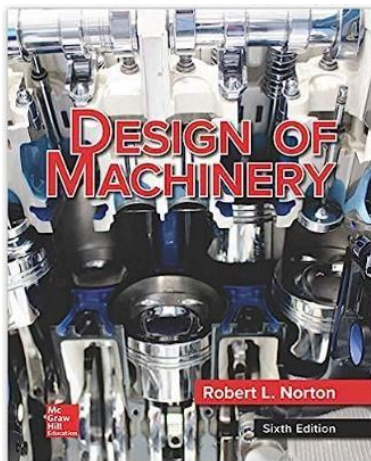
- Comprehend standard structure/mechanical design methods. (Abet 1)
- Understand stress and deformation of structural elements. (Abet 1)
- Understand major mechanical/structural components. (Abet 2)
- Know machine/structural designs. (Abet 2)
- Enhance Communication Skills through Technical Reports. (Abet 3)

### **Appropriate ABET Student Learning Outcomes:**

Engineering Technology Accreditation Commission: An engineering technology program must demonstrate that graduates have:

- ABET 1: An ability to apply knowledge, techniques, skills, and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering projects;
- ABET 2: An ability to design systems, components, or processes meeting specified needs for broadly defined engineering problems appropriate to program educational objectives
- ABET 3: An ability to apply written, oral and graphical communication in broadly defined technical and nontechnical environments; and an ability to identify and use appropriate technical literature.

### **Required Text/Associated Software**



**Design of Machinery 6th Edition**  
by [Robert Norton](#) (Author)

ISBN-10	ISBN-13	Edition	Publisher	Publication date
1260113310	978-1260113310	6th	McGraw Hill	January 24, 2019

### **Technical Skill Requirements:**

MS Office Suite (Excel, Word, PowerPoint), MATLAB, Engineering Graphics, Internet usage, emails, Canvas, SolidWorks.

### **Attendance:**

Responsibility for class and laboratory attendance rests with the student. Attendance at all class and laboratory meetings is required. Attendance surveys will be taken throughout the semester, and it is a student's responsibility to ensure signing attendance surveys during class at the discretion of the instructor. Per University policy 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 University is officially closed. It is the student's responsibility to provide satisfactory evidence to receive an excused absence.

### **Calculators:**

The **only calculators** that are approved for this course are those permitted on the Fundamentals of Engineering (FE) exam for Professional Engineer (PE) licensing:

- **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.)

### **Teamwork:**

You have been assigned to a team. Each team has between 2 to 3 people. Teamwork is an objective of this course, and every student is expected to contribute equitably to their team's success. Peer evaluations will be conducted for all Team Work and factored into individual grades for the work. If a team member is not meeting expectations, it is the responsibility of the team to notify the instructor promptly.

Examples of unacceptable team behavior include but are not limited to:

- Failure to participate in team activities or contribute meaningfully to the design process
- Engaging in unethical conduct such as plagiarism or falsification of data/results
- Poor collaboration with teammates
- Repeatedly missing deadlines or misusing course materials
- Any actions that hinder or compromise the team's progress

### **Attendance and Scheduling**

Per University of North Texas policy, work or employment obligations are not valid excuses for missing team meetings or failing to support teammates. Students must proactively manage their schedules to ensure full participation in team responsibilities. Teams are expected to find mutually agreeable meeting times.

### **Assignments:**

1. Assignments will be done individually.
2. Assignments will be posted on Canvas and are due on the date and time given.
3. All assignments should be done using Engineering Computation Pad or on Graph Ruled Reinforced filler paper, 8-1/2" x 11, 3-Hole Punched.
4. All assignments should be turned in on Canvas. A hard copy should be maintained in your portfolio.
5. No emailed assignments will be accepted.
6. It is the student's responsibility to check and see what assignment is available and to turn them in a timely manner.
7. The solutions to the Assignment problems should be in a specific format. A separate set of instructions (Problem Solution Methodology) will be provided for this in the Introduction Module of Canvas.

### **Knowledge Checks:**

1. Knowledge Checks will be given during each class typically at the beginning of class and/or Laboratory at the discretion of the instructor and will cover material from previous lectures / laboratory.
2. Knowledge Checks may be on Canvas. You will need to be present in class to take them.
3. You will have between 10 to 15 minutes to take the Knowledge Check.
4. On occasion Knowledge Checks may be assigned to be completed out of the classroom setting.
5. All Knowledge Checks once graded should be scanned and uploaded to Canvas within 3 calendar days of receiving it back.
6. If you miss a Knowledge Check, you cannot make it up unless it is a valid absence as per University Policy.
7. Once you receive the Knowledge Check back, you are expected to rework it based on the grade and comments received. The corrected version should also be part of your portfolio.
8. If you fail to upload the graded Knowledge Check you will not receive credit for the same.
9. A hard copy (original & corrected version) should be maintained in your portfolio.

### **Laboratory Assignments:**

1. Laboratory Assignments will be given regularly throughout the semester and are intended to reinforce concepts from lectures and provide hands-on experience with mechanical design tools and methods.
2. All assignments must be completed as a Team unless otherwise specified. Team assignments must clearly indicate the contributions of each team member.
3. Laboratory Assignments will typically include a combination of experiments, analytical work, CAD modeling, and/or simulation and analysis using software tools such as SolidWorks, MATLAB, or equivalent.
4. Each assignment will specify the required deliverables (calculations, figures, tables, CAD drawings, simulation results, and a written explanation). Reports should follow the **Lab Report Guidelines** provided in this course.

5. Laboratory reports must be submitted electronically on Canvas in PDF format by the posted due date. Late submissions will be penalized unless prior arrangements are made or the absence is excused under University Policy.
6. Students are expected to keep a hard copy in their portfolio of all Laboratory reports, including corrected versions after grading.
7. Once graded, students should review instructor feedback, make corrections, and resubmit the revised version as part of their portfolio. This practice ensures continuous improvement in technical writing and analysis.
8. Plagiarism or copying from other students or sources is not permitted. All work must reflect your own understanding and effort, even when using shared data or group results.
9. Professional presentation is expected: clear organization, labeled figures/tables, correct units, and concise, technical writing. Poorly formatted or incomplete submissions may lose credit.

### **Portfolio:**

As part of the course requirements, each student must maintain a **Portfolio**, which serves as a comprehensive, well-organized, and continuously updated record of all academic work completed throughout the semester.

#### **Purpose and Expectations**

The Portfolio is intended to:

- Document your progress and engagement with the course material.
- Serve as a structured reference for your learning throughout the semester.
- Encourage ongoing reflection, study discipline, and synthesis of key concepts.

Students are expected to begin assembling their Portfolio at the start of the semester and maintain it consistently throughout the course.

#### **Format and Organization**

The Portfolio must be maintained in physical form using a three-ring binder and should be organized according to the course modules. Each module section should include relevant and dated materials in the order listed below:

1. Course Syllabus – A printed copy of the syllabus must be placed at the beginning of the Portfolio.
2. Modular Sections – The body of the Portfolio should be organized by course module, with clearly labeled dividers for each module. Each section should include:
  - Class notes
  - Knowledge checks (Original & Rework)
  - Completed assignments related to the module (Original & Rework)
3. Laboratory reports – Documentation for all projects must be included in a dedicated section.
4. Projects – Documentation for all projects must be included in a dedicated section.
5. Examinations – Copies of all exams should be included in a dedicated section.
6. Appendix – Any pre-approved reference materials (e.g., charts, diagrams, or supplementary readings) should be placed in an appendix at the end of the binder.

#### **Evaluation and Credit**

- The instructor may request to review the Portfolio at any point during the semester.
- Credit will be awarded only if the Portfolio is complete, clearly organized as per the format in the Syllabus, and reflects meaningful engagement with the course content.

- Students are expected to expand and refine their lecture notes and assignments as they proceed through each module, incorporating insights from textbooks and other course resources.

The Portfolio is not merely a collection of documents—it is a demonstration of your intellectual commitment to the course. Consistent and thoughtful maintenance of this record will support your learning and contribute significantly to your overall performance.

### **Grading Criteria**

Attendance	0%
Homework Assignments	10%
Laboratory Assignments	30%
Portfolio	10%
Knowledge Checks	15%
Project(s)	10%
Exam I	10% (9/26/2025; 8:30 AM to 10:20 AM)
Final Exam (Cumulative)	15% (12/8/2025; 8:00 AM to 10:00 AM)

### **Expected Grade Distribution:**

A:  $\geq 90\%$ , B: 80-89%, C: 70-79%, D: 60-69%, F:  $< 60\%$ ; Your grade will not be based on a curve.

The instructor reserves the right to change this grade distribution at the end of the semester. If any changes occur, the changes will be less stringent than the distribution above.

### **Tentative Course Topics:**

This is a tentative course outline. The instructor will attempt to follow it closely and reserves the right to substitute any other relevant material at any point throughout the course. The laboratory following the lecture will be based on the information covered in the lectures.

S No	Tentative Topics
1	Introduction to Course
2	Introduction to Mechanisms and Kinematics
3	Kinematics Fundamentals
4	Graphical Linkage Analysis
5	Position and Displacement Analysis
6	Analytical Linkage Synthesis
7	Velocity Analysis
8	Acceleration Analysis
9	Cam Design
10	Gear Trains
11	Engine Dynamics

## **Disability Policy:**

All reasonable accommodations will be made to facilitate special needs. If special accommodations are required, the student must first meet with the staff of the Office of Disability Accommodation (ODA), (940) 565-4323. After meeting with that office, please contact me to discuss what accommodations will be necessary. For more information, see <http://www.unt.edu/oda>.

## **Policies and Procedures:**

1. This syllabus is subject to change during the semester with changes to be announced in class and provided on Canvas.
2. This course provides opportunities for students to take advantage of several software packages supported by the department in the classroom or in lab experiments, in simulation studies, homework assignments, or in projects.
3. The classes will be held in person at the scheduled times.
4. Canvas Learning Management System, at <https://canvas.unt.edu/> will be used for posting announcements, Video meeting invitations, course-related materials, assignments, and grades. Students are encouraged to check the course website often.
5. You are free to form a group of no more than 2 students as members of the group. If you are unable to find a group, you will be assigned to a Group by the instructor.
6. Projects will be assigned to the group. A format and brief guidelines for the project report, posters, presentation, and oral presentation will be provided and discussed.
7. Grades are based in part on the student's ability to communicate. You must present your work in a well-organized and well-articulated manner with appropriate depth.
8. Requests for the review of a graded report/assignment must be made within one week of the grade announcement. Upon review, the report/assignment score may increase, remain the same, or decrease.
9. There will be **no** make-up quizzes or assignments unless you have a university-excused absence. If you know in advance that you will miss a quiz or assignment, you must contact the instructor before the scheduled quiz or assignment.
10. An "I" (incomplete) grade is given only for extenuating circumstances.
11. The instructor reserves the right to change the grade distribution at the end of the semester. If any changes occur, the changes will be less stringent than the distribution above.
12. **Technical Assistance.** art of working in the online environment involves dealing with the inconveniences and frustration that can arise when technology breaks down or does not perform as expected. Here at UNT we have a Student Help Desk that you can contact for help with Canvas or other technology issues.

**UIT Help Desk:** [UIT Student Help Desk site](http://www.unt.edu/helpdesk/index.htm) (<http://www.unt.edu/helpdesk/index.htm>)

**Email:** [helpdesk@unt.edu](mailto:helpdesk@unt.edu); **Phone:** 940-565-2324; **In Person:** Sage Hall, Room 130

**Walk-In Availability:** 8am-9pm

**Telephone Availability:**

- Sunday: noon-midnight
- Monday-Thursday: 8am-midnight
- Friday: 8am-8pm
- Saturday: 9am-5pm

**Laptop Checkout:** 8am-7pm For additional support, visit [Canvas Technical Help](https://community.canvaslms.com/docs/DOC-10554-4212710328) (<https://community.canvaslms.com/docs/DOC-10554-4212710328>)

13. **Rules of Engagement.** Rules of engagement refer to the way students are expected to interact with each other and with their instructors. Here are some general guidelines:

- While the freedom to express yourself is a fundamental human right, any communication that utilizes cruel and derogatory language on the basis of race, color, national origin, religion, sex, sexual orientation, gender identity, gender expression, age, disability, genetic information, veteran status, or any other characteristic protected under applicable federal or state law will not be tolerated.
- Treat your instructor and classmates with respect in any communication online or face-to-face, even when their opinion differs from your own.
- Ask for and use the correct name and pronouns for your instructor and classmates.
- Speak from personal experiences. Use “I” statements to share thoughts and feelings. Try not to speak on behalf of groups or other individual’s experiences.
- Use your critical thinking skills to challenge other people’s ideas, instead of attacking individuals.
- Avoid using all caps while communicating digitally. This may be interpreted as “YELLING!”
- Be cautious when using humor or sarcasm in emails or discussion posts as tone can be difficult to interpret digitally.
- Avoid using “text-talk” unless explicitly permitted by your instructor.
- Proofread and fact-check your sources.
- Keep in mind that online posts can be permanent, so think first before you type.
- All communication via email should be done using the UNT domain. Emails originating from outside this domain will not be responded to.

See these [Engagement Guidelines](https://clear.unt.edu/online-communication-tips) (https://clear.unt.edu/online-communication-tips) for more information.

14. **Exam Protocol:**

- Your cell phone, plus all books and class notes, **must be placed on the floor** (not in your pant/shirt pockets) at the side of the room, front of the room, or back of the room. It is suggested that you not bring them. **If you get caught using a cell phone during an exam, this will result in an automatic zero for the exam!**
- A seating chart may be created or prepared for the instructor to assign you to particular seats before the exam begins.
- Students will not be allowed to leave the room during an examination for bathroom breaks. Please use the restroom before you begin your exam. Once you leave the room, the exam will be collected as **you will be done with the exam.**
- Bring your UNT IDs to be checked.
- Arrive early to put your books, etc., away and to find your assigned seat.
- You may be given scratch paper and formulas will be part of the exam. Cell phones cannot be used as calculators. The test is closed book so you may have no other materials at your desk.
- You may use a calculator as stated in the syllabus.
- The instructor may quickly go over the test at the beginning of the period. Do not expect questions to be answered about the test while you are taking it.



- Absolutely no talking, looking at another student's exam, or passing anything between students is permitted during the test. Such actions will be construed as cheating. Students are not permitted to leave the room during the exam. Suspicious activity will be noted on the seating chart. The test may be videotaped.
  - Anyone finishing the test early must sit quietly until the end of the period. All tests will be taken up at one time.
  - All attempts will be made to return the exam to you in the next class period.
15. **Academic Integrity Standards and Sanction for Violations:** According to UNT Policy 06.003, Student Academic Integrity, 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. Any violation of academic honesty in an quiz, exam, project or assignment will result in a grade of zero and a report to <https://faculty.success.unt.edu/academic-integrity>.
16. **Acceptable Student 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 classrooms, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at [deanofstudents.unt.edu/conduct](https://deanofstudents.unt.edu/conduct).
17. **Access to Information- Eagle Connect:** Students' access point for business and academic services at UNT is located at: [my.unt.edu](https://my.unt.edu). All official communication from the University will be delivered to your Eagle Connect account. For more information, please visit the website that explains Eagle Connect and how to forward e-mail: [eagleconnect.unt.edu/](https://eagleconnect.unt.edu/).
18. **ADA Statement:** UNT makes reasonable academic accommodations 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 at [disability.unt.edu](https://disability.unt.edu).
19. **Emergency Notification & Procedures:** UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Blackboard for contingency plans for covering course materials.

20. **Retention of Student Records:** Student records pertaining to this course are maintained in a secure location by the instructor of record. All records such as exams, answer sheets (with keys), and written papers submitted during the duration of the course are kept for at least one calendar year after course completion on Canvas. Course work completed via the online system, including grading information and comments, is also stored in a safe electronic environment for one year. Students have the right to view their individual records; however, information about students' records will not be divulged to other individuals without proper written consent. Students are encouraged to review the Public Information Policy and the Family Educational Rights and Privacy Act (FERPA) laws and the University's policy.
21. **Student Perceptions of Teaching Effectiveness (SPOT):** Student feedback is important and an essential part of participation in this course. The student evaluation of instruction is a requirement for all organized classes at UNT. The survey will be made available during the last weeks of the long semesters to provide students with an opportunity to evaluate how this course is taught. Students will receive an email from "UNT SPOT Course Evaluations via IASystem Notification" ([no-reply@iasystem.org](mailto:no-reply@iasystem.org)) with the survey link. Students should look for the email in their UNT email inbox. Simply click on the link and complete the survey. Once students complete the survey they will receive a confirmation email that the survey has been submitted. For additional information, please visit the spot website at [www.spot.unt.edu](http://www.spot.unt.edu) or email [spot@unt.edu](mailto:spot@unt.edu).

## **Academic Support & Student Services**

### **Mental Health**

UNT provides mental health resources to students to help ensure there are numerous outlets to turn to that wholeheartedly care for and are there for students in need, regardless of the nature of an issue or its severity. Listed below are several resources on campus that can support your academic success and mental well-being:

- [Student Health and Wellness Center](https://studentaffairs.unt.edu/student-health-and-wellness-center) (<https://studentaffairs.unt.edu/student-health-and-wellness-center>)
- [Counseling and Testing Services](https://studentaffairs.unt.edu/counseling-and-testing-services) (<https://studentaffairs.unt.edu/counseling-and-testing-services>)
- [UNT Care Team](https://studentaffairs.unt.edu/care) (<https://studentaffairs.unt.edu/care>)
- [UNT Psychiatric Services](https://studentaffairs.unt.edu/student-health-and-wellness-center/services/psychiatry) (<https://studentaffairs.unt.edu/student-health-and-wellness-center/services/psychiatry>)
- [Individual Counseling](https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling) (<https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling>)

### **Chosen Names**

A chosen name is a name that a person goes by that may or may not match their legal name. If you have a chosen name that is different from your legal name and would like that to be used in class, please let the instructor know. Below is a list of resources for updating your chosen name at UNT.

- [UNT Records](#)
- [UNT ID Card](#)
- [UNT Email Address](#)
- [Legal Name](#)

*\*UNT eulDs cannot be changed at this time. The collaborating offices are working on a process to make this option accessible to UNT community members.*

### *Pronouns*

Pronouns (she/her, they/them, he/him, etc.) are a public way for people to address you, much like your name, and can be shared with a name when making an introduction, both virtually and in-person. Just as we ask and don't assume someone's name, we should also ask and not assume someone's pronouns.

You can [add your pronouns to your Canvas account](#) so that they follow your name when posting to discussion boards, submitting assignments, etc.

Below is a list of additional resources regarding pronouns and their usage:

- [What are pronouns and why are they important?](#)
- [How do I use pronouns?](#)
- [How do I share my pronouns?](#)
- [How do I ask for another person's pronouns?](#)
- [How do I correct myself or others when the wrong pronoun is used?](#)

### **Additional Student Support Services**

- [Registrar](https://registrar.unt.edu/registration) (<https://registrar.unt.edu/registration>)
- [Financial Aid](https://financialaid.unt.edu/) (<https://financialaid.unt.edu/>)
- [Student Legal Services](https://studentaffairs.unt.edu/student-legal-services) (<https://studentaffairs.unt.edu/student-legal-services>)
- [Career Center](https://studentaffairs.unt.edu/career-center) (<https://studentaffairs.unt.edu/career-center>)
- [Multicultural Center](https://edo.unt.edu/multicultural-center) (<https://edo.unt.edu/multicultural-center>)
- [Counseling and Testing Services](https://studentaffairs.unt.edu/counseling-and-testing-services) (<https://studentaffairs.unt.edu/counseling-and-testing-services>)
- [Pride Alliance](https://edo.unt.edu/pridealliance) (<https://edo.unt.edu/pridealliance>)
- [UNT Food Pantry](https://deanofstudents.unt.edu/resources/food-pantry) (<https://deanofstudents.unt.edu/resources/food-pantry>)

### **Academic Support Services**

- [Academic Resource Center](https://clear.unt.edu/canvas/student-resources) (<https://clear.unt.edu/canvas/student-resources>)
- [Academic Success Center](https://success.unt.edu/asc) (<https://success.unt.edu/asc>)
- [UNT Libraries](https://library.unt.edu/) (<https://library.unt.edu/>)
- [Writing Lab](http://writingcenter.unt.edu/) (<http://writingcenter.unt.edu/>)