MEET 3750/ Digital Manufacturing

Instructor Contact

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Communication Expectations: The primary tool to be used for enabling communication between instructor and students is the email. The timeframe for responding emails is 2 days. The feedback for the assignments will be posted after two weeks of submission. CLEAR has a webpage for students that provides Online Communication Tips (https://clear.unt.edu/online-communication-tips).

Welcome to UNT!

As members of the UNT community, we have all made a commitment to be part of an institution that respects and values the identities of the students and employees with whom we interact. UNT does not tolerate identity-based discrimination, harassment, and retaliation. UNT's full Non-Discrimination Policy can be found in the UNT Policies section of the syllabus.

Course Description

This is an advanced course for undergraduate students in Engineering Technology, with the intention of applying the fundamental and technological knowledge of Digitalization and Additive Manufacturing. Basic knowledge of materials behavior and manufacturing processes is required. As a learning outcome, the student will develop the ability to design, configure and implement processes of Additive Manufacturing and 3D scanning.

Course Structure

The course will be delivered in a remote mode. The length of the semester is according to the UNT current policies. The materials of the course are distributed in 16 modules, and each module is equivalent to one week of learning.

Course Prerequisites or Other Restrictions

ENGR 1304 Engineering Graphics or consent of instructor.

Course Objectives

The goal of this course is to provide undergraduate Engineering Technology students fundamental and practical knowledge to:

1. Understand the adoption of non-traditional manufacturing technologies in the production of mechanical parts.
2. Appreciate the use of different technologies of Additive Manufacturing and 3D Digitizing for the development of engineering products.

3. Perform practical work with Digital Manufacturing technologies for product realization.
4. Develop technical abilities for the use of Additive Manufacturing and 3D Digitizing equipment for the fabrication of mechanical components.

Appropriate Program Outcomes

According to the Engineering Technology Accreditation Commission (ETAC) of ABET, an Engineering Technology program must demonstrate that graduates have:

1. an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, or technology to solve broadly-defined engineering problems;
2. an ability to design solutions for well-defined technical problems and assist with engineering design of systems, components, or processes appropriate to the discipline;
3. an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results;
4. an ability to function effectively as a member of a technical team;
5. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature.

Student learning outcomes

(ETAC of ABET Program Outcomes Addressed)

1. To know the basic principles of Additive Manufacturing (ABET 1).
   1.1. To know Fused Deposition Modeling (FDM) and associated technologies.
   1.2. To understand Selective Laser Sintering (SLS) and associated technologies.
   1.3. To know Light-curing, Stereolithography and associated technologies.
   1.4. To know other relevant processes for Additive Manufacturing.
2. To know and apply the principles of design for Additive Manufacturing (ABET 1 and 2).
   2.1. To develop knowledge and practical exercises to apply mechanical considerations for the re-design of plastics and metal components.
   2.2. To develop knowledge and practical exercises for validation and testing of prototypes manufactured by additive manufacturing.
   2.3. To develop knowledge and practical exercises of the economic considerations of the re-design of consumer goods and capital goods.
   2.4. To develop analysis of life cycle of products manufactured by Additive Manufacturing.
3. To know and apply 3D digitizing technologies (ABET 1 and 2).
   3.1. To develop knowledge and practical exercises with the basic principles of 3D digitizing of mechanical components.
   3.2. To develop practical exercises with computational tools associated with the 3D digitizing for pre-processing and post-processing of sculptured parts.
   3.3. To develop practical exercises of the digital manufacturing of complex components.
   3.4. To learn about new trends in the development of 3D digitizing technologies.
4. To understand and develop applications of additive manufacturing and 3D digitizing technologies (ABET 2 and 3).

4.1. To know and carry out practical exercises of biomedical applications: Tissue Engineering and implants development.
4.2. To generate knowledge and carry out practical exercises of aeronautical applications: development of free-form components.
4.3. To generate knowledge and carry out practical exercises of automotive applications: development of molds, dies and tooling.
4.4. To generate knowledge from the perspective of the impact of the Additive Manufacturing and 3D digitizing

Materials

Support Books:

1. Gibson, Ian, David W. Rosen, and Brent Stucker. Additive manufacturing technologies. Vol. 238. New York: Springer, 2010.
2. Gu, Dongdong. Laser additive manufacturing of high-performance materials. Springer, 2015.
3. Page, Tom. Design for Additive Manufacturing: Guidelines for Cost Effective Manufacturing. Lap Lambert Academic Publishing, 2011.

Recommended readings:

1. Journal academic articles from online databases. These can be accessed via the UNT Library subscription services and via Google Scholar.
2. Internet webpages from technology vendors. These will be defined by the instructor during the lectures.

Teaching Philosophy

Research-Based Learning (RBL) which allows the student to be incorporated into research based on scientific method.

1. Learning activities guided by the teacher:
2. Presentation of the theoretical framework that supports the key topics of the course: Additive Manufacturing Processes and 3D digitizing.
3. Exemplify the contents of the class with applications in industry.

Discussion for problem solving of course topics.

1. Practical sessions in workshop and laboratory to link theory and practice.
2. Independent learning activities:
3. Development of final project including all the subjects seen.
4. Solution of practical exercises for the understanding of each course topic.
5. Corroboration of the subjects seen in class with a report prior to practice in a workshop.

Course Technology & Skills

Minimum Technology Requirements

- Computer: Equipped with multimedia capabilities, Windows 10 or superior in the case of PC users or Safari 8 or superior system in the case of Mac users.

- Canvas Technical Requirements (https://clear.unt.edu/supported-technologies/canvas/requirements)

Technical Assistance

Part 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)
Email: 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)

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.

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

Course Requirements/Outline

1. Introduction to the basic principles of additive manufacturing.
   1.1. Fused Deposition Modeling (FDM) and associated technologies.
   1.2. Selective Laser Sintering and related technologies.
   1.3. Light-curing, Stereolithography and associated technologies.
   1.4. Other relevant processes for additive manufacturing.
2. Design for Additive Manufacturing.
   2.1. Mechanical considerations for the re-design of plastics and metal components.
   2.2. Validation and testing of prototypes manufactured by Additive Manufacturing.
   2.3. Economic considerations of the re-design of consumer goods and capital goods.
   2.4. Considerations for environmental sustainability of products manufactured by additive manufacturing life cycle.
3. 3D Digitizing technologies.
   3.1. Basic principles of 3D digitizing of mechanical components.
   3.2. Computational tools associated with the 3D digitizing.
   3.3. Direct Digital Manufacturing of complex components.
   3.4. New trends in the development of 3D digitizing technologies.
4. Applications of Additive Manufacturing and 3D digitizing technologies.
   4.1. Biomedical applications: Tissue Engineering and implants prototyping.
   4.2. Aeronautical applications: Development of components of free form shapes.
   4.3. Automotive applications: Development of molds, dies and tooling.
   4.4. Prospective impact of Additive Manufacturing and 3D digitizing.

Grading Elements and Weights

The evaluation of student learning has procedures and criteria that allow monitoring and evaluation of the results of the learning process. The procedures and the weighting of each of them are the following:

- 20% Midterm exam. It is a mid-term exam that evaluates the understanding and application of concepts seen in class during the first half of the academic semester.
- 20% Final exam. It is a final exam that evaluates the understanding and application of concepts seen in class during the second half of the academic semester.
- 30% Homework, quizzes, exercises and activities. Activities carried out throughout the semester to reinforce the understanding of the course.
- 30% Final project. The knowledge of the contents of the whole semester is evaluated in a comprehensive final project about the application of Digital Manufacturing in an industrial scenario.

  - A: 90-100% (Outstanding, excellent work. The student performs well above the minimum criteria.)
  - B: 80-89% (Good, impressive work. The student performs above the minimum criteria.)
  - C: 70-79% (Solid, college-level work. The student meets the criteria of the assignment.)
  - D: 60-69% (Below average work. The student fails to meet the minimum criteria.)
  - F: 59 and below (Sub-par work. The student fails to complete the assignment.)

Course Evaluation

Student Perceptions of Teaching (SPOT) is the student evaluation system for UNT and allows students the ability to confidentially provide constructive feedback to their instructor and department to improve the quality of student experiences in the course.

Course Policies

COVID-19 Impact on Attendance

While attendance is expected as outlined above, it is important for all of us to be mindful of the health and safety of everyone in our community, especially given concerns about COVID-19. Please contact me if you are unable to attend class because you are ill, or unable to attend class due to a related issue regarding COVID-19. It is important that you communicate with me prior to being absent so I may make a decision about accommodating your request to be excused from class.

If you are experiencing 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 Hotline at 844-366-5892 or COVID@unt.edu for guidance on actions to take due to symptoms, pending or positive test results, or potential exposure. While attendance is an important part of succeeding in this class, your own health, and those of others in the community, is more important.

Class Materials for Remote Instruction

The UNT Spring schedule requires this course to have **face-to-face instruction**. Additional 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 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.

Statement on Face Covering

Face coverings are required in all UNT facilities. Students are expected to wear face coverings during this class. If you are unable to wear a face covering due to a disability, please contact the Office of Disability Access to request an accommodation. UNT face covering requirements are subject to change due to community health guidelines. Any changes will be communicated via the instructor.

Late Work

All work turned in after the deadline will receive a grade of zero unless the student has a university-excused absence and provides documentation with 48 hours of the missed deadline.

Examination Policy

Students will be evaluated by a Middle Term Examination, by a Final Examination and by Quizzes. There is no any restriction to use open books or to use Internet browsers. However, since each evaluation is time constraint, and the problems/exercises will be displayed in a random manner, it is required to be focused on the tests and to use reading and analytical skills for answering all the questions and solving all the exercise in a timely manner.

Assignment Policy

The University is committed to providing a reliable online course system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time sensitive assessment activity, the instructor will extend the time windows and provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor and contact the UNT Student Help Desk: helpdesk@unt.edu or 940.565.2324 and obtain a ticket number. The instructor and the UNT Student Help Desk will work with the student to resolve any issues at the earliest possible time.

Instructor Responsibilities and Feedback

Grade Disputes

The student is required to wait 24 hours before contacting me to dispute a grade. Within that time, the instructor will review the assignment details and reflect on the quality of the work the student turned in.

Communication

Most general questions should go through the Q & A forum in the Discussion Board area. If the student has a private question, he/she can contact the instructor, who should be able to respond within 24 hours on weekdays (usually sooner).

Instructor Feedback on Assignments

The instructor should return feedback on all assignments within 1 week of the due date. If the instructor is unable to return feedback he will post an Announcement to let everyone know when it can be expected.

Attendance Policy

Since this course will be delivered partially remote, the attendance will be recorded with the Assignments. Visit the University of North Texas' Attendance Policy (http://policy.unt.edu/policy/15-2-) to learn more.

Syllabus Change Policy

This syllabus is subject to change at any time during the semester with changes to be announced in class.

UNT Policies

Academic Integrity Policy

Academic Integrity Standards and Consequences. 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. [Insert specific sanction or academic penalty for specific academic integrity violation.]

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/).

Prohibition of Discrimination, Harassment, and Retaliation (Policy 16.004)

The University of North Texas (UNT) prohibits discrimination and harassment because 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 in its application and admission processes; educational programs and activities; employment policies, procedures, and processes; and university facilities. The University takes active measures to prevent such conduct and investigates and takes remedial action when appropriate.

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 Canvas for contingency plans for covering course materials.

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. Course work completed via the Canvas 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 record; however, information about student's 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. See UNT Policy 10.10, Records Management and Retention for additional information.

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 classroom, labs, discussion groups, field trips, etc. Visit UNT's Code of Student Conduct (https://deanofstudents.unt.edu/conduct) to learn more.

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).

Student Evaluation Administration Dates

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 weeks 13, 14 and 15 [insert administration dates] 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) 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 (http://spot.unt.edu/) or email spot@unt.edu.

Sexual Assault Prevention

UNT is committed to providing a safe learning environment free of all forms of sexual misconduct, including sexual harassment sexual assault, domestic violence, dating violence, and stalking. Federal laws (Title IX and the Violence Against Women Act) and UNT policies prohibit discrimination on the basis of sex, and therefore prohibit sexual misconduct. If you or someone you know is experiencing sexual harassment, relationship violence, stalking, and/or sexual assault, there are campus resources available to provide support and assistance. UNT's Survivor Advocates can assist a student who has been impacted by violence by filing protective orders, completing crime victim's compensation applications, contacting professors for absences related to an assault, working with housing to facilitate a room change where appropriate, and connecting students to other resources available both on and off campus. The Survivor Advocates can be reached at SurvivorAdvocate@unt.edu or by calling the Dean of Students Office at 940-565- 2648. Additionally, alleged sexual misconduct can be non-confidentially reported to the Title IX Coordinator at oeo@unt.edu or at (940) 565 2759.

Important Notice for F-1 Students taking Distance Education Courses

Federal Regulation

To read detailed Immigration and Customs Enforcement regulations for F-1 students taking online courses, please go to the Electronic Code of Federal Regulations website (http://www.ecfr.gov/). The

specific portion concerning distance education courses is located at Title 8 CFR 214.2 Paragraph (f)(6)(i)(G).

The paragraph reads:

(G) For F-1 students enrolled in classes for credit or classroom hours, no more than the equivalent of one class or three credits per session, term, semester, trimester, or quarter may be counted toward the full course of study requirement if the class is taken on-line or through distance education and does not require the student's physical attendance for classes, examination or other purposes integral to completion of the class. An on-line or distance education course is a course that is offered principally through the use of television, audio, or computer transmission including open broadcast, closed circuit, cable, microwave, or satellite, audio conferencing, or computer conferencing. If the F-1 student's course of study is in a language study program, no on-line or distance education classes may be considered to count toward a student's full course of study requirement.

University of North Texas Compliance

To comply with immigration regulations, an F-1 visa holder within the United States may need to engage in an on-campus experiential component for this course. This component (which must be approved in advance by the instructor) can include activities such as taking an on-campus exam, participating in an on-campus lecture or lab activity, or other on-campus experience integral to the completion of this course.

If such an on-campus activity is required, it is the student's responsibility to do the following:

(1) Submit a written request to the instructor for an on-campus experiential component within one week of the start of the course.

(2) Ensure that the activity on campus takes place and the instructor documents it in writing with a notice sent to the International Student and Scholar Services Office. ISSS has a form available that you may use for this purpose.

Because the decision may have serious immigration consequences, if an F-1 student is unsure about his or her need to participate in an on-campus experiential component for this course, s/he should contact the UNT International Student and Scholar Services Office (telephone 940-565-2195 or email internationaladvising@unt.edu) to get clarification before the one-week deadline.

Student Verification

UNT takes measures to protect the integrity of educational credentials awarded to students enrolled in distance education courses by verifying student identity, protecting student privacy, and notifying students of any special meeting times/locations or additional charges associated with student identity verification in distance education courses.

See UNT Policy 07-002 Student Identity Verification, Privacy, and Notification and Distance Education Courses (https://policy.unt.edu/policy/07-002).

Use of Student Work

A student owns the copyright for all work (e.g. software, photographs, reports, presentations, and email postings) he or she creates within a class and the University is not entitled to use any student work without the student's permission unless all of the following criteria are met:

- The work is used only once.
- The work is not used in its entirety.
- Use of the work does not affect any potential profits from the work.
- The student is not identified.
- The work is identified as student work.

If the use of the work does not meet all of the above criteria, then the University office or department using the work must obtain the student's written permission.

Download the UNT System Permission, Waiver and Release Form

Transmission and Recording of Student Images in Electronically-Delivered Courses

1. No permission is needed from a student for his or her image or voice to be transmitted live via videoconference or streaming media, but all students should be informed when courses are to be conducted using either method of delivery.

2. In the event an instructor records student presentations, he or she must obtain permission from the student using a signed release in order to use the recording for future classes in accordance with the Use of Student-Created Work guidelines above.

3. Instructors who video-record their class lectures with the intention of re-using some or all of recordings for future class offerings must notify students on the course syllabus if students' images may appear on video. Instructors are also advised to provide accommodation for students who do not wish to appear in class recordings.

   Example: This course employs lecture capture technology to record class sessions. Students may occasionally appear on video. The lecture recordings will be available to you for study purposes and may also be reused in future course offerings.

No notification is needed if only audio and slide capture is used or if the video only records the instructor's image. However, the instructor is encouraged to let students know the recordings will be available to them for study purposes.

Class Recordings & Student Likenesses

Some synchronous (live) sessions in this course will be recorded for students enrolled in this class section to refer to throughout the semester. Class recordings are the intellectual property of the university or instructor and are reserved for use only by students in this class and only for educational purposes. Students may not post or otherwise share the recordings outside the class, or outside the Canvas Learning Management System, in any form. Failing to follow this restriction is a violation of the UNT Code of Student Conduct and could lead to disciplinary action.

Academic Support & Student Services

Student Support 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)
- Counseling and Testing Services (https://studentaffairs.unt.edu/counseling-and-testing-services)
- UNT Care Team (https://studentaffairs.unt.edu/care)
- UNT Psychiatric Services (https://studentaffairs.unt.edu/student-health-and-wellness-center/services/psychiatry)
- 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 euIDs 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)
- Financial Aid (https://financialaid.unt.edu/)
- Student Legal Services (https://studentaffairs.unt.edu/student-legal-services)
- Career Center (https://studentaffairs.unt.edu/career-center)
- Multicultural Center (https://edo.unt.edu/multicultural-center)
- Counseling and Testing Services (https://studentaffairs.unt.edu/counseling-and-testing-services)
- Pride Alliance (https://edo.unt.edu/pridealliance)
- UNT Food Pantry (https://deanofstudents.unt.edu/resources/food-pantry)

Academic Support Services

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