

# ST: AR/VR in Manufacturing

## INEN-5301

Spring 2026 Section 01 3 Credits 01/20/2026 to 05/14/2026 Modified 02/27/2026

### Meeting Times

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#### Lecture

Week #1 - #15

Tuesday, Thursday, 3:50 PM to 5:15 PM, LUCAS ENGINEERING 00114

### Contact Information

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#### Assistant Professor: Dr. Wenhao Yang

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Office: Cherry 1608

Phone: 409-880-1891

Website: <https://www.lamar.edu/engineering/industrial/faculty/yang/index.html>  
(<https://www.lamar.edu/engineering/industrial/faculty/yang/index.html>)

### Catalog Description

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An investigation into specialized study in advanced areas of engineering under guidance of a faculty member. This course may be repeated for credit when topics of investigation differ.

### Course Objectives

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- Know the basics of AR/VR techniques and the history, current status, and future trend of AR/VR techniques.
- Know the characteristics and working principles of AR/VR systems' 3D user interfaces and interactions.
- Know the primary research efforts about AR/VR in smart manufacturing and the future trends.
- Know the mainstream programming languages and 3D engines for creating AR/VR systems.
- Be able to program AR/VR applications based on the Unity 3D engine and a market-available head-mounted display (HMD).

- Be able to prepare 3D models and assets for AR/VR applications.
- Be able to design and implement interactive AR/VR systems in the context of smart manufacturing.

## Student Learning Outcomes

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Upon successful completion of this course, students will be able to:

1. Demonstrate an understanding of the foundational concepts, historical evolution, current advancements, and emerging trends in AR/VR technologies.
2. Describe the characteristics and operational principles of 3D user interfaces and interaction techniques in AR/VR systems.
3. Analyze and critique key research initiatives in AR/VR for smart manufacturing and identify future opportunities in this domain.
4. Utilize mainstream programming languages and 3D engines to develop AR/VR systems.
5. Develop functional AR/VR applications using the Unity 3D engine and commercially available head-mounted displays (HMDs).
6. Create and prepare 3D models and digital assets tailored for AR/VR applications.
7. Design and implement interactive AR/VR systems, particularly within the context of smart manufacturing environments.

## Grading and Assignments

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### Graded Assignments

Type	Weight	Topic	Notes
Homework	20%		
Paper Presentation Project	20%		

Type	Weight	Topic	Notes
Attendance	15%		<p>Attendance accounts for <b>15%</b> of your total grade. The policy is as follows:</p> <p><b>1. Excused Absences</b></p> <ul style="list-style-type: none"> <li>◦ If you notify me in advance and provide a valid reason, your absence will be marked as "excused."</li> <li>◦ One excused absence is equivalent to <b>0.3 unexcused absences</b>.</li> </ul> <p><b>2. Late Attendance</b></p> <ul style="list-style-type: none"> <li>◦ Arriving late to class will count as <b>0.5 unexcused absences</b>.</li> </ul> <p><b>3. Grading Criteria</b></p> <ul style="list-style-type: none"> <li>◦ If you have fewer than <b>3 unexcused absences</b>, you will receive full credit for attendance.</li> <li>◦ <b>3 unexcused absences</b>: Your grade will drop by one letter grade.</li> <li>◦ <b>4 unexcused absences</b>: Your grade will drop by two letter grades.</li> <li>◦ <b>5 or more unexcused absences</b>: You will receive an <b>F</b> for this course.</li> </ul>
Midterm coding projects	25%		
Final coding project	20%		

## Grading Scale

A	B	C	D	F
100-90	89-80	79-70	69-60	<59

## Course Subject Outline

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Topics:

- Introduction to AR/VR techniques
- Foundations of virtual perception in AR/VR
- AR/VR applications in smart manufacturing
- Research frontier of AR/VR in smart manufacturing
- User interfaces and interactions in AR/VR
- Development pipeline of AR/VR applications
- Programming on Unity 3D platform
- 3D modeling & animation in Blender

### Academic Honesty Policy

Lamar University (LU) expects all students to engage in academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in their academic experiences. Any student found responsible for academic dishonesty in any phase of their course work will be subject to disciplinary action.

The university and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating, plagiarism, collusion, and the abuse of resource materials.

All persons involved in academic dishonesty will be disciplined in accordance with university regulations and procedures. Discipline may include failure of the assignment and/or course, up to suspension or expulsion from the university.

Additional information is available on the Academic Policy website:

<https://www.lamar.edu/students/academic-policies.html>

#### Academic Integrity, Artificial Intelligence (AI), and Digital Tools

Lamar University grants instructors the freedom to set their own policies on the use of approved technology. Because these rules will differ for each course, instructors must provide clear written guidelines on what is permissible. Some faculty may restrict certain tools to ensure students meet learning objectives. Students should not assume that unclear or limited information means that it is permissible to use the technology. **It is the student's responsibility to review each course's policy and, if it is unclear or unavailable, ask the instructor in writing for clarification before using any such technology.**

*Special Note:* The university does not currently allow instructors to use AI detection software in academic contexts. More information here: <https://www.lamar.edu/lu-online/artificial-intelligence/ai-guidelines.html> (<https://www.lamar.edu/lu-online/artificial-intelligence/ai-guidelines.html>). However, be advised that AI misuse is still prohibited and may be evaluated by instructors or university officials through other methods. Should misuse be suspected, you may be asked to provide evidence of your work. See information on transparency following.

**The following policy will be enforced in this course:**

- **Principle:** Generative AI, advanced software, and other digital applications and tools can be powerful aids for learning; however, they must not substitute original thought, critical analysis, and intellectual labor. Unauthorized use of such tools constitutes a violation of academic integrity.

- **Permissibility:** The use of generative AI or other advanced digital tools (including, but not limited to, translation services, paraphrasing tools, and automated problem-solvers) on any assignment is permitted only with explicit, prior authorization from the instructor for that specific assignment.
- **Transparency:** If the use of a tool is permitted, students must be transparent about the extent and nature of its use. Students are required to disclose which tool(s) were used and how it contributed to the work, following the citation guidelines provided by the course instructor. If the instructor has not provided guidelines, request this information in writing. Always document your use of technologies thoroughly to stay prepared should any use be questioned.

### Approved Academic Support

If the use of specific technologies is restricted but support to improve work is needed, the Lamar University Writing Center, Student Tutoring and Retention Services (STARS) Office, and University Library are excellent resources. Students may also check with the instructor to determine whether it is acceptable to use basic assistance tools or the non-generative features of writing support applications.

### Policy Adherence and Consequences

Students must adhere to each instructor's specific course policies on academic integrity and technology. Infringement of this policy will be treated as academic dishonesty and may lead to consequences including, but not limited to, an academic penalty on the assignment, failure of the course, and/or referral to the university for disciplinary action.

## Course Drop Policy

Students may drop a course and receive a grade of "Q" during the penalty-free period of the semester or session. For drops after this penalty-free period, grades are recorded as "Q" or "F," indicating the student was passing or failing at the time of the drop. A grade of "Q" may not be assigned unless an official drop has been processed through the Records Office. Students may drop a course online up to the census day by logging into Self-Service Banner. After the census day, courses must be dropped through the Records Office. For additional help, contact the academic advisor or the Records Office at [registration@lamar.edu](mailto:registration@lamar.edu). **Students may not drop a course during the last 20 percent of the term.** Students should check the academic calendar at <https://www.lamar.edu/academic-calendar> (<https://www.lamar.edu/academic-calendar>) for specific dates.

## Students with Disability Policy

Lamar University is committed to providing equitable access to learning opportunities for all students. The Accessibility Resource Center (ARC) is located in the Communication building, room 105. Office staff collaborate with students who have disabilities to provide and/or arrange reasonable accommodations.

If you have, or think you may have, a disability (e.g. mental health, attentional, learning, chronic health, sensory, or physical), please contact the ARC at 409-880-8347 or [arc@lamar.edu](mailto:arc@lamar.edu) to arrange a confidential appointment with the Director of the ARC to explore possible options regarding equitable access and reasonable accommodations.

If you are registered with the ARC and have a current letter requesting reasonable accommodations, we encourage you to contact your instructor early in the semester to review how the accommodations will be applied in the course.

Additional information is available at the [ARC website \(http://www.lamar.edu/disability-resource-center/\)](http://www.lamar.edu/disability-resource-center/).

## Academic Support

Academic Support can be located at <https://www.lamar.edu/students/#acad-supp> (<https://www.lamar.edu/students/#acad-supp>).

There are many areas (i. e. Advising, Writing Center, etc.) of academic support. Each area provides their own specific contact information and days and hours of operation.

**Cardinal Course Materials** simplifies the student experience by reducing costs and providing access to required materials on or before the first day. Physical books are rented and digitally accessible through Blackboard for \$24 per credit hour, added to the student account. Students receive reminders to return rental books at the end of the term. Please click on this link to review [Cardinal Course Materials \(CCM\)](https://www.lamar.edu/students/paying-for-school/cardinal-course-materials-bookstore.html). (<https://www.lamar.edu/students/paying-for-school/cardinal-course-materials-bookstore.html>).

## Student Services

*Lamar University recognizes that students may experience challenges that hinder success in their academics and/or college experience. We believe in giving all students access to resources that allow them to overcome these challenges. If you are struggling with stress, procrastination, anger management, depression, anxiety, substance abuse and/or eating disorders, please reach out to our counseling professionals at the **Student Health Center at 880-8466 to call for an appointment or visit our website <https://www.lamar.edu/students/student-engagement/student-health-center/index.html>** (<https://www.lamar.edu/students/student-engagement/student-health-center/index.html>), for more information about our services.*

*Your information and situation will be treated with the utmost privacy and is protected by Texas law. These services are available to all currently enrolled students at Lamar University and Lamar Institute of Technology.*

*Information on Student Services can be located at <http://students.lamar.edu/index.html> (<http://students.lamar.edu/index.html>). There are many resources (i. e. Course schedules, important phone numbers, etc.) available. Each area provides their own specific contact information and days and hours of operation.*

## Academic Continuity Policy

In the event of an announced campus closure in excess of four days due to a hurricane or other disaster, students are expected to check Lamar University's website and login to LU Connect for instructions about continuing courses remotely.

# Emergency Procedures

Many types of emergencies can occur on campus; instructions for severe weather or violence/active shooter, fire, or chemical release can be found at the [Office of Environmental Health/Safety and Risk Management \(https://www.lamar.edu/about-lu/administration/risk-management/index.html\)](https://www.lamar.edu/about-lu/administration/risk-management/index.html) webpage.

## Severe Weather

Follow the directions of the instructor or emergency personnel.

Seek shelter in an interior room or hallway on the lowest floor, putting as many walls as possible between you and the outside.

If you are in a multi-story building and you cannot get to the ground floor, pick a hallway in the center of the building.

Stay in the center of the room, away from exterior walls, windows, and doors.

## Violence/Active Shooter

CALL - 7777 from a campus phone (Text 409-241-8002 from a cell phone). Note: Calling 911 from either a campus or cell phone will contact the City of Beaumont dispatch rather than the LU police.

AVOID - If possible, self-evacuate to a safe area outside the building. Follow directions of police officers.

DENY - Barricade the door with desks, chairs, bookcases or any other items. Move to a place inside the room where you are not visible. Turn off the lights and remain quiet. Remain there until told by police it is safe.

DEFEND - Use chairs, desks, cell phones or whatever is immediately available to distract and/or defend yourself and others from attack.

# Copyright Policy Statement

Copyright is defined as the ownership and control of the intellectual property in original works of authorship, which are subject to copyright law. As an institution of higher learning that values intellectual integrity, Lamar University prohibits the distribution of published materials (print or electronic) in violation of copyright law.

# LU Connect Portal

Students are asked to obtain a Lamar Electronic Account username and password so they can log onto the LU CONNECT website. Students may get information on how to get into the LU CONNECT website from the University's homepage (<http://www.lamar.edu> (<http://www.lamar.edu>)) by clicking on the LU CONNECT link on the left top corner of the screen. Follow the steps to secure your LU CONNECT username and password.

# LU Learn/Blackboard Learning Management System (LMS)

Students will utilize Lamar University's Learning Management System (LMS), Blackboard, for online courses.

For Blackboard technical support go to <https://blackboardsupport.lamar.edu> (<https://blackboardsupport.lamar.edu/>).

Phone: 866-585-1738

Phone and chat are available 24/7/365

Exams and quizzes taken within LULearn (Blackboard) may require online proctoring. For additional information about online proctoring, click [here \(https://www.lamar.edu/lu-online/technology-support/index.html\)](https://www.lamar.edu/lu-online/technology-support/index.html), and view details under proctoring services.

Lamar University uses Honorlock for virtual proctoring of exams, assignments, and assessments. Faculty have the option to require students to use one or two cameras during any assessment that is proctored. In the case of two required cameras, you will need:

Your regular front-facing webcam (required for one camera configuration)A secondary side-angle camera (such as a smartphone or additional webcam; check setup instructions before purchasing) that clearly shows your hands, keyboard, and workspace. When required, students are responsible for obtaining a compatible device as part of their course materials. Your Instructor of Record may choose whether to use proctoring for specific assessments and whether they use a one or two camera configuration but must clearly communicate how many cameras are needed and when Honorlock will be required in their syllabi. If you are required to have two cameras for this course, please review the setup instructions before your first proctored assessment:

<https://honorlock.kb.help/setting-up-a-side-angle-camera/> (<https://honorlock.kb.help/setting-up-a-side-angle-camera/>). Students who do not have both cameras set up may be unable to complete required proctored work, which can affect their grade. Plan ahead to ensure you have the necessary equipment and a working setup.

## Network Use

### ACCEPTABLE USE

Students must respect the integrity and security of Lamar University computer systems and network, and the privacy and preferences of other users. Responsibility for learning about and complying with Lamar University Acceptable Use Policy ultimately rests with the individual. The network may be used to download, copy, or store any software, shareware, digital media files or freeware, as long as the use complies with copyright law licensing agreements, and campus policies, such as storage space limitations and network bandwidth restrictions. The network may not be used for any activity, or to transmit any material, that violates United States or local laws.

### UNACCEPTABLE USE

The network may not be used for commercial purposes. Advertising and sponsorships on Lamar University websites is restricted. In addition, students may not permit other persons to use their usernames, passwords, accounts or disk space, or disclose their usernames, passwords or account

information to any third party. Students may not log on to someone else's account, internet address, or other network codes, or attempt to access another user's files. Students may not create false or dummy accounts to impersonate someone else. Students may not try to gain unauthorized access ("hacking") to the files or computer systems of any other person or organization. Students may not impersonate another person by forging e-mail, web pages or other electronic media. Students who maliciously access, alter, delete, damage or destroy any computer system, computer network, computer program, or data will be subject to disciplinary action by Lamar University, and criminal prosecution as well. Students may not disrupt or attempt to disrupt network traffic, and they may not attempt to monitor or capture network traffic in any way. Finally, students may not intentionally create, store, display, print or transmit information that violates the university's Sexual Harassment Policy.

## Student Conduct & Professionalism

Students are required to maintain professional conduct and mutual respect in all course formats (in-person, online, hybrid). All digital and face-to-face interactions must be courteous and professional. Use of university network resources must comply with the requirements of the syllabus section entitled, "Network Use."

This policy supplements the Lamar University Code of Student Conduct and applies to all course-related activities and communications.

By enrolling in this course, you agree that you will adhere to the following:

Respectful Interactions: Use professional and courteous language in all interactions, including emails, discussion boards, collaborative activities, and classroom participation. Treat all participants with dignity and respect, recognizing the right of each person to express differing viewpoints while maintaining civil discourse.

- **Professional Communication:** Use proper grammar and academic language in all communications. Avoid typing in all caps, alternating caps, or use of other non-traditional writing (e.g., excessive or disparaging emoji or gif use) to prevent misinterpretation of tone. Clearly identify yourself with your enrolled name in all course communications and contributions.
- **Constructive Participation:** Be prepared for class by completing any required pre-reading or work. Contribute thoughtfully and constructively to discussions and activities to enhance the learning experience. Dialogue should further academic discourse. Avoid disruptive behaviors.
- **Responsible Technology:** Use only LU Email, Blackboard, or other LU-approved communication methods for course communication, checking messages daily. Use technology appropriately to support learning.
- **Privacy & Confidentiality:** Respect the privacy of peers and instructors, including refraining from unauthorized recording, distribution of course materials, or sharing confidential discussions outside of the course environment. Course content, discussions, and materials are intended solely for enrolled students and may not be shared with external parties without explicit instructor permission.
- **Conflict Resolution:** First seek resolution directly with the instructor of record through respectful and professional dialogue. If direct resolution is not possible, you may follow the academic chain

of command. If you have questions about this chain of command, please contact the Dean of Students' office or (409) 880-7759 or by email at Student Conduct and Care Services.

- **Academic Integrity & Accessibility:** See the "Academic Honesty" and "Students with Disability Policy" sections of this syllabus.

Consequences: Violations of these standards may result in disciplinary action, ranging from an initial warning to removal from the course and/or referral to university disciplinary procedures, depending on the severity of the offense. For complete details, consult the [Lamar University Student Code of Conduct \(https://www.lamar.edu/students/student-affairs/about/code-of-conduct.html\)](https://www.lamar.edu/students/student-affairs/about/code-of-conduct.html).

## Technical Support

Technical Support can be located at <http://students.lamar.edu/it-services-and-support/index.html> (<http://students.lamar.edu/it-services-and-support/index.html>).

Phone: 409-880-2222

Email: [servicedesk@lamar.edu](mailto:servicedesk@lamar.edu)

### Hours of Operation (CST):

Monday - Thursday 7:30 a.m.-12:00 a.m.

Friday 7:30 a.m. - 7:30 p.m.

Saturday 9:00 a.m. - 6:00 p.m.

Sunday 3:00 p.m. - 12:00 a.m.

## Attendance Verification

Students must complete an Attendance Verification Quiz for ALL COURSES - both on-campus and online - in which they are enrolled each term by the third class day to comply with U.S. Department of Education attendance requirements. Failure to complete this quiz by the deadline may result in loss of course enrollment and/or financial aid. The quiz is located in EVERY COURSE through LULearn (Blackboard), even if the course meets on campus.

## Privacy Policies

Student data within Blackboard may be collected by third-party products that have been carefully reviewed for compliance to privacy and other standards and approved by Lamar University. Only products meeting our standards for data privacy, security, and educational value are approved. It's important to us that your data is protected, but please note that your data may be tracked or stored by these products as related to their use. [Privacy Policies for third-party products \(https://www.lamar.edu/lu-online/technology-support/privacy-policies.html\)](https://www.lamar.edu/lu-online/technology-support/privacy-policies.html)