3D Modeling and Computer Graph
CPSC-4380
Spring 2021  Section 48F  3 Credits  03/16/2021 to 05/07/2021  Modified 03/16/2021

Meeting Times

This is an online course. There are no specific meeting times.

Contact Information

LU email: troden@lamar.edu
Office: Parker 203
Phone: 409-880-2179

Catalog Description

This introductory course in three-dimensional (3D) modeling covers techniques for creating content designed for use in real-time computer graphics applications using appropriate software with particular emphasis on computer games. Topics include mathematical foundations, 3D file formats, creation and modification of 3D geometric shapes, surface texturing, lighting, rendering and a survey of current software tools and techniques.

Outcomes

Students who successfully complete this course will be able to:

- Apply mathematical foundations, knowledge of current tools and specific modeling techniques to problems involving real-time computer graphics.
- Create 3D models for real-time computer graphics applications.
- Combine 2D textures with 3D models.
- Produce renders of 3D models using appropriate lighting and camera control.
- Construct textured 3D models using techniques for rigid-body animation.
- Construct textured 3D models using techniques for non-rigid-body animation.

Course Materials

Required Text: None

Required Electronic Course Materials: Lightwave 2015 (see Software Used in this Class, above)

Recommended: None

Optional Material: None

Evaluation

GRADING POLICY AND EVALUATION
Grading Scale: (based on maximum 800 points)

<table>
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<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
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<tbody>
<tr>
<td>800-720</td>
<td>719-640</td>
<td>639-560</td>
<td>559-480</td>
<td>479 - below</td>
</tr>
</tbody>
</table>

GRADING OF ASSIGNMENTS

8 Assignments  800 points (100 points each)
TOTAL POINTS  800

LATE WORK

Late homework assignments will receive a 20% grade reduction (regardless of how late) and may not be turned in after 3 calendar days late.

Institutional Policies

Academic Honesty Policy

Lamar University 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 both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic 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 on an examination or other academic work which is to be submitted, 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. The penalty may vary by instructor.

Additional information is available on the Academic Policy website (https://students.lamar.edu/academic-support/academic-policies.html).

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. 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 for specific dates.

Students with Disability Policy

Lamar University is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center (DRC) 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 DRC at 409-880-8347 or drc@lamar.edu to arrange a confidential appointment with the Director of the DRC to explore possible options regarding equitable access and reasonable accommodations.

If you are registered with the DRC 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 DRC website (http://www.lamar.edu/disability-resource-center/).

Academic Support

Academic Support can be located at 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.

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 for more information about our services.

Students who face challenges securing food or housing, tuition and/or books and believes this may affect their performance in the course is urged to contact the LU Strong program. The program is located in the Setzer Student Center, Room 230 at 409-880-8458 or at lustrong@lamar.edu. Furthermore, please notify your professor if you are comfortable in doing so. This will enable them to provide any additional resources they may possess.

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. 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 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) 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) 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 the Lamar University’s Learning Management System (LMS), Blackboard, for online courses.

For Blackboard technical support go to 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. Lamar University uses Proctorio for online proctoring. For additional information about online proctoring click here (https://www.lamar.edu/lu-online/student-support-services-quick-links/index.html#proctoring-services) and view details under proctoring services.

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.

Netiquette (Online Etiquette) Statement

Please adhere to the same standards of behavior and professional respect online that you would follow in face-to-face communication with others, but most particularly when writing email and when taking part in collaborative and discussion board activities. Lamar provides access to network resources, including the Internet, in order to support learning and to prepare
students for the 21st century world. Students, however, are expected to adhere to the *Lamar University Acceptable Use Policies when Using Networks*. More comprehensive student code of conduct can be found at [https://students.lamar.edu/academic-support/code-of-conduct.html](https://students.lamar.edu/academic-support/code-of-conduct.html).

**GENERAL GUIDELINES TO RESPECT ALL PARTICIPANTS**

- Respect the right of each person to disagree with others.
- Treat people the same as you would face-to-face.
- Respect the time of others.

**GUIDELINES WHEN COMMUNICATING WITH OTHERS (EMAIL, DISCUSSIONS, BLOGGING, AND ETC.)**

- Always sign your name to any contribution you choose to make.
- Be constructive in your responses to others in the class.
- Do not use all caps (Doing so may be interpreted as shouting).
- Re-read your postings before sending them.
- Always think before you write.
- Respond respectfully.
- Use appropriate grammar and structure.
- Spell-check your postings.
- Use short paragraphs focused on one idea.
- Use appropriate business language at all times.

**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  

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.

**COVID-19 Requirements**

The Lamar community is beginning this semester during a health crisis, which is unprecedented for a university and which has erupted on a massive scale. President Evans has outlined and required the following personal mitigation steps.

- Adhering to social distancing protocols (6 feet)  
- Following enhanced personal hygiene practices, including regular handwashing and/or use of hand sanitizing products when soap and water are not readily available  
- Self-screening for any signs or symptoms of COVID-19 before coming to campus (or leaving dorm room if a campus resident) and seeking medical care if feeling ill  
- Wearing masks or other face coverings inside all buildings at all times except when alone in an office or dorm room

Students taking this class are required to wear masks or face coverings in the classroom at all times. Faculty and students share the same goals during this health crisis; we want success in this course, and we want the campus to remain open. Members of the Lamar community share significant and unrelenting responsibilities. As members of the larger world community, we have not only the opportunity but the duty to develop and to exhibit a sense of social responsibility. Masks protect those people around...
you, and everyone has to wear a mask for this measure to benefit all of us. During this Coronavirus pandemic, wearing a mask is a sign of mutual respect. The journal *Proceedings of the National Academy of Sciences* suggests that “among all strategies for reducing transmission, wearing face masks may be the central variable that determines the spread of the virus.”

We are responsible for each other. Each of us has to protect the Lamar family and to remember that we have especially vulnerable populations among us; for example, some students have chronic illnesses or disabilities, some students have children, some students are older, and some faculty are older. Our individual choices are of the utmost importance. The university has confidence that all students will recognize their part in maintaining a safe environment for the campus community and that students will make the best choices while on and off-campus. In large part, your behavior will determine if the campus remains open for the entire semester. Also, an outbreak on the campus would affect not only our campus but the regional communities. Universities have an ethical responsibility to lead and to model good behavior. You, the students, are the heart of the university. Everyone has to participate because an outbreak becomes everyone’s problem.

Students who exhibit any of the symptoms of COVID-19 have a civic responsibility not to expose others to the virus. If a student has symptoms like a fever or a cough, the student should seek medical help and not attend class. As President Evans has stated, “In the spirit of caring for one another and ensuring the health of each other, it is important that we accept a role of responsibility.”

Any student who has a medical condition or a disability that would prohibit the student from wearing a mask should provide documentation to the Lamar Disabilities Resource Center.

### Course Subject Outline

<table>
<thead>
<tr>
<th>Module</th>
<th>Week</th>
<th>Description</th>
<th>Topics</th>
<th>Assignments (due)</th>
<th>Book chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Introduction</td>
<td>Mathematical foundations, current tools, real-time vs. non-real-time graphics, stylistic vs. realistic methods, animation, bounding volumes, procedural methods</td>
<td>Homework 1 (Sun. Mar. 21)</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>Basic Modeling</td>
<td>Lightwave interface, primitive shapes, selection, shape modification</td>
<td>Homework 2 (Sun. Mar. 28)</td>
<td>15-16,18</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Basic Rendering</td>
<td>Lighting, camera control</td>
<td>Homework 4 (Sun. Apr. 11)</td>
<td>33</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>Advanced Rendering</td>
<td>Multiple lights, high resolution models, video rendering</td>
<td>Homework 5 (Sun. Apr. 18)</td>
<td>1-5</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>Advanced Texturing</td>
<td>Alpha-blending, billboards</td>
<td>Homework 6 (Sun. Apr. 25)</td>
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<tr>
<td>7</td>
<td>7</td>
<td>Advanced Modeling</td>
<td>Hierarchical models, rigid-body animation</td>
<td>Homework 7 (Sun. May 2)</td>
<td>23</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>Non-Rigid Body Animation</td>
<td>Characters, morph targets, skinned bones, non-rigid-body animation</td>
<td>Homework 8 (Sun. May 9)</td>
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The book chapters refer to the Lightwave 2015 documentation that comes with Lightwave.

Additional Items