Contacting Your Instructor(s)
Instructor: Dr. Bo Li
Office: Science Building, Room 105D
Office hours: 2:00-5:30 PM M&T, 9:00-12:00 AM M, or by appointment
Email: bo.li@usm.edu
Phone: 228-214-3306

Course coordinator: Mr. Tom Rishel
Email: Tom.rishel@usm.edu

Course Description
3 hrs. Architecture of display systems, basic 2-D and 3-D mathematics, 3-D viewing and geometry, advanced surface mathematics, advanced architectures for raster and vector displays, hidden line and hidden surface problems, realistic imaging, software design for 3-D systems.

Course Objectives
- To give practical knowledge of the fundamentals of the graphics pipeline
- To learn the state-of-the-art graphics techniques
- To improve your programming skills
- To refresh your math knowledge
- To focus on
  - Modeling
  - Rendering

Course Materials

Course Workload Statement
Students are expected to invest considerable time outside of class in learning the material for this course. The expectation of the University of Southern Mississippi is that each week students should spend approximately 2-3 hours outside of class for every hour in class working on reading, assignments, studying, and other work for the course. We realize that most students work and have family or other obligations. Time management is thus critical for student success. All students should assess their personal circumstances
and talk with their advisors about the appropriate number of credit hours to take each term. Resources for academic support can be found at [https://www.usm.edu/success](https://www.usm.edu/success).

**Grading Policies and Calculation**

A list of possible grades at the University can be found in the Bulletin ([http://catalog.usm.edu](http://catalog.usm.edu)). Note that students will receive an “interim grade” at the six-week point to give them an indication of their performance at that point in the semester.

Students may drop a course with no penalty in the first week of the semester. If students wish to leave a course with a grade of “W” (for “withdrawal”), they may request to do so before April 5, 2017 (specific dates can be found here: [https://www.usm.edu/registrar/calendars](https://www.usm.edu/registrar/calendars)).

Important note: Students who receive a grade of W do not receive any money back and that grade is permanently included on their transcripts.

Students should be aware that “Incompletes” can only be assigned in cases of “extraordinary circumstances” beyond the student’s control.

<table>
<thead>
<tr>
<th>Items</th>
<th>Percentage</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Attendance &amp; Performance</td>
<td>5% extra credits total</td>
<td>Every class</td>
</tr>
<tr>
<td>Homework</td>
<td>20%</td>
<td>Four times</td>
</tr>
<tr>
<td>Programming Assignments</td>
<td>20%</td>
<td>Two assignments</td>
</tr>
<tr>
<td>Course Project</td>
<td>20%</td>
<td>One project</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Due: April 30, 2017</td>
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<tr>
<td>Final Exam</td>
<td>40%</td>
<td>May 2, 2017</td>
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**Grade**                  **Percentage**
A grade                        >= 90%
B grade                       80%-89%
C grade                       70%-79%
D grade                       60-69%
F grade                       < 60%

**Academic Integrity Statement**

All students at the University of Southern Mississippi are expected to demonstrate the highest levels of academic integrity in all that they do. Forms of academic dishonesty include (but are not limited to):

- Cheating (including copying from others’ work)
- Plagiarism (representing another person’s words or ideas as your own; failure to properly cite the source of your information, argument, or concepts)
- Falsification of documents
- Disclosure of test or other assignment content to another student
- Submission of the same paper or other assignment to more than one class without the explicit approval of all faculty members’ involved
• Unauthorized academic collaboration with others
• Conspiracy to engage in academic misconduct

Engaging in any of these behaviors or supporting others who do so will result in academic penalties and/or other sanctions. If a faculty member determines that a student has violated our Academic Integrity Policy, sanctions ranging from resubmission of work to course failure may occur, including the possibility of receiving a grade of “XF” for the course, which will be on the student’s transcript with the notation “Failure due to academic misconduct.” For more details, please see the University’s Academic Integrity Policy: https://www.usm.edu/institutional-policies/policy-acaf-pro-012

Note that repeated acts of academic misconduct will lead to expulsion from the University.

Academic Support Resources
Please see our Student Success Website: http://www.usm.edu/success for information on where you can find tutoring and other academic assistance, as well as the location of key resources on campus.

If a student has a disability that qualifies under the Americans with Disabilities Act (ADA) and requires accommodations, he/she should contact the Office for Disability Accommodations (ODA) for information on appropriate policies and procedures. Disabilities covered by ADA may include learning, psychiatric, physical disabilities, or chronic health disorders. Students can contact ODA if they are not certain whether a medical condition/disability qualifies.

Address:
The University of Southern Mississippi
Office for Disability Accommodations
118 College Drive # 8586
Hattiesburg, MS 39406-0001
Gulf Coast: 228-214-3232
Voice Telephone: 601.266.5024 or 228.214.3232 Fax: 601.266.6035
Individuals with hearing impairments can contact ODA using the Mississippi Relay Service at 1.800.582.2233 (TTY) or email ODA at oda@usm.edu.

Important Class Policies

Class Attendance
Attendance will be taken every class period. Students who are excessively absent (30% of all the lectures, not including exams) and/or tardy will be assigned a grade of NA (Not Attending) according to the University’s Class Attendance Policy. Coming to class unduly late and leaving class unduly early is treated the same as being absent.

Plagiarism
Plagiarism or cheating of any type will not be tolerated. This includes, but is not limited to, copying programs, projects, assignments, abstracts, documentation, wandering

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eyes/copying on tests, turning in previously submitted term papers or projects (in whole
or part), using other person's USM computer accounts to do projects, programs, etc.,
getting other people to do your assignments, etc. Copying from the internet of any type is
not allowed.

**Missing Exams**

If you should miss an exam, you must let me know why you will be missing the exam
before the exam is administered to the class (at least a couple of days before). You may
send me an e-mail, or come by my office to explain why you will be missing the exam. If
the excuse is reasonable, (I am the sole judge of reasonability) I will allow you to retake
the exam. Please be aware that I am not responsible for lost e-mail. It is your
responsibility to make sure that I know you are missing the exam.

**Once I agree upon your excuse, please furnish me with a confirmation of your reason(s) for missing the exam.** This confirmation must be in my hands by a maximum
of 5 days after the exam is administered.

**Tardiness for Tests**

It is your responsibility to make it to class on time for all scheduled examinations. If you
are late for an examination, you will be allowed only the remainder of the scheduled
period to complete the examination.

**Cell Phones/Beepers/Pagers/etc.**

Please make sure you switch off all cell phones/beepers/pagers while you are in class. I
may ask you to leave the class under such circumstances.

**Turning In Work**

Assignments not turned on time will not receive full credit. All homework, programming
assignments as well as course project will be submitted via Blackboard, due on 11:59
PM of the submission day.

**Test Regrading Policy**

I will be glad to review any test for possible grading errors. Any requests for regrading of
tests must be made within one calendar week upon the return of the test to the class,
regardless of when you received your test back. If you submit your test for regrading, I
reserve the right to regrade your entire test.

**More Than Two Finals on the Same Day**

If you have two or more final examinations scheduled for the same day and you wish to
reschedule my examination, please inform me.

**E-mail Addresses**

I may contact you during the whole semester and will use the email address provided on
SOAR.
Mental Well-Being Statement
USM recognizes that students sometimes experience challenges that make learning difficult. If you find that life stressors such as anxiety, depression, relationship problems, difficulty concentrating, alcohol/drug problems, or other stressful experiences are interfering with your academic or personal success, consider contacting Student Counseling Services on campus at 601-266-4829. More information is also available at https://www.usm.edu/student-counseling-services. All students are eligible for free, confidential individual or group counseling services. In the event of emergency, please call 911 or contact the counselor on call at 601-606-HELP (4357).

Class Schedule

Tentative syllabus
Intro (2 weeks)
- Course overview & Introduction to CG
- Math review (H&B Appendix)

Modeling (6 weeks)
- OpenGL programming basics (Redbook Ch1, H&B Ch. 3-5)
- Geometric transformation (H&B Ch. 7-9)
- 3D viewing (H&B Ch. 10)
- 3D object representation (H&B Ch. 13-15)
- Visibility algorithms (H&B Ch. 16)
- Digital geometry processing *

Rendering (5 weeks)
- Scene graphs *
- GPU rendering & ray tracing *
- Basic shading & texturing (H&B Ch. 17-18)
- Global illumination (H&B Ch. 21)

Final exam review (1 week)

Note: * denotes the advanced topic (based on research papers)

Tentative time schedule

<table>
<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>January 17</td>
<td>Course overview &amp; Introduction to CG</td>
<td>Reading: H&amp;B Ch. 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Math review</td>
<td>Reading: H&amp;B Appendix</td>
</tr>
<tr>
<td>2</td>
<td>January 24</td>
<td>Math review</td>
<td>Reading: H&amp;B Appendix</td>
</tr>
<tr>
<td></td>
<td>Date</td>
<td>Topic</td>
<td>Reading</td>
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| 3 | January 31 | OpenGL programming basics                           | **Reading:** Redbook Ch. 1  
|   |            |                                                    | H&B Ch. 3-5      |
| 4 | February 7 | OpenGL programming basics (Cont.)                   | **Reading:** Redbook Ch. 1  
|   |            |                                                    | H&B Ch. 3-5      |
| 5 | February 14| Geometric transformation                            | **Reading:** H&B Ch. 7-9 |
| 6 | February 21| 3D viewing                                          | **Reading:** H&B Ch. 10 |
| 7 | February 28| 3D object representation                           | **Reading:** H&B Ch. 13-15 |
| 8 | March 7    | Visibility algorithms                               | **Reading:** H&B Ch. 16 |
|   |            | Digital geometry processing *                       |                  |
| 9 | March 14   | Spring Break                                        | No class         |
| 10| March 21   | Scene graphs*                                       |                  |
| 11| March 28   | GPU rendering & ray tracing*                        |                  |
| 12| April 4    | GPU rendering & ray tracing*                        | **Reading:** H&B Ch. 17-18 |
|   |            | Basic shading & texturing                           |                  |
| 13| April 11   | Basic shading & texturing                           | **Reading:** H&B Ch. 17-18 |
|   |            | Global illumination                                 | **Reading:** H&B Ch. 21 |
| 14| April 18   | Global illumination                                 | **Reading:** H&B Ch. 21 |
| 15| April 25   | Final Review                                        |                  |
| 16| May 2      | Final Exam                                          | **Exam Time:** 06:30 PM-09:15 PM |