

[Send To Printer](#) | [Close Window](#)

Syllabus



Western Science

Department of Computer Science

Computer Graphics 1 (CS3388B) Course Outline

1. Course Information

Course Information

The viewing pipeline; clipping and visibility problems. The graphical kernel system; picture generation and user interfaces.

This course uses OpenGL as the graphics environment. The programming language to interface with it should be C/C++ or Python. But, C/C++ will be the language of choice for examples.

1. Introduction

- A review of linear algebra
- Raster Displays, Pixels
- Overview of graphics libraries and paradigms
- Window Systems

2. “2D” Graphics

- Drawing Basic Shapes and Pictures
- Plots
- Viewports and Clipping
- Lerp and Tweens
- Curves and Splines

3. 3D Graphics

- 3D transforms

- Projective Geometry
 - Model View Projection
 - Polygon Meshes
 - Rendering Pipeline
4. Emerging Technologies (Subject to Change)
- Shading Models
 - Programmable Rendering Pipeline
 - Physical-Based Rendering
 - Ray Tracing
 - Vulcan
 - Neural Radiance Fields (NERFs).
 - Graphics for VR, AR, XR 101

List of Prerequisites

Prerequisites: Computer Science 2211A/B or (Software Engineering 2203A/B, Software Engineering 2205A/B and Software Engineering 2250A/B); and one of Mathematics 1600A/B, Numerical and Mathematical Methods 1411A/B or the former Applied Mathematics 1411A/B.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor Information

Full name, title and appropriate contact information of the instructor and, if the course is taught by more than one instructor, the name of the person responsible for the course (course coordinator).

Instructors	Email	Office	Office Hours
Dr. Brent Davis	Bdavis56@uwo.ca	MC28C	By appointment; scheduled extra near assessments

Students must use their Western (@uwo.ca) email addresses when contacting their instructors. For course content and assignment help, students should first contact their TA.

Teaching Assistants this year are Rishabh Agrawal ragrawa9@uwo.ca and Mohammad Farzan Heidari mheidar5@uwo.ca. Students will be assigned a TA based on an alphabetical ordering. Office hours will be announced in the first or second week of class.

3. Course Syllabus, Schedule, Delivery Mode

Tuesdays, 15:30 - 17:30, SSC 2050

Thursdays, 16:30 - 17:30, SSC 2050

Classes begin: January 8, 2024

Fall Reading Week: February 17 – 25, 2024

Classes end: April 8, 2024

Exam period: April 11 – 30, 2024

Contingency plan

Although the intent is for this course to be delivered in person, should any university-declared emergency require some or all of the course to be delivered online, either synchronously or asynchronously, the course will adapt accordingly. The grading scheme will **not** change. Any assessments affected will be conducted online as determined by the course instructor.

4. Course Materials

All course materials will be posted to OWL: <http://owl.uwo.ca>. This includes course notes and

supplementary materials. Students are responsible for checking OWL on a regular basis for news, announcements, and forum posts. This is the primary method by which information will be disseminated to all students in the class. If students need assistance, they can seek support on the [OWL Help page](#). Alternatively, they can contact the Western Technology Services Helpdesk at 519-661-3800.

There is no required textbook for this course. However, suggested readings will be given from *Computer Graphics using OpenGL*, 3rd Edition, 2007, by F.S. Hill, Jr. and Stephen M. Kelley; and *Computer Graphics: Principles and Practice*, 3rd Edition, 2014, by John F. Hughes et al

Technical Requirements

Students will require a stable internet connection to access course content. A computer which is capable of running the programs in class will be required; modern laptops will have no issues. Students believing their hardware to be insufficient should with the instructor in the first week of class.

5. Methods of Evaluation

Assignments		62%
1	January 19	4%
2	February 2	8%
3		
4	February 16	10%
5	March 8	10%
6	March 22	15%
	April 8	15%
Problem Sets	Ongoing	8%
Quizzes	February 8	15%
	April 4	15%

Assignments

- Assignments are to be submitted electronically to OWL. See the OWL website.
- Assignments are due at 23:55 on the due date. Late assignments will be handled as follows.

15% per day, up to a maximum of 45%, after which the assignment will be given a zero. Weekends count as one day of time. Content submitted near to, but over the deadline, will be penalized 5%, here defined as 1 seconds

- Under extenuating circumstances, students may not be able to complete an assignment on time. In such cases, students should contact the academic counselling of their home faculty. Accommodation typically will be a waiver of the late penalties. That is, students must still submit the assignment within 72 hours of the original due date, but will not receive late penalties.
- Plagiarism is unacceptable. It is reasonable to assume that students discuss assignments and possible solutions, however all assignments shall be independent. Similarity of code generated by generative techniques **will** be pursued as plagiarism; code should be written in the student's style such that it is distinct from any reference materials.
- Any concerns with assignment marking must be addressed *within one week* of the assessment being returned. No adjustments will be made after this time.

Problem Sets

- There are 10 problem sets to be given throughout the semester. They are basically “knowledge checks”. They should not be difficult or take too much time. They are good preparation for the quizzes! In addition, they will be assessed on a pass/fail basis. Problem sets which would get a mark of more than 60% will be given a mark of ‘1’ and below will be given a mark of ‘0’, for a total possible of 8 marks.
- Students should submit their solutions to the problem sets electronically to OWL in their dropbox.
- Problem sets are due on the Friday (at 23:55) of the week in which they are given.
- Late submission of problem sets *will not be accepted*.
- The 8 best problem sets will be used to calculate the Problem Set portion of the student’s final mark. Thus, a student may miss 2 problem sets throughout the semester without penalty. No communication with the instructor is required for the first two missed problem sets. If more than two are missed, please communicate with the professor to determine an accommodation.

Quizzes

- The quizzes will occur **in-class** during the Thursday lecture.
- Quizzes are closed book. Any required information, numerical constants, formulas, etc.

will be provided to you.

- No electronic devices other than a simple scientific calculator may be used.
- If you miss a quiz, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. If your academic consideration is approved, the weight of the quiz will be moved to the other quiz. There are no makeups.
- Missing both quizzes will be handled on a case by case basis.

Student Absences

Assessments worth 10% or more of the overall course grade:

For work totalling 10% or more of the final course grade, you must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible. For further information, please consult the University’s medical illness policy at

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration.pdf

The Student Medical Certificate is available at

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

6. Accommodation and Accessibility

Physical Health

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. All documentation required for absences must be submitted to the Academic Counselling office of a student's Home Faculty

For the policy on Accommodation for Medical Illness - Undergraduate Students, see: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf and for the Student Medical Certificate (SMC), see: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

[/www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf) and for the Student Medical Certificate (SMC), see: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

Mental Health

Mental and emotional well-being is highly important and should not be treated lightly. Students who are in emotional/mental distress should refer to [Health and Wellness at Western](#) for a complete list of options about how to obtain help. Students in immediate distress should contact Student Health Services, Campus Police, or Psychological Services whose contact information can be found [here](#).

Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>.

Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf.

7. Academic Policies

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf,

the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

Only simple calculators will be allowed on tests.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

8. Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>.

Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at

http://academicsupport.uwo.ca/accessible_education/index.html

if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (<https://learning.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Additional student-run support services are offered by the USC, <https://westernusc.ca/services/>.