UNIVERSITY OF WINDSOR
SCHOOL OF COMPUTER SCIENCE
COMP-3520 (0360-352) Winter 2019
Introduction to Computer Graphics

Course Outline

INSTRUCTOR:

Dr. Robert D. Kent
Email: rkent@uwindsor.ca
Office: 5100 Lambton Tower
Phone: 519-253-3000 ext. 2993 (Email preferred)
Office Hours: Monday/Wednesday 02:30pm – 3:45pm (or by appointment)

Office Hours: Tuesdays & Wednesdays, 12:00pm – 2:30pm, LT 5100.

Dr. Kent will set up appointments with students who cannot meet during scheduled office hours. Dr. Kent often uses email to answer many questions from students. Students are advised to use proper English spelling and grammar in email communications. Students must use the official University of Windsor student email account and identify the course COMP-3520 in the Subject field.

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TEACHING ASSISTANT:

Shane Peelar
Office hours: TBA in ER3146
Tutorial sessions to be announced later in the lectures.

PRE-REQUISITES:

You cannot register in this course unless you have taken the following courses: COMP-2540 (60-254) and MATH-1250 (62-120) with a minimum passing grade in each course.

NOTE: Students are advised that courses may be taken only twice to obtain credit. If a passing grade is not obtained upon the second attempt students will normally be required to withdraw from the program of study.

LECTURES:

Monday and Wednesday, 04:00pm - 05:20pm, Chrysler Hall South 53

TUTORIALS:

There are no laboratory classes or sections associated with this course. However, the GA will arrange to meet with students to provide regular tutorial assistance and guidance. Tutorial sessions will be held in Erie Hall room 3119 (the X-lab) on Friday afternoon from 4pm to 5:20pm.

There will be significant amounts of programming and some networked computers, suitable for graphics programming support, available through the School of Computer Science facilities.

COURSE DESCRIPTION:

An introduction to computer graphics hardware and software, interfaces, standards, programming libraries, fundamental algorithms, rendering techniques, and algorithms for 2D and 3D applications. Substantial programming work is vital to this course. (3 lecture hours a week)

RECOMMENDED TEXTBOOK:

Title: Computer Graphics with Open GL (4th Edition),
Authors: Donald D. Hearn, M. Pauline Baker, Warren Carithers
Year: 2010; Publisher: Pearson Ed.

All lecture references to material in the text will be made using the listed edition above. The following is a suitable alternative textbook.

Title: 3D Computer Graphics,
Author: Alan Watt
Year: 1993; Publisher: Addison-Wesley

SUPPLEMENTS:

The Blackboard Learning Management System (LMS) will be used with this course.

It is expected that the Instructor and GA will provide additional notes, slides and hyperlinks to various resources. It is vital that students maintain regular contact to be aware and take advantage of teaching and learning resources provided.

Students must note that the Blackboard content is certainly not a substitute for attending lectures and tutorials, completing assigned readings, programming and general practice. Blackboard will be used for some announcements, but students are expected to attend lectures in order to stay fully informed about course related matters.

GRADING SCHEME:

The University of Windsor uses a percentage marking and grading scale. The following are the university-wide grade descriptors for undergraduate programs - these will be printed on the back of student transcripts.

% Score	*Grade*
90.0-100	A+
85.0-89.9	A
80.0-84.9	A-
77.0-79.9	B+
73.0-76.9	B
70.0-72.9	B-
67.0-69.9	C+

% Score	*Grade*
63.0-66.9	C
60.0-62.9	C-
57.0-59.9	D+
53.0-56.9	D
50.0-52.9	D-
0-49.9	F

Students must understand that the professor reserves the right to adjust the marks of the entire class at the end of the semester and before submitting grades to the Registrar. If such adjustments are made, they are made by adding a constant value to all student total marks before calculating the letter grade.

For a more detailed explanation, students are directed to the webpage: www.uwindsor.ca/calendar and from there, follow the link to **Examinations, Grading and Graduation** and then to the link **MARKS/GRADES DESCRIPTORS**.

COURSE EVALUATION:

This schema is tentative and will be finalized within the first 2 weeks of lectures.
20% Midterm #1 (Wed., Feb. 13 – in class, 75 minutes)
20% Midterm #2 (Wed., Mar. 13 – in class, 75 minutes)
25% Assignments (4-5 assignments)
35% Project (Presentation and defense of project software TBA, between Thursday, March 21 and Wednesday, March 27, 2019)

NOTE: Consistent with University Senate Bylaws, no marked work will be assigned to students during the last week of classes, nor will any assigned work come due for submission during the last week of classes. It is possible, even likely, that a final assignment or project may become due for submission immediately following the Final Examination itself.

Tentative Topic Schedule:

Week	**Topic*** *(*The instructor reserves the right to change the outline to accommodate selection of topics and student pace in understanding of the subject matter)*
1	Overview of Computer Graphics Systems Output Primitives and their attributes
2	Coordinate systems, Two-dimensional Transformations and viewing.

Wednesday, January 16, 2019	*Last day for late registration and change of course. Last day for full tuition refund.*
3	Three-dimensional Concepts and object Representations
4	Three-dimensional Concepts and object Representations
5	Three-dimensional Transformations and viewing.
6	Three-dimensional Transformations and viewing. **Midterm Exam #1 - Wed. Feb 13, 2019**
Saturday, February 16 to Sunday, February 24, 2019 *Monday, Feb. 18th, 2019*	*Reading Week* *Ontario Family Day Holiday - University Closed. Leddy Library Open.*
7	Hidden line and surface detection and removal, overlapping objects, sidedness
8	Illumination Models and Shading
9	Illumination Models and Shading, Ray Tracing **Midterm Exam #2 - Wed. Mar 13, 2019**
Wednesday, March 13, 2019	*Last day to withdraw voluntarily from courses. After this date students remain registered in courses and receive final grades as appropriate. Last day for partial tuition refund.*
10	Curves and Surfaces
11	Curves and Surfaces **Presentation and defense of project software TBA, between Thursday, March 21 and Wednesday, March 27, 2019**
12	Texturing & color models(if time permits) ***Student Evaluation of Teaching (SET)***
Wednesday, April 3, 2019	*Last lecture. Last day of classes.*

The Student Evaluation of Teaching (SET) will be conducted during the last 2 weeks of class.

CAUTION: This course assumes the student will allocate a significant amount of independent study and time spent on coding programs. You are strongly encouraged to ensure that sufficient time is allocated in order to succeed in this course.

Notes to Students:

- Attendance and student participation are essential to succeed in this course. You are encouraged to ask questions.
- Students are encouraged to keep class notes in good order, repeat the examples demonstrated in class, and ask questions. Solving exercises on your own and participating in class are very important to succeed.
- Assignments are expected to be completed and submitted for evaluation no later than the assigned due date and time in each case. **LATE ASSIGNMENTS WILL BE PENALIZED HEAVILY**. You must allocate enough time to complete the assignments; start early and report difficulties to the instructor. **UNDOCUMENTED CODE WILL BE PENALIZED HEAVILY**. Failure to submit the work in the required format may result in the work being inaccessible for marking. (i.e. incorrect email subject or unreadable/missing or incorrect file attachments as instructed, etc.).
- **THERE IS NO MAKE-UP EXAM FOR MISSED MIDTERMS**. Missing a midterm exam with no excuse will greatly affect your grade since they carry a lot of weight. In the case of illness or serious and unavoidable reason (as

per the Senate Bylaws), please consult with the instructor. You must formally inform the instructor in writing using the official Student Medical Certificate that must be filled in and signed by a certified medical doctor. If the reason for absence from exam is deemed valid, the weight of the missed midterm will be added proportionally to that of the other midterm exam and assignments.

- You will need access to a C compiler and a university email account. You need a UNIX (UWinID) student account (from ITS x4440 or helpdesk@uwindsor.ca for support). Programs may be developed and tested using the Computer Science server machines. Linux based machine configurations should be able to use standard GNU compilers and editors and should be suitable for any required OpenGL libraries and API's. For the most part, however, students may choose to use their own computers, self-installed programming frameworks (e.g. MS Visual Studio Community or other product) and a suitable low-level programming language (although SDL will be referenced in the course).
- **PLAGIARISM:** Should the instructor or grader find a reason for suspicion – or just cause – in plagiarized student work (assignment, lab or test), the work in question will not be graded and the student(s) will have to answer to the department's Director and the Dean of Science. Refer to the University's policy on Plagiarism in the Senate Bylaws. This issue is taken extremely seriously and students who are found guilty of plagiarism may suffer considerable short and long term negative effects.
- **Students who submit semantically equivalent assignments [or labs] (in other words, the same thing to within trivial modifications) will receive a grade of zero on each such assignment [or lab].**
- To the extent possible, students should contact the instructor outlining their problems with the course. Most consultations will be in person, or by e-mail.

TIP: To succeed in this course you need to DESIGN, PROGRAM and PRACTICE! Allocate a **minimum of 3 to 6 hours a week** on reading and code development!

Makeup Exams and Absenteeism

In the event that a student misses an examination due to illness or other excuse, it is required that an official (ie. Registrar approved) **Student Medical Certificate** form be filled out and submitted to the instructor.

Students who miss a midterm exam for acceptable reasons (e.g. medical) will have their examination marks reweighted so that the remaining midterm exam will be weighted at 30% – note that Assignment and Project work will remain weighted at 40% and 30% respectively.

Students who miss both midterm examinations are advised to voluntarily withdraw from the course. It is the instructor's opinion, based on experience and past student performance, that students in such circumstances have essentially no chance for academic success in this course.

Students who do not submit Assignment work will receive a mark of zero (0) for each missed assignment.

All examinations, assignments and project requirements will be marked by the Instructor and Graduate Teaching Assistant, under direct supervision of the Instructor.

Marks/Grades Descriptors:

The University of Windsor uses a percentage marking and grading scale. For a more detailed explanation, students are directed to the webpage: www.uwindsor.ca/calendar and from there, follow the link to **Examinations, Grading and Graduation** and then to the link **MARKS/GRADES DESCRIPTORS**.

Students must understand that the professor reserves the sole right to adjust the marks of the entire class at the end of the semester and before submitting grades to the Registrar. If such adjustments are made, they are made by adding a constant value to all student total marks before calculating the letter grade.

University Regulations and Policies Concerning Final Examinations:

EXAM CONFLICTS DUE TO OBSERVANCE OF RELIGIOUS HOLY DAYS.

Students who are unable to write a final examination(s) during the regularly scheduled time slot because of a conflict with religious conviction must apply for the alternative examination(s) in the course(s) involved by the end of the normal add/drop period for the particular session. The Registrar's Office will schedule the alternative examination(s) for those students in another slot(s) within the regular examination period. Please download the appropriate form from http://www.uwindsor.ca/registrar and submit to the Office of the Registrar.

WRITING THREE OR MORE EXAMS ON THE SAME DAY.
A student scheduled to write three invigilated final examinations in one calendar day may apply to have one examination rescheduled on an alternate examination day. The determination of which examination shall be rescheduled and the date of the alternate examination (may be the last possible day of the examination period) shall be made by the Vice-Provost, Students and Registrar. Please download the appropriate form from http://www.uwindsor.ca/registrar and submit to the Office of the Registrar.
Note: These applications must be submitted by the end of the fourth week of classes.

Policy on academic dishonesty (ie. cheating):

The professor and teaching assistants for 60-265 will put a great deal of effort into helping students to understand and to learn the material in the course. However, they will not tolerate any form of academic dishonesty, or cheating.

The professors and teaching assistants will report any suspicion of cheating to the Director of the School of Computer Science. If sufficient evidence is available, the Director will begin a formal process according to the University Senate Bylaws. The instructor will not negotiate with students who are accused of cheating but will pass all information to the Director of the School of Computer Science.

The following behavior(s) will be regarded as cheating (together with other acts that would normally be regarded as cheating in the broad sense of the term):

- Copying assignments
- Allowing another student to copy an assignment from you and present it as their own work
- Copying from another student during a test or exam
- Referring to notes, textbooks, etc. during a test or exam
- Talking during a test or an exam
- Not sitting at the pre-assigned seat during a test or exam
- Communicating with another student in any way during a test or exam

Characteristics of a University of Windsor Graduate:

A University of Windsor graduate will have the ability to demonstrate:

A. the acquisition, application and integration of knowledge
B. research skills, including the ability to define problems and access, retrieve and evaluate information (information literacy)
C. critical thinking and problem-solving skills
D. literacy and numeracy skills
E. responsible behaviour to self, others and society
F. interpersonal and communications skills
G. teamwork, and personal and group leadership skills
H. creativity and aesthetic appreciation
I. the ability and desire for continuous learning

Students should understand that education and personal development result from the mutual investment of time and effort spent by both student and the instructional team. Without the full participation of all partners learning is less effective, so motivate yourself to do your best at all times.

Student Accessibility Services:

Student Accessibility Services provides a variety of services and supports to students with documented disabilities (including: learning disabilities, attention deficit/hyperactivity disorder, acquired brain injuries, vision, hearing and mobility impairments, chronic medical conditions and psychiatric issues), who have registered with SAS. If you have, or think you may have a disability, you may wish to visit Student Disability Services to learn how best to meet your academic goals. The SAS office is located in Room 117, Dillon Hall, (519) 253-3000 ext. 3288 or online at:
http://www.uwindsor.ca/studentaccessibility/