SCIENCE DEPARTMENT

COURSE OUTLINE – Fall 2022

CS 3110: Introduction to Computer Graphics – 3 (3-0-3) 90 Hours for 15 Weeks

Northwestern Polytechnic acknowledges that our campuses are located on Treaty 8 territory, the ancestral and present-day home to many diverse First Nations, Metis, and Inuit people. We are grateful to work, live and learn on the traditional territory of Duncan's First Nation, Horse Lake First Nation and Sturgeon Lake Cree Nation, who are the original caretakers of this land.

We acknowledge the history of this land and we are thankful for the opportunity to walk together in friendship, where we will encourage and promote positive change for present and future generations.

INSTRUCTOR:	David Gregg	**PHONE:**	TBA
OFFICE:	TBA	**E-MAIL:**	dgregg@nwpolytech.ca
OFFICE HOURS:	TBA		

CALENDAR DESCRIPTION:

Graphical input and output devices; segments; interactive input techniques; user interface design; windowing and clipping; 2D and 3D transformation; 3D modelling and viewing; hidden-line and hidden-surface removal.

PREREQUISITE(S)/COREQUISITE: CS1150 or CS2010

REQUIRED TEXT/RESOURCE MATERIALS:

WebGL Programming Guide: Interactive 3D Graphics Programming with WebGL by Kouichi Matsuda. ISBN: 978-0321902924

Class Handouts will be provided

DELIVERY MODE(S):

This course includes 3 hours of lecture and 3 hours of lab per week

Lectures:

H211	Tuesday	14:30 - 15:50
H211	Thursday	14:30 - 15:50

Labs:

G112	Friday	08:30 – 11:20

COURSE OBJECTIVES:

- Understand the mathematics used in computer graphics
- Be able to use WebGL, OpenGL and GLSL

LEARNING OUTCOMES:

Students will be able to design and implement reasonably complex interactive 3D computer graphics applications, using WebGL with modelling, viewing, lighting, shading, texturing and rendering techniques.

TRANSFERABILITY:

Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at the Alberta Transfer Guide main page http://www.transferalberta.ca.

** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. **Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability**

EVALUATIONS:

Lab Assignments	**30%**
Quiz	**10%**
Midterm Exam	**25%**
Final Exam	**35%**

GRADING CRITERIA:

Please note that most universities will not accept your course for transfer credit **IF** your grade is **less than C-**.

Alpha Grade	4-point Equivalent	Percentage Guidelines		Alpha Grade	4-point Equivalent	Percentage Guidelines
A+	4.0	90-100		C+	2.3	67-69
A	4.0	85-89		C	2.0	63-66
A-	3.7	80-84		C-	1.7	60-62
B+	3.3	77-79		D+	1.3	55-59
B	3.0	73-76		D	1.0	50-54
B-	2.7	70-72		F	0.0	00-49

COURSE SCHEDULE/TENTATIVE TIMELINE:

1	Introduction and Overview of OpenGL and WebGL
2	2D Geometric Modeling and Viewing Transforms
3	Scan Conversion and Clipping
	Quiz (topics 1 through 3)
4	3D Geometric Modeling Transforms
5	3D Viewing Transforms
	Midterm
6	OpenGL 3.3, Windowing systems, and GLEW
7	Lighting and Shading with the programmable graphics pipeline using GLSL 3.0+
8	Texturing
9	Data Structures and Complex Models
10	Buffers, Blending, Mirrors, and Shadows
	Final Exam (topics 1 through 10)

STUDENT RESPONSIBILITIES:

STATEMENT ON PLAGIARISM AND CHEATING:

Cheating and plagiarism will not be tolerated and there will be penalties. For a more precise definition of plagiarism and its consequences, refer to the Student Conduct section of the Northwestern Polytechnic Calendar at https://www.nwpolytech.ca/programs/calendar/ or the Student Rights and Responsibilities policy which can be found at https://www.nwpolytech.ca/about/administration/policies/index.html.

**Note: all Academic and Administrative policies are available on the same page.