

# Fall 2023 CS 464 Introduction To Computer Graphics

3 credit hours

TuTh 12:00AM - 01:15pm

Remote: <https://boisestate.zoom.us/j/92428177488> passcode=631170

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**Instructor:** Steve Cutchin, email: [stevencutchin@boisestate.edu](mailto:stevencutchin@boisestate.edu)

*Office Hours:* To Be Announced: a combination of Zoom and in person.

**Textbooks:** Introduction to Computer Graphics by David J. Eck <http://math.hws.edu/graphicsbook>  
Additional excellent books are:

- Interactive Computer Graphics A Top-Down Approach with WebGL 7th Edition by Edward Angel and Dave Shreiner 2015
- WebGL Programming Guide: Interactive 3D Graphics Programming with WebGL (OpenGL) - Optional but useful

**Prerequisites:** CS 321 or Permission of Instructor. Knowledge of basic data structures like lists, hash tables, binary search trees. Knowledge of Java or Javascript is required.

**Course Catalog Description:** Mathematics and programming techniques for computer graphics that cover raster graphics, transformations, rendering pipeline, clipping algorithms, lighting models, shading and shadows, texture mapping, antialiasing, ray tracing, non-photorealistic graphics. MATH 275 or MATH 301 recommended. PREREQ: CS 321.

## Course Objectives:

- Introduce students to the fundamental mathematics used in computer graphics algorithms.
- Learn fundamental graphics algorithms for rendering, transformations, viewing, clipping...
- Implement algorithms for viewing, interaction, lighting and shading as well as ray tracing
- Explore graphics hardware and familiarize yourself with shaders and their use.
- Discuss advanced graphics topics such as non-photorealistic rendering.

**Course Outline:** numbers are estimates

Topic	Lectures
Intro to WebGL, Javascript	3
Math	1
Scenes and Primitives	1
Pipeline/Shaders	2
Transformations	2
Viewing Transform	1
Lighting and Shading	2
Image Mapping	2
GPU Architecture	1
Framebuffers/Pixmap/Color	1
Raytracing	1
Aliasing	1
Exams and reviews	2

## Grade Information:

5 Programs .....	50%
Take Home Quizzes .....	10%
Midterm Exam .....	10%
Final Project .....	20%
Final exam .....	10%
<b>Total .....</b>	<b>100%</b>

## Exams:

- The class has a midterm and a final exam.
- There will be a collection of take home quizzes that will be excellent preparation for the exams.

**Grade Scale:** You are guaranteed to receive at least the grade as follows:

A+	≥ 95%	A	≥ 91%	A-	≥ 88%
B+	≥ 85%	B	≥ 81%	B-	≥ 78%
C+	≥ 75%	C	≥ 71%	C-	≥ 68%
D+	≥ 65%	D	≥ 61%	F	< 60%

- I reserve the right to lower the cutoffs if I feel it is appropriate.
- Assignments lose 10% for each day submitted past the deadline. No exceptions.
- No assignments will be accepted beyond one week after due date.

**Academic Honesty:** The University's goal is to foster an intellectual atmosphere that produces educated, literate people. Because cheating and plagiarism are at odds with that goal, those actions shall not be tolerated in any form. Academic dishonesty includes assisting a student to cheat, plagiarize, or commit any act of academic dishonesty. Plagiarism occurs when a person tries to represent another person's work as his or her own or borrows directly from another person's work without proper documentation.

If a student engages in academic dishonesty, the student may be dismissed from the class and may receive a failing grade. Other penalties may include suspension or expulsion from the University.

Much more information about academic integrity, including examples of academic dishonesty, is at:

<http://cs.boisestate.edu/~buff/files/www-integrity.pdf>

If you are unsure about a particular behavior, ask your instructor.

**University Attendance Policy:** <http://registrar.boisestate.edu/catalogs/gr-online/gr-general-policies.shtml#attendancel>: Students are expected to attend classes regularly. Missing one of two first classes may result in your automatic withdraw from the class.