

Contact Information*Instructor:* Jeff Timanus*Phone:* (514) 927-8949*Email:* jtimanus@champlain.edu**Do not use Canvas for correspondence with the instructor. Please email instead.****Course Information***Number:* EGP 425*Title:* Game Physics*Term:* Spring 2015*Time:* 5:30 PM*Location:* Foster Hall - 202*Days:* Tuesdays**Description**

Students learn the theory and practical application of techniques used in games to simulate real-world physical interactions. Implementation of 2D and 3D algorithms to effect movement, particle systems, collision detection, gravitational forces, kinematics, and spring systems are covered. Implementations trade-offs of efficiency for accuracy are adapted for real time games.

Student Centered Learning Outcomes

- In this course each student will build a physics engine.
- Students will demonstrate knowledge of the mathematics of the engine.
- Students will demonstrate common practices in implementation of the engine.

Textbook

Game Physics Engine Development 2nd Edition
by Ian Millington

Evaluation

Exams	40%
Coursework and Assignments	60%

Course Calendar and Outline

The following topics will be covered in this course (although order is subject to change). Some projects may stretch multiple weeks. The Canvas LMS will be up-to-date with assignment due dates and requirements.

Course Topics

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|--------------------------------------------------------|----------------|
| 1. Intro and Mathematics of Particles (Week 1) | Chapters 1-2 |
| 2. Part 1: Building a Particle Physics Engine (Week 2) | Chapters 3-4 |
| 3. Part 2: Mass Aggregate Physics (Weeks 3-6) | Chapters 5-8 |
| 4. Part 3: Rigid-Body Physics (Weeks 8-10) | Chapters 9-11 |
| 5. Part 4: Collision Detection (Weeks 11-12) | Chapters 12-13 |
| 6. Part 5: Contact Physics (Weeks 13-14) | Chapters 14-17 |

Coursework and Assignments

Weekly assignments will be announced in class and will be posted on the learning management system (Canvas). In addition, all coursework is to be submitted through the same system. It is the student's responsibility to become familiar with using Canvas.

Grading – Criteria and Standards

- Listed homework requirements should always be considered the “minimum requirements”. Meeting these minimum requirements will result in a maximum grade of “C”. In order to receive a grade higher than “average”, students must produce “above average” work. If a student is unclear on ways to improve their project beyond the “minimum requirements”, they should seek out the instructor for advice as soon as possible.
- All projects should be delivered in “production quality”. That is, they should be zipped in a single file. Well organized and clearly marked files are important. The zipped file should include at a minimum:
 - A “README.TXT” or similar document describing the author, project, and purpose
 - The README file should include a link to a commit hash on the student's public GitHub account.
 - Compliant source code, solution and project files (without the temp, cached, or object files)
 - A fully compiled x86 executable for PC (Windows 7 or 8)

Grading – Late Assignments

All assignments **MUST** be completed by the start of class the day the homework is due. An automatic 10% penalty will be imposed on assignments uploaded after the start of class (even if it is 1 minute after). A further 10% penalty will be imposed for each 24 hours after the due date.

Grading – Homework Presentations

All students **MUST** present their assignment in class the day the assignment is due. Failure to attend class or present on the due date will result in **NO CREDIT** awarded for the assignment. Excused absences (as defined by the Student Handbook and approved by the instructor) will require the student to present their work during the following class meeting in order to receive credit. If you anticipate that you will be missing class, you should notify the instructor in advance.

Presentations should be clear, concise, and focus on the learning objectives of the assignment.

Regularly Backing-Up

Students are advised to regularly back-up their work through both manual and automatic systems. Computer or other technical failure will not be accepted as an excuse for incomplete or late work. A variety of back-up solutions are available both on and off campus including the Redmine Project Server (<http://pineapple.champlain.edu>), the IS provided network drives, and the other 3rd party solutions like GitHub and Google Code.

Computer Labs

The Skiff-102 lab has limited availability and may be necessary to complete coursework. Be sure to work early. The availability (or unavailability) of lab equipment will not be accepted as an excuse for late or incomplete work. If a student is having issues with the lab (access, hardware, software, etc), it is the student's responsibility to contact the instructor, the campus HelpDesk, or the division Operations Manager as appropriate. (Contact information is available at <http://champlain.edu>).

Coding Standards

To facilitate readability and grading of your code, you are encouraged to follow one of the IT&S coding standards set forth by Professor's Chen and Lawson, or the published Google coding standard. Code that does not follow a consistent standard may be subject to a grading penalty.

Course Policy

The professor reserves the right to modify the course syllabus, if needed. Any changes will be disseminated to the class at the earliest possible time.

Course Withdrawal

It is the student's responsibility to officially withdraw from a course. Potential consequences of a student's failure to do so include: failing grades, reduction in financial aid and academic dismissal from the College.

Academic Honesty

Introduction

In addition to skills and knowledge, Champlain College aims to teach students appropriate Ethical and Professional Standards of Conduct. The Academic Honesty Policy exists to inform students and Faculty of their obligations in upholding the highest standards of professional and ethical integrity. All student work is subject to the Academic Honesty Policy. Professional and Academic practice provides guidance about how to properly cite, reference, and attribute the intellectual property of others. Any attempt to deceive a faculty member or to help another student to do so will be considered a violation of this standard.

Instructor's Intended Purpose

The student's work must match the instructor's intended purpose for an assignment. While the instructor will establish the intent of an assignment, each student must clarify outstanding questions of that intent for a given assignment.

Unauthorized Assistance

The student may not give or get any unauthorized assistance in the preparation of any work. Authorship The student must clearly establish authorship of a work. Referenced work must be clearly documented, cited, and attributed, regardless of media or distribution. Even in the case of work licensed as public domain or Copyleft, (See: <http://creativecommons.org/>) the student must provide attribution of that work in order to uphold the standards of intent and authorship.

Declaration

Placing one's name on the exam, assignment, or any course document is a statement of academic honor that the student has not received or given inappropriate assistance in completing it and that the student has complied with the Academic Honesty Policy in that work.

Consequences

An instructor may impose a sanction on the student that varies depending upon the instructor's evaluation of the nature and gravity of the offense. Possible sanctions include but are not limited to, the following: (1) Require the student to redo the assignment; (2) Require the student to complete another assignment; (3) Assign a grade of zero to the assignment; (4) Assign a final grade of "F" for the course. A student may appeal these decisions according to the Academic Grievance Procedure. (See the relevant section in the Student Handbook.) Multiple violations of this policy will result in a referral to the Conduct Review Board for possible additional sanctions.

The full text of the Academic Honesty Policy is in the College Catalog.

Students Requiring Accommodations

If you believe that you require accommodations in this class, please contact Counseling and Accommodation Services as soon as possible. You will be able to schedule a meeting with Denise Myers and have your documentation reviewed. During that meeting, Denise will provide you with letters for your faculty, which will detail your needed accommodations. It is the student's responsibility to seek and secure accommodations prior to the start of a test or project.

Counseling and Accommodation Services

Contact: Denise Myers

Office: Skiff Hall 100

Phone: 802-865-5484

Email: dmyers@champlain.edu

Class during an Extended Campus Closure

Champlain College is taking precautionary measures to ensure that this class can continue in a "virtual environment" even during an extended emergency such as severe weather, contagious disease, physical infrastructure failure, campus closure, or similar incident. This course will continue either online through a college-provided learning management system (Canvas), or through some other process unless cancelled.

In the event of such an emergency, students are expected to continue instructor-designated class activities, as directed by the instructor. Due to the nature of the "virtual environment" learning activities may differ slightly from the on-campus course. In order for this emergency preparedness plan to be effective, you are asked to do the following:

Immediately

- Ensure that you will have a computer and broadband Internet access at the location (home or other) in which you will reside during an extended campus closure.
- Prepare yourself with the basic skills of logging into Canvas via the dashboard, finding your course(s) and entering them.
- Participate in a "warm up" online activity in the "virtual environment" when directed to do so by your instructor.

During an Emergency

- Test your broadband Internet access immediately upon arriving at your chosen residence during the campus closure.
- Log into Canvas and enter your courses.
- Check for emergency information on Champlain College main website (www.Champlain.edu) which will indicate the semester week and day on which college classes will resume online.
- Enter your class and go to the appropriate week of class where you will receive directions from your instructor.

Submitted Course Material

Submitted student material may be used for academic, marketing, or other purposes. It may be posted on the web or used in other presentations by the instructor. In all cases, appropriate credit to the student will be acknowledged. If a student does NOT want their course material used, make this known in writing to the instructor. In all cases, FERPA requirements will be followed.