|  |  |  |
| --- | --- | --- |
|  | **Course Name:** | Math and Physics for Game Programmers |
| **Course Number:** | AGGP 247 |
| **Course Sections:** | 1/ 1A |
| **Course Format:** | 2 hour lecture/week  3 hour lab/week |
| **Semester/Year:** | Spring 2022 |

**Course Description:** Converting scientific principles and equations into code is a critical game programming skill. Applications that use math and physics concepts form the foundation for this hands-on course. Increasing one’s critical thinking abilities and learning how to make the conceptual become ‘real’ are two of the course’s main goals. Topics covered will include 3D perspective; collision reactions; equations of motion; implementation of friction and gravity; and 2D and 3D transformations using vectors and matrices.

**Major Course Objectives/ Learning Outcomes:**

At the end of this course the student will be able to demonstrate the following:

* Critically analyze problems including proposed features and technical issues, decompose problems into sub problems, and develop appropriate solutions.
* Demonstrate initiative to prototype and develop solutions using documentation and research.
* Applies math and physics to develop solutions for proposed features or technical issues.

**Prerequisites:**

AGGP 101C, CPET 125C, and both AGGP Math Electives;

or with permission of Program Coordinator for AGGP

**Instructor:**

Professor **Dana LeMay**

Office: **Little Hall 231**

E-mail: **dnlemay@ccsnh.edu**

Office Hours: **After 5pm during the week**

**Instructor Availability:**

Dana is always available via email [dnlemay@ccshnh.edu](mailto:gwalek@ccshnh.edu) and Discord.

Messages sent via Discord will have a faster response time.

**Help with this course:**

* Re-read and examine the materials given to you.
* Email your instructor

**Required Text(s) and Material(s)**:

**Class Repository**

[**https://github.com/AGGP-NHTI/AGGP247c**](https://github.com/AGGP-NHTI/AGGP247c)

**Unity**

Version: 2020.3.15f2

**Visual Studio**

We will be using C#

*While we won’t use C++ in this class, you will need it in other and future classes*

**Glint**

*See the class repository, under Labs.*

**Instructional Methods:**

The primary delivery of course concepts will be through lectures utilizing both Power Point slides and the white board. The textbook, lecture assignments and materials provided will reinforce lectures. However, students are responsible for material covered in the assigned reading but not presented in the lecture. Laboratory experience is essential for thorough comprehension of this material.

The instructor retains the right to give quizzes as needed.

**Assessment of Student Level of Achievement Measured Against Specific Course Objectives:**

* Software assignments
* Written Work (aka Math Assignments)
* Participation and conduct during lab and lecture
* Final Project Assignment

**Grade Calculation**

* Labs & Written Work (60% of course grade)
* Final Project (30% of course grade)
* Professionalism (*see below*) (10% of course grade)

**Professionalism** **includes the following:**

Students are expected to contribute to a cooperative and productive learning environment. To meet this objective, students are expected to show up for class (and lab) on time, be attentive, not disrupt the instructor or other students, work quietly and use time in the lab time to complete assigned work, stay in lab until assigned work is complete, demonstrate respect for other people, demonstrate initiative and self-motivation, and take responsibility for academic success.

Please note that each unexcused absence or late arrival from from lecture or lab will result in a loss in your professionalism score.

The professionalism score is graded with no lower limit. Thus it is possible for a student to receive a negative grade and reduce their overall course grade beyond the allotted 10%.

*The instructor can remove students from this class with a grade of ‘AF’ for students that display consistent unprofessional behavior or commit an unprofessional act of an egregious and\or malicious nature.*

**Grading System:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A** | 93 - 100 | B | 83 – 86.9 | **C** | 73 – 76.9 | **D** | 63 – 66.9 |
| **A-** | 90 – 92.9 | B- | 80 – 82.9 | **C-** | 70 – 72.9 | **D-** | 60 – 62.9 |
| **B+** | 87 – 89.9 | C+ | 77 – 79.9 | **D+** | 67 – 69.9 | **F** | 0 – 59.9 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Other Grades** | **W** | **WP** | **WF** | **AF** |

For the definition of the grades W, WP, WF, and AF, please refer to the NHTI Grading Policy at: <http://www.nhti.edu/academics/requirements-policies/grading-system>

**Attendance:**

Being on time and attendance at all lectures and labs is a requirement for successful completion of this course. While there may be circumstances over which the student has no control that may necessitate absence from lecture or lab, such absences do not excuse the student from being responsible for the course material missed due to that absence.

Any student that is absent for 10% or more of the semester total number of labs and lectures may receive an immediate grade of AF for the course. This course has 1 lecture/week and 1 lab/week for 15 weeks. Missing 4 of any combination of labs/lectures may result in an AF.

* If you see Professor Walek counting heads, he’s trying to take attendance.
* As required, you will be asked to sign in on an attendance sheet.
* If you know you will be absent from a class or lab, you are responsible for communicating that to the instructor via email prior to the class or lab. If a serious illness keeps you from notifying the instructor via prior to the class or lab, as soon as you are able, send the instructor an email explaining your situation.
* If your absence results in missing, a lab or an exam, it is your responsibility to explain the reason for your absence to the instructor. If warranted, the instructor may allow you to make up the missed exam or lab etc. (The instructor may also deduct points on make-up exams or labs)
* Otherwise, missed exams or labs will be graded as an F.
* If you are late for lab, at the instructor’s discretion, you will be counted as absent and/or points will be deducted from your lab grade.
* If you leave the lab or lecture before it ends without the instructor’s permission, at the instructor’s discretion, you will be counted as absent and/or points will be deducted from your lab grade.

**Late Assignments:**

All homework assignments, pre-lab assignments, and lab reports have due dates posted to Canvas. This out-of-class/lab course work is a critical part of mastering the course material by:

1) reinforcing and supplementing what was taught in lecture,

2) developing the student’s problem solving skills,

3) developing the student’s ability to learn new material/concepts on their own and

4) developing the student’s ability to meet schedule deadlines.

All of these are essential to preparing students to meet the demands of the “hi-tech” industry.

Because new course material is covered each week and builds on the previous week’s material, completing assigned out-of-class/lab work on time is essential.

* Unless otherwise noted, lecture assignments are due at beginning of the lecture or it is late.
* Unless otherwise noted, lab reports and pre-lab assignments are due at beginning of the lab or it is late.

**Student absence from lecture or lab does not excuse the student from the due date for assigned out-of-class/lab course work.** Therefore, the student should give the instructor the out-of-class/lab work prior to the due date or scan each page to pdf and email the out-of-class/lab work to the instructor by the due date (or take a clearly readable picture of each page and email that).

**Homework assignments:** 15% deducted for each day late

**Pre-Lab assignments:** Grade of 0 for being late but must be completed prior to starting the lab exercise.

**Lab Reports:** 15% deducted for each day late

**Lecture and Lab Etiquette:**

Unless explicitly allowed by the professor, students should not use PC’s, cell phones, or be texting during the lecture or lab. Please set cell phones to silent during lab or lecture, and keep “chit-chat” to a minimum during lab time.

For safety reasons and for the protection of equipment, no food or drink is allowed in the lab. Student may bring a beverage to lecture but may not eat during the lecture.

**Student Delivery of Completed Assignments:**

* All programming assignments will be returned to the instructor electronically using Canvas. The instructions for the procedure to return assignments electronically are posted to this course’s Canvas.
* All lecture assignments (homework) will be returned to the instructor in paper format.

**Document Formats:**

**Assignments:** See the assignment format document posted to this course’s Canvas.

**Collaboration Versus Cheating Policy:**

* Students are encouraged to provide appropriate support to their peers. For example, sharing concepts and ideas with peers is appropriate support.
* However, providing appropriate support to a peer should NOT result in a reduction of the academic requirements or rigor all students are expected to meet for course work. For example, it is NOT appropriate to share your work to another student or to provide answers to assigned course work (e.g. homework, lab results, lab exercises, quizzes & tests, etc.)
* Unless otherwise specified by the instructor, students repeating a course cannot submit, or use in any way, their work from a previous semester. Doing so will be considered cheating.
* Unless otherwise specified by the instructor, all assignments, pre-labs, lab reports, take home exams, etc. should represent the work of the student only. Students doing otherwise may be considered to have plagiarized or cheated.
* Students using answer keys, another student’s work from a previous semester, etc. may be considered to have plagiarized or cheated.
* Any portion of work turned in, that is not the sole product of the student, should be clearly identified and annotated with a reference indicating the source. In such cases, the student will not be considered to have plagiarized or cheated. However, the instructor has the discretion to deduct points from the grade for the portion of the work that was not the sole product of the student.
* The department head may impose additional and more serious disciplinary action when cheating is discovered.
* See also NHTI policy: [**http://www.nhti.edu/academics/requirements-policies/plagiarismcheating-policy-and-procedures**](http://www.nhti.edu/academics/requirements-policies/plagiarismcheating-policy-and-procedures)

**Minimum Grade:**

The minimum required grade in major courses for AGGP students is C. Any grade below this indicates that the student is not ready to continue with subsequent courses or to successfully enter the workforce. As such, major courses with a grade of less than C will not count toward meeting the program’s completion requirements.

**Computers/Software/Printers:**

The PCs in the lab for this course are equipped with the hardware and software necessary for students to complete their assignments. These PCs may be used outside of the scheduled lab for this course. Please see the course instructor for more information on when these PCs are available for student use.

Students may find it convenient to use their own PC or laptop to complete assignments outside of the scheduled lab for this course. However, neither the instructor nor NHTI is responsible for providing technical support for a student’s PC or laptop.

This course uses Visual Studio 2018 as its software development environment. Visual Studio 2018 is compatible with a PC or laptop running Windows 10. Students choosing to use other computing platforms or operating systems do so with the understanding that they are solely responsible for any compatibility issues with the software used in this course.

It is a computer security policy of NHTI that student PC’s or laptops must NEVER be connected to the NHTI network using an 802.3 (wired Ethernet) connection.

It is the student’s responsibility to have access to a PC and the ability to:

* connect to the web and access SIS and Canvas,
* use their NHTI email account to send and receive email; including attachments,
* use a word processor (e.g. Word) to produce documents,
* store and retrieve files to removable media (e.g. thumb drive),
* print pdf and Microsoft Office documents, and
* install and use software utilized in this course.

**Technical Standards:**

If you have a concern about whether you will have an issue with the technical standards for the course, please see the course instructor and/or the Office of Accessibility Services <https://www.nhti.edu/student-resources/where-can-i-get-help-my-studies/accessibility-services>

The exercises in this course are designed to reflect the environment typically found in the game development and software engineering industry. The knowledge and skills developed in the lab exercises in this course are required by employers of software developers. As such:

* The lab exercises for this course require the student to possess skills to
* Operate a computer running a modern desktop operating system;
* Write, edit, debug, and compile code using the selected programming languages and integrated development environments;
* Maintain a safe lab environment for the student and other students;
* Work in a team environment with other students;
* Present work in a public demonstration including other students.
* Some lab exercises limit the time a student has to complete the lab exercise.

**Class Cancelations:**

**Campus wide Cancellation:**

[**http://www.nhti.edu/student-life/student-handbook/cancellations-and-delays**](http://www.nhti.edu/student-life/student-handbook/cancellations-and-delays)

Students should also sign up for alerts to be sent to their email and/or mobile phone. <https://www.nhti.edu/student-life/campus-safety/nhti-alerts>

**Cancelling this Class:**

When the instructor cancels or delays the start of lecture/lab, the instructor will post the cancellation to the course’s Canvas and send an email to students’ email accounts as far in advance as possible. The same notice will be posted in the corresponding classroom/lab.

**Student Communication Responsibility:**

* Students are responsible for reading their NHTI student email at least once each day.
* Students are responsible for regularly accessing this course’s Canvas for the latest course announcements, assignments, and course materials.
* Canvas will be used for instructor announcements; an email noting the announcement will be sent to each student’s NHTI email account.
* GitHub will serve as the repository for instructor provided course materials, schedules, etc
* A Link to the repository will be posted in Canvas.
* All lecture assignments will be posted to this course’s Canvas.
* Grades for assignments, labs, quizzes, etc. will be posted to Canvas regularly. Students should retain their graded materials and verify that the grades posted to Canvass are match.

**Academic Affairs Notices:**

Students are responsible for reading the [Academic Affairs Notices](https://ccsnhfacultystaff-my.sharepoint.com/:w:/g/personal/tdionne_ccsnh_edu/ETzth2kGvVRFs5qkD1OOqRwBKjmgDx-vbxRbG8drUOcN9A?e=rUATnN) found in this Canvas folder. NOTE: These are the same for each course at NHTI and are updated each semester.