

Design and Technology Academy (DATA)

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Game Programming and Design

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Course Syllabus 2021 – 2022

COURSE DESCRIPTION:

In this course students will learn the concepts of video game program and design and how to apply those concepts in the programs we will be using in class. The main programs will be Unity and Microsoft Visual Studio. Unity is a game engine and Visual Studio is compiler that we write our code in for the game engine. Our focus will be learning how to create games in Unity so you can take and pass the Industry Based Certification (IBC) for Unity. This IBC is called Unity Certified User: Programmer and is the first of several IBCs that Unity has. We will be writing code using C# (C sharp). The first semester we will use an online learning platform called CompuScholar to help prepare you for the certification exam. Some additional programs we will talk about, and use later in the year are Quixel, Autodesk Maya, and Blender.

If possible, I strongly encourage students to have a computer that can run these programs and install them at home. Especially if Game Design, Animation, Architecture, Graphic Design, or Video Production is something they want to pursue as a career. Most gaming computers can run these programs. The programs are all free to download and use at home. Some of these programs have a limited use requirement meaning that they are free for use if the programs are used for educational purposes only.

Again, it is NOT a requirement to have a computer or download this software at home.

Here are the websites where these programs can be downloaded:

Unity: <https://store.unity.com/download-nuo>

Visual Studio 2019: <https://visualstudio.microsoft.com/vs/> This program installs with Unity, but if for some reason it does not you can download it from here.

Blender: <https://www.blender.org/>

Quixel: Set up your Unreal Epic Games account first, then sign in using your Epic Games Login.

Once signed in go to both and install them:

Quixel Bridge: <https://quixel.com/bridge>

Quixel Mixer: <https://quixel.com/mixer>

Autodesk Maya: <https://www.autodesk.com/education/free-software/maya> Once here you will need to create an account. Ask me which version we are using in class. You can download any version you wish and can have multiple versions installed.

All these programs work for both Mac and PC. All work can be completed at school in the D24 computer lab.

Core Learning Goals:

1. The student will learn video game design concepts and apply them to their individual and group projects.
2. The student will learn to use Unity to make different types of video games.
3. The student will learn C# programming for their games.
4. The student will learn how to design video game environments and how to animate characters and objects in their video games.
5. Students will take the Unity Certified User: Programmer certification exam. The cost of this exam is paid for by the school district.

Classroom Rules:

1. Be on time to class
2. Be ready for class
3. Be respectful to everyone's
 - a. Ideas
 - b. Time
 - c. Space
 - d. Things
4. Turn work in on time
 - a. Projects in this class take practice and time
 - b. When you are in my class, you only work on assignments for my class
 - c. If you are "done early", refine your project and make it better. Practice makes your work better.

Consequences for Not Following Classroom Expectations (including tardiness):

1. 1st infraction: You will receive a verbal warning.
2. 2nd infraction: Conference with teacher.
3. 3rd infraction: Conference with teacher and a phone call to Parent or Guardian.

Classroom Procedures:

1. Walk in and immediately take your seat. If we are working on projects, get started immediately. We only have 52 minutes a day to accomplish what game designers in the business accomplish using many hours a day over weeks and months. We do not have time to waste.
2. All class work will be assigned through Microsoft Teams. I will add students to Teams which will send a link to their student emails. Students check your school assigned email and Teams daily for assignments and updates. Students will have access to Teams on school computers. They will also have access to Teams and other Microsoft Office 365 programs online from any other computer, tablet, or smartphone by signing into Office 365 with their student login email address and password or from the NEISD Launchpad (<https://launchpad.classlink.com/neisd>). Here is the link to [Office 365](#). We will go over Teams in class to make sure everyone can sign in, understands how to use it, and understands the expectations. After that, check Teams daily for updates, new material, tips, and links.
 - a. **Parents:** Please provide your preferred email address to me so I can invite you to our OneNote Class Notebook (Which is part of Teams). This will enable you to log in and see what your student is doing in our class and to follow along with our projects, schedules, and assignments.
3. Follow the classroom rules while in my class. They are not negotiable. I will communicate with parents regularly and I am available to answer questions at any time in class. Outside of class or for parents, the best way to contact me with questions is through my email address, pfritz@neisd.net.

Tardy Procedure:

1. If you walk into class tardy without a valid pass, you will be sent back to get a pass. Tardiness is also a loss of time, which you will need to make up.
2. If you have a pass, do not disturb the classroom environment. Provide your pass and continue with the classroom flow.

Hall Pass Procedure:

1. No hall passes will be issued during the first 15 minutes, or the last 15 minutes of the class period.
2. No hall pass will be issued during the instructional period (when teacher is explaining the class work procedures for the class period).
3. Students are not allowed to walk out of class without a hall pass.

Small Group Procedure:

1. When an assignment requires group work, you will receive instructions on the assignment first.
2. Group assignments are a two-part grade: One part is based upon your individual group participation and involvement. The second part is based upon the actual completed work.

3. All individuals in the group must have a valid role in the group process. No role, no grade.
4. Group members will be assigned by the Teacher.

Classroom Expectations:

1. Come to class prepared every day and be in your seat when the bell rings.
2. Raise your hand when you want to speak in class.
3. Absolutely no eating, drinking, or chewing gum in the classroom. Water bottles with a lid will be allowed.
4. Always show respect for others and yourself.
5. Follow all classroom policies in addition to the rules of the Student Behavior Code of Conduct.
6. While in class, do not make or receive phone calls, write, or receive texts, watch videos, snapchat, Facebook, or any other form of social media, and distraction while in class. The only exception is to watch tutorial videos for the class work while working. Failure to follow this rule will require you to place your phone on my desk during each class period.
7. The use of devices to listen to music while working is allowed, but earbuds or headphones must be used. Not everybody in class will want to hear your style of music.
8. Please do not have earbuds or headphones over your ears while I am giving instruction. I will revoke your music listening privileges for the rest of the class. If it is a reoccurring issue, you will not be allowed to use your device in class.
9. The charging of Personal Electronic Devices using the classroom electrical outlets is allowed, but do not unplug any computers or other classroom devices to gain access to an outlet.
10. The computers in class are not meant for your use of social media or watching the latest YouTube video. Yes, we will be using YouTube and some other media for instruction, but those are the only authorized uses on those sites. You will only use the computers for their intended class purposes.

Make-up Work for Absences:

According to Board Policy, students are required to make up assignments, homework, projects, quizzes and tests missed due to absences.

NEISD distinguishes absences as excused and unexcused. Make-up work for excused absences will be eligible for full credit. Students shall receive a 20% deduction from the total grade earned for any assignment or assessment not made up within the allotted time. A truant absence is an unexcused absence with disciplinary consequences. Make-up work for unexcused absences will be penalized equal to late work. A 20% deduction from the total grade earned will be taken on make-up work for unexcused absences.

1. Students will be allowed reasonable time to make up assignments, homework, projects, quizzes and

tests missed due to absences.

- a. At the secondary school level, reasonable time is defined as one class day per class missed, e.g. a student who misses class on Tuesday has until the beginning of class on Thursday to turn in make-up work.
 - b. For extended absences, make-up assignments shall be made available to students after two consecutive class days of absence.
 - c. Teachers will provide the assignments to the students and inform students of the time allotted for completing make-up assignments, homework, projects, quizzes and tests.
 - d. It is the student's responsibility to obtain, complete and submit the missed work in the time allotted.
2. Students will not be required to take a quiz or test on the day returning to class from an absence if the quiz or test was announced during the student's absence.
 3. After their return to class, teachers are required to make arrangements with the student within two class days to take a test/quiz if the test/quiz was announced during the student's absence.
 4. Make-up work and tests for all absences should be of the same rigor, but not necessarily the same format, as the original activity, assignment or test.
 5. Make-up tests or presentations may be scheduled before school, after school, during study hall or during the student's class period, at the teacher's discretion to ensure that new and/or significant content is not missed.
 6. Students should make prior arrangements with teachers for making up missed work when the absence can be anticipated, e.g., a dental appointment, court appearance or appointment, approved school-related activities, etc.
 7. After a prolonged absence, the teacher has the right to exempt a student from some assignments if the teacher determines that doing so will not have a negative impact on the student's ability to master the content or unfairly bias his/her grade.
 8. NEISD shall not impose a grade penalty for make-up work after an absence because of suspension.

Late Work:

1. Late work is defined as any assignment that is not submitted on the due date and class period with the exception of make-up work for absences or approved school activities.
2. A 20% deduction from the total grade earned will be taken for late assignments.
3. Late assignments will be accepted until the material has been assessed summatively or within a three-week grading period.

4. Extenuating circumstances may occur that prevent the completion and turning in of assignments on the due date. It is the parent/guardian and/or student's responsibility to inform the teacher and/or an appropriate administrator of any such circumstances so that an exception to the rule may or may not be granted. The teacher and/or appropriate administrator shall have the authority to render a final decision on the granting of any exceptions.

REQUIRED MATERIALS FOR CLASS:

1. My intent is to have as much of the class in Microsoft Teams. However, some paper will be needed to take notes, make sketches, develop ideas, concepts, and to storyboard. - Students should have a notebook of their choosing that allows them to do this. There are tablets and other touch screen devices that will work for this as well and are an acceptable option, but they are **NOT required**.
2. A pencil with an eraser is required for sketching ideas and concepts. The process of sketching ideas and story boarding is usually done in pencil and then inked in, and the pencil lines are erased for the final copy. This is not a drawing class, but if students wish to follow this process, then they will need pens for this as well. **Only the pencil and eraser are required.**
3. Spiral notebook, Loose-leaf paper, or Sketchbook.
4. All work will be required to be backed up. Saving work on a computer as the only copy is not a good idea. We have issues from time to time on our computers and students have lost work as a result. Students can save their work on OneDrive, Google Drive, a Flash Drive, or some other form of a portable hard drive or cloud backup. Remember, save your work, back it up, and do this often. Our projects take many hours to complete and losing your work will require you to redo it all. Losing your work is **NOT** an acceptable excuse for turning it in late.

Grading Policy:

• Projects	40%
• Exams	25%
• Quizzes	20%
• <u>Homework</u>	15%
Total	100%

Game Programming and Design

Lesson Calendar – 1st Semester

Week 1: 16 – 20 August

Introductions

Syllabus and class expectations

Teams – What it is and how we will use it

Getting set up on Unity and CompuScholar

Introduction to game design concepts

Week 2: 23 – 27 September

Chapter One: Game Engines

Chapter Two: Unity Development Environment

Week 3: 30 August – 3 September

Chapter Three: Introduction to Scripting

Chapter Four: Simple Movement and Input

Week 4: 6 – 10 September

Chapter Five: 2D Physics Concepts

Chapter Six: Primitive Data and Math

Week 5: 13 – 17 September

Chapter Seven: Decisions and Flow Control

Chapter Eight: Organizing Game Objects

Week 6: 20 – 24 September

Chapter Nine: Object-Oriented Concepts

Chapter Ten: Managing Game Objects

Week 7: 27 September – 1 October

Chapter Eleven: Exceptions and Debugging

Chapter Twelve: Loops and Arrays

Week 8: 4 – 8 October

Chapter Thirteen: Game Design Strategies

Week 9: 11 – 15 October (end of 1st quarter)

Chapter Fourteen: Mid-Term Project (End of 1st Quarter Project)

Week 10: 18 – 22 October

Chapter Fifteen: Virtual Worlds

Chapter Sixteen: Scrolling Games

Week 11: 25 – 29 October

Chapter Seventeen: Animation

Chapter Eighteen: Sound Effects

Week 12: 1 – 5 November

Chapter Nineteen: Advanced Game Physics

Chapter Twenty: Multiple Scenes

Week 13: 8 – 12 November

Chapter Twenty-One: Artificial Intelligence

Chapter Twenty-Two: User Interfaces

Week 14: 15 – 19 November

Chapter Twenty-Three: Game Art

Chapter Twenty-Four: Publishing Games

Week 14: 22 – 26 November

Thanksgiving Holiday!

Week 15: 29 November – 3 December

Chapter Twenty-Five: Software Development Lifecycles and Teamwork

Week 16: 6 – 10 December

Chapter Twenty-Six: Final Project

Week 17: 13 – 17 December

Final Review

Finals (Written Exam)

December 20 – December 31: Winter Break!!