

GAME 1020 - Tools Programming Video Game Technology Certification

Instructor:

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Course Description:

Every game development team will write or adapt tools for making the development easier. They could be simple tools for gathering the game program and data and pushing it to the target device, or could be complex tools like level editors. Since bad tools can sometimes be worse than no tools at all, it is important for a well-rounded game programmer to have thought about the role of tools in a game's development. That is the reason this course is a requirement. Topics include: When should you make a tool?; Common tool patterns; Commercial tools and components; Open source tools and components; Making your user's life easier, even if it makes your job harder; The responsibility of maintenance; Pipelines; Cross team tool issues.

Prerequisites:

Video game Programming, C/C++ Programming Experience or consent of instructor.

Learning Objectives:

1. Understand industry tools.
2. Know when to make a tool.
3. Make user's lives easier.
4. Maintain toolsets.
5. Write or adapt tools to make the development easier.

Course Length:

42 Hours

Office Hours:

An optional group discussion time will be held during the last hour of each scheduled class (from 8pm – 9pm). If students need additional time with the instructor arrangements can be made as needed.

Textbook:

The Game Asset Pipeline, by Ben Carter, ISBN: 1584503424

Attendance Policy:

While attendance is not required, it is strongly encouraged. Students with poor attendance will receive less lenience when grading their final project.

Course Schedule:

The class will meet from 6pm – 9pm, Thursdays, Jan 25 – May 3.

Session 1

Introduction to the course: review of syllabus, course project, grading policy and introduction of textbook. Discussion and demonstration of existing game tools.

Session 2

Components and goals of the toolchain, common problems, and ideal use cases.

Session 3

Databases and intermediate files. *At this time students should have submitted a description of their target game engine.*

Session 4

Asset management and version control.

Session 5

Dependency-management and automated builds.

Session 6

Working with Digital Content Creation tools.

Session 7

Transforming toolchain data into game-ready assets.

Session 8

Level editors and other specialized tools for your game.

Session 9

Localization and multi-platform development.

Session 10

Evaluating the quality of your toolchain. *At this time students should have notified instructor of any commercial tools required by their toolchain.*

Session 11

Documentation and maintenance.

Session 12

Guest Lecture.

Session 13

Guest Lecture.

Session 14

Project Presentations. *At this time students' projects are due, deliverable on a CD.*

Course Project:

There is only a single assignment for this course due on the last day of the course (session 14). The student is to construct a toolchain that targets a game engine of their choice. The project is graded on both design and implementation, though design is more heavily weighted. The project has the following requirements:

- Ability to export from DCC tool to intermediate file
- Processing of intermediate file into game-ready asset
- Dependency-management of intermediate files and game-ready assets
- Automated build of all intermediate files into game-ready assets
- Version-control and asset management solution
- Custom tool for asset creation

The student will need to provide a CD containing the following files:

- All executables required to demonstrate the toolchain. If the student chooses to use software packages that cannot be included on the CD then instructions for acquiring the package should be included. For commercial software, arrangements should be made with the instructor prior to session 10.
- A tutorial for the instructor to follow that will fully demonstrate all of the requirements of the toolchain as well as any specific features that the student wants the instructor to consider in grading the project.
- A design document describing the student's toolchain, its various components, and its expected use cases during the game development process.

A final component of the project is a demonstration of the toolchain to the class. This requirement may be changed based on the size of the class.

Due to the variety of potential game engines that the student's may be targeting, the instructor will provide case-by-case specifics on the requirements as they relate to the student's chosen game engine.

Grading Policy:

The student's final project will be graded on the following criteria:

- **Usability (25%)** – how user-friendly are the tools provided? Are the tools intuitive for non-programmers? Are there a succinct number of steps required to effectively use the tools and accomplish a user's routine tasks?
- **Flexibility (10%)** – how flexible are the tools and their associated APIs? Can the tools be easily extended or adapted to changes in the game's requirements?
- **Efficiency (5%)** – is the time from tool to game reasonable considering the amount of content and processing required? Are the requirements to run the tools reasonable considering the likely development platforms of the users?
- **Completeness (45%)** – does the toolchain meet all of the requirements of the project?
- **Documentation (15%)** – is the toolchain sufficiently documented such that a user does not require personal instruction for the toolchain's author?

General Grading Policies

College work must exhibit higher order thinking skills including analysis, synthesis, and evaluation. Mere knowledge about a situation or demonstration of comprehension of the material is not sufficient to prepare you for employment consideration. As a Video Game Development student, you must consistently apply higher order thinking in order demonstrate mastery of the material covered in this course. Grades are given for results not for effort. Read the definitions for each grade noted below, as this is really how grades are determined.

Grading is based on an absolute scale - you are not competing with anyone else, but you will be challenging yourself. There are no distributions of grades; hence, all of you can earn an A in this course. Note: Students earns grades, faculty members do not give them. Your final grade will be based on both individual and learning team performance.

Your final grade will be based on the points that you earn during the course. You may receive "fractions" of points on some assignments. When calculating your final grade, I will use the standard rounding convention – meaning that scores with a fraction of $\frac{1}{2}$ or greater will be rounded up, those with a score of less than $\frac{1}{2}$ will be rounded down. I will use the following grading scale to calculate your letter grade.

The grading scale is based on a 100-point (or percentage) scale:

How points and percentages equate to grades

A	90 and above	A = Excellent performance. Work is exemplary and worthy of emulation by others. Student is in full attendance and constructively contributes to the learning environment.
B	80-89	B = Above average performance. All assignments are complete and exhibit a complete understanding and an ability to apply concepts.
C	70-79	C = Average performance. Accomplishes only the minimum requirements. Oral and written communication is at an acceptable level for a college student.
D	60-69	D = Demonstrates understanding at the most rudimentary level. Work is minimally passing.
F	< 59	F = Work is not passing, characterized by incompleteness, lateness, unsatisfactory demonstration of understanding and application.

Video Game Development Program Philosophy

The Video Game Development Program has been designed, developed and implemented in partnership with leading video games studio managers and directors in Austin. The video games industry has undergone significant changes in how games are developed. They are rarely developed by few persons working in isolation. Today's games are often developed by teams of 50 to 200 on schedules from 2 to 3 years with budgets of \$10M to \$20M. The large publishers drive the game development funding and schedules. Consequently, it is critical that personnel in the industry communicate and collaborate effectively.

This drove the certificate requirements definition. Students are required to successfully complete courses in four categories:

1. The base industry courses: Video Games Industry, Business of Video Games and Video Games Development.
 - a. Students will understand what drives the industry, why games are developed, what is needed for success and how to get from idea to delivery.
2. The course specialization courses: Video Game Programming, Video Game Art, Video Game Design and Video Game Production.
 - a. Students will understand the requirements, objectives, limitations and goals of the different disciplines in a studio. This is essential for communication and collaboration.

- b. Students in these core courses will be cross-discipline in order to build an understanding and appreciation of how different discipline teams collaborate and contribute to the final product.
3. The five specialization electives.
 - a. Students will develop skills in the discipline in which the student will seek employment.
4. Non-specialization electives
 - a. These are optional courses that will give you a deeper understanding of what other disciplines do and how they function. They will help you understand how to work with others on the team and to get the 'big picture.' These courses do not count towards the Video Game development certificate.
5. Capstone Project
 - a. This multi-person team project will simulate the real video game development environment. Students will develop a concept, turn it into a design, implement the programming and art required and produce it on the committed schedule. Go/no go milestones and final "publisher" acceptance reviews will mimic the industry. The students will have a deliverable for their portfolio that can be used for employment purposes.

Throughout the program each course will focus on knowledge transfer, skill building and teamwork. There will be a heavy emphasis on projects that will broaden and deepen each student's portfolio development. Portfolios are critical to demonstrating an individual's capabilities. Some projects will individual, many will be team based. How much a student gets out of each course will largely be determined by how much the students puts into the course. Video game development is highly complex, difficult work. The courses are designed to prepare students for that environment. So, come expecting to work hard. The program is designed to reinforce key concepts such as teamwork, collaboration, and cooperation across all disciplines in the games development and management process. Many concepts are repeated throughout the program because they are extremely important to successful game development.