

GAME DEVELOPMENT AND SIMULATION PROGRAMMING (BS)

Program Overview Bachelor of Science Degree

The Bachelor of Science in Game Development and Simulation Programming will prepare students for careers in game programming and software engineering. The program builds on the foundations established in the associate degree program with emphasis placed on acquiring the technical skills necessary to implement games on a variety of platforms including phones, handheld devices, and Xbox.

Through studying and applying key principles of software design as well as specific game algorithms and techniques, students will learn to design and implement games of increasing size and complexity. Class work is centered on developing games in small teams, an approach which allows students to acquire both the technical and interpersonal skills necessary for the game and simulation industry.

A key feature of the program is the senior capstone project where students will bring together knowledge gained throughout the program. Under the supervision of a faculty member, students in teams of two to four will design and develop a game over a period of six months. The project work will be evaluated by a team of three faculty members.

Graduates from this program will be eligible for positions such as game designer, level designer, game developer, quality assurance engineer, software engineer, and game programmer.

Curriculum

With the permission of the Department Chair and recommendations from two discipline faculty members, students may substitute this special project course, VGD 422 Special Projects, for another technical course.

Course	Title	Quarter Credit Hours
Term VII		
GDS 373	Advanced Algorithms and API	4
GDS 375	Simulation and Serious Games	3
GDS 383	2D Game Console Programming	4
MA 315	Math for Game Developers (MA/SCI Core) ¹	4
Quarter Credit Hours		15
Term VIII		
GDS 371	2D Game Engine and Tool Development	4
GDS 381	Software Testing and Quality Assurance	3
GDS 388	Web API for Games	4
EN 322	Argumentative Research Writing (COM Core) ¹	4
Quarter Credit Hours		15
Term IX		
GDS 370	Advanced Game Design	3
GDS 399	3D Game Console Programming I	4
SE 402	Design Patterns	4

MA 310	Calculus I (MA/SCI Core) ¹	4
Quarter Credit Hours		15
Term X		
GDS 404	Artificial Intelligence	4
GDS 405	3D Game Console Programming II	4
VGD 417	Introduction to Virtual Reality Development	4
EN 421	Technical Communications (COM Core) ¹	4
Quarter Credit Hours		16
Term XI		
GDS 410	Introduction to Senior Project	5
Elective	300-400 Level Humanities (or Arts/Foreign Language) Core ¹	4
Elective	300-400 Level Humanities or Social Sciences Core ¹	4
Choose one of the following:		4-6
SE 408	Programming Mobile Devices	
IT 415	Cooperative Learning I	
Quarter Credit Hours		17-19
Term XII		
GDS 420	Senior Project	6
Elective	300-400 Level Social Sciences Core ¹	4
Choose one of the following:		4-7
GDS 422	Emerging Technologies in Game Development	
IT 425	Cooperative Learning II	
Quarter Credit Hours		14-17
Total Quarter Credit Hours		92-97

¹ Liberal Arts Core.

Legend

C = Number of lecture hours per week

L = Number of laboratory hours per week

T = Total Quarter Credit Hours where each lecture hour per week is one credit, every 2-4 laboratory hours are one credit depending on the expected amount of pre- or post-lab work.

All bachelor's degree students are required to take 28 credits of liberal arts and math/science courses as selected from the liberal arts core. See the course descriptions section of this catalog for a list of the core area courses.

Subject to change.

Program Mission, Goals, and Outcomes Program Mission

The mission of the Game Development and Simulation Programming bachelor's degree (GDS BS) program is to provide an advanced program to prepare students to become professional programmers working in the game development or simulation industry, and to prepare students for further education at the master's level.

Through a combination of theory, hands-on state-of-the-art laboratory experiences, small class sizes led by experienced instructors, and a

capstone project, the program emphasizes application of knowledge to the design and development of games and simulations.

Program Goals

The GDS BS program will provide the opportunities:

1. To learn the game development life cycle from design to production, including storytelling, project management, puzzle design, storyboarding and documentation for all genres. Students will learn how new project proposals are approved.
2. To learn 2D and 3D graphics programming, including sprites, scrolling, collision detection and sound effects using industry standard graphics libraries.
3. To learn the latest techniques of advanced programming including algorithms and data structures, artificial intelligence, pattern-based design, network, Internet and mobile programming as well as emerging technologies.
4. To learn game mathematics, including geometry, algebra, matrices, physics, collision detection, lighting and shading.
5. To develop a capstone project incorporating all of the above skills.
6. To instill in the student a sense of commitment to the game programming profession's core values and ethics.

Program Outcomes

Students will:

1. Learn the game development life cycle from design to production, including storytelling, project management, puzzle design, storyboarding and documentation for all genres. Students will learn the appropriate methods and processes used to present new project proposals to management with the purpose of procuring the required approval.
2. Learn 2D and 3D graphics programming, including sprites, scrolling, collision detection and sound effects using industry standard graphics libraries.
3. Learn the latest techniques of advanced programming including, algorithms and data structures, artificial intelligence, pattern-based design, network, Internet and mobile programming as well as emerging technologies.
4. Learn game mathematics, including geometry, algebra, matrices, physics, collision detection, lighting and shading.
5. Complete a capstone project incorporating all of the above skills.
6. Demonstrate clear and concise oral and written communication skills, function as a member of a team, act ethically and responsibly, and respect all people and cultures.

Q&A and Technical Standards Questions & Answers

1. When do my classes meet?

Day Classes: Technical classes normally meet for at least three hours a day for up to five days a week. Classes normally begin in the early morning (7:45 a.m.), late morning (usually 11:25 a.m.), or mid-afternoon. The time slot for your program may vary from term to term.

Evening Classes: Technical classes meet on the average of three nights a week, although there may be times when they will meet four nights a week. Classes normally begin at 5:45 p.m.

In addition, to achieve your bachelor's degree, you will take a total of approximately seven liberal arts courses, which will be scheduled around your program schedule over the course of your entire program. Each liberal arts course meets approximately four hours per week. Liberal arts courses are offered days, evenings, and Saturdays.

At the beginning of each term you will receive a detailed schedule giving the exact time and location of all your classes. The College requires that all students be prepared to take classes and receive services at any of NEIT's locations where the appropriate classes and services are offered.

When a regularly scheduled class falls on a day which is an NEIT observed holiday (Columbus Day, Veterans Day, Martin Luther King, Jr. Day, and Memorial Day), an alternate class will be scheduled as a make up for that class. The make up class may fall on a Friday. It is the student's responsibility to take note of when and where classes are offered.

2. How large will my classes be?

The average size for a class is about 20 to 25 students; however, larger and smaller classes occur from time to time.

3. How much time will I spend in lab?

Almost half of your technical courses consist of laboratory work. In order for you to get the most out of your laboratory experiences, you will first receive a thorough explanation of the theory behind your lab work.

4. Where do my classes meet?

Students should be prepared to attend classes at any of NEIT's classroom facilities: either at the Post Road, Access Road, or East Greenwich campus.

5. How long should it take me to complete my program?

To complete your degree requirements in the shortest possible time, you should take the courses outlined in the prescribed curriculum. For a typical six-term curriculum, a student may complete the requirements in as little as 18 months.

To complete all your degree requirements in the shortest time, you should take at least one liberal arts course each term.

Students may also elect to complete some of their liberal arts requirements during Intersession (except for EN courses), a five-week term scheduled between Spring and Summer Terms. Students will not be assessed any additional tuition for liberal arts courses taken during the Intersession but may be assessed applicable fees.

Students wishing to extend the number of terms needed to complete the required technical courses in their curriculum will be assessed additional tuition and fees.

6. Is NEIT accredited?

NEIT is accredited by the New England Commission of Higher Education (NECHE). Accreditation by NECHE is recognized by the federal government and entitles NEIT to participate in federal financial aid programs. Some academic departments have specialized professional accreditations in addition to accreditation by NECHE. For more information on accreditation, see NEIT's catalog.

7. Can I transfer the credits that I earn at NEIT to another college?

The transferability of a course is always up to the institution to which the student is transferring. Students interested in the transferability of their credits should contact the Office of Teaching and Learning for further information.

8. Can I transfer credits earned at another college to NEIT?

Transfer credit for appropriate courses taken at an accredited institution will be considered upon receipt of an official transcript for any program, biology, science, and mathematics courses in which the student has earned a "C" or above within the past three years and for English or humanities courses in which the student has earned a "C" or above within the last ten years. An official transcript from the other institution must be received before the end of the first week of the term for transfer credit to be granted for courses to be taken during that term. Students will receive a tuition reduction for the approved technical courses based on the program rate and will be applied against the final technical term of the curriculum's tuition amount. No tuition credit is provided for courses which are not a part of the technical curriculum.

9. What is the "Feinstein Enriching America" Program?

New England Institute of Technology is the proud recipient of a grant from the Feinstein Foundation. To satisfy the terms of the grant, the College has developed a one-credit community enrichment course which includes hands-on community enrichment projects. The course can be taken for a few hours per term, spread over several terms. Students who are already engaged in community enrichment on their own may be able to count that service towards course credit.

10. How many credits do I need to acquire my Financial Aid?

In order to be eligible for the maximum financial aid award, you need to maintain at least 12 credits per academic term.

11. What does my program cost?

The cost of your program will be as outlined in your enrollment agreement, along with your cost for books and other course materials. Students who decide to take more terms than the enrollment agreement describes to complete the technical courses in their curriculum will be subject to additional fees and possible additional tuition costs. Students who elect to take the technical portion of the degree requirements at a rate faster than the rate prescribed in the curriculum and the enrollment agreement will be assessed additional tuition.

Students who require prerequisite courses will incur additional tuition and fees above those outlined in their enrollment agreement.

If a student elects to take a course(s) outside of the prescribed curriculum, additional tuition and fees will be assessed.

Remember, students who withdraw and re-enter, one time only, pay the tuition rate that was in effect for them at the time of their last day of attendance for up to one year from their last day of attendance. Second re-entries and beyond pay the tuition rate in effect at the time they re-enter. The most economical way for you to complete your college degree is to begin your program now and continue your studies straight through for the six terms necessary to complete your degree requirements.

12. What kind of employment assistance does NEIT offer?

The Career Services Office assists NEIT students and graduates in all aspects of the job search, including resume writing, interviewing skills, and developing a job search strategy. Upon completion of their program, graduates may submit a resume to the Career Services Office to be circulated to employers for employment opportunities in their fields. Employers regularly contact us about our graduates. In addition, our Career Services Office contacts employers to develop job leads. A strong

relationship with employers exists as a result of our training students to meet the needs of industry for over fifty years. No school can, and NEIT does not, guarantee to its graduates employment or a specific starting salary.

13. Where will job opportunities exist?

Graduates have obtained employment in the local area. However, one of the most exciting aspects of this program is the ability to look nationally for employment opportunities.

14. What kind of jobs will I be qualified to look for?

Generally, jobs will exist in the entry-level positions in the computer industry. Upon completion of a bachelor's degree at NEIT, positions on the management level become attainable.

Technical Standards

These technical standards set forth by the Computer Science department establish the essential qualifications considered necessary for students admitted to the program. The successful student must possess the following skills and abilities or be able to demonstrate they can complete the requirements of the program with or without reasonable accommodation, using some other combination of skills and abilities.

Cognitive Ability

- Good reasoning and critical thinking skills.
- Ability to learn, remember and recall detailed information and to use it for problem solving.
- Ability to deal with materials and problems such as organizing or reorganizing information.
- Ability to use abstractions in specific concrete situations.
- Ability to separate complex information into its component parts.
- Ability to perform tasks by observing demonstrations.
- Ability to perform tasks by following written instructions.
- Ability to perform tasks following verbal instructions.
- Possession of basic keyboarding skills and knowledge of computer programs.

Communications Skills

- Ability to speak in understandable English in a classroom situation on a one-on-one basis as well as before a group.
- Ability to communicate effectively with faculty and other students.
- Ability to demonstrate and use the knowledge acquired during the classroom training process.
- Ability to verbally express technical concepts clearly and distinctly.
- Ability to express thoughts clearly.

Adaptive Ability

- Ability to remain calm in the face of computer lab equipment and/or software failure.
- Ability to maintain emotional stability and the maturity necessary to interact with members of the faculty and students in a responsible manner.
- Ability to tolerate the differences in all students, faculty, and administration.

- Ability to follow instructions and complete tasks under stressful and demanding conditions.
- Ability to adapt in a positive manner to new and changing situations with an open mind and flexibility.
- Ability to think clearly and act quickly and appropriately in stressful situations.

Physical Ability

- Ability to sit continuously at a personal computer for long periods of time in order to learn and become proficient in computer programming and networking.
- Ability to perform learned skills independently, with accuracy and completeness within reasonable time frames in accordance with classroom and business procedures.

Manual Ability

- Sufficient motor function and sensory abilities to participate effectively in the classroom laboratory.
- Sufficient manual dexterity and motor coordination to coordinate hands, eyes and fingers in the operation of computers and business equipment.

Sensory Ability

Visual

- Acute enough to see clearly and interpret the contents on the computer screen.

Degree Progress Checklist

Game Development and Simulation Programming - BS

Degree Progress Checklists

- For students entering Sequence A January 2021 or later
- For students entering Sequence B January 2021 or later

- For students entering Sequence A October 2017 to December 2020
- For students entering Sequence B October 2017 to December 2020