



# Catalog Addendum 2013-2014

# RULES AND POLICIES FOR THE ACADEMIC YEAR 2013-2014

## GENERAL INFORMATION

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### Accreditation

*[Updated: March 2013]*

DigiPen Institute of Technology is accredited by the Accrediting Commission of Career Schools and Colleges ("ACCSC", or "the Commission"), a recognized accrediting agency by the United States Department of Education.

Important dates in DigiPen's accreditation history are as follows:

- 2002: DigiPen was granted initial accreditation by ACCSC, including the approval for the Bachelor of Science in Real-Time Interactive Simulation degree program.
- 2002: DigiPen received ACCSC approval for the Bachelor of Fine Arts in Production Animation (BFA) degree program.
- 2003: DigiPen received ACCSC approval for the Bachelor of Science in Computer Engineering degree program.
- 2005: DigiPen was granted a renewal of accreditation by ACCSC.
- 2006: DigiPen was granted approval for its Master of Science in Computer Science degree program by ACCSC.
- 2008: DigiPen was granted approval for its Bachelor of Arts in Game Design and Bachelor of Science in Game Design degree programs by ACCSC.
- 2010: DigiPen was granted approval for its relocation to its current facility by ACCSC.
- 2010: DigiPen received ACCSC approval which allows DigiPen Institute of Technology Singapore to disclose in its advertising that it is a branch campus of DigiPen Institute of Technology.
- 2010: DigiPen was granted approval to change the program name from the Bachelor of Fine Arts in Production Animation to the Bachelor of Fine Arts in Digital Art and Animation.
- 2011: DigiPen was granted approval to change the program name from the Bachelor of Science in Real-Time Interactive Simulation to the Bachelor of Science in Computer Science in Real-Time Interactive Simulation.
- 2011: DigiPen Institute of Technology Singapore was granted accreditation by ACCSC as a branch campus of the main school located in Redmond, Washington, USA.
- 2011: DigiPen was granted approval for its Master

of Fine Arts in Digital Arts degree program by ACCSC.

- 2012: DigiPen was granted approval for its Bachelor of Arts in Music and Sound Design and Bachelor of Science in Engineering and Sound Design degree programs by the ACCSC.
- 2012: DigiPen was granted approval to change the program name from the Bachelor of Science in Game Design to the Bachelor of Science in Computer Science and Game Design.

Any person desiring information about the accreditation requirements or the applicability of these requirements to the Institute may contact the ACCSC by mail at 2101 Wilson Boulevard, Suite 302, Arlington, VA 22201, or by phone at (703) 247-4212. ACCSC's website address is [www.accsc.org](http://www.accsc.org).

## HISTORY OF DIGIPEN INSTITUTE OF TECHNOLOGY

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*[Updated: February 2013]*

DigiPen was founded in 1988 by Mr. Claude Comair as a computer simulation and animation company based in Vancouver, British Columbia, Canada. As the demand for production work increased, DigiPen faced difficulty finding qualified personnel, and in 1990, it began offering a dedicated training program in 3D computer animation to meet this growing need.

That same year, DigiPen approached Nintendo of America to jointly establish a post-secondary program in video game programming. The result of this collaborative effort was the DigiPen Applied Computer Graphics School, which in 1994, officially accepted its first class of video game programming students to its Vancouver campus for the two-year Diploma in the Art and Science of 2D and 3D Video Game Programming. In 1995, DigiPen implemented a revised two-year 3D computer animation program and graduated student cohorts over each of the following four years.

Around this time, the video game industry underwent a paradigm shift from dealing primarily with 2D graphics and gameplay to full 3D worlds that players could freely explore. As these worlds became more sophisticated, so did the task of programming, designing, and animating them. In anticipation of this change, DigiPen developed a four-year bachelor's degree in video game programming (the Bachelor of Science in Computer Science in Real-Time Interactive Simulation) that would prepare students for the challenges of creating complex 3D game and simulation software.

In 1996, the Washington State Higher Education Coordinating Board (HECB) granted DigiPen the authorization to award both Associate and Bachelor of Science degrees in Real-Time Interactive Simulation. Two years later, in 1998, DigiPen Institute of Technology opened its campus in Redmond, Washington, USA. In 1999, DigiPen began offering the Associate of Applied Arts in 3D Computer Animation. At this time, DigiPen phased out its educational activities in Canada, moving all operations to its Redmond campus. On July 22, 2000, DigiPen held its first commencement ceremony, where it awarded Associate of Science and Bachelor of Science degrees.

In 2002, DigiPen received accreditation from the Accrediting Commission of Career Schools and Colleges (ACCSC). In 2004, DigiPen began offering three new degrees: the Bachelor of Science in Computer Engineering, the Master of Science in Computer Science, and the Bachelor of Fine Arts in Digital Art and Animation. In 2008, DigiPen added two more degree programs: the Bachelor of Science in Computer Science and Game Design and the Bachelor of Arts in Game Design.

Also in 2008, DigiPen partnered with Singapore's Economic Development Board to open its first international branch campus, offering the following degrees: the Bachelor of Science in Computer Science in Real-Time Interactive Simulation, the Bachelor of Science in Computer Science and Game Design, the Bachelor of Fine Arts in Digital Art and Animation, and the Bachelor of Arts in Game Design. In 2010, DigiPen announced plans to open its first European campus in Bilbao, Spain\*.

That same year, DigiPen relocated its US campus to its current location at 9931 Willows Road Northeast in Redmond, Washington. In addition to uniting DigiPen's BFA and BS programs under one roof, the larger campus provides more spaces for students to learn, meet, and collaborate on group projects.

On September 26, 2011, DigiPen launched DigiPen Institute of Technology Europe – Bilbao offering two bachelor's degree programs: Bachelor of Science in Computer Science in Real-Time Interactive Simulation and Bachelor of Fine Arts degree in Digital Art and Animation, to forty students.

On October 11, 2011, DigiPen Institute of Technology Singapore was granted accreditation by ACCSC as a branch campus of the main school located in Redmond, Washington, USA.

In 2012, DigiPen added three new degree programs: the Bachelor of Arts in Music and Sound Design, the Bachelor of Science in Engineering and Sound Design, and the Master of Fine Arts in Digital Arts.

*\*DigiPen's Europe-Bilbao campus does not fall within the scope of ACCSC accreditation.*

## **WAIVER CREDIT, AP EXAMINATIONS, CLEP, AND OTHER CREDIT**

*[Updated June 2013]*

Students may apply for course waivers if they can demonstrate that their knowledge and skills - whether they were gained by formal education, exam, work experience, or life experience – are equivalent to those gained by courses offered at DigiPen Institute of Technology Singapore. Credit may be granted through other means: Advanced Placement (AP) Exam scores, International Baccalaureate (IB) courses, College-Level Examination Program (CLEP) subject exam scores, or transfer credits from other post-secondary institutions. A maximum of nine credits per semester may be earned by these means. Course transfers and waivers are processed at S\$42.80 (inclusive of 7% GST) per credit.

## **Transfer Credits**

*[Updated July 2013]*

Credit earned by examination at other colleges or universities in the last 10 years may be transferred, provided such credit meets the guidelines used by the Institute. For undergraduate programs, a student must take a minimum of 50% of the entire program at the Institute.

The Registrar will evaluate college credits earned elsewhere with respect to graduation requirements at the Institute. Developmental classes, orientation classes, or classes in which a student receives a "Pass" are not eligible for transfer credit consideration. Courses transferred or waived are entered on transcripts, but no grades or quality points are awarded.

Transfer credit may be accepted subject to the following conditions and restrictions:

1. The courses(s) offered for transfer must be taken at a bona fide, legitimate institution recognized and approved by a regulatory authority which oversees the educational system in the country where the institution is located. These courses must appear on official transcripts from the institution. The final decision regarding the transferability of credits remains at the Institute's discretion.
2. The course(s) must be comparable in academic quality to the Institute courses; transfer credit will be denied for courses not meeting this standard. Accordingly, current students are strongly urged to seek transfer approval from their advisor and the Registrar using the form provided for this purpose prior to enrollment in any course for which transfer approval might be sought.
3. Transfer credit will be considered for courses in which the grade of "B-" or better is recorded.
4. Courses transferred to a student's major may also require a validation examination in order to be accepted.
5. "Credit" or "Pass" grades will not be accepted for transfer.

If a course is accepted for credit, it will be counted as a transfer credit. No grade points from such transfer courses will be calculated in the Institute grade point average. However, grades transferred for courses taken in residence at institutions with which the Institute has direct, formal institutional exchange agreements are exempt from this policy and will be recorded. Credit hours from another institution that are accepted towards the student's educational program must count as both attempted and completed hours. Courses transferred in may not be used to substitute improved grades for passing grades earned at the Institute.

# INTERCAMPUS TRANSFER POLICY

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[New: July 2013]

Intercampus Transfers are students who have enrolled in a DigiPen degree program and wish to permanently transfer to another DigiPen campus. Students who intend to complete an intercampus transfer should submit a completed Application for Campus Transfer to the Office of Admissions for the campus to which they wish to transfer.

Before applying for intercampus transfer, it is important for students to be made aware of the following conditions:

1. Students should complete a minimum of twenty-five percent (25%) of the credits required for the undergraduate degree program at the DigiPen campus awarding the degree;
2. At a minimum, students must maintain matriculated status for at least one academic year and complete the final semester at the campus awarding the degree.

Students may contact the Office of the Registrar at their current campus for more information on transfer requirements, deadlines, and any other special procedures.

## STANDARDS OF PROGRESS

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[Updated July 2013]

### Semester Credit Hour

The semester credit hour is the basic unit of credit awarded at the Institute. The academic value of each course is stated in semester credits. DigiPen defines a semester credit hour as follows:

Over any semester, one semester credit hour of academic credit equals:

- at least 15 hours of classroom contact, or
- at least 22.5 hours of supervised laboratory time, or
- at least 45 hours of internship or externship experience.

In addition, each semester credit also assumes:

- a minimum of 30 hours over the semester for external preparation, project work, or homework by the student, except for independent studies or internship or externship experience.

A classroom contact hour is 53 minutes in length.

Whenever “semester hour” is used in this Catalog, it is synonymous with “semester credit hour” (SCH) and does not always represent “hours per week in class.”

## Satisfactory Progress

[Updated: July 2013]

Satisfactory progress toward a degree by a full-time student is defined as a full attempt of 24 credits during an academic year. This should include registration for at least 12 credits per semester and successful completion of at least 12 credits per semester. “Full attempt” is defined as the receipt of a final letter grade (“A” to “F”) but not the receipt of a “W” or an “I.” Successful completion is defined as the receipt of a passing letter grade (“A” to “C-” in a degree’s core courses, and “A” to “D” in non-major courses). Core courses and non-major courses are denoted under each individual degree program’s recommended sequence of required classes chart. The Registrar makes decisions on student status.

A program of study must be completed within a reasonable period of time for a student to be eligible for graduation; that is, the credit hours attempted cannot exceed 1.5 times the credit hours required to complete the program. For example, the BFA in Digital Art and Animation program normally takes 145 credits to complete. Students in this program have up to 217.5 credits to complete their program. The Registrar will withdraw students from the Institute who do not meet this requirement.

## Academic Warning

[Updated: July 2013]

Students who fail to maintain the required minimum cumulative Grade Point Average (GPA) or who fail to complete their academic program within the maximum attempted credits allowed will be placed on Academic Warning.

### Failing to Meet Minimum GPA Requirement

Students who fail to maintain the required minimum cumulative GPA will be placed on Academic Warning the semester following the one where their cumulative GPA falls below the minimum required GPA. Students are removed from Academic Warning as soon as their cumulative GPA is above the minimum required GPA. Students who earn a 2.0 during their probationary semester but do not raise their cumulative GPA above the minimum requirement will continue Academic Warning until their cumulative average meets the minimum requirement.

While on Academic Warning, students will be restricted to a maximum course load of 15 credits of which 50% must be core courses as defined in the course catalog.

Probationary students must achieve a GPA of 2.0 or higher during their probationary semester. Failure to satisfy these requirements will result in academic expulsion, and expelled students must wait 12 months before they can reapply for admission.

# OVERSEAS IMMERSION PROGRAM

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*[New: July 2013]*

As required by the collaboration with Singapore Institute of Technology, DigiPen Institute of Technology Singapore operates an overseas exchange program, named as "Overseas Immersion Program," for all DigiPen – SIT students to attend a particular phase of the Institute's baccalaureate degree programs of study (as defined by the Program Directors) at the main campus, DigiPen Institute of Technology, located at Redmond, Washington, USA.

The Overseas Immersion Program is designed to allow DigiPen Institute of Technology Singapore's students to acquire overseas learning and immersion experience at the main campus, which would enrich their baccalaureate programs of study. All DigiPen – SIT students should complete this program at their own expenses. For more information, please refer to the SIT's website at [www.singaporetech.edu.sg](http://www.singaporetech.edu.sg).

## EDUCATIONAL RIGHTS AND PRIVACY OF STUDENT RECORDS

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*[Updated: June 2013]*

DigiPen Institute of Technology Singapore reserves certain rights for students with respect to their education records. These rights are:

1. The right to inspect and review the student's education records within 45 days of the day the Institute receives a request for access: Students should submit to the Registrar, Dean, or head of the academic department (or appropriate official) written requests that identify the record(s) they wish to inspect. The Institute official will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the Institute official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.
2. The right to request the amendment of the student's education records that the student believes is inaccurate or misleading: Students may ask the Institute to amend a record that they believe is inaccurate. They should write to the Institute official responsible for the record, clearly identify the part of the record they want changed, and specify why it is inaccurate. If the Institute decides not to amend the record as requested by the student, the Institute will notify the student of the decision and advise the student of his or her right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing.

3. The right to consent to disclosures of personally identifiable information contained in the student's education records: One exception, which permits disclosure without consent, is disclosure to school officials with legitimate educational interests. A school official is defined as a person employed by the Institute in an administrative supervisory, academic, or support staff position (including law enforcement unit personnel and health staff); a person or company with whom the Institute has contracted (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks. A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility. Upon request, the Institute discloses education records without consent to officials of another school to which a student seeks or intends to enroll.

## REGULATION OF CONDUCT AND DISCIPLINARY PROCEDURES

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*[Updated June 2013]*

The Institute has the right to take appropriate disciplinary action warranted by a student's misconduct. The specific provisions as to offenses, penalties, and disciplinary procedures set out below should not be construed as limiting the general authority of the Institute.

### Rules and Regulations

1. It is strictly forbidden to bring in or out of the premises any digital storage and any form of memory sticks or optical media, diskettes, video recorders, etc., other than for academic and approved usages which directly apply to courses being taken by the student during the term of this agreement, or for the required purpose of maintaining back-up copies of student-created projects and assignments. Additionally, it is forbidden to bring in any personal computers or software, as well as any video or audio recording equipment, without first agreeing to and signing a Network and Internet Usage Agreement. Students are responsible for guaranteeing that any files transferred to and from the Institute's equipment are free of malicious viruses or Trojan horses. In respect to the above, students are only allowed to carry in and out of the Institute premises data files only and not executable files. This includes student-created executables. Following this policy will greatly reduce the risks of virus infections to the Institute network. In order for the Institute faculty to review and grade projects and assignments, source code must be stored and executables must be generated at the Institute from the corresponding source code.
2. Students are forbidden from downloading any files from the Internet or installing any software, including

but not limited to freeware and/or shareware, without the written approval from the Institute's faculty member or IT department. Furthermore, illegal use of the Internet may be prosecuted to the fullest extent of the law.

3. In order to prevent damage to equipment and facilities, food and/or drink are not permitted anywhere within the training areas of the premises.
4. Smoking is not permitted anywhere within the premises, washrooms, elevators, or stairwells.
5. Student ID tags must be worn visibly when on the premises. Lost or stolen ID tags must be reported to the Administration Office as soon as possible.
6. All student projects must receive approval from the Institute's instructors prior to commencement of any production. The Institute reserves the right to reject ideas or to stop production of any student game, animation, or project for reasons deemed appropriate to the Institute. The Institute will not allow the production of any student work that contains or makes a direct or indirect reference to any of the following material/subjects:
  - Religious content
  - Religious symbols
  - Pornographic material
  - Excessive violence
  - Sexual and nude content
  - Promotion of illegal substances
  - Promotion of racism or hate
  - Content demeaning to any group of society
7. Plagiarism will not be tolerated. Any student who submits the work of another person as his or her own is considered to have committed plagiarism. Types of work that can be plagiarized include, but are not limited to, source code, artwork, concepts, designs, or other material. Anyone submitting someone else's work without the explicit written permission from the legal owner may have violated the owner's intellectual property rights or copyrights, in addition to committing plagiarism. If any student is unsure as to what constitutes a case of plagiarism, he or she should consult an instructor for clarification.
8. Cheating on an examination will not be tolerated. Using any materials other than those authorized by the examiners during an exam is an example of cheating.
9. Submitting false documents, transcripts, or any other academic credentials to gain admission to the Institute or to obtain any academic benefit is grounds for expulsion without recourse.
10. Disrupting instructional activities, including making it difficult to proceed with scheduled lectures, seminars, examinations, tests, etc., shall be considered an offense.
11. In the interest of maintaining an environment that is safe and free of violence and/or threats of violence for its employees, students, and visitors, possession of a dangerous weapon is prohibited on property owned by or under the control of the Institute. Weapons and ammunition are potential safety hazards. Possession, use, or display of weapons or ammunition is inappropriate in an academic community for any reason, except by law enforcement officials. No weapons or ammunition shall be worn, displayed, used, or possessed on campus. Any member of the Institute community who violates this policy shall be subject to appropriate disciplinary action up to and including dismissal from the Institute and shall be subject to all appropriate procedures and penalties including, but not limited to, the application of the criminal trespass provisions of the law of the Republic of Singapore. Any person who is not a member of the Institute community who violates this policy shall be subject to all appropriate procedures and penalties including, but not limited to, the application of the criminal trespass provisions of the law of the Republic of Singapore. Members of the Institute community who are aware of any violations of this policy or who have other concerns about safety or weapons should report them to the Dean of Faculty, Director of Operations, or the Chief Operating Officer.
12. Evidencing symptoms of alcohol or drug use while on Institute property, or the procurement or possession of alcohol or illegal substances on Institute property, is considered an offense.
13. It is forbidden to damage, remove, or make unauthorized use of the Institute's property or the personal property of faculty, staff, students, or others at the Institute. Without restricting the generality of "property," this includes information, however it may be recorded or stored.
14. It is strictly forbidden to use any equipment in the premises to produce any commercial work. The equipment is only to be used for homework and training purposes. Any attempt to produce commercial work will result in legal action against the offenders.
15. Public areas and equipment of the building must be kept clean. No tampering, moving, defacing, or otherwise altering the premises, equipment, or the building property is allowed.
16. Graffiti, other forms of mural art, or the posting of signs anywhere in the premises and the building without permission of the Administration is not permitted.
17. Office equipment (photocopier, fax, office phone, etc.) is not available for student use.
18. The assault of individuals, whether verbal, non-verbal, written, physical, including conduct, or any other kind of assault which leads to the physical or emotional injury of faculty, staff, students, or others at the Institute, or which threatens the physical or emotional well-being of faculty, staff, students, or others at the Institute, is considered an offense.
19. In accordance with applicable law, the Institute prohibits sexual harassment and harassment

between employees, between students, and between employees and students. Harassment due to race, sex, color, national origin, ancestry, religion, physical or mental disability, veteran status, age, or any other basis protected by federal, state, or local law may violate the law and will not be tolerated. The Institute's policy prohibits inappropriate conduct even though it may not reach the legal standard for harassment.

20. It is forbidden to attempt to engage in, aid and abet others to engage in, or attempt to engage in conduct which would be considered an offense.
21. Downloading or installing software on the Institute's equipment without written permission from the Institute is considered an offense.
22. Failing to comply with any penalty imposed for misconduct is considered an offense.

*[Updated: August 2013]*

### Program Overview

The electronic and digital entertainment industry is one of the fastest growing and most exciting career choices of the future. The video game, movie, and military industries are only a few of those that demand well-trained, enthusiastic programmers, designers, artists, and managers. DigiPen Institute of Technology is a key provider of these individuals, and the Bachelor of Science in Computer Science in Real-Time Interactive Simulation prepares programmers for these industries. Designed and developed by industry experts and DigiPen faculty, the Institute's four-year BS in Computer Science in Real-Time Interactive Simulation program is a computer science degree that is highly focused on the technical area of graphics and simulations. Participants in the BS in Computer Science in Real-Time Interactive Simulation program specialize in the skills and tools necessary to create real-time simulations of real-life events and imaginary situations.

The BS in Computer Science in Real-Time Interactive Simulation program offers extensive training in mathematics and physics as a foundation for the various topics presented in general computer science and computer graphics. Throughout the degree program, BS in Computer Science in Real-Time Interactive Simulation students participate in several team-based projects. These substantial projects are designed to give students concrete experiences in which they apply the theoretical knowledge gained from their courses. Forming the cornerstone of the program, these projects exemplify many of the skills necessary in the video game industry today: teamwork, design, implementation, follow through, and business knowledge, among others. BS in Computer Science in Real-Time Interactive Simulation students gain the experience of designing, programming, and testing a variety of simulations and games, including text-based, scrolling, simulation, and 2D and 3D games.

Students in this degree program work both individually and collaboratively to learn the fundamentals of game design, production, and programming. Additionally, they write game design documents and technical design documents, learn how to schedule tools and techniques, and participate in the full production of several games. These game-oriented productions are a perfect media to present complicated subjects in a format agreeable to students. These productions:

- Are graphics-oriented simulations, including 2D and 3D simulations.
- Can realistically reproduce or simulate natural phenomena and real-life events. Flight simulators are excellent examples of such simulations.
- Are highly interactive, requiring an elaborate and efficient graphical user interface (GUI). The development of a GUI requires the management of windows, menus, dialog boxes, and hardware resources including keyboards, mice, and display monitors.



- React in real time. The implementation of such simulations requires a thorough knowledge of computer hardware and computer languages.
- Are story-based simulations requiring a plot in which game objects must interact intelligently with each other. Therefore, in order to make games challenging and interesting, students must design and implement good artificial intelligence algorithms, which serve as the cognitive processes for the computer-controlled game objects.
- Could be designed for either a single-player or multi-player environment. The development of the latter requires the understanding of subjects such as computer networks, TCP/IP, and Internet programming.
- Are excellent examples of large and complex productions. Teamwork is essential to the successful completion of such productions. Therefore, students are divided into teams and are rigorously trained in object-oriented programming languages, paradigms, and software engineering techniques and practices.

Graduates of this degree program will be prepared to enter the video game industry as entry-level computer scientists and software engineers. Possible entry-level position titles include computer scientist, software engineer, software developer, software development engineer, software development engineer in test, software analyst, computer programmer, gameplay programmer, engine programmer, physics programmer, graphics programmer, networking programmer, artificial intelligence programmer, user interface programmer, tools programmer, web programmer, or game scripter. After many years in the industry, graduates may attain titles such as lead engineer, lead developer, development manager, principal engineer, technical director, and chief technology officer. This degree program also includes secondary training that can contribute directly to a graduate obtaining positions with titles such as producer, program manager, technical program manager, technical designer, and technical writer.

Students in the BS in Computer Science in Real-Time Interactive Simulation program who are interested in pursuing a graduate degree at DigiPen or taking graduate level coursework during their undergraduate studies, may participate in the “Accelerated Schedule” option, which permits students who meet the minimum requirements to take selected graduate-level courses during the junior and senior years of their undergraduate study and apply up to 15 credits towards both BS and MS degree requirements. Students who pursue the accelerated schedule can successfully complete their BS in Computer Science in Real-Time Interactive Simulation degree and Master of Science in Computer Science in five years sequentially. Please refer to the section about the “Accelerated Schedule” for more details.

Rather than attempt to provide a broad, general education, this degree program is an intensive educational experience in a specialized and highly technical area, and it prepares students for a career in several rapidly expanding industries. Staff and faculty are prepared to guide students desiring more general education course work about supplementary opportunities available through other institutions.

## Degree Requirements

### Number of Credits and GPA

The BS in Computer Science in Real-Time Interactive Simulation requires completion of at least 154 credits with a cumulative GPA of 2.0 or better. The program usually spans eight semesters of 15 weeks each, or a total of four academic years.

### Grade Requirements and Core Courses

Students must receive a grade of “C-” or higher in all core courses for the BS in Computer Science in Real-Time Interactive Simulation major. (In a non-core course, a grade of “D” or higher is considered passing.) The core courses are all those taken to fulfill the GAM, MAT, and CS requirements as described below. PHY 200 is also a core course.

### Art Requirements

Students are required to take ART 210, CG 130 and 2 additional credits from the following: ANI 125, ART 400, FLM 115, FLM 151, FLM 152, FLM 275, or ART 410. (Total: 7 credits)

### Computer Science Requirements

The following courses are required: CS 100, CS 120, CS 120L, CS 170, CS 170L, CS 180, CS 200, CS 225, CS 230, CS 250, CS 260, CS 280, CS 300, CS 315, CS 330, CS 350, and CS 365. Students must select four more courses (12 credits) numbered higher than 200 or PHY 350. (Total: 60 credits)

### Electives Requirements

At least eight credits from any courses in any departments at DigiPen. (Total: 8 credits)

### Humanities and Social Sciences Requirements

Required courses are COL 499, ENG 110 and COM 150. Five additional ENG credits are required from ENG 116 and above. Students must take an additional three credits in HIS, PSY, or SOS. (Total: 15 credits)

### Mathematics Requirements

The following courses are required: MAT 140, MAT 150 or MAT 180, MAT 200 or MAT 230, MAT 250, MAT 258, MAT 300, and one MAT elective numbered higher than 300, or MAT 256. (Total: 24 credits)

### Physics Requirements

The following courses are required: PHY 200 and PHY 250. (Total: 6 credits)

### Projects Requirements

The following courses are required: GAM 100, GAM 150, GAM 200, GAM 250, GAM 300, GAM 350, GAM 400, and GAM 450. (Total: 34 credits)

### **Note on General Education Courses**

The following courses satisfy the general education requirement for the BS in Computer Science in Real-Time Interactive Simulation: ART 210 (2), ART elective (2), COM 150 (3), ENG 110 (3), ENG electives numbered ENG 116 or higher (5), a social science elective in HIS, PSY, or SOS (3), MAT 150 or MAT 180 (4), MAT 250 (3), PHY 200 (3), and PHY 250 (3), for a total of 31 credits.

**Recommended Course Sequence Chart  
(BS in Computer Science in Real-Time  
Interactive Simulation)**

Semester	Course	Course Title	Core*	Credits
Semester 1	MAT 140	Linear Algebra and Geometry	X	4
	CS 100	Computer Environment 1	X	4
	CS 120	High-Level Programming I – The C Programming Language	X	3
	CS 120L	High-Level Programming I Lab	X	1
	GAM 100	Project Introduction	X	3
	ENG 110	Composition		3
	<b>Semester Total</b>			
Semester 2	MAT 150 or MAT 180	Calculus and Analytic Geometry I or Vector Calculus I	X	4
	CS 170	High-Level Programming II – The C++ Programming Language	X	3
	CS 170L	High-Level Programming II Lab	X	1
	CS 230	Game Implementation Techniques	X	3
	GAM 150	Project I	X	3
	COM 150	Interpersonal and Work Communication		3
	<b>Semester Total</b>			
Semester 3	MAT 200 or MAT 230	Calculus and Analytic Geometry II or Vector Calculus II	X	4
	CS 180	Operating System I, Man-Machine Interface	X	3
	CS 200	Computer Graphics I	X	3
	CS 225	Advanced C/C++	X	3
	GAM 200	Project II	X	4
	PHY 200	Motion Dynamics	X	3
	<b>Semester Total</b>			
Semester 4	PHY 250	Waves, Optics, and Aerodynamics		3
	CS 250	Computer Graphics II	X	3
	CS 365	Software Engineering	X	3
	CS 280	Data Structures	X	3
	GAM 250	Project II	X	4
	MAT 250	Linear Algebra	X	3
	<b>Semester Total</b>			

Semester	Course	Course Title	Core*	Credits
Semester 5	CS 300	Advanced Computer Graphics I	X	3
	CS 260	Computer Networks I, Interprocess Communication	X	3
	CS 330	Algorithm Analysis	X	3
	MAT 258	Discrete Mathematics	X	3
	CG 130	3D Computer Animation Production I		3
	GAM 300	Project III	X	5
	<b>Semester Total</b>			
Semester 6	MAT 300	Curves and Surfaces	X	3
	CS 350	Advanced Computer Graphics II	X	3
	CS 315	Low-Level Programming	X	3
	Computer Science or Physics Elective	Any 200-level or higher CS course not required or PHY 350	X	3
	GAM 350	Project III	X	5
	COL 499	Career Search Preparation: Materials, Logistics and Communication	X	1
	Elective	An elective of the student's choice from any department at DigiPen Institute of Technology Singapore		3
<b>Semester Total</b>				<b>21</b>
Semester 7	Art Elective	Select one: ANI 125, ART 400, FLM 115, FLM 151, FLM 152, FLM 275, or ART 410		2-3
	English Elective	One English elective chosen from any ENG course, ENG 116 and above		2-4
	Computer Science or Physics Elective	Any 200-level or higher CS course not required or PHY 350	X	3
	Math Elective	MAT 256 or any MAT course greater than 300	X	3
	GAM 400	Project IV	X	5
	Elective	An elective of the student's choice from any department at DigiPen Institute of Technology Singapore		3
	ART 210	Art Appreciation		2
<b>Semester Total</b>				<b>20-23</b>
Semester 8	English Elective	One English elective chosen from any ENG course, ENG 116 and above		2-4
	Computer Science or Physics Elective	Any 200-level or higher CS course not required or PHY 350	X	3
	Computer Science or Physics Elective	Any 200-level or higher CS course not required or PHY 350	X	3
	GAM 450	Project IV	X	5
	Elective	An elective of the student's choice from any department at DigiPen Institute of Technology Singapore		3
	HSS Elective	One humanities & social science elective from any three-credit HIS, PSY or SOS courses		3
<b>Semester Total</b>				<b>19-21</b>
<b>Degree Total</b>				<b>154 minimum</b>

\*Note: Please see the Degree Requirements for an explanation of core courses.

# BACHELOR OF SCIENCE IN COMPUTER SCIENCE AND GAME DESIGN

[Updated: February 2013]

## Program Overview

The field of digital entertainment has grown from using small teams of just a handful of developers for an entire game to using large teams of one hundred or more on a single title. This large increase in the size of teams, scope, and investment in digital entertainment titles has naturally resulted in more and more specialization into the roles of engineer, artist, and designer. Despite this increased specialization overall, the digital entertainment industry has also seen a growing demand for a hybrid engineer/designer: someone who has strong programming and mathematics skills, combined with formal training in game design. This type of developer is the bridge between the technical and creative sides of game development, able to work as an engineer or designer as needed. This degree program prepares graduates for precisely this “technical designer” role.

Graduates of this program will be trained to write computer programs in core languages such as C and C++, as well as the scripting languages commonly used by all designers. Graduates of this program will be well versed in programming game logic, user interfaces, artificial intelligence, databases, and design tools. Graduates will also be well versed in game design theory for digital and non-digital games, level design, system design, and behavior design, with their strong foundation in programming and mathematics generally making them strong system and behavior designers. Graduates will have extensive experience testing, iterating, and polishing both digital and non-digital designs, through the completion of many individual projects and multiple team game projects.

Graduates of this degree program will be prepared to enter the video game industry as entry-level software engineers and game designers. Possible entry-level position titles include software engineer, software developer, software development engineer, software development engineer in test, software analyst, computer programmer, gameplay programmer, artificial intelligence programmer, user interface programmer, tools programmer, game scripter, technical designer, system designer, level designer, content designer, encounter designer, and game designer. After many years in the industry, graduates may obtain titles such as lead engineer, lead designer, technical director, creative director, and director. This degree program also includes secondary training that can contribute directly to a graduate obtaining positions with titles such as producer, program manager, technical program manager, and technical writer.

## Degree Requirements

### Number of Credits and GPA

The BS in Computer Science and Game Design requires completion of at least 154 semester credits with a cumulative GPA of 2.0 or better. The program usually spans eight semesters of 15 weeks each, or four academic years.

### Grade Requirements and Core Courses

Students must receive a grade of “C-” or higher in all core courses for the BS in Computer Science and Game Design. (In a non-core course, a grade of “D” is considered passing.) The core courses include all courses except general electives.

### Art Requirements

The following courses are required: ART 105, ART 260, ART 310, CG 102 or CG 201, and CG 125 or CG 225. (Total: 15 credits)

### Computer Science Requirements

The following courses are required: CS 100, CS 120, CS 120L, CS 170, CS 170L, CS 180, CS 225, CS230, CS 251, CS 280, CS 311, CS 330, and CS 380. (Total: 36 credits)

### Design Requirements

The following courses are required: GAT 110, GAT 120, GAT 210, GAT 211, GAT 240, GAT 250, GAT 251, GAT 315, and GAT 316. Three additional credits must be selected from other courses with the designation GAT. (Total: 29 credits)

### Electives Requirements

At least six credits from any courses in any departments at DigiPen Institute of Technology Singapore. (Total: 6 credits)

### Humanities and Social Science Requirements

The following courses are required: COL 499, COM 150, ENG 110, and PSY 101. Three additional credits must be selected from other courses with the designation COM, ENG, ECN, HIS, LAW, PHL, PSY, or SOS. (Total: 13 credits)

### Mathematics Requirements

The following courses are required: MAT 140, MAT 150 or MAT 180, MAT 200 or MAT 230, MAT 258, and either MAT 340 or MAT 364. (Total: 18 credits)

### Physics Requirements

One course is required: PHY 200. (Total: 3 credits)

### Projects Requirements

The following courses are required: GAM 100, GAM 150, GAM 200, GAM 250, GAM 302, GAM 352. Two courses from the following list are also required: GAM 375, GAM 390, GAM 400, GAM 450, and GAM 490. (Total: 34 credits)

### Note on General Education Courses

The following courses satisfy the general education requirement for the BS in Computer Science and Game Design: COM 150 (3), ENG 110 (3), ENG 120 (3), MAT 140 (4), MAT 150 or MAT 180 (4), MAT 200 or MAT 230 (4), MAT 258 (3), PHY 200 (3), PSY 101 (3), and one Humanities and Social Sciences elective (3), for a total of 33 credits.

## Recommended Course Sequence Chart (BS in Computer Science and Game Design)

Semester	Course	Course Title	Core*	Credits
Semester 1	CS 100	Computer Environment	X	4
	CS 120	High-Level Programming I – The C Programming Language	X	3
	CS 120L	High-Level Programming I Lab	X	1
	GAM 100	Project Introduction	X	3
	GAT 110	Game History	X	3
	MAT 140	Linear Algebra and Geometry	X	4
	GAT 120	Game Analysis	X	2
			<b>Semester Total</b>	<b>20</b>
Semester 2	CS 170	High-Level Programming II – The C ++ Language	X	3
	CS 170L	High-Level Programming II Lab	X	1
	CS 230	Game Implementation Techniques	X	3
	ENG 110	Composition	X	3
	GAM 150	Project I	X	3
	GAT 210	Game Mechanics I	X	3
	MAT 150 or MAT 180	Calculus and Analytic Geometry I or Vector Calculus I	X	4
			<b>Semester Total</b>	<b>20</b>
Semester 3	CS 225	Advanced C/C++	X	3
	GAT 240	Technology for Designers	X	3
	MAT 200 or MAT 230	Calculus and Analytic Geometry II or Vector Calculus II	X	4
	PHY 200	Motion Dynamics	X	3
	GAT 211	Game Mechanics II	X	3
	GAM 200	Project II	X	4
			<b>Semester Total</b>	<b>20</b>
Semester 4	CS 280	Data Structures	X	3
	COM 150	Interpersonal and Work Communication	X	3
	ART 105	Art Processes	X	3
	GAT 250	2D Game Design I	X	3
	CS 180	Operating System I, Man-Machine Interface	X	3
	GAM 250	Project II	X	4
			<b>Semester Total</b>	<b>19</b>

Semester	Course	Course Title	Core*	Credits
Semester 5	CS 380	Artificial Intelligence for Games	X	3
	CS 251	Introduction to Computer Graphics	X	3
	PSY 101	Introduction to Psychology	X	3
	ART 260	Graphic Design, User Experience, and Input	X	3
	GAT 251	2D Game Design II	X	3
	GAM 302	Project III for Designers	X	5
	<b>Semester Total</b>			
Semester 6	ART 310	Architectural Spaces, Design, and Lighting I	X	3
	CG 125	Introduction to 3D Production for Designers	X	3
	CG 102	2D Raster and Vector Graphics for Designers	X	3
	GAT 315	3D Game Design II	X	3
	GAM 352	Project III for Designers	X	5
	MAT 258	Discrete Mathematics	X	3
	<b>Semester Total</b>			
Semester 7	CS 330	Algorithm Analysis	X	3
	GAT 316	3D Game Design II	X	3
	Design Elective	Any three-credit course with the GAT designation.	X	3
	CS 311	Introduction to Databases	X	3
	MAT 340 or MAT 364	Probability and Statistics or Combinatorial Game Theory	X	3
	GAM 400	Project IV	X	5
	<b>Semester Total</b>			
Semester 8	General Elective	An elective of the student;s choice from any department at DigiPen Institute of Technology Singapore.		3
	General Elective	An elective of the student;s choice from any department at DigiPen Institute of Technology Singapore.		3
	HSS Elective	Any three-credit COM, ENG, ECN, HIS, LAW, PHL, PSY, or SOS course.	X	3
	GAM 450	Project IV	X	5
	COL 499	Career Search Preparation: Materials, Logistics and Communication	X	1
	<b>Semester Total</b>			
<b>Degree Total</b>				<b>154 minimum</b>

\*Note: Please see the Degree Requirements for an explanation of core courses.

# BACHELOR OF ARTS IN GAME DESIGN

[Updated: June 2013]

## Program Overview

The field of digital entertainment has moved from an era where designers were self-taught and learned on the job, to one where even entry-level designers are expected to be well-trained with proven design skills, along with an understanding of technology, art, audio, narrative, and psychology. Designing digital entertainment is ultimately about breathing life into every aspect of what would otherwise be lifeless code and static pixels on a screen. Designers must continually place themselves in the heads and hearts of their players, shaping every action, every response, the ebb-and-flow of the game's intensity, and then skillfully blend the mechanical, spatial, narrative, visual, and aural aspects of the entire experience. This degree program prepares graduates to be a modern game designer, capable of working in large teams, communicating and collaborating with other designers, artists, and engineers, and able to create an experience that is greater than the sum of its parts.

Graduates will be extremely well versed in game design theory for digital and non-digital games, level design, system design, and behavior design. Graduates will have extensive experience testing, iterating, and polishing both digital and non-digital designs, through the completion of many individual projects and multiple team game projects. However, modern game designers must have a much greater breadth of knowledge than just design. Graduates will also learn the basics of programming, art, psychology, and writing, along with an introduction to sound design, economics, statistics, and probability. Students can bolster any one of these areas by taking additional courses to emphasize skills in narrative design, world design, character design, visual design, sound design, or psychology.

Graduates of this degree program will be prepared to enter the video game industry as entry-level game designers. Possible entry-level position titles include game scripter, technical designer, system designer, level designer, content designer, encounter designer, user interface designer, quest designer, and game designer. After many years in the industry, graduates may obtain titles such as lead designer, creative director, and director. This degree program also includes secondary training that can contribute directly to a graduate obtaining positions with titles such as producer, program manager, writer, technical writer, editor, artist, or technical artist.

## Degree Requirements

### Number of Credits & GPA

The BA in Game Design requires completion of at least 147 semester credits with a cumulative GPA of 2.0 or better. The program usually spans eight semesters of 15 weeks each, or four academic years.

### Grade Requirements and Core Courses

Students must receive a grade of "C-" or higher in all core courses for the BA in Game Design major. (In a non-core course, a grade of "D" is considered passing.) The core courses include all courses except general electives.

### Advanced Electives

Students are required to take nine credits of advanced electives, which must be selected from any courses in any departments at DigiPen Institute of Technology Singapore that are designated as 200 level or higher, other than GAM, GAT, or PRJ courses. (Total: 9 credits)

### Art Requirements

The following courses are required: ART 101 or ART 102, ART 125 or ART 126, ART 260, ART 310, CG 102 or CG 201, CG 125 or CG 225, and FLM 151. (Total: 21 credits)

### Computer Science Requirements

The following courses are required: CS 116, CS 170 or CS 175, and CS 176 or CS 225. A combination of CS 120 and CS 101 or CS 120 and CS 100 can replace CS 116. (Total: 10 credits)

### Design Requirements

The following courses are required: GAT 110, GAT 120, GAT 210, GAT 211, GAT 212, GAT 240, GAT 250, GAT 251, GAT 315, GAT 316, and GAT 330. Three additional credits must be selected from other courses with the designation GAT. (Total: 35 credits)

### Humanities and Social Science Requirements

The following courses are required: COL 499, COM 150, ENG 110, ENG 120, ECN 100, PSY 101, and PSY 201. Three additional credits must be selected from other courses with the designation COM, ENG, ECN, HIS, LAW, PHL, PSY, or SOS. (Total: 22 credits)

### Mathematics Requirements

Students must take MAT 100 or MAT 140, and MAT 105. (Total: 7 credits)

### Music Requirements

Students must take MUS 115. (Total: 3 credits)

### Projects Requirements

The following courses are required: GAM 100, GAM 152, GAM 205, GAM 255, GAM 302, GAM 352, and MGT 451. Two courses from the following list are also required: GAM 375, GAM 390, GAM 400, GAM 450, and GAM 490. (Total: 37 credits)

### Science Requirements

Students must take PHY 115 or PHY 200. (Total: 3 credits)

### Note on General Education Courses

The following courses satisfy the general education requirement for the BA in Game Design: COM 150 (3), ENG 110 (3), ENG 120 (3), ECN 100 (3), MAT 100 or MAT 140 (4), MAT 105 (3), PSY 101 (3), PSY 201 (3), PHY 115 or PHY 200 (3), and one Humanities and Social Sciences elective (3), for a total of 31 credits.



## Recommended Course Sequence Chart (BA in Game Design)

Semester	Course	Course Title	Core*	Credits
Semester 1	PSY 101	Introduction to Psychology	X	3
	CS 116	Introduction to Computer Technology and Programming	X	4
	GAM 100	Project Introduction	X	3
	GAT 110	Game History	X	3
	GAT 120	Game Analysis	X	2
	MAT 103	Precalculus with Discrete Mathematics	X	4
	<b>Semester Total</b>			
Semester 2	MAT 105	Introductory Probability and Statistics	X	3
	ART 102	Fundamentals of Visual Expression	X	3
	ENG 110	Composition	X	3
	GAT 210	Game Mechanics I	X	3
	GAM 152	Project I for Designers	X	3
	CS 175	Scripting Languages	X	3
	PHY 115	Introduction to Applied Math and Physics	X	3
<b>Semester Total</b>				<b>21</b>
Semester 3	GAM 205	Project II for Designers	X	4
	PSY 201	Cognitive Psychology	X	3
	CS 176	Advanced Scripting	X	3
	GAT 211	Game Mechanics II	X	3
	GAT 240	Technology for Designers	X	3
	ART 126	Principles of Composition and Design	X	3
<b>Semester Total</b>				<b>19</b>
Semester 4	GAT 250	2D Game Design I	X	3
	GAM 255	Project II for Designers	X	4
	ENG 120	Research, Reasoning, and Writing	X	3
	COM 150	Interpersonal and Work Communication	X	3
	CG 102	2D Raster Graphics and Animation for Designers	X	3
	CG 125	Introduction to 3D Production for Designers	X	3
<b>Semester Total</b>				<b>19</b>

Semester	Course	Course Title	Core*	Credits
Semester 5	GAT 251	2D Game Design II	X	3
	FLM 151	Visual Language and Film Analysis	X	3
	MUS 115	Fundamentals of Music and Sound Design	X	3
	Advanced Elective	A 200 level or higher elective of the student's choice from any department at DigiPen Institute of Technology Singapore	X	3
	ART 260	Graphic Design, User Experience, and Input	X	3
	GAM 302	Project III for Designers	X	5
	<b>Semester Total</b>			
Semester 6	ART 310	Architectural Spaces, Design, and Lighting I	X	3
	GAT 315	3D Game Design I	X	3
	ECN 100	Introduction to Economics	X	3
	Advanced Elective	A 200 level or higher elective of the student's choice from any department at DigiPen Institute of Technology Singapore	X	3
	GAT 212	Advanced Game Mechanics	X	3
	GAM 352	Project for Game Designers	X	5
	<b>Semester Total</b>			
Semester 7	GAT 316	3D Game Design II	X	3
	GAT 330	Interactive Narrative and Character Creation for Games	X	3
	Advanced Elective	A 200 level or higher elective of the student's choice from any department at DigiPen Institute of Technology Singapore	X	3
	GAM 400	Project IV	X	5
	<b>Semester Total</b>			
Semester 8	Design Elective	Any three-credit course with the GAT designation	X	3
	HSS Elective	Any three-credit course from the Department of Humanities and Social Sciences offered at DigiPen Institute of Technology Singapore	X	3
	MGT 451	Project Management	X	3
	GAM 450	Project IV	X	5
	COL 499	Career Search Preparation: Materials, Logistics and Communication	X	1
	<b>Semester Total</b>			
<b>Degree Program Total</b>				<b>147 minimum</b>

\*Note: Please see the Degree Requirements for an explanation of core courses.

# BACHELOR OF FINE ARTS IN DIGITAL ART AND ANIMATION

[Updated: August 2013]

## Program Overview

As the animation and video game industries mature, there is a noticeable shift by companies to hire employees who demonstrate more than a working knowledge of a specific commercial software package or traditional artistic skills. Industry-quality standards continue to rise, and competition for entry-level positions demands that artists possess sophisticated skill sets before they can even begin their careers. Studios seek artists with a broad and integrated foundation of theoretical, practical, and technical skills in production animation, traditional art, modern computer software, and media story flow. Insight and long-term potential have become increasingly important. The studios also demand professional accountability and consistency.

Digital art and animation remain viable career opportunities for graduates possessing these abilities. Animation is capable of solving informational, educational, and entertainment problems no other discipline can resolve. It provides a cornerstone for many industries including cinema, broadcast entertainment, cable television, software development, the Internet, education, simulation, product design, research, forensic science, architecture, telecommunications, advertising, travel and tourism, and video games. The fact that these industries depend upon qualified candidates accentuates the need for quality digital art and animation education.

The broad scope of these demands presents a series of significant academic challenges. Most art students enter collegiate training with little or no substantial background knowledge relative to this field. Many secondary schools have been forced to cut back on the level of arts training that they are able to provide. Consequently aspiring artists must acquire this foundation while they are also trying to establish their professional focus. The complexity of the individual components of this field demand highly structured curricula and programmed sequencing simply to enable most students to be successful. Some students are capable of the rapid assimilation of the integrated knowledge the studios now require, but most are better served by a deeper and more sequential approach to the material.

DigiPen's BFA in Digital Art and Animation seeks to address these needs. Examples of student projects can be found in the DigiPen's Digital Gallery. Students who successfully complete this curriculum will possess the following skills and appropriate samples of professional work:

- A broad foundation of production experiences in both 2D and 3D art and animation. This base allows students to gain an overview of the profession and provides long-term adaptability.
- An area of production emphasis and focus. This enables students to target a specific sector of the industry upon graduation. Each student will produce a portfolio to support this focus.
- Strong foundational skills in storytelling. This includes visual storytelling, literary traditions, story through dialog, story through acting, and cinematic conventions.

- Strong foundational skills in applied technology using industry-standard hardware and software. Students will be thoroughly familiar with modern interface and workflow conventions. They will also understand how to learn new software while maintaining a production schedule.
- A solid foundation in professional work habits and attitude. Students will understand how to utilize and integrate professional criticism into their work. Additionally, they will be able to identify and create work that meets professional quality standards. They will also understand production flow and be able to generate and maintain appropriate schedules and production goals for their work.
- Social perspective and civic accountability relative to the roles that animation plays in society. Students will explore the long-term ramifications of this industry and be able to intelligently discuss their responsibilities to the betterment of the animation industry and society as a whole.

This degree prepares a graduating student for a career in digital art and digital 3D animation, digital 2D animation, and video game or animation pre-production. Some of the careers for which graduates of the BFA in Digital Art and Animation are trained include Props and Environment Modelers, Texture Artists, Level Designers, Character Modelers, Character Riggers, Character Animators, 3D Lighting and Camera Design, Effects Animator, Conceptual Illustration and Character Design, and Storyboard Artists.

## Degree Requirements

### Number of Credits and GPA

The BFA in Digital Art and Animation requires completion of at least 145 credits with a cumulative GPA of 2.0 or better. Courses are either mandatory or elective and must in either case be passed with a final grade of C- or better (2.0 GPA). The program usually spans eight semesters of 15 weeks each, or four academic years.

### Grade Requirement and Core Courses

Certain non-elective courses which are part of the DigiPen BFA in Digital Art and Animation course sequence are survey or introductory courses intended to widen the student's understanding and educational experience but are additional to, not central to the degree. These courses (SOS 115, PHY 115, CS 115, and LAW 115) are all 100 level courses which are not taught during the first year of the degree program. As such they are considered to be non-core classes and the grading protocols for non-core courses apply (i.e., credit is given if the class is passed with a grade of "D" or better). All other courses, required or elective, are core courses and students must receive a grade of "C-" or higher to pass.

### Animation Requirements

The following animation courses are required: ANI 101, ANI 125, and ANI 151. (Total: 9 credits)

### Art Requirements

The following art courses are required: ART 101, ART 110, ART 115, ART 125, ART 151, ART 201, ART 251, ART 300, ART 350, ART 401, and ART 450. (Total: 34 credits)

### **Computer Graphics Requirements**

The following computer graphics courses are required: CG 201, CG 225, CG 275, and CG 300. (Total: 12 credits)

### **Elective Requirements**

Students must take a minimum of 24 credits from any DigiPen courses excluding the following: ART 102, ART 126, ART 210, ART 400, CG 102, CG 125, CG 130, CG 135. (Total: 24 credits)

### **Film Requirements**

The following film courses are required: FLM 115, FLM 151, and either FLM 201 or FLM 210. (Total: 9 credits)

### **Humanities and Social Science Requirements**

The following courses are required: COL 499, LAW 115, SOS 115, ENG 116, and ENG 315. (Total: 15 credits)

### **Projects Requirements**

The following projects courses are required: PRJ 201, PRJ 251, PRJ 300, PRJ 350, PRJ 400, and PRJ 450. Please note that INT 390 and INT 450, internship courses, may be taken in place of PRJ 400 and PRJ 450. (Total: 30 credits)

### **Science Requirements**

The following courses are required: CS 115, PHY 115, BIO 150, BIO 200. (Total: 12 credits)

### **Note on General Education Courses**

The following courses satisfy the general education requirement for the BFA in Digital Art and Animation: ART 110 (3), ART 115 (4), (3), ENG 116 (4), ENG 315 (4), FLM 115 (3), LAW 115 (3), SOS 115 (3), CS 115 (3), and PHY 115 (3), for a total of 30 credits.

## Recommended Course Sequence Chart (BFA in Digital Art and Animation)

Semester	Course	Course Title	Core*	Credits
Semester 1	ANI 101	Introduction to Animation - Theories and Techniques I	X	3
	ART 101	The Language of Drawing	X	3
	ART 110	Fundamentals of Visual Communication and Design Process	X	3
	ART 115	Art and Technology	X	4
	ENG 116	Storytelling	X	4
	FLM 115	History of Film and Animation	X	3
	<b>Semester Total</b>			
Semester 2	ANI 125	Acting for Animation	X	3
	ANI 151	Advanced Animation - Theories and Techniques II	X	3
	ART 125	Tone, Color, and Composition	X	3
	ART 151	Basic Life Drawing	X	3
	BIO 150	Human Muscular, Skeletal, and Kinetic Anatomy	X	3
	FLM 151	Visual Language and Film Analysis	X	3
	<b>Semester Total</b>			
Semester 3	ART 201	Advanced Life Drawing	X	3
	BIO 200	Animal Muscular, Skeletal, and Kinetic Anatomy	X	3
	CG 201	2D Raster Graphics and Animation	X	3
	CG 225	Introduction to 3D Animation	X	3
	PRJ 201	2D Animation Production	X	5
	<b>Semester Total</b>			
Semester 4	FLM 201 or FLM 210	Cinematography or Cinematography for Visual Effects.	X	3
	ART 251	Character Design	X	3
	ART 350	Storyboards	X	3
	CG 251 or Elective	2D Vector Animation Production or **any course from the Elective Requirements list.	X	3
	CG 275	3D Character Animation	X	3
	PRJ 251	2D Vector Animation	X	5
	<b>Semester Total</b>			

Semester	Course	Course Title	Core*	Credits
Semester 5	ANI 300 or Elective	Acting through an Interface or **any course from the Elective Requirements list.	X	3
	ART 300	Perspective, Backgrounds, and Layouts	X	3
	CG 300	3D Environment and Level Design	X	3
	ENG 315	Story Through Dialogue	X	4
	PRJ 300	Limited-Scope 3D Production	X	5
			<b>Semester Total</b>	<b>18</b>
Semester 6	ANI 350 or Elective	Voice Acting for Animation or **any course from the Elective Requirements list.	X	3
	ART 225 or Elective	3D Design and Sculpture or **any course from the Elective Requirements list.	X	3
	PHY 115	Introduction to Applied Math and Physics		3
	CG 350 or Elective	Graphics for Gaming or **any course from the Elective Requirements list.	X	3
	PRJ 350	3D Animation Production	X	5
	COL 499	Career Search Preparation: Materials, Logistics and Communication	X	1
			<b>Semester Total</b>	<b>18</b>
Semester 7	ART 401	Conceptual Illustration and Visual Development	X	3
	FLM 250 or Elective	Digital Post-Production or **any course from the Elective Requirements list.	X	3
	FLM 275 or Elective	Fundamentals of Music and Sound Design or **any course from the Elective Requirements list.	X	3
	ART 450	Portfolio	X	3
	PRJ 400	Capstone Project I	X	5
			<b>Semester Total</b>	<b>17</b>
Semester 8	ANI 400 or Elective	Cinematic Animation or **any course from the Elective Requirements list.	X	3
	SOS 115	Media and Ethics: A Social Science Perspective		3
	CS 115	Introduction to Scripting and Programming		3
	LAW 115	Introduction to Intellectual Property and Contracts		3
	PRJ 450	Capstone Project II	X	5
			<b>Semester Total</b>	<b>17</b>
			<b>Degree Total</b>	<b>145 minimum</b>

\*Note: Please see the Degree Requirements for an explanation of core courses.

\*\*Note: Please refer to the Elective Requirements.

# Course Descriptions for the Academic Year 2013-2014

## DEPARTMENT OF COMPUTER SCIENCE

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### Computer Science Courses

*[New: June 2013]*

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#### **CS 100 Computer Environment (4 Cr.)**

Prerequisite(s): None

This course provides students with a detailed examination of the fundamental elements on which computers are based. Topics covered include number systems, representation of numbers in computation, basic electricity, electric circuits, digital systems, logic circuits, data representations, digital memory, computer architecture, and operating systems. Operational code and assembly languages are discussed, examined, and used in either a microprocessor or micro-controller environment, such as a personal computer or an autonomous car.

*[Updated: June 2013]*

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#### **CS 180 Operating System I, Man-Machine Interface (3 Cr.)**

Prerequisite(s): CS 100 or CS 101 & CS 170

This course presents an overview of modern operating systems, in particular Windows and Linux/Unix as implemented on modern PCs. After an overview of what an operating system is and does, the following is also covered: organization and design (the kernel and various subsystems), process management (creation and management of processes and threads, including an introduction to multi-threaded programming), networks (the TCP/IP stack and the organization of the Internet), interprocess communication, process synchronization (locks, semaphores, and methods to avoid deadlocks), memory management (hardware and process views of memory layout and demand-paged virtual memory), file systems, and security and protection (viruses, worms, and Trojan horses).

*[Updated: June 2013]*

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#### **CS 260 Computer Networks I, Interprocess Communication (3 Cr.)**

Prerequisite(s): CS 180 & CS 225

This course introduces the hierarchical network communication in a distributed computing environment. Course topics cover network technologies, architecture, and protocols. The curriculum gives specific emphasis to the TCP/IP stack and in making students familiar with writing portable socket based software. It prepares students for programming multi-player games in later semesters.

## DEPARTMENT OF FINE ARTS

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### Art Courses

*[New: July 2013]*

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#### ART 105 Art Processes (3 Cr.)

Prerequisite(s): None

This course provides a basic working knowledge of the processes used in making art. Topics include the origins and techniques involving drawing, tone, color, composition and artistic process as well as a simple overview of art history.

## DEPARTMENT OF GAME SOFTWARE DESIGN AND PRODUCTION

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### Game Projects Course

*[Updated: May 2013]*

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#### GAM 152 Project I for Designers (3 Cr.)

Prerequisite(s): CS 116 or CS 120 & CS 120 L & GAM 100

Credit may be received for either GAM 150 or GAM 152, but not for both

This project focuses on the creation of a simple game or simulation. Students work together on teams of three or four members. All projects are created using a scripting language in a rapid development environment. Topics include effective team communication, planning, documentation, debugging, source control, testing, and iterative software development techniques.

*[New: March 2013]*

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#### GAM 205 Project II For Designers (4 Cr.)

Prerequisite(s): CS 175, GAM 152, and MAT 100  
Credit may be received for either GAM 200 or GAM 205, but not for both

This project is divided into two semesters and focuses on the creation of a simple real-time game or simulation with 2D graphics (3D games are not allowed). Students will either work in teams made up only of BA in Game Design students or with students from GAM 200. BA in Game Design-only teams can use commercial game engines, middleware, or other libraries that teams with GAM 200 students cannot. Additional topics may include basic software architecture, essential development practices, fundamentals of team dynamics, and task prioritization methods.

*[New: March 2013]*

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#### GAM 255 Project II For Designers (4 Cr.)

Prerequisite(s): CS 176, GAM 205  
Credit may be received for either GAM 250 or GAM 255, but not for both.

This project is divided into two semesters and focuses on the creation of a simple real-time game or simulation with 2D graphics (3D games are not allowed in this course). Students will either work in teams made up only of BA in Game Design students or with students from GAM 200.

BA in Game Design-only teams can use commercial game engines, middleware, or other libraries that teams with GAM 200 students may not use. Additional topics may include basic software architecture, essential development practices, fundamentals of team dynamics, and task prioritization methods.

*[Updated: February 2013]*

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#### GAM 300 Project III (5 Cr.)

Prerequisite(s): CS 200 or CS 251, CS 245 or CS 260 or CS 365, CS 280, GAM 250, PHY 200

This project is divided into two semesters and focuses on the creation of an advanced real-time game or simulation with hardware-accelerated graphics. BS in Computer Science in Real-Time Interactive Simulation students work together on teams of three to five members and implement technical features, such as networking, artificial intelligence, and physics. All projects must be written with a core of C++ code and cannot use middleware, such as pre-existing physics engines, networking engines, etc. Additional topics may include advanced software architecture, 3D art pipelines, building content tools, and advanced team dynamics.

*[Updated: July 2013]*

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#### GAM 302 Project III for Designers (5 Cr.)

Prerequisite(s): GAT 211, GAM 250 or GAM 252, GAT 251 or CS 280, PHY 115 or PHY 200

Credit may be received for either GAM 300 or GAM 302, not both.

This project is divided into two semesters and focuses on the design of an advanced real-time game or simulation. Students work in teams either made up only of designers or with students from GAM 300. Designer-only teams can use commercial game engines, middleware, or other libraries that teams with GAM 300 students cannot. Additional topics may include online portfolios, effective presentations, managing scope, and advanced team dynamics.

*[Updated: April 2013]*

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#### GAM 352 Project III for Designers (5 Cr.)

Prerequisite(s): GAM 302  
Credit may be received for either GAM 350 or GAM 352, but not for both

In this class, students work to complete the projects they began in GAM 302. Additional topics may include large project design, advanced testing techniques, internships, and an introduction to resumes and interviews.

## Game Design and Development Courses

*[New: March 2013]*

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#### GAT 120 Game Analysis (2 Cr.)

Prerequisite(s): None

This course focuses on learning the fundamental design principles of digital games through repeated examination of existing games. Students will be taught how to analyze and reverse-engineer the designs of major works in gaming history, then will analyze a variety of games themselves. Topics may include game mechanics, actions, controls, rewards, punishment, intensity curves, teaching the player, visual aesthetics, and aural aesthetics.



*[Updated: March 2013]*

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### **GAT 210 Game Mechanics I (3 Cr.)**

Prerequisite(s): GAT 110 & GAT 120

In this course, students start building a foundational knowledge of game mechanics by creating, analyzing, and testing non-digital dice, card, and board games of their own design. Topics may include randomness, game state, hidden information, positioning, designing to a specification, writing rules, and playtesting.

*[Updated: July 2013]*

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### **GAT 240 Technology for Designers (3 Cr.)**

Prerequisite(s): CS 170 or CS 175, MAT 100 or MAT 140

This course is a survey of the technologies commonly used in game development. Topics may include spreadsheets, file formats, lighting, shaders, art pipelines, networking, databases, physics engines, audio engines, and artificial intelligence. These topics are covered only at a basic level—enough to be able to use them as a designer, but not to the depth they are covered in equivalent CS classes.

*[Updated: March 2013]*

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### **GAT 315 3D Game Design I (3 Cr.)**

Prerequisite(s): GAT 251

Credit may be received for either GAT 310 or for GAT 315, but not for both.

This course focuses on designing and implementing games using a 3D engine. Students will work to create one or more levels from start to finish, including any needed modifications to game mechanics, controls, and cameras. Topics may include aesthetics, environment building, lighting, texturing, resource placement, player guidance, player controls, camera controls, scripting, and game mechanics in 3D.

*[Updated: March 2013]*

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### **GAT 316 3D Game Design II (3 Cr.)**

Prerequisite(s): ART 310 & GAT 315

This course focuses on designing and implementing 3D games in specific genres, such as first-person shooters, adventure games, role-playing games, platformers, or real-time strategy games. Students work to create an original prototype for each genre covered using a 3D engine of the appropriate type. Topics may include puzzle design, platforming design, boss fight design, cover mechanics, and terrain modification for a 3D game.

*[Updated: March 2013]*

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### **GAT 330 Interactive Narrative and Character Creation for Games (3 Cr.)**

Prerequisite(s): ENG 110 & GAT 251

This course focuses on how to write stories that integrate with gameplay and mechanics. From creating characters to writing branching and interactive dialogue, students work on storytelling in various genres by incorporating their stories and characters into an existing game engine. Topics may include the design and structure of dialogue trees, creating mood parameters for dialogue choices, interactive narrative, autonomous behaviors, emergent gameplay, adding

emotional depth through the use of character archetypes, and weaving theme and story into the game in a way that resonates with the player.

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## **DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES**

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### **College Success Courses**

*[New: May 2013]*

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### **COL 499 Career Search Preparation: Materials, Logistics and Communication (1 Cr.)**

Prerequisite(s): None

College 499 is a capstone course for students to prepare their application materials and learn how to effectively search for an entry-level job in their field. The goal of the course is for each student to have a polished resume, cover letter, business card, and online/web presence by the end of the semester, as well as a search strategy for seeking employment.

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### **Economics Courses**

*[New: March 2013]*

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### **ECN 100 Introduction to Economics (3 Cr.)**

Prerequisite(s): None

This course introduces the fundamentals of micro- and macroeconomics. Topics may include supply and demand, competition, market efficiency, auctions, barter, monopolies, externalities, welfare, unemployment, growth, inflation, interest rates, exchange rates, and budget deficits.

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## **DEPARTMENT OF MATHEMATICS**

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### **Mathematics Courses**

*[New: March 2013]*

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### **MAT 105 Introductory Probability and Statistics (3 Cr.)**

Prerequisite(s): None

This course presents fundamentals of probability and statistics without calculus. Topics include: data representation, population mean, variance, and standard deviation, finite probabilities, events, conditional and marginal probability, discrete random variables, binomial distribution, normal distribution, sampling distributions for mean and variance, estimation of means, confidence intervals, hypothesis testing, inference, and chi-square tests.

# DEPARTMENT OF MUSIC AND SOUND

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## Music Courses

*[New: May 2013]*

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### **MUS 115 Fundamentals of Music and Sound Design (3 Cr.)**

Prerequisite(s): None

Credit may be received for either MUS 115 or FLM 275, but not for both

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This course offers an introduction to the fundamentals of music and sound design, and an overview of the production of music and sound for animation, film, and video games. Topics include music notation, key, meter, rhythm, melody, harmony, texture, tempo, genre and form; historical musical styles; dialog and timing; and digital audio production methods and techniques.



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