DigiPen
Institute of Technology

Redmond, Washington

CATALOG FOR THE ACADEMIC YEAR

2006-07

Updated: July 13, 2006

Notices

Registration:

DigiPen Institute of Technology is authorized by the Washington State Higher Education Coordinating Board and meets the requirements and minimum educational standards established for degree-granting institutions under the Degree Authorization Act. This authorization is valid until *May 15, 2008 and authorizes DigiPen Institute of Technology to offer the following degrees:

Associate of Applied Arts in 3D Computer Animation

**Associate of Science in Real-Time Interactive Simulation

Bachelor of Fine Arts in Production Animation

Bachelor of Science in Computer Engineering

Bachelor of Science in Real-Time Interactive Simulation

Master of Science in Computer Science

Any person desiring information about the requirements of the Act or the applicability of those requirements to the institution may contact the board office at P.O. Box 43430, Olympia, WA 98504-3430.

*DigiPen Institute of Technology has been authorized since 1996 and strictly adheres to the bi-annual authorization renewal process.

**DigiPen is not accepting applications for the A.S. in Real-Time Interactive Simulation program for the Fall 2006 academic year.

Accreditation:

DigiPen Institute of Technology is authorized by the Washington Higher Education Coordinating Board (HECB) and meets the requirements and minimum educational standards established for degree-granting institutions under the Degree Authorization Act. This authorization is valid until May 15, 2008, and authorizes DigiPen Institute of Technology to offer the following programs: Associate of Applied Arts in 3D Computer Animation; Associate of Science in Real Time Interactive Simulation; Bachelor of Fine Arts in Production Animation; Bachelor of Science in Computer Engineering; Bachelor of Science in Real Time Interactive Simulation; and Master of Science in Computer Science. Any person desiring information about the requirements of the Act or the applicability of those requirements to the institution may contact the HECB office at P.O. Box 43430, Olympia, WA 98504-3430.

Trademarks:

DigiPen® is a trademark of DigiPen (Canada) Corp.
ProjectFUN™ is a trademark of DigiPen (U.S.A.) Corp.
All other product names mentioned in this booklet are trademarks or registered trademarks of their respective companies and are hereby acknowledged.

Important Notices:

* *All items including, but not limited to, application forms, transcripts, reference letters, resumes, software, and any accompanying documentation or works of art (collectively "the Items"), forwarded to DigiPen by any person (the "Sender") whether at the request of DigiPen or otherwise, become the exclusive property of DigiPen unless otherwise agreed to in writing by DigiPen, and DigiPen shall be under no obligation whatsoever to return the Items to the Sender. At DigiPen's discretion, the Items may be destroyed after being reviewed.*

* *DigiPen Institute of Technology reserves the right to make changes to the curricula and calendar without any prior notice.*

Caution: The course offerings and requirements of DigiPen Institute of Technology are under continual examination and revision. This catalog is not a contract; it merely presents the offerings and requirements in effect at the time of publication and in no way guarantees that the offerings and requirements will not change. The Institute specifically reserves the right to change requirements for any major during any particular year. Whenever changes in course offerings or requirements occur, students will be notified by a posting outside the Office of the Registrar. The individual student assumes full responsibility for compliance with all current academic requirements. Current course offerings may be obtained from the Office of the Registrar. Current major and degree requirements may also be obtained from the Office of the Registrar. For the most current information, visit our official course catalog online at www.digipen.edu.

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General Information

Name of the School
DigiPen Institute of Technology

Contact Information
DigiPen Institute of Technology
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Redmond, WA
USA   98052
Telephone: (425) 558-0299
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Email: info@digipen.edu
Web: www.digipen.edu

Degree Authorization
DigiPen Institute of Technology is authorized by the Washington State Higher Education Coordinating Board (HECB) and meets the requirements and minimum educational standards established for degree-granting institutions under the Degree Authorization Act. This authorization was first received in 1996. HECB authorizes the DigiPen Institute of Technology to offer the following degree programs:

- **Associate of Science in Real-Time Interactive Simulation**
- **Bachelor of Science in Real-Time Interactive Simulation**
- **Bachelor of Science in Computer Engineering**
- **Associate of Applied Arts in 3D Computer Animation**
- **Bachelor of Fine Arts in Production Animation**
- **Master of Science in Computer Science**

Any person desiring information about the requirements of the Act or the applicability of those requirements to the institution may contact the HECB office at P.O. Box 43430, Olympia, WA 98504-3430.

Accreditation
Under the guidelines set by the Accrediting Commission of Career Schools and Colleges of Technology (ACCSCT), DigiPen Institute of Technology is an accredited university. Accreditation is a voluntary system of non-government, self-regulation of the nation's education institutions. Through the accrediting process, institutions and their programs are evaluated and recognized for quality education. This recognition is extended through national, specialized, or regional accrediting agencies who themselves are recognized by the U.S. Department of Education.

Accreditation is a formal status granted to an institution meeting or exceeding stated educational quality criteria. The purposes of accreditation are to assess and enhance the educational quality of an institution, assure consistency in institutional operations, promote institutional improvement, and provide for public accountability.

DigiPen applied for accreditation with the ACCSCT, recognized by the U.S. Department of Education as a national accrediting agency. One of the steps in the application process is a team visit by the ACCSCT. During the visit, the team met with the institution's administrative staff, faculty, and students to assess its educational programs and overall effectiveness. DigiPen Institute of Technology received three "Items of Excellence" in the Team Summary Report:

- The team commends the school (DigiPen Institute of Technology) for its two innovative training opportunities offsite. The training is to motivate high school students to become more interested in mathematics and sciences through the implementation and programming of video games.
- The team commends the school on its facilities, which provide an environment highly conducive to learning. In addition, extensive equipment in the laboratories is available to students for thirteen hours each day, Monday thru Friday, and eight hours on Saturdays.
- The team commends the school for the level of student satisfaction achieved at the school. Specifically, of the students surveyed, 93% (84 of 90) felt good about their decision to attend the school and would recommend the school to a friend.

At its November 2002 meeting, the ACCSCT voted to grant accreditation to DigiPen Institute of Technology.

By becoming an accredited institution, DigiPen has joined in partnership with other educators and institutions committed to providing programs of quality and conducting their affairs with honesty, integrity, and dignity. We take this responsibility seriously and proudly embrace accreditation as a means of continuous self-analysis and the achievement of our educational mission and goals.

Brief History of DigiPen

In 1988, Mr. Claude Comair founded DigiPen Corporation in Vancouver, B.C., Canada as a computer simulation and animation company. As the demand for production work grew, DigiPen faced the difficulty of finding qualified personnel, and in 1990 it began offering a dedicated training program in the area of 3D computer animation. In late 1990, building on the success and educational experience of preparing students for careers in 3D computer animation production, DigiPen approached Nintendo of America to work together to establish a post-secondary program for those interested in programming video games. With the demand for qualified personnel growing and no other school in North America offering such a dedicated program, Nintendo was very supportive of the idea. The result of this collaborative effort was that in 1994 DigiPen Applied Computer Graphics School officially accepted its first class of video game programming students to its campus in Vancouver, B.C. for the two-year Diploma in The Art and Science of 2D and 3D Video Game Programming. In 1993, DigiPen implemented a revised two-year 3D computer animation diploma program.

While DigiPen graduates quickly found employment in the industry, video game consoles were becoming more complex, sophisticated computers; DigiPen realized there was a need to offer a bachelor degree-level program dedicated to the interactive computing industry. Based on their expertise and experience, DigiPen engineers developed a four-year degree curriculum, which they submitted to the Washington State Higher Education Coordinating Board (HECB) for authorization. In May 1996, the HECB granted DigiPen the authorization to award Associate and Bachelor of Science Degrees in Real-Time Interactive Simulation, the world's first bachelor degree program dedicated to computer/video game development. After two years of getting the logistics in place, in 1998, DigiPen opened the DigiPen Institute of Technology in Redmond, Washington, U.S.A. and began offering the following degree programs:

- Associate of Science in Real-Time Interactive Simulation
- Bachelor of Science in Real-Time Interactive Simulation

In 1999, DigiPen added the Associate of Applied Arts in 3D Computer Animation to its degree-program offerings. At this time, DigiPen phased out its educational activities in Canada, and the Redmond campus became the only DigiPen educational facility.

The first graduation ceremony took place on July 22, 2000. There were six Associate of Science Degree graduates and five Bachelor of Science Degree graduates in the inaugural class. In November 2002, DigiPen Institute of Technology received national accreditation from the Accrediting Commission of Career Schools and Colleges of Technology. In the fall of 2004, DigiPen added the following degree programs:

- Bachelor of Science in Computer Engineering
- Bachelor of Fine Arts in Production Animation
- Master of Science in Computer Science

With over 700 students registered for fall 2006, DigiPen continues to strive for the highest standard of education demanded by the industry, and it is still considered a leader in the field of digital interactive entertainment education.

DigiPen Outreach

In addition to its post-secondary degree programs, DigiPen offers opportunities for middle school and high school students to learn about the process of video game and 3D animation production. Now branded as part of DigiPen's ProjectFUN Initiative, DigiPen has three programs, all of which promote a strong stay-in-school message, targeted at this audience.

ProjectFUN Workshops

Since 1994, DigiPen has been offering highly engaging one- and two-week workshops, which give students a first taste of what is involved with programming games, producing 3D animations, and working with robotic vehicles. Not only are these run at DigiPen's campus during the summer, but these workshops are also offered across the U.S. as well as in Canada, Jamaica, New Zealand, and even Norway.

ProjectFUN Technology Academies

In the fall of 2000, DigiPen began teaching a computer science program for junior and senior high school students who are interested in taking a serious computer science program. There are currently ProjectFUN Technology Academy sites in Washington, California, Wisconsin, Illinois, Ohio, and Kansas.

ProjectFUN Online

In May 2006, DigiPen launched its newest outreach efforts, taught live online by DigiPen instructors. This allows students to participate in this program year-round from the comfort of their own homes and communities. The content is similar in nature to that taught in the workshops and is another option for those unable to attend a workshop.

Mission of Institution

The mission of DigiPen Institute of Technology is to offer higher education to those who would like to pursue studies and careers in fields of interactive computer technologies, which include graphics and real-time interactive simulation, and provide highly qualified personnel to the interactive computer industries to sustain their growth and productivity.

Notice of Non-Discrimination

DigiPen Institute of Technology is committed to maintaining a diverse community in an atmosphere of mutual respect and appreciation of differences.

DigiPen Institute of Technology does not discriminate in its educational and employment policies on the basis of race, color, creed, religion, national/ethnic origin, sex, sexual orientation, age, or with regard to the basis outlined in the Veterans' Readjustment Act and the Americans with Disabilities Act.

Program of Studies Offered

Currently, the Institute offers the following degree programs:

- **Bachelor of Science in Real-Time Interactive Simulation**
- **Bachelor of Science in Computer Engineering**
- **Associate of Applied Arts in 3D Computer Animation**
- **Bachelor of Fine Arts in Production Animation**
- **Master of Science in Computer Science**

About our Facilities

DigiPen encompasses over 52,000 square feet with a library, lunchroom, and auditorium; dedicated computer labs for each program of students; as well as additional classrooms for lectures and instruction. As our student body grows larger each year, DigiPen is expanding its facilities to accommodate our new numbers.

Weekly student access to our campus is from 8:30 A.M. to 10 P.M., Monday through Friday and from 10 A.M. to 6 P.M. on Saturday. DigiPen's facilities are not open for student access on Sundays. Core office hours for our Administration staff run from 9:00 AM to 5:00 PM Monday through Friday with additional hours as needed.

Major equipment items include microphones and LCD projection systems in many of the classrooms. Various presentation formats are also available, including DVD players, VCRs, document cameras, Laser Disc, and CD players. Students also have access to a BetacamSP recorder. The majority of the student computers currently range from Pentium 4 1.6 GHz systems with 512MB RAM to P4 3.06 hyperthreaded systems with 2GB RAM. All computers are on our internal network and have access to printers, servers, and archival media. DigiPen upgrades the computer equipment on a regular basis. Our current student to computer ratio is better than 1:1.

Description of the Library Facilities and Internet Access

Library Facilities

The DigiPen library aims to support the Institute's curriculum and students. To serve this goal, the library has copies of every recommended textbook for each class offered. Additionally, students have access to a variety of resources like sound effects and reference books relevant to their program of study. The library also subscribes to a selection of major journals and magazines related to the fields of gaming, simulation, computer engineering and animation. Furthermore, DigiPen allocates a yearly budget for updating the contents of the library.

The 1600 square foot library currently holds over 2500 books, subscriptions to over 50 different magazines, and more than 120 console and computer games. Located in our dedicated computer labs, over 500 networked computers form an integral part of the library resources available to students. In addition to these curriculum-related resources, the library has a collection of career-oriented material, including books on resumes, cover letters, and interviews along with an updated list of job offerings within the video game and computer animation industries. The library facilities provide a quiet place to study and areas for small groups to meet and work collaboratively.

DigiPen's library is open approximately 50 hours each week, from 10 A.M. to 8 P.M., Monday through Thursday, and 10 A.M. to 5 P.M. Friday.

Internet Access

Internet access is a regulated service and is provided for our students free of charge. Students may lose this privilege if they do no abide by the *Computer and Network Usage Policy.*

Important Dates

Institutional Calendar

Aug. 28 – Sept. 1, 2006	Orientation – First Year Students	
Sept. 4, 2006	Labor Day	No Class
Sept. 5, 2006	Classes Begin – Fall Semester	
Nov. 10, 2006	Veterans Day Observed	No Class
Nov. 23-26, 2006	Thanksgiving	No Class
Dec. 11-15, 2006	Final Exams	
Dec. 15, 2006	Fall Semester Ends	
Dec. 16, 2006-Jan. 1, 2007	Winter Holidays	No Class
Jan. 2-7, 2007	Intersession	No Class
Jan. 8, 2007	Classes Begin – Spring Semester	
Jan. 15, 2007	M.L. King Day	No Class
Feb. 3, 2007	Founder's Day	No Class
Feb. 19, 2007	Presidents Day	No Class
Mar. 5-9, 2007	Spring Break	No Class
Apr. 23-27, 2007	Final Exams	
Apr. 27, 2007	Spring Semester Ends	
Apr. 29, 2007	Commencement	
Apr. 30-May 4, 2007	Intersession	No Class
May 7, 2007	Classes Begin – Summer Session	
May 28, 2007	Memorial Day	No Class
Jul. 4, 2007	Independence Day	No Class
Jul. 23-27, 2007	Summer Session Final Exams	
Jul. 27, 2007	Summer Session Ends	

The Institute is closed on all statutory holidays. Exam periods and breaks may be subject to change if necessary. The laboratory facilities may be closed for a period of two consecutive days per month for maintenance. It is usually the last two working days of the month unless otherwise posted.

Enrollment occurs once a year in September.

Deadlines

April 20, 2006	Tuition deposit for Fall Semester due
June 20, 2006	Tuition balance for Fall Semester due
Sept. 11, 2006	Last day to add classes for Fall Semester; Withdrawal deadline for 90% refund
Sept. 15, 2006	Automatic withdrawal date from classes missing pre-requisites Final day to drop class without academic penalty
Sept. 20, 2006	Tuition deposit for Spring Semester due;
Oct. 1, 2006	Withdrawal deadline for 75% refund
Oct. 26, 2006	Final day to receive a 'W' on transcript for Fall (and then Spring for Feb) Semester withdrawals, 50% refund. Withdrawals from institute after this date will receive 'F' grades on transcript. Final day to drop a class.
Nov. 20, 2006	Balance of tuition for Spring Semester due
Jan. 15, 2007	Last day to add classes for Spring Semester; Withdrawal deadline for 90% refund
Jan. 19, 2007	Final day to drop class without academic penalty
Feb. 3, 2007	Withdrawal deadline for 75% refund
Feb. 15, 2007	Tuition deposit for Summer Session due
March 1, 2007	Final day to receive a 'W' on transcript for Fall (and then Spring for Feb) Semester withdrawals, 50% refund. Withdrawals from institute after this date will receive 'F' grades on transcript. Final day to drop a class.
March 20, 2007	Balance of tuition for Summer Session due

Tuition and Fees

All tuition and fees are in U.S. dollars.

Enrollment Application Fee

A $75.00 application fee must accompany the application form. The application fee is refundable if the applicant is not accepted to the Institution or if the applicant requests a refund within three days after signing an enrollment agreement.

Registration Fee

Upon acceptance into a degree program, a $150.00 registration fee must be paid to confirm enrollment. The registration fee is refundable if requested within three days after signing an enrollment agreement and making an initial payment.

Tuition Fee Payment

Please see the payment schedule in your student enrollment agreement for dates and amounts due. The payment of tuition and all associated fees is the sole responsibility and obligation of the registering student. Tuition increases will be announced six months before taking effect.

Late Registration Fee

Students are responsible for registering for classes each semester by the posted date. All late class registrations will cost $100.00 to cover administrative costs due to late registrations.

Books

Text and reference books are estimated to be approximately $750.00 per year. This cost is not included as a part of the tuition.

Tuition

	Undergraduate U.S. Citizen & Resident	Undergraduate Non-U.S. Citizen or Resident	Graduate U.S. Citizen & Resident	Graduate Non-U.S. Citizen or Resident
Cost/Credit	$380.00*	$495.00*	$500.00*	$650.00*
Total Cost B.S. in R.T.I.S. & B.S. in C.E.	$58,520.00* (154 credits)	$76,230.00* (154 credits)	N/A	N/A
Total Cost B.F.A.	$54,720.00* (144 credits)	$71,280.00* (144 credits)	N/A	N/A
Total Cost A.A.A.	$30,400.00* (80 credits)	$39,600.00* (80 credits)	N/A	N/A
Total Cost M.S. in C.S.	N/A	N/A	$15,000* (30 Credits)	$19,500* (30 Credits)

Tuition is subject to change with 6 months notice.
Students re-registering for a failed course must pay the regular course fees.

Cancellation and Refund Policies 2006-07

Parking

On-campus parking is available for $320.00 per academic year. Please see the Administration Office for details regarding parking applications.

Administrative Fee

This fee covers a limited number of transcript requests, add/drop requests, enrollment verifications, and re-registrations. This fee is $40.00 per semester for all students.

Technology Fee

This fee covers paper and toner for the student-use printers and maintenance costs associated with the upkeep of the computer labs. This fee is $40.00 per semester for all students.

Graduation Fee

This $75.00 fee covers the cost of processing the graduation application. This fee must accompany the graduation application.

Transfer and Waiver Fees

Course transfers and waivers are processed at $25.00 per credit. Waiver exams, when required, have an associated $100.00 fee.

Course Fees

Some courses may require lab or material fees. Please refer to course descriptions on course registration forms.

Additional Courses

Students registered in an undergraduate degree program at DigiPen may register for up to 6 credits of graduate level classes. Tuition for these 6 credits will be assessed at the undergraduate rate. There is also as additional, one time fee of $40.00 to cover access to graduate-level research resources.

Graduate Resource Access

Students enrolled in graduate level studies will be assessed a fee of $40.00 annually to cover access to graduate-level research resources.

Tuition Refund Schedule

Cancellation Policies

a. Applicants who have not visited the school prior to enrollment will have the opportunity to withdraw without penalty within three business days following either the regularly scheduled orientation procedures or following a tour of the school facilities and inspection of equipment where training and services are provided.

b. All monies paid by an application will be refunded, if requested, within three days after signing an enrollment agreement and making an initial payment. An applicant requesting cancellation more than three days after signing an enrollment agreement and making an initial payment, but prior to entering the school, is entitled to a refund of all monies paid minus a registration fee of 15% of the contract price of the program, but in no event will the school retain more than $150.

Students who submit an official withdrawal in writing or who are determined by the Administration to have withdrawn from the Institute:

- Before the beginning of classes are entitled to a tuition refund of all money paid towards tuition for the upcoming semester.
- Before the close of the seventh calendar day after the beginning of classes must pay 10% of the semester's tuition. Any portion of tuition paid above this percentage will be refunded.
- Before the close of the 27th calendar day of the semester must pay 25% of the semester's tuition. Any portion of tuition paid above this percentage will be refunded.
- Before the close of the 52nd calendar day of the semester must pay 50% of the semester's tuition. Any portion of tuition paid above this percentage will be refunded.
- After the 52nd calendar day of the semester must pay 100% of the semester's tuition.

All other assessed fees are refunded on the same schedule as tuition payments.

Tuition Account Reimbursement

Active student accounts: If a student has an excess balance of funds in their tuition account (other than Title IV federal funds), a student may request at any time that the excess funds be returned to them by filling out a Reimbursement Request Form. A reimbursement check will be issued to the student within 2 to 4 weeks after receipt of the completed form. If a reimbursement is not requested, any excess funds in a student's account are automatically applied towards future charges.

Inactive student accounts: Any earned tuition credit balance remaining in a tuition account that becomes inactive (through graduation, withdrawal or other means) is returned by mail to the student in the form of a check within 60 days of the account change of status. If a student wishes to have the earned funds returned directly to a lender, the student must complete the appropriate form at the time of withdrawal from the Institute.

Termination Date

The termination date for refund purposes for institutional withdrawal is the last date of actual attendance at the institute by the student. The termination date for refund purposes for withdrawal from individual classes is the date of receipt of the appropriate withdrawal form. Notice of cancellation or withdrawal should be given by completing the appropriate withdrawal form, whether it is withdrawal from the Institute or from specific classes for which the student is registered.

If the student's account remains delinquent for over 30 days, the Institute reserves the right to cancel the student's registration.

Special Cases

In the documented event of prolonged illness or accident, death in the family, or other special circumstances that make it impractical to complete the program, the Institute shall make a settlement that is reasonable and fair to both parties. These will be judged on a case-by-case basis.

Application of Policy

Any monies due the student shall be refunded within 60 days from the last date of student attendance or within 60 days from the date of receipt of payment in the event that the date of such receipt is after the student's last date of attendance.

If a student's financial obligation is not fulfilled, the Institute is authorized to do the following until the owed monies are paid:

- Withhold the release of the student's academic records or any information based upon the records.
- Withhold the issue of the student's transcripts.

Financial Assistance

The Role of the Office of Financial Aid

The Office of Financial Aid assists students and their parents in meeting basic educational costs. Its goal is to deliver student assistance in a timely manner and to ensure availability of financial aid for students who, without such assistance, would be unable to pursue their educational goals at DigiPen.

The primary objective of the Office of Financial Aid is to provide adequate financial assistance to the maximum number of eligible students through coordination with and full utilization of all governmental, community, and on-campus resources. DigiPen administers all financial aid programs in accordance with established state, federal, and institutional regulations and policies.

The Office of Financial Aid endeavors to fully fund students to the maximums provided under the law and strives to eliminate unnecessary steps by simplifying the aid process. The Office of Financial Aid attempts to provide individualized service to students. It also provides intervention and liaison support when necessary to resolve problems related to an individual student's award. Additionally, DigiPen takes a proactive approach to default management and prevention by performing an active role in student loan counseling and delinquency notification procedures.

The U.S. Department of Education has designated the Institute as an eligible institution for participation in the following programs:

Federal Pell Grant Program

Federal Pell Grants are the largest source of free money for college from the government. Recently ranging between $400 and $4,050, these need-based grants are awarded to every undergraduate student who qualifies and has not already earned a bachelor's, master's, or other professional degree. Grants can be used for tuition, fees, and living expenses. The amount a student may receive depends on the student's family's financial situation, and the student's full-or part-time enrollment status.

Academic Competitiveness Grant Program (ACG)

An eligible student may receive an Academic Competitiveness Grant of $750 for the first academic year of study and $1300 for the second academic year of study. To be eligible for each academic year, a student must:

- Be a U.S. citizen
- Be a Federal Pell Grant recipient
- Be enrolled full-time in a degree-program
- Be enrolled in the first or second academic year of his or her program of study at a two-year or four-year degree-granting institution
- Have completed a rigorous secondary school program of study (after January 1, 2006, if a first-year student, and after January 1, 2005, if a second-year student)
- If a first-year student, not have been previously enrolled in an undergraduate program; and
- If a second-year student, have at least a cumulative 3.0 grade point average on a 4.0 scale for the first academic year.

National SMART Grant Program

An eligible student may receive a National SMART Grant of $4000 for each of the third and fourth academic years of study. To be eligible for each academic year, a student must:

- Be a U.S. citizen
- Be a Federal Pell Grant recipient
- Be enrolled full-time in a degree program
- Be enrolled in a four-year degree-granting institution
- Major in physical, life or computer science, engineering, mathematics, technology, or a critical foreign language; and
- Have at least a cumulative 3.0 grade point average on a 4.0 scale in the coursework required for the student's major

Washington State Need Grant Program

Washington State Need Grants (WSNG) is awarded to every undergraduate student who qualifies.

WSNG recipients agree that the Higher Education Co-ordinating Board (Washington state agency that issues the grant) and DigiPen Institute Of Technology reserve the right to withdraw, reduce, or modify the grant due to funding limitations or due to changes in circumstances, which will affect the student's eligibility for the WSNG.

An eligible student may receive a Washington State Need Grant of up to $5390.00 per year depending on enrollment status. Keep in mind that the amount varies each year based upon Washington State funding. To be eligible you must:

- Be a U.S citizen
- Domicile in the State of Washington-resident of the state of Washington
- Provide documentation of residency verification (If dependent: one from student, and two from parent. If independent: two from student) For required verification, please visit, call, or email the financial aid office.
- Meet satisfactory academic progress (NOTE: the SAP for Washington State Need Grant recipients are set forth and approved by the State of Washington and is different than the Institution's satisfactory progress policy)
- Enrolled at least half-time (6-11 credits)
- Apply using the FAFSA and DigiPen Financial Aid application
- Not owe a repayment to the WSNG or any other student aid program
- Not have exceeded either of the following limits: A) ten semesters of WSNG use, B) 125% of the published length of this or her program
- Not be pursuing a degree in theology
- Be an undergraduate and not be pursuing a second Associate degree with assistance of SNG, unless five years have elapsed since the first Associate degree

Federal Family Educational Loan Programs (FFELP)

The Federal Family Education Loan Program offers long term loans, which allow students to postpone paying for a portion of their school expenses until after they graduate or leave school. Repayment begins six months after completion or withdrawal from the degree program. The following loan programs fall under the umbrella of the FFEL Programs: the Federal Subsidized Stafford Loan Program, the Federal Unsubsidized Stafford Loan Program, and the Federal Parent Loan for Undergraduate Students.

Federal Stafford Loans

DigiPen participates in the Stafford Loan Program. These loans are the most common ones and are for undergraduate students. There are two types: subsidized loans, for which the government pays the interest while you are in college; and unsubsidized loans, for which you are responsible for paying all the interest on the loans, during college and after. You may receive both types of loans at the same time. The U.S. Department of Education and the loan guarantor charge an origination fee of 3% for both subsidized and unsubsidized Stafford Loans. Loans with a disbursement made on or after 7/1/06 will have an origination fee of 2%. To receive loan funds, you must be enrolled at least as a half-time student.

Subsidized Federal Stafford Program

Subsidized Stafford Loans are awarded based on demonstrated financial need. The federal government pays the interest while you are in college and during the six-month grace period after you graduate, leave school, or enroll as less than a half-time student. The government also pays your interest costs during deferment. A student will be obligated for a 3% origination fee on each subsidized Federal Stafford Loan he or she receives. Loans with a disbursement made on or after 7/1/06 will have an origination fee of 2%. To qualify, you must meet all the requirements for federal student financial aid and have your eligibility for a Pell Grant determined. Repayment terms may vary from lender to lender.

Unsubsidized Federal Stafford Program

Unsubsidized Stafford Loans are for all eligible students, regardless of their income and assets. You must meet the same requirements as those for the subsidized Stafford Loan, except for demonstrating financial need. You are responsible for paying all the interest on the loan, but you can allow it to accumulate while you're in college and during the grace period. If you do, the interest will be added to the amount you borrowed when repayment begins and future interest will be based on the higher loan amount. The maximum interest rate on an unsubsidized Federal Stafford Loan is 8.25%, as the date this catalog was published. First disbursements made on or after 7/1/06, the Stafford loan interest rate will change to a fixed rate of 6.8%. A student will be obligated for a 3% origination fee on each unsubsidized Federal Stafford Loan he or she receives. Loans with a disbursement made on or after 7/1/06 will have an origination fee of 2%.

Federal PLUS Loan Program

The Federal Parent Loan for Undergraduate Students (PLUS Loans) enables parents or stepparents to borrow up to the total cost of their dependent child's education, minus any other aid he or she may receive. PLUS Loans are for undergraduate study only and are not based on your family's income or assets. These loans are always unsubsidized. The maximum interest rate for Federal PLUS Loans is 9%, as of the date this catalog was published. The interest rates charged on these loans may change, so the student must check with a lender or the school for the current rate. First disbursements made on or after 7/1/06, the PLUS loan interest rate will change to a fixed rate of 8.5%. Parents will be obligated for a 3% origination fee on each Federal PLUS Loan they receive. Federal PLUS Loan borrowing is limited to parents with a favorable credit history.

Graduate PLUS loans

Starting July 1st, 2006 Grad PLUS loans will be available to graduate students, offering you another option for financing your college education. The Graduate PLUS loan offers several benefits:

- In-school deferment-meaning students can delay payments until they have graduated
- Easy credit eligibility requirements
- Wide availability since they are federally guaranteed

The maximum interest rate for Grad PLUS Loans is 9%. The interest rates charged on these loans may change, so the student must check with a lender or the school for the current rate. Students will be obligated for a 2% origination fee on each Federal PLUS Loan they receive. Think the Graduate PLUS loan is right for you? First, fill out the FAFSA, and fill out a DigiPen financial aid application (print one off on our website, or call 425-895-4427 to request one). Then check with DigiPen's Financial Aid Office for the latest information.

Other Loans

Other financial aid options include private bank loans and private scholarships. Also known as alternative loans, private loans can help you pay for college if you are still short after exhausting all your resources, federal loans, and other college financial aid. Private loans usually carry higher interest rates and fees than federal loans and typically are based on creditworthiness. A number of commercial lenders offer private loans.

Scholarships

It is a good idea to check with employers and local civic groups to see if scholarship opportunities exist. Additionally, many community organizations, foundations, and religious organizations offer scholarships. Start your research with the local organizations in your community, then browse the scholarship directories on the Web or in the libraries and use the free search engines online. Additionally, many professional and trade associations offer scholarships. Leads may also be listed in magazines or on Web sites devoted to your interests or skills. Also contact the personnel offices of companies in your area or your parents' employers or labor unions to see if they offer scholarships. You may need to write letters and essays or be interviewed as part of the application process, so start your research early.

Private organizations will notify you directly of an award, its requirements, and how you will receive the funds. Keep in mind that colleges must apply any outside scholarship toward your unmet need or reduce other aid—scholarship dollars usually will not replace your Estimated Family Contribution (EFC). DigiPen will reduce loan aid rather than grant aid. Be sure to let DigiPen know about any outside awards as soon as you receive them. You can apply for private scholarships and grants throughout your college years.

For additional information, please visit the Office of Financial Aid.

DigiPen WASL Scholarship
The DigiPen Institute of Technology offers a limited number of scholarships to Washington high school students who earn "Level 4" scores in math and at least "Level 3" on all other sections on the Washington Assessment of Student Learning (WASL). There are four scoring levels students can achieve on the WASL, and Level 4 is the highest. The scholarships will cover 50 percent of total tuition costs at the institute.

Careers That Work Scholarship
Washington Federation of Private Career Schools and Colleges presents, " Careers That Work" scholarship program. Three $1000.00 tuition scholarships are available to every high school in the state of Washington. Please ask your high school counselor for the application. The high school counselor will make the decision as to whom will be awarded the $1000.00 scholarship. There is no criteria, the scholarship is at the discretion of your high school counselor. Please see your high school counselor for details, or call DigiPen Financial Aid Office at 425-895-4427.

Imagine America Scholarship Program
Each year, every high school in the United States and Puerto Rico can select up to three graduating seniors to receive a $1000 Imagine America scholarship. Students must meet the standard admissions rquirements at DigiPen Institute of Technology. The Career College Foundation (CCF) which manages the scholarship will select students based off of the following criteria:
- Likelihood of successful completion of postsecondary education
- High school grade point average of 2.5 or greater
- Demonstrate Financial need
- Demonstrated voluntary community service during their senior year

Interested students please visit www.imagine-america.org, the CCF will begin accepting applications January 1st, 2006. Scholarship recipients will be honored the $1000 scholarhip over a course of four semesters ($250/semester).

Veterans Administration Benefits
The Higher Education Coordinating Board's State Approving Agency (HECB/SAA) has approved DigiPen's academic programs for enrollment of persons eligible to receive educational benefits. The following VA educational assistance benefits are available at DigiPen:
- Chapter 30 (Title 38, U.S. Code) – Montgomery GI Bill for Active Duty and Veterans
- Chapter 32 (Title 38, U.S. Code) – Veterans Educational Assistance Program
- Chapter 35 (Title 38, U.S. Code) – Dependents of Disabled/Deceased Veterans
- Chapter 1606 (Title 10, US Code) – Montgomery GI Bill for National Guard & Selected Reserves

To be eligible for VA educational benefits, you must be a degree-seeking student with a declared major at DigiPen. Eligibility for the various VA Educational Benefits programs is determined, in part, by your date of enlistment. In all cases, the Department of Veterans Affairs makes the final determination of eligibility. Application forms for your VA benefits are available at http://www.vba.va.gov/pubs/educationforms.htm.

If you are a prospective student and believe you might be eligible for educational benefits, call or visit the DigiPen's Financial Aid Office for more information and to begin the application process. The Financial Aid Office may assist veterans in seeking other sources of financial aid in addition to their VA Educational Assistance benefits. [Marti Jackson, Financial Aid Administrator: (425) 895-4427 (mjackson@digipen.edu); and Office of Financial Aid: (425) 895-4446 (financialaid@digipen.edu).]

DigiPen's Veterans Affairs Office exists to serve the needs of individuals eligible for Veterans Administration educational benefits. The staff of the office is here to assist veterans, veterans' dependents, and others eligible for educational benefits with problems or questions regarding benefits, certification, or other matters relating to VA benefits.

The Office of Veterans Affairs at DigiPen is responsible for certifying veteran enrollment to the Regional Veteran Administration Office each semester. Therefore, you must complete your registration on time and indicate that you are a VA student. You will receive your first VA Educational Benefit check approximately six to eight weeks after submission of the VA certification. The amount of money you will receive for education benefits differs for each program – call the VA Regional Office (888-442-4551) for more specifics.

A veteran who is enrolling for the first time or who has not been enrolled for at least 30 days at any educational institution may be eligible for advance pay. The school generally receives this payment no later than 10 days after classes begin. The first check will cover the first partial month plus the first full month of school attendance. This check may be picked up at the Business Office upon payment of any balance owed DigiPen. The veteran will receive the next check at the end of the second full month of classes. If you are interested and eligible for advance pay, please contact the Veteran Services Office at least 45 days before the first day of the class you plan to attend.

It is advisable for new or re-entering students who are or may be eligible for VA benefits to contact DigiPen's Veterans Affairs Office prior to registration to insure that all necessary VA paperwork is properly initiated. Please remember that the Veterans Administration determines eligibility for VA educational benefits and that eligibility for VA educational benefits bears no relationship to an individual's indebtedness to DigiPen. New DigiPen students who have not used any VA educational assistance programs should apply for these benefits at DigiPen's Office of Veterans Affairs.

- Veterans who have not used any of their Montgomery GI Bill-Active Duty Educational Assistance (Chapter 30) benefits will need an original or certified copy of their Member 4 of their DD Form 214 to send to the VA.
- Dependents who have not received Dependents' Educational Assistance (Chapter 35) benefits will need to apply using VA Form 22-5490 or provide a Certificate of Eligibility.
- Reservists who have not used any of their Montgomery GI Bill-Selected Reserve Educational Assistance (Chapter 1606) benefits, will need the original DD Form 2384, or Notice of Basic Eligibility, from their Reserve Unit. New Chapter 30 & 1606 recipients will need to complete a VA Form 22-1990.
- Transfer students who have received VA educational assistance benefits at other institutions of higher education should also apply in person at DigiPen's Office of Veterans Affairs; they will need to complete a Change in Place of Training form.

Contacts
DigiPen's Financial Aid Office: 425-895-4427 or email (mjackson@digipen.edu).

If you need additional assistance, please call the toll-free number 1-888-GI-BILL-1 (1-888-442-4551) or visit http:///www.gibill.va.gov/education/benefits.asp.

You may also contact the Department of Veterans Affairs at the following:

- Education information: (888) 442-4551
- Other VA information: (800) 827-1000
- VA monthly certification: (827) 823-2378
- Web site: www.gibill.va.gov

Enrollment Requirements

Full-time enrollment for traditional undergraduate students consists of 12 credits per semester. At a minimum, a student must be enrolled at least half-time (6-11) credits in order to be eligible for federal financial aid. Changes in a student's enrollment may require an adjustment and/or repayment of financial aid funds awarded.

Financial Aid Eligibility

To be considered for Financial Aid, you must satisfy the following:

- Be a U.S. citizen, national, or permanent resident
- Have a valid Social Security number
- Have a high school diploma or GED
- Make Satisfactory Academic Progress
- Be enrolled as a regular student in a matriculated program
- Be at least half time (6 or more credits)
- Not actively in Default of any Federal Loan Program
- Program does not exceed the allowable limits (150% of your program)
- Males between the ages of 18-26 must be registered with the Selective Service System

Proof of Citizenship

The U.S. Department of Education will attempt to match with the Department of Homeland Security (DHS) verification of your immigration status. If there is a match, your Student Aid Report (SAR) will reveal that your claim of an eligible immigration status has been confirmed. If there is no match, the Financial Aid Office will need to further obtain confirmation of your immigration status.

- Types of Acceptable Documentation:
  - U.S. passport (Must be stamped "Non Citizen National"
  - A Certificate of Citizenship (Must have student's name, certificate number, and the date the certificate was issued)
  - A certificate of Naturalization (Must have student's name, certificate number, alien Registration Number, name of the court and date where naturalization occurred)
  - Certification of Birth Abroad, Report of Birth Abroad (Form FS-545, DS-1350, or FS-240) (Must have embossed seal "U.S. of America" and "State Department")
  - Temporary Residency Card (Form I-688)
  - An alien Registration Receipt Card, U.S. Non-citizen National (Form 1-151, I551, or I-551C
  - U.S. birth certificate
  - An Arrival-Departure Record (Form I-94)
  - A completed Form G-641
  - A form FS-240
  - A Family Unity Status Form (1-797s)

A decision determination about your Financial Aid eligibility will not be made until you have submitted your immigration documents and they have been confirmed.

Deadlines

In order to obtain Federal Financial Aid, the Financial Aid Office must have your FAFSA (Free Application for Federal Student Aid) completed and certified that this information is finalized and approved by your last day of enrollment.

You will not be able to receive any disbursement of Federal Funding until the Financial Aid Office has determined that your application information, including the confirmation of your immigration status, is complete and correct. If you do not meet the above deadlines, you will lose your eligibility to receive Federal Funding for the current award period.

Satisfactory Academic Progress for Financial Aid

Students who receive financial aid at DigiPen Institute Of Technology must be making Satisfactory Academic Progress (SAP). Financial aid applicants are required to meet the standards for all terms of attendance at DigiPen, including terms when no aid is received. For further clarification, please see the section under Satisfactory Academic Progress in this catalog.

Probation

Students will be placed on Financial Aid Probation for the following semester if they are not meeting SAP. Students on Financial Aid Probation remain eligible to receive aid, but will be notified in writing and by DigiPen email that improved academic performance is expected.

Suspension

If a student does not meet SAP after one semester of probation, the student will be placed on Financial Aid Suspension at DigiPen and will have their financial aid cancelled until he or she has attained SAP.

Appeals

A student on suspension may appeal by indicating in writing to the Financial Aid Office (a) reasons why he or she did not achieve academic standards and (b) reasons why his or her aid eligibility should not be terminated or should be reinstated. Please include appropriate documentation (letters from physicians or instructors, etc.) to support the statements in your appeal. Each appeal will be considered on a case-by-case basis. Individual cases will not be considered as precedent. Financial aid cannot be reinstated for a prior semester. Your appeal should be submitted within 21 days of the beginning of the semester you want aid reinstated. The Financial Aid Director will review the appeal and, if necessary, have the Financial Aid Appeals Committee review the appeal within two weeks of its receipt to determine whether the financial aid disqualification or suspension is justified. The student will be advised in writing of the decision. The committee's decision is final, and you cannot appeal at a higher level. If your appeal is approved, reinstatement of aid is dependent on availability of funds.

Reinstatement

Suspended students can re-establish their financial aid eligibility after successfully completing – without receiving financial aid – at least 12 credit hours with the required G.P.A. Students can complete these hours at DigiPen or another accredited institution.

Satisfactory Academic Progress Requirements

Milestone	Minimum GPA Requirement
At the end of the first semester	1.0 or better cumulative GPA
25% of program (38.5 attempted credits for B.S., 20 attempted credits for A.S. and A.A.A., 36 attempted credits for B.F.A.)	1.5 or better cumulative GPA
50% of program (77 attempted credits B.S., 40 attempted credits for A.S. and A.A.A., 72 attempted credits for B.F.A.)	2.0 or better cumulative GPA
100% of program (154 attempted credits B.S., 80 attempted credits for A.S. and A.A.A., 144 attempted credits for B.F.A.)	2.0 or better cumulative GPA

Washington State Need Grant
Satisfactory Academic Progress Policy

Satisfactory Academic Progress

To be eligible for financial aid, federal regulations require students to make satisfactory progress in an eligible degree or certificate program. Students must be in good academic standing with DigiPen Institute Of Technology and the policy applies to all semesters of enrollment regardless if financial aid was received or not. All credits attempted at DigiPen Institute Of Technology will be considered when determining Academic Progress.

If students do not meet the requirements, they will be placed on financial aid probation or suspended from financial aid. If placed on probation, students must make satisfactory progress in their next semester of enrollment or their financial aid eligibility will be terminated. Eligibility can be reinstated using one of the options in this policy.

General Policy Requirements

- Achieve and maintain the required grade point average
- Complete the minimum required credits
- Complete a degree or within the maximum time frame

Minimum Credits Completed

To establish and maintain eligibility for financial aid, students must pass a minimum number of credits each semester and a minimum number of credits for the academic year, whether or not they receive aid. Generally, students must pass half-time credits for each semester and the equivalent credits related to enrollment/financial aid status by the end of the academic year.

Completion of credits

	You Must Complete:	Probation status if you only complete:	Cancellation status if you complete less than
Full-time (12+ credits)	12 credits/semester	6-11 credits/semester	6 credits/semester
¾ -time (9-11 credits)	9 credits/semester	6-8 credits/semester	6 credits/semester
½ -time (6-8 credits)	6 credits/semester	no probation available	6 credits/semester
Less than 6 credits	All credits registered	no probation available	All credits registered

Grades of I (incomplete), AU (audit), W (withdrawal), F (failure), FN (failure for never attending), FS (Failure for stopping attendance) do not count as completed credits.

a) Semester: Students are expected to complete the credits for which they enroll. Credit completion progress will be reviewed each semester and status will be determined according to the chart above. (Two consecutive probationary semesters will result in termination of aid.)

b) Annual: The annual requirement is based on the student's enrollment and aid received. Generally, a student who attempts full-time enrollment all two semesters must pass at least 24 credits by the end of spring semester. Students who receive aid as full-time students for three semesters (fall through summer) increase their annual credit requirement by one-third.

All credits attempted including credits attempted before the student applied for or received financial aid, will be monitored at the end of each academic year, or before financial aid is awarded for the academic year.

Maximum Time Frame
Students can receive financial aid to complete their program of study, up to 125% of the published credits required to complete the program. All attempted courses are counted, including: incompletes, withdrawals, repeated courses, and transfer credits. When students have completed their program, or have attempted 125% of the credits in their program, they will be ineligible for financial aid. Students in programs with additional required courses to complete the degree or who have exceptional circumstances that prevented them from completing their degree within the time frame can submit an appeal.

In cases where students need to take required prerequisite credits courses needed to enter classes in their program an exception to the time frame can be made by submitting an appeal to the financial aid office. Please note that the financial aid office and registration office have separate policies and appeal procedures.

Unsatisfactory Academic Progress
Probation
When students are on probation status for unsatisfactory academic progress, they must make satisfactory progress in their next semester of enrollment. Students must complete the credits for which they receive financial aid, a minimum of 12 credits with a 2.0 cumulative g.p.a. For example, if a student on probation receives financial aid for 12 or more credits, the student must complete at least 12 credits to be considered as making satisfactory progress. While a student is on probation they may receive the following semester's of financial aid, but must make up credits within the academic year in order to satisfy year-end requirements.

Cancellation-Termination
Students who have two consecutive probationary semesters, or who fail to complete the minimum number of credits for which they have registered, will be cancelled from financial aid. Students who lose eligibility must reinstate their eligibility using one of the two options described below.

Reinstatement of Eligibility
When aid has been canceled due to unsatisfactory progress, students may use one of the following options to reinstate eligibility in their next semester of enrollment.

1. Suspended students can re-establish their financial aid eligibility after successfully completing without receiving financial aid- at least 12 credit hours with a required G.P.A of a 2.0 or higher. Students can complete these hours at DigiPen or another accredited institution; or

2. A student on suspension may appeal by indicating in writing to the Financial Aid Office (a) reasons why he or she did not achieve academic standards and (b) reasons why his or her aid eligibility should not be terminated or should be reinstated. Please include appropriate documentation (letters from physicians or instructors, etc.) to support the statements in your appeal. Each appeal will be considered as prec-

edent. Financial aid cannot be reinstated for a prior semester. Your appeal must be submitted within 21 days of the beginning of the semester you want aid reinstated. The Financial Aid Director will review the appeal and, if necessary, have the Financial Aid Appeals Committee review the appeal within two weeks of its receipt to determine whether the financial aid disqualification or suspension is justified. The student will be advised in writing of the decision. The committee's decision is final, and you cannot appeal at a higher level. If your appeal is approved, reinstatement of aid is dependent on availability of funds.

Reinstatement-125% Maximum Timeframe

Students who have attempted the maximum timeframe of 125% of the required credits but have not completed their program are considered to not be making satisfactory progress and they are ineligible for additional aid. Students with exceptional circumstances may submit an appeal for additional eligibility along with an Educational Plan from their academic advisor. The appeal must explain the exceptional circumstance that prevented them from completing the program within the maximum number of credits. An Educational Plan signed by the advisor and listing the remaining courses required to complete the degree is helpful in making a determination and in some cases may be required. Appeals will be considered only for the remaining required coursework.

Additional Information

Second Program
Generally, students will receive financial aid for only one-degree program at DigiPen Institute Of Technology. To request funding for a second degree, a student will need to submit an appeal along with an Educational Plan including credit evaluation and transferability of credits from the first degree to the second degree. If the appeal is denied, a student is not eligible for financial aid, but may be able to apply for alternative loans.

Transfer Students
Credits from prior schools that are accepted and applied towards a degree at DigiPen Institute Of Technology will be counted in the total maximum time frame limits of eligibility for aid at DigiPen Institute Of Technology. Until an official Transfer Credit Evaluation is completed by the Registrar, all prior credits will be assumed to be transferable.

Withdrawal/Unofficial Withdrawal

Students who withdraw from classes after receiving financial aid including student loans may be required to repay funds back to the financial aid program(s). Unpaid amounts due will be referred to our Business office for collection and to the appropriate agency including the U.S. Department of Education. Students are ineligible for financial aid until the aid is repaid.

Withdrawal from DigiPen Institute of Technology

If at any time, a student decides to leave DigiPen Institute Of Technology, it is absolutely necessary for him/her to see the Financial Aid Office or make an appointment with the Director of Financial Aid for an exit interview prior to leaving the campus. This applies to students who are withdrawing and/or transferring to another institution. Failure to meet for an exit interview may increase the risk of defaulting on student loans as well as incurring a potential liability to DigiPen for not maintaining compliance with a federal requirement. Students who withdraw may be subject to the return of Title IV Funds.

Return of Federal and State Funds and Repayment Policy

DigiPen Institute Of Technology's Institutional Refund Policy operates independently from the Return of Title IV Funds policy required for all Financial Aid recipients. The return of Title IV and State Funds policy applies to students who cease enrollment prior to the end of a financial aid "payment period." The return of federal Financial Aid funds policy is applied to all Financial Aid recipients who withdraw, drop out or otherwise fail to complete 60% of the payment period for which they have received federal funds. Unearned Title IV funds (grants and loans) must be returned to the appropriate federal program by both the college and the student. The percent of funds "earned" is based upon the number of days completed in the payment period divided by the number of hours in the payment period for which the student received federal funds. The percentage of assistance "earned" is equal to the percentage of the payment period completed.

The percentage of federal funds "unearned" equals 100% minus the percent of federal and/or state aid "earned." The student and the college may retain the earned portion of aid, but are required to return a portion of the unearned aid to the appropriate federal grant and/or loan program. Amounts returned to grant programs if applicable, are reduced by 50%.

This federal law means that the federal government expects that student must "earn" the aid they receive. Once a student receives federal aid and state funds such as Federal Pell grant, or Federal Stafford loans, she/he is expected to "earn" those funds by attending school and completing the number of credit hours for which she/he was paid.

If a student shows eligibility for funds not disbursed, then the school performs a Return of Title IV funds calculation and determines that the student did not receive Title IV funds for which they were eligible to receive is called a "post-withdrawal disbursement."

The above Return of Title IV funds formula will be applied to students with Washington State Need Grant. If the return of funds based on the Federal Title IV calculation results in no repayment to the state programs, the obligation to repay the State Need Grant fund is the student's responsibility.

DigiPen Institute Of Technology allocates unearned Title IV funds and State funds to the following financial aid programs, in the order shown:

1. Unsubsidized Stafford Loan
2. Subsidized Stafford Loan
3. PLUS
4. Pell Grant
5. Washington State Need Grant

The Institution will repay the programs the unearned aid based on dates of attendance.

If a student owes a repayment due to the lack of attendance, the overpayment will first be adjusted by subsequent payments of State Need Grant award. If the overpayment cannot be resolved first by adjusting the subsequent payments, then the student is responsible for returning the State Need Grant funds. DigiPen Institute Of Technology will be responsible for submitting the collected repayments directly to the Higher Education Coordinating Board. If students do not make payment arrangements within 45 days, it will be reported to the Higher Education Coordinating Board.

Applying to DigiPen

Open House

DigiPen offers a weekly open house to the general public free of charge. Any person interested in finding out more about the offered programs is welcome to attend an information session held at the Institute. Currently, the information session is held every Friday at 4:00 P.M., excluding holidays. Students who are accepted are required to attend an official orientation session prior to the start of the program.

Continuing Education

Applicants who are interested in taking individual courses and not a full program of study may pursue the continuing education program. Applicants to the non-degree program may register for courses based on each semester's course offerings and availability. Course registration will be handled on a first-come, first-served basis. Please inquire with the Registrar's Office to determine course availability. All non-degree seeking applicants must submit:

1. Official high school transcripts.
2. $75.00 application fee (U.S. funds only).
3. DigiPen Institute of Technology Application for Admission.

Note: Non-U.S. residents are ineligible for F-1 student visas under the continuing education program and may only pursue studies under this program if they have a current visa that allows them to study in the United States. If an applicant is a permanent resident or has a visa that allows him/her to pursue studies in the United States, a copy of the visa or the permanent residency card is required as part of the application. The copy of the visa or the permanent residency card serve as confirmation of the applicant's immigration status before a student can be admitted into the non-degree program.

Admission to the Programs of Study

Admission requirements vary from one program to the next. The Institute determines eligibility for acceptance into a program. Please view the section that matches your needs. In general, admission is competitive; those who exceed the minimum admission requirements are more likely to be accepted into the program.

Beyond the usual requirements that applicants to DigiPen must meet, a few crucial characteristics can make your academic career with us successful:

- **A strong desire to achieve.** DigiPen is a challenging school; individuals must be prepared to work long hours on projects and studying for exams. The coursework is meant to transform students into programmers, animators, and engineers in a dynamic and competitive industry.

- **An affinity for logical thinking.** Programming is a highly logical and organized way of thinking, and some people find themselves better suited for it than others. Programmers look at the world, analyze why and how things happen, and try to figure out how to make it happen in a simulated environment on a computer.

- **An understanding of creativity.** Programmers need to be able to appreciate artists and the artistic way of thinking and be able to work with artists on an equal level. Since art and programming go hand-in-hand, neither is more important than the other in making quality products.

- **Artists will need to learn to work with programmers,** who can tend to see in a very linear but not necessarily artistic fashion. Being able to bring your own aesthetic to someone else's design can be challenging; we can help you learn to meet the challenge.

- **Thick skin is necessary** for both artists and programmers in the game industry. Learning how to take constructive criticism is very important in this field.

- **Respect for yourself and your peers.** One of the best personality traits for any professional is to always respect yourself and the people with whom you work. If you treat people the way you want to be treated, you will succeed better than you can imagine.

Undergraduate Application Process

All undergraduate applicants must submit the following for consideration:

1. DigiPen Institute of Technology Application for Admission.
2. US $75.00 application fee: If an applicant is denied admission to the program, DigiPen will refund the application fee.
3. Official high school transcripts or official GED test scores, if applicable.
    - DigiPen requires all applicants to have completed grade 12 or the equivalent with a minimum 2.5 cumulative GPA.
    - Applicants who have earned their GED should submit sealed transcripts for the time that they attended high school, along with their GED test scores to prove high school equivalence.
    - Home-schooled applicants who have completed an accredited curriculum may submit official transcripts. Home-schooled applicants who have not completed an accredited curriculum should submit official GED test scores as proof of having earned high-school equivalence.
4. Official transcripts from ALL post-secondary institutes attended, if applicable. This includes transcripts for high school concurrent enrollment programs. Transcripts must be sent by the issuing school directly to DigiPen Institute Of Technology or may be sent by the applicant if SEALED in an envelope and stamped over the seal by the registrar, showing that they have not been opened.
5. Official SAT or ACT exam scores. DigiPen requires completion of the SAT OR ACT test and submission of these scores from all undergraduate applicants, except for animation applicants who have already graduated from high school and have at least 1 year of college experience. The writing portion is not required but may be taken into consideration if sent. There is no minimum score requirement for either test. SAT or ACT test scores must be sent directly to DigiPen by the issuing organization. DigiPen also accepts them on high school transcripts. SAT code: 4138; ACT code: 6659.
6. Two letters of recommendation from individuals familiar with your academic background and/or work ethic, i.e. an instructor, guidance counselor, or employer. Recommendation letters from family members will not be considered. Each letter MUST be sealed, signed, and dated by the author and must contain a contact phone number. Please download the recommendation letter templates online at https://management.digipen.edu/srs-app/ or contact the Office of Admissions at 425-558-0299 for copies to be mailed to you.
7. Personal statement. Guidelines for the personal statement will be included on the Application for Admission.
8. Other official documentation, if applicable. This includes, but is not limited to, TOEFL scores, copy of Permanent Resident card, and a financial responsibility form for international students.
9. Art Portfolio (3D Computer Animation and Production Animation applicants only). Please see the admission section for these programs for more information.

Real-Time Interactive Simulation (B.S.) and Computer Engineering (B.S.)

Applicants to these programs must also have completed grade 12 or the equivalent with a "B" average or 3.0 GPA in mathematics. We highly recommend taking Algebra, Geometry, and Pre-Calculus at a minimum, but we encourage applicants to take through Calculus/AP Calculus and other relevant courses in Physics, Chemistry, and Computer Science if possible.

**3D Computer Animation (A.A.A.) and
Production Animation (B.F.A.)**

Portfolio

Applicants to these programs must also submit an art portfolio. This portfolio should contain between 10-20 samples of original artwork by the applicant for review. Fifty percent of the portfolio must be drawings from direct observation; they may not be from photos or other 2D reference or from the student's imagination. The other fifty percent of the portfolio should demonstrate an applicant's artistic range and skill. Samples of animation, figure/animal studies, character designs, architectural renderings, landscape studies, sculpture, and painting are preferred for this second half. If necessary, DigiPen may request more samples for review.

- Color copies, photocopies, slides, photographs, or work contained on CDs will be accepted, since portfolios *will not be returned.* Applicants should label portfolios clearly with their name on the front. All artwork should be labeled with the date of completion and medium used. Applicants who submit hard copies of artwork should contain their portfolios in 8.5x11-inch binders.
- DigiPen's admission portfolio review is not a competitive process. Our intent in reviewing applicants' portfolios is to insure that a student has appropriate foundational skills rather than culling for the best available class. DigiPen continuously reviews portfolios as they are received. Applicants should consider them a benchmark demonstration of foundations rather than an audition.

We are looking for two things when we review portfolios:

1. Does the applicant's work demonstrate that the applicant is a serious amateur artist? To this end, we expect to see 5-10 samples of the applicant's best work regardless of subject matter or medium. This work should be selected with an eye toward quality, design, composition, and a dedication to craft.

2. Does the applicant have strong enough foundational drawing skills to handle the rigors of our curriculum? 5-10 pieces of the application portfolio must be drawings directly from observation, preferably of people and animals. Do not draw from your imagination or from two-dimensional reference such as a photograph or another artist's work. Your drawings should clearly communicate the structure and three-dimensional form of the subject. The emphasis should be on representational accuracy rather than cartooning or heavy stylization.

Our intent is to find students who are well matched, in goals and temperament, to the rigorous nature of DigiPen's animation programs. Ultimately, the audition for DigiPen's animation programs is more in the essay answers than the portfolio. A student coming here should be willing to work 80-hour weeks and spend an extensive amount of time honing their foundational skills, theoretical understanding, technical abilities, and professional preparation. They should be focused on making the transition from serious amateur artist to career animation professional. This is the focus of our program. They should expect to be challenged by their faculty and possess the personal discipline and maturity to handle constructive criticism. Our community is intense and passionate about their lives as professionals. Applicants should share this passion.

**SAT/ACT Scores for Applicants with
Previous College Experience**

DigiPen does not require animation applicants with at least one year of college experience to submit SAT/ACT scores. However, any animation applicant coming straight from high school will need to submit SAT/ACT scores regardless of whether or not he or she has taken some college courses.

Graduate Application Process

All Master of Science in Computer Science applicants should complete their application by July 1st to guarantee timely evaluation of their application. Any applications completed after July 1st may not be evaluated for the current application year. All graduate applicants must submit the following:

1. DigiPen Institute of Technology Application for Admission.
2. US $75.00 application fee: If an applicant is denied admission to the program, DigiPen will refund the application fee.
3. Official Graduate Record Examination (GRE) scores for the General Test. All graduate applicants must complete the Graduate Record Examination General Test and arrange for those scores to be sent directly to DigiPen Institute Of Technology by the testing agency. GRE code: 4193. Beginning with the 2007-2008 Application year, all applicants with an undergraduate degree in any major other than Computer Science or Computer Engineering will be required to submit scores for the GRE Subject Test in Computer Science.
4. Official transcripts from ALL colleges and universities attended.
   - Applicants must provide evidence of their completion of a bachelor's degree with a minimum 2.5 cumulative GPA.
   - Official transcripts from all colleges and universities attended must be sent directly by the issuing institutions or may be sent by the applicant if SEALED and STAMPED across the seal by the registrar.
5. Two letters of recommendation, which MUST be from individuals familiar with your academic background and/or work ethic, i.e. an instructor, guidance counselor, or employer. Recommendation letters from family members will not be considered. Each letter MUST be sealed, signed, and dated by the author and must contain a contact phone number. Please download the recommendation letter templates online at https://management.digipen.edu/srs-app/ or contact the Office of Admissions at 425-558-0299 for copies to be mailed to you.
6. Statement of Purpose. Guidelines for the Statement of Purpose will be included on the Application for Admission.
7. Other official documentation, if applicable. This includes, but is not limited to, TOEFL scores, copy of Permanent Resident card, etc.

International (Non-U.S. Resident) Applicants

DigiPen Institute of Technology welcomes students from different countries and cultures. Because of language and educational differences, DigiPen finds it necessary to request additional information from international applicants in order to ensure a successful experience for students. DigiPen requests international applicants to complete the application process early to allow time to process required documents for the Immigration and Naturalization Service (INS).

In addition to the degree-specific requirements found under the undergraduate or graduate admission requirements, all international applicants should meet the following minimum requirements:

1. Proficiency in the English Language
   - A minimum Test of English as a Foreign Language (TOEFL) score of 550 (paper exam) or 213 (computer exam). TOEFL code: 4138.
   - Completion of four years of high school in the United States at an English-speaking school.
   - Completion of a bachelor's degree at an English-speaking institution.
   - Other English proficiency exam scores, such as the International English Language Testing System (IELTS) may also be accepted.
2. Financial Support
   Evidence of financial support indicating that sufficient funds are available for the 12-month period of study and living expenses must be submitted to DigiPen and made available to U.S. Immigration Service upon entry into the United States. The Financial Responsibility form must be submitted, regardless of whether or not a student is living in the U.S.

International students intending to study at DigiPen Institute of Technology must obtain an F-1 visa from the U.S. Citizenship and Immigration Services (USCIS). An F-1 student is a non-immigrant who is pursuing a full course of study towards a specific educational or professional objective at a school in the United States. Once that objective has been attained, the F-1 student is expected to return to his or her residence abroad. International students should note their citizenship on the application form for admission. If accepted, DigiPen will send you a Form I-20 (Certificate of Eligibility for Nonimmigrant (F-1) Student Status). If you are a foreign citizen and are accepted, but do not receive a Form I-20 in your acceptance packet, please contact the Office of Admissions.

After you receive your I-20, take the USCIS Form I-20 to the nearest U.S. consulate to obtain a student visa. Please note that the visa process may take several months to complete, so we recommend that you complete your application process early. You must also take your Financial Responsibility form and documents to prove that you have sufficient financial resources for your education and stay in the United States. For more information on visas, please consult the U.S. Citizenship and Immigration Services web page at http://uscis.gov/graphics/

Permanent Residents do not need a student visa, but must prove their immigration status by submitting a copy of their permanent residency card and marking the appropriate citizenship status on the application for admission. The copy of the permanent residency card confirms that a student is a legal resident and that he/she may pursue studies at DigiPen. Permanent residents are subject to the same rights, services and rates as U.S. citizens.

Admission/Denial to the Program

Accepted undergraduate and graduate applicants will receive an enrollment packet via standard mail. This packet will include an enrollment agreement, information on financial aid, student services information, and, if applicable, a request to furnish proof of high school graduation before the start of classes in the fall. By returning the signed enrollment agreement, proof of high school graduation, and the enrollment fee, an applicant has confirmed enrollment.

Applicants who are not accepted to the Institute will receive a letter of denial by mail. If an applicant is denied admission to an undergraduate program, $50.00 of the application evaluation fee will be refunded to them.

Readmission Information

Any student who wishes to return to DigiPen Institute of Technology after an absence may apply to do so by completing a Readmission Application and submitting the following:

1. Completed Readmission Application
2. Non-refundable $25 application fee
3. Official transcripts (sealed) from all institutions attended since last attending DigiPen
4. Other official documentation for specific circumstances as requested on the application (e.g. physician's statement for medical withdrawals)

Medical Withdrawals

If you withdrew from DigiPen for medical reasons, a physician's statement indicating that you are ready to resume your studies and describing any special needs you may require upon your return to campus must be sent to the Office of Admissions. Your application cannot be processed without this statement.

Waiver, Credit, AP Examinations, CLEP, and Other Credit

Readmission After Academic Dismissal

If you are applying for readmission after academic dismissal, your explanation of what you have been doing since you last attended the Institute, why you would like to return, and how you plan to be successful in returning will be carefully considered during the review of your application for readmission.

Readmission After Disciplinary Action

If you were suspended from DigiPen for disciplinary reasons or left with disciplinary charges pending, you must receive clearance from the Disciplinary Committee to return. Please include a formal appeal for the Committee to review along with your application.

Readmission for Personal Reasons

If you were in good academic and financial standing when you withdrew, other than space availability, there usually are no impediments to returning. However, an academic plan may need to be developed with your advisor. Students requesting readmission after an extended period of time must meet with an academic advisor to determine the viability of completing a degree program.

Readmission After Non-Payment of Account

If the Institute withdrew you for non-payment of your account, you must settle your account before applying. Once you have settled your account, then the readmission policy follows the same guidelines as for personal reasons.

Transcripts of Non-DigiPen Coursework

If you have taken courses from another college after leaving DigiPen, you must have an official transcript forwarded to the Office of Admissions from the registrar of each institution attended. The transcripts should show all academic work through the last semester you completed. If you are approved for readmission with coursework in progress, your admission status will be provisional pending receipt of your final transcript.

Students may apply for course waivers if they can demonstrate that their knowledge and skills are equivalent to those gained by courses offered at DigiPen Institute of Technology – whether they were gained by formal education, exam, work experience, or life experience. Credit may be granted through other means: Advanced Placement (AP) Exam scores, International Baccalaureate courses, College-Level Examination Program (CLEP) subject exam scores, or transfer credits from other post-secondary institutions. A maximum of 9 credits per semester may be earned by these means. For undergraduate programs, no less than 75% of a student's total program must be taken at DigiPen. Graduate programs allow a maximum of 6 transfer credits from other colleges and other DigiPen programs. Course transfers and waivers are processed at $25.00 per credit. Waiver exams, when required, have an associated $100.00 fee.

Course Waiver Examinations

A student may meet an academic requirement, within specified limits, by passing a waiver examination at least equal in scope and difficulty to a final examination in a course. Successful completion of the examination waives the curricular requirement for a specific course but does not result in credit earned. Waiver credits will increase the available number of elective hours for a degree. The department in which the course is offered considers waiver requests at its discretion. Waiver credits will not reduce the total number of semester hours required for a degree. Waiver examinations must be taken prior to the final semester of residence and may not be repeated.

Students have the opportunity to waive designated core courses by demonstrating mastery of the material in two steps:

1. A waiver petition to the respective department, indicating prior academic coursework and relevant work experience in the subject area; and

2. Performance on a placement exam offered by the respective department at the beginning of each term.

To petition to waive a core course, the student must complete a waiver request for each course, submit a transcript

or photocopy of transcript with relevant coursework highlighted, and submit the requests to the Office of the Registrar. Waiver requests may be completed online through the SRS system. Each department will decide the courses for which a waiver exam or credit exam may be offered.

For waiver requests received by July 1, students will receive notification by August 1. Waiver requests arriving in the Office of the Registrar after July 1 will be handled on a rolling basis, as faculty schedules allow. Because of faculty schedules, results of waiver requests received after the deadline are not guaranteed to be available before the start of classes.

It is not possible to predict the results of faculty review of core course waiver requests. Core courses generally include intermediate level material, so a student who has completed only introductory work in a subject is not likely to be granted a waiver. Faculty take many factors into consideration, including the academic caliber of the school where the course was taken, the difficulty of the text, the grade received, and the time elapsed since completion of the course.

The following restrictions apply to all waiver examinations:

1. A student must have an approved waiver request on file before credit by examination can be recorded on the permanent record.
2. A student must be currently enrolled before a waiver examination can be recorded on the permanent record.
3. A maximum of 15 semester hours may be waived toward a baccalaureate degree and a maximum of 9 semester hours may be waived toward an associate degree.
4. Examinations may not be repeated.
5. Repeat course work and F grades are not open to waiver requests.
6. Students may not take waiver examinations on courses they have audited.

Advanced Placement Examination

Course waivers or credit may be granted for satisfactory attainment on Advanced Placement Exams of the College Entrance Examination Board taken within the last ten years. An exam score of four or above earns from three to six course waiver hours or credit. No grades will be assigned to the courses, nor will they be figured into a student's grade point average. Courses waived or transferred are entered on students' transcripts, but no grades or quality points are awarded. Official results must be sent to the Registrar before course waivers or transfers are granted.

A maximum of two courses may be waived or transferred through AP examinations, which may be applied to satisfy DigiPen's degree requirements. The examinations and the courses for which waiver hours or credit are granted are listed below. Waiver/credit granted for a specific course counts toward the satisfaction of any requirement toward which the listed course counts.

AP Exam	Score
Art – History of Art	4
English – Composition	4
English – Creative Writing	4
Mathematics – Calculus AB	4
Mathematics – Calculus BC	4
Physics – Physics (mechanical)	4

International Baccalaureate (IB)

In general, three semester credit hours are waived for each Higher Level subject in which a score of five or greater was earned in the last ten years.

The IB courses and scores listed below are eligible for waiver hours at DigiPen.

Course & Level	Score
Computer Science – HL	5, 6, 7
English (A1 & A2) – HL	5, 6, 7
Mathematics – HL	5, 6, 7
Philosophy – HL	5, 6, 7
Psychology – HL	5, 6, 7
Social Anthropology – HL	5, 6, 7
Theatre Arts – HL	5, 6, 7

College-Level Examination Program (CLEP)

There are two types of CLEP examinations, General and Subject. DigiPen grants credit for Subject Examinations only. These tests may not be repeated. Examination must be taken prior to the student's completion of a total of 40 hours of college credit.

CLEP offers a number of subject-matter examinations. Students obtaining the percentiles established by the mathematics, computer science, and general education departments will receive credit toward that basic requirement. Students wishing credit in courses other than those listed above should consult the appropriate departmental chair.

Credit or course waivers may be granted for satisfactory attainment on Subject Examinations of the College-Level Examination Program (CLEP) of the College Entrance Examination Board. Credit will be given only in those areas in which comparable courses are offered at DigiPen. Students should check with the College Board at www.collegeboard.org for further details and information concerning test centers and dates. Courses waived or transferred are entered on students' transcripts, but no grades or quality points are awarded. Official results must be sent to the Office of the Registrar.

DigiPen Institute of Technology will grant credit to students who pass the CLEP Subject Examinations approved by the department appropriate to the examination. The score necessary to receive credit through a Subject Examination will be the mean score achieved by C students in the national norms sample. The appropriate department will determine the number of course credits to be given for passing a Subject Examination.

Transfer Credit

Credit earned by examination at other colleges or universities in the last ten years may be transferred provided such credit meets the guidelines used by DigiPen Institute of Technology.

The Registrar will evaluate college credits earned elsewhere with respect to graduation requirements at DigiPen. Transfer credit is granted for academic classes appearing on official transcripts of post-secondary institutions in which students earn a grade of B or better. Developmental classes, orientation classes, or classes in which a student receives a Pass are not eligible for transfer credit consideration. Current DigiPen students are advised to consult with the Registrar prior to enrolling in course work at other institutions if they intend that the credit be applied toward graduation from DigiPen. Courses transferred or waived are entered on transcripts, but no grades or quality points are awarded. Students who wish to have transfer credit applied to their major at DigiPen may be required to take a challenge exam for that course.

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

1. The course(s) offered for transfer must be taken at an accredited institution.
2. The course(s) must be comparable in academic quality to DigiPen 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 DigiPen grade point average.

However, grades transferred for courses taken in residence at institutions for which DigiPen has direct, formal institutional exchange agreements are exempt from this policy and will be recorded. Courses transferred in may not be used to substitute improved grades for passing grades earned at DigiPen.

Credit Evaluation Forms

Application forms for challenge, and/or waiver examinations may be obtained from the Registrar or online. A student must have approval for an exam prior to taking an exam.

Transferability of Credits to Other Institutions

DigiPen will furnish transcripts and other documents necessary for a receiving institution to judge the quality and quantity of a student's work. The Institute advises all prospective students that the work reflected on their transcript may or may not be accepted by a receiving institution. Students should inquire with the specific receiving institution about transferability of Institute credits.

Granting Credits for Experience

At this point the Institute does not grant credits for experience.

Standards of Progress

Semester Credit Hour

The semester credit hour is the basic unit of credit awarded at this institution. The academic value of each course is stated in semester hour credits. As a rule, one semester credit hour of academic credit is given for at least 15 hours of classroom contact hours, or at least 30 hours of supervised laboratory time or at least 30 hours of documented independent study activities, or at least 45 hours of internship or work related experience. In addition, undergraduate students typically will be expected to spend two hours in preparation outside of class for each hour of lecture. Additional outside work may be required for laboratory or studio classes. During the summer session, the student earns semester credit hours for class contact hours that are equivalent to those provided in the fall and spring semesters. Whenever semester hour is used in this Catalog, it is synonymous with semester credit hour (sch). A classroom contact Hour is 53 minutes in length.

Grading System

The following system applies to undergraduate students; information on the grading system for graduate programs refer to the Master of Science in Computer Science program section.

The following grading system is in use and, except where otherwise specified, applies to both examinations and term work. The weight of a final examination grade is a matter individually determined by each instructor. See the following Grade Point Average section for additional information.

A   Excellent = 4.0 quality points
A- Excellent = 3.7 quality points
B+ Good = 3.3 quality points
B   Good = 3.0 quality points
B- Good = 2.7 quality points
C+ Fair = 2.3 quality points
C   Fair = 2.0 quality points
C- Fair = 1.7 quality points
D   Poor = 1.0 quality points lowest passing grade, failing grade for major
F   Failure = 0 quality points

FN Failure for Never Attending = 0 quality points
FS   Failure for Stopping Attendance = 0 quality points

Grade FN – Failure for Never Attending

Given when a student has officially registered but never attended and never dropped.

FS – Failure for Stopping Attendance

Given when a student stops attending but never officially drops a course.

The following grades do not affect the GPA:

AU – Audit

Indicates course was attended without expectation of credit or grade.

M – Missing Grade

Not available from instructor at the time transcript was printed. Ignored in credit and grade computation.

I – Incomplete

The Incomplete is intended for use when circumstances beyond a student's control prohibit taking the final exam or completing course work. The Incomplete is not intended as a mechanism for allowing a student to retake a course. A student who has fallen substantially behind and needs to repeat a course can drop the course prior to the end of the eighth week of classes. Otherwise, the instructor should assign the appropriate final grade (D or F, for example).

An Incomplete may not be used simply to allow a bit more time for an undergraduate student who has fallen behind for no good reason. An I may be granted only to students who have a legitimate excuse. Examples of unacceptable reasons for approving an Incomplete include the need to rewrite a paper, the demands of a time-consuming job, the desire to leave town for a vacation or family gathering, the desire to do well on tests in other courses, and the like.

The I indicates one of the following two circumstances:

1. Some work remains to be completed to gain academic credit for the course. An I is assigned in the first instance at the discretion of the instructor. This assignment shall not be automatic but shall be based upon an evaluation of the student's work completed up to that point and an assessment of the student's ability to complete course requirements within the allowed time limit. Work to remove an I must be performed within the 12 months following the last day of the semester in which the I is incurred or earlier if the instructor so requires. When such work is completed, the instructor will assign a final grade for the course. Should the work not be completed within the agreed-upon time frame, the instructor will assign a final grade of "F".

2. When work is not completed because of documented illness or other "emergency" occurring after the eighth week of the semester.

Registrar's Note: An "emergency" is formally defined as a situation or event which could not be foreseen and which is beyond the student's control, preventing the student from taking the final examination or completing other work during the final examination period. Also note that as previously defined, a student may not request an I before the end of the eighth week; the rationale is that the student still has the option to drop the course until the end of the eighth week. The grade I exists so there is some remedy for illness or emergencies that occur after the drop deadline.

Arrangements for the grade of I and its completion must be initiated by the student and agreed to by the instructor prior to the final examination. An Assignment of Final Grade for Completion of an Incomplete (I) Form must be completed each time a grade of I is assigned. On the form, the instructor will specify to the student and the department the work remaining to be done, the procedures for its completion, the grade in the course to date, and the weight to be assigned to work remaining to be done when the final grade is computed.

If make-up work requires classroom or laboratory attendance in a subsequent term, the students should not register for the course again; instead, the student must audit the course and pay audit fees. If the make-up work does not require classroom or laboratory attendance, the instructor and student should decide on an appropriate plan and deadline for completing the course.

When the student completes the course, the instructor will submit a change of grade to the Registrar's Office. These procedures cannot be used to repeat a course for a different grade. An I grade should not be assigned to a student who never attended class; instead, instructors may assign a failing grade.

W – Withdrawal

Indicates withdrawal from the course before the end of the eighth week of classes or withdrawal from the Institute. The grade of W will not be assigned to any student who has taken the final examination in the course. An instructor may not withdraw a student from a course.

S – Satisfactory

Given only in non-credit courses.

U – Unsatisfactory

Given only in non-credit courses.

P – Pass

Given for internship courses.

Grade Reports

Reports of the final grade in each subject will be made available to the student soon after the close of each semester. However, grade reports are withheld from students who have delinquent accounts with the Administration Office, Security, or Library.

Grade Point Average

The academic standing of each student is determined on the basis of the grade point average (GPA) earned each semester. The GPA is determined by using the quality points assigned to each student's grade.

The quality point value for each grade earned during a semester is multiplied by the number of credit hours assigned to that course as listed elsewhere in this catalog. The sum of these points is the total number of quality points earned during the semester. This sum is divided by the number of credit hours attempted (hours from courses with grades of A through FS) to obtain the GPA.

The cumulative GPA is obtained by calculating the GPA for all courses attempted at DigiPen. Course grades of AU, I, W, S, U, and P are non-punitive grades. They are not calculated in the overall GPA since they carry no quality points.

The following example will help you calculate your grade point average:

Course	Credits	Grade	Points
CS 100	3	A	12.0 (3 x 4.0)
MAT100	4	A-	14.8 (4 x 3.7)
CS 105	3	B	9.0 (3 x 3.0)
ENG110	3	D	3.0 (3 x 1.0)
CS 120	3	B+	9.9 (3 x 3.3)
Totals	16		48.7

Total grade points divided by total credits equals the cumulative grade point average. Therefore, the grade point average for the above example is 48.7 divided by 16 for a 3.04 GPA.

Milestone	Minimum GPA Requirement
At the end of the first semester	1.0 or better cumulative GPA
25% of program (38.5 attempted credits for B.S., 20 attempted credits for A.S. and A.A.A., 36 attempted credits for B.F.A.)	1.5 or better cumulative GPA
50% of program (77 attempted credits B.S., 40 attempted credits for A.S. and A.A.A., 72 attempted credits for B.F.A.)	2.0 or better cumulative GPA
100% of program (154 attempted credits B.S., 80 attempted credits for A.S. and A.A.A., 144 attempted credits for B.F.A.)	2.0 or better cumulative GPA

Satisfactory Progress

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 FS) 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 the major 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" outline. The Registrar makes decisions on student status.

A program of study must be completed within a reasonable period of time to be eligible for graduation; that is, the credit hours attempted cannot exceed 1.5 times the credit hours required to complete the program. Full-time students who do not complete their studies during this time frame will be withdrawn from the Institute by the Registrar.

Undergraduate Students

To maintain satisfactory progress, undergraduate students must attain a minimum cumulative grade point average at various points in their program of study. *An attempted credit is defined as any credit that is awarded a final letter grade (A to FS). Credits earning a W or I are not considered attempted credits.

Appeals involving extenuating circumstances may be addressed to the Chair of the Student Appeals and Discipline Committee for action and resolution.

Passing Classes and Graduation

In addition to the pre-requisites set forth in the Catalog, Associate of Arts students must successfully complete all 100 level PRJ courses in order to proceed to any 200 level courses. All students must have a cumulative GPA of at least 2.0 to graduate.

Graduate Students

During the course of study, graduate students may not receive more than three C grades and must have an overall 3.0 GPA to graduate.

Academic Probation

Students who fail to maintain the required minimum cumulative GPA or fail to complete their academic program within the maximum attempted credits allowed will be placed on Academic Probation.

Failing to Meet Minimum GPA Requirement

Students who fail to maintain the required minimum cumulative GPA will be placed on Academic Probation the semester following the one where their cumulative GPA falls below the minimum required. A student is removed from Academic Probation as soon as their cumulative GPA is above the minimum required grade point average.

While on Academic Probation, a student 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 the student must wait 12 months before they can reapply for admission.

Students who earn a 2.0 during their probationary semester but do not raise their cumulative GPA above the minimum requirement will continue Academic Probation until their cumulative average meets the minimum requirement.

Students with a cumulative GPA of 0.5 or lower are not eligible for Academic Probation and become academically ineligible to continue. They will not be allowed to re-register for a period of one academic year. Any student in this circumstance may re-apply for admission after they have served one year on suspension.

Failing to Complete Program Within the Maximum Timeframe

Students who fail to complete their degree program within the maximum time frame, as defined under the satisfactory progress policy, will be placed on academic probation to direct them towards completion. Working with their academic advisor, these students will develop a program completion plan that outlines the quickest path to completion. These students will be held to the same conditions of probation as outlined above, with the exception that the maximum credit load per semester is waived.

Grade Changes

The faculty person who administered the grade makes grade changes. In cases where the faculty is not available to consider a grade change, the department chair in consultation with the Dean of Faculty may make such a change. Grade appeals go to the department chair responsible for the course then to the Dean of Faculty.

Repeating Courses

A student may repeat any course in which he or she has not received a passing grade (below a C- in a core course, below a D in a non-core course), as long as the student is in good standing with the school and eligible to continue his or her studies.

All grades and attempted classes remain on the student's transcript and are calculated in the student's GPA. Courses in which a student has earned a passing grade may be repeated as audit courses only.

Withdrawing from School and the W Grade

To formally withdraw from the Institute, a student must submit a completed Withdrawal notice form to the Office of the Registrar. Withdrawal notice forms may be obtained from Student Services or Financial Aid. Students below the legal age must have a parent or guardian submit the withdrawal notice.

A student may withdraw from the Institute before the end of the eighth week of instruction of a semester:

1. If a student withdraws before the end of the second week of instruction, no course entries will appear on the student's transcript for that quarter.
2. If a student withdraws after the end of the second week of instruction and before the end of the eighth week of instruction, the registrar will assign a final grade of W to the student for each course in which the student was enrolled at the beginning of the fourth week of instruction.
3. Each student will receive a final grade for each course in which the student was enrolled at the end of the eighth week of instruction of the semester.

Dean's Honor List Requirements

The Dean's Honor List, prepared at the end of the fall and spring semester, officially recognizes and commends students whose grades for the semester indicate distinguished academic accomplishment. Both the quality and quantity of work done are considered.

You must meet the following qualifications to be a recipient of this honor:

1. You must be matriculated.
2. You must be registered full-time in credit-bearing courses.
3. Full-time students must complete 12 or more credits in one semester.
4. Only passing grades (A, B, C, and D) in credit-bearing courses are counted for eligibility.
5. No failing grades: a grade of F in any course makes the student ineligible, regardless of other grades.
6. Minimum GPA Required:
    a. 12 credits – 3.65 or higher
    b. 15 or 16 credits – 3.55 or higher
    c. 17 or more credits – 3.45 or higher
7. Any courses that do not count towards the degree are excluded.
8. AP, Internship, and Independent Study credits are excluded.
9. Pass/Fail credits are NOT to be counted when calculating qualifying credits.

10. Incomplete grades will be evaluated after they are made up. The student must have qualified for the Dean's Honor List before and after the Incomplete grade was made up.

The student's cumulative grade-point average is not considered; only the grade-point average for that particular semester is relevant.

Grievance and Appeal Process
Academic Standing
Students who would like to file an appeal against a decision regarding their academic standing in a particular course should discuss the matter with their instructor. If a satisfactory resolution is unattainable, the student may file an appeal with the Head of the Department. If the resultant solution is still unsatisfactory, then the student may file an appeal with the Dean of the Institute.

Students may appeal grades and review exams no later than two weeks after transcripts are issued.

The Administration reserves the right to destroy any examination papers after the two-week appeal period. However, academic records will be kept indefinitely.

Appeal for Refund of Tuition
Students who would like to file an appeal against a decision regarding their tuition refund shall file **a written request** to the Office of the Registrar. If dissatisfied with the decision of the Registrar, the student may file a second appeal with the Chief Operating Officer. If still unsatisfied with the decision, he or she may appeal to the Executive Director of the Higher Education Coordinating Board of the State of Washington at:

**Higher Education Coordinating Board
of the State of Washington
P.O. Box 43430
Olympia, WA 98504-3430**

Schools accredited by the Accrediting Commission of Career Schools and Colleges of Technology must have a procedure and operational plan for handling student complaints. If a student does not feel that the school has adequately addressed a complaint or concern, the student may consider contacting the Accrediting Commission. All complaints considered by the Commission must be in written form, with permission from the complainant(s) for the Commission to forward a copy of the complaint to the school for a response. The complainant(s) will be kept informed as to the status of the complaint as well as the final resolution by the Commission. Please direct all inquiries to:

**Accrediting Commission of Career
Schools and Colleges of Technology
2101 Wilson Blvd./Suite 302
Arlington, VA 22201
(703) 247-4212**

A copy of the Commission's Complaint Form is available at the school and may be obtained by contacting Meighan Shoesmith, Sr. Vice President, Administration.

Attendance

Students more than 15 minutes late to class will be marked as absent for that entire class. Students may not leave class early without instructor permission.

Students absent without explanation for a period of two weeks or more are considered to have withdrawn as of their last date of attendance.

Exams

All students are required to be in attendance at the times scheduled by DigiPen for final exams. Instructors are not required to make arrangements for individuals to write final exams at a different time than the rest of the class. Should a student miss an exam, it is the student's responsibility to notify the instructor within 24 hours of the missed exam. In the event that a student fails to provide such notification to an instructor, or if the Institute does not find the reasons for missing an exam justifiable, the student will be given a failure grade for the exam(s).

Should a student miss a final exam and notify his or her instructor within 24 hours of the missed exam, the Registrar shall review the individual circumstances. Only documented emergencies will be considered acceptable reasons for missing exams. Exam retakes shall be allowed at the sole discretion of the Registrar and Department Chair. Examples of unacceptable reasons for missing an exam include the demands of a time-consuming job, the desire to leave town for a vacation or family gathering, the desire to do well on tests in other courses, and the like.

A retaken exam shall be different than the original one taken by the students, and the timing of it shall be at the sole discretion of the individual instructors. In all cases, the retakes shall be administered no later than one week after the original, missed exam.

Student Internship Guidelines

Overview

Student internships are monitored on-site work or service experiences for which students earn credit in any setting related to their career goals. The internship usually takes place in a professional workplace under the supervision of an experienced professional whereby a high degree of responsibility is placed on the student. Internships can be part-time or full-time, paid or unpaid.

All registered upper division students in the Real-Time Interactive Simulation and 3D Animation programs are eligible for internships. They can vary in duration and location. For example, interns have worked at companies in Washington, California, Texas, and New York.

Objectives of Internship Program

Through the internship program, students establish and meet intentional learning goals through actual product development experience, while actively reflecting on what they are learning throughout the experience. The goals for the internship may include:

- Academic learning – applying knowledge learned in the classroom to tasks in the workplace.
- Career development – gaining knowledge necessary to meet minimum qualifications for a position in the student's field of interest.
- Skill development – an understanding of the skills and knowledge required in a specific job category.
- Personal development – gaining decision-making skills, critical thinking skills, and increased confidence and self-esteem.

Since they have a strong academic component, students are carefully monitored and evaluated for academic credit. As a rule, one semester credit hour of academic credit is awarded for 45 hours of internship/work experience. Typically, a five (5) credit internship taken during the Fall, Spring, or Summer semester means the student will spend no less than 225 hours in the experience. Students may register for up to two semesters of internship credit (e.g. RTIS students may not register for more than ten (10) Internship credits). The element that distinguishes an internship from a short-term job or community service is the intentional "learning agenda" that the intern brings to the experience.

In support of a positive experience for the student and the employer, the Internship Coordinator assists in assuring that the work experience meets both student and organizational needs, with priority given to the student's interests and to the assurance that the experience will result in learning outcomes acceptable to the student's degree program.

More detailed information about student internships can be found in the Internship Guidelines available in the Administration Office.

Change of Major and Graduation

Graduation Requirements

Degrees and certificates will be granted at the end of the semester in which the final requirements are completed. For example, if you receive an I in a course required for graduation in your final semester, you will not graduate until the semester in which the I is replaced by a letter grade. During that semester, you must reapply for graduation.

A program of study must be completed within a reasonable period of time to be eligible for graduation; the credit hours attempted cannot exceed 1.5 times the credit hours required to complete the program. Full-time students who do not complete their studies during this maximum time frame will be placed on academic probation and will have to complete their program requirements under the conditions of their academic probation.

A student may apply to change their major by completing the appropriate Change of Major forms in SRS. Students applying to change majors are subject to the admission requirements of the new program. The Office of the Registrar reserves the right to review each request on a case-by-case basis.

Applying for Graduation

The Institute sets minimum requirements for all students seeking undergraduate degrees. *The Institute reserves the right to change graduation requirements at any time. Every degree candidate is expected to comply with changes in requirements as they relate to the uncompleted portion of coursework.*

Most students will follow the graduation requirements published in the catalog for the year they enter DigiPen. Students who interrupt their attendance may be held to the requirements of the current catalog when they return.

Students are responsible for ensuring that all graduation requirements have been completed.

Approximately four to six weeks after students apply for graduation, a degree audit report will be issued. This report identifies courses students have taken to complete the bachelor's degree requirements. This report is used to assist students in planning future coursework to ensure that all graduation requirements are met. Students should take the degree audit report with them when checking progress toward graduation with their academic advisor and/or the Office of the Registrar.

Students are responsible for notifying the Office of the Registrar of any changes in their proposed programs and questions resolved prior to registration for their final term at DigiPen.

Undergraduate students who feel there is justification for an exception to these graduation requirements may petition the Appeals/Discipline Committee. Information on filing a petition is available at the Registrar's Office.

All Incomplete grades and conditions affecting graduation must be removed from the student's record by the last regular class period of the term.

All credit course work affecting graduation must be completed by the regular class period of the term.

A letter of instruction is mailed to degree candidates in March regarding deadlines and procedures for commencement-related activities.

Graduation Application Process

1. The student completes the Graduation Application and submits the $75.00 graduation fee by the following deadlines:

Graduation Date	Graduation Application Due Date
April	December 1st
July	April 1st
December	April 1st

2. The academic advisor or administrator will review the most recent transcript or degree plan to verify progress and will notify the student whether or not s/he has completed all courses satisfactorily to date, and, if upon satisfactory completion of courses for which the student is currently registered, he or she will be eligible for graduation.

3. Final approval will not be made until after final grades are submitted and posted to student's record. Degrees will be mailed as soon as possible after that process, which should be from four to six weeks after completion. The student needs to keep the Office of the Registrar informed of address changes so that degrees are mailed to the correct address.

Student Services

Student Advising

DigiPen has adopted a faculty-advisor model to provide academic and career-related advising for students. Each student is assigned a full-time faculty member as academic advisor. Advisors provide answers to academic questions, approve extra-classes, and perform degree audits and other administrative functions. Students meet with their advisor during new student orientation and are encouraged to meet with their advisors at any time during their education. Advisors are instructed to follow-up with advisees once a semester especially during class registration time. Students are required to seek advisor approval for academic status changes such as changing majors or applying for graduation.

Placement Assistance

Student services, faculty in the Game Production and Design and Art departments work together to establish relationships with various prospective employers on an on-going basis. Student services offers resume and job-hunting workshops to supplement career education found in the curriculum. The school has a career bulletin board and uses an e-mail mailing list to post job postings. Advice on career options is available for enrolled students. The Institute also provides placement services in the form of internships that may be available during the summer; the placement program bases its recommendations of students on their academic performance. Employment upon graduation is not guaranteed.

The Institute also hosts an annual career day that attracts employers from around the country to our campus to review student portfolios and conduct interviews. DigiPen also attends industry events such as the Game Developer's Conference to promote our program and its students. Placement assistance continues beyond graduation as these services are extended to alumni.

Special Needs

DigiPen Institute of Technology strives to ensure that all students are provided with an equal opportunity to participate in the college's programs, courses and activities. Students requiring special assistance must self-identify to the Student Services Director and provide current documentation supporting their disability. Students must assist in identifying the proper accommodations and negotiate these accommodations at the beginning of each semester. As outlined by the American with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, DigiPen will provide reasonable accommodations and academic adjustments as long as provisions do not fundamentally alter the nature of the program or the academic requirements that are considered essential to the program of study.

Housing

DigiPen does not offer student housing but we do maintain a housing referral and a roommate referral program for students. The Student Services Director administers these programs with help from the Admissions department. The roommate referral program is an online program for students, giving them an opportunity to 'meet' one another online and find a compatible roommate before the beginning of the classes in the Fall. Many students reside in apartment units that are within walking distance to DigiPen.

Meal Plan

DigiPen contracts with a local catering company that operates the 3D Café, offering students the choice of a prepaid meal plan or a-la-carte cafeteria-style service. The 3D Café offers lunch and dinner during the Fall and Spring semesters and offers lunch during the summer semester, depending on demand.

Lockers

The Institute provides lockers free of charge for voluntary student use. A deposit of $5.00 is required when a locker is requested. The Institute will provide combination locks to be used with the lockers, and a copy of the combination code will be kept with the Administration. The $5.00 deposit will be returned when the student returns the combination lock in good and working condition.

The Institute is not responsible for any loss or damage to the contents placed in the lockers, and the Institute reserves the right to search the contents of the lockers at any time, without prior notification to the student, to ensure that no illegal substances are being brought to the premises and for other reasons deemed appropriate by the Institute.

Student Association

There is a Student Association elected by the student body. This council consists of two class representatives from each cohort, with an internally elected President, Vice President, Secretary and Treasurer. This association is the formal student voice to the staff and faculty at DigiPen.

Family Educational Rights and Privacy Act (FERPA)

Counseling Services

Currently, DigiPen contracts with a licensed counselor to provide brief counseling sessions for students (maximum 3-4 sessions) on school related issues, crisis intervention and interpersonal relationships with other students and staff. Referral to outside community resources for on-going services will also be provided. The counselor also provides workshops and/or courses on Stress Management, Interpersonal Communication, Conflict Resolution, and other human service topics as needed. The counselor also provides individual consultation for faculty/staff on emotional disorders in young adults.

Graduate Follow-Up

A database of all graduates is maintained and alumni are encouraged to report back regarding changes to their professional status. DigiPen hosts an annual reunion at the Game Developer's Conference and extends placement services to all alumni.

The Family Educational Rights and Privacy Act (FERPA) reserves for students certain rights 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. Students may ask the Institute to amend a record that they believe is inaccurate. They should write 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, except to the extent that FERPA authorizes disclosure without consent. 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 in which a student seeks or intends to enroll.

4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by the Institute in compliance with the requirements of FERPA. The name and address of the Office that administers FERPA is:

> **Family Policy Compliance Office**
> **U.S. Department of Education**
> **400 Maryland Avenue, S.W.**
> **Washington, DC 20202-4605**

Release of Student Directory Information

The Family Educational Rights and Privacy Act (FERPA) of 1974 protects the privacy of your education records. However, the following information is considered public or directory information and may be released to anyone unless you inform the Office of the Registrar that you do not wish any information released:

1. Name
2. Local telephone number
3. Institute e-mail address
4. Major field of studies
5. Dates of attendance
6. Degrees and awards received
7. Full or part-time enrollment status
8. Educational institutions attended

NO to Release of Information

If you do not wish to authorize directory release and do not want your directory information to appear in any published or electronic Student Directory, you may restrict access through the Administration Office. No information will be released on students or to students who have restricted release of directory information, including degrees awarded and dates of attendance.

Change from NO to YES

If you restricted release of directory information and now wish to change your authorization and allow release, you must go to the Administration Office and present photo identification and a completed release/restrict of directory authorization form.

Regulation of Conduct and Disciplinary Procedures

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

Offenses

Misconduct subject to penalty includes, but is not limited to, the following offenses:

1. Bringing in or out of the premises any magnetic media or optical media, diskettes, prints, slides, videos, etc. other than for academic or approved usage. Additionally, it is forbidden to bring in any personal computers or software, as well as any video or audio recording equipment.

2. Consuming food and/or drink that could damage equipment and/or facilities anywhere within the training areas of the premises.

3. Smoking anywhere within the premises, including washrooms, elevators, or stairwells.

4. Students are responsible for keeping their work area clear. All personal belongings brought to the premises must be left in the indicated storage areas. The Institute does not assume any responsibility for any personal belongings brought to the premises.

5. Student ID tags must be worn visibly when on the premises. Lost or stolen ID tags must be reported to Security as soon as possible. There is a $25 replacement fee for lost ID tags.

6. All student projects must receive approval from DigiPen's instructors prior to commencement of any production. DigiPen reserves the right to reject ideas or stop production of any student game, animation, or project for reasons deemed appropriate to DigiPen. The Institute will not allow the production of any student work that contains or makes direct or indirect references 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
   - Demeaning to any group or 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, concept, design or other material. Anyone submitting someone else's work without the explicit written permission from the legal owner of the work may have violated the owner's intellectual property rights or copyrights as well as committing plagiarism. If any student is unsure as to what constitutes a case of plagiarism, please consult an instructor.

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 DigiPen or to obtain any academic benefit is ground for expulsion without recourse.

10. Disrupting instructional activities, including making it difficult to proceed with scheduled lectures, seminars, examinations, and tests, for example.
11. Evidencing symptoms of alcohol or drug use while on school property, or the procurement or possession of illegal substances on school property.
12. Damaging, removing, or making 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.
13. Using any equipment in the premises to produce any commerical 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.
14. Tampering, moving, defacing, or otherwise altering the premises, equipment, or building property.
15. Defacing, such as graffiti or other forms of mural art, or the posting of signs anywhere in the premises and the building without permission of the Administration.
16. Using office quipment, such as photocopier, fax, or office phone, for student's personal use.
17. Assaulting individuals, including conduct 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.
18. Attempting to engage in, or aiding and abetting others to engage in, conduct which would be considered an offense.
19. Downloading or installing software on school equipment without express permission from school authorities.
20. Tampering with the emergency exit doors, any safety devices, or alarm systems. Students are responsible for becoming familiar with the emergency exits on the premises and should not use the elevator in case of fire.
21. Failing to comply with any penalty imposed for misconduct.
22. All students must abide by DigiPen's Computer and Network Usage Policy, which may be amended from time to time.

Photo Release and Interview

The Student hereby acknowledges that DigiPen may take photographs/videos of Program participants and activities, and that DigiPen shall be the owner of and may use such photographs/videos relating to the promotion of any programs offered by DigiPen without compensation to the Student. The Student also grants permission for their quotes, photos, and video to be posted on DigiPen's website or other promotional material.

Penalties

The penalties that may be imposed, singly or in combination, for any of the above offenses may include, but are not limited to, the following:

1. A failing grade or mark of zero for any course, examination, or assignment in which the academic misconduct occurred.
2. Suspension from the Institute for a specified period of time or indefinitely. Students will not receive credit for courses taken at another institution during a suspension.
3. Reprimand, with the letter placed in the student's file.
4. Restitution, in the case of damage to property or unauthorized removal of property.
5. A notation on the student's permanent record of the penalty imposed.
6. Legal action against the student committing the offense.

Warning

1. The penalty for plagiarism or for cheating is normally suspension from the Institute.
2. Charges filed under federal or state legislation or the commencement of civil proceedings do not preclude disciplinary measures taken by the Institute.

Procedures

An alleged instance of student misconduct deemed serious enough for action by the Institute shall be referred to the Student Appeals/Discipline Committee. After an investigation and hearing at which the student is invited to appear, the committee makes its recommendation to the Dean of Faculty. The student then has the opportunity to meet with the Dean of Faculty, if he or she wishes, before a final decision is rendered.

A student suspected or apprehended in the commitment of an offense shall be notified, within a reasonable period of time, of intention to report the alleged offense to a department head, Student Services Director, or other appropriate person. The student shall also be given the opportunity to explain the incident and, if he or she requests, to meet with the Student Appeals/Discipline Committee before the alleged offense. The Committee will then make its recommendation to the Dean of Faculty.

Dismissal by the Institute

By written notice to a student, the Institute may, at its sole discretion, dismiss a student at any time if he or she is in default of any of the terms, covenants, or conditions of the Institute. Furthermore, the Institute reserves the right to withdraw a student if he or she is unable to maintain the minimum required GPA in his or her courses at the end of each semester. Upon dismissal, the student shall immediately return all materials in his or her possession to the Institute relating to the program, whether created by the student, other students, or provided by the Institute.

Appeals

A student has the right to dispute the decision of the Dean of Faculty. A student who wishes to make an appeal must notify the Chief Operating Officer in writing and must provide a full explanation of the reasons for appealing.

Appeal hearings take place before a committee called together by the Chief Operating Officer. A student is entitled to be represented or assisted throughout the appeal process by an advocate who may be a friend, relative, or legal counsel. The student is entitled to explain the reasons for appealing either orally or in writing, and he or she may call witnesses. The Dean of Faculty is also present and puts forth the reasons for the original decision.

The members of the committee may ask questions of both the student and the Dean of Faculty. As soon as possible after the hearing is completed, the Chief Operating Officer will notify the student of the final decision in writing.

DEGREE PROGRAMS FOR THE ACADEMIC YEAR

2006-07

Degree Programs Table of Contents

Listed below are the page numbers for the following degree programs.

Bachelor of Science in Real-Time Interactive Simulation

Program Overview

The electronic and digital entertainment industry is one of the fastest growing and most exciting career choices of the future. Video games, movies, military simulations, air flight simulations – these 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 Real-Time Interactive Simulation prepares programmers for these industries. Designed and developed by industry experts and DigiPen faculty, our four-year R.T.I.S. program is a computer science degree that is highly focused on the technical area of graphics and simulations. Participants in our program specialize in the skills and tools necessary to create real-time simulations of real world events.

The B.S. in R.T.I.S. program offers extensive training in mathematics and physics as a foundation for the various topics presented in general computer science and computer graphics. R.T.I.S. students participate in several major team-based projects, which embody in a practical way the theoretical knowledge gained from the courses offered in the previous and current semesters. Forming the cornerstone of the program, these projects exemplify many of the skills necessary in the video game industry today: team work, design, implementation, follow-through, and business knowledge, among others. R.T.I.S. students gain the experience of designing, programming, and testing a variety of simulations and games: text-based, scrolling, simulation, and two-dimensional and three-dimensional 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 projects are game-oriented productions since games are a perfect media to present complicated subjects in a format agreeable to students. Such game-oriented productions:

- Are graphics-oriented simulations, including two and three-dimensional based 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 or multiple-player environment. The development of a multiple-player game 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. These collaborative efforts reinforce student ability to work competently within a group while completing projects.

Graduates of this program will gain the skills required to successfully pursue entry-level careers in the rapidly growing world of computer technologies in general, and computer graphics and simulations in particular. This degree prepares students to work in the computer and video game industry as intermediate-level programmers in graphics, artificial intelligence, networking, or general programming; beginning designers; or engineering tool staff members. Some of the job titles that graduates of this program may aspire to are Solutions Architect, Compatibility/Playability Tester, Game Analyst, Quality Assurance Engineer, Quality Assurance Supervisor, Computer or Software Programmer, Software Engineer, Game Programmer, Engine and Tools Programmer, Game Graphics Programmer, Artificial Intelligence Programmer, Audio Programmer, Web Programmer, or Software/Lead Tester.

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

Math Minor

To earn a math minor at DigiPen, a student must complete a block of 27 credits satisfying the following:

- The courses are taken from MAT 140 or higher (any MAT course excluding MAT 100)
- PHY 300 may substitute for one of the MAT courses
- 6 credits must be numbered 300 or higher
- 9 credits must be taken at DigiPen (not transfer credit)
- All credits must be earned with a grade of C- or better.

Physics Minor

Creating realistic simulations requires knowledge of the underlying physical laws of the universe. In modern simulations, physics is the cornerstone around which the engine is built. Translating a set of natural laws into rules for the computer requires not just the ability to understand, but also the ability to synthesize these laws given the restrictions of modern computing. All students with an RTIS or CE degree will understand the basic physical rules of simulations, but the students with a minor in physics will have a proven ability to recreate those rules.

Students that minor in physics will also have a wider exposure to the place of physics in the modern world, from electromagnetism to quantum mechanics. They will be introduced to many of the quandaries facing the modern physical sciences.

Students must complete 18 credits in PHY courses numbered 200 and above with a C- or better to earn a physics minor. Additionally, students must achieve a grade C- or better in MAT 100 or 140, 150, 200, and 225 or 250.

General Education Requirement

The B.S. in RTIS requires a minimum of 30 semester hours in general education courses.

Beyond the required English courses (e.g. ENG 110 and ENG 150), RTIS students may take any of the following courses to meet the minimum requirement of five additional English credits: ENG 115, ENG 240, ENG 241, ENG 320, ENG 400, and ENG 450.

Length

The Bachelor of Science in Real-Time Interactive Simulation consists of 154 credits offered over 8 semesters of 15 weeks each. This program usually takes four academic years to complete.

Recommended Course Sequence

Listed on the following page is the recommended course sequence for the Bachelor of Science in Real-Time Interactive Simulation. Please note the following:

- Students must achieve a grade of C- or higher in the Core courses to earn credit toward this degree.
- *Students must receive special permission from the Dean to take more than 18 credits first semester and 22 credits second semester.

Bachelor of Science in Real-Time Interactive Simulation | Recommended Sequence of Required Classes

Semester	Course	Course Title	Core	Credits
	MAT 100 or 140	Precalc. w/ Linear Algebra & Geometry or Linear Algebra & Geometry	X	4
	CS 100	Computer Environment I	X	3
	CS 120	High Level Programming I – The C Programming Language	X	3
	GAM 100	Project Introduction	X	3
	ENG 110	Composition		3
	ART 210	Art Appreciation		2
Semester 1		Semester Total		18*
	MAT 150	Calculus and Analytic Geometry I	X	4
	CS 105	Computer Environment II	X	3
	CS 170	High Level Programming II – The C++ Programming Language	X	3
	CS 230	Game Implementation Techniques	X	3
	GAM 150	Project I	X	3
	ENG 150	Mythology for Game Designers		3
	SOS 150	Society and Technology		3
Semester 2		Semester Total		22*
	MAT 200	Calculus and Analytic Geometry II	X	4
	CS 200	Computer Graphics I	X	3
	CS 225	Advanced C/C++	X	3
	CS 180	Operating System I, Man-Machine Interface	X	3
	GAM 200	Project II	X	4
	PHY 200	Motion Dynamics	X	3
Semester 3		Semester Total		20
	PHY 250	Waves, Optics and Aerodynamics		3
	CS 250	Computer Graphics II	X	3
	CS 260	Computer Networks I	X	3
	MAT 258/358	Discrete Math	X	3
	CS 280	Data Structures	X	3
	GAM 250	Project II	X	4
	MAT 250	Linear Algebra	X	3
Semester 4		Semester Total		22
	CS 300	Advanced Computer Graphics I	X	3
	CS 315	Low-Level Programming	X	3
	CS 330	Design and Analysis of Algorithms	X	3
	MAT 300	Curves and Surfaces	X	3
	GAT 300	3D Computer Animation Production I		3
	GAM 300	Project III	X	5
Semester 5		Semester Total		20
	One of: MAT 350-359, 361	One Math Elective chosen between MAT 350 – MAT 359, 361 See course descriptions section for titles of individual courses.	X	3
	CS 350	Advanced Computer Graphics II	X	3
	CS 365	Software Engineering	X	3
	Elective	One CS Elective chosen from CS 245, 270, 380, 381, 400, 460, or PHY 350. See course descriptions section for titles of individual courses.	X	3
	GAM 350	Project III	X	5
	Elective	An elective of your choice in CS, MAT, PHY, GENED, or ART		3
Semester 6		Semester Total		20
	Elective	Select one: ANI125, ART400, FLM115, FLM151, FLM275, or ART410		2-3
	ENG Elective	One ENG Elective chosen from ENG 115, 240, 241, 320, 400 or 450		2-3
	Elective	One CS Elective chosen from CS 245, 270, 380, 381, 400, 460, or PHY 350	X	3
	GAM 400	Project IV	X	5
	Elective	An elective of your choice in CS, MAT, PHY, GENED, or ART		3
Semester 7		Semester Total		15-17
	ENG Elective	One ENG Elective chosen from ENG 115, 240, 241, 320, 400 or 450		2-3
	Elective	One CS Elective chosen from CS 245, 270, 380, 381, 400, 460, or PHY 350	X	3
	CS 420	Graphics File Format	X	3
	GAM 450	Project IV	X	5
	Elective	An elective of your choice in CS, MAT, PHY, GENED, or ART		3
Semester 8		Semester Total		16-17
		Total		154 minimum

Note: Please see the explanation of Core Courses and the [*] on the preceding page.

Bachelor of Science in Computer Engineering

Program Overview

The Computer Engineering (CE) Program at DigiPen educates engineers to understand both sides of the hardware-software interface, from designing circuits to creating operating systems. Multidisciplinary in scope, the CE curriculum integrates the fields of electrical engineering and computer science. This program will uniquely prepare CE graduates to design and develop embedded, digital, and computer systems. Graduates with a degree in CE will be highly skilled and ideally suited for 21st century industries, including the games industry.

DigiPen concentrates on the practical application of theoretical learning through a variety of semester- and year-long projects. Students will have increasing levels of creative control in their projects and receive feedback from expert instructors. The CE curriculum and student projects will focus on embedded systems, a term that refers to any device that uses a microprocessor or microcontroller. Embedded systems appear in a wide array of household, industrial, and military applications, including portable and console game systems, robots, game peripherals, electronic toys, digital cameras, audio/video component systems, and aircraft flight systems. Applications of computer engineering include:

Technology Areas	Application Domains
■ Game System Hardware ■ Electronic Toys ■ Virtual Reality Hardware ■ Human Interface Devices ■ Robotics & Automation ■ Artificial Intelligence ■ Operating Systems ■ Information Systems ■ Telecommunications ■ Signal Processing ■ Control Systems & Instrumentation ■ Multimedia	■ Aerospace and Avionics ■ Automotive ■ Consumer Electronics ■ Medical Sciences ■ Internet ■ Entertainment ■ Military

There is real potential for innovation in the field of computer engineering and a growing demand for skilled graduates. For example, hardware design limits game software development. CE graduates possess the proficiency to design and implement new hardware interfaces that will expand the bounds of video games and other interactive media.

Students who successfully complete the CE curriculum acquire the following:

- A broad foundation in mathematics, physics, and computer science that allows students to remain current in the profession as tools and techniques evolve.
- A foundation in electrical engineering that includes the principles of circuits with an emphasis on digital electronics, microprocessors, microcontrollers, and embedded systems.
- The ability to work in small teams to design, build, and test prototype systems typical of those current in the industry.
- Strong foundational skills in system design, software engineering, coding, and system integration.
- Extensive skills in applied technology using industry-standard hardware and software.
- Professional work habits and attitude, including the ability to maintain a production schedule and respond to professional criticism.
- Social perspective and civic accountability relative to the roles that technology plays in our society.

Math Minor

To earn a math minor at DigiPen, a student must complete a block of 27 credits satisfying the following:

- The courses are taken from MAT 140 or higher (any MAT course excluding MAT 100)
- PHY 300 may substitute for one of the MAT courses
- 6 credits must be numbered 300 or higher
- 9 credits must be taken at DigiPen (not transfer credit)
- All credits must be earned with a grade of C- or better.

Physics Minor

Creating realistic simulations requires knowledge of the underlying physical laws of the universe. In modern simulations, physics is the cornerstone around which the engine is built. Translating a set of natural laws into rules for the computer requires not just the ability to understand, but also the ability to synthesize these laws given the restrictions of modern computing. All students with an RTIS or CE degree will understand the basic physical rules of simulations, but the students with a minor in physics will have a proven ability to recreate those rules.

Students that minor in physics will also have a wider exposure to the place of physics in the modern world, from electromagnetism to quantum mechanics. They will be introduced to many of the quandaries facing the modern physical sciences.

Students must complete 18 credits in PHY courses numbered 200 and above with a C- or better to earn a physics minor. Additionally, students must achieve a grade C- or better in MAT 100 or 140, 150, 200, and 225 or 250.

General Education Requirement

The B.S. in Computer Engineering requires a minimum of 30 semester hours in general education courses.

Beyond the required English courses (e.g. ENG 110 and ENG 150), CE students may take any of the following courses to meet the minimum requirement of five additional English credits: ENG 115, ENG 240, ENG 241, ENG 320, ENG 400, and ENG 450.

Length

The Bachelor of Science in Computer Engineering consists of 154 credits offered over 8 semesters of 15 weeks each. This program usually takes four academic years to complete.

Bachelor of Science in Computer Engineering | Recommended Sequence of Required Classes (154 credits)

Semester	Course	Course Title	Core	Credits
	MAT 100 or MAT 140	Pre-calculus with Linear Algebra and Geometry or Linear Algebra and Geometry	X	4
	CS 100	Computer Environment I	X	3
	CS 120	High Level Programming I – The C Programming Language	X	3
	GAM 100	Project Introduction		3
	ENG 110	Composition		3
	ART 210	Art Appreciation		2
Semester 1		Semester Total		18
	MAT 150	Calculus and Analytic Geometry I	X	4
	CS 105	Computer Environment II	X	3
	CS 170	High Level Programming II – The C++ Programming Language	X	3
	CS 180	Operating System I, Man-Machine Interface	X	3
	GAM 150	Project I		3
	MAT 258/358	Discrete Math	X	3
Semester 2		Semester Total		19
	MAT 200	Calculus and Analytic Geometry II	X	4
	CS 225	Advanced C/C++	X	3
	CS 315	Low Level Programming	X	3
	EE 210	Digital Electronics I	X	3
	EEL 220	Introduction to Robotics	X	4
	PHY 200	Motion Dynamics	X	3
Semester 3		Semester Total		20
	MAT 256	Differential Equations I	X	3
	CS 280	Data Structures	X	3
	EE 200	Electric Circuits	X	3
	EE 260	Digital Electronics II	X	4
	EEL 270	Real-time Operating Systems	X	4
	PHY 270	Electricity and Magnetism	X	3
Semester 4		Semester Total		20
	CS 260	Computer Networks I, Interprocess Communication	X	3
	CS 380	Robotic Intelligence	X	3
	EE 300	Embedded Microcontroller Systems	X	3
	EEL 310	Project III Hand Held Gaming Device	X	5
	MAT 225	Calculus and Analytic Geometry III	X	3
	Elective	GENED Elective		3
Semester 5		Semester Total		20
	MAT 340	Probability and Statistics	X	3
	CS 365	Software Engineering	X	3
	CS 370	Image Processing	X	3
	EE 350	Linear Control Systems	X	3
	ECN 350	Engineering Economics		3
	EEL 360	Project III Hand Held Gaming Device	X	5
Semester 6		Semester Total		20
	EE 400	Motors and Sensors	X	3
	ART 410	Mechanical Drawing		3
	ENG Elective	One ENG Elective chosen from ENG 115, 240, 241, 320, 400 or 450		3
	EEL 410	Project IV Robots	X	5
	Elective	GENED Elective		3
Semester 7		Semester Total		17
	ENG Elective	One ENG Elective chosen from ENG 115, 240, 241, 320, 400 or 450		3
	EEL 460	Project IV Robots	X	5
	SOS 150	Social and Cultural Perspectives on Technology		3
	Electives	GENED Electives		6
	Elective	An elective in CS, MAT, or PHY	X	3
Semester 8		Semester Total		20
		Total		154 minimum

Note: Students must achieve a grade of C- or higher in the Core courses to earn credit toward this degree.

*Students must receive special permission from the Dean to take more than 18 credits first semester and

22 credits second semester

Associate of Applied Arts in 3D Computer Animation

Program Overview

As the 3D computer animation industry matures, companies increasingly seek employees with skills beyond simply a working knowledge of a specific commercial 3D software package. More than ever, employers need computer animators who have strong content creation skills. Studios like to see strong traditional art skills in addition to an understanding of fundamental animation principles. If they wish to be successful, animators must also have a good grasp of story development, character design, storyboarding, lighting, camera composition, and sound design.

Using industry-standard computer hardware and software, our program provides students with the necessary practical skills employers need. More importantly, our instructors educate students about creative content issues to ensure they have the ability to maximize the potential of this digital medium. To help students develop a strong work ethic characteristic of successful production artists, students complete numerous individual and collaborative projects under deadlines similar to those they would face in the industry. These animation productions reinforce the intensive theory courses taken during the program. Examples of student projects can be found in our Digital Gallery.

Over the course of the production-oriented environment of the two-year program, students develop a high quality portfolio. The guidance of our art faculty ensures that the portfolio work is marketable to industry companies while still allowing this critical component of any animator's resume to express an individual's artistic vision and skills.

Graduates receiving the associate degree can anticipate eligibility for entry-level jobs as 3D artists in various industries, including game development, electronic media, and graphic design. Some of the job titles that graduates of this program can aspire to are Texture Artist, Character Animator, 3D Lighting and Camera Designer, Props and Environment Modeler, 3D Broadcast Graphics Modeler and Animator, Level Designer, or Character Rigger.

DigiPen's Associate of Applied Arts Degree in 3D Computer Animation seeks to achieve the following:

- To provide students with the necessary practical skills using industry-standard, computer hardware and software.
- To educate students about creative content issues to ensure they have the ability to maximize the fullest potential of this digital medium.
- To help students develop a strong work ethic needed by successful production artists including the ability to work with others and to complete the work by the deadline.
- To allow students to express themselves artistically while ensuring that student portfolio work is marketable to industry companies.
- To implement a production-oriented environment that will allow students to produce a high-quality portfolio.

The intensive theory courses will be reinforced through multiple production cycles whereby students will be expected to complete several animation productions.

General Education Requirement

The A.A.A. in 3D Computer Animation requires a minimum of 15 semester hours in general education courses.

Length

The Associate of Applied Arts in 3D Computer Animation consists of 80 credits offered over 4 semesters of 15 weeks each. This course usually takes two academic years to complete.

Associate of Applied Arts in 3D Computer Animation | Recommended Sequence of Required Classes (80 Credits)

Semester	Course	Course Title	Core	Credits
	ANI 101	Introduction to Animation – Theories and Techniques	X	3
	ART 101	The Language of Drawing	X	3
	ART 115	Art and Technology	X	4
	CG 105	Introduction to 3D Graphics	X	3
	ENG 116	Storytelling	X	3
	PRJ 105	Introduction to 3D Production	X	4
Semester 1		Semester Total		20
	ANI 151	Advanced Animation – Theories and Techniques II	X	3
	ART 155	Basic Life Drawing and Anatomy	X	3
	CG 275	3D Character Animation	X	3
	FLM 151	Visual Language and Film Analysis	X	3
	FLM 275	Sound Design and Foley	X	3
	PRJ 155	Personal 3D Production	X	5
Semester 2		Semester Total		20
	ART 205	Character and Environment Design	X	3
	ART 225	Dimensional Design and Sculpture	X	3
	CG 300	3D Environment and Level Design	X	3
	ENG 316	Story Through Dialogue	X	3
	FLM 201	Cinematography	X	3
	PRJ 205	Team Projects	X	5
Semester 3		Semester Total		20
	ANI 125	Acting for Animation	X	3
	ART 125	Tone, Color, and Composition	X	3
	ART 255	A.A.A. Portfolio	X	3
	CG 350	3D Graphics for Gaming	X	3
	FLM 250	Post-Production	X	3
	PRJ 255	Final Projects	X	5
Semester 4		Semester Total		20
Total				80

Note: Students must achieve a grade of C- or higher in the Core courses to earn credit toward this degree.

Bachelor of Fine Arts in Production Animation

Program Overview

As the animation industry matures, 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 animation skills. Industry-quality standards continue to rise, and competition for entry-level positions demands that animators possess sophisticated skill sets before they can even begin their careers. Studios seek animators 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.

For all of these restrictions, animation remains a very viable career opportunity. 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 animation education.

The broad scope of these demands presents a series of significant academic challenges. Most current animation 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 they are able to provide. Consequently aspiring animators 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 Institute of Technology's Bachelor of Fine Arts in Production Animation seeks to address these needs. Examples of student projects can be found in our 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 animation. This base allows the student to gain an overview of the profession and provides long-term adaptability.
- An area of production specialization and focus. This enables the student to target a specific sector of the industry upon graduation. A thesis portfolio will support this focus.
- Strong foundational skills and a thorough grounding in applied drawing. This will include an understanding of how to maintain and continually enhance the student's drawing skill throughout his or her career, in addition to building the habits to sustain this growth.
- Strong foundational skills in storytelling. This includes visual storytelling, literary traditions, story through dialogue, 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. Finally, they will understand the stresses of production and methods for positively managing this stress.
- Social perspective and civic accountability relative to the roles that animation plays in our 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 three-dimensional animation, digital two-dimensional animation, and animation pre-production. Some of the careers for which graduates of the B.F.A. in Production 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, or Storyboard Artists.

General Education Requirement

The B.F.A. in Production Animation requires a minimum of thirty 30 semester hours in general education courses.

Length

The Bachelor of Fine Arts in Production Animation consists of 144 credits offered over 8 semesters of 15 weeks each. This course usually takes four academic years to complete.

Bachelor of Fine Arts in Production Animation | Recommended Sequence of Required Classes (144 credits)

Semester	Course	Course Title	Core	Credits
	ANI 101	Introduction to Animation – Theories and Techniques	X	3
	ART 101	The Language of Drawing	X	3
	ART 115	Art and Technology		4
	BIO 100	Visual Perception	X	3
	ENG 116	Storytelling	X	4
	FLM 115	History of Film and Animation		3
Semester 1		Semester Total		20
	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
Semester 2		Semester Total		18
	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 Sprite Animation Production	X	5
Semester 3		Semester Total		17
	ART 225	3D Design and Sculpture	X	3
	ART 251	Character Design	X	3
	CG 251	2D Vector Graphics and Animation	X	3
	CG 275	3D Character Animation	X	3
	PRJ 251	2D Vector Animation Production	X	5
Semester 4		Semester Total		17
	ANI 300	Acting Through an Interface	X	3
	ART 300	Perspective, Backgrounds, and Layouts	X	3
	CG 300	3D Environment and Level Design	X	3
	FLM 201	Cinematography	X	3
	PHY 115	Introduction to Applied Math and Physics		3
	PRJ 300	Limited Scope 3D Animation Production	X	5
Semester 5		Semester Total		20
	ANI 350	Voice Acting for Animation	X	3
	ART 350	Storyboards	X	3
	CG 350	3D Graphics for Gaming		3
	ENG 315	Story Through Dialogue	X	4
	PRJ 350/INT 500	Applied 3D Animation Production Problems/Internship	X	5
Semester 6		Semester Total		18
	ART 401	Conceptual Illustration and Visual Development		3
	FLM 250	Digital Post-Production	X	3
	FLM 275	Sound Design and Foley		3
	SOS 115	Media and Ethics: A Social Science Perspective	X	3
	PRJ 400/ INT 501	Team Projects/Internship	X	5
Semester 7		Semester Total		17
	ANI 400	Cinematic Animation	X	3
	ART 450	Portfolio	X	3
	CS 115	Introduction To Scripting and Programming	X	3
	LAW 115	Introduction to Intellectual Property and Contracts		3
	PRJ 450/ INT 502	Final Projects/Internship	X	5
Semester 8		Semester Total		17
Total				144

Note: Students must achieve a grade of C- or higher in the Core courses to earn credit toward this degree.

Which DigiPen Animation Degree is Right for Me?

DigiPen Institute of Technology currently offers two degrees in the field of animation: an Associate of Applied Arts (A.A.A.) in 3D Computer Animation and a Bachelor of Fine Arts (B.F.A.) in Production Animation. These two degrees do share some coursework, faculty, and facilities. The degrees also have identical application packet requirements. However, the degrees have very different educational scopes and admission evaluation criteria. The A.A.A. degree is not the first two years of the B.F.A. curriculum.

The A.A.A. in 3D Computer Animation is an extremely intense and accelerated two-year study. The curriculum specifically addresses the unique needs of three-dimensional computer animation for today's commercial production environments. Entrance into this program is highly competitive and highly restricted – only serious amateur artists with significant traditional skills should consider applying for this program. Typical applicants for this program have often already completed college-level training in art, and many already have college degrees in art and/or professional experience. However, previous degrees in art are not a guarantee that an applicant's skill level is sufficient for admission into this program. This A.A.A. degree is best suited for a trained artist looking to supplement his or her existing foundations with animation-specific training. A typical student workload in the A.A.A. program is a minimum of 72-80 hours/week between homework and classroom instruction.

The B.F.A. in Production Animation is an intense four-year study into the aspects of modern production animation. It covers a broader and deeper cross-section of the animation industry than the A.A.A. degree, including education in two-dimensional computer animation and animation pre-production art in addition to three-dimensional computer animation. It also allows for a sequential acquisition of skills and knowledge that will benefit many students. Entrance into this program is competitive and restricted, but does not have the same minimum standards as the A.A.A. degree. Applicants for the B.F.A. in Production Animation should have a strong foundation in art and a sincere willingness to work. Recent graduates from high school are strongly encouraged to consider the B.F.A. program if they are considering earning an animation degree from DigiPen Institute of Technology. This degree is best suited for any serious amateur artist wishing to prepare for a lifelong career as a commercial animator or animation artist. A typical student workload in the B.F.A. program is a minimum of 55-60 hours/week between homework and classroom instruction.

Please note that due to the intensity and integrated scope of the Institute's animation curricula, DigiPen highly restricts college transfer credits. DigiPen does not accept any transfer credits for drawing or projects classes from any student regardless of his or her educational or professional background.

Master of Science in Computer Science

Program Overview

The interactive real-time simulation software and video game industry is exciting and dynamic. Currently worth about 35 billion US dollars worldwide, the industry is an active research field that is still young and offers tremendous opportunities to talented people. The number of people involved in different game activities (game console, personal computer, hand-held, on-line, wireless devices, etc.) is expected to thrive. The trend is conservatively estimated to be growing at the rate of 10% per year. The 3D computer graphics technology continues to drive innovations and new game titles as well. It is an exciting and dynamic industry and an active research field that is still young, offering tremendous opportunities to talented people.

Gaming companies increasingly demand programmers or leading engineers with an in-depth comprehension and a solid background in mathematics, physics, and 3D computer graphics. On the other hand, many developers currently working in the field have been seeking postgraduate education to update their knowledge, sharpen their professional skills, or advance in the industry. The curriculum taught in many colleges and universities, however, lacks a focus on implementation of these exclusive objectives. Both companies and individuals consequently feel that a four-year program with a bachelor degree is evidently inadequate and often limits them from advancing professionally. More extensive training at a postgraduate level is needed.

DigiPen Institute of Technology has awarded the Bachelor of Science in R.T.I.S. since 2000. This degree provides both academic and practical training for programming computer games. It has been highly successful, and DigiPen was named the top school in the world for game-degree programs by Electronic Gaming Monthly Magazine (Dec. 2002). The Institute is now pleased to award a Master of Science Degree in Computer Science. This new program will specialize in real-time interactive simulation and is designed to attract talented students who have recently graduated with a Bachelor's degree in one of the following:

- Computer Science
- Computer Engineering or related studies
- A general field, along with some computer science studies or some game-industry experience

The M.S. in C.S. program offers extended education in areas of 3D computer graphics, animation and modeling techniques, artificial intelligence algorithms, image processing, and real-time rendering, combined with related training in computer science, mathematics, and physics.

This graduate program at DigiPen provides an opportunity for students to expand their knowledge of academic fundamentals in 3D computer graphics. Students who successfully complete the degree will possess and/or improve the following professional skills:

- In-depth foundation in mathematics and physics, such as implicit curves and surfaces, theory and applications of quaternions, differential geometry, computational geometry, wavelets, graph theory, advanced numerical analysis, and finite elements.
- Advanced knowledge in 3D computer graphics, including advanced animation and modeling algorithms (interpolation, rigid body, deformable object, inverse kinematics, natural phenomena facial, motion blending and capture, etc.), advanced rendering techniques (level of details, implicit surfaces, pipeline optimization, advanced intersection and collision detection, etc.), artificial intelligence, game engine design, physically-based modeling algorithms, ray tracing, and radiosity.
- Solid hands-on experience on game projects, including advanced game (single or multi-player) design, documentation, project management, marketing, networking, distributed systems, streaming media testing, and working with external contractors.
- Strong capability of academic research in the area of 3D computer graphics, including virtual reality, illumination and shading algorithms, animation techniques, surface representation and rendering, volume visualization and morphing algorithms, geometry, and modeling.

Computer technology pervades modern society. Those who thoroughly comprehend it have a wide range of rewarding career options. This graduate degree program prepares students specifically for advanced career choices and job opportunities in existing and emerging industries where computer graphics skills are in great demand such as the computer game, aerospace, and medical industries. Graduates of this program may attain occupations as software engineers, engine and tools programmers, game graphics programmers, and solutions architects.

Length

The Master of Science in Computer Science consists of 30 credits. Full-time students must complete the requirements for the degree in 3 years or 36 months, and part-time students must complete the requirements for the degree in 4.5 years or 54 months.

Graduation Requirements

Graduation from the masters degree program requires:

- A cumulative grade point average of 3.0 or better
- Satisfactory achievement of all required coursework
- Successful defense of master's thesis
- Submission of two original paper copies and one electronic copy of the thesis with all the required signatures. Submission directions are available in the Thesis Style Guide.

Full-time Status

Full-time enrollment for graduate students consists of 9 credits per semester.

Graduate Student Grading System

The following system applies to graduate students. If you are an undergraduate student, please refer to Standards of Progress – Grading System.

A   Excellent = 4.0 quality points
A -   Excellent = 3.7 quality points
B+   Good = 3.3 quality points
B   Good = 3.0 quality points
B-   Good = 2.7 quality points
C+   Fair = 2.3 quality points
C   Fair = 2.0 quality points.*
C-   Fair = 1.7 quality points
D   Poor = 1.0 = quality points
F   Failure = 0 quality points

AU   Audit
M   Missing grade
I   Incomplete
W   Withdrawal
S   Satisfactory
U   Unsatisfactory
P   Pass

A grade of 2.0 or better is required to earn credit for graduate level classes.

For complete descriptions of special grades, please refer to the Standards of Progress – Grading System.

Grade Reports

Reports of the final grade in each subject will be made available to the student soon after the close of each semester. However, grade reports are withheld from students who have delinquent accounts with the Administration Office, Security, or Library.

Satisfactory Progress

Minimum GPA Requirements

Graduate students are required to maintain a cumulative GPA of 3.0 or better. If the cumulative GPA falls below 3.0 then the student will be placed on academic probation. Probationary students must earn 3.0 GPA in their graduate level classes in subsequent semesters until the cumulative GPA is 3.0 or better. Students who fail to attain a 3.0 in graduate level classes during a probationary semester will be academically terminated. Terminated students may apply for re-admission after 12 months suspension.

Failing to Complete Program within the Maximum Timeframe

Students who fail to complete their program within 45 attempted credits will be placed on academic probation. Probationary students will work with their graduate advisor to develop a completion plan that outlines the quickest path to completion. Failure to meet the terms of this plan will result in academic termination.

Transfer Credits

Graduate students are eligible to transfer up to 6 credits from other colleges and other DigiPen programs. Refer to the chapter on Waivers of the Rules and Policies section for complete guidelines on DigiPen's transfer policy.

Master of Science in Computer Science

Required Courses	Course	Course Title	Credits
Computer Science	CS 510	Advanced Rendering Techniques	3
	CS 560	Advanced Animation Algorithms I	3
		Total	6
Mathematics (Select One)	MAT 551	Quaternions, Interpolation and Animation	3
	MAT 554	Computational Geometry	3
	MAT 557	Numerical Analysis	3
		Total	3
Projects	GAM 550	Game Project I	3
	GAM 551	Game Project II	3
		Total	6
Thesis	CS 601	Thesis - I	3
	CS 602	Thesis - II	3
		Total	6
Electives (Select Three: at least two must be in CS)	CS 500	Ray Tracing	3
	CS 520	Reasoning Under Uncertainty	3
	CS 530	Advanced Game Engine Design	3
	CS 561	Advanced Animation and Modeling II	3
	CS 599	Special Topics	3
	PHY 500	Advanced Physically-based Modeling	3
	MAT 550	Curves and Surfaces	3
	MAT 551	Quaternions, Interpolation and Animation	3
	MAT 552	Wavelets	3
	MAT 553	Differential Geometry	3
	MAT 554	Computational Geometry	3
	MAT 555	Graph Theory	3
	MAT 557	Numerical Analysis	3
		Total	9
		Total Required for Degree	30

Note: During the course of study, graduate students may not receive more than three C grades and must have an overall GPA of 3.0 to graduate.

COURSE DESCRIPTIONS
FOR THE ACADEMIC YEAR
2006-07

Course Descriptions Table of Contents

Listed below are the page numbers for the following departments and course titles.

Department of Art

ANIMATION

ANI 101 Introduction to Animation – Theories and Techniques (3 Cr.)

Prerequisites: None

Description: This course introduces students to the principles of animation through classical animation techniques. Students will explore the art of creating convincing movement through good timing, spacing, and drawing. Works of master animators will be screened and analyzed frame-by-frame to illustrate the principles covered in class, and students will put their knowledge to work through a series of exercises. The ultimate goal of both this course and its sequel is to introduce methods by which animators "act" and bring characters to life through sequential images.

ANI 125 Acting for Animation (3 Cr.)

Prerequisites: None

Description: An animator's ability to express attitude, thought, and emotion through body language is a fundamental skill necessary for success. Therefore, the focus of this course is to present tools and techniques for translating thoughts and feelings into specific gestures and actions. The course introduces students to the history of acting in the theater, animation, and film. Students will explore the basic fundamentals and differences of acting for the stage, film, and animation through a series of acting exercises and problems. Special emphasis will be given to classical method acting.

ANI 151 Advanced Animation-Theories and Techniques II (3 Cr.)

Prerequisite: ANI 101

Description: In ANI 151 students will continue to explore and exercise the concepts and techniques of classical animation through a series of assignments. The exercises in this course will be considerably more demanding than those completed in ANI 101 as they will be longer and will require more refinement, subtlety, and creativity. There will also be a greater emphasis on character development – the expression of personality, mood, thought, and attitude through motion and posing.

ANI 300 Acting Through a Interface (3 Cr.)

Prerequisites: ANI 125, ANI 151, ART 225, CG 275

Description: An animator's ability to express attitude, thought, and emotion through a surrogate is a fundamental skill of animation. This course builds upon the earlier acting curriculum and introduces the traditions of puppetry and marionettes. It next explores stop-motion animation techniques. Finally, students will extrapolate their knowledge to 3D biped animation and 2D character animation problems.

ANI 350 Voice Acting for Animation (3 Cr.)

Prerequisite: ANI 300

Concurrent Course: ENG 315

Description: This course explores the nature of acting through the medium of the human voice. The curriculum will explore narration, expressive reading, diction, and vocal refinement. It will introduce students to basic audio technology and recording equipment. The course also covers lip synchronization techniques in animation and culminates in a series of practical exercises in both 2D and 3D animation.

ANI 400 Cinematic Animation (3 Cr.)

Prerequisites: ANI 350, ART 401, FLM 275

Description: This course is a culmination of the student's ability to use animation as a storytelling medium. It also provides an opportunity for the student to demonstrate his or her personal artistic growth. Each student will work to complete a short piece of cinematic animation. Working independently or in small groups with the instructor's approval, students may use either 2D or 3D tools.

ART

ART 101 The Language of Drawing (3 Cr.)

Prerequisites: None

Description: This course explores the nature of drawing as a language skill and the use of drawing by production artists and animators. Applied drawing goals and critical thinking skills will be given special consideration. Students will be introduced to basic professional habits in drawing practice, drill, and play. Design principles, basic research, and the design process will be introduced and applied to a series of practical problems. This course also explores basic drawing materials, drawing strategy, drawing sequence, linear drawing methodology, practice, and theory.

ART 115 Art and Technology (4 Cr.)

Prerequisites: None

Description: This course provides an overview of art history from Paleolithic times until the modern day. It traces the technological advances of society and art and considers the interplay between art and technology. Classical art materials and methods will be examined, and students will explore how art has historically impacted society. This course has a worldwide scope and is not limited to just European and Western traditions.

ART 125 Tone, Color, and Composition (3 Cr.)

Prerequisite: ART 101

Description: This course continues to build upon students' abilities to draw by exploring the nature and use of tone, color, and composition in drawing. It emphasizes methods of creating tone, using luminance as an organizational element, and critical thinking. Additionally, the course will introduce students to a variety of classical tonal systems and tonal illusions including atmospheric perspective, sculptural modeling, basic direct lighting, lighting position relative to viewpoint, light intensity, local value, and reflectivity. Students will then explore the artistic use of color. The course will cover systems and traditions of organizing hue and saturation and will examine methods of building from tonal preliminary studies. Students will also explore classical forms of compositional organization such as symmetry, asymmetry, golden mean, and figure-ground relationships.

ART 151 Basic Life Drawing (3 Cr.)

Prerequisite: ART 101

Description: This course introduces students to the challenges of drawing the human form for animation. Students will examine life drawing for animation in addition to methods for attaining these goals. The course will emphasize capturing skeletal structure, muscle form, emotion, and gesture. Using clothed and nude models of both genders, students will learn to apply lessons in anatomy to the figure, significantly expanding their understanding of human kinetics and structure. Additionally, students will practice extrapolating basic human life drawing strategies to other animals.

ART 155 Basic Life Drawing and Anatomy (3 Cr.)

Prerequisite: ART 101

Description: This course introduces students to the challenges of drawing the human form for animation. Students will examine the goals of life drawing for animation, and the instructor will demonstrate methods for attaining these goals. Additionally, students will study human skeletal and muscular anatomy and learn to apply this knowledge to drawing. The course will emphasize capturing skeletal structure, muscle form, emotion, and gesture. Using clothed and nude models of both genders, students will learn to apply lessons in anatomy to the figure and will significantly expand their understanding of human kinetics and structure. Finally, they will practice extrapolating basic human life drawing strategies to other animals.

ART 201 Advanced Life Drawing (3 Cr.)

Prerequisites: ART 125, ART 151

Description: This course builds upon the anatomy and drawing courses students have already taken. Students will continue to improve their ability to capture kinetics in humans and animals. By engaging in a series of exercises designed to enhance their visual memory, students will build the foundation for drawing accurate figures from their imagination. They will also explore putting the figure into an environment, figurative composition, and introductory sequential figurative composition.

ART 205 Character and Environment Design (3 Cr.)

Prerequisite: ART 155

Description: Students will apply their drawing and anatomy knowledge to the creation of animation characters. The course will introduce traditions of character design and the basic structural strategies for creating animation characters. Students will explore simplification gradients relative to human, animal, and inanimate object-based characters. The course will also cover issues of costume, personality, and story interaction. Additionally, students will learn to place these characters into appropriately designed environments. The curriculum will emphasize professional applications, techniques, and standards of quality.

ART 210 Art Appreciation (2 Cr.)

Prerequisites: None

Description: This introduction to art will provide students with a better understanding of the artistic influences upon our modern culture. Along with the history of art, students will study the meanings, purposes, styles, elements, and principles of art and the various media used to create works of art. In helping students gain basic awareness, knowledge, and enjoyment of the visual arts, the course will provide the groundwork for further personal study in the arts. In turn, this will influence the development of their creativity.

ART 225 3D Design and Sculpture (3 Cr.)

Prerequisite: ART 201 or ART 155

Description: This course introduces students to the principles of 3D design using both traditional and digital tools. Students will become acquainted with additive, subtractive, and cast sculpture. They will consider the basic concepts of architectural space, interior design, landscape design, surface interplay with light, lofted forms, and skinning systems. The course will emphasize using modern polymer clays and building an animation maquette.

ART 230: Painting (3 Cr.)

Prerequisites: ART 125

This course explores ideas and various techniques related to painting. The use of color and the representation of space will be emphasized. Students will explore masterworks, studio painting and painting "en plein aire." Technical and social problems related to painting will be explored using portraiture, still life and environment/landscape. A portable field easel and appropriate painting supplies will be required. The course will culminate in a group show of student projects. (Note: This course is outside of the current Animation curricula and will not count towards graduation requirements. This course is for personal growth and will be offered on a Pass/Fail basis.)

**ART 251 Character Design
(3 Cr.)**

Prerequisite: ART 201

Description: Students will leverage their drawing and anatomy knowledge to the creation of animation characters. This course introduces student to the traditions of character design and the basic structural strategies for creating animation characters. Students will explore simplification gradients relative to human, animal, and inanimate object-based characters. They will consider issues of costume, personality, and story interaction. The course will emphasize professional applications, techniques, and standards of quality. The work completed in this course will serve as pre-production design for PRJ 300, PRJ 350, or ANI 300.

ART 255 A.A.A. Portfolio (3 Cr.)

Prerequisites: ART 205, PRJ 205

Description: Students will use this course to compile the elements of their professional portfolio. The course will introduce them to the marketing campaign needs of modern animation portfolios including visual continuity, business documents, traditional still art portfolios, process and practice samples, digital portfolios, web sites, demo reels, and promotional items. They will use this knowledge to assemble their own portfolios. The course also covers related information regarding job interviews, trade shows, professional standards, and contract negotiation.

ART 300 Perspective, Backgrounds, and Layouts (3 Cr.)

Prerequisites: ART 225, ART 251

Description: This course explores the animation pre-production skills of background and layout art. Students will review classical depth cue and perspective systems and apply this knowledge to the creation of animation backgrounds and layouts. Additionally, students will explore means of using drawing to create camera lens illusions, architectural space, theatrical sets, level design, matte painting, and surface texture. The course will emphasize professional applications, techniques, and standards of quality. The work completed in this course will serve as pre-production design for PRJ 300, PRJ 350, or ANI 300.

ART 350 Storyboards (3 Cr.)

Prerequisites: ART 300, ENG 115, FLM 200

Description: This course explores the animation pre-production skills of storyboard art. Students will leverage their knowledge of drawing, storytelling, and cinematography to create both production and presentation storyboards. They will also explore means of using drawing to create story flow, character development, mood, time, and place. The course will emphasize professional applications, techniques, and standards of quality. The work completed in this course will serve as pre-production design for PRJ 300, PRJ 350, or ANI 300.

**ART 400 Drawing Fundamentals
(2 Cr.)**

Prerequisites: None

Description: The development of strong drawing skills is of extreme importance since they are essential tools for expressing ideas, particularly during the pre-production stages of an animation project. Therefore, this course presents the basic elements of drawing and graphic design in order to improve the student's practical ability to draw with skill and imagination. It will cover methods of observing, describing, and organizing forms using various mediums such as pencil, charcoal, and color pencils.

ART 401 Conceptual Illustration and Visual Development (3 Cr.)

Prerequisite: ART 350

Description: This course explores the animation pre-production skills of conceptual illustration and visual development. Students will apply their knowledge of drawing, storytelling, and composition to create speculative drawings for animation. They will review compositional systems, design process, and illustration techniques. Additionally, students will explore means of using drawing to visually explore story and character ideas from both existing and original story materials. They will also consider adaptation, stylization, and visual variety. The course will emphasize professional applications, techniques, and standards of quality. The work completed in this course will serve as pre-production design for PRJ 300, PRJ 350, or ANI 300.

**ART 410 Mechanical Drawing
(3 Cr.)**

Prerequisites: None

Description: Traditional and digital skills in drafting are key components of an engineering career. This course introduces students to the basic skills of mechanical drafting including layout and formatting conventions, typographic traditions, and classical drafting tool usage. Students will apply these skills to actual problems in traditional mechanical drafting. They will then be exposed to modern digital tools in mechanical drafting. The course will explore subjects such as interface conventions, usage strategies and output options. Students will work with a CAD program and complete a variety of exercises designed to establish foundational skills. The course will pay special attention to addressing how professionals use these skills in production and prototyping.

ART 450 Portfolio (3 Cr.)

Prerequisites: ART 401, PRJ 400, FLM 250

Concurrent Courses: ANI 400, PRJ 450

Description: Students will use this course to compile the elements of their professional portfolio, which will serve as their B.F.A. thesis. Additionally, this course will introduce students to the marketing campaign needs of modern animation portfolios including visual continuity, business documents, traditional still art portfolios, process and practice samples, digital portfolios, web sites, demo reels, and promotional items. They will use this knowledge to assemble their own portfolios. The course will also cover related information regarding job interviews, trade shows, professional standards, and contract negotiation.

COMPUTER GRAPHICS

CG 105 Introduction to 3D Graphics (3 Cr.)

Prerequisites: None

Description: This course covers all of the general principles of computer graphics, introducing students to the primary 3D computer animation software used to create the various productions. In addition, students will learn how to use a 2D paint package for the creation of maps. Topics will include general subjects such as file management, traditions of interface structure, strategies for learning new software, and tactics for staying abreast of software evolution. Additionally, the course will introduce students to animation-specific topics including modeling, materials, lighting, rigging, cameras, animation, and output.

CG 201 2D Raster Graphics and Animation (3 Cr.)

Prerequisites: ANI 151, ART 101, ART 125

Description: This course introduces students to the industry-standard software and practices of raster graphics and animation. The course begins with basic information such as interface organization strategies, system components, bit depth, resolution, memory management, and output strategies. Then it explores techniques and critical thinking skills for digital painting, scanning, still compositing, and texture creation. Additionally, it looks at basic interface customization options and strategies in 2D raster graphics.

CG 225 Introduction to 3D Animation (3 Cr.)

Prerequisites: ANI 151, ART 101, ART 125

Description: This course introduces students to the industry-standard software and practices of 3D animation. The course begins with basic information such as interface organization strategies, equipment options, and production elements. Then it introduces techniques and critical thinking skills for texture mapping, modeling, rigging, lighting, cameras, and animation. Additionally, it looks at basic interface customization options and strategies in 3D graphics, culminating in a series of applied problems in 3D production techniques.

CG 251 2D Vector Graphics and Animation (3 Cr.)

Prerequisite: CG 201

Description: This course examines the principles and practices of 2D vector graphics and animation. It will introduce students to industry-standard software, output options, and production strategies for using vector graphics in both graphic design and animation. The course will give special consideration to critical thinking and refinement strategies when modifying vector images. Students will examine methods of using vector-based tools for creating web and broadcast animation, and the course concludes with a series of applied problems in 2D vector animation.

CG 275 3D Character Animation (3 Cr.)

Prerequisite: CG 105 or CG 225

Description: Students will continue to explore and exercise the concepts and techniques of 3D animation through a series of assignments applied to characters. Exercises in this course will be considerably more demanding than those completed in CG 125 as they will be longer and require more refinement, subtlety, and creativity. The course will emphasize character development – the expression of personality, mood, thought, and attitude through motion and posing. It will also give special consideration to proper model rigging.

CG 300 3D Environment and Level Design (3 Cr.)

Prerequisite: CG 275

Description: This course introduces students to the principles of 3D environment design. Theatrical sets, architectural simulations, and level design will all be considered. In order to provide students with a broader skill set, this course also presents the "mechanics" of how to use another 3D animation program, with an emphasis on the unique strengths of the package. Students will explore the comparative strengths of different software packages and the impact that this has on workflow. The course will emphasize critical thinking skills and strategies for tool selection.

CG 350 3D Graphics for Gaming (3 Cr.)

Prerequisite: CG 300

Description: The tremendous growth of the video game industry has resulted in a high demand for specialized 3D animation skills. Limited color palettes, file size, file formats, surface restrictions, real-time implementation, cyclical animation, and levels of detail are some of the issues that need to be handled properly for inclusion into a game. This course examines the unique problems of creating 3D graphics for games and teaches effective production techniques for addressing these issues.

FILM

FLM 115 History of Film and Animation (3 Cr.)

Prerequisites: None

Description: This course examines the more than 100-year history of film and animation. Beginning with the scientific and technical advances that made these media technologies possible, students will explore every major movement and genre as well as their impact on society. The course will give special consideration to examining all of the various professional outlets for this technology.

FLM 151 Visual Language and Film Analysis (3 Cr.)

Prerequisites: None

Description: Animation is ultimately "film making," and animators should learn from the many classics on how to effectively bring various film production elements together. Students will review several films and study how the relationships between scripts, cameras, lighting, sets, production design, sound, acting, costumes, props, directing, and production lead to successful visual stories. They will also examine the fundamental theories underlying visual storytelling. Understanding the creative processes utilized by these influential filmmakers will provide insight into how students may improve their own animations.

FLM 201 Cinematography (3 Cr.)

Prerequisite: FLM 151

Description: Like a director of photography, computer animators must have a good understanding of appropriate camera composition and lighting techniques to enhance the visual impact of the story being told. Appropriate composition and camera movement help to reveal action, and lighting establishes focus, place, and mood. Students will analyze examples of effective cinematic techniques from a variety of different animations and films. Assignments in camera composition, movement, and lighting will help students solidify their understanding of the concepts presented.

FLM 250 Post-Production (3 Cr.)

Prerequisite: FLM 201 or FLM 150

Description: The last step of any animation project involves the assembly of various production elements ranging from rendered files to sound effects. This is also the stage where the visual effects artists add the effects seen in today's movies. This course teaches the fundamental skills these artists use in post-production. Effective editing skills are the primary outcome of the course. Students will also cover the planning, execution, and addition of special effects to animation.

FLM 275 Sound Design and Foley (3 Cr.)

Prerequisites: None

Description: Every good animation relies on a well-designed soundtrack to enhance the production. While most animators do not produce the soundtrack themselves, they need to understand the effect of music, voice, and sound effects on an audience. Animators must be able to communicate their ideas to a musician and understand the technological possibilities of modern sound design. Initially students will survey a broad range of music from different cultures. Emphasis will be on developing basic listening skills in hearing rhythm, melody, harmony, color, texture, and form. Students will then learn how to apply this to the production needs of animation. The course will give special attention to the generation of sound, how to use sound to advance a story, and how it can create mood, a sense of place, and emphasis.

There may be course fees associated with this class. Please see the course registration packet for details.

PROJECTS

Projects Note 1: If one hopes to be a successful professional, it is insufficient for an animator to only understand the theory of animation and art. He or she must also understand the rigors and demands of commercial animation production. The projects classes create academic production environments where students learn the principles, practices, and habits that will help them adapt readily to the demands of the commercial animation industry. Each projects class focuses upon a series of related production problems and culminates in the students generating professional-quality work on a rigid deadline. This work will serve as the foundation for their graduation portfolios. Weekly production meetings with an instructor ensure that the production stays on schedule and that students maintain professional-quality standards.

Projects Note 2: Generally, students decide the subject of the projects class animations, but the instructor must consider the undertaking within the scope of a student's skill set, commercial marketability, academic soundness, and appropriateness in nature. DigiPen reserves the right to refuse any student production proposal that it deems inappropriate. Students are also expected to maintain an exceptional level of professionalism within these production environments, striving to produce quality work. Failure to meet this standard may result in academic discipline.

PRJ 105 Introduction to 3D Production (4 Cr.)

Prerequisites: None

Concurrent Courses: ANI 101, ART 101, ART 115, CG 105, ENG 115

Description: PRJ 105 introduces students to the basic concepts of the production process utilizing small-scale applied problems in 3D animation. Additionally, students will learn how to work within the professional animation production pipeline, which they must successfully navigate in order to achieve professional results and hone their professional critical thinking skills. The course culminates in students creating the pre-production work for their PRJ 155 project.

PRJ 155 Personal 3D Production (5 Cr.)

Prerequisite: PRJ 105

Concurrent Courses: ANI 151, ART 155, CG 275, FLM 151, FLM 275

Description: PRJ 155 addresses two of the more serious emotional challenges facing commercial animators: professional focus and realistic expectations. Animation is a team sport, and it requires a significant commitment of time and resources to accomplish even the most mundane tasks. During this course, students will face a series of choices. Each student will use the pre-production work they created in PRJ 105 to generate a single piece of limited animation. They must limit themselves to a production scale that allows for extensive professional refinement and meets the stringent specification criteria established by the faculty. Students will be introduced to realities of commercial art direction and quality control in conjunction with production deadlines. They should be prepared to repetitively revisit the same material with a relentless attention to subtle detail.

PRJ 201 2D Sprite Animation Production (5 Cr.)

Prerequisites: ANI 151, ART 125

Concurrent Courses: ART 201, BIO 200, CG 201, CG 225

Description: PRJ 201 introduces students to the basic concepts of the production process utilizing small-scale applied problems in 2D sprite animation. These digital artists heavily employ sprite animations in hand-held devices such as watches, cell phones, PDA's, and hand-held game platforms. Sprite animations are also a cornerstone of Internet graphics and fundamental to animated texture maps. Their restrictive nature makes them excellent teaching platforms because they cannot be readily solved through brute force. Digital artists must account for each pixel and thoroughly plan for issues such as color management and movement. Students must successfully navigate the production pipeline in order to achieve professional results and hone their professional critical thinking skills.

PRJ 205 Team Projects (5 Cr.)

Prerequisite: PRJ 155

Concurrent Courses: ART 205, ART 225, CG 300, ENG 316, FLM 201

Description: This course introduces students to the realities of team-based production environments. Each student will pitch a proposed team project to the faculty and the class for consideration. (Select RTIS program junior and senior level projects may also be presented by academic approval.) The animation faculty will then decide which team projects will be produced and will assign students to specific teams based upon their artistic strengths and career goals. Each team will be assigned a primary and secondary faculty advisor.

Each student's individual effort will be assessed as well as the overall success of each team. All members will be evaluated for the overall teamwork and professional success of the group. Just like a professional work environment, student teams will not be allowed to jettison individual members due to production conflicts or performance. Only the faculty will possess the ability to remove a team member for failure to perform.

PRJ 251 2D Vector Animation Production (5 Cr.)

Prerequisites: PRJ 201

Concurrent Courses: ART 225, ART 251, CG 251, CG 275

Description: Students will build upon the foundations of their first two years by exploring a 2D vector-based animation production. 2D vector animations are found throughout the Internet, video game, educational software, and broadcast entertainment industries. Students will apply the production pipeline to a sustained project spanning an entire semester. The course will give special consideration to concepts in research, project development, workflow projection, scheduling, time management, administrative documentation, and quality control. Additionally, it will emphasize appropriate work habits.

PRJ 255 Final Projects (5 Cr.)

Prerequisite: PRJ 205

Concurrent Courses: ANI 125, ART 125, ART 255, CG 350, FLM 250

Description: Students will use this course to complete an independent or team project. This project will help round out a student's portfolio and will demonstrate an appropriate level of professional challenge. These projects may focus on any aspect of 3D digital animation. Students will contract with the faculty about the content of their project. Completed projects will assist students in marketing their skills and knowledge to a specific animation industry segment upon graduation.

PRJ 300 Limited Scope 3D Production (5 Cr.)

Prerequisites: CG 275, PRJ 251

Concurrent Courses: ANI 300, ART 300, CG 300, FLM 201, PHY 115

Description: PRJ 300 addresses two of the more serious emotional challenges facing commercial animators: professional focus and realistic expectations. Animation is a team effort, and it requires a significant commitment of time and resources to accomplish even the most mundane tasks. During this course students will face a series of choices. First, they must choose one area of focus within 3D animation and spend the entire semester working on a project within this narrow scope. Second, they must limit themselves to a production scale allowing for extensive professional refinement. This course will introduce students to the realities of commercial art direction and quality control in conjunction with production deadlines. Students should be prepared to repetitively revisit the same material with a relentless attention to subtle detail.

PRJ 350 Applied 3D Animation Production Problems (5 Cr.)

Prerequisites: ART 300, CG 300, PRJ 300

Concurrent Courses: ANI 350, ART 350, CG 350, ENG 315

Description: This course challenges students to apply their knowledge of 3D animation and general art theory to a series of problems in 3D production. Historically, memory and bandwidth limitations have forced commercial animators to restrict themselves when producing 3D animations. Often the power of the 3D software has outstripped the technical and storage capabilities of the delivery media. Using a series of game and simulation problems, students will face a series of real-world production restrictions they must overcome while maintaining highly professional aesthetic standards. Problems will include polygonal face limitations, frame limitations, levels of detail, texture map scale, limited color palettes, simulated lighting illusions, compositing, and cyclical motion.

PRJ 400 Team Projects (5 Cr.)

Prerequisites: ART 350, ENG 315, PRJ 350, Senior class standing

Concurrent Courses: ART 401, FLM 250, FLM 275, SOC 115

Description: This course introduces students to the realities of team-based production environments. Each student must first declare an area of specialization in either 2D or 3D animation. This area of specialization will apply to PRJ 300, PRJ 350, and ANI 300. Each student will then present his or her pre-production work from ART 250, ART 300, ART 350, and ENG 215 to the faculty and the senior class for consideration. (Select RTIS program junior and senior level projects may also be presented by academic approval.) The animation faculty will then decide which team projects will be produced and will assign students to specific teams based upon their artistic strengths and career goals. Each team will be assigned a primary and secondary faculty advisor.

Each student's individual effort will be assessed as well as the overall success of each team. All members will be evaluated for the overall teamwork and professional success of the group. Just like a professional work environment, student teams will not be allowed to jettison individual members due to production conflicts or performance. Only the faculty will possess the ability to remove a team member for failure to perform.

PRJ 450 Final Projects (5 Cr.)

Prerequisites: ART 401, PRJ 400, Senior class standing

Concurrent Courses: ANI 400, ART 400, CS 115, LAW 115

Description: Students will use this course to complete an independent or team project in their area of specialization as chosen in PRJ 300. This project will round out a student's portfolio and demonstrate an appropriate level of professional challenge. These projects may focus on animation pre-production, 2D digital animation, or 3D digital animation. Students will contract with the faculty about the content of their project. Completed projects will assist students in marketing their skills and knowledge to a specific animation industry segment upon graduation.

PRJ 475 Summer Animation Team Production (3 Cr.)

Prerequisites: Two full-time semesters, interview by permission of Department Chair, and a portfolio evaluation

Description: This advanced projects class will allow students to gain invaluable experience and knowledge on a short animated film (approximately one to two minutes) in a professional production setting. The instructor will direct and supervise the film, and students will carry out staff roles as designers, layout/lighting artists, animators, riggers, modelers, and texture artists. This is an opportunity for students to work in a professional setting, which fosters responsibility, teamwork, and artistic excellence.

Department of Computer Science

COMPUTER SCIENCE

CS 100 Computer Environment I (3 Cr.)

Prerequisites: None

Description: This course provides students with a solid understanding of the fundamental elements on which computers are based. Topics covered by the curriculum include basic electricity and electric circuits, digital systems, logic circuits and algebra, and data representations. This knowledge eliminates "mysteries" about hardware and provides students with a well-rounded understanding of computers.

CS 105 Computer Environment II (3 Cr.)

Prerequisites: CS 100, CS 120

Description: CS 105 students learn the function and implementation of digital memory, microprocessors, microcontrollers, and embedded systems. Students work together in small teams to design, build, and test autonomous robotic car projects. This practical exercise builds upon the theoretical lectures on electronics, low-level programming, and algorithm design. This understanding of hardware enables students to expand the limits of their future games with unique interface devices, while the practical experience of low-level programming provides the students with skills essential for code optimization.

CS 115 Introduction to Scripting and Programming (3 Cr.)

Prerequisite: CG 350

Description: This class introduces programming environments to students who are not experienced programmers. This course will cover simple logic, programming flow, and the use of variables. It will introduce students to the history of programming and the basic vocabulary of the programming industry. The course culminates in a series of hands-on exercises using this knowledge to solve problems. At his or her discretion, the instructor may cover special topics in programming and scripting.

CS 120 High-Level Programming I – The C Programming Language (3 Cr.)

Prerequisites: None

Description: In presenting the C programming language, this course serves as a foundation for all high-level programming courses and projects. It provides the fundamentals in programming, including control-flows (such as statement grouping, decision making, case selection, procedure iteration, and termination test) and basic data types (such as arrays, structures, and pointers). Additionally, it will discuss intensively the lexical convention, syntax notation, and semantics.

CS 170 High-Level Programming II – The C++ Programming Language (3 Cr.)

Prerequisite: CS 120

Description: This course is a continuation of High Level Programming I (CS 120). It introduces the C++ language with particular emphasis on its object-oriented features. Topics to be covered include stylistic and usage differences between C and C++, namespaces, function and operator overloading, classes, inheritance, class and function templates, STL lists, and vectors.

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

Prerequisites: CS 100, CS 120

Description: 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, we cover the following: 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).

CS 200 Computer Graphics I (3 Cr.)

Prerequisites: MAT 150, CS 170

Description: CS200 presents fundamental mathematical elements, data structures, and algorithms useful for animating and viewing two-dimensional primitives. The course aims to fulfill two objectives. The first objective is to provide students with a sufficient mathematical and algorithmic background to design and implement 2D graphics applications. The second objective is to prepare students with the knowledge required for writing three-dimensional graphics applications. The first half of the course deals with scan-conversion algorithms for rasterizing 2D primitives such as lines, circles, ellipses, triangles, and arbitrary polygons. The second half of the course is concerned with the viewing and animation of these 2D primitives. The course covers topics such as interpolation techniques, transformations, culling, clipping, animation techniques, and the 2D viewing pipeline.

CS 220 Advanced C (3 Cr.)

Prerequisite: CS 170

Description: This course focuses on advanced topics of the C programming language. Such topics include advanced pointer manipulation techniques, pointer applications, and using standard library functions more efficiently. The course also presents students with many methods designed to avoid common C programming errors and pitfalls. Mastering the various topics presented in this course will enable students to become more productive programmers.

CS 225 Advanced C/C++ (3 Cr.)

Prerequisite: CS 170

Description: This course builds on the foundation created in the first two high-level programming courses (CS 120/170). It presents advanced topics of the C/C++ programming language in greater detail. Such topics include advanced pointer manipulation, utilizing multi-dimensional arrays, complex declarations, and standard library functions. Advanced C++ topics include class and function templates, operator overloading, multiple inheritance, runtime type information, the standard template library, and performance issues.

CS 230 Game Implementation Techniques (3 Cr.)

Prerequisites: CS 120

Concurrent Course: CS 170

Description: This course introduces students to Win32 user-interface programming, GDI+, and the fundamentals of 2D bitmap operations. Win32 UI programming and GDI+ are important when creating tools for production purposes, while 2D bitmap operations are the foundation of all computer graphics. The course also covers C++ programming techniques. Assignments will test all topics covered and emphasize correctness, maintainable coding styles, and performance.

CS 241 Fundamental Computer Graphics (3 Cr.)

Prerequisites: MAT 140, MAT 200

Description: This course covers the contents of CS 200 and CS 250 in a single semester. It examines the algorithms and mathematical elements needed to generate and render 2D and 3D scenes. Topics include the graphics pipeline 2D and 3D coordinate systems and their transformations, homogeneous coordinates and perspective calculations, scan-conversion algorithms, color models, collision detection techniques, and basic culling, clipping, and intersection.

CS 245 Introduction to Interactive Sound Synthesis (3 Cr.)

Prerequisites: CS 170, CS 180, MAT 140, PHY 200

Description: This course explores dynamic sound synthesis, 3D-directional auditory effects, and sonic ambience to real-time simulation and video games. The subjects include mixing audio and modulating dry recorded sounds using wave table synthesis. Students will learn how to create collision sounds using additive synthesis, wind effects using subtractive synthesis, natural sounds using granular synthesis and physical modeling, ambiences using layering and spectral filtering, 3D spatialized surround sound panning, inter-aural time difference, inter-aural intensity difference, and Head Related Transforms (HRTFS). Students will also study algorithms and techniques for real-time multi-threaded programming and synthesized sound integration for the game engine.

CS 250 Computer Graphics II (3 Cr.)

Prerequisite: CS 200

Description: CS 250 examines the mathematical elements and algorithms used in the design and development of real-time three-dimensional computer graphics applications such as games, cockpit simulators, and architectural walkthroughs. 3D computer graphics involve drawing pictures of 3D objects, usually on a 2D screen. This process of generating a 2D image of a 3D graphics application can be described as a series of distinct operations performed on a set of input data. Each operation generates results for the successive one. This process is called the graphics rendering pipeline, and it is the core of real-time computer graphics.

The graphics pipeline can be conceptualized as consisting of three stages: application, transformation, and rasterization. The course begins by introducing the 3D graphics pipeline. The application stage is examined from the viewpoint of the representation, modeling, and animation of 3D objects. Topics considered include user interaction, camera animation techniques, simulation of dynamic objects, and collision detection techniques. Next, the course examines the process of mapping 3D graphic objects from model-space to viewport coordinates. The transformation stage implements this process. Finally, the conversion of a geometric primitive in viewport coordinates into a 2D image is studied. The rasterization stage implements this final process.

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

Prerequisite: CS 170

Description: This course introduces the hierarchical network communication in a distributed computing environment. Course topics cover network technologies, architecture, and protocols. The curriculum will give 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.

CS 261 Computer Networks II (3 Cr.)

Prerequisite: CS 260

Description: This class extends the TCP/IP protocols studied in CS 260 to wireless devices. This course goes further in depth into some topics covered in the introductory networks course as well as additional subjects of interest. Topics include TCP/IP related protocols such as NAT, WAP, and DNS; physical media access such as aloha, OFDM, and WIDEBAND; wireless standards and protocols; and network security. The curriculum will cover additional topics based on the state of the industry.

CS 270 Advanced C++, Designing Classes (3 Cr.)

Prerequisite: CS 220

Description: This course presents the Object-Oriented Methodologies used in the development of large software projects. Combined with the knowledge acquired in the C++ Programming Language courses (CS 120/170/220), students will be able to better manage their Game Software Design and Production and produce reusable code and libraries. Among the advanced C++ topics are class and function templates, function and operator overloading, multiple inheritance, runtime type information, the standard template library, and performance issues.

CS 280 Data Structures (3 Cr.)

Prerequisite: CS 220 or CS 225

Description: This course introduces the classical Abstract Data Types (ADT) in computer science. ADTs provide the hierarchical views of data organization used in programming. Among the topics covered are the algorithms and primitives of the data structures for arrays, linked lists, stacks, queues, trees, hash tables, and graphs. In addition, the course provides an introduction to algorithm complexity and notation.

CS300 Advanced Computer Graphics I (3 Cr.)

Prerequisite: CS 250

Description: As the complexity of 3D computer environment and objects increase, the efficiency of the graphics rendering pipeline becomes critical to all video game and real-time simulation software. This course deals with the issues of how to effectively remove invisible objects/polygons to reduce the workload of the pipeline processors. The class covers two groups of hidden surface removal algorithms: the first group identifies the invisible objects/polygons by putting them in certain order (such as BSP-tree, Octree, priority list, etc.), while the second group eliminates hidden objects/polygons while only processing visible ones (such as back-face culling, portal, occlusion map, etc.). This class will also introduce students to basic programming in OpenGL.

CS 315 Low-Level Programming (3 Cr.)

Prerequisite: CS 105, CS 120, CS 180

Description: This course introduces students to microprocessor architecture as well as the knowledge required to directly address and program the microprocessor and the various hardware devices connected to it. Since the resulting code is usually faster than similar code written in a high-level language such as C or C++, low-level programming has great importance in improving the response speed of real-time interactive programs.

In this course, students program a microprocessor used to control a hand-held gaming device. The processor used is typically an 8-bit machine, which is easier to understand than 32 or 64-bit machines, but uses the same principles. Topics include registers, instruction set, addressing modes, the stack, I/O ports, interrupts, graphics, animation, collision detection, scrolling, and windowing. There is also a brief introduction to the instruction sets used on larger machines.

CS 330 Algorithm Analysis (3 Cr.)

Prerequisites: CS 270 or CS 225, CS 280, MAT 200

Description: This course provides students with an introduction to the analysis of algorithms, specifically proving their correctness and making a statement about their efficiency. Topics for discussion may include loop invariants, strong mathematical induction and recursion, asymptotic notation, recurrence relations, and generating functions. Students will examine examples of algorithm analysis from searching and sorting algorithms.

CS 341 Advanced Computer Graphics (3 Cr.)

Prerequisites: CS 241, MAT 250

Description: This course studies algorithms and techniques that are designed to improve the efficiency of the graphics pipeline and increase the realism of a 3D graphical environment. Students will study techniques that add details on objects' surfaces, including lighting and shading models, texture mapping, bump mapping, environmental mapping, and shadow algorithms. The course will also address algorithms that eliminate invisible polygons/objects from being further processed by the graphics pipeline, including BSPTree, occlusion, and portal. It will also introduce students to programming in OpenGL.

CS 350 Advanced Computer Graphics II (3 Cr.)

Prerequisite: CS 300

Description: This course is the continuation of CS 300. Students will study the algorithms and methods that add surface details to objects without increasing the complexity of the geometric representation of 3D graphical environment. These techniques are essential for improving the efficiency and realism of video games. Topics covered in this class include illumination models, transparency models, shading algorithms, mapping techniques (such as texture mapping, bump mapping, environmental mapping, and refractive mapping), and shadow models. The class will also introduce students to the corresponding OpenGL API supporting these surface detail functions.

CS 365 Software Engineering (3 Cr.)

Prerequisite: CS 225 or CS 270

Description: This course covers a wide range of topics in software engineering from the practical standpoint. It encompasses project management issues as well as technical development principles and methods. Topics include system architecture, security, methodologies and notation, UML, object oriented analysis and design, requirements analysis, implementation, verification, validation, maintenance, and software engineering standards. Risk management and iterative design receive special emphasis. Student teams will apply acquired knowledge to a substantial project.

CS 370 Image Processing (3 Cr.)

Prerequisite: CS 280

Description: This course introduces some of the popular image processing techniques. Course material covers methods students can apply in creating special effects with digital images and preparing graphics information for either human or computer interpretation. Professionals use these methods for either image enhancement or restoration. Course content covers both image processing, which transforms an image, and computer vision, which extracts a measurement or description. It also presents the Fourier transform and frequency domain interpretation of images. Other topics include edge detection, color transformations, high dynamic range, histograms, segmentation, morphology, and pattern classification. Students may do a project using a live camera.

CS 380 Robotic Intelligence (3 Cr.)

Prerequisite: CS 280

Description: The techniques developed for real-time adaptive control of mobile robots are among the AI methods most suitable for game characters. Since robots and game characters must navigate unknown terrain and avoid or overcome obstacles, all planning must be subject to instant revision. This class treats game characters as virtual robots. Students will use robotic AI methods without building any physical robots. The class covers the hierarchical control paradigm and expert systems based on LISP or related scripting languages. It then focuses on reactive agents using subsumption architecture or potential fields. The class then examines the hybrid paradigm and navigation. It concludes with implementation examples in games.

CS 381 Machine Learning (3 Cr.)

Prerequisite: CS 280

Description: This course deals with constructing computer programs that automatically improve with experience. Observed events are used to inductively construct decision trees, which can be used by computer-controlled game characters to change behaviors. Students will explore concept learning, partial ordering, reinforcement learning, conditional probability, Bayesian learning, the evaluation of hypotheses and instance-based learning. Types of neural networks examined include perceptrons, back-propagation, radial basis functions, and adaptive resonance theory. We demonstrate the effectiveness of genetic algorithms and show the power of a neuro-genetic approach. The class concludes by looking at inductive analytical learning.

CS 400 Ray Tracing (3 Cr.)

Prerequisite: CS 350 or equivalent

Description: This course introduces students to the ray tracing technique used in computer graphics. Students will examine the ray tracing model, the mathematics of ray-surface intersection computations, the physics underlying local and global illumination models, various antialiasing techniques, and the practicalities of implementing a recursive ray tracer.

CS 420 Graphics File Format and Data Compression Techniques (3 Cr.)

Prerequisites: CS 250 and CS 280, or CS 341

Description: This course covers data compression techniques for still images and multimedia. It includes the theory behind data compression and demonstrates how it is used in specific formats. Methods include run length encoding, entropy coding, dictionary compression, transforms, and motion compensation. The techniques are illustrated by examining various popular graphic file formats such as BMP, TIFF, GIF, JPEG, DXF, and MPEG.

CS 460 Advanced Animation and Modeling I (3 Cr.)

Prerequisites: CS 300, MAT 300, GAT 300

Description: 3D animation and modeling play significant roles in computer simulation and video game software. This course introduces students to algorithms for specifying and generating motion for graphical objects. It addresses practical issues, surveys accessible techniques, and provides straightforward implementations for controlling 3D moving entities with different characteristics.

CS 500 Ray Tracing (3 Cr.)

Prerequisite: Entrance into the Master of Science in Computer Science program

Description: This course introduces the ray tracing technique in computer graphics. It places particular emphasis on studying the mathematical elements of light illumination models, light intersection calculations, and data structure organization. This is a graduate version of CS 400.

CS 510 Advanced Real-time Rendering Techniques (3 Cr.)

Prerequisite: CS 341 or CS 350

Description: This course introduces students to data structures, algorithms, and techniques concerned with rendering images more accurately and efficiently in interactive computer simulations and video game software. Topics include patch and surface algorithms, terrain rendering techniques, anti-aliasing theory and practice, light map and shadow map methods, multi-pass rendering techniques, and real-time vertex/pixel shader programming essentials. Additionally, students will practice these subjects by working with the supporting OpenGL functions.

CS 520 Reasoning Under Uncertainty (3 Cr.)

Prerequisites: CS 380, CS 381, or equivalent

Description: This class covers advanced search techniques. It explores decision making in uncertain environments and uses techniques from blackboard architectures, fuzzy inference systems, and knowledge engineering. Students are expected to have a basic understanding of machine intelligence since this course will cover advanced techniques. For example, support vector machines are a more sophisticated form of a neural network that uses advanced mathematics to achieve faster learning. Adaptive resonance theory has been extended using a theory of brain functioning to the Artificial Brain. Type 1 fuzzy systems cover the ambiguities of the world; Type 2 fuzzy systems extend to deal with uncertainty.

CS 530 Advanced Game Engine Design (3 Cr.)

Prerequisite: CS 341 or CS 350

Description: A game engine is a complex framework or library that provides vital functionalities to any video game independent of the game content or genre. A well-designed game engine must at least provide the following functionalities: data management, rendering, networking, dynamics, input controllers, audio, editing tools, modeling tools, and a high-level application programming interface (API) for the entire framework that hides the low-level details of graphics, networking, and audio programming. Thus, a game engine is a complex library consisting of various components that must all be integrated together into a single framework in an efficient manner using the principles of object-oriented design. In this course, students will study the computer graphics, mathematics, data structures, and algorithms required to design and architect a game engine that can handle complex graphics applications that handle three-dimensional data such as games and computer-aided design.

CS 560 Advanced Animation Algorithms I (3 Cr.)

Prerequisites: CS 341, CS 460

Description: 3D animation and modeling play significant roles in computer simulation and video game software. This course introduces students to algorithms for specifying and generating motion for graphical objects. It addresses practical issues, surveys accessible techniques, and provides straightforward implementations for controlling 3D moving entities with different characteristics.

CS 561 Advanced Animation and Modeling II (3 Cr.)

Prerequisite: CS 460 or CS 560

Description: This course is the continuation of CS 460/560. It introduces students to advanced animation and modeling algorithms and techniques in some special areas to increase the physical realism of dynamic objects in 3D graphical environments. The topics include group object (particles, fish, and birds) control, natural phenomena (water, snow, soil, smoke, and fire) simulation, plant (trees and grass) modeling, facial animation (expression and speech synchronization), and deformable object modeling.

CS 599 Special Topics (3 Cr.)

Prerequisite: Upon approval of academic advisor

Description: This course is an upper-level graduate class. It is offered infrequently to explore various subjects that may be topical or of special interest. Subjects might include (but are not limited to) 3D graphics rendering algorithms, advanced animation and modeling techniques, artificial intelligence, numerical solutions, and mathematics, physics, and their applications in real-time interactive simulations and video game software.

CS 601 Thesis I (3 Cr.)

Prerequisite: Upon approval of academic advisor

Description: This course is the first part of master's program thesis. The student shall work with the thesis advisory committee to select a research topic, conduct a complete survey in the related field, identify fundamental knowledge, and collect materials and tools that are essential to his or her research work. Upon completion of the course, the student shall produce a written document to summarize the above steps and also include the proposed approaches to the problem.

CS 602 Thesis II (3 Cr.)

Prerequisite: CS 601 and approval of thesis advisory committee

Description: This course is the second part of master's program thesis. The student shall continue to work under the supervision of the thesis advisory committee to create the theory of the proposed research topic, develop algorithms, and possibly create a prototype to verify the theory and methods. Upon completion of the class, the student must submit his or her formal written thesis to the advisory committee to summarize the entire research and pass the oral exam to defend the thesis.

ELECTRICAL ENGINEERING

EE 200 Electric Circuits (3 Cr.)

Prerequisite: CS 105

Description: Usually taken after EE210, this course is more theoretical than digital electronics. It emphasizes the basic principles on which digital electronics are based. Exploring these principles leads one to conclude that all electronics are really analog. Effects seen in digital circuits may be due to unanticipated capacitance or inductance. It is important to understand how these transient phenomena arise. It is also often useful to have an analog section in a primarily digital circuit. Topics in this course include passive components, series and parallel circuits, two-terminal networks, two-port networks, circuit reduction techniques, impedance analysis, measurement of waveforms, power, and filters. It also looks at operational amplifiers, step responses of various simple circuits, and the Laplace transform.

EE 210 Digital Electronics I (4 Cr.)

Prerequisites: CS 105

Description: The objective of this class and the following EE260 is to prepare a students well enough at hardware design and trouble shooting so that he or she can determine whether a problem comes from hardware or software. The class uses TTL family integrated circuits to build digital devices. Part of the time is spent in the lab. Topics in this course include digital logic, programmable logic devices, FPGA, arithmetic circuits, multiplexers and demultiplexers, logic families, memory devices, and flip-flops.

EE 260 Digital Electronics II (4 Cr.)

Prerequisite: EE 210

Description: In this course, students will enhance their abilities with digital logic and learn about the trade-offs in putting functionality in circuits or programming them. Students learn how to use the power of a logic analyzer to track down system anomalies. Topics include counter circuits, shift registers, timers, digital/analog conversion, microprocessor architecture, ports, and interrupt handling. This course also examines the use of logic analyzers and in-circuit emulation (ICE) with particular emphasis on small-scale systems for embedded devices. Lab time will enhance concepts covered in the lectures.

EE 300 Embedded Microcontroller Systems (3 Cr.)

Prerequisites: CS 315, EE 260

Concurrent Course: EEL 310

Description: This class covers the remaining concepts needed to build the hardware and software for a hand-held gaming device. By this point, students will have studied many pieces needed in electronic systems and have worked with microprocessors. This class aims to bring together additional concepts and expand the understanding of a microprocessor or microcontroller system. Topics include Harvard architecture, microprocessor systems, analog/digital conversions, timing control, serial ports, peripheral access, and digital signal processor (DSP) applications to real-time audio processing. Students will emerge with a better understanding of system architecture and how the key components interact.

EE 350 Linear Control Systems (3 Cr.)

Prerequisite: MAT 256

Description: Systems can be described mathematically, which prevents wasting time on something that does not work. While the course will focus primarily on electro-mechanical systems, the techniques are also applicable to purely mechanical systems. Topics in this course include signals and systems, state-space description, convolution, frequency analysis of signals, feedback, Bode, Nyquist, root locus analysis, stability, phase margin, observability, errors in tracking and steady-state, motor control, PID control, and Kalman filters. Laplace and Fourier transforms are used to consider frequency domain as well as time domain. Since the only prerequisite for this class is differential equations, it is suitable as an elective for non-majors.

EE 400 Motors and Sensors (3 Cr.)

Prerequisite: PHY 270

Description: An electronic system is useless unless it interacts with the outside world. Students have used sensors and actuators before, but in this course, they will examine them in more detail. They will develop their understanding of the capabilities and limitations of some popular sensors. Additionally, they will study the physical principles behind an electrical motor/generator. Topics in this course include three-phase circuits, transformers, power transmission, motors and generators, stepper motors and encoders, motor controllers, limit switches, and sensors (optical, acoustic, eddy current, and triangulation).

ELECTRICAL ENGINEERING LABORATORY

EEL 220 Introduction to Robotics (3 Cr.)

Prerequisites: CS 105, GAM 150

Concurrent Course: EE 210

Description: Continuing the concepts learned in CS 105, students will build a robot that uses an embedded microprocessor system. They will document the design, production, and service of their device. Additionally, students will learn mechanical design using gears and grippers. This course introduces concepts of software engineering and process documentation and will emphasize system level design so that students can build an initial prototype and then revise key components to be cost-competitive. Students may enter their finished robot in a competition.

EEL 270 Real-Time Operating Systems (3 Cr.)

Prerequisites: GAM 150, CS 315

Description: Students will build a prototype of a consumer or industrial device or a collection of devices that use an embedded microprocessor system and a commercial real-time operating system (RTOS). After completing their prototype, students will understand what a RTOS does, decide when one is needed, and know how to use it. This class covers multitasking, interrupt handling, threads, synchronization, preemption, resources, and messaging. It will also emphasize secure communications between devices, an important function since more embedded devices contain wireless and are more vulnerable than previously. Additionally, students will examine techniques for fault tolerance, availability and reliability.

EEL 310/360 Project III Hand-Held Gaming Device (5 Cr. Each)

Prerequisites: CS 315

Concurrent Course: EE 300

Description: In this course, students will work in small teams to design, build, program, and test a device similar to the Color Game Boy studied previously. Students will assemble a microprocessor with storage, input, and display devices into a hand-held game platform. This project makes use of micro-processor and operating system concepts studied earlier. Additionally, students will program a game to run on the system. By this point students have acquired much of the knowledge needed to make a whole system. This class allows them to pull together basic principles into a sophisticated system.

EEL 410/460 Project IV Robots (5 Cr. Each)

Prerequisites: EEL 360

Concurrent Course: EE 400, ART 410

Description: In this course, students will build an electronic device of their own design. Some possibilities are mobile or entertainment robots or an advanced hand-held gam-ing device. The project includes specification and construction of mechanical and electrical subsys-tems. A CAD system will be used to design mechanical parts. The team may interact with students from RTIS or the Fine Arts Program. This is the capstone class of the Computer Engineering program. By this point, students have acquired the skills needed to design and build an embedded device. This course lets them apply their abilities on a substantial project and prepares them for industrial employment.

Department of Game Software Design and Production

GAME

GAM 100 Project Introduction (3 Cr.)

Description: This class presents an overview of the way the game development industry works and a history of game development. It will expose students to the positions and job responsibilities that each member of a game development team has along with the industry requirements for the creation of a game design document (GDD) and a technical design document (TDD). Over the course of the semester, the instructor will organize students into teams responsible for designing and developing text-based games, complete with a functional GDD and TDD, schedule, and milestones. Additionally, each student will create individual games using the ProjectFUN game development environment created by DigiPen. Games created via ProjectFUN will be graphical in nature, serving to enhance the student's retention of C/C++ coding techniques and math functions taught in the first semester CS and MAT classes.

GAM 150 Project I (3 Cr.)

Prerequisites: GAM 100, CS 120

Description: Continuing with the teams to which they were assigned in GAM 100, each team will prepare a GDD and TDD for one team-based project. Teams will complete the approved game design according to the schedule they will establish in their technical design. They will present these completed games to the Institute during the final week of the semester. Additionally, each student will design and develop smaller projects using a variety of tools. These projects reinforce the game design and implementation curriculum.

GAM 200/GAM 250 Project II (4 Cr. Each)

Prerequisites (GAM 200): GAM 150, CS 170, CS 230, MAT 140

Concurrent Courses (GAM 200): CS 200

Prerequisites (GAM 250): GAM 200, CS 225

Description: This project is divided into two semesters during which students design and implement a 2D scrolling game engine. Similar to Project I, they start by writing a Game Design Document and a Technical Design Document. Along with creating a scrolling engine, stu-dents will also explore multiplayer functionality within conventional games, sound, and music as it af-fects game design for a multiplayer environment. Additionally, students will explore basic enemy program-ming and level design while learning to work in a team environment.

GAM 240 Intermediary Game Project I (5 Cr.)

Prerequisites: BS in Computer Science with knowledge of C++, permission of instructor

Description: This course focuses on the game production cycle in theory and in practice. Course lectures will cover the entire production cycle of a game – from pre-production documentation, to tool creation and coding, to marketing the finished project. In addition, students will form into three- to four-mem-ber teams to create a 2D or 3D simulation game on the PC. Topics include game design theory, project management, Windows gaming environment, and user interface implementation. During the course, each team will complete a pitch presentation (to be presented to the faculty), Game Design Document, a Technical Design Document, and a first-playable prototype. The project and marketing campaign will be completed in GAM 340.

GAM 300/350 Project III (5 Cr. Each)

Prerequisites (GAM 300): GAM 250, CS 200, CS 260, CS 280, PHY 200

Prerequisites (GAM 350): GAM 300

Concurrent Courses (GAM 350): CS 250

Description: This project is divided into two semesters and focuses on the programming of a simula-tion-type game, complete with artificial intelligence, networking, and physics. Given the complexities and nuances of a simulation, ideally the teams will remain together for the entire

year to work on a specific form of simulation (sport, vehicle, or city management). A large component of this class will be focused on AI-related research and the requirements for AI in games from a simulation perspective. Also, since real-game and real-life physics will be required to be modeled in the projects, this course will cover an understanding of what this entails. Additionally, students will learn about networking up to eight players on a LAN.

GAM 340 Intermediary Game Project II (5 Cr.)

Prerequisites: GAM 240, permission of instructor

Description: At the completion of the GAM 340 project, student teams will have a fully functional game/simulation including manual and marketing material. Topics will cover the business side of the game industry and the marketing of games. Teams will present their projects in pre-beta version to focus groups and present analyses of their responses. Successful completion of the project will require a comprehensive marketing plan and game packaging materials (box, manual, and sell sheet). At the completion of the project, the team will be required to generate a postmortem suitable for submission to an online game development site.

GAM 390/490 Internship I/II (5 Cr.)

Prerequisites: GAM 200, GAM 250, GAM 300

Description: An internship is any carefully monitored work or service experience in which an individual has intentional learning goals and reflects actively on what she or he is learning throughout the experience. It is usually a professional activity under general supervision of an experienced professional and in a job situation, which places a high degree of responsibility on the student. Internships are well structured along the Internship Guidelines available in the Administration Office.

GAM 400/450 Project IV (5 Cr. Each)

Prerequisites (GAM 400): GAM 350, CS 250

Prerequisites (GAM 450): GAM 400, GAT 300, MAT 300

Concurrent Courses (GAM 400): GAT 300

Description: This is a two-semester project, with a focus on PC-based 3D games. This course will cover the requirements of modeling in a 3D (as opposed to sprite-based) game. Students will work in teams to design and develop a fully functional 3D game or simulation. These projects should include an AI, physics, and networking. Course topics will range from creating a 3D game, to working on job and interview skills, to Web site design for promotional purposes of the students and of the game itself. 3D games push the student to manage their memory effectively in order to sustain a high frame rate for polygonal animation. The course may cover advanced techniques such as pixel shading.

GAM 550 Game Project I (3 Cr.)

Prerequisites: B.S. in Computer Science or related field of study, permission of instructor

Description: This course challenges students to research the latest techniques in game design and technology and apply their findings in a 3D game/simulation. Students will investigate issues in 3D techniques, artificial intelligence, and "next generation" game console architecture as well as such advanced game design issues as massively multi-player "persistent worlds," input/GUI theory and design, and advanced simulation theory and applications. Students will report their results to the class and present a pitch paper for a product that incorporates their findings both to the class and a faculty review board. Students will then create a Game Design Document and Technical Design Document for the approved project. Depending on the scope of their projects, students will work individually or on teams. By the end of the semester, students should complete a prototype of their game/simulation.

GAM 551 Game Project II (3 Cr.)

Prerequisite: GAM 550

Description: At the completion of the GAM 551 project, students will have a fully functional game/simulation including manual and marketing material. Topics in this course will include advanced team leadership skills, short-term project budgeting and long-term financial planning, and legal issues related to the game industry. Teams will present their projects in pre-beta version to focus groups and analyze their responses. Successful completion of the project will require a FLASH/XML/multimedia presentation of the finished title and a marketing plan to a creative board. At the completion of the project, the team will generate a postmortem suitable for submission to an online game development site.

GAME APPLICATION TECHNIQUES

GAT 300 3D Computer Animation Production I (3 Cr.)

Prerequisites: None

Description: This course introduces students to the basic theories and techniques of 3D computer animation. The curriculum emphasizes standard 3D modeling techniques, including polygonal and spline modeling, texture map creation and application, keyframing, and animating through forward kinematics and inverse kinematics. Students will do all projects in 3D Studio Max with supplemental work done in Photoshop or GIMP.

Earlier catalogs listed this course as GEN 300.

GAT 350 3D Computer Animation Production II (3 Cr.)

Prerequisites: GAT 300

Description: This course builds on the fundamentals taught during GEN 300. Students will learn about key framing, special effects, final rendering, and recording.

GAT 400 Multimedia Aspects of Game Making I (3 Cr.)

Prerequisites: None

Description: With the introduction into the market of high-level tools allowing the assembly of video games from a set of pre-programmed components, game programmers can very quickly assemble games. More often than not, these games lack optimization and are more suitable for prototyping or creating interactive, multimedia presentations. Some of these tools include high-level programming languages in addition to the click and point Graphic User Interface. This course introduces students to these high-level tools and gives them experience in using them.

Earlier catalogs listed this course as GEN 400.

GAT 450 Multimedia Aspects of Game Making II (3 Cr.)

Prerequisites: None

Description: Students will study various languages, tools, and techniques to make a variety of multimedia and games ranging for casual online games, to making interactive game Web sites, to using databases to support online games. Tools include scripting languages, commercially available databases, and commercially available middleware. Students will create multiple projects, including the creation of a game, interactive portfolio, or Web site.

Earlier catalogs listed this course as GEN 450.

Department of General Education

BIOLOGY

BIO 100 Visual Perception (3 Cr.)

Prerequisites: None

Description: This course explores the nature of human visual perception. Beginning with the physics of light and the anatomy of the human eye, the course examines how human beings process light information and use this data to survive. Additionally, students will examine neuro-physiology, perceptual psychology, and artistic traditions. The course will give special consideration to the modern technological and professional uses of this knowledge.

BIO 150 Human Muscular, Skeletal, and Kinetic Anatomy (3 Cr.)

Prerequisites: None

Description: This course explores the skeletal and muscular structures of the human body. Students will learn to identify skeletal and muscular forms from both live models and anatomical references. Additionally, students will consider terminology, structural arrangement, and kinetic function. The course will give special emphasis to adapting this knowledge to the needs of artists and animators.

BIO 200 Animal Muscular, Skeletal, and Kinetic Anatomy (3 Cr.)

Prerequisite: BIO 150

Description: This course introduces the major skeletal and muscular structures of animals. Students will extrapolate their knowledge of the human form to the structure and form of a variety of animal types, specifically focusing upon the impact of locomotion and feeding strategies upon form. Additionally, students will consider terminology, structural arrangement, and kinetic function. The course also considers standard locomotion cycles and the relationship between humans and various animals. It will give special emphasis to adapting this knowledge to the needs of artists and animators.

ECONOMICS

ECN 350 Engineering Economics (3 Cr.)

Prerequisites: None

Description: This course will give students a sound basis for making economic decisions in business and industry environments. Students will learn how to decide which projects are worthwhile, determine priorities, and select components. Topics in this course include present worth; future amounts; cash flows; salvage value; depreciation; rates of return; income tax; basic cost accounting; and funding sources, including venture capital and SBIR. The course will also cover the basics of intellectual property, patents, and copyright.

ENGLISH

ENG 110 Composition (3 Cr.)

Prerequisites: None

Description: George Leonard, a leading writer on education, wrote, "To learn is to change. Education is a process that changes the learner." Writing is also a process that changes the writer. In this practical course in composition, students will spend time generating ideas for writing, sharing and critiquing their writing and ideas, revising their ideas, and learning more about themselves as a result. The course will emphasize using writing as a tool to explore and discover their thought processes, beliefs, and world concepts. Students will employ writing as a tool to develop critical thinking skills. In the process of organizing ideas and, subsequently, manifesting those ideas into various compositional styles and forms, students will become conscious of the concepts which have shaped and are continually shaping their personal realities.

ENG 115/116 Storytelling (3 Cr. for 115 and 4 Cr. for 116)

Prerequisites: None

Description: Storytelling is one of the oldest art forms, yet narrative—the description of an event—is also one of the most complex of human endeavors. The art of narrative is endless, and we have created an almost boundless number of forms for telling stories: gesture, speech, writing, painting, photography, cinema, television, comics, newspapers, music, theater, and video games. Contemporary narrative strategies and structures share much in common with the most archaic of storytelling traditions. This course begins by investigating the psychosocial drive to tell stories, and proceeds to examine how the principal elements of narrative assert themselves in a variety of narrative genres and across different media.

Students will explore the rhetoric of narrative in its many guises, and gain an appreciation for both classical and contemporary formulations of story structure. In particular, this course focuses on how narrative may be adapted across media and genres. A series of written assignments focuses on the demands of storytelling made by different genres. Such a study discloses the particular attributes of each genre, and exposes the inextricable bond between narrative form and narrative content. Additionally, we will consider several ways to interpret narrative, negotiate the temporal restrictions of commercial storytelling applications, and begin to think about the ethics of storytelling.

ENG 150 Mythology for Game Designers (3 Cr.)

Prerequisite: ENG 110

Description: The power of myth resides in its ability to touch the essence of our humanity and put meaning into our lives. Artists, filmmakers, game designers, and writers have appropriated elemental mythological premises and updated them to create modern myths accessible to contemporary audiences. Whether we are playing a role-playing game wherein the task is to rescue the princess and save the planet, reading the latest cyberpunk novel, or watching an animated Disney classic, the power of mythology touches our psyches.

This course is an overview and analysis of cross-cultural mythology presented as poetry, prose, film, drama, and game. This class will provide an in-depth discussion of the idea that myths have influenced cultures of the past and continue to inform and influence our culture today. It also will examine the practical use of myth. Additionally, it will emphasize the monomyth of the hero's journey and how a game developer may redefine the archetypal figures and adventures therein and incorporate them in a game design. One central aim of this course is to identify the many characteristics of the hero and suggest reasons why the hero is such a common figure in disparate traditions.

ENG 240 Post Modern Fantasies: A Multicultural Perspective (3 Cr.)

Prerequisites: ENG 110 and ENG 150 or equivalent

This course explores what post modernity has meant or not meant to American writers whose histories and cultures are not European in origin but who themselves are steeped in European-American traditions. The course explores the cultural hybridism of this literature as well the unique visions of the world they have created. The postmodern fantasies of their imaginary worlds are quintessentially American, yet are also the unique product of their ethnically distinct experiences that are funny, humorous, bitterly satirical at times, and downright serious.

Among the writers and works to be read are Ralph Ellison Invisible Man, Ishmael Reed The Last Days of Louisiana Red, Frank Chin The Chickencoop Chinaman, A Play, Luiz Valdez Zoot Suit, A Play, and Sherman Alexie The Lone Ranger and Tonto Fist Fight in Heaven, A Collection of Short Stories.

ENG 241 Creative Writing Across the Arts (3 Cr.)

Prerequisites: ENG 110, ENG 115/116, or equivalents or permission of the instructor.

In this course, students will study and apply the basics of fiction writing. The goal is to produce two high-quality short stories during the term. The first short story will satisfy the requisites of fiction. The second short story will also satisfy the requisites of literature; however, it will also be a story that can be adapted to a video game.

ENG 315/316 Story Through Dialogue (4 or 3 Cr.)

Prerequisite: ENG 115

Description: Dialogue is more than just what people say; dialogue is a crucial element that animates contemporary narrative genres, including fiction, graphic novels, film and television, drama, and even video games. Through an intensive reading of fiction and critical texts, film screenings, written and oral exercises, and a series of workshops, this course aims to provide students with an introduction to the centrality of dialogue in a variety of narrative genres. One central aim of this course is to identify the characteristics of effective dialogue and the role dialogue plays in crafting action, characterization, and theme in different narrative modes. Students will also be coached to consider reading texts or viewing films as a dialogic exercise—a give and take between reader/viewer and text. Additionally, students will learn traditional dialogue and scripting formats and utilize them in their written work, with the eventual goal of producing a pre-production script proposal. This course offers students an opportunity to participate in a hybrid literature-writing class that provides the invaluable experience of reading closely, writing often, and reflecting upon their work in a supportive environment.

ENG 320 Interpersonal and Work Communication (3 Cr.)

Prerequisite: ENG 110 or equivalent

Description: Students will explore how their culture, gender, economic status, age and other personal characteristics influence their work communications. The course will explore verbal and non-verbal communication skills in a global work environment. Students will learn written communication techniques most effective for use in the technology workplace. Additionally, students will explore and practice negotiation skills, both internally and externally to their workplace.

ENG 400 Creative Writing for Game Design (3 Cr.)

Prerequisite: ENG 110 or 150

Description: This course will focus on the narrative elements of creative writing. Exercises will generate thinking and hone students' basic storytelling talents including characterization, exposition, plot, conflict, back-story, dialogue, and appropriate use of language. Students will learn how to use symbols to design a story and how to manipulate the symbols to create character, plot, message, and interactivity. Students will be encouraged to access their own genius, culture, and life experience in the development of their stories.

ENG 420 Cybertexts: Interactive Media and the Future of Narrative (3 Cr.)

Prerequisite: ENG 110 or 150, equivalents or permission of instructor

Description: Video games and other forms of interactive media are widely touted as the future of both popular entertainment and narrative storytelling. If video games and other interactive media are developing into art forms, then we can expect that these emerging narrative forms will be able to accommodate genres of storytelling that have existed since time immemorial, including romance, comedy, tragedy, epic, and romance. Yet the dynamics of nonlinear storytelling, the limits of current video game technology, and the constraints of the marketplace do not seem conducive to expanding the narrative elements of interactive media. This course traces the boundaries between narratives and games, and aims to identify areas of overlap that can lead to the development of new expressions of narrativity in interactive media. One central goal of the course is to grapple with the problem(s) posed by interactive narrative.

Assigned readings examine the difference between traditional narrative texts and texts that require a higher degree of interactivity, collectively called cybertexts. The goal of the course is to identify what differences may exist, and to analyze the possibilities for adapting traditional narrative into interactive media. This class's central innovation requires students to actively adapt an element of traditional narrative into a cybertext. By the end of the class, students will have reached a conclusion, based on their reading and course work, as to whether cybertexts can effectively encompass traditional narrative genres, and if not, whether this is due to limitations of the form, or the limitations of technology.

ENG 450 Elements of Media and Game Development (2 Cr.)

Prerequisites: None

Description: Relative to modern technological media, the most important issue to consider is the nature of the interactive loop of influence between media and culture. Interactivity is one of the most powerful and important potentials of the game medium, but the term is often used with superficial understanding of its implications. This course emphasizes the nature of interactivity primarily from psychological and sociological perspectives. Students will review and define interactive media using examples drawn from academic research, film, television, and games. Students will have ample opportunity to contemplate and discuss how they can apply a more comprehensive understanding of interactivity in order to surpass the current limits of interactive media products.

LAW

LAW 115 Introduction to Intellectual Property and Contracts (3 Cr.)

Prerequisites: None

Description: The animation and computer software industries are founded upon the principle of intellectual property. This course introduces students to the social concepts and traditions that led to the idea of intellectual property. It surveys the various international legal systems governing intellectual property, giving special consideration to Title 17 and the local statutes that govern copyrights, trademarks, and patents in the United States. Students will grapple with fundamental issues surrounding this field such as fair use, international relations, and economics. The course will also introduce students to a basic overview of contracts including structure, traditions, and vocabulary.

MANAGEMENT

MGT 450 Product Management (2 Cr.)

Prerequisite: ECN 350

Description: This course provides an in-depth examination of theories and techniques in product management. Lectures will cover various aspects of product management including team leadership, interaction with management, marketing, budgeting, long-range project planning, and contract negotiations. The course will include exercises that will give students insight into dealing with team effectiveness and performance issues.

SOCIAL SCIENCES

SOS 115 Media and Ethics: A Social Science Perspective (3 Cr.)

Prerequisites: None

Description: This course guides students in the ethical assessment of both the processes and outcomes of social decision-making. After an introduction to basic ethical theories, students will acquire an understanding of the structure of social institutions and the process through which one makes social choices. Central to the analysis is a study of ethics as a criterion for assessment of social decision-making with emphasis on the study of particular issues of social choice. The course also provides a theoretical framework within which to spot and analyze ethical issues in the media.

SOS 150 Society and Technology (3 Cr.)

Prerequisites: None

Description: This course draws on techniques and perspectives from the social sciences, humanities, and cultural studies to explore technology and change in the modern era. In particular, students will examine how technology influences and is influenced by values and cultures in America and abroad. The course will help students recognize the range of consequences that technology in general, and information and communication technology (ICT) in particular, have when shaped and used by individuals, organizations, and society. Through readings, discussion, lectures, and written assignments, students will become acquainted with current controversies related to the socio-cultural dimensions of technology in the "digital era."

While the course examines the impact of technologies—including video gaming and robotics—on the contemporary world, it will also use an historical approach to address some of the technological innovations that have most affected U.S. society in the past. The course will consider how technologies are developed and sustained, and how they interact with and affect our urban culture. Specific themes likely to be addressed include technology's impact on the private and public spheres; the body and the self in cyberspace; and the criteria we use to determine a technology's success, failure, and danger.

Department of Mathematics and Physics

MATH

MAT 100 Pre-Calculus with Linear Algebra and Geometry (4 Cr.)

Prerequisites: None

Description: This course is intended for the student with a weak high school math background. It presents a review of college algebra and trigonometry. The most basic part covers a review of functions and their graphs. This course emphasizes polynomial, rational, trigonometric, exponential and logarithmic functions as well as their inverses. Topics in trigonometry include analytic trigonometry and identities, the unit circle, and trigonometric functions of a real variable. Other topics include systems of equations and conic sections.

MAT 140 instead of MAT 100 is recommended for RTIS freshmen. Students may only earn credit for one of MAT 100 or MAT 140.

MAT 140 Linear Algebra and Geometry (4 Cr.)

Prerequisites: None

Description: The two main themes throughout the course are vector geometry and linear transformations. Topics from vector geometry include vector arithmetic, dot product, cross product, and representations of lines and planes in three-space. Linear transformations covered include rotations, reflections, shears and projections. Students will study the matrix representations of linear transformations along with their derivations. The curriculum also presents Affine geometry and affine transformations along with connections to computer graphics. This course also includes a review of relevant algebra and trigonometry concepts.

MAT 140 is recommended for RTIS freshmen. Students may only earn credit for one of MAT 100 or MAT 140.

MAT 150 Calculus and Analytic Geometry I (4 Cr.)

Prerequisite: MAT 100 or MAT 140

Description: This course introduces the calculus of functions of a single real variable. The main topics include limits, differentiation, and integration. Limits include the graphical and intuitive computation of limits, algebraic properties of limits, and continuity of functions. Differentiation topics include techniques of differentiation, optimization, and applications to graphing. Integration includes Riemann sums, the definite integral, antiderivatives, and the Fundamental Theorem of Calculus.

MAT 200 Calculus and Analytic Geometry II (4 Cr.)

Prerequisite: MAT 150

Description: This course builds on the introduction to calculus in MAT 150. Topics in integration include applications of the integral in physics and geometry and techniques of integration. The course also covers sequences and series of real numbers, power series and Taylor series, and calculus of transcendental functions. Further topics may include a basic introduction to concepts in multivariable and vector calculus.

MAT 225 Calculus and Analytic Geometry III (3 Cr.)

Prerequisite: MAT 200

Description: This course extends the basic ideas of calculus to the context of functions of several variables and vector-valued functions. Topics include partial derivatives, tangent planes, and Lagrange multipliers. The study of curves in two- and three-space will focus on curvature, torsion, and the TNB-frame. Topics in vector analysis include multiple integrals, vector fields, Green's Theorem, the Divergence Theorem and Stokes' Theorem. Additionally, the course may cover the basics of differential equations.

MAT 250 Linear Algebra (3 Cr.)

Prerequisites: MAT 140 and MAT 150, or MAT 200

Description: This course presents the mathematical foundations of linear algebra, which includes a review of basic matrix algebra and linear systems of equations as well as basics of linear transformations in Euclidean spaces, determinants, and the Gauss-Jordan Algorithm. The more substantial part of the course begins with abstract vector spaces and the study of linear independence and bases. Further topics may include orthogonality, change of basis, general theory of linear transformations, and eigenvalues and eigenvectors. Other topics may include applications to least-squares approximations and Fourier transforms, differential equations, and computer graphics.

MAT 256 Introduction to Differential Equations (3 Cr.)

Prerequisite: MAT 200

Description: This course introduces the basic theory and applications of first and second-order linear differential equations. The class will emphasize specific techniques such as the solutions to exact and separable equations, power series solutions, special functions and the Laplace transform. Applications include RLC circuits and elementary dynamical systems, and the physics of the second order harmonic oscillator equation.

MAT 258 Discrete Mathematics (3 Cr.)

Prerequisites: MAT 140 and MAT 150, or MAT 200

Description: This course gives an introduction to several mathematical topics of foundational importance in the mathematical and computer sciences. Typically starting with propositional and first order logic, the course considers applications to methods of mathematical proof and reasoning. Further topics include basic set theory, number theory, enumeration, recurrence relations, mathematical induction, generating functions, and basic probability. Other topics may include graph theory, asymptotic analysis, and finite automata.

MAT 290 Linear Algebra and Geometry of Curves (3 Cr.)

Prerequisite: MAT 200

Description: This course combines material from MAT 250 and MAT 300 into a single course. Topics from linear algebra include vector spaces, linear transformations, change of basis, function spaces, and piecewise polynomials. Topics from geometry include Bezier curves, splines, interpolation, and constructive curves and surfaces.

Students may not earn credit for MAT 290 if they also earned credit for either MAT 250 or MAT 300.

MAT 300 Curves and Surfaces (3 Cr.)

Prerequisites: MAT 250, MAT 258

Description: This course is an introduction to parametrized polynomial curves and surfaces with a view toward applications in computer graphics. It will discuss both the algebraic and constructive aspects of these topics. Algebraic aspects include vector spaces of functions, special polynomial and piecewise polynomial bases, polynomial interpolation, and polar forms. Constructive aspects include the de Casteljau algorithm and the de Boor algorithm. Other topics may include an introduction to parametric surfaces and multivariate splines.

MAT 340 Probability and Statistics (3 Cr.)

Prerequisites: MAT 200, MAT 258

Description: This course is an introduction to basic probability and statistics with an eye toward computer science and artificial intelligence. Basic topics from probability theory include sample spaces, random variables, continuous and discrete probability density functions, mean and variance, expectation, and conditional probability. Basic topics from statistics include binomial, Poisson, chi-square, and normal distributions; confidence intervals; and the Central Limit Theorem. Further topics may include fuzzy sets and fuzzy logic.

MAT 350/550 Advanced Curves and Surfaces (3 Cr.)

Prerequisite: MAT 300

Description: This course is a continuation of MAT 300 with topics taken from the theory and applications of curves and surfaces. The class will treat some of the material from MAT 300 in more detail, like the mathematical foundations for non-uniform rational B-spline (NURBS) curves and surfaces, knot insertion, and subdivision. Other topics may include basic differential geometry of curves and surfaces, tensor product surfaces, and multivariate splines.

MAT 351/551 Quaternions, Interpolation and Animation (3 Cr.)

Prerequisite: MAT 300

Description: This course covers topics in abstract algebra and geometry woven together by the thread of quaternions. This particular thread is chosen with an eye toward applications in computer graphics, specifically to the interpolation of rotation operators and their relations to animation. The course will also present a self-contained summary of abstract algebra, including elements of finite groups, rings, fields, and real algebras. Students will pay attention to certain examples of these structures, including the complex numbers as an algebra, and the unit complex numbers as the rotation group in the plane. These examples in two dimensions are then extended to three and four dimensions with the study of division algebras and Hamilton's quaternion algebra. In particular, the unit quaternion sphere is exhibited as a two-fold cover of the rotation group of three-space. The second part of the course will review basic differential geometry, continuity, and differentiability of curves in four-space. Here the students will have the opportunity to combine their knowledge of abstract algebra with their knowledge of parametrized curves and produce some interesting visual applications to three-dimensional animation.

MAT 352/552 Wavelets (3 Cr.)

Prerequisites: MAT 250, MAT 258

Description: This course presents the foundations of wavelets as a method of representing and approximating functions. It will discuss background material in complex linear algebra and Fourier analysis. Basic material on the discrete and continuous wavelet transforms forms the core subject matter. This includes the Haar transform, and multiresolution analysis. Other topics may include subdivision curves and surfaces, and B-spline wavelets. Applications to computer graphics may include image editing, compression, surface reconstruction from contours, and fast methods of solving 3D simulation problems.

MAT 353/553 Differential Geometry (3 Cr.)

Prerequisite: MAT 300

Description: This course presents an introduction to differential geometry, with emphasis on curves and surfaces in three-space. It will include background material on the differentiability of multivariable functions. Topics covered include parametrized curves and surfaces in three-space and their associated first and second fundamental forms, Gaussian curvature, the Gauss map, and an introduction to the intrinsic geometry of surfaces. Other topics may include an introduction to differentiable manifolds, Riemannian geometry, and the curvature tensor.

MAT 354/554 Discrete and Computational Geometry (3 Cr.)

Prerequisites: MAT 250, MAT 258

Description: This course gives an introduction to the basic theorems and algorithms of computational geometry, with particular attention paid to mathematical foundations. Topics include convex hulls, the theory of triangulation, Art Gallery Theorems, Voronoi diagrams, and the Delaunay graph. Further topics may include Minkowski sums, path finding, and randomized algorithms. CS 330 (Analysis of Algorithms) is recommended background for this course.

MAT 355/555 Graph Theory (3 Cr.)

Prerequisites: MAT 250, MAT 258

Description: This course provides an introduction to the basic theorems and algorithms of graph theory. Topics include graph isomorphism, connectedness, Euler tours, Hamiltonian cycles, and matrix representation. Further topics may include spanning trees, coloring algorithms, planarity algorithms, and search algorithms. Applications may include network flows, graphical enumeration, and embedding of graphs in surfaces.

MAT 356/556 Advanced Differential Equations (3 Cr.)

Prerequisites: MAT 250, MAT 256

Description: This course covers the advanced theory and applications of ordinary differential equations. The first course in differential equations focused on basic prototypes such as exact and separable equations and the second-degree harmonic oscillator equation. This course builds upon these ideas with a greater degree of generality and theory. Topics include qualitative theory, dynamical systems, calculus of variations, and applications to classical mechanics. Further topics may include chaotic systems and cellular automata. With this overview, students will be prepared to study the specific applications of differential equations to the modeling of problems in physics, engineering, and computer science.

MAT 357/557 Numerical Analysis (3 Cr.)

Prerequisites: MAT 250, MAT 258

Description: This course covers the numerical techniques arising in many areas of computer science and applied mathematics. Such techniques provide essential tools for obtaining approximate solutions to nonlinear equations arising from the construction of mathematical models of real-world phenomena. Topics of study include root finding, interpolation, approximation of functions, cubic splines, integration, and differential equations. Further topics may include stability, iterative methods for solving systems of equations, eigenvalue approximation, and the Fast Fourier Transform.

MAT 359/559 Computational Algebraic Geometry (3 Cr.)

Prerequisite: MAT 300

Description: This course introduces computational algebra as a tool to study the geometry of curves and surfaces in affine and projective space. The central objects of study are affine varieties and polynomial ideals, and the algebra-geometry dictionary captures relations between these two objects. The precise methods of studying polynomial ideals make use of monomial orderings, Grobner bases, and the Buchberger algorithm. Students will have opportunities to program parts of these algorithms and to use software packages to illustrate key concepts. Further topics may include resultants, Zariski closure of algebraic sets, intersections of curves and surfaces, and multivariate polynomial splines.

MAT 361/561 An Introduction to Number Theory and Cryptography (3 Cr.)

Prerequisites: MAT 250, MAT 258

Description: This course introduces topics from classical number theory and discusses the applications of some of these topics to the subject of cryptography. Topics from classical number theory include divisibility, the Euclidean Algorithm, congruences, and quadratic reciprocity. Further topics in number theory may include finite fields, number fields, and arithmetic of elliptic curves. Topics from cryptography include factoring algorithms, public key cryptosystems, the discrete log problem, zero knowledge protocols, the RSA algorithm, and primality testing.

MAT 362 Fuzzy Sets and Logic (3 Cr.)

Prerequisites: MAT 250, MAT 258

This course introduces the basic theory of Fuzzy Sets and Fuzzy Logic and explores some of their applications. Topics include: Classical Sets and their Operations, Fuzzy Sets and their Operations, Membership Functions, Fuzzy Relations, Fuzzification and Defuzzification, Classical Logic, Fuzzy Logic, Fuzzy Reasoning, Fuzzy Systems, Decision Making with Fuzzy Information, Classical Groups, Fuzzy Groups. Applications include: Approximate Reasoning, Fuzzy Control Systems, Fuzzy Behavior and Interaction in Computer Games.

MAT 390/590 Special Topics (3 Cr.)

Prerequisite: Permission of instructor

Description: The content of this course will change each time it is offered. It is for the purpose of offering a new or specialized course of interest to the faculty and students that is not covered traditionally by the courses in the current catalog.

MAT 399/599 Independent Study (3 Cr.)

Prerequisite: Permission of instructor

Description: An independent study allows a student to take a course by meeting regularly one-on-one with an instructor instead of attending scheduled lectures. Through reading and self-study in lieu of lectures, this type of study places the onus of covering new material on the student. Because of this, an independent study course is usually more difficult than a regular class, and only strong math students should expect to get faculty permission for an independent study.

MAT 400 Introductory Analysis I (3 Cr.)

Prerequisite: MAT 250

Description: This course will introduce the foundations of real analysis by means of a rigorous reexamination of the topics covered in elementary calculus. The course starts with the topology of the real line and proceeds to a formal examination of limits, continuity, and differentiability. The course will also cover the convergence of sequences and series of real numbers and the uniform convergence of sequences of real valued functions.

MAT 410 Introductory Analysis II (3 Cr.)

Prerequisite: MAT 400

Description: A continuation of MAT 400, this course emphasizes the formal treatment of the theory of integration of functions of a real variable. It reexamines the Riemann integral and the Fundamental theorem of calculus as well as the theory of the Stieltjes and Lebesgue integral and their applications in probability and Fourier analysis. The course concludes with a discussion of the topology of R^n, and the differentiability and integrability of functions of several variables, including the theorems of Green and Stokes and the divergence theorem.

MAT 450 Abstract Algebra I (3 Cr.)

Prerequisites: MAT 250, MAT 258

Description: This course provides an introduction to the foundations of abstract algebra. The fundamental objects of study are groups, rings, and fields. The student will build on previous courses in algebra, particularly linear algebra, with an even greater emphasis here on proofs. The study of groups is an ideal starting point, with few axioms but a rich landscape of examples and theorems, including matrix groups, homomorphism theorems, group actions, symmetry, and quotient groups. This course will extend these ideas to the study of rings and fields. Topics in ring theory include polynomial rings and ideals in rings. The course will also cover fields, their construction from rings, finite fields, basic theory of equations, and Galois theory.

MAT 460 Abstract Algebra II (3 Cr.)

Prerequisite: MAT 400

Description: This course builds on the foundations established in MAT 450. It will extend the fundamental objects of groups, rings, and fields to include modules over rings and algebras. The course will give the basic ideas of linear algebra a more rigorous treatment and extend scalars to elements in a commutative ring. In this context, students will study the general theory of vector spaces and similarity of transformations. The curriculum will also discuss non-commutative algebras and rings, emphasizing examples such as quaternion algebras. Further topics may include non-associative rings and algebras, Galois theory, exact sequences, and homology.

PHYSICS

PHY 115 Introduction to Applied Math and Physics (3 Cr.)

Prerequisites: None

Description: We live in a world governed by physical laws. As a result, we have grown accustomed to objects' motions being in accordance with these laws. This course examines the basic physics and mathematics governing natural phenomena such as light, weight, inertia, friction, momentum, and thrust as a practical introduction to applied math and physics. Students will explore geometry, trigonometry for cyclical motions, and physical equations of motion for bodies moving under the influence of forces. With these tools, students will develop a broader understanding of the impact of math and physics on their daily lives.

PHY 200 Motion Dynamics (3 Cr.)

Prerequisites: None

Concurrent Course: MAT 200

Description: This calculus-based course presents the fundamental principles of mechanics for simulation and engineering majors. Students will learn the laws that govern the mechanical world and how to use these laws to form a simulated world. They will examine the concepts involved with kinematics, Newtonian dynamics, work and energy, momentum, rotational motion, and statics.

PHY 250 Waves, Optics, and Aerodynamics (3 Cr.)

Prerequisite: PHY 200

Description: This calculus-based course provides a fundamental understanding of fluid dynamics, oscillations and waves, optics, and thermodynamics. By understanding the physical laws governing these phenomena, students will be able to implement ray casting and ray tracing algorithms, as well as create realistic flight simulators, lens effects, and many-body simulations.

PHY 270 Electricity and Magnetism (3 Cr.)

Prerequisite: PHY 200

Description: This calculus-based course studies the basic concepts underlying electrical and magnetic phenomena. It considers the following topics: atoms and free electrons; Coulomb's law; the electric field, Gauss's Law, and potential; capacitance, properties of dielectrics, current, resistance, and EMF; DC circuits and instruments, and Kirchhoff's rules; the magnetic field and magnetic forces on current-carrying conductors; magnetic field of a current; electromagnetic induction and magnetic properties of matter; alternating current; Maxwell's equations; electromagnetic waves; semiconductors and the PN junction; and photoelectric effect.

PHY 290 Modern Physics (3 Cr.)

Prerequisites: PHY 200, PHY 250 or PHY 270, MAT 200

Description: The wake of modern physics has given rise to massive technological advancements that have changed our daily lives. This course covers many of the modern issues within the field and emphasizes the problem-solving nature of physics. The class is a calculus-based scientific examination of topics from general relativity and quantum mechanics through nuclear physics, high-energy physics, and astrophysics.

PHY 300 Advanced Mechanics (3 Cr.)

Prerequisites: PHY 200, PHY 250, MAT 150, MAT 200, MAT 250, CS 200, CS 250

Description: This course covers the physics behind more complex mechanical interactions as well as the numerical techniques required to approximate the systems for simulations. A thorough analysis of mechanical systems through energy analysis will provide the basis for the understanding of linear and rotational systems. The combination of theoretical physics and numerical methods will provide students with the background for simulating physical systems with limited computational power. Topics covered include Lagrangian Dynamics, Hamilton's Equations, dynamics of rigid bodies, motion in non-inertial reference frames, the use of the inertia tensor, collision resolution, and numerical techniques including methods of approximation.

PHY 350 Physics Simulation (3 Cr.)

Prerequisites: PHY 300, MAT 300

Description: In this course, students will gather into teams of two to three and create a physics engine with minimal interface and graphics. Weekly lectures will go over the implementation of concepts covered in PHY 300 as well as collision resolution, objects on surfaces, holonomic and nonholonomic constraints, numerical approximations, and special topics that address project-specific physics.

PHY 500 Advanced Physically-based Modeling (3 Cr.)

Prerequisite: Entrance into the Master's program in Computer Science

Description: This class covers the topics in dynamics modeling techniques, including methods in the calculus of variations, Hamilton's principle, Lagrangian dynamics, Hamiltonian dynamics, motion in a non-inertial reference frame, dynamics of rigid bodies (moments of inertia, inertia tensor, and stability), collision resolution (impact parameters, scattering, and restitution), and physics of continuous bodies (elasticity, deformation, stress, and strain).

PHY 550 Physics Simulation (3 Cr.)

Prerequisite: Entrance into the Master's program in Computer Science

Description: Students will gather into teams of two to three and create a physics engine with minimal interface and graphics. Weekly lectures will detail the implementation of concepts covered in PHY 300 as well as collision resolution, objects on surfaces, holonomic and nonholonomic constraints, and numerical approximations. Additionally, students will study special topics that address project-specific physics.

Faculty and Staff Roster

Computer Science		
Xin Li*	B.S. Computer Science M.S. Computer Science Ph.D. Computer Science	Northwest University (China) Academic Sinica (China) University of Central Florida
Jason Hanson	B.S. Mathematics/B.S. Physics M.S. Physics M.A. Mathematics Ph.D. Mathematics	University of Massachusetts University of Virginia Columbia University University of Hawaii
Matthew Mead	B.S. Computer Science M.S. Computer Science	Portland State University Portland State University
Prasanna Ghali	B.S. Electrical Engineering M.S. Electrical Engineering	Osmania University (India) University of Oklahoma
Scott Dee	B.S. Electrical Engineering	University of British Columbia
Hao Wu	B.S. Electrical Engineering M.S. Electrical Engineering	Tsinghua University (China) University of Washington
Claude Comair	Le diplôme d'Ingenieur Archit. M.Eng. Environmental Eng.	L'Université du Saint Esprit (Lebanon) Osaka University (Japan)
Gary Herron	B.A. Mathematics Ph.D. Mathematics	Northern Michigan University University of Utah
Bruce Dawson	Professional Experience	
Mathematics & Physics		
Matt Klassen*	B.S. Mathematics Ph.D. Mathematics	University of Arizona University of Arizona
Michael Jahn	B.S. Mathematics B.S. Electrical Engineering Ph.D. Mathematics	Southern Methodist University Southern Methodist University University of Wisconsin-Madison
Erik Mohrmann	B.S. Physics M.S. Physics	Rensselaer Polytechnic Institute University of Washington
Martin Weinless	B.S. Physics Ph.D. Mathematics	City College of New York Polytechnic University
Michael Aristidou	B.S. Mathematics M.S. Mathematics M.A. Philosophy Ph.D Mathematics	Aristotle University of Thessaloniki, Greece Louisiana State University Louisiana State University Louisiana State University
Charles Duba	B.S. Physics M.S. Physics	University of California-San Diego University of Washington
Natalie Solórzano	B.S. Physics M.S. Meteorology Ph.D. Space Physics	Federal University of Minas Gerais (Brazil) National Institute for Space Research (Brazil) National Institute for Space Research (Brazil)

Game Software Design & Production		
Michael Moore*	B.A. Communication Arts	St. Mary's College
	B.A. English	St. Mary's College
	M.A. Communication Arts	Southern Illinois University
Ben Ellinger	B.S. Kinesiology	University of Texas
Jen Sward	B.S. Electrical & Computer Engineering	University of California
Christopher Erhardt	B.S. Human Resources & Org. Behavior	University of San Francisco
	M.S. in Organization and Management	Capella University
Steve Rabin	B.S. Computer Engineering	University of Washington
	M.S. Computer Science	University of Washington
Ian Lewis	Professional experience in game development	
Jay Gale	B.A. Broadcast Communication	University of Colorado

General Education		
Cedric Page*	B.A. Geography	Syracuse University
	M.A. Geography	Rutgers University
	Ph.D. Geography	Rutgers University
Stephen Schafer	B.A. Psychology	University of Denver
	M.A. English	University of Denver
Adam Rovner	B.A. English Literature	Washington University
	M.A. Comparative Literature	Hebrew Univeristy of Jerusalem
	Ph.D. Comparative Literature	Indiana University
Claire Joly	B.A. English Language & Literature	Sorbonne (France)
	M. A. American Studies	Sorbonne (France)
	M.A. Theatre & African American Studies	Smith College
	Ph.D. Comparative Cultures	University of California at Irvine
Ryan Adams	B.A. Interdisciplinary Literature Studies	University of Washington
	M.A. English	Western Washington University
Peter Bacho	B.A. Theology	Seattle University
	J.D. (Juris Doctor)	University of Washington
	LL.M. (Master of Laws)	University of Washington

Art		
Abbott Smith*	A.A.A. Computer Animation & Multimedia B.F.A. Studio Art B.A. Biology M.A. Illustration	The Art Institute of Seattle Augusta College Wabash College Syracuse University
Royal Winchester	A.A.A. 3D Computer Animation B.S. Physics	DigiPen Institute of Technology Purdue University
Billy Jarcho	B.F.A Visual Design in Media Arts	Emerson College
Monte Michaelis	A.A.A. Computer Animation	The Art Institute of Seattle
Lawrence Schwedler	B.A. Music M.F.A. Music Performance	University of California at Los Angeles University of California at Los Angeles
Alecia Rossano	B.A. Studio Art M.F.A. Sculpture	Scripps College New York Academy of Art
Donald "BJ" Becker	B.A. 3-D Design M.A. Illustration	West Surrey College of Arts and Design Syracuse University
Jim Johnson	B.A. Theater Arts M.A. Cinematography	Humboldt State University Humboldt State University
Jazno Francoeur	B.F.A. Illustration	Kansas City Art Institute
Charles Wood	B.A. Biology B.S Medical Illustration Science M.S. Medical Illustration Ph.D. Physical Anthropology	Kalamazoo College The Medical College of Georgia The Medical College of Georgia University of Washington
Tony White	East Ham Technical College Extensive study of and professional experience in advanced animation techniques	London, England
Geraldine Kovats	B.F.A. Illustration Certificate of Completion – Painting, Animation	Academy of Art (San Francisco) Walt Disney Feature Animation
Anthony Ginn	B.A. Psychology M.F.A. Theater Arts	Central Washington University Estell Harmon Acting Academy
Riley Prigg	A.A. Digital Imaging & Computer Animation	Bellevue Community College
Matthew Dudley	B.F.A. Illustration	Cornish College of the Arts

Department Chair
Computer Engineering Program Advisor
***Real Time Interactive Simulation Program Advisor*

Staff	
Claude Comair	President
Jason Chu	Chief Operating Officer
John Bauer	Chief Financial Officer
Raymond Yan	Senior Vice President of Operations
Cedric Page	Sr. Vice President of Academic Affairs/Dean of Faculty
Meighan Shoesmith	Sr. Vice President of Administration/Registrar
Melvin Gonsalvez	Senior Vice President of Production
Prasanna Ghali	Senior Vice President of Engineering
Christopher Erhardt	Vice President of Production/Associate Dean of Continuing and Professional Education
Scott Dee	Vice President of Institutional Advancement
Matthew Klassen	Associate Dean of Mathematics, Sciences and Engineering
Abbott Smith	Associate Dean of Art and Animation
Mayu Davis	Controller
Yuki Taber	Director of Administration/Bursar
Asuka Miyahara	Accounting Assistant
Gordon Dutrisac	Student Services Director/Director of Learning Resource Center
Marci Myers	Assistant Librarian
Kim King	Financial Aid Director
Marti Jackson	Financial Aid Administrator
Angela Kugler	Admissions Manager
Tony Keim	Admissions Coordinator
Heidi Munoz	Admissions Outreach Coordinator
Katie McCully	Enrollment Coordinator
Masayo Arakawa	Marketing and Outreach Support
Linnéa Mobrand	Outreach Program Assistant
Monte Michaelis	Art Director
Katrina Chu	Production Artist
Emma Johansson	Receptionist
Atom Powers	Systems Administrator
Ryan Fulcher	IT Support
Aaron Klemm	IT Support
Joel Smith	Director of Facilities/Security/Prototype Engineer