If you have any questions or concerns, please call the university administration office. Tel: (510) 657-5913; Fax: (510) 657-8975; e-mail: npuadm@npu.edu. The university Website address is http://www.npu.edu. For Admission Office- e-mail: admission@npu.edu.

In this catalog:

- Is NPU accredited and recognized nation-wide?
  See Accreditation on page 2.

- How can I apply to NPU?
  See admission and application information on pages 3-5.

- How can I get an application form? What should I submit for application?
  You may apply online from the NPU website at www.npu.edu or download the application form from http://www.npu.edu/admissions/forms.shtml.

  The required application materials are listed on the application forms; you may also find the information on page 3 in the catalog or on NPU’s website.

- How can I see an admission officer or an academic counselor?
  Admission officers and academic counselors are available on campus to assist the applicants and the students during office hours as posted on the NPU Website.
  Also see Academic Counseling on page 13.

- What courses do I need to complete for my major?
  See Curriculum under various degree programs:
  School of Engineering - pages 36-55
  School of Business and Information Technology – pages 56-63

- I want to know the costs for taking courses or pursuing a degree.
  See the tuition and fees information on pages 8-9

- How do I register for classes?
  See Registration and related information on pages 13-14.

- How do I gain access to computers, e-mail, the Internet?
  See Facilities and Learning Resources on pages 30-35.

- Where can I find the directions to NPU?
  See page 115.
# 2006 Academic Calendar

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<td>- Registration continues for new students.</td>
<td>- Registration continues for new students.</td>
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<td>- Late registration for current students.</td>
<td>- Late registration for current students.</td>
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<td>- Add/Drop</td>
<td>- Add/Drop</td>
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<td>Orientation on internship courses (12:30 PM)</td>
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<td>- Deadline for changing program or catalog requirement (without late fee)</td>
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<td>1-14 Mid-term exams.</td>
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<td>- Check point – student counseling</td>
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<td>21 Begin pre-registration for the fall semester.</td>
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<td>Fall semester application deadline – international applicants.</td>
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<td>Late registration begins (current students).</td>
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<td>- Check point – student counseling</td>
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*May refer to the month.*
# 2006 Academic Calendar

**Fall Semester (10/9/06 – 1/27/07)**

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<td>20-25</td>
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<td>Mid-term exams.</td>
</tr>
<tr>
<td>Orientation on internship courses (12:30 PM)</td>
<td>2 Deadline for graduation petition for 2007 spring semester (without late fee)</td>
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<tr>
<td>16</td>
<td>9-13</td>
</tr>
<tr>
<td>Last day to add/drop without records</td>
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<tr>
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<td>Classes resume.</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Semester and classes begin.</td>
<td>Deadline for graduation petition for 2007 spring semester (without late fee)</td>
</tr>
<tr>
<td>- Registration continues for new students.</td>
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<td>2-14 Mid-term exams.</td>
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<td>9-13</td>
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<tr>
<td>14</td>
<td>Second faculty evaluation - by students</td>
</tr>
<tr>
<td>Orientation on project/thesis courses (12:45 PM)</td>
<td>23 Spring registration ends (for current students).</td>
</tr>
<tr>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td>Last day to add/drop without records</td>
<td>Spring semester application deadline -domestic applicants.</td>
</tr>
<tr>
<td></td>
<td>22-27</td>
</tr>
<tr>
<td>Mid-term exams.</td>
<td>Course review and final exams.</td>
</tr>
<tr>
<td></td>
<td>27</td>
</tr>
<tr>
<td>Faculty in-service training workshop</td>
<td>28 Memorial holiday; campus closed.</td>
</tr>
<tr>
<td>29-31</td>
<td>29-31</td>
</tr>
<tr>
<td>Administration office observes semester break office hours.</td>
<td>Administration office observes semester break office hours.</td>
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<tr>
<td><strong>2007 January</strong></td>
<td><strong>2007 February</strong></td>
</tr>
<tr>
<td>1 New Year holiday; campus closed</td>
<td>1-10 Administration office observes semester break office hours.</td>
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<tr>
<td>Classes resume.</td>
<td>- Posting final grades for 2006 fall semester.</td>
</tr>
<tr>
<td>- Late registration for spring semester begins (current students).</td>
<td>- Check point – student counseling</td>
</tr>
<tr>
<td>- Spring semester application deadline – international applicants.</td>
<td>2 Graduation ceremonies (for students graduating from 2006 fall to 2007 summer semesters)</td>
</tr>
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<td>8-13</td>
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**2007 Spring Semester (2/12 - 5/26)**

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<thead>
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<td>- Registration continues for new students.</td>
<td>23 Begin pre-registration for the summer semester.</td>
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<td>- Late registration for current students.</td>
<td>30 Summer registration ends (for current students).</td>
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<tr>
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<td>Summer semester application deadline –domestic applicants.</td>
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<td>Orientation on internship courses (12:30 PM)</td>
<td>5 Orientation on project/thesis courses (12:45 PM)</td>
</tr>
<tr>
<td>17</td>
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<td>Second faculty evaluation - by students</td>
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<tr>
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<td>14 Summer semester application deadline -domestic applicants.</td>
</tr>
<tr>
<td>19</td>
<td>21-26</td>
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<td>Last day to add/drop without records</td>
<td>Course review and final exams.</td>
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<td>Deadline for changing program or catalog requirement (without late fee)</td>
<td>Faculty in-service training workshop</td>
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<tr>
<td>22-27</td>
<td>28</td>
</tr>
<tr>
<td>Course review and final exams.</td>
<td>Memorial holiday; campus closed.</td>
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<tr>
<td>27</td>
<td>29-31</td>
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<td><strong>June</strong></td>
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<td>1-9 Administration office observes semester break office hours.</td>
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<td>4</td>
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<td>Graduation ceremonies (for students graduating from 2006 fall to 2007 summer semesters)</td>
<td>- Posting final grades for spring semester.</td>
</tr>
<tr>
<td>3</td>
<td>16</td>
</tr>
<tr>
<td>- Posting final grades for 2006 fall semester.</td>
<td>Check point – student counseling</td>
</tr>
<tr>
<td>- Check point – student counseling</td>
<td>Summer semester application deadline –international applicants.</td>
</tr>
<tr>
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<td>6</td>
</tr>
<tr>
<td>- Late registration begins (current students).</td>
<td>Summer semester application deadline –domestic applicants.</td>
</tr>
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</tr>
</tbody>
</table>
A MESSAGE FROM THE PRESIDENT

To all prospective students:

Today, we all face the continuous demands and challenges of a fast-paced and complex society that shoulders us with an ever-increasing level of family, social, and economic responsibilities. Northwestern Polytechnic University (NPU) is an educational institution established with the specific intent to provide the learning opportunities and the high-technology training ground needed to help each individual meet these challenges.

The location of NPU in the heart of Silicon Valley along with the efforts and accomplishments of NPU’s faculty and administrators combine to provide a unique environment for students to learn and to gain practical experience. NPU’s ties with universities and companies around the world help to promote the international understanding and cooperation that give our graduates a wider view of their roles as individuals and as members of society.

Our university dedicates itself to the continual improvement of academic curricula and programs that combine existing knowledge and new developments arising from today’s ever-changing world. In doing so, NPU’s programs encourage both analytical and creative thinking. Even though the specific goals and objectives of each student are different, it is the dedication to learning that matters. If you are devoted to the pursuit of education and self-enrichment, we welcome you to accept the challenge and further your career and intellectual growth by attending NPU.

Dr. George T. C. Hsieh
President
# 2006 Catalog
(Effective 2006 spring semester)

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Introduction

The NPU catalog is an annual publication containing information on academic requirements, learning facilities, tuition and fees, and disciplinary issues concerning all applicants and students at NPU. This catalog is effective from the 2006 spring semester through the fall semester. Student handbooks, for local and for international students, are published separately every semester and distributed to the new students on the New Student Orientation Day. The handbooks provide additional information to help the students adjust to the school environment quickly and learn how to use the administrative services provided to them.

The majority of the information contained in this catalog and other pertinent information are also available on the university website at www.npu.edu.

Educational Philosophy

The educational philosophy of the University includes an absolute commitment to academic excellence, providing programs available to the interested students - both full-time and working adult students, conducting effective business practices, and adopting teaching methods and environments conducive to the development of graduates with critical thinking skills as well as competence in the subject area.

Objectives

Northwestern Polytechnic University strives to meet the needs of professionals in the high-technology fields and local and global business markets by providing learning opportunities in electrical engineering, computer systems engineering, computer science, and business administration and information technology. Because Silicon Valley continually demands a multitude of electronics, computer, and business professionals, NPU aims to prepare individuals to achieve the proficiency necessary for quality work in the cluster industry and local and global business communities. Silicon Valley’s most pressing needs are for high-end technical professionals in electronics and computer engineering as well as in system integration and embedded engineering, professionals trained in bioengineering and nanotechnology, and service professionals in healthcare service management and hospitality management. The cluster industry is also in need of business professionals capable of project and technology business management for headquarter and global projects. While training students to acquire these skills efficiently, NPU likewise strives to promote quality and integrity in higher education.

NPU provides a unique educational culture and learning environment for students because NPU has been able to attract a strong pool of talented individuals from Silicon Valley to teach, conduct research, and provide student services. The abundance of talent and technical resources in Silicon Valley has also provided NPU with a unique student body. A significant number of the NPU students have had work experience in high-tech industries and local business community, which makes the teaching and learning even more stimulating academically.

NPU continues to keep abreast of the fast-paced changes in the cluster industry. Each program is designed for the student to accomplish specified goals and objectives and contribute to competence in the subject area or profession. At the same time, the school aims to provide the students with a rewarding educational experience.

Mission

The mission of Northwestern Polytechnic University is to provide advanced education for adult learners in order to cultivate growth and development in their professional and personal lives. NPU aims to bring qualified faculty who have had active careers in high-technology industries and businesses into contact with highly motivated students in a stimulating learning environment. NPU continually adapts its curricula to reflect the fast-paced cluster industry and global business environment. Currently NPU’s programs focus on computer engineering, electronics technology, and business disciplines, leading both to undergraduate and graduate degrees.
Faculty

The University faculty maintains a tradition of personal attention to students and devotion to teaching and research. Many members of the faculty have been cited for excellence in teaching. Some of them are leaders in their disciplines and professional organizations. Members of the faculty have had the experience of working in high-tech fields and various business professions; some also acted as consultants to educational institutions, industry, businesses, government, and foundations.

Accreditation

Northwestern Polytechnic University is an academic institution accredited by the Accrediting Council for Independent Colleges and Schools (ACICS) to award bachelor’s degrees, master’s degrees, and doctorate degrees. ACICS is listed as a nationally recognized accrediting agency by the United States Department of Education and is recognized by the Council for Higher Education Accreditation. ACICS may be contacted at 750 First Street, NE, Suite 980, Washington, DC 20002-4241, Tel: (202) 336-6780.

NPU has been granted approval by the State of California since 1984 as a California degree granting institution. The Bureau for Private Post-secondary and Vocational Education of California granted NPU a re-approval in April 2005.

The ACICS is recognized by the U.S. Department of Education to accredit institutions that offer educational programs at these credential levels: certificate, diploma, occupational associate’s degree, academic associate’s degree, bachelor’s degree, and master’s degree. At the time of publication of this catalog, the U.S. Department of Education recognizes ACICS for the accreditation of institutions that offer programs through the master’s degree level only, not the applied doctorate. Contact the NPU administration office for further information.

Corporate Status

Northwestern Polytechnic University is organized under California Corporate Law as a nonprofit, public-benefit corporation and is deemed tax-exempt, as applies to corporations falling within the IRS 501(c)(3) ruling.

NORTHERN POLYTECHNIC UNIVERSITY ADMINISTERS ALL ITS PROGRAMS WITHOUT REGARD TO RACE, ETHNIC ORIGIN, AGE, OR SEX. NPU CONFRONTS AND REJECTS ALL MANIFESTATIONS OF DISCRIMINATION IN ITS EDUCATIONAL POLICIES, ADMISSION POLICIES, SCHOLARSHIPS, OR OTHER SCHOOL ADMINISTERED PROGRAMS.

Governing Board

NPU is governed by its Board of Trustees. Board members consist of NPU faculty members, well-known scholars and educators, and community leaders. They provide voluntary service and receive no remuneration as NPU is a nonprofit, public-benefit educational institution.

Community Involvement

The University is first and foremost an institution of learning and teaching, committed to serving the needs of society and involved in the academic and civic communities of which it is a part. To this end, the University is a member of the Fremont and San Jose Chambers of Commerce. University staff and faculty serve on committees of the Fremont City Council and on community college foundations, and act as members of visiting teams for certain academic accrediting organizations. The NPU administrators participate in local job fairs and work with local businesses to provide job opportunities for our students. The University also provides space for meetings of various local government bodies and businesses.
Admission Policies

- NPU admits all qualified individuals into the university without regard to race, religion, sex, ethnic origin, or physical handicap.

- NPU makes education available to all individuals who meet the qualifications for entrance into NPU.

All undergraduate and graduate degree applicants should refer to this section for admission information. Doctoral applicants and students should refer to the section on “Doctorate Degree Programs” for further information.

Trimester: An applicant may apply for entrance in any of the three trimesters each year.

The NPU undergraduate programs accept qualified high school graduates and college transfer students. The graduate program applicants must hold a valid bachelor’s degree before attending NPU and meet the minimum grade point average requirement for consideration of acceptance.

The NPU Admissions Committee provides individualized admission evaluation service and follows the approved credit transfer policy to transfer credit for each applicant. A copy of the evaluation report will be provided to the accepted applicant.

Application Requirements

To apply for admission, an applicant is required to submit (1) an Application Form (online or hardcopy), (2) a nonrefundable application fee by, (3) official transcripts from previously attended colleges and/or high school (for freshmen only) to the NPU Admissions Office, (4) documentation verifying English proficiency to qualify the student for taking degree courses. Non-English speaking students without proof of English proficiency will be required to take an on-campus English placement examination. The exam results determine whether the student is required to take English as A Second language (ESL) classes and at what level. ESL classes are offered at NPU. See English Requirement below for detailed information, and (5) Entrance assessment tests for freshman applicants and applicants for the MBA, DBA and DCE degree programs. The scores are for reference purpose and will not affect the admission evaluation for the applicants. Applicants are also encouraged to submit their resumes.

NPU is authorized under federal law to enroll non-immigrant international students. In addition to the above general application requirements, an international applicant is also required to submit the following additional documents: (6) a financial support document – either the applicant’s bank statement or a certified affidavit of support (form I-134 or equivalent) from a financial sponsor indicating a minimum amount of $15,500 available for the applicant to pursue his/her study in the first academic year at NPU, (7) a transfer student is required to submit a photocopy of his/her previous I-20 form and request the previous international student advisor to complete the International Student Transfer Record form for NPU and conduct the required SEVIS transfer process, and (8) upon arrival to NPU, photocopies of the student’s passport, visa, and I-94 (admission & departure) document.

Official Transcripts

All official transcripts must be received before the admission evaluation. Students enrolled in courses at another institution at the time of application will have 60 days after the completion of the courses to provide NPU the updated transcript.

Freshmen Applicants: Undergraduate applicants who have not completed at least 30 semester units of college credit are considered freshmen and are required to submit the following to NPU:

- Official high school and college transcripts (if applicable).
- Results of the SAT-I: Reasoning Test, taken within the last two years. The SAT Institution code for NPU is 4335. Applicants without the SAT-I score will be required to take an equivalent placement test at NPU before or on the New Student Orientation Day. The score is for reference purpose.

NPU recognizes the General Educational Development (GED) tests and accepts the GED graduates.
The application deadline for each trimester is given in the Academic Calendar.

Late Application: A late application fee will be charged for applications received after the deadline each trimester. Overseas applicants should apply earlier to allow sufficient time for processes related to visa application and overseas travel.

New Student Orientation: All new students are required to attend the New Student Orientation program conducted at NPU before each semester starts. The schedule is shown in the Academic Calendar

- Entrance English Requirement
To enroll in degree courses, an applicant must demonstrate English proficiency by providing documents satisfying at least one of the following: (1) graduation from an institution where English was an official language, or (2) having completed a college-level English course at an institution where English was an official language, or (3) meeting NPU’s minimum TOEFL requirement – a score of 550 on the paper-based test, and 213 on the computer-based test; **The TOEFL institution code for NPU is 9626**, or (4) earning an above average SAT-1 verbal score, or (5) having completed advanced English language courses (ESL) at NPU or at English institutions recognized by NPU, or (6) passing NPU’s English Placement Examination (EPE) conducted prior to the students’ first semester at NPU.

- English Placement Examination (EPE)
Without documented evidence of English proficiency, the applicant will be required to take the EPE at NPU prior to enrolling in degree courses. The computerized examination will be given to the new students free of charge before and on the New Student Orientation Day. An applicant is allowed to take the EPE once. A fee will be assessed for those who do not take the examination as scheduled and require the EPE to be administered to them separately.

- American Language Classes (ESL classes)
If the student does not pass the EPE, he/she will be placed in a proper level of American language classes (ESL) based on the examination result. The ESL classes are offered at NPU with the same trimester schedule as other courses. Courses cover conversation, grammar, writing, pronunciation and accent reduction, vocabulary development, and presentation skills. NPU offers ESL classes at the following levels: high-beginner, intermediate, and advanced. The student may be promoted to the next higher level of ESL courses upon successful completion of the current level of courses. The student proceeds to complete the highest level of ESL classes offered at NPU in order to meet the entrance English requirement for the degree students. Students placed in the highest levels of American language classes may be allowed to concurrently take a limited number of degree classes at NPU, provided that this optimizes their learning objectives.

- College English Course Requirement for Graduate Students
In addition to meeting the entrance English proficiency requirement for all students, a graduate student is required to take a college level English course or the equivalent. Except for those who belong to categories (1) and (2) specified under the header “Entrance English Requirement”, a graduate student must complete at least one of the following courses at NPU: (a) a business communication course (BUS300), or (b) a professional development course (course number 398) or (c) a college-level English course after meeting the course prerequisite requirement.

- Entrance Assessment Tests
The entrance assessment tests are required for reference purpose. They will not affect the admission evaluation for the applicants.

Graduate applicants for the MBA and DBA degree programs are required to take the GMAT. **NPU's Institution code for reporting the GMAT scores is 5485.** Applicants without the GMAT score will be required to take an equivalent assessment test at NPU before or on the New Student Orientation Day. The cost is $50.

Applicants for the DCE degree program are required to take the GRE. **NPU's Institution code for reporting the GRE scores is 5485.**
Applicants without the GRE score will be required to take an equivalent assessment test at NPU before or on the New Student Orientation Day. The cost is $50.

**Freshman applicants** are required to take the SAT-I. NPU’s Institution code for reporting the SAT scores is 4335. Freshman applicants without the SAT-I score will be required to take an equivalent assessment test at NPU before or on the New Student Orientation Day. The cost is $50.

### General Background Requirements

- **Undergraduate Programs**
  
  Remedial courses are not offered at NPU except for English as a Second Language classes. Applicants to all programs are required to have completed pre-calculus subjects in algebra, trigonometry, and geometry prior to admission into any program.

- **Graduate Programs**
  
  **Background preparation:** The background preparation for each graduate program is described at the beginning of each program. In the admission evaluation report received by each applicant, background deficiencies are identified, if any. The student is required to clear the deficiencies at NPU in the first few semesters.

  **How to clear deficiencies?** The graduate student may clear each background deficiency by either (1) taking and passing the subject course (an undergraduate course) **at NPU** or (2) taking and passing a **proficiency exam** on the subject.

  The student may not be allowed to take graduate level coursework until clearing all deficiencies. Courses taken elsewhere after admission to NPU will not waive a deficiency requirement. Students may not take the deficiency courses at another institution while attending NPU.

### Notification of Admission

Normally, prospective students may expect to receive notification of admission status in two weeks after filing complete application materials with the NPU Admissions Office.

### Cancellation of Admission and Readmission

If an applicant is accepted into a degree program for a given semester and does not begin classes in that semester, admission will automatically be canceled. The prospective student’s application records (transcripts from previous colleges and American language proficiency records) are kept on file for a period of six months from the semester start date. If the applicant then wishes to be considered for readmission in a later semester, he/she will be required to resubmit (1) an Application Form and pay (2) a readmission fee. A reevaluation of admission will be made for the applicant.

### Returning Students

When a former NPU student returns to continue his/her study in an unfinished program after making a longer-than-one-semester absence, the returning student must submit a new application (online or hardcopy) form and pay a readmission fee. The student will receive a new evaluation and study plan based on the graduation requirements specified in the current catalog.

### NPU Institution Codes for Standardized and International Tests

<table>
<thead>
<tr>
<th>Test</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>4335</td>
</tr>
<tr>
<td>GMAT</td>
<td>5485</td>
</tr>
<tr>
<td>GRE</td>
<td>5485</td>
</tr>
<tr>
<td>TOEFL</td>
<td>9626</td>
</tr>
<tr>
<td>CLEP</td>
<td>7569</td>
</tr>
<tr>
<td>DANTES</td>
<td>9670</td>
</tr>
</tbody>
</table>
Transfer of Credit from Other Institutions

In both the undergraduate and graduate degree programs, classes completed at other institutions of higher education may be transferable. The following statements apply to all transfer credits:

-- NPU Admissions Office must receive all official transcripts prior to the student’s joining a degree program. Transcripts received after the student joins NPU cannot be used in transferring credits, except for records from the term immediately preceding the student’s starting semester at NPU.

-- The student was officially enrolled in the course.

-- Credits are transferred by the following conversion:

**Definition of a Trimester/Semester Unit:**
One unit = 15 classroom lecture periods of 50 minutes each; or
= 30 laboratory clock hours.

**Conversion Factor:**
1 quarter unit = 0.66 trimester/semester unit

**Grades Required for Transfer Credit**

**Undergraduate programs:** In the bachelor's degree programs, courses completed with grades “A”, “B”, and “C” are transferable.

**Graduate programs:** In the graduate level programs, courses completed with grades “A” and “B” are transferable.

Courses completed with a “CREDIT” grade are transferable only if the institution’s grading policy states that “CREDIT” is granted with a letter grade which meets the above condition. This policy must be in writing from the institution (transcript key or letter of verification).

**Major courses and proficiency exams:** Transfer credit granted for courses in the major area that were completed more than ten years prior to application with NPU by successful completion of a proficiency examination.

Transfer of Credit in the Bachelor's Degree Programs

**Lower-Division Credit**

Courses that are considered lower division are courses completed in the freshman or sophomore years of a four-year undergraduate program of study or courses completed at a two-year junior college.

All the required lower-division credits for graduation are transferable. The minimum required lower-division credit meeting NPU graduation requirements is specified in each undergraduate program. Credits are transferred by the Admissions Committee while the admission evaluation is processed based on the student’s official transcript records from previous colleges.

- Lower-division courses may not be used to waive upper-division courses.
- Courses for transfer to NPU may not be completed concurrently at another institution while attending NPU.
- College English courses taken at an institution where English is not an official language cannot be transferred as general education courses.

**Upper-Division Credit**

In order to transfer as upper division credit, the course must be at the junior or senior level of an accredited or state approved four-year college program of study. The Admissions Committee decides on upper-division transfer credits at the time of the application evaluation. Transcripts received after the student joins NPU will not be considered for transferring credits.

A maximum of 20 upper-division units may be transferred to meet the graduation requirements of the program.

**Types of Undergraduate Transfer Credit**

NPU accepts undergraduate transfer credit from the following types of courses and schools:
• Junior colleges or courses completed in a 4-year undergraduate program.

• Vocational/Technical Schools
  Courses from U.S. technical/vocational institutions are transferable for lower-division credit only if the school’s curriculum leads to an associate’s degree, and the institution is accredited.

• Credit by Examination - CLEP
  NPU grants credit to those students who pass examinations in English, natural sciences, humanities, and social sciences subjects offered by the College Level Examination Program (CLEP). Only General Education credits will be granted. Students should consult with the Admissions Office for information on acceptable CLEP scores and units. The CLEP Institution Code for NPU is 7569.

• Transfer of Credit from Defense Activity for Nontraditional Education Support (DANTES) and Military Services
  Credits will be allowed for DANTES Subject Standardized Tests and professional military education evaluated by the American Council on Education (ACE). The maximum transferable lower-division and upper-division credits follow the same policies as specified in above sections on lower-division and upper-division credit transfers. NPU’s evaluation of an application is made prior to the student’s admission to a program unless otherwise approved by the authorizing VA office. The DANTES Institution Code for NPU is 9670.

• Transfer of Credit in the Master’s Degree Programs

  A maximum of 6 units of graduate-level courses may be transferred from an accredited graduate school or an equivalent foreign institution for the Master’s degree programs. The Admissions Committee decides on graduate transfer credits at the time of the application evaluation. Transcripts received after the student’s joining NPU will not be considered for transferring credits. Graduate courses for transfer to NPU may not be completed concurrently at another institution while attending NPU.

  NPU undergraduate students who take graduate level courses for graduate credits at NPU while completing their undergraduate degrees are allowed a maximum of 12 units to be counted towards a graduate degree. These courses may not count towards the undergraduate degree. These students may apply for admission to a Master’s degree program at NPU in the last semester of their undergraduate study. They are required to complete their undergraduate study before being officially admitted into a graduate program.

• Refer to the section on “Doctorate Degree Programs” for information on transfer of credit for the doctorate degree programs.

Enrollment Agreement

Upon joining NPU, a student is presented an Enrollment Agreement form which indicates the student’s program, length of study, estimated costs, refund policy, and other information. The student should read the information on the form. Both the student and the admissions staff will sign the form; the student and the school each keeps a copy of the form.
Tuition and Fees

■ Tuition Per Unit for Undergraduate Studies (BS/BBAIS)

Tuition for courses taken to fulfill an undergraduate degree requirement is $275.00 per unit.

■ Tuition Per Unit for Graduate Degrees in Business Administration (MBA/DBA)

Tuition for courses taken to fulfill the graduation requirements of the Master of Business Administration and the Doctor of Business Administration is $390.00 per unit. Graduate students taking undergraduate courses to clear deficiencies pay at the undergraduate unit rate.

■ Tuition Per Unit for Graduate Degrees in Engineering (MS/DCE)

Tuition for courses taken to fulfill the graduation requirements of the Master’s degrees in engineering and the Doctor of Computer Engineering degree is $450.00 per unit. Graduate students taking undergraduate courses to clear deficiencies pay at the undergraduate unit rate.

■ Tuition Per Unit for Courses Repeated or Audited

Except for Internship and ESL courses, tuition for repeated courses or for courses audited (without earning credit) is half the regular unit rate.

I. Estimated Semester Cost of Tuition for a Full-Time Student

(Based on an undergraduate student taking 12 units per semester and a graduate student taking 9 units per semester)

A. Undergraduate Program Tuition: (BSEE/BSCS/BSCSE/BBAIS) $3,300

B. Graduate Business Program Tuition: (MBA/DBA) $3,510

C. Graduate Engineering Program Tuition: (MSEE/MSCS/MSCSE/DCE) $4,050

❖ Textbook is estimated at $80-$130 per course.
❖ All international students are required to purchase a health insurance plan. The annual cost is estimated at $641.

II. Admission Fees

<table>
<thead>
<tr>
<th>Fee Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application for admission (one-time fee)</td>
<td>$60</td>
</tr>
<tr>
<td>Readmission fee</td>
<td>$30</td>
</tr>
<tr>
<td>Late fee</td>
<td>$50</td>
</tr>
</tbody>
</table>

III. Service Fee Schedule

(Incurred upon request of services only)

Notice: Please observe deadlines to avoid late fee charges. All late fees are $50 except if specified.

<table>
<thead>
<tr>
<th>Fee Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration fee (per semester)</td>
<td>$50</td>
</tr>
<tr>
<td>Student Assoc. fee (per semester)</td>
<td>$20</td>
</tr>
<tr>
<td>Add/Drop request processing fee</td>
<td>$10</td>
</tr>
<tr>
<td>Late registration fees (continuing Students only):</td>
<td></td>
</tr>
<tr>
<td>- Up to end-of-semester</td>
<td>$50</td>
</tr>
<tr>
<td>- During semester break</td>
<td>$75</td>
</tr>
<tr>
<td>- After start of new semester</td>
<td>$100</td>
</tr>
<tr>
<td>Payment Plan service fee</td>
<td></td>
</tr>
<tr>
<td>- 2-payment plan</td>
<td>$25</td>
</tr>
<tr>
<td>- 3-payment plan</td>
<td>$50</td>
</tr>
<tr>
<td>Transcript Fees</td>
<td></td>
</tr>
<tr>
<td>- First 2 copies</td>
<td>free of charge</td>
</tr>
<tr>
<td>- Additional copies</td>
<td>$5 each</td>
</tr>
<tr>
<td>Replacement of lost student ID card</td>
<td>$10</td>
</tr>
<tr>
<td>Returned/bad check fee</td>
<td>$20</td>
</tr>
<tr>
<td>Express service fee</td>
<td>$20</td>
</tr>
<tr>
<td>Change major/new study program</td>
<td>$50</td>
</tr>
<tr>
<td>Change to current catalog requirement (new study plan)</td>
<td></td>
</tr>
<tr>
<td>Each placement test (SAT-I/GMAT/GRE equivalency)</td>
<td>$50</td>
</tr>
</tbody>
</table>
Undergraduate student challenge exam fee (in addition to the course tuition)  $100
Proficiency exam fee (per subject) - no credit earned  $150
Petition for graduation fee  $250
Each re-petition for graduation  $50
International student special service fees  Specified on request forms

Refund Policy

Refunds Due to Regular Add/Drop of courses

For students remaining enrolled in at least one course in a semester, refunds are processed at the end of add/drop period each semester. The students will receive email notices for receiving refund checks within three weeks from the add/drop deadline. The following policy applies to these students:

1. For courses dropped before the end of the first week of instruction, the school will refund to the appropriate party any tuition received by the school from or on behalf of the student for the current semester.

2. For courses dropped after the first week of instruction, but within the first 50% of the current semester, the school will refund to the appropriate party a prorated portion of the tuition received by the school from or on behalf of the student for the current semester as follows:

<table>
<thead>
<tr>
<th>Before the end of week</th>
<th>%Refund</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>90%</td>
</tr>
<tr>
<td>3 &amp; 4</td>
<td>75%</td>
</tr>
<tr>
<td>5, 6, 7, &amp; 8</td>
<td>50%</td>
</tr>
<tr>
<td>9 through 15</td>
<td>0%</td>
</tr>
</tbody>
</table>

For a student receiving VA education benefits, in addition to the prorated tuition, the school will refund a prorated portion of the application fee.

3. After the first 50% of any semester the student attends the school, the school will only refund to the appropriate party the tuition and fees received by the school from or on behalf of the student for any future semesters, if applicable.

4. Registration fee and Student Association fee are non-refundable.

5. An additional 2% deduction will be applied to refunds for tuition/fees paid by credit cards.

Withdrawal – Temporary or Long Term

A student is considered “withdrawing” from NPU when either of the following occurs: (1) the student drops all courses enrolled in a semester in an add/drop process, (2) the student submits a “Request for Withdrawal from NPU” form to the office, or (3) the student is terminated due to disciplinary issues, unsatisfactory academic performance, or violation of regulations required for international students. A student who has not enrolled at NPU for two consecutive semesters or more is considered withdrawn from NPU.

Students who leave a course without official withdrawal (drop) are subject to a failing grade in the course.

Refund due to withdrawal from NPU:

1. 3-day full refund: If the withdrawal occurs within 3 days after enrollment and no classes have been attended by the student, full refund applies, including tuition, registration fee, and Student Association fee paid for the semester.

2. Except for the case of 3-day full refund, the registration fee is non-refundable.

3. Other than the case of 3-day full refund, the Student Association fee is refundable if the withdrawal occurs by the end of the first week of instruction.

4. If the withdrawal occurs before the end of the first week of instruction, the school will refund to the appropriate party:

   (a) any tuition received by the school from or on behalf of the student for the current semester.
(b) any tuition and fees received by the school from or on behalf of the student for any future semesters.

5. If the withdrawal occurs after the end of the first week of instruction, the same refund policy (see the refund table on the last page), applicable to other students who remain enrolled, applies.

6. The school will issue a refund for withdrawal within 30 days of the student’s withdrawal, termination date, or the specified time period under applicable law, whichever occurs first. The student will remain obligated to the school for all unpaid tuition, fees, and other amounts charged the student pursuant to the agreement or otherwise that are not subject to refund in accordance with this section.

7. An additional 2% deduction will be applied to refunds for tuition/fees paid by credit cards.

8. A student withdrawing from NPU should submit the proper paperwork to the administration office in order for the Records Office and the Business Office to process the student’s tuition refund. In general, the student’s withdrawal or termination date will be the student’s last date of attendance at the school.

The student should return all items owed to the library and the school and clear any financial balance owed to the school upon withdrawing from the school.

9. If the school determines, in its sole and absolute discretion, that the student's withdrawal or termination from the program during any semester was the proximate result of the student’s suffering from an incapacitation, such as

(i) illness,
(ii) accident,
(iii) death of a close family member, or
(iv) similar circumstances,

the school will determine whether to increase the refund amount specified above of the tuition and fees received by the school from or on behalf of the student for the semester.

NOTE: Any outstanding fees owed to the University by the student will be deducted from the tuition refund.

International students must complete one entire semester at NPU before withdrawal or transferring to another institution. No refunds will be given during the first semester of the student’s attendance at NPU.

Minimum Terms for Tuition Payments

The student is only obligated for the portion of the program cost applicable to each semester in which student is enrolled in the school. The student must pay the school the applicable cost (i.e., semester tuition, other required fees) at the time of registration, unless the student and school agree in writing to a tuition payment plan.

Students whose accounts are more than thirty days past due are suspended from class attendance until satisfactory arrangements are made to bring their account to current status. Students who fail to fulfill the financial arrangements agreed upon are suspended from school and may reenter only upon full payment of the delinquent portion of their account unless the school has agreed in writing to a different payment arrangement.

If the student withdraws or is terminated from the program for any reason and subsequently applies to reenter the school, the school will determine in its sole discretion whether to allow the applicant to reenter. If the school allows the applicant to reenter, the student must execute a new enrollment agreement and pay all the current program costs.

Debts Owed to the University

Should a student or former student fail to pay a debt owed to the University, NPU may withhold permission to register, to use facilities for which a fee is authorized to be charged, to receive services, materials, or any combination of the above from any person owing a debt until the debt is paid (see Title 5, California
Alternative Student Loan

NPU students may receive financial aid for their studies and living expenses through a variety of commercial bank student loan programs. These student loan programs operate similarly to federal-sponsored financial aid loans, however, they are "credit-based" as opposed to government guaranteed. This means that the applicant must be "credit-worthy" in the U.S., or have a credit-worthy cosigner. If qualified, the loans (depending on the program) can offer:

- No payments for up to six months after graduation
- No loan fees
- Low student loan rates
- Fast approvals
- Flexible repayment plans

VA Educational Assistance

The University is authorized by the U.S. Veterans Administration (VA) to accept qualified veterans who receive veteran’s education benefits. In administering student financial and academic affairs for veteran and military students, the University follows VA and related military regulations. A newly admitted student is required to submit a Certificate of Release or Discharge from Active Duty Form (Form DD-214). Please contact the NPU Administration Office for additional information.

NPU’s Student On-campus Work-study Opportunities

Limited openings in NPU’s work-study programs are available to highly qualified degree-seeking candidates. NPU work-study application forms are available at the Information Office.

The students may apply for Teaching Assistantships (TAs) and Laboratory Instructorships (LIs). These assistantships are offered primarily on the basis of outstanding academic and professional achievement. Students chosen to provide these services must have the heart for helping fellow students. Each semester the administrative staff works with the faculty to assign graders, TAs, and LIs to assist faculty and students in a group of classes. Graders’ duties are to grade student homework.
for the instructors. TAs’ duties are to assist both the instructors and the students. The TAs hold office hours in order to tutor students who have questions about the course material. They provide additional assistance to the students after class. They also assist the instructors to maintain the online learning resource information for their assisted courses. An LI’s duties are to conduct laboratory sessions for courses which have labs as an integral part of the courses. Refer to the section on “The University Library and Learning Resource Facility” under “Facilities” for more information.

The administrative staff also selects qualified students to manage the practicum laboratories.

Industrial Cooperative Projects and Internships Opportunities

Highly selective internship opportunities with a number of local companies are available for qualified students. An online job posting board provides the current internship project information to the students on the controlled NPU Online Service Center web site. For further information, please contact the Administration Office.

Academic Information

Study Plan

Upon admission to a degree program, the new student receives a copy of his/her admission evaluation form which also includes his/her graduation requirements. The electronic file of the student’s study plan will be maintained by designated administrative staff as the student continues his/her study at NPU. The student will have access to his/her own study plan through NPU’s Online Service Center. The student is advised to check his/her online study plan regularly and report any error to the administrative staff immediately.

Designated academic advisors will assist each student to select a concentration area, if it is required in the program, as well as courses to fulfill the requirements for the concentration area as well as the electives.

Follow proper sequence: In general, a student should complete lower-level courses before taking higher-level courses. A graduate student is advised to clear all deficiencies before taking graduate level courses. For students taking ESL courses, see the section on “American Language Classes (ESL)” under “Admission Policies”.

Follow original plan: A student should follow his/her original study plan to complete his/her study in the program. When courses are replaced due to catalog update, the student should take the replacement courses accordingly as substitutes. The student is advised to submit a “Request for Substitution of Required Course” form to the Administration Office for each such change for official record filing purposes.

Use new curriculum: As the school catalog is updated each year, a student is allowed to submit a request for upgrading his/her study plan by using the graduation requirements specified in the newer and current catalog. The evaluation committee will make a new study plan for the student. The student may risk additional course requirements with such a request since the new requirements are different from the previous ones for the same program. The student is advised to make a careful decision before submitting such a request as the process is not reversible.

Returning student: When a student returns to NPU to continue his/her study in an unfinished program after making a longer than one-semester absence, the returning student must submit a new application form and will receive a new study plan based on the graduation requirements specified in the current catalog. All or part of the credits earned from his/her previous study in the unfinished program at NPU will apply towards the new graduation requirements.
**Academic Advising and Counseling**

Academic advising and counseling is an essential element of the educational process. Designated faculty members and staff advisors serve as academic advisors and counselors to the students. Ideally one of continuity and commitment, academic advising and counseling involves both the student and the academic counselor.

Each student is required to meet with an academic advisor before and during the course registration period each semester. During the meeting, the advisor and the student will examine the student's study plan and academic records, choose suitable courses, and verify course prerequisites. Academic advising is also available to students throughout the school year. In addition to helping students plan course schedules, academic advisors encourage students to explore how their academic options and personal goals relate to the practical world of work.

To ensure satisfactory progress of each student, designated administrative staff maintains close contact with the faculty and the teaching assistants in addition to using the online management tools in order to provide counseling to the student when either of the following occurs: (1) the student’s course performance does not meet the class standards at any checkpoint during the semester or (2) the student has poor attendance record.

**Class Schedule**

The school’s annual calendar is based on a trimester system of three 15-week semesters starting in February, June, and October. An applicant may apply for entrance in any of the three semesters.

Degree program classes are primarily conducted on weekday evenings and on weekends to allow both non-working students and working professionals to pursue their studies during after-work hours. ESL classes (English as A Second Language) are conducted on weekdays in the daytime. Full-time students may use weekdays’ daytime to study, do homework, conduct hands-on exercises in the labs or work on projects in the practicum labs, or get involved in extracurricular activities. Some international students attend ESL classes conducted on weekdays in the daytime.

Full-time administrative personnel are available on campus both day and evening, weekdays and Saturdays to assist the students, faculty, and prospective applicants.

A new semester class scheduled is published before pre-registration starts; it is usually published 7-8 weeks before the new semester starts.

**Registration**

The registration calendar is listed in the University catalog and on the NPU website. The semester registration notice is sent to the students by e-mail and posted on the NPU website and bulletin boards. The registration packages are available online as well as in the library. Late registration fees will be imposed on all continuing students who register after the official registration deadline.

1. All applicants to NPU must first be admitted into the University by the Admissions Office before being allowed to attend classes.
2. Except for new students registering for courses in the first semester, all on-going students must register on or before the scheduled registration deadline for each semester, which is normally set at 6-7 weeks prior to the semester’s starting date. Therefore, registration for any semester occurs soon after the mid-term point in the preceding semester.

New students who have received their acceptance documents are encouraged to register during the same registration period as for the on-going students.

3. Staff advisors assist the students to select courses and register by using the NPU online facility. The online program allows the staff advisors to see their advisees’ study plans in order to provide proper advice for registration.

4. Tuition and fees are due and payable in full at the time of registration unless the student has signed up for a tuition payment plan.

5. Working professionals who receive tuition reimbursements from their employers may follow NPU’s special payment plan by
submitting supporting documents to the NPU administration office prior to registration.

6. An undergraduate student wishing to enroll in more than 16 units in a given semester must obtain written permission from the Academic Review Committee, demonstrate superior academic performance, and have a cumulative G.P.A. of 3.5 or better. The limitation for graduate students is 12 units.

7. Undergraduate students on academic probation will not be allowed to register for more than 12 units under any circumstances. The limitation for graduate students is 9 units.

8. Any student attending a class without officially registering in the class will be required to pay a fine as defined by the administration.

9. An international student is required to enroll as a full-time student (see definition in the next section) and maintain good status with the university during his/her study at NPU.

10. All international students are required to have a valid health insurance plan. An international student may use the health insurance plan contracted by NPU and pay the insurance fee at registration or provide evidence of outside insurance in order to be waived of the NPU plan.

11. Registration is complete when all fees are paid. The University is not responsible for billing students.

A non-international student may enroll as a full-time or part-time student.

- **Part-Time Students**

Undergraduate students taking less than 12 units per semester and graduate students taking less than 9 units per semester are considered part-time students.

A part-time graduate student is encouraged to take at least two courses per semester in order to complete his/her study within two years.

- **Non-degree Students**

A person may wish to take courses at NPU as a non-degree student. However, they must meet the prerequisite requirements of each intended course. Therefore, a non-degree student must also submit his/her previous academic records, official or unofficial, to the Admissions Office for an unofficial evaluation before being allowed to enroll in courses at NPU.

**Change study plan:** In the event that the student later decides to apply for a degree study at NPU, he/she must go through the regular degree program application procedures. No more than **12 units** earned in non-degree status at NPU may be applied to the degree requirements.

To ensure the quality and continuity of NPU's programs, degree students will not be permitted to take courses at other institutions or to change to non-degree status.

- **Adding and Dropping Courses**

After registering for a semester, a student may add/drop courses by the add/drop deadline - one week after the semester starts - and add courses only on a space available basis. **Only one request of Add/Drop (for one or multiple courses) is allowed by the add/drop deadline after each registration** except for courses affected by cancellations made by the administration. A student may drop courses without records effect if it is made before the deadline.

From the second through the fourteenth week of the semester, a student may drop courses for serious and compelling reasons after discussing with an academic counselor. The student will be issued a grade of “W”. Classes may not be dropped during the fifteenth (last) week.
To add/drop courses, a student must:

1. Meet with a staff advisor to add/drop courses online. The Records Officers will review the add/drop request and approve/deny the request. International students must observe “full-time” requirement.
2. Pay applicable fees (including $10 Add/Drop fee except for courses affected by cancellations made by the administration).

The late registration fee is not assessed for courses added under this policy. Any refund for dropped courses will be calculated according to the Refund Policy.

No official withdrawal: Students who leave a course without official withdrawal (drop) are subject to a failing grade in the course.

Grading Policy and Academic Standards

Grades

The instructors are requested to submit their semester grades for their classes within one week after the last day of the semester. An online grade entry system is used by the instructors to enter grades. Each student may check his/her own academic records online. Grades are not given out over the telephone. The following symbols shall be used in evaluating student performance. The symbols reflect the quality of the student’s accomplishments relative to standards set for each course.

A = Highest level, showing excellence.
B = Performance is good, but not the highest level.
C = Performance is adequate in an undergraduate course, below average in a graduate course.
D = Performance is less than adequate in an undergraduate course and failing in a graduate course.
F = (Fail) Course requirements have not been met. Credits are not earned by the student.
I = Incomplete grade is issued with approval by the faculty and the Records Office. Coursework was passing at the time. Completion of coursework and grade conversion must follow the academic policy in effect.

CR = Credit by passing challenge examination. Grade equals to C or better.
TR = Transfer credit.
S = Satisfactory performance (for project/thesis courses only). Credits are earned by the student.
P = Pass without credit. Student passed the course which was offered on pass/no-pass basis.
NP = (Not pass) Student did not pass the course which was offered on pass/no-pass basis. In the case of a project/thesis course, the student made unsatisfactory performance and no credit was earned.
IP = (In progress) performance is satisfactory, but a final grade is not yet assigned.
AU = (Audit) Student was enrolled on a non-credit basis.
RD = (Grade report delayed) Grade was not available at regular grade reporting time.
W = (Withdrawal) Student was permitted to drop a course after the add/drop deadline.
NC = (No credit) The student did not pass a challenge examination. Prior to May 1998 the grade NC might also be issued to a student taking an ESL course.
U = (Unauthorized withdraw) The student did not withdraw from the course but failed to meet attendance and course requirements. “U” grade equals “F” grade.
* = Course has been repeated.
RE = Course is currently being repeated.

Grades assigned by each course instructor conform to individual policies as stated in the published course syllabus. A grade submitted by an instructor is considered final and may be changed only for one of the following reasons:

1) Error in recording a score for a student product (test, quiz, paper, etc.)
2) Miscalculation of a score, including the cumulative score for a semester.
3) Omission from consideration of valid student products that were submitted in time.

No other reason constitutes a basis for a request for grade change. All requests for grade changes must be submitted to the Records Office within two weeks following the date of issuance of the grade in question. Under no condition will a grade change be
permitted after a degree has been awarded. A grade will not be changed after one semester from the date of its issuance unless it has been repeated.

• Grade Point Average

The grade point average (G.P.A.) is based on courses in which letter grades are earned. Instructors may add plus (+) or minus (-) options to letter grades in order to refine evaluation procedures. To compute the G.P.A., divide the total number of grade points by the total number of units attempted in courses receiving letter grades. Use the table for grade point assignments.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Points Per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>4.0</td>
</tr>
<tr>
<td>A</td>
<td>4.0</td>
</tr>
<tr>
<td>A-</td>
<td>3.7</td>
</tr>
<tr>
<td>B+</td>
<td>3.3</td>
</tr>
<tr>
<td>B</td>
<td>3.0</td>
</tr>
<tr>
<td>B-</td>
<td>2.7</td>
</tr>
<tr>
<td>C+</td>
<td>2.3</td>
</tr>
<tr>
<td>C</td>
<td>2.0</td>
</tr>
<tr>
<td>C-</td>
<td>1.7</td>
</tr>
<tr>
<td>D+</td>
<td>1.3</td>
</tr>
<tr>
<td>D</td>
<td>1.0</td>
</tr>
<tr>
<td>D-</td>
<td>0.7</td>
</tr>
<tr>
<td>F</td>
<td>0.0</td>
</tr>
<tr>
<td>U</td>
<td>0.0</td>
</tr>
<tr>
<td>NP</td>
<td>0.0</td>
</tr>
</tbody>
</table>

All other grading symbols receive no grade points, and units for those courses are excluded from G.P.A. computation.

• Incomplete

In order to receive a grade of “I”, a student must have completed all homework and test/quizzes to date, passed the mid-term exam, and have serious and compelling circumstances beyond the student’s control that occur within the last two weeks of the semester preventing the student from taking the final exam or submitting the final project. Issuance of an “I” grade requires approvals from both the course instructor and the responsible Records officer.

The student is required to submit the “Request for Incomplete Grade” form to the Records Office before the final exam starts. The student will be notified of the review result. If approvals are granted by both the instructor and the Records officer, an “I” grade will be issued to the student. The “incomplete” work must be made up and a final grade issued by the instructor by the end of the 4th week of the following semester. An “F” grade will be issued to the student if an “I” grade is not cleared within the 4-week deadline.

• Auditing Courses

Any student may audit a course instead of enrolling for credit. No credit is earned by the student and the grade symbol of “AU” is received by the student for auditing a course. NPU views auditing classes as an opportunity for students and alumni to review courses previously taken, or to become informed about current information on a subject.

Priority will be given to students enrolled in the class for credit toward graduation. When enrollments in a class exceed the class limit, the university reserves the right to remove auditors from the registration list and refund tuition paid for the class.

A student may change his/her status from audit to credit or from credit to audit by the add/drop deadline by conducting a regular ADD/DROP process.

Attendance: A student enrolled in a class on audit status must observe the NPU attendance policy and rules set by the instructor although the student is not required to do homework nor take exams given to the class. An “F” grade will be given if the student does not observe these requirements.

• Repetition of Courses

1. Undergraduates

Students may repeat any course in order to gain a better understanding of the subject. For purposes of academic renewal, however, any required general education, foundation, or core course in which a grade of D+, D, D-, F, U, or NP was earned must be repeated. Only the highest grade earned is used in the G.P.A. computation. Students who repeat a course are charged half the unit tuition, except for Internship and ESL
NPU’s Online courses are similar to residential courses with regard to learning objectives, credits earned, and course duration; however, they are different with regard to the type of activities and interaction required of the student.

Writing ability: Students taking online courses are required to have completed a college level writing course.

To start: NPU students wishing to enroll in an NPU Online course will be required to (1) complete a Self-Assessment survey, (2) read the NPU Online Student Orientation Handbook, (3) be Interviewed by an administrative counselor, and (4) have acquired English writing ability. The Self-Assessment survey is an online questionnaire, which will help assess whether an NPU Online course is the right choice for the student. The Interview is a face-to-face or telephone interview between a student interested in enrolling in an NPU Online course and an administrative counselor. The interview will take approximately 15 minutes and will help determine whether an NPU Online course is the right choice for the student.

Weekly activities: The NPU Online courses are designed for the students to learn and proceed on a weekly basis; all assignments and learning materials are laid out on a weekly schedule and the students must complete the weekly work on time in order to proceed successfully. To succeed, the individual must participate in all activities required for the online course.

Class participation: Online class participation activities of each student enrolled are recorded electronically by the online program and by the instructors. In addition to weekly reading and homework assignments, other activities include discussion board, chat room, e-mail, Q&A, group study, and webcasting (interactive audio/video communication for the instructor and all students in the class). Among these activities, webcasting requires a real-time participation of all parties.

Take exams: The instructor of an online course determines how to conduct the exams for the course.

Taking online courses: Students taking online courses must follow the course requirements to participate in weekly activities to communicate with the instructor and classmates in addition to doing reading and homework assignments. All online activities are recorded for evaluation purpose.

In case of emergency or illness, the student must notify the instructor or the Administration Office via either email, online request (the NPU Online Service Center), or phone call as soon as possible.

Taking Online Courses

The University offers a number of courses in an online delivery mode as well as in-class mode. These courses are open only to regularly admitted NPU students. There are no additional fees for NPU students for enrollment in an NPU Online course. Online learning normally requires a great deal of self-discipline.
Students enrolling in an NPU Online course will not be allowed to transfer or “migrate” to the equivalent residential course once the semester has begun (students may add and drop to make the switch by the add/drop deadline only).

* Standards of Satisfactory Progress (SSP) *

All students must maintain satisfactory progress at NPU. According to the academic standards at NPU, an undergraduate student remains in good standing if the student's cumulative G.P.A. is 2.0 or above; a graduate student remains in good standing if he/she earns a cumulative G.P.A. of 3.0 or above. The minimum standards are set forth below.

► Maximum Program Length (MPL): In order to calculate the student's progress, NPU determines a maximum program length for each student at the time of admission. The maximum program length is equal to the number of units required for the student to complete the program times 1.5.

► Earning Degree/Credential: A student is required to successfully complete his/her degree program within the maximum program length (MPL) in order to receive the academic credential/degree.

► Evaluation Points in the Academic Program: A student is evaluated at the end of every semester based on NPU’s academic standards. In addition, evaluations on minimum course completion % - percentage of successful course completion versus courses attempted - are also made at the following points: (1) at 25% of the maximum program length (MPL), (2) at 50% of the MPL, (3) at the end of each academic year, (4) at the end of the second academic year, if applicable, (5) at the end of each subsequent year, if applicable, and (6) at 100% of the MPL.

► Meeting Standards of Satisfactory Progress (SSP): A student is considered meeting the standards of satisfactory progress if meeting the following requirements:

### SSP Chart - Undergraduate Students

<table>
<thead>
<tr>
<th>Status</th>
<th>Evaluation Point</th>
<th>Min. GPA</th>
<th>Min. Successful Course Completion % of Course Attempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25% of MPL</td>
<td>2.0</td>
<td>55%</td>
</tr>
<tr>
<td>2</td>
<td>50% of MPL</td>
<td>2.0</td>
<td>60%</td>
</tr>
<tr>
<td>3</td>
<td>1st academic yr</td>
<td>2.0</td>
<td>75%</td>
</tr>
<tr>
<td>4</td>
<td>2nd academic yr</td>
<td>2.0</td>
<td>100%</td>
</tr>
<tr>
<td>5</td>
<td>Subsequent yr</td>
<td>2.0</td>
<td>100%</td>
</tr>
<tr>
<td>6</td>
<td>100% of MPL</td>
<td>2.0</td>
<td>100%</td>
</tr>
</tbody>
</table>

### SSP Chart - Graduate Students

<table>
<thead>
<tr>
<th>Status</th>
<th>Evaluation Point</th>
<th>Min. GPA</th>
<th>Min. Successful Course Completion % of Course Attempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25% of MPL</td>
<td>3.0</td>
<td>55%</td>
</tr>
<tr>
<td>2</td>
<td>50% of MPL</td>
<td>3.0</td>
<td>60%</td>
</tr>
<tr>
<td>3</td>
<td>1st academic yr</td>
<td>3.0</td>
<td>75%</td>
</tr>
<tr>
<td>4</td>
<td>2nd academic yr</td>
<td>3.0</td>
<td>100%</td>
</tr>
<tr>
<td>5</td>
<td>Subsequent yr</td>
<td>3.0</td>
<td>100%</td>
</tr>
<tr>
<td>6</td>
<td>100% of MPL</td>
<td>3.0</td>
<td>100%</td>
</tr>
</tbody>
</table>

► Academic Probation: The following students are placed on academic probation: (1) those who fail to meet the requirements in the rows marked as “status 1” in the above SSP charts, and in addition, in any semester, (2) an undergraduate student’s cumulative G.P.A. is below 2.0, or (3) a graduate student’s cumulative G.P.A. is below 3.0.

► Maximum Terms of Academic Probation: A student placed on academic probation the first time or in a semester following a successful semester must remedy the condition within two semesters. Otherwise, the student is dismissed from the study program. A student placed on academic probation for two consecutive terms must remedy the condition in the following semester. Otherwise, the student is dismissed from the study program. A student who receives VA education benefits and does not clear the probationary status within two semesters will be disqualified for VA education benefits and dismissed from the study program. In such event both the authorizing VA office and the student will be notified.

► Removing Academic Probation Status: A student who is able to remedy the condition and reestablish satisfactory progress within the terms specified in the
above section of Maximum Terms of Academic Probation will be removed from academic probation. Observations will be made on the student every semester thereafter.

► Dismissal: A student will be dismissed from his/her program of study if meeting either of the following conditions: (1) failing to meet the requirements in the rows marked as “status 2” in the above SSP charts, or (2) failing to correct his/her academic probation status specified in the Maximum Terms of Academic Probation section. These students are not eligible for financial aid.

► Academic Evaluation of Students Placed on Academic Probation or Dismissal: An academic evaluation of the student placed on academic probation or dismissal will be conducted by an academic counselor or a counseling committee formed by more than one academic counselor. The purpose is to determine that the student has the desire and the academic ability to progress satisfactorily in the program. If the academic counselor or the counseling committee finds that the student lacks the desire or ability to progress satisfactorily, the student will be referred to another institution with a learning environment more suitable for the student.

► Extended Enrollment Status: A student dismissed due to conditions specified in the section of “Dismissal” is allowed to enroll for an extended period of one semester, provided the student’s evaluating counselor/committee has determined that the student has the desire and ability to progress satisfactorily, and the student agrees in writing to the following: (1) The student is not eligible for additional student aid at NPU while in an extended enrollment status and is responsible for all financial arrangements with NPU, (2) the student is not enrolled in an eligible program for the purpose of student aid eligibility, (3) the student must seek to correct academic deficiencies by retaking and successfully completing previously failed course(s) in this extended enrollment period, and (4) under no circumstances will a student be granted a degree if his/her study in the program exceeds the maximum program length (MPL).

► Effect of Grades on Satisfactory Academic Progress:
1. Units attempted but not completed include the following grades: D for a required course for undergraduates, C and D for a required course for graduate students, F (fail), U (unauthorized incomplete), W (withdraw), NP (no-pass), NC (not passing a challenge exam), and I (incomplete).

2. The grade CR (credit through challenge exam by undergraduates) counts as units attempted and completed. The grades A, B, and S count as units attempted and completed for both undergraduates and graduate students. The grade C counts as units attempted and completed for all courses for undergraduates. The grade C counts as units attempted and completed only for elective courses for graduate students.

3. For repeated courses, only the higher grade counts toward the G.P.A. The lower grade is replaced by “*” after the higher grade is earned. The repeated course counts only once for units completed but will count twice for units attempted.

4. The grades of P (pass without credit) and AU (audit) do not count for credit attempted nor completed; they have no effect on the calculations of G.P.A. and percentage of successful course completion.

5. Credits transferred (TR) after initial program admission evaluation is made will reduce the maximum program length by the number of units transferred. This process requires approval from the Academic Review Committee. TR has no effect on the calculation of the student’s G.P.A.

► Filing Complaint of Academic Probation Status or Dismissal: A student who has been placed on probation or dismissal and disagrees with the finding may appeal according to the grievance procedures set forth in this catalog and in the NPU Student Handbook. The Administration Office will hold a hearing and make a decision on the probation/dismissal. This procedure also applies for students who wish to appeal because of special or mitigating circumstances.
Examinations

NPU has five different kinds of examinations:

• **Course Examinations:** Most courses at the university have at least two examinations a semester: a midterm and a final. These examinations may be comprehensive or partially comprehensive, so students need to ascertain from their instructors the precise scope of the examinations. Course examinations can consist of information found in the textbook, in outside reading, and in the lectures; thus, students should review and synthesize all of the course material. Further, the structure of course examinations can be a combination of essay, multiple-choice answers, and short answers. At the end of each semester the students are required to take final examinations.

• **Examination for Challenging a Course:** NPU recognizes that exceptional undergraduate students, by reason of independent studies, overlapping course work, or work experience, may have achieved the learning objectives of a course. Therefore, undergraduate students with the course background may petition to receive credit for the course by completing a “Challenge Examination”.

Students wishing to challenge a course by examination must enroll for the course and pay tuition fees in the same manner as courses to be completed by regular class attendance. The course to be challenged must be listed on the schedule of classes for the semester. A formal petition for challenge must be submitted to the Records Office at the time of registration, which must be before the beginning of the semester. Petition forms are available at the Information Office. Permissions from both the instructor and the Records Office are required.

The student must complete the examination before the end of the first week of the semester. Passing grades for challenge examinations are C- or better. A grade of credit “CR” is assigned for passing the test; otherwise the grade is no credit “NC”. The student may choose to stay in the class and complete the course work for a letter grade at the end of the term. Students who fail the challenge examination must attend the class.

PLEASE NOTE: ONLY CHALLENGES TO CURRICULUM-REQUIRED COURSES ARE PERMITTED.

How many can you take? The maximum number of courses that may be challenged is three.

A fee per examination for the challenged course is charged to the student in addition to the course tuition.

• **Proficiency Examinations:**

Graduate students who have knowledge and experience of a background (undergraduate) subject but have not taken a course in the subject may clear the background requirement by taking a proficiency examination. The proficiency exam should be taken early enough to satisfy the “prerequisite” requirement for higher-level courses.

An undergraduate student maybe required to take a proficiency examination on a major subject if the subject was taken more than ten years ago and the student has not had relevant experience in the subject for ten years.

New business graduate students who took the following courses in foreign countries may be required to take proficiency examinations on these subjects: accounting, finance, economics, marketing, and business law.

Passing grades for proficiency examinations are C- or better. A non-refundable fee is charged to the student for taking a proficiency examination. The student is allowed to apply for taking a proficiency examination on a subject only once. If the student misses a pre-scheduled proficiency examination, the exam fee is non-refundable and the student loses his/her chance of taking the examination on the subject.

• **Entrance Assessment Examinations:**

See page 4 for entrance placement examinations on English skills, SAT-I for freshmen, GMAT for applicants pursuing the MBA and DBA degrees, and GRE for those pursuing the DCE degree.
Graduation

• Bulletin Requirements

The NPU catalog serves as the school’s contract with the students. Therefore, students fall under the graduation requirements written in the catalog used at the time of student’s entering the program as a degree-seeking student. The section on “Study Plan” in “Academic Information” describes the rules for the student to follow the graduation requirements.

• Petition to Graduate

As a student approaches the end of his/her undergraduate/graduate study, he/she must initiate a review process for the Records officers to verify the student’s eligibility for graduation. The student must file a petition with the Records Office one semester in advance - prior to his/her last registration – by using the NPU Online Service Center to make this request. The records staff will then make a graduation evaluation in time for the petitioner to register for the last semester before graduation. The student will receive a copy of the evaluation report to confirm the courses left for him/her to complete the graduation requirements. The University graduation fee is charged to each graduation petition.

Re-petition to graduate: A student is required to resubmit the request and pay a re-petition fee after filing the original graduation request if any of the following occurs:

1. If the petition for graduation is denied.
2. If the student is unable to complete the rest of his/her course work by the approved graduation date.
3. If the student decides to make a change to his/her graduation requirements by adopting the requirements specified in the current catalog (a new admission evaluation and study plan will be made for the student).
4. If an international student wishes to enrich his/her knowledge and skills by taking courses in addition to the minimum graduation requirements beyond the approved graduation date, the student is required to enroll as a full-time student until final graduation.

A re-evaluation of the student’s graduation requirements will be made and a new checklist will be provided to the student.

Students are responsible for compliance with the announcements and regulations specified in the catalog and with all policies, rules and regulations of the University. Upon completion of their study programs and fulfilling their financial obligations to the University, students are granted degrees and receive diplomas.

• Completion of a Program

The semester in which a student fulfills the graduation requirements, including course requirements, project completion (if applicable), and any financial obligations, is the semester the student graduates and is the date that is shown on the diploma.

The student will not have his/her degree awarded or diploma or transcript released until all University fees have been paid and library records cleared.

Enrolled in the last semester: A student must be enrolled with NPU in the semester he/she graduates.

Students may pick up their diplomas 60 days after graduation and after they have cleared their accounts.

Withdrawal from the University

As in withdrawal from a course, formal withdrawal from the University must be received in writing by the Records Office. The student may use the facility in the NPU Online Service Center to inform the school of the withdrawal.

Withdrawal during the first week of a semester will not be recorded on the permanent transcript. For withdrawal after the first week, a “W” grade for each enrolled course is posted on the permanent transcript.

A student withdrawing from the University without formal notification to the Records Office
is subject to a “U” grade which is posted on the permanent transcript.

Refer to the “Refund Policy” section for the policy on refunds for students withdrawing from NPU. Students who withdraw from NPU without clearing their financial balances will not be issued their official transcripts.

- **Re-entry to NPU:** Any student who withdraws from NPU and is absent for more than one semester before resuming studies at a later date must submit a new Application for Admissions form (online, and falls under the admissions and graduation requirements in effect at the time of reentrance.

- **International students** who plan to transfer to another institution must complete a “Transfer Out Record” form (online) and submit it to the Records Office in order for the designated school officials (international student advisors) to properly report the students’ status in the online data management program as required by the U.S. Citizenship and Immigration Services.

## Educational Records

Education records are all files, records, or documents maintained by the school, which contain information directly related to the students. Examples of education records are the student education files, placement files, and financial aid files. It is the policy of the school to monitor educational records to ensure that they do not contain information that is inaccurate, misleading, or otherwise inappropriate. The school may destroy records that are no longer useful or pertinent to the students’ circumstances.

### Student Privacy

The only persons allowed access to such records are those who have a legitimate administrative or educational interest. Under the authority of the Family Educational Rights and Privacy Act of 1974, as amended, students have the right to examine certain files, records or documents maintained by the school which pertain to them. The school must permit students to examine such records within forty-five days after submission of a written request, and to obtain copies of such records upon payment of a reproduction fee.

Students may request that the school amend their education records on the grounds that they are inaccurate, misleading, or in violation of their right of privacy. In the event that the school refuses to so amend the records, students may, after complying with the Filing a Grievance procedure, request a hearing. If the outcome of the hearing is unsatisfactory, the student may submit an explanatory statement for inclusion in the education record.

Students have the right to file complaints with the U.S. Department of Education concerning the school’s alleged failure to comply with the Act.

### Access by Officials

The school may release student information without written consent of the students to:

(a) Other schools and NPU officials who have legitimate educational interests.
(b) Other schools where students have applied for admission.
(c) Authorized representatives of the Department of Education or the Comptroller General of the United States.
(d) Veterans Administration.
(e) State and local authorities where required.
(f) Accrediting agencies.
(g) Parents of students who are their dependents for purposes of the Internal Revenue Code. However, the school is not required to release such records.
(h) Appropriate persons or agencies in connection with student applications for or receipt of financial aid.
(i) Courts in compliance with a court order or subpoena, provided that a reasonable attempt is made to notify the student prior to compliance.
(j) Appropriate persons or agencies in the event of a health or safety emergency, where such release without consent is necessary under the circumstances.
(k) Organizations conducting studies to develop, validate, and administer predictive tests, to administer student aid programs, or to improve instruction.

In all other cases, the school shall obtain the written consent of the students prior to releasing such information to any person or organization.
Exemptions

The following items are exempt from the Family Educational Rights and Privacy Act of 1974:

(a) Parent’s confidential statement, financial need analysis report, and the Pell Grant A.D. report.

(b) Confidential letters of recommendation received by the school prior to January 1, 1975. As to such letters received after 1974, the Act permits students to waive their right of access if the letters are related to admissions, employment, or honors.

(c) Records about students made by teachers or administrators that are maintained by and accessible only to the teachers or administrators.

(d) School security records.

(e) Employment records for school employees who are also current or former students.

(f) Records compiled or maintained by physicians, psychiatrists, psychologists, or other recognized professionals or paraprofessionals acting or assisting in such capacities, for treatment purposes, and which are available only to persons providing the treatment.

Student Discipline

Inappropriate Conduct

The University subscribes to relevant portions of the California Administrative Code as it applies to the California State University System. Inappropriate conduct by students or by applicants for admission is subject to discipline as provided in portions of Sections 41301 and 41303. The applicable parts of these sections are as follows:

41301. Expulsion, Suspension, and Probation of Students

(a) Cheating or plagiarism in connection with an academic program.

(b) Forgery, alteration, or misuse of campus documents, records, or identification, or knowingly furnishing false information to the University.

(c) Misrepresentation of oneself or of an organization to be an agent of another school.

(d) Obstruction or disruption of the campus educational process, administrative process, or other campus function, whether on or off campus.

(e) Physical abuse on or off campus of the person or property of any member of the campus community or of members of his or her family or the threat of such physical abuse.

(f) Theft of, or non-accidental damage to campus property, or property in the possession of, or owned by, a member of the campus community.

(g) Unauthorized entry into, unauthorized use of, or misuse of campus property; unauthorized entry into classes.

(h) On campus property, the sale or knowing possession of dangerous drugs, restricted dangerous drugs, or narcotics as those terms are used in California statutes, except when lawfully prescribed pursuant to medical or dental care, or when lawfully permitted for the purpose of research, instruction, or analysis.

(i) Knowing possession or use of explosives, dangerous chemicals, or deadly weapons on campus property or at a campus function without prior authorization of the President.

(j) Engaging in lewd, indecent, or obscene behavior on campus property or at a campus function, either in person or by correspondence.

(k) Abusive behavior directed toward, or hazing of, a member of the campus community.

(l) Violation of any order of the President of the University, notice of which has been given prior to such violation and during the academic term in which the violation occurs, either by publication, or by posting on an official bulletin board designated for this purpose, and which order is not inconsistent with any of the other provisions of this section.

41303. Conduct by Applicants for Admission

Not withstanding any provision in this chapter to the contrary, admission or readmission may be denied to any person who, while not enrolled as a student, commits acts which, were he or she enrolled as a student, would be the basis for disciplinary proceedings pursuant to Section 41301. Admission or readmission may be denied to any person who, while a
student, commits acts that are subject to disciplinary action pursuant to Section 41301.

 Appeal of Dismissal

A student has one week from the time of notification of dismissal to file an appeal. He/she may request an appeal of dismissal by writing a letter of response to the dismissal charges and requesting an appeals hearing. If the hearing is granted, based on the student’s reply letter, the individuals involved in the process will convene to hear the appeal. If an appeal is granted, the student may resume course work at NPU. The following process must be followed to appeal disciplinary action/probation served to a student:

1) The appeal is made in writing to NPU’s President for presentation of any extenuating circumstances or evidence the student believes applicable.

2) The President then sets up a hearing with an administrative appeals committee to review the appeal. The committee will be comprised of a minimum of two administrators and one student member. Copies of the appeal shall be distributed to each member of the committee prior to the hearing.

3) The student will meet with the committee to explain the appeal.

4) The committee will make its decision based upon the evidence presented and the interview with the student making the appeal.

5) The decision of the committee will be communicated to the student making the appeal within 48 hours of the final decision.

 Student Grievance Procedures

Every student has access to a formal grievance process if so needed. If a student has a problem or concern of any nature regarding any aspect of NPU whether it is with personnel, course of study, or general university policies, s/he has the right to file a grievance. S/he is encouraged to communicate the concern in writing to the Office of Student Affairs. The Office of Student Affairs will act to bring a final resolution to the stated grievance. The following procedure should be observed:

Anyone with a grievance or complaint may request an individual conference with the appropriate instructor or staff member to discuss the problem. If a satisfactory resolution is not reached during step one, the aggrieved party should seek guidance from the Office of Student Affairs.

If step two does not resolve the grievance, the aggrieved party should seek guidance from the Office of Academic Affairs. If this is not an academic issue, proceed to step four.

If the previous steps have not solved the grievance within 48 hours of the incident, the aggrieved party must present to the President, in writing, all facts of the grievance.

Within 24 hours, upon receipt of the written information, the President (or his designee) will schedule a Grievance Committee hearing. The time of the meeting will be communicated, in writing, to all concerned parties. All persons involved with the incident must be present at the time of the hearing. All parties involved will be given an opportunity to discuss the grievance. The discussion of the Committee will be communicated to those involved within 48 hours of the hearing. The Committee decision will be final.

The Accreditation Council for Independent Colleges and Schools (ACICS) provides procedures for filing of complaints against accredited institutions. ACICS requires that the complainant has exhausted all complaint and grievance procedures provided under NPU’s policies. Should such a complaint be filed, ACICS will review the matter to determine whether there may have been a violation of its criteria and standards and can take action only if it determines there to have been such a violation. ACICS can be contacted at:

750 First Street, NE, Suite 980
Washington, DC 20002
(202) 336-6780
POLICIES AND STATEMENTS
ADDRESSING THE INVESTIGATION AND TREATMENT OF STUDENTS, STAFF, AND FACULTY REGARDING SEXUAL HARASSMENT AND ASSAULT

It is the policy of the University to provide a work and study environment free of sexual harassment. All students and employees should be aware that the University strongly disapproves of any conduct that constitutes sexual harassment and takes disciplinary measures to ensure compliance. All complaints are investigated and appropriate action taken. Deans, chairs and supervisors have an obligation to maintain a positive and productive work environment for faculty, staff, and students. They are expected to halt any harassment by calling attention to this policy or, if necessary, by taking more direct disciplinary action. When a situation involving sexual harassment is discovered, corrective action must be taken immediately. Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute sexual harassment when (1) submission to such conduct is made either explicitly or implicitly a term or condition of an individual’s continuation at NPU or a grade in a class or other activity, (2) submission to or rejection of such conduct by an individual is used as the basis for a decision affecting such an individual, or (3) such conduct has the purpose or effect of unreasonably interfering with an individual’s performance or creating an intimidating, hostile or offensive work environment.

It should be noted that sexually harassing behavior is not limited to overt physical aggression towards strangers. It can occur among acquaintances, friends, even lovers. In some cases it may not be maliciously intended; it may not even be conscious on the part of its perpetrator. Its undesirable consequences include mental and emotional stress or discomfort as well as occasional bodily harm. It is usually felt by its victims to be demeaning, or coercive, or punitive. As the National Advisory Council on Women’s Educational programs reported to the federal government in 1980, the sexual harassment of postsecondary students is an increasingly visible problem of great dimensions, which is correctly viewed as a form of illegal sex-based discrimination.

In addition to its possible legal consequences and to the more direct form of mental, emotional, or physical anguish caused to its victims, in a community like ours sexual harassment can seriously interfere with freedom of educational or social opportunity. After an experience of sexual harassment by a faculty member, administrator, or fellow student, for example, or even after hearing of another’s experience, a student may be inhibited from electing a particular course, or from seeking a staff member’s assistance, or from attending a social function conducted by the school or the student organization. Thus not only the student who is victimized, but also the whole social and educational community is harmed by incidents of sexual harassment.

Though sexual harassment in any situation is reprehensible, it must be a matter of particularly deep concern to an academic community in which students and faculty are related by strong bonds of intellectual dependence and trust. Further, the vulnerability of undergraduates to such harassment is particularly great, and the potential impact on them is particularly severe. Not only does sexual harassment betray the special bond between teacher and student, it also exploits unfairly the power inherent in an instructor’s relationship to a student.

We believe that reaffirmation of a firm stand against sexual harassment and the establishment of procedures specifically designed to resolve complaints of sexual harassment are extremely important for the University.

Treatment of Complaints

The Administrative Office will call for a special committee to handle harassment complaints. The committee’s treatment of complaints will be guided by the following principles, which are intended to protect the legitimate interest of all persons.

Next, committee members will decide if there is any conflict of interest that requires any of them to withdraw from consideration of the complaint. The committee will then decide on a course of action. Should the committee decide to take no action, the committee will inform the student and explain what, if any, other course of action the student might take.
Should the committee decide that the complaint requires formal institutional action (i.e., notification of the police) the committee will transmit the complaint directly to the President.

If a less serious complaint is judged to fall under the committee’s mandate, then one or more members of the committee, one of whom is a member of the faculty or the administration, will speak with the person(s) involved in order to obtain further information and report the results to the committee.

The committee will limit its informal investigation to what it deems necessary to resolve the complaint or to make a recommendation to the President. Should it appear necessary for the committee to address any persons other than the parties involved in the complaint, the committee will do so only after informing the involved parties.

After review, the committee may decide (1) that there is no basis on which to pursue the complaint, or (2) that the complaint has been resolved, or (3) that the complaint is to be forwarded with recommendations to the President. The President will inform the committee of the final disposition of complaints forwarded.

One responsible member of the committee will be in communication with the student making the complaint until the complaint is resolved. The student will be informed of general actions taken, although not of specific conversations held with the person named in the complaint.

If either the person making the complaint or the person named in the complaint is not satisfied with the recommendations of the committee, she or he may discuss the matter with the President.

**Sexual Assault**

An allegation of sexual assault must promptly be reported to the Director of Student Services who will, in turn, report the allegation to the Police Department. The University will not attempt to adjudicate allegations of felonious acts.

**Compliance with the Reform Act of 1989**

The University intends to comply with the Educational Reform Act of 1989. To this end it will publish the relevant specifications of the act in its student, staff and faculty handbooks and will urge its personnel to become familiar with such provisions of the Act as may apply to them or their duties and responsibilities. Personnel found in willful violation of the Act will face disciplinary action and may, in extreme cases, be permanently separated from the University.

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**Student Life**

Our mission at Northwestern Polytechnic University is to provide a welcoming and supportive environment for students, while maximizing their opportunities for career growth and personal development. We believe that student life is not only an integral part of the campus community, but also a fundamental part of the educational process. Student services at the University are designed to meet the needs of our student body. These include both academic and non-academic issues and activities. Many of our students work part- or full-time in local industries and come from a variety of social and ethnic backgrounds. As such, our services are tailored to meeting the needs and concerns of a mature and multicultural student body.

**University Orientation**

All new students are required to attend the new student orientation workshop offered before the beginning of each semester. On the Orientation Day, orientation packages are distributed to the new students; all administrative staff members and representatives from the faculty and the student body welcome the new students; both presentations and hands-on workshops are conducted to inform and to connect. The new
students are informed of the staff’s duties in order to receive proper administrative services, the facility and learning resources information to prepare them for classes, and important policies to stay focused on their academic objectives. Hands-on workshops are also conducted to teach the new students how to use the university computer networks system, how to properly set up their accounts for printing services, how to access the NPU Online Service Center to obtain online learning resources as well as make online requests for services, and how to access the university library online system to find library collection information. New students who have not registered in classes also receive academic advising and register for classes on the same day. International students are also provided a health insurance plan and information on particular regulations they must observe in compliance with the Federal regulations for international students. Those required to take an English placement test but could not take it on an earlier scheduled dates may take it on the orientation day before they can register in classes.

All NPU students are welcome to attend the orientation to welcome new students and receive current university information.

Housing Assistance

The university provides several types of housing units for the students to choose from. Guaranteed housing is provided to all new students. However, certain housing units are assigned on a first-come-first-served basis. Students reside in the dormitories with a full-semester commitment. Residents of student housing must be regularly enrolled, full-time NPU students. The NPU Housing Services also provides information on a variety of well-maintained off-campus living options. The NPU website provides the housing service information and the housing application form.

New applicants to NPU who require housing assistance should indicate it on the Application for Admission form. Current students are also eligible to receive housing services by contacting the staff in charge.

Although applicants are given the opportunity to express preferences and housing officers will make an effort to meet the applicants’ needs, no guarantee can be given that specific house, room, or roommate preferences can be met. It is recommended that students interested in dormitory living apply as early as possible to increase their chances of selection.

Transportation Service

Public and personal transportation service information is posted on the NPU website in the Student Services section under Housing and Transportation Directory.

Nonacademic Counseling

The Student Services Office offers assistance with personal and interpersonal issues such as relationships, cultural differences, assertiveness and self-esteem. If a student needs a professional counselor, the Student Services Office will help the student find a suitable counselor. Additionally, the Student Services Office helps students with educational/vocational concerns such as coping with university life, academic performance, test anxiety, reentry adjustment and determining life goals. Students are encouraged to seek assistance from a counselor in dealing with any problems that might affect their success at NPU.

Culture Immersion Workshops

The NPU student body reflects the international flavor of Silicon Valley. It includes both local and international students from more than twenty countries. To help international students adjust to the new environment, culture immersion workshops are conducted every semester, free of charge, and open to all interested students.

Professional Development Seminars

Offering professional development seminars is an integral part of the Student Services. The seminars are intended to enhance the students’ abilities in their professional lives – in both cultural, communicative, and technical aspects. The seminar information is posted on the NPU website every semester.

Intercollegiate Activities

To broaden students’ learning experiences and interactions with other institutions, there has been exchange student activities with Oulu
Polytech in Finland in the undergraduate business administration program and several colleges in Taiwan in both under- and graduate programs. The NPU table tennis team has also participated in regional intercollegiate table tennis tournaments and won championships in the past. The basketball team members have participated in Bay Area basketball tournaments sponsored by local organizations. Several other student clubs are also making contact with outside institutions and organizations for social activities.

- **Career Placement Services**

As a key component of Student Services, career placement services can help students (1) prepare resumes and sharpen interview skills, (2) identify their abilities and interests and how they relate to career choices, (3) gain access to practical experience that will increase their competitiveness in the job market, (4) find out how and where to look for the jobs they want, and (5) plan for their career development.

Career placement services include online service facility and access to current job information—local and nationwide, individual and group counseling, individualized resume writing assistance, on-campus interviews with industry representatives, visits to local companies for interviews, visits to job fairs, and internships. The service provides career planning and job search assistance prior to and after graduation.

The Career Center in the library provides the students with access to a collection of books, articles, magazines, brochures, and videotapes about employment opportunities. The students may also use the computer facility in the Career Center for job search.

Employment announcements can be found on the online job posting board through the eCareer Center in the NPU Online Service Center.

All students are encouraged to begin working with a Student Services counselor on their resumes and career development plans in the early stages of their academic study.

- **Student Handbook**

The NPU student handbook describes policies and regulations that affect the lives of students at NPU. It also outlines procedures through which students can communicate formally or informally with the University.

Each new student receives a copy of the Student Handbook at the orientation meeting. The Handbook complements the information contained in the University Catalog. All students are urged to read and refer to the most current editions of both the Student Handbook and the University Catalog. Both documents are available online.

- **The Student Association**

The Student Association is the voice of the student body at NPU, which enables students to maximize the social, vocational, and educational aspects of their learning experience. Students automatically become members of the Student Association when they register with NPU. All students are encouraged to support the association's activities.

The association is governed by officers elected from officially registered students on campus. Election is held each year in the fall semester. Officers elected include President, Vice President, Secretary, Treasurer, and two Directors. The officers represent the student body in communicating with the faculty and university administration. They ensure the students have a voice in the planning of extra-curricular activities. The association is responsible for expressing student opinions on issues relevant to the University and for working to improve the educational process and university environment. Student volunteers work with the elected officers to conduct extracurricular activities. A designated administrator serves as the advisor to the Student Association.

The Student Association, under the guidance of the advisor, plans various extracurricular activities such as field trips/tours, picnics, parties, sporting events, and intercollegiate activities.

- **Affiliation to Professional Societies**

To expand and enrich student life on campus, NPU students are actively involved in a variety of professional organizations. These
involvements also take the students a step closer to the professional world. Examples include activities sponsored by the NPU IEEE Student Branch, sponsoring and hosting major events conducted by professional organizations locally, and campus-wide participations in joining membership of professional organizations.

- **NPU Student Branch of IEEE**

The Institute of Electrical and Electronics Engineers, Inc. (IEEE) is the world’s largest technical professional society. A non-profit organization, IEEE promotes the development and application of electro-technology and allied sciences for the benefit of humanity, the advancement of the profession and the well being of its members. IEEE members participate in its activities in approximately 150 countries. The technical objectives of the IEEE focus on advancing the theory and practice of electrical, electronics and computer engineering and computer science.

NPU is proud to have a student branch of IEEE on campus and a group of students in the School of Engineering serves as the central committee to encourage participation of all students in IEEE activities. The participants are able to connect with the latest technical information, research, career opportunities, and a community of innovators who inspire the students to strive for succeed in their chosen profession. This connection enables the engineering students to have convenient access to valuable IEEE publications and participate in organized IEEE activities, particularly ones held in Silicon Valley. Several faculty members serve as senior advisors to enroll the students.

Students in the School of Business are encouraged to join at least one of the following professional organizations:

- Institute of Management Accountants
- American Institute of CPAs
- California Society of CPAs
- United States Association for Small Business and Entrepreneurship (USASBE)
- Project Management Institute
- Asian American Management Association (AAMA)

- **Other On-campus Clubs**

**Entrepreneurship Club**

NPU serves as the host site for the Entrepreneurship Club of Silicon Valley. This organization helps promote start-up businesses, offers training workshops for young professionals to develop start-up businesses, and provides networking opportunities in the Bay Area.

The following extracurricular organizations have been actively participated by their club members on regular basis. These intellectual, athletic, and culture-rich activities are the results of concerted efforts from three parties, namely the student body, faculty, and the administrative staff members.

- Tennis Club
- Table Tennis Club
- Basketball Club
- Golf Club
- Volleyball Club
- Baseball
- Bowling
- Badminton
- Hiking Club
- Tai Chi Club
- Dance Club
- Music Club
- Computer Games Club
- Chess Club

Refer to the NPU web site for information on the student club and special events information.

- **Alumni Association**

The Alumni Association is made up of all NPU graduates. Playing an important role in the life of the University, the Alumni Association helps to build lasting ties between NPU graduates and the University, as well as broadens communication and mutual support among current and former students, faculty, staff, and the community. Members of the Association provide timely and invaluable input and advice to the University on a variety of topics, including curriculum development, industry trends, student mentoring, and career development. As such, it serves as a crucial link between the academic community and the outside world.
Donations to the University

From time to time we receive calls from generous individuals, representing themselves or corporations, wishing to donate funds or items useful to the academic development of the University. We appreciate their consideration and altruistic action. Northwestern Polytechnic University enjoys tax-exempt status with the IRS; therefore, gifts of money and items of value are tax deductible. We encourage individuals to consult their personal or company tax advisors for details on how these gifts may benefit the giver as well as the University.

Facilities

Campus Description

In accord with the University's emphasis on technology and business, NPU's main campus is located in a high-technology R&D and business development area in southern Fremont, occupying three modern research and development building complexes.

The University is close to highways I-880 and I-680, conveniently accessible from the highways via Mission Boulevard and Warm Springs Boulevard. The fully landscaped and abundant parking areas provide convenient traffic flow and easy building access; the peaceful neighborhood provides an appropriate learning environment for the students. All buildings are also accessible to people using wheelchairs.

The facilities support academic teaching/learning and research and development activities, administrative functions, and students’ recreational activities. The buildings are equipped with central heating/air conditioning systems. They include classrooms, electronics and physics laboratories, computer labs, system administrator offices, several practicum labs, a language learning lab, an IT development office, faculty offices, teaching assistant offices and tutorial hall, administration offices, a library, conference rooms, several student lounges, lunchroom and recreation areas, a Student Association office, an assembly hall, and an indoor sports facility.

Each classroom has a temperature control unit; each room is equipped with an LCD projector connected to an instructor’s demo computer with access to the campus networks system and the Internet, an overhead projector, and a projection screen in addition to other standard classroom provisions. Mobile TV/VCR sets are also available to the instructors. Designated staff prepares the classrooms each day before the classes start.

- Health, Security, and Safety: The University strives to provide students with a secure and safe environment. Classrooms and laboratories comply with the requirements of the various government building codes, the Board of Health, and Fire Marshal regulations. Students are responsible for their own security and safety, and must be considerate of other school members’ security and safety. A security monitor system has been installed on campus to increase campus security.

Teaching and Research Facilities

NPU teaching, research, and laboratory facilities are equipped with state-of-the-art hardware and software tools. In keeping pace with the
advancement of information technology, NPU’s IT Department provides a modern digital campus environment to the faculty, students, and administrative staff.

Based on the hardware and software requirements for each course, the classroom is set up accordingly at the beginning of each semester. A group of classrooms are equipped with computer systems and Internet facility for the classes to use. Modern design, simulation, and testing tools are installed based on class requirements.

**Computer networks:** There are a variety of high-performance computers on campus to support teaching and learning, including high-capacity servers, advanced workstations, and modern PCs. All computers are connected together via a local area network (LAN). The campus network is connected to the Internet via a dedicated T-1 line. NPU has a node on the Internet, allowing faculty and students access to electronic mail, file transfer, and the World Wide Web. Each student and faculty member has an individual computer account and e-mail address. A separate T-1 line is designated for certain research projects and practicum laboratories to use.

**Examples of modern CAD/CAE tools** include the entire Cadence EDA tools suite, Synopsys Design Compilers, Xilinx and Altera design tools, Mentor Graphics tools, Synplicity and Lattice design and simulation tools, Specman tool, Vericity tool, Cilos tool, PSPICE and HSPICE simulators, SystemView, GSM Alliance Developer Program, VxWorks, MATLAB software packages, and MS Fortran PowerStation. XManager and an X-windows utility are also provided to support the students’ needs.

**Examples of available computer science teaching and learning software tools and packages** include Oracle server/client tools, Macromedia Web Design Studio (Dreamweaver, Flash, Fireworks, Freehand, HomeSite), Adobe tools (Acrobat, Photoshop, Illustrator), WebGain software (WebLogic, VisualCafe), Microsoft .NET, Microsoft SQL server, Microsoft Visual Studio (Visual C++, Visual Basic, Visual InterDev), MS Office, and various popular software QA and testing programs such as Silktest, WinRunner, LoadRunner, Astra LoadTest, Astra Quick Test etc.. In addition to Unix and MS Window systems, Linux is also provided to the students for their learning needs.

**In order to provide the business students a real-world enterprise environment** to enhance their learning, SAP software is integrated into the business curriculum and the students gain hands-on experience with the software. Other accounting, auditing, and management tools are also provided to the students in foundation classes, such as Quicken, QuickBook, Peachtree, Electronic Auditor, MS Project, and PPC Software.

**The laboratories and computers with these design and software tools provide the students the education and hands-on training specifically related to their areas of concentration.**

**Examples of current projects conducted in the labs by the students** under their advisors’ guidance are: application-specific VLSI design, digital signal processor design, system-on-chip (SOC design and simulation, wireless and mixed-signal IC design (including low-power IC design), IT and e-commerce service system infrastructure design and simulation, .NET applications software development, specific applications in e-banking, e-content development, and distant learning management system, advanced network traffic and security research projects, and embedded systems design and implementation projects. Other newly developed areas include Nanotechnology and NEMS design and simulation as well as biotechnology in bioinformatics, biochip, and bioengineering research and product development.

- **Learning Resources and Laboratories**

Specific software programs for courses teaching circuit design and software design and applications are installed on computers in various classrooms and laboratories. Software licensing agreements are observed. Designated learning laboratories for the students to conduct after-class hands-on practices are available to the students daily. Practices focus on the following:
- VLSI /SOC design
- DSP/Multimedia and interface design
- ASIC/FPGA design
- Embedded systems design
- Computer networking, systems administration, and network security
- Database administration and database design
- Nanosystem design
- Bioinformatics and bioengineering design and analysis
- e-Business, business logic design, and digital system development and implementation
- SAP (ERP, CRM, HR, PM, FIN/ACC)

✦ VLSI /SOC Design Lab

This laboratory is a dedicated facility to support learning and research projects in the area of VLSI/SOC design and implementations. In this lab a SPARC server is loaded with industry-standard CAE/CAD tools for state-of-the-art sub-micron VLSI/SOC design and implementation. These tools are HSPICE simulators, Synopsys design compilers, the entire Cadence EDA tools suite, Mentor Graphics design tools, etc.

✦ DSP/Multimedia Systems Lab

In the DSP design and implementation area, high-speed Pentium II PCs with up-to-date digital signal processing software, such as SystemView, for DSP algorithms' development and simulation and related MatLab tools are used. Specific DSP development tools in the laboratory include Texas Instruments' DSP C compiler, an assembler, a simulator and debugger, and a high performance TI in-circuit emulator. The laboratory also has Motorola's MCU in-circuit emulators, a function generator, and a high-performance 100 MHz digital oscilloscope with math analysis functions. Currently the DSP laboratory is supporting several research projects in the voice compression and speech recognition, wireless communication, and other areas.

✦ Electronics and Physics Lab

The electronics laboratory provides hands-on training accompanying digital and analog circuits classes. This lab gives students fundamental skills needed for future course work and research projects in digital/analog design, simulation, and analysis. It is equipped with analog and digital oscilloscopes, digital multimeters, frequency counters, signal generators, wave-form analyzer, power meter, and breadboarding equipment. Experiments performed in this laboratory include operational amplifiers in instrumentation application, diode rectifier-circuit applications and analysis, MOSFET measurement and applications, multistage-amplifier frequency compensation, basic output-stage topologies, BJT op-amp topologies, op-amp-RC filter topologies, tuned-amplifier techniques, CMOS logic characterization, CMOS signal generation and modification, and TLL characterization and application. This lab is also equipped with the popular PSPICE/HSPICE tools for digital/analog circuit design and commonly used MatLab software for general-purpose design. It also provides the facilities for learning digital design and microprocessor/microcontroller interfacing and applications. Design and development tools include in-circuit emulators, logic analyzers, high-speed oscilloscopes, EPROM programmers, erasers and all the necessary debugging and compiling software. The laboratory provides hands-on training in the interfaces between µ-processors/µ-controllers and a variety of computer bus structures that are currently used in the industry. For research and project design, the lab is also equipped with the latest EPLD, PAL, and GAL tools for building hands-on µ-processor/µ-controller-based projects, which allow the students to keep up with the latest technology and applications.

Experiments performed in this laboratory include logic gates behavior studies, basic combinatorial circuits investigation, logic circuit design and implementation, flip-flops operations, binary adders and 2’s complement system, troubleshooting various devices, data busing, semiconductor random access memory (RAM) demo, synchronous counter design, and wiring and troubleshooting digital circuits.

This laboratory is also used by students doing physics experiments for taking the college physics courses. It is equipped with modern MatLab tools for physics modeling and simulation and the latest instructional
apparatus for the teaching of mechanics, thermodynamics, electromagnetism, and optics. Experiments performed in this laboratory include the study of measurements, kinematics, dynamics, conservation of energy and momentum, rotational motion, oscillations, fluids, heat, electrostatic fields and potentials, DC circuits, e/m of electron, induction, AC circuits, waves, speed of sound, geometrical optics, interference and diffraction, and polarization.

The physics lab assistant sets up the lab weekly for the students to use.

✦ ASIC/FPGA Design
The computer setup supports teaching and research projects in the area of Field Programmable Gate Arrays and ASIC design. It includes eight high-speed Pentium PCs with Xilinx Field-Programmable Gate Array software for interfacing, platform design, testing, and debugging. The PCs are loaded with Altera design tools. The students learn VHDL language and VHDL simulations, creating component libraries and using FPGA to build microprocessors. All of the PCs are networked together with an interactive computer teaching facility.

✦ Networking, Systems Administration, and Network Security Lab
The networking/systems administration/network security lab is designed to allow students to gain hands-on experience in computer networks technology. Computers, routers, switches, hubs, cables, and other required components and software are provided for the students to learn how to set up computer networks, install system software, configure network devices, study networks architecture design and conduct systems administration, test network traffic, deal with network security issues and disaster recovery techniques.

This lab is also used for students taking database technology courses or working on such projects to have an independent practice environment to learn how to install and configure the database system, practice client/server configuration, multithreaded server configuration, applications logical and physical design, database storage management, database security and monitoring, utilities, data integrity and tuning, and backup and recovery. Currently Oracle database and MS SQL are the major learning tools. The lab is also intended to allow the students to practice on various platforms including Unix, Linux, and Windows.

The computer hardware and software on campus allow the students and faculty to conduct research and practice in the following popular areas:

✦ Internet Technology and QA Practice
The setup is designed to offer software engineering students and MIS students an opportunity to work on state-of-the-art e-commerce and multimedia related development and design projects; it also allows the students to gain hands-on experience in using modern software testing tools for software quality assurance implementations. Dedicated servers, networked high-speed computers, and popular commercial software packages are provided in this lab.

Internet-based programming tools, computer graphics tools, testing tools, network management and telecommunication tools, wireless developer program for telecommunication applications, and other programs are provided to the students for practicing in the lab.

Many of these programs have multiple versions to run on multiple platforms such as on Microsoft, Unix, and/or Linux systems. All faculty and students can easily access these facilities via the Internet.

✦ Object-oriented Programming and Design
Object-oriented programming and design is the basic skill required for computer science students, even for the electrical engineering students. Several sets of computer setups are loaded with object-oriented programming language programs, such as C++, C#, and Java, for the students to practice their programming skills.
e-Business, Business Logic Design, and Digital System Development and Implementation
This is an ever-developing attraction to the students who are interested in learning and using new information technologies to develop e-business projects. The project advisors are instructors who maintain cutting-edge knowledge and skills in information technology in the industry and are sharing the knowledge and skills with the students.

SAP (ERP, CRM, HR, PM, FIN/ACC)
NPU has joined an education alliance program offered by SAP America to integrate SAP software into the business curriculum. The software tool gives the students an opportunity to gain hands-on experience in an enterprise environment.

Accounting and Auditing Tools
Several accounting software programs and an auditing software program are set up in a group of computers for the students to gain hands-on experience with the tools.

The University Library and the Learning Resource Facility
The NPU administration strives to provide an up-to-date digital campus facility to the students to increase their learning efficiency. In addition to standard library services, an online course management system has been developed for the faculty and students to use and it is maintained by the NPU IT Department. Teaching assistants and lab instructors provide after-class assistance to the students. Additional training and workshops enhance students’ communication skills and culture awareness.

The Library Services
The students are encouraged not only to learn from classes but also to pursue independent research by using resources provided by the library services. The development of information technology has brought worldwide information into the grasp of anyone interested, with accessibility unlimited by time nor distance. While the NPU library has collections of books, journals, audio/visual materials, and other library items, the NPU e-library has incorporated the information conveniently provided by the vast world-wide-web in the library’s online services. This provides additional learning resources to the students. For gaining access to controlled online resources requiring membership or licenses, the NPU library seeks solutions in two ways: (1) by directly joining memberships and/or purchasing licenses and (2) by referring the faculty and the students to the Dr. Martin Luther King, Jr. Library in San Jose which is co-managed by the San Jose City government and the San Jose State University. The Dr. Martin Luther King, Jr. Library was awarded “2004 Library of the Year” by the Library Journal. Several of its librarians offer workshops on research methodology and related subjects to the NPU students. At least one of the librarian serves on the advisory committee for our doctorate degree programs. A large number of the NPU students reside in San Jose area and can benefit greatly from the wealth of collections at the library.

To aid students to develop their professional skills, the collections at the University Library and learning resource facility focus on the electronics, computer, business fields as well as general educational subjects.

The University Library provides the latest in resources for teaching and learning effectiveness. In addition to book items and audio/visual collections, the library subscribes to more than 160 technical journals, magazines, and newspapers in business, sciences, and the electronics and computer areas. The e-library further extends its coverage to provide access to the wealth of information on the Internet, including the library database of the U.C. library systems.

Students are encouraged to keep abreast of developments in their fields by reading important professional journals. The university's collection is always increasing in order to meet the changing needs of the programs and curricula. Most books circulate for one month.

The Book Stacks area is stocked with open-shelf books and periodical collections, freely available to students, faculty, and staff. Library staff as well as assistants in the library are prepared to assist the faculty and the students.
The NPU Library welcomes suggestions from the faculty and students on new reading and research material and tools.

In order to have access to more comprehensive collections, all degree-seeking students are encouraged to have library cards from local major university libraries (e.g., University of California at Berkeley, San Jose State University, Stanford University, University of California at Santa Cruz, California State University at Hayward). Students can access many information systems of these libraries via NPU’s network connection. NPU encourages students to use these libraries in order to broaden their education and deepen their research.

✦ The On-line Course Management Programs

Web-based teaching and learning utility programs have been developed to support faculty teaching and increase students’ learning efficiency. Only NPU faculty members and registered students have access to these online facilities. Designated staff users also use certain online tools to perform administrative support tasks.

Faculty members use the online course management program to post their course syllabi and handout materials, manage their students’ academic and attendance records, and post instructions to their students. They may also submit the information to their designated assistants (teaching assistants) or the system administrator for posting the information. The teaching assistants may access the system to post homework related information for individual courses. They also assist the faculty members by searching for useful learning materials or web site links and include them in the posted course material for students’ use. They can also communicate with the students in their assisted courses through this facility.

The system is designed such that an authorized student user can have access to all course information but only his/her own personal data and academic records. Using this facility, a student may also check his/her own study plan and report changes of personal contact data to the administration. In addition, e-mail has become the standard tool used by all parties to deliver and increase communication.

Internet technology has been widely used to not only increase learning resources’ accessibility to the students and faculty but also help the instructors and the administrators to monitor the students’ learning progress.

✦ Teaching Assistants and Lab Instructors

In each semester, graders, teaching assistants (TA), and lab instructors (LI) are selected by faculty and responsible administrators to assist faculty teaching and student learning in many courses. These services are provided by the school to the students free of charge. Students chosen to provide these services must have the heart for helping fellow students. The graders, TAs, and LIs earn financial credit for services they provide. They are required to attend an orientation program before the semester starts in which they also receive job descriptions and requirements information.

In the first class meeting, each TA meets with the students in his/her assisted class to determine his/her service schedule for the semester. The TAs work in a designated TA office equipped with network computers with access to the Internet. Their pictures and work schedules are posted outside the TA office at the beginning of the semester.

The TAs are expected to conduct review sessions to help the students before mid-term and final examinations. The TAs are also instructed to observe the students’ study progress and performance and provide feedback to the faculty and the administrators for service improvement.

Lab instructors are assigned to courses for which labs are an integral part. They assist the course instructors to design and maintain the labs and manuals. The lab work is designed to enhance classroom teaching by allowing the students to experiment in the laboratory with hardware and software as designed for each of these courses. It has been proven that hands-on practices increase students’ learning effectiveness.
Audio/Visual Aids for American Language Learning

Audio/visual materials for improving American language skills are available for all NPU students who wish to improve their communication skills. Students may use the selected audio and videotapes and software programs and workstations to improve English pronunciation, grammar, spelling, conversation, etc. Scheduled communication workshops and related activities conducted by English language instructors provide additional assistance to the interested students.

Training and Workshops

The Student Services staff and the systems group provides scheduled training activities and workshops to the students on the following subjects: NPU computer networks orientation, orientation to the NPU online course management system, TA and LI orientation workshop, comparative cultures workshop, American culture and effective communication workshops, workshop for international students, and others.

Audio/Video Taping

Students wishing to make video and/or audio recordings of lectures presented by NPU faculty members and/or visiting lecturers must obtain the written consent of the faculty members or lecturers. Students do not own any copyrights, etc., to such recordings.

The university’s e-broadcasting system has been developed to provide additional assistance to student learning. Recording of lectures, including voice and electronic data of each course, is filed and available for students to review to increase learning efficiency.

Academic Programs

NPU’s undergraduate and graduate programs are designed to prepare students for the practice of engineering, computer science, and business administration at a professional level. In addition to courses teaching the fundamentals, each degree curriculum is designed to be connected to Silicon Valley’s major industries in electronics, computer engineering, information technology, enterprise management, and global business development.

As Silicon Valley is a dynamic and fast changing high-technology hub where fierce competition among businesses is the norm, employers are more demanding on workers’ qualifications. Job seekers in the Valley are required to be well prepared in their background training as well as continued education.

NPU’s curriculum committees in various disciplines hold regular meetings to ensure that the curriculum design and facility support in hardware and software can meet industry standards. Further, faculty members must have had previous or current industry experience and are equipped with up-to-date knowledge and skills in their teaching subjects.

Students for the doctorate degree programs should refer to the section on “Doctorate Degree Programs” for program information.

SCHOOL OF ENGINEERING

Dr. Pochang Hsu, Ph.D., Dean
Dr. Jahan Ghofraniha, Ph.D., Assistant Dean
Purpose

The bachelor’s and master’s degree programs in the School of Engineering are designed for students who intend to become professional engineers in the high-technology electronics or computer industry, as well as for those who desire a modern, general education based on the problems and the promises of a technological society. The environment in which students are educated is as important in shaping their future as their classroom experiences. The School of Engineering offers a friendly atmosphere and a variety of academic programs that have made NPU engineering graduates highly valued in high-tech firms and Bay Area communities.

Faculty

All NPU engineering faculty members possess the following qualities: advanced degrees earned in engineering and science disciplines, high-tech work experiences, and enthusiasm in teaching and helping the students. Engineering is not a homogeneous discipline; it requires many special talents. Some faculty members in the School are goal-oriented designers, concerned with teaching students how to solve problems -- how to synthesize relevant information and ideas and apply them in a creative, feasible design. Other engineering faculty members function more typically as method-oriented scientists, using the techniques of their disciplines in their teaching and research to investigate various natural and artificial phenomena.

Objectives

- To provide each student a goal-oriented education by tailoring each student’s study plan based on the student’s background and interests.
- To provide in-depth professional training in a range of state-of-the-art specialty areas in electrical engineering, computer systems engineering, and computer science, equipping the student with both a theoretical background and practical experience in these disciplines.
- To provide relevant laboratory experience throughout each program as an integral part of the education, emphasizing extensive use of simulation and hands-on practice in the learning process.
- To provide a well-rounded and balanced undergraduate education through required studies in engineering, natural science, communications, humanities, and social science.
- To nurture a learning environment which leads to professional values recognizing high quality and integrity in truly complete engineers.
- To provide further advanced training and professional development for graduate students who wish to practice their profession with increased competence.

Undergraduate Programs

The School of Engineering offers three undergraduate degree programs:

- Bachelor of Science in Electrical Engineering (BSEE);
- Bachelor of Science in Computer Systems Engineering (BSCSE);
- Bachelor of Science in Computer Science (BSCS).

Graduation Requirements

Each program requires course work in the following areas:

1. General Education Requirements

   An overall G.P.A. of 2.0 or better and “C-” grades or higher on all general education and major study subjects at NPU are required. The student must be in good standing with the University and has an approved petition to graduate on file.

   1. General Education Requirements

      All undergraduate students in the engineering programs must complete at least 42 semester units in general education. Among all GE courses, at least 24 units are in “Mathematics, Natural Sciences, and/or Physical Sciences,” and 18 units in “Humanities and Communications” and “Social Sciences”. Examples of courses that fall under each area of general education are as follows:
Each project requires a faculty member serving as the project advisor to offer guidance to the student or a group of students (limited to three) working on the project. Academic counselors are available to assist the student to select a project advisor.

Upon completion of the project, the student or the project team is required to submit a project report, following the university’s project report guide, to the project advisor for approval before submitting it to a technical writer for editing. The project advisor determines whether to require the student or the project team to make an open-forum presentation to share the project work experience with other students.

In summary, a senior project is considered complete when:

(A) A project proposal is approved by the advisor and submitted to the administration office within the first two weeks of the semester when the project starts,
(B) The project work and report have been approved by the project advisor and the advisor has submitted a grade report to the Registrar,
(C) A technical writer has edited and approved the report,
(D) If required by the advisor, the student/team has given an open-forum presentation at NPU, and
(E) the student/team has submitted two copies of the final version of the report to the administration office.

Repeat: A student unable to complete the project in the semester he/she is enrolled in the course is required to continue to enroll in the course, as repeating the course, in the following semester until completion of the project.

Grade: The student receives either an “S” grade for satisfactory performance and earns the credits or an “NP” grade for unsatisfactory performance without earning credit in each semester the project is being conducted. The project advisor has the option of issuing a letter grade to a project course. Extra credits
earned for repeatedly taking the project course cannot substitute for other course requirements.

3. Electives

Electives are built in each program to promote breadth as well as depth in the study program. The student must complete a sufficient number of elective courses to meet the graduation requirements for both the lower-division and the upper-division curricula in a program.

The following are detailed descriptions of the general education requirements and the lower-division study flow for all engineering programs, followed by individual program descriptions. Courses numbered in the 100s and 200s are lower-division courses; courses numbered in the 300s and 400s are upper-division courses.

General Education Requirements
(for all undergraduate engineering programs)

(A) The course numbers for humanities, English, and communications courses start with HU and ENGL.
(B) The course numbers for mathematics and physics courses start with MATH and PHYS.
(C) The course numbers for social sciences courses start with SOC and ECON.

A minimum of 42 units of General Education courses, in both lower- and upper-divisions, is required:

(A) Humanities and Communications courses: A minimum of 12 units in humanities and communications, including 6 units in humanities (HU) and 6 units in English and communications (ENGL),
(B) Mathematics and Physics: A minimum of 24 units in mathematics and physics, including MATH201, MATH202, MATH203, MATH208, PHYS201, PHYS202, and
(C) Social Sciences: A minimum of 6 units in social sciences (SOC, ECON).

Lower Division Study Flow:
(for all undergraduate engineering programs)

CS150 Computer Fundamentals
CS200 Discrete Logic: for BSCS only
MATH201 Calculus – I
A College English course
An elective course: for BSEE/BSCSE only

CS204 Program Design and Analysis in C Language
MATH202 Calculus – II
MATH208 Statistics
PHYS201 Physics – I

CS230 Introduction to Unix/Linux
EE205 Digital Circuits and Laboratory
MATH203 Differential Equations & Linear Algebra
PHYS202 Physics – II

Humanities courses
Social sciences courses
A College English course
Begin to take upper-division courses
Bachelor of Science in Electrical Engineering (BSEE)

The Bachelor of Science in Electrical Engineering program is designed to provide the student with the analytic skills necessary for active problem solving and innovative applications. Analysis is concerned with the formulation and solving of physical and electrical models. The student learns engineering theory and uses industry standard circuit design tools to develop skills in practical approaches to real-world engineering systems and problem solving. After completing the undergraduate degree, a student is also prepared to enter an advanced degree program in an electrical engineering related field if he/she desires. A minimum of 136 units is required for graduation.

Lower-division courses are numbered in the 100s and 200s; upper-division courses are numbered in the 300s and 400s.

Graduation Requirements:

1. **42 units of general education courses**, including both lower- and upper-division general education courses:
   
   (a) **Humanities and Communications**: 12 units in humanities and English, including 6 units in humanities (HU) and 6 units in English and communications (ENGL),
   
   (b) **Mathematics and Physics**: 24 units in mathematics and physics, including MATH201, MATH202, MATH203, MATH208, and PHYS201, PHYS202, and
   
   (c) **Social Sciences**: 6 units in social sciences (SOC, ECON).

2. **69 major unit requirements**, including
   
   (a) 20 lower-division units: CS150, CS204, CS230, EE205, EE210, and
   
   (b) 49 upper-division units: EE301, EE302, EE322, EE323, EE398, PHYS301, CE450, EE450, EE451, EE461, EE481, EE488, EE490, EE494, and EE495.

3. At least **25 elective units**, including at least 21 units in upper-division coursework:

   The student may choose courses in any subject area. Prerequisite requirements must be met when taking any of these courses.

Notice: There are a total of 67 units with the general education and elective coursework combined, including both lower- and upper-division courses. To meet the graduation requirements, the 67 units must include at least 42 units in general education; among the 67 units, at least 21 units must be in upper-division.

### BSEE Curriculum

*(Total 136 units)*

1. **General Education (minimum 42 units)**

   The purpose of general education is to give breadth to the student’s education. With a general background in humanities, communications, mathematics, natural sciences, and the social sciences, the student will be prepared for his/her roles both in society and at work. Students who have not completed the general education requirements upon entering a degree program at NPU are required to observe the following curriculum to meet the general education requirements.

   (a) **Humanities and Communications**: 12 units in humanities and English, including 6 units in humanities (HU) and 6 units in English and communications (ENGL),
(b) **Mathematics and Science**: 24 units in mathematics and science, including:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH201</td>
<td>Calculus - I</td>
<td>4</td>
</tr>
<tr>
<td>MATH202</td>
<td>Calculus - II</td>
<td>4</td>
</tr>
<tr>
<td>MATH203</td>
<td>Differential Equations and Linear Algebra</td>
<td>4</td>
</tr>
<tr>
<td>MATH208</td>
<td>Statistics</td>
<td>4</td>
</tr>
<tr>
<td>PHYS201</td>
<td>Physics - I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS202</td>
<td>Physics – II</td>
<td>4</td>
</tr>
</tbody>
</table>

(c) **Social Sciences**: 6 units in social sciences (SOC, ECON).

2. **Major Requirements** *(minimum 69 units)*

   [Sciences, Engineering, and Computer Science; a course to prepare for professional career; a major design experience that builds upon the fundamental concepts in mathematics, basic sciences, the humanities and social sciences, engineering topics, and communication skills]

I. Lower-division

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS150</td>
<td>Computer Fundamentals</td>
<td>4</td>
</tr>
<tr>
<td>CS204</td>
<td>Program Design and Analysis in C Language</td>
<td>4</td>
</tr>
<tr>
<td>CS230</td>
<td>Introduction to Unix/Linux</td>
<td>4</td>
</tr>
<tr>
<td>EE205</td>
<td>Digital Circuits and Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>EE210</td>
<td>Circuit Theory - I</td>
<td>4</td>
</tr>
</tbody>
</table>

II. Upper-division

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE301</td>
<td>Circuit Theory - II</td>
<td>4</td>
</tr>
<tr>
<td>EE302</td>
<td>Analog Circuits and Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>EE322</td>
<td>Analog Circuit Design</td>
<td>4</td>
</tr>
<tr>
<td>EE323</td>
<td>Logic Design</td>
<td>4</td>
</tr>
<tr>
<td>EE398</td>
<td>Professional Development</td>
<td>2</td>
</tr>
<tr>
<td>PHYS301</td>
<td>Introduction to Device Physics</td>
<td>4</td>
</tr>
<tr>
<td>CE450</td>
<td>Fundamentals of Embedded Systems</td>
<td>3</td>
</tr>
<tr>
<td>EE450</td>
<td>Signals and Systems</td>
<td>3</td>
</tr>
<tr>
<td>EE451</td>
<td>Introduction to Communication Systems</td>
<td>3</td>
</tr>
<tr>
<td>EE461</td>
<td>Verilog HDL and Digital Design</td>
<td>3</td>
</tr>
<tr>
<td>EE481</td>
<td>Microcomputer Structure and Programming</td>
<td>3</td>
</tr>
<tr>
<td>EE488</td>
<td>Computer Architecture</td>
<td>3</td>
</tr>
<tr>
<td>EE490</td>
<td>Computer Hardware Design</td>
<td>3</td>
</tr>
<tr>
<td>EE494</td>
<td>Senior Design Project - I</td>
<td>3</td>
</tr>
<tr>
<td>EE495</td>
<td>Senior Design Project - II</td>
<td>3</td>
</tr>
</tbody>
</table>

3. **Electives** *(minimum 25 units - at least 21 in upper-division coursework)*

   The student may select courses in any discipline to fulfill this requirement. Electrical engineering students are encouraged to take courses outside the EE area in order to promote breadth as well as depth in their study program. For a list of courses in each area, please refer to the course listings in this catalog.
Bachelor of Science in Computer Systems Engineering (BSCSE)

The Bachelor of Science in Computer Systems Engineering program is designed to equip the student with a strong background in computer systems, emphasizing both hardware and software. The student acquires skills in the design and analysis of computer systems as well as in developing skills for programming and designing software capable of solving scientific and engineering problems. After completing the undergraduate degree, a student is also prepared to enter an advanced degree program in a computer systems engineering related field if he/she desires. A minimum of 134 units is required for graduation.

Lower-division courses are numbered in the 100s and 200s; upper-division courses are numbered in the 300s and 400s.

Graduation Requirements:

1. 42 units of general education courses, including both lower- and upper-division general education courses:
   (a) Humanities and Communications: 12 units in humanities and English, including 6 units in humanities (HU) and 6 units in English and communications (ENGL),
   (b) Mathematics and Physics: 24 units in mathematics and physics, including MATH201, MATH202, MATH203, MATH208, PHYS201, and PHYS202,
   (c) Social Sciences: 6 units in social sciences (SOC, ECON).

2. 68 major unit requirements, including
   (a) 20 lower-division units: CS150, CS204, CS230, EE205, and EE210,
   (b) 48 upper-division units: CE398, CS350, CS360, CS380, CS385, EE323, PHYS301, BE450, CE450, CE453, CE470, CE494, CE495, EE481, and EE488.

3. At least 24 elective units, including at least 21 units in upper-division coursework: The student may choose courses in any subject area. Prerequisite requirements must be met when taking any of these courses.

Notice: There are a total of 66 units with the general education and elective coursework combined, including both lower- and upper-division courses. To meet the graduation requirements, the 66 units must include at least 42 units in general education; among the 66 units, at least 21 units must be in upper-division

BSCSE Curriculum (Total 134 units)

1. General Education (minimum 42 units)

The purpose of general education is to give breadth to the student’s education. With a general background in humanities, communications, mathematics, natural sciences, and the social sciences, the student will be prepared for his/her roles both in society and at work. Students who have not completed the general education requirements upon entering a degree program at NPU are required to observe the following curriculum to meet the general education requirements.

(a) Humanities and Communications: 12 units in humanities and English, including 6 units in humanities (HU) and 6 units in English and communications (ENGL),
(b) **Mathematics and Physics**: 24 units in mathematics and science, including:

<table>
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</table>

(c) **Social Sciences**: 6 units in social sciences (SOC, ECON).

2. **Major Requirements (minimum 68 units)**

[Sciences, Electrical Engineering, and Computer Science; a course to prepare for professional career; a major design experience that builds upon the fundamental concepts in mathematics, basic sciences, the humanities and social sciences, engineering topics, and communication skills]

<table>
<thead>
<tr>
<th>Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower-division</td>
<td></td>
</tr>
<tr>
<td>CS150</td>
<td>Computer Fundamentals</td>
</tr>
<tr>
<td>CS204</td>
<td>Program Design and Analysis in C Language</td>
</tr>
<tr>
<td>CS230</td>
<td>Introduction to Unix/Linux</td>
</tr>
<tr>
<td>EE205</td>
<td>Digital Circuits and Laboratory</td>
</tr>
<tr>
<td>EE210</td>
<td>Circuit Theory - I</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper-division</td>
<td></td>
</tr>
<tr>
<td>CS350</td>
<td>Data Structures</td>
</tr>
<tr>
<td>CS360</td>
<td>Object-oriented Programming in C++</td>
</tr>
<tr>
<td>CS380</td>
<td>Introduction to Operating Systems</td>
</tr>
<tr>
<td>CS385</td>
<td>Unix/Linux Shell Programming and System Administration</td>
</tr>
<tr>
<td>CE398</td>
<td>Professional Development</td>
</tr>
<tr>
<td>EE323</td>
<td>Logic Design</td>
</tr>
<tr>
<td>PHYS301</td>
<td>Introduction to Device Physics</td>
</tr>
<tr>
<td>BE450</td>
<td>Introduction to Bioengineering</td>
</tr>
<tr>
<td>CE450</td>
<td>Fundamentals of Embedded Systems</td>
</tr>
<tr>
<td>CE453</td>
<td>Compiler Design</td>
</tr>
<tr>
<td>CE470</td>
<td>Computer Networks</td>
</tr>
<tr>
<td>CE494</td>
<td>Senior Design Project - I</td>
</tr>
<tr>
<td>CE495</td>
<td>Senior Design Project - II</td>
</tr>
<tr>
<td>EE481</td>
<td>Microcomputer Structure and Programming</td>
</tr>
<tr>
<td>EE488</td>
<td>Computer Architecture</td>
</tr>
</tbody>
</table>

3. **Electives (minimum 24 units - at least 21 in upper-division coursework)**

The student may select courses in any discipline to fulfill this requirement. Computer systems engineering students are encouraged to take courses outside the CE area in order to promote breadth as well as depth in their study program. For a list of courses in each area, please refer to the course listings in this catalog.
Bachelor of Science in Computer Science (BSCS)

The Bachelor of Science in Computer Science curriculum is designed to provide in-depth professional training in a range of current computer science subjects, including structured programming, object-oriented analysis and program design, computer organization principles and industry-wide operating systems, database principles and applications, and principles of computer networks. It is designed to equip the student with both a theoretical background and hands-on experience.

The curriculum provides training in software engineering and prepares the students for employment in computer software related areas, such as computer software design and development, and computer software applications in computer, network, and Internet systems. The computer training will enable the students to work with computers as programmers, program and/or systems analysts, software engineers, computer systems administrators, database developers or administrators, Internet application software engineers, and technical program managers. After completing the undergraduate degree, a student is also prepared to enter an advanced degree program in a computer science related field if he/she desires. A minimum of 129 units is required for graduation:

Lower-division courses are numbered in the 100s and 200s; upper-division courses are numbered in the 300s and 400s.

Graduation Requirements:

1. **42 units of general education courses**, including both lower- and upper-division general education courses:
   (a) **Humanities and Communications**: 12 units in humanities and English, including 6 units in humanities (HU) and 6 units in English and communications (ENGL),
   (b) **Mathematics and Physics**: 24 units in mathematics and physics, including MATH201, MATH202, MATH203, MATH208, PHYS201, and PHYS202, and
   (c) **Social Sciences**: 6 units in social sciences (SOC, ECON).

2. **67 major unit requirements**, including:
   (a) 20 lower-division units: CS150, CS200, CS204, CS230, and EE205, and
   (b) 47 upper-division units: CS350, CS360, CS380, CS385, CS398, CE305, CE450, CS453, CS455, CS457, CS470, CS494, CS495, and 6 units in major elective courses.

3. **At least 20 elective units**, including at least 18 units in upper-division coursework: The student may choose courses in any subject area. Prerequisite requirements must be met when taking any of these courses.

**Notice**: There are a total of 62 units with the general education and elective coursework combined (not including the 6-unit upper-division major electives), including both lower- and upper-division courses. To meet the graduation requirements, the 62 units must include at least 42 units in general education; among the 62 units, at least 18 units must be in upper-division.

**BSCS Curriculum**

(Total 129 units)

1. **General Education (minimum 42 units)**

   The purpose of general education is to give breadth to the student’s education. With a general background in humanities, communications, mathematics, natural sciences, and the social sciences, the student will be prepared for his/her roles both in society and at work. Students who have not completed the general education requirements upon entering a degree program at NPU are required to observe the following curriculum to meet the general education requirements.
(a) **Humanities and Communications**: 12 units in humanities and English, including 6 units in humanities (HU) and 6 units in English and communications (ENGL),

(b) **Mathematics and Physics**: 24 units in mathematics and science, including:

<table>
<thead>
<tr>
<th>Units</th>
<th>Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH201</td>
<td>Calculus - I</td>
<td>(4)</td>
</tr>
<tr>
<td>MATH202</td>
<td>Calculus - II</td>
<td>(4)</td>
</tr>
<tr>
<td>MATH203</td>
<td>Differential Equations and Linear Algebra</td>
<td>(4)</td>
</tr>
<tr>
<td>MATH208</td>
<td>Statistics</td>
<td>(4)</td>
</tr>
<tr>
<td>PHYS201</td>
<td>Physics - I</td>
<td>(4)</td>
</tr>
<tr>
<td>PHYS202</td>
<td>Physics - II</td>
<td>(4)</td>
</tr>
</tbody>
</table>

(c) **Social Sciences**: 6 units in social sciences (SOC, ECON).

2. **Major Requirements (minimum 67 units)**

   [Science, Digital Circuits, and Computer Science; a course to prepare for professional career; a major design experience that builds upon the fundamental concepts in mathematics, basic sciences, the humanities and social sciences, computer science topics, and communication skills]

<table>
<thead>
<tr>
<th>Units</th>
<th>Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Lower-division</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS150</td>
<td>Computer Fundamentals</td>
<td>(4)</td>
</tr>
<tr>
<td>CS200</td>
<td>Discrete Logic</td>
<td>(4)</td>
</tr>
<tr>
<td>CS204</td>
<td>Program Design and Analysis in C Language</td>
<td>(4)</td>
</tr>
<tr>
<td>CS230</td>
<td>Introduction to Unix/Linux</td>
<td>(4)</td>
</tr>
<tr>
<td>EE205</td>
<td>Digital Circuits and Laboratory</td>
<td>(4)</td>
</tr>
<tr>
<td>II. Upper-division</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CE305</td>
<td>Computer Organization</td>
<td>(4)</td>
</tr>
<tr>
<td>CS350</td>
<td>Data Structures</td>
<td>(4)</td>
</tr>
<tr>
<td>CS360</td>
<td>Object-oriented Programming in C++</td>
<td>(3)</td>
</tr>
<tr>
<td>CS380</td>
<td>Introduction to Operating Systems</td>
<td>(3)</td>
</tr>
<tr>
<td>CS385</td>
<td>Unix/Linux Shell Programming and System Administration</td>
<td>(4)</td>
</tr>
<tr>
<td>CS398</td>
<td>Professional Development</td>
<td>(2)</td>
</tr>
<tr>
<td>CE450</td>
<td>Fundamentals of Embedded Systems</td>
<td>(3)</td>
</tr>
<tr>
<td>CS453</td>
<td>Compiler Design</td>
<td>(3)</td>
</tr>
<tr>
<td>CS455</td>
<td>Structured Programming and Algorithms</td>
<td>(3)</td>
</tr>
<tr>
<td>CS457</td>
<td>Database Design</td>
<td>(3)</td>
</tr>
<tr>
<td>CS470</td>
<td>Computer Networks</td>
<td>(3)</td>
</tr>
<tr>
<td>CS494</td>
<td>Senior Design Project - I</td>
<td>(3)</td>
</tr>
<tr>
<td>CS495</td>
<td>Senior Design Project - II</td>
<td>(3)</td>
</tr>
<tr>
<td>III. Upper-division major electives</td>
<td></td>
<td>(6)</td>
</tr>
</tbody>
</table>

The student is required to take 6 units in upper-division major electives – (course numbers starting with EE, CE, CS, BE, IT, and PHYS).

3. **Electives (minimum 20 units - at least 18 in upper-division coursework)**

The student may select courses in any discipline to fulfill this requirement. Computer science students are encouraged to take courses outside the CS area in order to promote breadth as well as depth in their study program. For a list of courses in each area, please refer to the course listings in this catalog.
## Master’s Degree Programs

The following master’s degree programs are offered by the School of Engineering:

- Master of Science in Electrical Engineering (MSEE)
- Master of Science in Computer Systems Engineering (MSCSE)
- Master of Science in Computer Science (MSCS)

The objective of the graduate-level programs is to provide advanced engineering training to those who wish to practice their profession with increased competence in the high-technology electronics and computer industries.

### Concentration Area and Career Planning

All graduate students pursuing engineering degrees at NPU are advised to plan for their studies and choose a concentration area early. Upon completing 12 units in graduate coursework, the student must choose a concentration area. Academic counselors are on-hand to assist the students to make their study plans and assess the technology trend and job market.

The students are encouraged to utilize the online eCareer Center and work with Student Services counselors to prepare their resumes and participate in job search activities when they are ready for such a pursuit.

### Graduation Requirements

A minimum of 36 units of graduate-level course work is required for all master’s degree programs. Additional coursework may be required for a student whose undergraduate degree program was in a discipline other than that of the master’s degree program.

In each master’s degree engineering program, there are four categories of course requirements:

1. Required graduate courses
2. Area of Concentration courses
3. Courses for breadth of study,
4. Advanced electives

The following are required for graduation:

- A graduate student entered with undergraduate deficiencies must clear the deficiencies in the first few semesters after joining NPU. The student may clear a subject by either taking the course and earning a passing grade or passing a proficiency exam on the subject.
- Earn a grade of “B-” or better in all required and concentration area courses,
- Earn a grade of “C-” or better in all elective courses,
- Maintain overall G.P.A. of 3.0 or better,
- Maintain good standing with the University,
- The student is approved to graduate after filing a petition for graduation.

Courses numbered in 500’s and above are graduate courses.

### Master’s Project/Thesis

Master’s degree students interested in research and development work may choose to take a 3-unit master’s project or a 6-unit master’s thesis to fulfill the requirement in either the concentration area or elective coursework. The information packages concerning the project/thesis requirements and guidance are distributed to the enrolled students in the project/thesis orientation workshops held twice each semester. The information is also posted on NPU’s web site in the NPU Online Service Center.

**Advisor:** A faculty member serves as the project/thesis advisor to offer guidance to the student. The master’s thesis course may be registered as a two-part course, with each part as a 3-unit course, taking a total of two semesters to complete. A student unable to complete the project/thesis in the semester he/she is enrolled in the course is required to continue to enroll in the course the following semester until completion of the project/thesis.

The student receives either an “S” or letter grade for satisfactory performance and earns the credits or an “NP” grade for unsatisfactory performance without earning credit in each semester the project is being conducted. Extra credits earned for repeatedly taking the project/thesis course cannot substitute for other course requirements.
Master of Science in Electrical Engineering (MSEE)

Undergraduate Preparation
Students admitted into the MSEE degree program are required to have the following background preparation. A student with any deficiency is required to clear it by either (1) taking the course at NPU and earning a grade of at least C- or higher, or (2) taking and passing a proficiency exam on the subject. The student is advised to clear all deficiencies before attempting to enroll in graduate level courses.

1. Mathematics and English/Communication:
   - Engineering mathematics (MATH201, MATH202, MATH203, MATH208);
   - English/communication (One of the following: EE398, BUS300 or a College English course);
2. Engineering Sciences: PHYS201, PHYS202, PHYS301;
3. Electrical Engineering Subjects:
   - Circuit theory and analysis (EE210, EE301);
   - Digital circuits and logic design (EE205, EE323);
   - Analog circuits (EE302);
4. Computer Science Subjects:
   - Programming language and logic (CS204); students choosing Bioengineering concentration also require a background in CS350;
   - Unix/Linux operating system (CS230); students choosing Embedded Engineering concentration also requires a background in CS380;
5. Mezzanine course: EE481/G (*Student may earn graduate credit by taking the course at NPU).

MSEE Curriculum

A minimum of 36 semester units of graduate study is required for the MSEE program. A maximum of four (4) 4xxG courses (400 level courses with a “G” designation taken as elective courses) are allowed to count towards graduation credits. The student must meet prerequisite requirements when taking any of the following courses.

I. Required Courses ................................................................. (6)

The required courses emphasize understanding of the mathematics and modeling techniques for circuits and other engineering systems, and the design of modern computers. A student must take the following two courses to complete the required graduate course requirement. These two courses cannot be used to meet concentration coursework requirements.

   EE501        Advanced Engineering Analysis
   EE504        Advanced Computer Organization and Structure

II. Area of Concentration ........................................................... (12)

In addition to the two required graduate courses in section I, a student must select an area of concentration and complete at least 12 units (four courses) listed in one chosen concentration area. This is to ensure the student’s competence in a selected area. As new courses are also offered between publications of school catalogs, the students are advised to refer to the “Concentration Area Course Tables” published with each release of the semester class schedule to select courses for meeting the concentration area requirements.
Area A. Chip Design and VLSI
(*Background requirement: EE461/G Verilog HDL and Digital Design)

Required courses:
EE505 Digital IC Design
EE506 Advanced Digital IC Design
EE507 Analog/Mixed Signal IC Design
EE529 Integrated Circuit Design Project

The students are encouraged to take additional courses in this area to further strengthen their study. Examples of other course in this area are: EE508, EE510, EE512, EE614, and EE616.

Area B. Digital Signal Processing
(* Background requirements: EE450/G Signals and Systems and EE452/G Digital Signal Processing)

Required courses:
EE531 Data Compression
EE532 Image processing and Applications
EE537 DSP Design Project
EE589 Special Topics

Area C. Nanotechnology and NEMS
(* Background requirement: PHYS450G Modern Physics)

Required courses:
EE582 Nanotechnology
EE583 Introduction to Nanoelectromechanical Systems (NEMS)
EE587 Nanophotonics
EE588 Quantum Computation

Area D. Embedded Engineering
(*Background requirements: CS380 Operating Systems and CE450/G Fundamentals of Embedded Systems)

Required courses:
CE521 Real-time Systems and Programming
CE523 Embedded Design in Device Driver Environment
CE589 Special Topics
CE589 Special Topics

Area E. Wireless Communications
(*Background requirements: EE450/G Signals and Systems and EE451/G Introduction to Communication Systems)

Required courses:
CE505 Wireless Networks and Architecture
CE507 Wireless Communication Systems
CE515 Wireless Communication Design Project
CE589 Special Topics
Area F. Bioengineering

(* Background requirement: CS350 Data Structures and BE450G Introduction to Bioengineering)

Required courses:

- BE510 Biometrics and Computer Aided Detection (CAD) Technology
- BE520 Bioinformatics Programming and Applications
- BE630 Biochips
- BE650 Advanced Topics on Bioengineering

III. Courses for Breadth of Study ................................................................. (6)

The student is required to take at least 6 units in graduate coursework outside the chosen concentration area to broaden his/her knowledge in one or two application areas. For example, a student choosing the Chip Design and VLSI concentration is encouraged to select one or two courses in the DSP applications, such as the course EE539. Courses for breadth of study may be at 400 level with a “G” designation or 500 level and above. The student must observe the limits on the number of 400 level courses with a “G” designation.

IV. Electives ..................................................................................................... (12)

The student may elect graduate-level courses in any discipline, in or outside the chosen concentration area, to meet the elective requirements. Elective courses may also include mezzanine courses taken to meet the background requirements for the program and/or for the chosen concentration area. The student must observe the limits on the number of 400 level courses with a “G” designation.

Mezzanine Course for program requirement—Students admitted with a background deficiency in microprocessor structure must take the course “EE481G Microcomputer Structure and Programming” at NPU. Credit earned can be counted as elective credit towards the MSEE graduation requirements.

* Other background requirements for the concentration area: Each concentration area requires certain 400 level background courses. Students may earn credit towards the degree, if observing the limit for the number of 400-level courses for the program, by taking these courses, such as EE450G, EE451G, EE452G, EE461G, BE450G, CE450G, or PHYS450G.

MSEE Total Requirements (36)
Master of Science in Computer Systems Engineering (MSCSE)

Undergraduate Preparation
Students admitted into the MSCSE degree program are required to have the following background preparation. A student with any deficiency is required to clear it by either (1) taking the course at NPU and earning a grade of at least C- or higher, or (2) taking and passing a proficiency exam on the subject. The student is advised to clear all deficiencies before attempting to enroll in graduate level courses.

1. Mathematics and English/Communication:
   - Engineering mathematics (MATH201, MATH202, MATH203, MATH208);
   - English/communication (One of the following: CE398, BUS300 or a College English course);

2. Engineering Sciences: PHYS201, PHYS202; PHYS301 recommended;

3. Electrical Engineering Subjects:
   - Circuit theory (EE210);
   - Digital circuits and logic design (EE205, EE323);

4. Computer Science Subjects:
   - Programming languages and data structures (CS204, CS350, CS360);
   - Operating systems (CS230, CS380);

5. Mezzanine courses (*Student may earn graduate credit by taking the courses at NPU):
   a. EE481/G Microcomputer Structure and Programming
   b. CE470G Computer Networks

MSCSE Curriculum

A minimum of 36 semester units of graduate study is required for the MSCSE program. A maximum of four (4) 4xxG courses (400 level courses with a G designation taken as elective courses) are allowed to count towards graduation credits. The student must meet prerequisite requirements when taking any of the following courses.

I. Required Graduate Courses ................................................................. (6)

The required courses emphasize understanding of the design of modern computers and networking systems. A student must take the following two courses to complete the required graduate course requirement. These two courses cannot be used to meet concentration coursework requirements.

EE504 Advanced Computer Organization and Structure
CS503 Advanced Computer Networks

II. Area of Concentration ................................................................. (12)

In addition to the two required graduate courses in section I, a student must select an area of concentration and complete at least 12 units (four courses) listed in one chosen concentration area. This is to ensure the student’s competence in a selected area. As new courses are also offered between publications of school catalogs, the students are advised to refer to the “Concentration Area Course Tables” published with each release of the semester class schedule to select courses for meeting the concentration area requirements.
Area A. Embedded Engineering
(*Background requirement: CE450/G Fundamentals of Embedded Systems)

Required courses:
- CE506 Operating System Design
- CE521 Real-time Systems and Programming
- CE522 Embedded Design in Networking Environment
- CE523 Embedded Design in Device Driver Environment

Area B. Wireless Communications
(*Background requirements: EE450/G Signals and Systems and EE451/G Introduction to Communication Systems)

Required courses:
- CE504 Introduction to Wireless Communications
- CE505 Wireless Networks and Architecture
- CE507 Wireless Communication Systems
- CE515 Wireless Communication Design Project

Area C. Bioengineering
(*Background requirement: BE450G Introduction to Bioengineering)

Required courses:
- BE510 Biometrics and Computer Aided Detection (CAD) Technology
- BE520 Bioinformatics Programming and Applications
- BE630 Biochips
- BE650 Advanced Topics on Bioengineering

Area D. Nanotechnology and NEMS
(*Background requirement: PHYS450G Modern Physics)

Required courses:
- EE582 Nanotechnology
- EE583 Introduction to Nanoelectromechanical Systems (NEMS)
- EE587 Nanophotonics
- EE588 Quantum Computation

Area E. Computer Networks and Network Security

Required courses:
- CS510 UNIX/Linux System Programming
- CS515 Linux / UNIX Network Programming
- CS535 Network Security Fundamentals
- CS565 Network Management

The students are encouraged to take additional courses in this area to further strengthen their study. Examples of other course in this area are: CS575, CS673, CS676, and CS678.
III. Courses for Breadth of Study .................................................. (6)

The student is required to take at least 6 units in graduate coursework outside the chosen concentration area. The courses may be at 400 level with a “G” designation or 500 level and above. The student must observe the limits on the number of 400 level courses with a “G” designation.

IV. Electives ................................................................. (12)

The student may elect graduate-level courses in any discipline, in or outside the chosen concentration area, to meet the elective requirements. Elective courses may also include mezzanine courses taken to meet the background requirements for the program and/or for the chosen concentration area. The student must observe the limits on the number of 400 level courses with a “G” designation.

Mezzanine Courses for program requirement—Students admitted with a background deficiency in (1) microprocessor structure and/or (2) computer networks must take the courses (1) “EE481G Microcomputer Structure and Programming” and/or (2) CE470G Computer Networks at NPU. Credit earned can be counted as elective credit towards the MSCSE graduation requirements.

* Other background requirements for the concentration area: Each concentration area requires certain 400 level background courses. Students may earn credit towards the degree, if observing the limit for the number of 400-level courses for the program, by taking these courses, such as BE450G, CE450G, EE450G, EE451G, or PHYS450G.

MSCSE Total Requirements (36)
Master of Science in Computer Science (MSCS)

Undergraduate Preparation

Students admitted into the MSCS degree program are required to have the following background preparation. A student with any deficiency is required to clear it by either (1) taking the course at NPU and earning a grade of at least C- or higher, or (2) taking and passing a proficiency exam on the subject. The student is advised to clear all deficiencies before attempting to enroll in graduate level courses.

1. Mathematics and English/Communication:
   - Statistics (MATH208);
   - English/communication (One of the following: CS398, BUS300 or a College English course);

2. Computer Science Subjects:
   - Programming languages and data structures (CS200, CS204, CS350, CS360);
   - Operating systems (CS230, CS380, CS385);

3. Electronics Subjects: (EE205, CE305);

4. Mezzanine courses (*Student may earn graduate credit by taking the courses at NPU):
   a. CS457/G Database Design
   b. CS470/G Computer Networks

MSCS Curriculum

A minimum of 36 semester units of graduate study is required for the MSCS program. A maximum of four (4) 4xxG courses (400 level courses with a G designation taken as elective courses) are allowed to count towards graduation credits. The student must meet prerequisite requirements when taking any of the following courses.

<table>
<thead>
<tr>
<th>Units</th>
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<tbody>
<tr>
<td>I. Required Courses</td>
</tr>
<tr>
<td>II. Area of Concentration</td>
</tr>
</tbody>
</table>

The required courses emphasize understanding of (1) the principles and architecture of computer networks and (2) the design of modern operating systems. A student must take the following two courses to complete the required graduate course requirement. These two courses cannot be used to meet concentration coursework requirements.

- CS503 Advanced Computer Networks
- CS506 Operating System Design

In addition to the two required graduate courses in section I, a student must select an area of concentration and complete at least 12 units (four courses) listed in one chosen concentration area. This is to ensure the student’s competence in a selected area. As new courses are also offered between publications of school catalogs, the students are advised to refer to the “Concentration Area Course Tables” published with each release of the semester class schedule to select courses for meeting the concentration area requirements.
Area A. Computer Networks and Network Security

Required courses:

- CS510 UNIX/Linux System Programming
- CS515 Linux/UNIX Network Programming
- CS535 Network Security Fundamentals
- CS565 Network Management

The students are encouraged to take additional courses in this area to further strengthen their study. Examples of other course in this area are: CS575, CS673, CS676, and CS678.

Area B. Internet Technology and Digital eBusiness Systems

(*Background requirements: CS486/G Windows-based Applications With C# and CS480/G Java Programming and Internet Applications)

Required courses:

- CS526 ASP.NET Web Applications
- CS527 .NET Windows Programming
- CS532 Advanced JAVA Programming
- CS536 Internet Technology: J2EE/EJB

The students are encouraged to take additional courses in this area to further strengthen their study. Examples of other course in this area are: CS534, CS548, IT510, CS637, and CS639.

Area C. Database Technology

(*Background requirement: CS480/G Java Programming and Internet Applications)

Required courses:

- CS540 Database Administration
- CS547 Advanced Database Design and Development
- CS548 Data Base and Internet Server Programming
- IT560 Enterprise Resources Planning (SAP)

Area D. Embedded Engineering

(*Background requirement: CE450/G Fundamentals of Embedded Systems)

Required courses:

- CE521 Real-time Systems and Programming
- CE522 Embedded Design in Networking Environment
- CE523 Embedded Design in Device Driver Environment
- CE528 Embedded Systems in VxWorks and Windows CE Environments

Area E. Bioengineering

(*Background requirement: BE450G Introduction to Bioengineering)

Required courses:

- BE510 Biometrics and Computer Aided Detection (CAD) Technology
- BE520 Bioinformatics Programming and Applications
- BE630 Biochips
- BE650 Advanced Topics on Bioengineering
III. Courses for Breadth of Study ......................................................... (6)

The student is required to take at least 6 units in graduate coursework outside the chosen concentration area. The courses may be at 400 level with a “G” designation or 500 level and above. The student must observe the limits on the number of 400 level courses with a “G” designation.

IV. Electives ................................................................. (12)

The student may elect graduate-level courses in any discipline, in or outside the chosen concentration area, to meet the elective requirements. Elective courses may also include mezzanine courses taken to meet the background requirements for the program and/or for the chosen concentration area. The student must observe the limits on the number of 400 level courses with a “G” designation.

Mezzanine Courses for program requirement – Students admitted with a background deficiency in (1) database design and/or (2) computer networks must take the courses (1) “CS457G Database Design” and/or (2) CS470G Computer Networks at NPU. Credit earned can be counted as elective credit towards the MSCS graduation requirements.

* Other background requirements for the concentration area: Each concentration area requires certain 400 level background courses. Students may earn credit towards the degree, if observing the limit for the number of 400-level courses for the program, by taking these courses, such as CS480G, CS486G, BE450G, or CE450G.

MSCS Total Requirements (36)
The School of Business and Information Technology offers both undergraduate and graduate degree programs. These are educational programs in the business and organizational disciplines intended to prepare individuals to make sustained contributions to organizations and society in a global, diverse and dynamic environment, focusing on developing an individual’s interdisciplinary problem solving skills, interpersonal and communication skills, ability to adapt to changing information technology and business environment, spirit of entrepreneurial innovation, and ethical and professional values. Successful completion requires not only an understanding of the important functional skills in accounting, financial management, marketing, and business and project management, but also an understanding of modern information systems, Internet technology pertinent to e-commerce and e-business applications.

To help the students gain real-world experience, an enterprise resource-planning tool, such as SAP software, is integrated into the business curriculum. Faculty members will guide the students to practice using SAP software and its applications in an enterprise environment.

Refer to the section on “Doctorate Degree Programs” for additional information.

- **Objectives**
  - To prepare students for professional careers in technology and service businesses and e-commerce fields.
  - To educate students to become business professionals who are not only familiar with the traditional business disciplines but also able to make use of the latest information technology.
  - To develop the students’ communication skills, analytical skills, and an understanding of organization and cross-culture issues, and to increase their awareness of business and social issues for them to be thoroughly grounded in ethical principles.
  - To provide real-world learning opportunities in a simulated enterprise environment as well as professional development opportunities for those who wish to practice the profession of business/project management with increased competence.

- **Undergraduate Program**

  **Bachelor of Business Administration and Information Sciences (BBAIS)**

  The Bachelor of Business Administration and Information Sciences degree program is to prepare students with the fundamentals of current business practices, management principles, and leadership skills, as well as modern information technology applied in a real-world business environment. The student shall learn subjects in the following areas:

  (A) General Education: English and communications, humanities, natural sciences and mathematics including statistics, and social sciences.

  (B) Business Administration: Business management and organization, economics, accounting, financial management, business law, marketing, and other selected business subjects.

  (C) Information Sciences: Management information systems with an emphasis in current information technology and its applications in business, database management, and related subjects.

  The Bachelor of Business Administration and Information Sciences curriculum offers training in both business administration and information sciences emphasizing applications to businesses. The training will enable the students to work with computers and information technology to
manage business in the information age and in the global business environment.

After completing the undergraduate degree, a student is also prepared to enter a graduate degree program in business administration, including using up-to-date information technology and enterprise resource-planning tools.

Graduation Requirements

A minimum of **125 units** is required for graduation. The program requires coursework in three areas:

1. General education,
2. Major study,
3. Electives.

An overall G.P.A. of 2.0 or better and “C-” grades or higher on all general education and concentration and major courses at NPU are required for meeting the graduation requirements. The student must be in good standing with the University and have an approved petition for graduation on file.

1. General Education Requirements

All students must complete at least 36 trimester units in general education with at least 18 units in “Humanities and Communications”, 9 units in “Natural Sciences and Mathematics” including “Statistics”, and 9 units in “Social Sciences”.

Examples of courses that fall under the general education area are as follows:

- Humanities and Communications:
  - Expository Writing, Composition, Creative Writing, Literature, Speech, Communication, Foreign Languages, Philosophy, Music, Fine Art, and Religion.
- Natural Sciences and mathematics:
  - Biology, Chemistry, Physical Sciences, Geology, Astronomy, Calculus, and Statistics.
- Social Sciences:
  - History, Political Science, Government, Psychology, Sociology, Environmental Studies, Geography, Human Development, and Anthropology.

2. Major Study Requirements

The undergraduate program is designed to include a series of major study coursework. The courses provide the student the foundation and training in business management and information technology. Students are encouraged to utilize the enterprise resource-planning and management tool provided by the school to gain hands-on experience in a simulated enterprise environment. A major senior project gives the students an opportunity to work on an independent project on a selected major subject under the guidance of a faculty advisor.

3. Electives

Electives are built into the program to promote breadth as well as depth in the study program. The student must complete sufficient number of upper-division elective courses to meet the graduation requirements in the program.

Senior Project

A major design experience – senior project, built upon the fundamental concepts and training in the major subjects, humanities, social sciences, and communication skills, gives the students an opportunity to work on an independent project under the guidance of a project advisor. This is a two-part course for a total of 6 units. Normally the student completes the course in two semesters by enrolling in one part of the course each trimester.

Orientation: A project course orientation meeting is conducted twice a semester: first is conducted shortly after the pre-registration ends, and the second is in the first week of the new semester. In the meeting, each registered student receives a package of project guidance concerning the course requirements and related information. The information is also posted online.

Advisor: A faculty member serves as the project advisor to offer guidance to the student or a group of students (limited to three) working on a project. Academic counselors are available to assist the student to select a project advisor.
**Project report:** Upon completion of the project, the student or the project team is required to submit a project report, following the university’s project report guide, to the project advisor for approval before submitting it to a technical writer for editing. The advisor determines whether to require the student or the project team to make an open-forum presentation to share the work experience with other students.

In summary, a senior project is considered complete when:

(A) The project work and report have been approved by the project advisor and the advisor has submitted a grade report to the Registrar,
(B) A technical writer has approved the form, including the English of the report,
(C) If required by the advisor, the student has given an open-forum presentation at NPU, and
(D) The student has submitted two copies of the final version of the report to the administration office.

**Repeat:** A student unable to complete the project in the semester he/she is enrolled in the course is required to continue to enroll in the course, as for repeating the course, in the following semester until completion of the project.

The student receives either an “S” or letter grade for satisfactory performance and earns the credits or an “NP” grade for unsatisfactory performance without earning credit in each semester the project is being conducted. The project advisor has the option of issuing a letter grade to a project course. Extra credits earned for repeatedly taking the project course cannot substitute for other course requirements.

Courses numbered in the 100s and 200s are **lower-division** courses; courses numbered in the 300s and 400s are **upper-division** courses.

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**BBAIS Curriculum**
(Total 125 Units)

1. **36 units in general education courses**, including both lower- and upper-division general education courses:
   (a) **Humanities and Communications:** **18 units** in humanities and English including 9 units in humanities (HU) and 9 units in English and communications (ENGL),
   (b) **Natural Sciences and Mathematics:** **9 units** in natural sciences (BE, PHYS) and mathematics (MATH), including MATH208,
   (c) **Social Sciences:** **9 units** in social sciences (SOC),

2. **67 units in major requirements**, including
   (a) 24 lower-division units: CS150, ACC201, ACC202, ECON201, ECON202, and MGT201,
   (b) 43 upper-division units: BUS300, BUS398, FIN310, IT310, IT370, LAW310, MKT310, IT450, MGT450, MGT460, MKT450, BUS494 and BUS495.

3. At least **22 elective units including at least 18 in upper-division course work**:
   (a) The student may choose courses in any subject area (in- or outside business and IT area);
   (b) Two aggregates are provided to meet the needs of the students with backgrounds or interests in health service management or tourism and hospitality management areas.

**Notice:** There are a total of 58 units with the general education and elective coursework combined, including both lower- and upper-division courses. To meet the graduation requirements, the 58 units must include at least 36 units in general education; among the 58 units, at least 18 units must be in upper-division.
1. General Education (minimum 36 units)

The purpose of general education is to give breadth to the student’s education. With a general background in humanities, communication, Science and mathematics, and the social sciences, the student will be prepared for his/her roles both in society and at work. Students who have not completed the general education requirements upon entering a degree program at NPU are required to observe the following curriculum to meet the general education requirements:

(a) **Humanities and Communications:** 18 units in humanities and English including 9 units in humanities (HU) and 9 units in English and communications (ENGL),

(b) **Sciences and Mathematics:** 9 units in sciences and mathematics, including:

   MATH208  Statistics  (4)

(c) **Social Sciences:** 9 units in social sciences (SOC),

2. Major Requirements (minimum 67 units)

   [Business Administration and Information Technology, a major design experience]

   I. Lower-division

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS150</td>
<td>Computer Fundamentals</td>
<td>(4)</td>
</tr>
<tr>
<td>ACC201</td>
<td>Principles of Accounting - I</td>
<td>(4)</td>
</tr>
<tr>
<td>ACC202</td>
<td>Principles of Accounting - II</td>
<td>(4)</td>
</tr>
<tr>
<td>ECON201</td>
<td>Macroeconomics</td>
<td>(4)</td>
</tr>
<tr>
<td>ECON202</td>
<td>Microeconomics</td>
<td>(4)</td>
</tr>
<tr>
<td>MGT201</td>
<td>Principles of Management</td>
<td>(4)</td>
</tr>
</tbody>
</table>

   II. Upper-division

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS300</td>
<td>Business Communication</td>
<td>(3)</td>
</tr>
<tr>
<td>BUS398</td>
<td>Professional Development</td>
<td>(2)</td>
</tr>
<tr>
<td>FIN310</td>
<td>Fundamentals of Finance</td>
<td>(4)</td>
</tr>
<tr>
<td>IT310</td>
<td>Introduction to Information Technology</td>
<td>(4)</td>
</tr>
<tr>
<td>IT370</td>
<td>Database Design and Development for Business</td>
<td>(4)</td>
</tr>
<tr>
<td>LAW310</td>
<td>Introduction to Business Law</td>
<td>(4)</td>
</tr>
<tr>
<td>MKT310</td>
<td>Principles of Marketing</td>
<td>(4)</td>
</tr>
<tr>
<td>IT450</td>
<td>Enterprise Information System Fundamentals</td>
<td>(3)</td>
</tr>
<tr>
<td>MGT450</td>
<td>Organizational Behavior and Management</td>
<td>(3)</td>
</tr>
<tr>
<td>MGT460</td>
<td>Production and Operations Management</td>
<td>(3)</td>
</tr>
<tr>
<td>MKT450</td>
<td>Marketing Management</td>
<td>(3)</td>
</tr>
<tr>
<td>BUS494</td>
<td>Senior Project - I</td>
<td>(3)</td>
</tr>
<tr>
<td>BUS495</td>
<td>Senior Project - II</td>
<td>(3)</td>
</tr>
</tbody>
</table>

3. Electives (minimum 22 units- at least 18 units in upper-division coursework)

The student may select courses in any discipline (in- or outside business and information sciences area) to fulfill this requirement. For a list of courses in each area, please refer to the course listings in this catalog.

**BBAIS Total: 125 Units**
Master’s Degree Program

The School of Business and Information Technology offers two graduate degree programs: Master of Business Administration and Doctor of Business Administration.

Refer to the section on “Doctorate Degree Programs” for information on the Doctor of Business Administration program.

Master of Business Administration (MBA)

Objectives

The primary objectives of the master’s degree program are: (1) to provide a knowledge base of interdisciplinary business theories and techniques to the students, particularly to the working adult population, and (2) to train and to develop students’ practical management skills in a chosen concentrated area for career development, and (3) to develop the students’ decision-making capability to face the challenge of the dynamic business world staged with diverse, multicultural, and global business settings.

Concentration of Study: The MBA program provides an opportunity for the student to choose from a variety of concentration areas including: information technology and enterprise management systems, accounting, project and technology business management, global business marketing, legal issues and intellectual property management, health service management, and hospitality management.

Graduation Requirements

A minimum of 36 units of graduate-level course work is required for the Master’s degree students. Additional coursework may be required for a student with a non-business related undergraduate background.

The student must complete the following three categories of course requirements:

1. Required courses,
2. Area of Concentration courses,
3. Electives.

The following are required for graduation:

- A graduate student entered with background deficiencies must clear the deficiencies in the first few semesters after joining NPU.
- Earn a grade of “B-” or better in all required and concentration area courses,
- Earn a grade of “C-” or better in all elective courses,
- Maintain an overall G.P.A. of 3.0 or better,
- Maintain good standing with the University,
- The student is approved to graduate after filing a petition for graduation.

Courses numbered in 500’s and above are graduate courses.

Concentration Area and Career Planning

All graduates in the MBA program at NPU are advised to plan for their studies and choose a concentration area early. Upon completing 12 units in graduate course work, the student must choose a concentration area. Academic counselors are on-hand to assist the student to make his/her study plan and assess the technology trend and job market.

The students are encouraged to utilize the online eCareer Center and work with Student Services counselors to prepare their resumes and participate in job search activities when they are ready for such a pursuit.

Master’s Project/Thesis

Students interested in research and development work may choose to do a 3-unit master’s project or 6-unit master’s thesis and earn elective units. An information package concerning the project/thesis requirements and guidance is available online as well as in the administration office. The packages are distributed to the enrolled students in the project/thesis orientation workshop conducted twice each semester: first is conducted shortly after the pre-registration ends and the second in the first week of the new semester. A student taking a graduate project or master’s thesis should pay attention to the
requirements for completing the project/thesis.

**Advisor:** The master’s thesis course may be registered as a two-part course, with each part as a 3-unit course, taking a total of two semesters to complete. A faculty member serves as the project/thesis advisor to offer guidance to the student.

**Repeat:** A student unable to complete the project/thesis in the semester he/she is enrolled in the course is required to continue to enroll in the course the following semester until completion of the project/thesis. Upon completion of the project/thesis, the student or the project team is required to submit a project/thesis report, following the university’s project report guide, to the project advisor for approval before submitting it to a technical writer for editing. The student or the project team must also arrange an open-forum presentation to share the work experience with other students.

The student receives an “S” or letter grade for satisfactory performance and earns the credits, or an “NP” grade for unsatisfactory performance without earning credit in each semester the project is being conducted. Letter grades issued by the advisor are acceptable. Extra credits earned for repeatedly taking the project/thesis cannot substitute for other course requirements.

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**Undergraduate Preparation**

Students admitted into the MBA degree program are required to have the following background preparation. A student with any deficiency is required to clear it by either (1) taking the course at NPU and earning a grade of at least C- or higher or (2) taking and passing a proficiency exam on the subject. The student is advised to clear all deficiencies before attempting to enroll in graduate level courses.

1. **Mathematics and English/Communication:**
   - Statistics (MATH208);
   - English/communication (either BUS398 or BUS300 or a College English course);

2. **Computer/IT Fundamentals:** IT310; students choosing the Information Technology Management concentration must also have the background in IT370;

3. **Business Fundamentals:**
   a. Accounting and Finance: ACC201 and FIN310; students choosing the Accounting concentration must also have the backgrounds in ACC202 and ACC300,
   b. Economics and Marketing: MKT310 and Either ECON201 or ECON202,
   c. Management and Business Law: MGT201 and LAW310;

4. **Mezzanine courses** (*The student may earn graduate credit by taking the courses at NPU*):
   a. MGT450G Organizational Behavior and Management
   b. MGT460G Production and Operations Management

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**MBA Curriculum**

A minimum of 36 semester units of graduate study is required for the MBA program. A maximum of four (4) 4xxG courses (400 level courses with a G designation) are allowed to count towards graduation credits. The student must meet prerequisite requirements when taking any of the following courses.
I. Required Courses ................................................................. (12)

The required courses provide a knowledge base of interdisciplinary business theories and techniques and decision-making methodology. A student must take the following courses to complete the required graduate course requirement:

- BUS501    Quantitative Methods for Business
- FIN501    Financial Management
- MGT530    Logistics and Operations Management
- MGT531    Human Resources Management

II. Area of Concentration ............................................................... (12)

In addition to the required graduate courses in section I, a student must select an area of concentration and complete at least **12 units (4 courses)** in the chosen concentration area. This is to ensure the student’s competence in a selected area. The courses taken to fulfill the concentration requirement must not overlap the courses taken for the above Required Courses requirement. As new courses are also offered between publications of school catalogs, the students are advised to refer to the “Concentration Area Course Tables” published with each release of the semester class schedule to select courses for meeting the concentration area requirements.

**Area A. Information Technology Management**
(Background requirements: IT370 and *IT450G*)

Required courses:

- IT500    Advanced Management Information Systems (SAP)
- IT530    Enterprise Networking Fundamentals
- IT553    Business Intelligence and CRM
- IT560    Enterprise Resource Planning (ERP)

**Area B. Accounting**
(*Background requirement: ACC451G*)

Required courses:

- ACC501    Advanced Accounting
- ACC512    Federal Taxation of Business Enterprises
- ACC630    Auditing
- ACC640    Accounting Information Systems

**Area C. Project Management**
(Background requirement: Advanced graduate standing)

Required courses:

- MGT501    Project and Risk Management
- MGT540    Management of Innovation
- MGT542    Technology Product Management and Marketing
- MGT635    Advanced Operations Management

**Area D. Global Business Marketing**
(*Background requirement: MKT450G Marketing Management*)

Required courses:

- MKT541    Strategic Marketing
- MKT542    International Marketing
- MKT545    International Trade and Operations
- MKT650    e-Commerce Marketing
III. Electives .......................................................... (12)

Students may elect graduate-level courses (4xxG, 500-level, and higher level courses) in any discipline as electives to meet the elective requirements.

Mezzanine Courses for program requirement – Students admitted with a background deficiency in organizational behavior and management must take the course “MGT450G Organizational Behavior and Management” course and those with a deficiency in production and operations management must take “MGT460G Production and Operations Management” course at NPU. Credits earned can be counted as elective credits towards the MBA graduation requirements.

* Other background requirements for the concentration area: Each concentration area requires certain 400 level background courses. Students may earn credit towards the degree, if observing the limit for the number of 400-level courses for the program, by taking these courses, such as
  a. Area A (Information Technology Management): IT450G,
  b. Area B (Accounting): ACC451G,
  c. Area D (Global Business Marketing): MKT450G,

MBA Total Requirements: (36 units)
Doctorate Degree Programs

NPU offers two doctorate degree programs:

(1) Doctor of Business Administration
(2) Doctor of Computer Engineering

Mission

The mission of the doctorate degree programs is to provide an opportunity for the students to attain professional and practical competence which qualifies the students for opportunities and additional responsibilities beyond the master's degree level. The doctorate programs are offered with the emphasis of practical and real-world applications in both the course work and the doctoral thesis requirements.

Objectives

The doctorate degree programs emphasize both mastery of subject matter as well as an understanding of related research and research methodology for professional-oriented projects/theses. The programs aim to develop the student’s ability to integrate and apply original and practical research into the subject matter. Each program is designed for the student to accomplish specified goals and objectives and contribute to competence in the subject area or profession at an advanced level.

Doctoral Advisory Committees

Each doctorate degree program is governed by its Doctoral Advisory Committee. The committee is responsible for developing, modifying, and maintaining the doctorate degree program. Committee members include qualified NPU faculty and administrators as well as other qualified professionals or practitioners not affiliated with NPU. Each committee is knowledgeable in methods of research and in the subject matter, co-chaired by credentialed individuals with expertise in the program area.

While pursuing their studies in the doctorate program, the students are required to work with their respective Doctoral Advisory Committee as well as advisors appointed by the committee.

Applicant Qualifications

1. Earned Bachelor’s or Master’s degrees in a related field with a cumulative GPA of 3.0 or above from an accredited or government recognized institution,
2. Strong interest in advanced study in the chosen subject area,
3. English proficiency,
4. Previous work experience in related field is preferred.

Admission Policies

NPU admits qualified students to pursue their studies in the doctorate degree programs with the following policies:

- NPU admits all qualified individuals into the university without regard to race, religion, sex, ethnic origin, or physical handicap.
- NPU makes education available to all individuals who meet the qualifications for entrance into NPU.

Application Material

1. A completed application form for the doctorate degree program (online application is available),
2. Application fee,
3. Official transcripts from all colleges and universities attended, including at least one showing a completed undergraduate program in related field. All official transcripts must be received before the admission evaluation. Applicants enrolled in courses at another institution at the time of application will have 60 days after the completion of the courses to provide the updated transcript. Any other transcripts submitted after the admission evaluation will not be accepted,
4. Evidence of English proficiency: Follow the same policy established for all applicants. Refer to the section on “Entrance English Requirement” in the section under “Admission Policies” in this catalog,
5. Entrance exam: Applicants to the Doctor of Business Administration degree program are required to take the GMAT. NPU’s Institution code for reporting the GMAT scores is 5485.
Applicants to the Doctor of Computer Engineering degree program are required to take the GRE. NPU’s Institution code for reporting the GRE scores is 5485. Applicants without the GMAT/GRE score will be required to take an equivalent placement test at NPU before or on the New Student Orientation Day. The score is primarily used for reference and analysis purposes.

6. A professional work history or a professional vita preferred,

7. An international applicant is also required to submit the following additional documents: (a) a financial support document – either the applicant’s bank statement or a certified affidavit of support (form I-134 or equivalent) from a financial sponsor indicating a minimum amount of $15,500 available for the applicant to pursue his/her study in the first academic year at NPU; (b) a transfer student is required to submit a photocopy of his/her previous I-20 form and request the previous international student advisor to complete the International Student Transfer Record form for NPU and conduct the required SEVIS transfer process, and (b) upon arrival to NPU, photocopies of the student’s passport, visa, and I-94 (admission & departure) document.

**Notification of Admission**

Normally, prospective students may expect to receive notification of admission status within two weeks after filing complete application materials with the Admissions Office.

**Cancellation of Admission**

If an applicant is accepted into a doctorate degree program for a given semester and does not begin classes in that semester, admission will automatically be canceled. The prospective student’s application records (transcripts from previous colleges, financial support documents for international students, and standardized test scores) are kept on file for a period of six months from the semester start date. If the applicant then wishes to be considered for readmission in a later semester, he/she will be required to resubmit an Application Form and pay a re-application fee. A reevaluation of admission will be made for the applicant.

**Transfer of Credit**

Students who wish to transfer graduate credit from another recognized institution are allowed to transfer a maximum of twenty (20) graduate semester units towards a doctorate degree at NPU.

**Life/Work Experience:** No credit will be awarded for life or work experience.

**Admission Evaluation**

The admission committee for each doctoral degree program will conduct an admission evaluation for each applicant based on the official records received from the applicant. An evaluation report will be generated for the applicant; it includes an academic background evaluation and credit transfer information. A layout of the program requirements is also given in the report.

The background requirements for each doctoral degree program are specified in the section of “Undergraduate Preparation” near the beginning of the program description.

**Tuition**

Tuition for courses taken to fulfill the graduation requirements for the Doctor of Business Administration program is $390/unit. Tuition for courses taken to fulfill the graduation requirements for the Doctor of Computer Engineering program is $450/unit.

Refer to the sections on “Tuition and Fees” and “Refund Policy” in this catalog for other fees and refund information.

**Academic Information**

Refer to the section on “Academic Information” in this catalog for the academic policies and regulations observed by all students.

**Graduation Requirements**

1. A minimum of 102 semester units beyond the bachelor’s degree is required to complete the study of a doctoral degree program, including 90 units of course work plus a minimum of 12 units of doctoral thesis or a comprehensive capstone project.

2. **Length of Study:** The length of study in a doctorate degree program is at a minimum of three (3) years and a maximum of seven (7) years. The normal length of study for a
student with a bachelor’s degree is 4-5 years. The normal length of study for a student with a master’s degree is 3-4 years.

Request for an extension of the study period beyond 7 years due to special reasons requires approvals by both the Doctoral Advisory Committee and the Dean of Academic Affairs.

3. All courses require appropriate usage of research and library resources.

4. **Statement of Purpose:** Upon completing 30 graduate units in Foundation Requirements, the student is required to submit a statement of purpose to the Doctoral Advisory Committee, or its appointed academic committee. The student will be requested to also make an oral presentation. The statement should include at least the student’s learning objective, practical research plan, and showing ability to integrate and apply practical research into the subject matter. Students unable to make a satisfactory statement of purpose may be advised to pursue a master’s degree instead.

This serves as a checkpoint in the student’s pursuit of the doctoral study.

5. The doctoral thesis or comprehensive capstone project must be reviewed, evaluated, and assessed by a committee appointed by the respective Doctoral Advisory Committee; the evaluating committee must include at least one individual from another appropriately accredited institution within the subject area. The student receives either an “S” or letter grade for satisfactory performance and earns the credits or an “NP” grade for unsatisfactory performance without earning credit in each semester the thesis is being conducted.

6. The student is required to maintain a minimum of 3.0 GPA every semester during the entire tenure of study. In addition, a grade of “B-” or better is required in all courses and thesis.

7. Students enrolled in the doctoral thesis or project course must follow the requirements specified in the Doctoral Thesis Handbook. A student unable to complete the doctoral thesis or project after earning 12 units in the thesis/project course is required to continue to enroll in the 6-unit doctoral thesis course part-II in the following semester and pay at the regular unit tuition rate until completion of the thesis/project. Extra credits earned for repeatedly taking the thesis/project can not substitute other course requirements.

8. An approved petition for graduation must be on file.

9. The student must maintain good standing with the University.

In each doctoral degree program, there are four categories of course requirements:

(1) Foundation courses
(2) Core courses
(3) Advanced major studies and elective courses
(4) Doctoral thesis/project

Courses numbered in 500’s and above are graduate courses. A number of courses numbered in 400’s with a “G” suffix are scheduled among the required foundation courses and the students may earn graduate credit by taking these courses.

- **Student Discipline, Student life, and Facilities**

Refer to the sections on “Student Discipline”, “Student Life”, “Facilities”, and others for relevant information unless otherwise stated in this section on “Doctoral Degree Programs”.

- **Faculty**

All faculty members serving as doctoral project/thesis or academic advisors possess graduate and terminal degrees, have demonstrated proper academic preparation and experience, and hold the same educational philosophy consistent with the university to encourage the best efforts of each learner. Faculty members are encouraged to engage in practical or scholarly research and to publish in professional journals.

Faculty members are to inspire, motivate, and direct student usage of the library resources.

- **Library & Instructional Resources**

Library and instructional resources are vital to the faculty as well as the doctoral students in their learning and research activities. The school is equipped with its on campus Learning Resource Center as well as the on-line learning resource environment to meet such needs. In this catalog, detail information is described in the sections on “Teaching and Research Facilities” and “The University Library and Learning Resource Facility” on pages 30-35. In addition, the university has an internal IT division to provide information.
management and development services to support the doctorate degree program students in their pursuit of the course work studies and thesis research.

Doctor of Business Administration (D.B.A.)

Undergraduate Preparation

Students admitted into the D.B.A. degree program without the following background preparation are required to clear the deficiencies early by taking and passing either (1) these courses at NPU or (2) the proficiency exams at NPU. Grades earned must be at least C- or higher. These students are advised to clear all deficiencies before attempting to enroll in graduate level courses. A student’s background deficiency information is provided on the admission evaluation form.

1. Mathematics and English/Communication:
   - Statistics (MATH208);
   - English/communication (either BUS398 or BUS300 or a College English course);

2. Computer/IT Fundamentals: IT310 and IT370;

3. Business Fundamentals:
   a. Accounting and Finance: ACC201 and FIN310,
   b. Economics: ECON201,
   c. Management and Business Law: MGT201 and LAW310,
   d. Marketing: MKT310.

D.B.A. Curriculum

A minimum of 102 semester units of graduate study is required for the D.B.A. program. Among them, 90 units are required to be graduate course work and a minimum of 12 units are in doctoral thesis or capstone research project work. Courses at 4xxG level must be taken at NPU in order to earn graduate credits. The student must meet prerequisite requirements when taking any of the following courses.

I. Foundation Requirements (First year of study) ...................................... (30)
   (Foundation in enterprise management and information systems, quantitative analysis)

Courses listed in this section should be completed by the student in the first year of study in the program.

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC480G</td>
<td>Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>FIN450G</td>
<td>Financial Markets and Institutions</td>
<td>3</td>
</tr>
<tr>
<td>IT450G</td>
<td>Enterprise Information System Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>MGT450G</td>
<td>Organizational Behavior and Management</td>
<td>3</td>
</tr>
<tr>
<td>MGT460G</td>
<td>Production and Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>MGT480G</td>
<td>Entrepreneurship and Venture Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS501</td>
<td>Quantitative Methods for Business</td>
<td>3</td>
</tr>
<tr>
<td>FIN501</td>
<td>Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>MGT530</td>
<td>Logistics and Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>MGT531</td>
<td>Human Resources Management</td>
<td>3</td>
</tr>
</tbody>
</table>
II. **Core Requirements** (Second year of study) .................................................. (30)

In addition to the first year foundation coursework, a student must take advanced level graduate courses (courses at 500 level and above), a research methodology course, research seminar, and teaching/TA training courses, as well as courses to prepare breadth of study for further mastery of the subjects of interest and in-depth understanding of related research. Courses described in this section (section II) should be taken immediately following the required foundation courses described in section I.

A. **Required Courses** (24)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN568</td>
<td>Corporate Finance</td>
<td>(3)</td>
</tr>
<tr>
<td>IT530</td>
<td>Enterprise Networking Fundamentals</td>
<td>(3)</td>
</tr>
<tr>
<td>LAW570</td>
<td>Modern Law of Corporations</td>
<td>(3)</td>
</tr>
<tr>
<td>MGT501</td>
<td>Project and Risk Management</td>
<td>(3)</td>
</tr>
<tr>
<td>MKT545</td>
<td>International Trade and Operation</td>
<td>(3)</td>
</tr>
<tr>
<td>FIN620</td>
<td>Portfolio Management</td>
<td>(3)</td>
</tr>
<tr>
<td>IT602</td>
<td>Emergent Information Technologies for Business</td>
<td>(3)</td>
</tr>
<tr>
<td>MGT601</td>
<td>Strategic Management</td>
<td>(3)</td>
</tr>
</tbody>
</table>

B. **Research Methodology and Teaching/TA Training** (6)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBA601</td>
<td>Research Methodology</td>
<td>(3)</td>
</tr>
<tr>
<td>DBA602A</td>
<td>Research Seminar - I</td>
<td>(1)</td>
</tr>
<tr>
<td>DBA602B</td>
<td>Research Seminar - II</td>
<td>(1)</td>
</tr>
<tr>
<td>DBA603</td>
<td>Teaching/TA Training Seminar</td>
<td>(1)</td>
</tr>
</tbody>
</table>

III. **Advanced Studies and Electives** (Third year of study) ...................... (30)

A. **Advanced Studies:** (24)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGT635</td>
<td>Advanced Operations Management</td>
<td>(3)</td>
</tr>
<tr>
<td>MGT645</td>
<td>Venture Partnership, IPO and Acquisition</td>
<td>(3)</td>
</tr>
<tr>
<td>MKT630</td>
<td>Consumer Behavior</td>
<td>(3)</td>
</tr>
<tr>
<td>MKT632</td>
<td>New Product Development</td>
<td>(3)</td>
</tr>
<tr>
<td>MKT650</td>
<td>e-Commerce Marketing</td>
<td>(3)</td>
</tr>
<tr>
<td>LAW670</td>
<td>Intellectual Property Law</td>
<td>(3)</td>
</tr>
<tr>
<td>MGT670</td>
<td>Entrepreneurship and High Technology Business</td>
<td>(3)</td>
</tr>
<tr>
<td>MGT685</td>
<td>Organizational Learning in Global business</td>
<td>(3)</td>
</tr>
</tbody>
</table>

B. **Electives:** (6)

The student is encouraged to take two 500/600 level elective courses outside the major area to meet this requirement

IV. **Doctoral Thesis** ................................................................. (12)

A Doctoral Thesis Committee (DTC) must be formed and approved by the Doctoral Advisory Committee before the student starts his doctoral research. The doctoral candidate is required to earn a minimum of 12 units in the work towards completion of Doctoral Thesis to meet the graduation requirement.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBA799</td>
<td>Doctoral Thesis – I</td>
<td>(6)</td>
</tr>
<tr>
<td>DBA800</td>
<td>Doctoral Thesis – II</td>
<td>(6)</td>
</tr>
</tbody>
</table>

**D.B.A. Total Requirements:** (min. 102 units)
Doctor of Computer Engineering (D.C.E.)

Undergraduate Preparation

Students admitted into the D.C.E. degree program without the following background preparation are required to clear the deficiencies early by taking and passing either (1) these courses at NPU or (2) the proficiency exams at NPU. Grades earned must be at least C- or higher. These students are advised to clear all deficiencies before attempting to enroll in graduate level courses. A student’s background deficiency information is provided on the admission evaluation form.

1. Mathematics and English/Communication:
   - Engineering mathematics (MATH201, MATH202, MATH203, MATH208);
   - English/communication (One of the following: CE398, BUS300 or a College English course);
2. Engineering Sciences: PHYS201, PHYS202; PHYS301 recommended;
3. Electrical Engineering Subjects:
   - Circuit theory (EE210);
   - Digital circuits and logic design (EE205, EE323);
4. Computer Science Subjects:
   - Programming languages and data structures (CS204, CS350, CS360);
   - Operating systems (CS230, CS380);

D.C.E. Curriculum

A minimum of 102 semester units of graduate study is required for the D.C.E. program. Among them, 90 units are required to be graduate course work and a minimum of 12 units are in doctoral thesis or capstone research project work. Courses at 4xxG level must be taken at NPU in order to earn graduate credits. The student must meet prerequisite requirements when taking any of the following courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE450G</td>
<td>Fundamentals of Embedded Systems</td>
<td>3</td>
</tr>
<tr>
<td>CE453G</td>
<td>Compiler Design</td>
<td>3</td>
</tr>
<tr>
<td>CE470G</td>
<td>Computer Networks</td>
<td>3</td>
</tr>
<tr>
<td>EE481G</td>
<td>Microcomputer Structure and Programming</td>
<td>3</td>
</tr>
<tr>
<td>IT450G</td>
<td>Enterprise Information System Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>MGT460G</td>
<td>Production and Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>CE502</td>
<td>Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE506</td>
<td>Operating System Design</td>
<td>3</td>
</tr>
<tr>
<td>EE501</td>
<td>Advanced Engineering Analysis</td>
<td>3</td>
</tr>
<tr>
<td>EE504</td>
<td>Advanced Computer Organization and Structure</td>
<td>3</td>
</tr>
</tbody>
</table>

II. Core Requirements (Second year of study) .......................................................... (30)

In addition to the first year foundation coursework, a student must take advanced level graduate courses (courses at 500 level and above), a research methodology course, research seminar, and teaching/TA training courses, as well as courses to prepare breadth of study for further mastery of the subjects of interest and in-
depth understanding of related research. Courses described in this section (II) should be taken immediately following the required foundation courses described in section I.

A. Computer Engineering Courses: (15)

The student must take at least 15 units of graduate courses in computer engineering area (courses with EE, CE, CS designations). The student receives consultation from course advisors when taking these courses.

B. Research Methodology and Teaching Training (6)

DCE601 Research Methodology (3)
DCE602A Research Seminar - I (1)
DCE602B Research Seminar - II (1)
DCE603 Teaching/TA Training Seminar (1)

C. Courses Preparing Breadth of Study (9)

IT602 Emergent Information Technologies for Business (3)
LAW670 Intellectual Property Law (3)
MKT632 New Product Development (3)

III. Advanced Studies and Electives (Third year of study) ......................... (30)

A. Advanced Studies: (24)

The student must take at least eight 600 level graduate courses in computer engineering area (courses with EE, CE, CS designations). The student receives consultation from course advisors when taking these courses. Due to fast-paced technological advancement in computer hardware and software industries, NPU’s Curriculum Committee updates the engineering courses regularly; new advanced courses have regularly been proposed by the engineering faculty members. Courses approved by the Curriculum Committee are added to semester course offerings between publications of the school catalog.

B. Electives: (6)

The student is encouraged to take two 500/600 level elective courses outside the major area to meet this requirement.

IV. Doctoral Thesis ................................................................. (12)

A Doctoral Thesis Committee (DTC) must be formed and approved by the Doctoral Advisory Committee before the student starts his doctoral research. The doctoral candidate is required to earn a minimum of 12 units in work towards completion of Doctoral Thesis to meet the graduation requirement.

DCE799 Doctoral Thesis – I (6)
DCE800 Doctoral Thesis – II (6)

D.C.E. Total Requirements: (min. 102 units)
Course Descriptions

For undergraduate programs, lower division courses are numbered in the 100s and 200s, and upper division courses are numbered in the 300s and 400s. Graduate courses are numbered in the 500s and above. Each graduate program allows for a limited number of credits for 400 level courses with a “G” suffix.

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Description</th>
<th>Course No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-199</td>
<td>Freshman level courses</td>
<td>200-299</td>
<td>Sophomore level courses</td>
</tr>
<tr>
<td>300-399</td>
<td>Junior level courses</td>
<td>400-499</td>
<td>Senior level courses</td>
</tr>
<tr>
<td>450G-499G</td>
<td>Mezzanine courses for graduates</td>
<td>500-799</td>
<td>Graduate level courses</td>
</tr>
</tbody>
</table>

Courses are listed by subject: Accounting, Bioengineering, Business (general courses), Computer Engineering, Computer Science, Economics, Electrical Engineering, English, Finance, Humanities, Information Technology, Law, MBA special topics and project, Management, Marketing, Mathematics, Physics and Physical Sciences, and Social Science.

Instructor’s consent: Prerequisite containing the phrase of “or instructor’s consent” is an option for the student to request the instructor to assess the student’s ability and background in the listed prerequisite subjects when the student has acquired the background through other means, such as work or other experience.

Graduate standing: Graduate students who have started to take graduate level courses.

Advanced graduate standing: Graduate students who have completed at least two semesters’ graduate coursework.

See page 106 for cross-listed courses. See page 107 for courses periodically offered with online mode of instructions. These courses are normally offered concurrently with the standard in-class sessions.

Accounting

ACC201 Principles of Accounting - I (4 units)
This course is the first of a 2-part basic accounting principles series. Topics include an introduction to basic elements of financial accounting, recording and analyzing financial transactions, opening and using accounts of various types, setting up and using a general journal, accounting methods for service businesses, and accounting methods for corporations. Students are required to use popular accounting tools, such as QuickBook, for homework and exercises. Other PC-based accounting software may also be introduced to the students for practice.

Prerequisite: Sophomore standing or instructor’s consent.

ACC202 Principles of Accounting - II (4 units)
This course is the second of a 2-part basic accounting principles series. Topics include analysis of accounting information, reporting, cash flows, and financial statements; management accounting and product costing, managerial accounting concepts and principles, manufacturing and job order cost accounting, process cost accounting, cost allocation, performance measurement, cost planning and control, cost-volume-profit analysis, master budgets and planning, and strategic analysis in managerial and cost accounting. Students are required to use popular accounting tools, such as QuickBook and PeachTree, for homework and exercises. Other PC-based accounting software may also be introduced to the students for practice.

Prerequisite: ACC201

ACC300 Cost Accounting (3 units)
This course teaches the students the process and job-order methods, relationships among cost, volume, and profit; standard costs, variance analysis, activity based costing, quantitative method and models used in cost accounting. It also teaches the students to apply the fundamentals to decision making in a business.

Prerequisite: ACC202 or instructor’s consent.

ACC451(G) Intermediate Accounting - I (3 units)
This course is designed for students who are interested in pursuing careers as accounting professionals. This course builds on the knowledge obtained in Principles of Accounting series. Topics include understanding financial accounting and accounting standards, financial statement preparation, required disclosures, and in-depth study of current assets, revenue recognition and fixed assets. Students are required to use popular accounting tools, such as PeachTree, for homework and exercises.

Prerequisites: ACC202 and FIN310
ACC452(G) Intermediate Accounting - II (3 units)
This course is a continuation of Intermediate Accounting - I. Subject matter includes current and long-term liabilities, stockholders’ equity, investments, pension and post-retirement benefits, leases and cash flow statements.
Prerequisite: ACC451

ACC480(G) Managerial Accounting (3 units)
This class applies the essentials of financial accounting to the practice of management. Students will understand cost definitions, cost concepts, cost behavior and cost estimation; also, how cost accounting is applied to manufacturing and service organizations, the principles of planning and control for effective cost-related management, capital budgeting, cash flow statements, and how to analyze financial statements.
Prerequisite: ACC201 or instructor’s consent.

ACC490(G) Introduction to Taxation (3 units)
This course covers taxation concepts applied to individual’s income, deductions, credits, property transactions, and tax accounting methods. An understanding of the concepts will enable students to prepare quality individual income tax returns as a professional. The course will also cover taxation rules governing financial planning.
Prerequisite: ACC201

ACC501 Advanced Accounting (3 units)
This course is designed for accounting track graduate students who want to have a complete understanding of the concept of consolidation requirements, consolidated financial statements, and accounting techniques relating to particular types of business and non-business entities. The student will also explore various tax aspects of consolidated financial statements and participate in case studies.
Prerequisite: ACC201

ACC512 Federal Taxation of Business Enterprises (3 units)
This course is designed to give students an understanding of the concepts of federal taxation of corporations, partnerships, estates and trusts. An understanding of the concepts will enable students to prepare corporation and partnership tax returns in a professional environment. Also covered are rules governing estates and trusts.
Prerequisite: ACC202

ACC620 Accounting for the Global Firm (3 units)
This course covers international business structures from an accounting perspective. Financial and managerial accounting aspects will both be considered. Currency translation, taxation, intercompany transfer pricing, and tax credits are also covered.
Prerequisite: ACC202

ACC630 Auditing (3 units)
In this course, students learn auditing techniques with an emphasis on the Electronic Data Processing environment, audit procedures, practice and programs; working paper preparation and report writing. The students will experience using electronic auditing software to work on their homework and projects.
Prerequisite: ACC202

ACC640 Accounting Information Systems (3 units)
This course provides a conceptual framework for contemporary accounting information systems and accounting cycles. It covers database concepts, internal control, transaction cycle and business process, expenditure cycle, conversion cycle, general ledger, and enterprise resource-planning systems. Students may be introduced to SAP R/3 for data manipulation and report generation.
Prerequisite: ACC202

Bioengineering

BE300 Introduction to Biological Science (3 units)
This course introduces the scientific method, biological chemistry, enzymes, metabolism, cells, genetics, biotechnology pertaining to biotech and bioengineering. The objectives are for the students to learn: (1) the fundamentals of chemistry, basic units of life, and cells, (2) basic chromosomal biology, (3) description of plant biology, and (4) to understand the circulatory system, digestion, and absorption.
(Upper-division GE in Area B- Science)

BE450/G Introduction to Bioengineering (3 units)
This course presents an overview of the bioengineering and biotech fields. It is intended to build a solid foundation for students who are interested in exploring emerging bioengineering fields such as bioinformatics and biometrics. Topics include fundamentals of biology, cell biology, genes and proteins, molecular genetics, the impact of modern biology on science and medicine, biosensors, biochips, bioinstrumentation, computer-aided diagnosis and biometrics.
Prerequisites: MATH201 and PHYS201.

BE510 Biometrics and Computer-Aided Detection (CAD) Technology (3 units)
The course introduces the concepts and principles of biometrics and CAD. Topics include neural networks, fuzzy logic, genetic algorithms, fingerprint, face recognition, voice recognition, computer-aided diagnosis, and their applications and implementation.
Prerequisite: BE450

BE520 Bioinformatics Programming and Applications (3 units)
This course introduces the fundamental concepts and methods used in the current interdisciplinary bioinformatics field for the purpose of understanding the informational flow encoded in human genome sequences. Several educational software programs are employed on the UNIX and Linux systems to give the students a hands-on
experience in emerging bioinformatics technology. The students also learn to write scripts and simple algorithms to extract sequence and structure patterns from a database and study the correlations between the patterns and their biological functions. In addition, the students learn to develop tools and programs for data mining in sequence and structure databases.

Prerequisites: CS350 and BE450

BE630 Biochip (3 units)
This course is designed for graduate students to explore the field of biochips. Topics include biochip history, various biochip technologies, industry trends, applications and the potential future of biochips.
Prerequisites: BE450

BE650 Advanced Topics on Bioengineering (3 units)
Advanced topics on bioengineering will be given by faculty members or invited guest speakers to expose the students to emerging bioengineering technology.
Prerequisites: BE450 and other prerequisites based on the topics.

Business (general courses)

BUS300 Business Communication (3 units)
This course instructs and develops business communication skills that are essential for daily business and professional activities. Topics include professional memo writing, e-mail format and filing, business letters and correspondence, and business reports. Attention will also be devoted to improving students’ active listening, speaking and nonverbal communication skills.
Prerequisites: Senior or graduate standing.

BUS398 Professional Development (2 units)
This course instructs the student to develop his/her professional career. Topics cover personality assessment, professional ethics, understanding the business professional world, recognizing company culture and organizational structure, how to survive office politics, career paths and pitfalls, resume writing and cover letters, and interview techniques.
Prerequisite: Junior or senior standing.

BUS399A Internship - I (2 units)
This course is designed for seniors in the School of Business to develop on-the-job skills by participating in real-world business activities. Internship project reports are required. Students are required to report to the campus internship coordinator on a regular basis. Only an “S” or “F” grade can be earned in this course. Credit will be counted as undergraduate electives only. Students are allowed to enroll in one internship course each semester. An undergraduate student is allowed to take no more than three Internship courses within a program of study. Graduate students, with approval from the internship coordinator, may enroll in this undergraduate course to gain practical experience. They must sign up for undergraduate units only. No graduate credit can be earned for this course.
Prerequisite: Advance approval from the internship coordinator.

BUS399B Internship - II (2 units)
This is the second course in the Business Internship series. It gives an opportunity to business students to participate in real-world business practice for a second term. Internship project reports are required and the student must regularly report to the on-campus internship coordinator. Only an “S” or “F” grade can be earned in this course. Credit can be counted as undergraduate electives only. The student is allowed to enroll in one internship course per semester. An undergraduate student is allowed to take no more than three Internship courses within a program of study. Graduate students, with approval from the internship coordinator, may enroll in this undergraduate course to gain practical experience. They must sign up for undergraduate units only. No graduate credit can be earned for this course.
Prerequisites: BUS399A and advance approval from the internship coordinator.

BUS399C Internship - III (2 units)
This is the third in a series of three courses designed for business students to participate in a real-world business setting. Internship project reports are required and the student must report to the on-campus project coordinator regularly. Only an “S” or “F” grade can be earned in this course. Credit can be counted as undergraduate electives only. The student is allowed to enroll in one internship course per semester. An undergraduate student is allowed to take no more than three Internship courses within a program of study. Graduate students, with approval from the internship coordinator, may enroll in this undergraduate course to gain practical experience. They must sign up for undergraduate units only. No graduate credit can be earned from this course.
Prerequisites: BUS399B and advance approval from the internship coordinator.

BUS494 Senior Project - I (3 units)
This is the first part of a 2-trimester senior project series. The course develops the creativity of graduating seniors in the Business and Information Sciences program by completing a research project. The student must follow the project progress guideline and project report style guide to conduct and complete the project work. The student is encouraged to do a real-life project by working with a business organization to develop and implement the project objectives. In the first part of the series, the student must complete the specifications for the subject, project objectives, research procedures, data collection, problem analysis, defining implementation methods, estimating effectiveness of methods, conducting implementation, and writing an initial draft of the project report.
**Computer Systems Engineering**

**CE305 Computer Organization**  (4 units)

This course is designed to provide a fundamental understanding of the issues and challenges involved in designing and implementing modern computer systems. The primary goal is to help students become more skilled in their understanding of computer systems, including how the hardware and software interact with each other. This course will also provide an understanding of where computers came from and where they are going, as well as understanding their strengths and weaknesses, such as why compiled code will always execute faster than JAVA code. Subjects will include: RISC vs. CISC CPU design approach, instruction sets, pipelining, instruction scheduling (branch prediction, speculative and out-of-order execution, etc), cache and storage hierarchy design. Additional key focuses will be on modern I/O architectures such as PCI, PCI-X, SATA, SCSI, USB, etc., and their importance on performance and compatibility.  
**Prerequisite:** EE205

**CE398 Professional Development**  (2 units)

This course instructs the student to develop his/her professional career. Topics cover personality assessment, professional ethics, understanding the engineering professional world, recognizing company culture and organizational structure, how to survive office politics, career paths and pitfalls, resume writing and cover letters, and interview techniques.  
**Prerequisite:** Junior or senior standing.

**CE399A Internship - I**  (2 units)

This course allows seniors in the Computer Systems Engineering program to learn by participating in real-world professional engineering activities. Internship project reports are required. The student must regularly report to the on-campus internship coordinator. Only an “S” or “F” grade can be earned in this course. Credit can be counted as undergraduate electives only. The student is allowed to enroll in one internship course per semester. An undergraduate student is allowed to take no more than three internship courses within a program of study. Graduate students, with approval from the internship coordinator, may enroll in this undergraduate course to gain practical experience. Students must sign up for undergraduate units only. No graduate credit can be earned by taking this course.  
**Prerequisite:** Advance approval from the internship coordinator.

**CE399B Internship - II**  (2 units)

This course is for students in the Computer Systems Engineering program to participate in real-world professional engineering practice for a second term. Internship project reports are required. The student must report regularly to the on-campus project coordinator. Only an “S” or “F” grade can be earned in this course. Credit can be counted as undergraduate electives only. The student is allowed to enroll in one internship course per semester. An undergraduate student is allowed to take no more than three internship courses within a program of study. Graduate students, with approval from the internship coordinator, may enroll in this undergraduate course to gain practical experience. They must sign up for undergraduate units only. No graduate credit can be earned by taking this course.  
**Prerequisite:** CE399A and advance approval by the internship coordinator.

**CE399C Internship - III**  (2 units)

This course is for students in the Computer Systems Engineering program to participate in real-world professional engineering practice. Internship project reports are required and the student must report to the internship coordinator on campus regularly. Only an “S” or “F” grade can be earned in this course. Credit can be counted as undergraduate electives only. The student is allowed to enroll in one internship course per semester. An undergraduate student is allowed to take no more than three internship courses within a program of study. Graduate students, with approval from the internship coordinator, may enroll in this undergraduate course to gain practical experience. They must sign up for undergraduate units only. No graduate credit can be earned by taking this course.  
**Prerequisite:** CE399B and advance approval by the internship coordinator.
CE450(G) Fundamentals of Embedded Systems  
(3 units)  
This is the first in a series of embedded systems courses designed for students who are interested in learning real-time embedded systems and practicing real-time programming of embedded systems. Topics include hardware issues including platform, microprocessors commonly used in these systems and how a microprocessor works in such systems, concept of memory, registers, I/O; interrupt generation and handling in an embedded system; the concept of real-time programming, multi-task, concurrency, mutual exclusion; overview of real-time kernel/OS, drivers; system initialization and startup, and debug issues. Hands-on exercises are required.  
Prerequisite: CS380 or EE481

CE453(G) Compiler Design  
(3 units)  
This course is designed to give students a fundamental knowledge of compilers and interpreters for modern computer languages. Topics include a study of modern computer languages, regular expressions, lexical analysis, parsing techniques, context-free grammars, and syntax-directed translation. Hands-on exercises and trimester projects are required.  
Prerequisite: CS380

CE470(G) Computer Networks  
(3 units)  
This course is designed to give students a global picture of computer networks. Topics include network-layered models (OSI, TCP/IP), data communication basics, circuit switching, packet switching, routing, and internetworking. Hands-on exercises are required.  
Prerequisite: CS380

CE494 Senior Design Project - I  
(3 units)  
This is the first part of a 2-trimester senior design project series. The project course is designed to develop the creativity of every graduating senior in Computer Systems Engineering through the exercise of the design effort on a self-selected project. The design project must be open-ended, whereas the design approach must employ the modern design techniques and methodologies in the related fields. Completion of the design project series entails (1) formulation of a design problem statement including realistic constraints such as economic factors, safety, and reliability issues, (2) design specifications, (3) consideration of alternative solutions, (4) manufacturing procedures, and (5) operation instructions. The research topic and proposal must be approved by the project advisor. The student must follow the design project work progress guideline through the period of research, implementation, testing, report writing, and related procedures and meet with the advisor regularly. The format for the report must be in accordance with NPU’s Project Style Guide. In the first part of the series, the student must complete the specification and initial design with sufficient detail to estimate the effectiveness of the project; the student should also complete the initial draft of the project report.  
Prerequisite: Advanced senior standing and Advisor’s approval.

CE495 Senior Design Project - II  
(3 units)  
This is the second part of a 2-trimester senior design project series. The student continues the design and construction of the project, system, or device, and completes the final report, including the design, implementation, and management of the project. Upon completion of the project, the student is required to conduct an open-forum presentation of the project.  
Prerequisite: CE494

CE502 Software Engineering  
(3 units)  
This course is designed to demonstrate the engineering approach to the development of large, high-quality software projects. Topics include software life cycle, development process, requirement specifications, design and testing techniques, verification and validation, and software management. Students learn to use project management tools, principles, and environment to facilitate development of software programs/systems. Hands-on exercises and projects are required.  
Prerequisites: CS360

CE504 Introduction to Wireless Communication  
(3 units)  
This course is the first for the wireless communication concentration. The purpose is to provide a broad but essential knowledge in wireless technology for the engineering students to pursue the wireless networks concentration. Topics include an overview of key wireless technologies; voice, data, cordless, paging, fixed and mobile broadband wireless systems; wireless system design fundamentals, path loss and related factors, modulation techniques, multiple access techniques. A broad overview of DSP, digital communication techniques, and radio frequency hardware architecture used in modern wireless systems will be made for non-electrical-engineering background students.  
Prerequisites: CS503 or EE451

CE505 Wireless Networks and Architecture  
(3 units)  
This course is a more in-depth study of wireless data networks, emphasizing fundamental wireless network architecture, wireless WAN, Bluetooth techniques to wireless LAN, and the latest 3G network. Topics include paging and narrowband PCS networks, mobility management, circuit switch - cellular network, handoff management, packet switch, network signaling, satellite networks, an overview of mobile CDPD and GSM, digital networks, GPRS and EDGE, WAP, wireless local area network 802.11 and wireless local loop. Hands-on practices and a research project are required.  
Prerequisite: CE504 or EE540
CE506 Operating System Design (3 units)
This course offers graduate students an in-depth understanding and hands-on experience in modern operating system design and implementation. Topics include process, memory, file system, I/O, deadlocks, case studies of operating system implementations, modern distributed and network system architectures, communication and synchronization in distributed systems, threads and processor allocation, scheduling in distributed operating systems, distributed file systems, and case studies of modern distributed operating system design. Projects are required. 
Prerequisite: CS380

CE507 Wireless Communication Systems (3 units)
This course covers the concept of frequency re-use, wireless communication channel characteristics, modulation and demodulation for wireless communications, equalization and channel coding, speech coding, multiple access techniques such as FDMA, TDMA, CDMA, FDD and TDD, and commercial wireless communication standards such as AMPS, GSM, IS136 (TDMA), IS-95 (CDMA). Hands-on simulations are used to help students gain an in-depth understanding of wireless communication. Familiarity with communication theory and simulation tools such as MATLAB or system view is required. (Note: This is an introductory course on wireless technologies. Any topic, such as GSM, TDMA, or CDMA can be expanded to a full-trimester course under EE489, CE589, or EE689 Special Topics.) 
Prerequisite: CE504 or CE540

CE515 Wireless Communication Design Project (3 units)
This course is designed for the engineering graduate students choosing the Wireless Communication concentration to gain hands-on experience after acquiring the knowledge and design simulation skills from courses taken in this concentration area. This course is a capstone course with emphases on the design and implementation aspects of a wireless communication system. The students also become familiar with commercial wireless communication standards. 
Prerequisites: Completion of at least two courses in this concentration area.

CE521 Real-time Systems and Programming (3 units)
This is the second in the embedded systems series. By examining an off-the-shelf real-time operating system, students will gain hands-on experience in real-time operating system programming and implementations. Specific topics include a review of embedded system design, the concept of real-time systems, real-time specification and design techniques, real-time kernels, system performance analysis, memory management, task management, time management, synchronization of inter-task communication, queuing models, real-time operating system tools for embedded systems, and real-time programming examples. Hands-on exercises are required. 
Prerequisite: CE450

CE522 Embedded Design in Networking (3 units)
Environment
This course is designed for the students to learn protocol stack implementation/porting in a real-time operating system (RTOS) kernel environment. Students learn the concept of network protocol stack implementation/porting, embedded real-time system software architecture, and real-time operating systems. They also learn to design and write programs as a collection of independent and concurrent tasks, non-preemptive and preemptive multi-tasking, task scheduling, and task synchronization and intertask communication including semaphores and message queues. Industry standard RTOS will be used for practice and projects. 
Prerequisites: CE450 and CE470.

CE523 Embedded Design in Device Driver Environment (3 units)
This course investigates the operating system (Windows NT, Linux, or Unix) components that interact with device drivers, the device driver building and debugging process, device driver architecture, functionality and the relevant kernel APIs. Topics include: operating system architecture; I/O API; operating system kernel; building, loading and debugging device drivers; device driver entry points; device driver data structures; I/O request processing; plug, play and power management; interrupts and timers; memory management; direct memory access; and timing. The goal of the course is to present a comprehensive coverage of the operating system kernel, HAL, device drivers and the related APIs. Upon completion of the course, the student should be able to develop, build, install and test basic device drivers, as well as to port existing drivers from one operating system to another. Hands-on practice is required. 
Prerequisite: CE521

CE528 Embedded Systems in VxWorks and Windows CE Environments (3 units)
This is a project course emphasizing hands-on practices for the students to learn how to bring up and develop embedded software, driver, firmware in VxWorks and Windows CE environments. Through extensive hands-on lab work and programming exercises, the students learn: how to install and develop software in a cross-platform development environment, board and system bring-up of VxWorks and Windows CE, install image on the target system and test its operations; port and test application programs (such as HTTPD and routing protocols) that utilize file I/O, networking I/O, and TCP/IP protocol stack. 
Prerequisite: CS204; CE450 preferred.
CE599 Special Topics (3 units)
Special topics courses are offered to graduate students in Computer Systems Engineering programs by current faculty members or invited guest speakers to expose the students to emerging technologies related to their studies. These courses are conducted the same way as regular courses.
Prerequisites: Graduate standing or instructor’s approval.

CE597 Master’s Project (3 units)
The course is designed to develop the creativity of graduate students in Computer Systems Engineering through the exercise of the design effort on a self-selected project. The design project must be open-ended, whereas the design approach must employ the modern design techniques and methodologies in the related fields. Completion of the design project entails (1) formulation of a design problem statement including realistic constraints such as economic factors, safety, and reliability issues, (2) design specifications, (3) consideration of alternative solutions, (4) manufacturing procedures, and (5) operation instructions. The research topic and proposal must be approved by the project advisor. The report format must be in accordance with NPU’s Project Style Guide and be approved by the advisor and tech writer. Upon completion of the project, the student is required to conduct an open-forum presentation of the project.
Prerequisite: Advanced graduate standing.

CE599A Master’s Thesis - I (3 units)
This is the first part of a 2-part master’s thesis course designed for a graduate student in the Computer Systems Engineering program who plans to pursue his/her research interests in depth. Each part requires one trimester’s effort to complete half of the entire project work. In this first part, the advisor will assist the student to identify the research topic, shape research ideas, and define the research objectives and scope. The student then performs the following: topic studies, identifying software and/or hardware requirements, defining the project objectives and procedures, writing a project proposal and submitting it to the administration after obtaining his/her advisor’s approval, working on research and implementation of the project, and documenting findings. Regular meetings with the advisor are required.
Prerequisite: Advanced graduate standing.

CE599B Master’s Thesis - II (3 units)
This is a continuation of the first part of the master’s thesis course. At the beginning of the semester, the student should draw a conclusion on the research and development work for the project and begin to write a thesis report following the required format. The student should make an analysis of the project work and results. Through this process, the student will gain in-depth knowledge of the selected subject and develop independent thinking and research capabilities. The report must be approved by the advisor and a tech writer. Upon completion of the project, the student is required to conduct an open-forum presentation of the project.
Prerequisite: CE599A

Computer Science

CS150 Computer Fundamentals (4 units)
This is an introductory computer literacy course introducing the students to the basics of computer hardware structure, the World Wide Web, and MS Windows software tools. Topics include introduction to computer components, input/output, data storage, the Internet and the WWW, operating systems, data management and databases, software program development and programming languages, and ethics for technical professionals. Students also learn to use the latest Microsoft Office tools – Word, Excel, Access, Powerpoint, MS Visual Basic, and the use of the Internet and browsers. Hands-on exercises are required.
Prerequisite: Freshman standing.

CS200 Discrete Logic (4 units)
This course is designed to introduce students to discrete logic concepts related to computer science and a broad spectrum of applications. Topics include logic set theory, Boolean matrix algebra, relations, structures, combinatorics, computational methods, elements of logic design, graphs theory and its applications to computer science and telecommunications, and design and analysis of efficient algorithms.
Prerequisite: pre-calculus or freshman standing.

CS204 Program Design & Analysis in C (4 units)
Language (3-hour lecture and 2-hour laboratory)
This course is designed to teach C language syntax rules and the analysis of a structured programming language, with emphasis on practical applications in engineering and business problems. Methods of testing and debugging well-structured programs in C are also covered. Topics include problem specification and analysis, writing-editing-compiling-linking a C program, data types, operators and expressions, selection and repetition, arrays, pointers, functions, text files, dynamic memory allocation, strings, structures and unions, binary files, and bitwise manipulation and preprocessor directives. Hands-on exercises are required and the weekly lab session is an integral part of this course.
Prerequisites: CS150 and CS200

CS230 Introduction to UNIX/Linux (4 units)
This course is designed to familiarize the students with the UNIX/Linux environment. Topics include concepts of the UNIX/Linux operating system, Shell commands, Visual editor, file manipulation and securities, UNIX utility commands, Shell features and Shell environment, online manual, controlling user processes and managing jobs, introduction of Regular Expression and its usage
with grep, sed, and awk UNIX power utilities, basic Shell programming techniques, large file management, and the user programming environment customization. Hands-on exercises are required.

Prerequisite: CS204 (may be taken concurrently).

CS350 Data Structures (4 units)
This course is designed to teach efficient use of data structures and algorithms to solve problems. Students study the logical relationship between data structures associated with a problem and the physical representation. Topics include introduction to algorithms and data organization, arrays, stacks, queues, single and double linked lists, trees, graphs, internal sorting, hashing, and heap structures. Hands-on exercises are required.

Prerequisites: CS204

CS360 Object-Oriented Programming in C++ (3 units)
This course is designed to develop the students' abilities to design, code, and document application programs using object-oriented design and analysis concepts and methodology. Emphasis is on the establishment of design objectives, criteria and specifications, processes of synthesis, analysis, construction, testing, and evaluation of open-ended problems. Topics include an introduction to general object-oriented programming as implemented in C++, data types, expression, statements, functions, program scope, run-time memory allocation, function overloading, template functions, class mechanism, derivation, inheritance, and migration from C to C++. Labs may accompany lectures in partial class meetings during the semester. Hands-on exercises are required.

Prerequisites: CS350

CS380 Introduction to Operating Systems (3 units)
This course is designed to introduce students to basic concepts of modern operating systems. Topics include processes, threads, micro-kernel, concurrency, memory management, scheduling, distributed systems, and file system. Solaris, UNIX System V, Linux, and Windows2000 are selected for case studies. Hands-on exercises are required.

Prerequisites: CS230, CE305, and CS350

CS385 UNIX/Linux Shell Programming (4 units) and System Administration
This course covers the fundamentals of and techniques involved in UNIX/Linux shell programming and system administration. Topics include UNIX/Linux shells (Bourne, Korn, C shell and bash), shell programming and environments, basic UNIX/Linux system administration of file system, resource management, system processes and network services. The students will be able to write shell scripts to accomplish routine tasks for software development, testing, and system and network management. Intensive hands-on practice is required.

Prerequisite: CS230

CS398 Professional Development (2 units)
This course instructs the student to develop his/her professional career. Topics cover personality assessment, professional ethics, understanding the engineering professional world, recognizing company culture and organizational structure, how to survive office politics, career paths and pitfalls, resume writing and cover letters, and interview techniques.

Prerequisite: Junior or senior standing.

CS399A Internship - I (2 units)
This course allows seniors in the Computer Science program to learn by participating in real-world professional engineering activities. Internship project reports are required. The student must regularly report to the on-campus internship coordinator. Only an “S” or “F” grade can be earned in this course. Credit can be counted as undergraduate electives only. The student is allowed to enroll in one internship course each semester. An undergraduate student is allowed to take no more than three internship courses within a program of study. Graduate students, with approval from the internship coordinator, may enroll in this undergraduate course to gain practical experience. Students must sign up for undergraduate units only. No graduate credit can be earned by taking this course.

Prerequisite: Advance approval from the internship coordinator.

CS399B Internship - II (2 units)
This course is for students in the Computer Science program to participate in real-world professional engineering practice for a second term. Internship project reports are required. The student must report regularly to the on-campus internship coordinator. Only an “S” or “F” grade can be earned in this course. Credit can be counted as undergraduate electives only. The student is allowed to enroll in one internship course per semester. An undergraduate student is allowed to take no more than three internship courses within a program of study. Graduate students, with approval from the internship coordinator, may enroll in this undergraduate course to gain practical experience. They must sign up for undergraduate units only. No graduate credit can be earned by taking this course.

Prerequisite: CS399A and advance approval by the internship coordinator.

CS399C Internship - III (2 units)
This course is for students in the Computer Science program to participate in real-world professional engineering practice. Internship project reports are required and the student must report to the internship coordinator on campus regularly. Only an “S” or “F” grade can be earned in this course. Credit can be counted as undergraduate electives only. The student is allowed to enroll in one internship course per semester. An undergraduate student is allowed to take no more than three internship courses within a program of study.
Graduate students, with approval from the internship coordinator, may enroll in this undergraduate course to gain practical experience. They must sign up for undergraduate units only. No graduate credit may be earned by taking this course. **Prerequisite:** CS399B and advance approval by the internship coordinator.

**CS453(G) Compiler Design (3 units)**
This course is designed to give students a fundamental knowledge of compilers and interpreters for modern computer languages. Topics include a study of modern computer languages, regular expressions, lexical analysis, parsing techniques, context-free grammars, and syntax-directed translation. Hands-on exercises and trimester projects are required. **Prerequisite:** CS380

**CS455(G) Structured Programming and Algorithms (3 units)**
This course provides an in-depth analysis and efficient use of algorithms to solve problems. Well-structured programs are studied; modular, top-down design is emphasized. Topics include the use of data structures techniques to design efficient algorithms and analyze their complexity, efficient implementation of combinatorial algorithms, sorting, searching, and geometric problems, and branch and bound algorithms. Hands-on exercises are required. **Prerequisite:** CS350

**CS457(G) Database Design (3 units)**
This is the first of a series designed to teach relational database concepts, design, and applications. Topics include database architecture, relational model, structured query language (SQL), data manipulation (DML), data definition language (DDL), database design, ER modeling, database normalization, denormalization, and physical database design. Popular database systems, such as Oracle and Microsoft SQL server, are used for hands-on exercises and projects. **Prerequisites:** CS204 or instructor’s consent.

**CS470(G) Computer Networks (3 units)**
This course is designed to give students a global picture of computer networks. Topics include network-layered models (OSI, TCP/IP), data communication basics, circuit switching, packet switching, routing, and internetworking. Hands-on exercises are required. **Prerequisite:** CS380

**CS475(G) UNIX/Linux Network Administration (3 units)**
This is the course to address the practical issue of UNIX/Linux network administration. Topics cover UNIX/Linux network environment, network file system, name services (DNS, NIS/NIS+, LDAP), mail, inetd superserver, interoperation with MS-Windows via samba, IP Masquerade and NAT, MySQL/Oracle database, kernel security and optimization, security services and utilities (SSH, SSL, IDS). Heavy hands-on practice is required. **Prerequisite:** CS385, CS470 preferred.

**CS480(G) JAVA Programming and Internet Applications (3 units)**
This course introduces students to the Java language, programming with object-oriented construct, GUI design and graphics programming, and core Java libraries. Students will learn Java language basics such as syntax and classes, inheritance, interfaces, reflection, graphics programming, event handling, user-interface components with Swing, Java applets, exception handling, stream, and files. Hands-on exercises are required. **Prerequisite:** CS360

**CS486(G) Windows-based Applications with C# (3 units)**
The goal of this course is to provide students with the knowledge and skills needed to develop C# applications for the Microsoft .NET Platform. The course focuses on C# program structure, language syntax, and implementation details. It covers the classes and interfaces of the Framework Class Library that support the development of Windows desktop user interfaces. Coverage includes how to use the features of Windows Forms to build sophisticated graphical user interfaces. The object-oriented methods of extending classes through inheritance, interfaces, and polymorphism are emphasized throughout the course. Hands-on practice is required. **Prerequisites:** CS360, CS380; CS470 preferred.

**CS489(G) Special Topics (3 units)**
Special topics courses are offered to senior students in Computer Systems Engineering and Computer Science programs by current faculty members or invited guest speakers to expose the students to emerging technologies related to their studies. These courses are conducted the same way as regular courses. **Prerequisite:** Senior standing.

**CS494 Senior Design Project - I (3 units)**
This is the first part of a 2-trimester senior design project series. The senior design project course is designed to develop the creativity of every graduating senior in Computer Science through the exercise of the design effort on a self-selected project. The design project must be open-ended, whereas the design approach must employ the modern design techniques and methodologies in the related fields. Completion of the design project entails (1) formulation of a design problem statement including realistic constraints such as economic factors, safety, and reliability issues, (2) design specifications, (3) consideration of alternative solutions, (4) manufacturing procedures, and (5) operation instructions. The research topic and proposal must be approved by the project advisor. The student must follow the design project work progress guideline through the period of
research, implementation, testing, report writing, and related procedures and meet with the advisor regularly. The format for the report must be in accordance with NPU’s Project Style Guide. In the first part of the series, the student must complete the specification and initial design with sufficient detail to estimate the effectiveness of the project; the student should also complete the initial draft of the project report.

Prerequisites: Advanced senior standing and Advisor’s approval.

CS495 Senior Design Project - II (3 units)
This is the second part of a 2-trimester senior design project series. The student continues the design and construction of the project, system, or device, and completes the final report, including the design, implementation, and management of the project. Upon completion of the project, the student is required to conduct an open-forum presentation of the project.

Prerequisite: CS494

CS502 Software Engineering (3 units)
This course is designed to demonstrate the engineering approach to the development of large, high-quality software projects. Topics include software life cycle, development process, requirement specifications, design and testing techniques, verification and validation, and software management. Students learn to use project management tools, principles, and environment to facilitate development of software programs/systems. Hands-on exercises and projects are required.

Prerequisites: solid programming experience, such as programming in Windows, Unix, C++/Java, networks, database, etc.

CS503 Advanced Computer Networks (3 units)
This is the sequel to CS470, Computer Networks, and is designed for an in-depth study of computer networks. Emphasis is on modern Internet technologies and implementations. Topics include a review of computer networks, OS reference model, a study of emerging Ethernet technologies (Fast, Gigabit), client and server implementation with socket programming, local and wide area networks, TCP/IP, routing, network protocol and architecture, Internet protocol, and IP addressing. Projects are required.

Prerequisite: CS470

CS506 Operating System Design (3 units)
This course offers graduate students an in-depth understanding and hands-on experience in modern operating system design and implementation. Topics include process, memory, file system, I/O, deadlocks, case studies of operating system implementations, modern distributed and network system architectures, communication and synchronization in distributed systems, threads and processor allocation, scheduling in distributed operating systems, distributed file systems, and case studies of modern distributed operating system design. Projects are required.

Prerequisite: CS380

CS510 UNIX/Linux System Programming (3 units)
This course is designed for students to gain fundamental knowledge of and hands-on experience with programming in the UNIX/Linux environment. Students will learn to program in C with UNIX/Linux system calls and other advanced topics such as the UNIX file system, process control, signals and inter-process communications. Students are required to do a term project with a substantial amount of programming. Upon completion of this course, students should be able to develop real-world UNIX/Linux applications. Hands-on practice and projects are required.

Prerequisites: CS385.

CS515 UNIX/Linux Network Programming (3 units)
This course is designed for the graduate students to gain hands-on experience in UNIX/Linux network programming. The students will learn to develop UNIX/Linux network applications using a number of UNIX/Linux network programming interface techniques including Sockets, XTI, and RPC. Topics include: an overview of transport layer (TCP/UDP), TCP sockets, UDP sockets, threads and client-server design, XTI, RPC, and Streams. Hands-on exercises and projects are required.

Prerequisites: CS470 and CS510

CS521 MS Windows System and Application Programming (3 units)
This course is designed to build a foundation for understanding Microsoft Windows systems. Students will learn the Windows programming environment, developing applications using the Microsoft Windows application-programming interface (API). Topics include the file system, the registry, threads, processes, inter-process communications, memory management, dynamic link libraries, network programming with sockets, and the window messaging. Graphical user interface functions will also be covered to develop GUI-based applications to demonstrate each operating system feature in action.

Prerequisites: CS 360 and CS 470.

CS526 ASP.NET Web Applications (3 units)
This course provides students with the knowledge and skills needed to develop dynamic web-based applications using ASP.NET and gain an understanding of the new architecture behind ASP.NET. Topics include creating ASP.NET pages, creating Web custom controls and Web user controls, using validation controls and composite controls, using ADO.NET to access data from various data sources, configuring and securing a Web application, state management, error handling and debugging, and migrating existing web applications to ASP.NET. Hands-on practice is required.

Prerequisite: CS486; CS457 and CS470 preferred.
CS527 .NET Windows Programming  (3 units)  
This course covers all of the key specifications and technologies needed to create and use interoperable Web services using Microsoft .NET. Students will implement a complete end-to-end Web service solution. The Web services architecture is discussed, integrating training in SOAP, WSDL, and UDDI. Students learn to communicate using SOAP messaging, how to define a service using WSDL, how to publish and find their service via UDDI. The course also includes the implementation of COM interoperability with .NET components, and remoting. Hands-on practice is required.  
Prerequisite: CS360; CS480 preferred

CS532 Advanced Java Programming  (3 units)  
This course is designed to give the students an in-depth understanding of Java programming techniques. The course focuses on advanced Java language features and packages which are essential for building a variety of application architectures. Topics include Java techniques of XML, JNI, thread, network programming, Servlet, JSP, JDBC, and internalization. Upon completion of this course, the students should be well prepared to create enterprise-wide, Java-centric solutions to client/server problems involving Java and networks. Each technology topic will cover its uses, implementation, and language issues. Students are required to implement a project for each Java technique. Hands-on exercises are required.  
Prerequisite: CS480

CS534 Internet and Client/Server  (3 units)  
This graduate level course is designed to give students interested in pursuing advanced study in Internet technology or computer networks the fundamental knowledge and hands-on experience of the Internet system architectures and application system developments. Topics cover system development and application development based on current Internet and Web technologies as well as Internet architecture configurations.  
Prerequisites: CS503

CS535 Network Security Fundamentals  (3 units)  
This course addresses the security issues on the Internet and the Web. Major topics include issues related to Internet infrastructure and applications running on the Internet, techniques to reduce security risks, and an introduction to the role of security as an enabling technology for electronic commerce. The course includes an overview of Internet and Web security, its applications and legal issues, encryption and cryptography, SSL and browsers, Web servers, and Java security.  
Prerequisite: CS503

CS536 Internet Technology: J2EE/EJB  (3 units)  
This course introduces Java 2 platform Enterprise Edition (J2EE) of which the Enterprise JavaBean (EJB) component architecture is a vital piece. With J2EE, one can rapidly construct distributed, scalable, reliable, and portable secure server-side deployments. Although J2EE is a conglomeration of concepts, programming standards, and innovations, this course will focus on EJB, JNDI, transaction and security aspects of J2EE with real-world programming examples. Hands-on practice and projects are required.  
Prerequisites: CS532 or CS548

CS540 Database Administration  (3 units)  
This course provides an in-depth understanding of the Oracle Database Management System. Emphasis is on the latest Oracle database architecture, database configuration and administration. Topics include logical/physical database layout, database server processes, database creation, various database physical objects; client/server configuration, multi-threaded server configuration, database storage management, database security, database utilities, database monitoring, partitions, and database backup/recovery methods. Hands-on practice is required.  
Prerequisites: CS457

CS547 Advanced Database Design and Development  (3 units)  
This course is intended for graduate students to further explore database server development and database tuning. The course specifically details procedural extensions to SQL to develop stored procedures, functions, packages and database triggers. In addition, it covers database performance tuning from an application development point of view by exploring query optimizer, database hints, and various database access methods. Hands-on exercises are required.  
Prerequisites: CS457

CS548 Database and Internet Server Programming  (3 units)  
This course introduces current client/server data access concepts on the Internet. It covers the fundamental concepts of the 3-tier model, Internet database access, and major tools and techniques utilized in application development. Topics include N-tier model, JDBC with database applications, Java Servlet, JSP and JavaBean, WML, and XML. Hands-on exercises are an integral part of the course.  
Prerequisites: CS457 and CS480.

CS565 Network Management  (3 units)  
This course is designed to give graduate students an in-depth understanding of and a hands-on experience in the management of network systems and applications. Emphases are on simple network management protocol (SNMP) management, MIB, management tools, system and applications. Current widely used applications by industry will be used to demonstrate the management concepts. Computer-based training software will be used to check/verify the students’ network management skills in order to ensure they are prepared for the industry challenge. Topics include Network
Management fundamentals; OSIMAN, SNMP and TMN standards; RMON and ITU TMN architecture; inside structure and practical applications of SNMP, SNMP2, SNMP3, RMON, RMON2, MIBs. Hands-on exercises are required.

Prerequisite: CS503

CS575 Network Analysis and Testing (3 units)

This course covers computer network analysis, testing techniques, and experience-based strategies to isolate and solve network problems. Topics include wiring and cable testing issues, transmission encoding techniques, dissecting the IEEE 48-bit MAC address, the impact of different types of broadcast traffic, operational details and analysis considerations for switches, Ethernet and Token Ring operational details and analysis, the IEEE 802.2 LLC protocol, datagrams and routing, IP specifics, protocol analysis and troubleshooting, baselining throughput and latency. Hands-on exercises using protocol analyzer are required to reinforce the topics.

Prerequisite: CS503

CS589 Special Topics (3 units)

Special topics courses are offered to graduate students in Computer Science program by current faculty members or invited guest speakers to expose the students to emerging technologies related to their studies. These courses are conducted the same way as regular courses.

Prerequisites: Graduate standing or instructor’s approval.

CS597 Master’s Project (3 units)

The course is designed to develop the creativity of graduate students in Computer Science through the exercise of the design effort on a self-selected project. The design project must be open-ended, whereas the design approach must employ the modern design techniques and methodologies in the related fields. Completion of the design project entails (1) formulation of a design problem statement including realistic constraints such as economic factors, safety, and reliability issues, (2) design specifications, (3) consideration of alternative solutions, (4) manufacturing procedures, and (5) operation instructions. The research topic and proposal must be approved by the project advisor. The report format must be in accordance with NPU’s Project Style Guide and be approved by the advisor and tech writer. Upon completion of the project, the student is required to conduct an open-forum presentation of the project.

Prerequisite: Advisor’s approval.

CS599A Master’s Thesis - I (3 units)

This is the first part of a 2-part master’s thesis course designed for a graduate student in the Computer Science program who plans to pursue his/her research interests in depth. Each part requires one trimester’s effort to complete half of the entire project work. In this first part, the advisor will assist the student to identify the research topic, shape research ideas, and define the research objectives and scope. The student then performs the following: topic studies, identifying software and/or hardware requirements, defining the project objectives and procedures, writing a project proposal and submitting it to the administration after obtaining his/her advisor’s approval, working on research and implementation of the project, and documenting findings. Regular meetings with the advisor are required.

Prerequisite: Advanced graduate standing.

CS599B Master’s Thesis - II (3 units)

This is a continuation of the first part of the master’s thesis course. At the beginning of the semester, the student should draw a conclusion on the research and development work for the project and begin to write a thesis report following the required format. The student should make an analysis of the project work and results. Through this process, the student will gain in-depth knowledge of the selected subject and develop independent thinking and research capabilities. The report must be approved by the advisor and a tech writer. Upon completion of the project, the student is required to conduct an open-forum presentation of the project.

Prerequisite: CS599A

CS609 Software Standards and QA/Testing (3 units)

This course is designed to give students an understanding of the issues related to software QA and testing: quality standards, QA-related processes and procedures, software testing techniques, software metrics, problem tracking, and designing test cases. Students will also learn to use testing tools for static analysis, coverage testing, performance testing, and GUI/Web testing. Hands-on exercises using software testing automation tools are required to reinforce topics.

Prerequisites: CS385

CS612 Object-Oriented Analysis and Design (3 units)

This course is designed for students to develop mastery of object-oriented analysis and design methods required for software product development. Students will learn the principles of object-oriented analysis, design, and implementation using current techniques and C++ or Java programming; understand UML and its applications in object-oriented analysis and design, and understand design patterns and their applications in software development. Use-Case models are introduced to reinforce concepts in writing requirements in context, drawing system sequence diagrams, and adding details with operation contracts. Design and implementation models are introduced to help the students understand new methodology used in the object-oriented analysis and design of software systems. Hands-on exercises are required.

Prerequisite: CS360 or CS480
CS618 Advanced Linux Design - Internals and Externals (3 units)
This course is designed for students to gain in-depth knowledge of Linux as well as hands-on experience in the Linux system, software design and development, and Linux network integration. Topics cover Linux system installation, configuration, and administration; GNU tools, Linux system call writing, I/O and multiplexing techniques, Posix thread, Linux kernel and module concepts, TCP/IP stack walk through, application software development using object-oriented languages, and network/web/application servers. Hands-on exercises and projects are required.
Prerequisites: CS506; CS503 preferred.

CS637 XML and Web Service Development (3 units)
Extensible markup language (XML) is rapidly becoming the standard information description language, and has been used in almost all areas related to computer and information technologies, such as Internet, semiconductor, bioinformatics, etc. Its usage will continuously grow. Web Services refer to the infrastructure that supports a rapidly emerging style for developing applications that rely on the Internet and WWW for portions of their functionality.
Prerequisite: CS480; C++ preferred.

CS639 Advanced Topics on Internet Technology (3 units)
This course is designed to allow graduate students to pursue specific advanced studies in emerging Internet technology.
Prerequisites: Advanced graduate standing.

CS649 Advanced Topics on Database Technology (3 units)
This course is designed to allow graduate students to pursue specific advanced studies in computer database technology. These may include data security, data mining, data warehousing, database tuning, and other relevant topics as database technology evolves in the high-technology industry. The student may use the credits earned from a limited number of these courses to fulfill the Database Technology concentration area course requirements.
Prerequisites: Advanced graduate standing.

CS673 Cryptography and Network Security (3 units)
The course addresses security risks in computer networks and computer systems and the fundamental techniques used to reduce these risks. It also gives an introduction to the role of security as an enabling technology for electronic commerce. The course is divided into four major parts: (1) Fundamentals of Network Security and System Security, (2) Fundamentals of Cryptography: This is probably the most important part of this course. This part involves basic reasoning and understanding of cryptography. This includes the fundamentals of symmetric and asymmetric key systems, message integrity (hashing functions), digital signature, digital certificate, key management, and familiarity with common standards for these techniques; (3) Cryptography in real world applications: Several security applications will be discussed, including PGP, SSL, IPSec, with SSL be the focus- major components of SSL protocol and its role in electronic commerce. Students will learn how to set up an https web server, and how to apply and integrate digital certificate with browsers, web servers, and communication protocols on the Web; (4) Hands-on Cryptography: This part is for those who are interested in implementing security software using cryptography. Several software libraries will be discussed, including Open SSL, RSA's libraries, Microsoft's security libraries, and Java-based security software. The topics include JCE, JCA, JSSE, JAAS, Language-Level Security, Java Virtual Machine-level Security, API-Level Security Features, Using the Security Packages, Browser-level Security, and Signing Java Programs.
Prerequisite: CS470 and CS480.

CS676 Network Security Design and Implementations (3 units)
This course is designed for students who have interest in learning network security technology and wish to become information security professionals. This course covers the concepts of network security fundamentals, firewall, VPN, NIDS, Anti-Virus, and Content-filtering. In addition, it also introduces security trends, strategy, policies, and security management. Real industry products will be introduced in this class. Students will gain hands-on experience in creating and maintaining Internet firewalls as well as exposure to the integrated security products solution.
Prerequisite: CS503

CS678 Network Security in Wireless Systems (3 units)
This is the third in the Network Security series. A secure network is the fundamental requirement for network communication. Network security issues have become ever more important for any organization with network systems. This class mainly addresses the security issue in accessing the network, including the security in wireless access. Many new proposals and technology have been developed in this field, for example, 802.1x, which have been implemented in Windows XP. The objectives of the class are to teach students the fundamentals in cryptography, the concept of security, and the practical use of virtual private networks (VPN). Topics include IPSec (IP Security), Web Security, VPN, and wireless network security. Some important RFCs will also be covered for the students to understand its development process in the network industry.
Prerequisite: CS503
DBA

DBA601 Research Methodology (3 units)
This course focuses on how to conduct research as well as how to prepare research plan or proposal for a scholarly journal article, dissertation, or thesis. The course will be conducted through formal lectures, seminars given by invited speakers, and the student’s engagement in practical research work. The student will be required to complete an applied research project.
Prerequisite: Advanced graduate standing or instructor’s consent.

DBA602A Research Seminar - I (1 unit)
In this course the students are exposed to a series of seminar topics to gain broad knowledge of subjects related to the advanced study areas of the program. Forum for invited speakers as well as presentations, criticisms, and problem analyses by students of research work in progress will be the form of this course. The students will be required to write topic reports on selected subjects and participate in discussions and presentations.
Prerequisite: Advanced graduate standing or instructor’s consent.

DBA602B Research Seminar - II (1 unit)
This course is similar to DBA602A; the purpose is to expose the students to a series of seminar topics to gain broad knowledge of subjects related to the advanced study areas of the program. Forum for invited speakers as well as presentations, criticisms, and problem analyses by students of research work in progress will be the form of this course. The students will be required to write topic reports on selected subjects and participate in discussions and presentations.
Prerequisite: Advanced graduate standing or instructor’s consent.

DBA603 Teaching/TA Training Seminar (1 unit)
This course is to provide an opportunity for graduate students to develop and practice teaching and instruction skills. Topics cover lecture preparation, recitation techniques, individual and small group communication, and classroom management.
Prerequisite: Advanced graduate standing or instructor’s consent.

DBA689 Advanced Topics (3 units)
Advanced topics courses are offered to the doctorate program students in the DBA program by current faculty members or invited guest speakers to expose the students to new subjects related to their studies. These courses are conducted the same way as regular courses.
Prerequisites: Instructor’s consent.

DBA799 Doctoral Thesis - I (6 units)
This is the first of a two-part thesis course series required for each doctorate student. The thesis and the research and development work involved serve as the capstone project by which the student demonstrates his/her ability of independent research and development as well as integrating and applying original and practical research into the subject matter. The student should also demonstrate his/her clear understanding of related research and research methodology for professional-oriented projects/thesis. The Doctor of Business Administration student enrolls in this course after completing all or almost all other required course work. A doctoral thesis committee (DTC) for monitoring the thesis work must be formed and approved by the Doctoral Advisory Committee before the student begins his/her thesis work. The student works with his/her thesis advisor throughout the project. The thesis must involve practical research and development effort which provides a first exposure to some fundamental issues in the domain of knowledge relevant to the student’s study fields.
Prerequisite: Advanced graduate standing.

DBA800 Doctoral Thesis – II (6 units)
This is the second of the two-part thesis course series required for each doctorate student. The doctorate student who has completed the first part of this course must enroll in this second course to continue his/her R&D work until completing the thesis. Upon completing the thesis project, the student must submit his/her thesis for review by the DTC; the student should also give an open forum thesis defense to the DTC members and other invited faculty members and outside guests. The student must receive the DTC’s final approval for completing the doctoral thesis course series. If the student fails to complete the thesis by the end of the semester when this course was registered for, the student must retake this part of the thesis course.
Prerequisite: DBA799

DCE

DCE601 Research Methodology (3 units)
This course focuses on how to conduct research as well as how to prepare research plan or proposal for a scholarly journal article, dissertation, or thesis. The course will be conducted through formal lectures, seminars given by invited speakers, and the student’s engagement in practical research work. The student will be required to complete an applied research project.
Prerequisites: Advanced graduate standing or instructor’s consent.

DCE602A Research Seminar - I (1 unit)
In this course the students are exposed to a series of seminar topics to gain broad knowledge of subjects related to the advanced study areas of the program. Forum for invited speakers as well as presentations, criticisms, and problem analyses by students of research work in progress will be the form of this course. The students will be required to write topic
reports on selected subjects and participate in discussions.  
**Prerequisite:** Advanced graduate standing or instructor’s consent.

**DCE602B Research Seminar - II**  
(1 unit)  
This course is similar to DCE602A; the purpose is to expose the students to a series of seminar topics to gain broad knowledge of subjects related to the advanced study areas of the program. Forum for invited speakers as well as presentations, criticisms, and problem analyses by students of research work in progress will be the form of this course. The students will be required to write topic reports on selected subjects and participate in discussions.  
**Prerequisite:** Advanced graduate standing or instructor’s consent.

**DCE603 Teaching/TA Training Seminar**  
(1 unit)  
This course is to provide an opportunity for graduate students to develop and practice teaching and instruction skills. Topics cover lecture preparation, recitation techniques, individual and small group communication, and classroom management.  
**Prerequisite:** Senior graduate standing or instructor’s consent.

**DCE689 Advanced Topics**  
(3 units)  
Advanced topics courses are offered to the doctorate program students in the DCE program by current faculty members or invited guest speakers to expose the students to emerging technologies related to their studies. These courses are conducted the same way as regular courses.  
**Prerequisite:** Instructor’s consent

**DCE799 Doctoral Thesis - I**  
(6 units)  
This is the first of a two-part thesis course series required for each doctorate student. The thesis and the research and development work involved serve as the capstone project by which the student demonstrates his/her ability of independent research and development as well as integrating and applying original and practical research into the subject matter. The student should also demonstrate his/her clear understanding of related research and research methodology for professional-oriented projects/thesis. The Doctor of Computer Engineering student enrolls in this course after completing all or almost all other required course work. A doctoral thesis committee (DTC) for monitoring the thesis work must be formed and approved by the Doctoral Advisory Committee before the student begins his/her thesis work. The student works with his/her thesis advisor throughout the project. The thesis must involve practical research and development effort which provides a first exposure to some fundamental issues in the domain of knowledge relevant to the student’s study fields.  
**Prerequisite:** Advanced doctoral standing.

**DCE800 Doctoral Thesis – II**  
(6 units)  
This is the second of the two-part thesis course series required for each doctorate student. The doctorate student who has completed the first part of this course must enroll in this second course to continue his/her R&D work until completing the thesis. Upon completing the thesis project, the student must submit his/her thesis for review by the DTC; the student should also give an open forum thesis defense to the DTC members and other invited faculty members and outside guests. The student must receive the DTC’s final approval for completing the doctoral thesis course series. If the student fails to complete the thesis by the end of the semester when this course was registered for, the student must retake this part of the thesis course.  
**Prerequisite:** DCE799

**Economics**

**ECON201 Macroeconomics**  
(4 units)  
This course teaches economic analysis at the level of the entire economic system or macro perspective. Topics include business cycles, unemployment or lack of demand, inflation, national income and expenditure, aggregate demand and fiscal policy, money and monetary policy, trade and balance of payments deficits, the national debt, productivity and economic growth.  
(Lower Division GE– Area C for non-business majors)  
**Prerequisite:** Pre-calculus subjects

**ECON202 Microeconomics**  
(4 units)  
This course studies the economic system from the individual decision-maker’s perspective. Topics include demand analysis, economic analysis of production, industry and competition analysis, market and economic analysis of public policies, and labor markets and income redistribution analysis of public policies.  
(Lower Division GE - Area C for non-business majors)  
**Prerequisite:** Pre-calculus subjects

**Electrical Engineering**

**EE205 Digital Circuits and Laboratory**  
(4 units)  
(3-hour lecture and 2-hour laboratory)  
This course is designed to be the first of the digital circuits series. It provides the fundamentals of digital circuit operations so that students can be ready for practical design considerations in digital electronics, and it includes hands-on experience with digital logic elements and testing and measuring equipment. Topics include number systems and codes, logic gates and Boolean algebra, combinational logic circuits, flip-flops and related devices, digital arithmetic, counters and registers, integrated-circuit logic families, A/D and D/A
converters. Laboratory experiments will accompany the class topics.

Prerequisite: Sophomore standing or instructor’s consent.

EE210 Circuit Theory - I (4 units)
This course is the first of a 2-part series on the fundamentals of electrical circuits. Topics include analysis of circuits containing resistors, capacitors, inductors, and controlled sources; Kirchhoff’s Laws; simple resistive circuits; node-voltage method, mesh-current method; Thevenin’s and Norton’s theorems; operational amplifier and its applications; transient analysis of first and second order circuits, and SPICE simulation.

Prerequisites: PHYS202, MATH202 (MATH202 may be taken concurrently).

EE301 Circuit Theory - II (4 units)
This course is the second of a 2-part series on electrical circuits that covers advanced topics, including sinusoidal steady-state circuit analysis using phasors, power calculations in AC circuits, balanced three-phase circuits, Laplace transform and its application in transient circuit analysis, frequency select circuits and filters, Fourier series and Fourier transforms, and two-port networks.

Prerequisites: EE210

EE302 Analog Circuits and Laboratory (4 units)
(3-hour lecture and 2-hour laboratory)
This course is the first of a series on the basics in analysis and design of analog circuits. Hands-on experimentation will accompany the course to demonstrate and verify the subjects covered and to assist understanding of the design techniques and theories. Topics include a review of circuit analysis techniques, operational amplifier applications, and device models (BJT and CMOS). Laboratory experience includes work on transistor amplifiers with feedback, discrete components, differential amplifier, op-amps and their applications, active filters and oscillators, regulated power supplies, class AB power amplifiers, and AM and FM communications.

Prerequisite: EE301

EE322 Analog Circuit Design (4 units)
(3-hour lecture and 2-hour laboratory)
This course is a sequel of EE302 Analog Circuits and Lab. It provides students with the opportunity to use the knowledge and experience acquired in previous circuit and analog circuit courses to further understand the design aspect of analog circuits and conduct analysis and design of differential amplifiers, current mirrors, frequency response of electronic circuits, feedback circuit analysis, output stages, integrated circuits, filter and oscillators.

Prerequisite: EE302

EE323 Logic Design (4 units)
(3-hour lecture and 2-hour laboratory)
This course is a sequel of EE205 Digital Circuits and Lab. It is intended to provide the students the opportunity to use the knowledge and experience acquired in previous digital circuit courses to further understand the design aspect of digital integrated circuits and devices. Hands-on design experience is provided in digital and logic circuits and their applications. The course focuses on various logic design techniques to design a variety of combinatorial and sequential circuits. Timing considerations are analyzed for asynchronous and synchronous circuit designs with emphasis on state machine design approaches. Students will be introduced to modern design techniques using HDL languages and concentration on verification of circuit designs. Simulation tools include Altera MAX+plus II, Xilinx Foundation, and espresso. Students will use HDL tools in labs to design and verify various projects.

Prerequisites: EE205

EE398 Professional Development (2 units)
This course instructs the student to develop his/her professional career. Topics cover personality assessment, professional ethics, understanding the engineering professional world, recognizing company culture and organizational structure, how to survive office politics, career paths and pitfalls, resume writing and cover letters, and interview techniques.

Prerequisite: Junior or senior standing.

EE399A Internship - I (2 units)
This course is designed for seniors in the Electrical Engineering program to learn by participating in real-world professional engineering activities. Internship project reports are required. The student must report regularly to the on-campus internship coordinator. Only an “S” or “F” grade can be earned in this course. Credit can be counted as undergraduate electives only. The student is allowed to enroll in one internship course per trimester. An undergraduate student is allowed to take no more than three internship courses within a program of study. Graduate students, with approval from the internship coordinator, may enroll in this undergraduate course to gain practical experience. They must sign up for undergraduate units only. No graduate credit can be earned for this course.

Prerequisite: Advance approval by the internship coordinator.

EE399B Internship - II (2 units)
This course is for students in the Electrical Engineering program to participate in real-world professional engineering practice for the second term. Internship project reports are required. The student must report regularly to the on-campus internship coordinator. Only an “S” or “F” grade can be earned in this course. Credit can be counted as undergraduate electives only. The student is allowed to enroll in one internship course per semester. An undergraduate student is allowed to take no more than three internship courses within a program of study. Graduate students, with approval from the internship coordinator, may enroll in this undergraduate course to gain practical experience.
They must sign up for undergraduate units only. No graduate credit can be earned for this course.  
**Prerequisites:** EE399A and advance approval by the internship coordinator.

**EE399C Internship - III (2 units)**
This course is for students in the Electrical Engineering program to participate in real-world professional engineering practice for a third term in a study program. Internship project reports are required and the student must report regularly to the on-campus internship coordinator. Only an “S” or “F” grade can be earned in this course. Credit can be counted as undergraduate electives only. The student is allowed to enroll in one internship course per semester. An undergraduate student is allowed to take no more than three internship courses within a program of study. Graduate students, with approval from the internship coordinator, may enroll in this undergraduate course to gain practical experience. They must sign up for undergraduate units only. No graduate credit can be earned for this course.  
**Prerequisites:** EE399B and advance approval by the internship coordinator.

**EE450(G) Signals and Systems (3 units)**
This course is an introduction to the basic concepts and principles of signals and systems. Both analog and digital signal processing techniques will be covered. Topics include analog signals and systems, digital signals and systems, LTI systems, Fourier transform, Z-transform, FFT, system stability, digital filter design, network. Matlab software will be used to implement some of the DSP algorithms.  
**Prerequisites:** MATH203

**EE451(G) Introduction to Communication Systems (3 units)**
This course covers the fundamental knowledge of communication theories and systems with special emphasis on the modulation schemes of analog and digital communication systems. Topics include Fourier analysis, filtering and signal distortion, spectral density and correlation, digital coding and analog waveforms, modulation techniques, probability theory and random process, noise in analog modulation, optimum receivers for data communication, and data communication. Matlab software will be incorporated into this course.  
**Prerequisites:** EE450 and MATH208

**EE452(G) Digital Signal Processing (3 units)**
This course is a study of the concepts in deterministic and statistical techniques for describing, analyzing, and characterizing generic signals and their applications. Topics include signal processing, continuous and discrete Fourier analysis, and fundamentals of sampling methods. Additional coverage includes the fundamentals of the algorithms and computational methods for digital FIR/IIR filter design and basic signal analysis techniques. Simulation exercises using Matlab/C Language are required.  
**Prerequisite:** EE450

**EE461(G) Verilog HDL and Digital Design (3 units)**
This course develops the students’ ability to design commonly used basic building blocks of modern digital systems and provides them with a fundamental knowledge of the state-of-the-art design methodology, design considerations, and verification strategies for complicated digital hardware design. Topics include Verilog HDL basics, Logic modeling, state machine design and memory modeling using Verilog HDL. Additional topics on FPGA architectures, device vendors, FPGA design tools, FPGA applications and latest trend in the programmable logic industry are also covered. Students can use Verilog tools such as Synopsys VCS, Mentor Modelsim, Cadence NC Verilog, and Silo III Verilog Simulator from SimuCAD for their homework and design projects. Hands-on practice is required. Students are encouraged to take the HDL based sequence of courses EE461, EE510 and EE512 to gain knowledge and experience in semi-custom IC design using industry grade EDA design tools.  
**Prerequisites:** EE323

**EE470(G) Applications of Operational Amplifier and Analog Integrated Circuits (3 units)**
This course emphasizes board level analog circuit analysis, design, and simulation. Topics include fundamentals of operational amplifier and its applications, active filters, stability of the feedback circuit, linear and switching regulator, and phase lock loop. Pspice and off-the-shelf analog IC are used by the students for circuit design and design verification. Hands-on practice and projects are required.  
**Prerequisite:** EE322

**EE481(G) Microcomputer Structure and Programming (3 units)**
This course is design for the students to learn microprocessor architecture and gain hands-on experience with at least one popular microprocessor. Topics include microprocessor architecture and development tools - using a popular microprocessor for case study, programming with ASM/C for exercises; instruction set, hardware feature, I/O and timer, interrupt, and a survey of other microprocessors. Hands-on experience in microcomputer programming and applications through laboratory projects are required.  
**Prerequisites:** CS204 and EE323

**EE482(G) Microcontroller Interfaces and Applications (3 units)**
This course is a continuation of the course EE481 to give students further hands-on design experience in microcontroller-based digital systems design with emphasis on interfacing and data processing. Topics include interfacing, A/D and D/A
conversions, data acquisition, input devices, output devices, displays, and application firmware programming. This course is project heavy and students will complete projects, including documentation, prototyping demonstration of functionality, presentation, and implementation evaluation.

**Prerequisite:** EE481

EE488(G) Computer Architecture  
(3 units)

This course examines the hardware design aspects of a typical modern computer system. The coherency among instruction set design, compiler requirements, and memory organization will be one of the discussion subjects. Topics include number systems, instruction set design, CPU internal, cache, pipeline, memory hierarchy, I/O organization, and parallel processing. A study of a certain existing computer system design schematic will give the students more practical knowledge on the subject. Hands-on exercises and projects are required.

**Prerequisite:** EE481

EE489(G) Special Topics  
(3 units)

Special topics courses are offered to senior students in the Electrical Engineering program by current faculty members or invited guest speakers to expose the students to emerging technologies related to their studies. These courses are conducted the same way as regular courses.

**Prerequisites:** Senior standing or instructor’s consent.

EE490(G) Computer Hardware Design  
(3 units)

This is a hands-on project-oriented course. It aims to consolidate the knowledge and skills the students have learned in logic design (EE461) and computer architecture (EE488) by having the students work on a real project to solve digital design problems. Students taking this course are assumed to have a working knowledge of at least one HDL language. The course emphasizes methodology used to convert a design requirement to a micro-architecture specification (in the form of design document as well as a HDL program). Each student in the course can choose from a list of design problems provided by the instructor. The student is also allowed to work on a self-defined project upon the instructor’s approval. The projects offer opportunities for the students to practice important design techniques such as block partitioning, datapath design, control logic design (using state machines and/or sequencers) and interface handling. Demonstrations of these techniques will be given in lectures by way of solving problems through a series of carefully selected design problems. They may include design of CPUs (including design of ALU, address decoder, instruction decoder and program controller), FIFO controllers, dataflow controllers and synchronizers. If time permits, design of arithmetic units, DMA units, bus bridges and protocol handlers can also be covered.

**Prerequisites:** EE461 and EE488.

EE494 Senior Design Project - I  
(3 units)

This is the first part of a 2-trimester senior design project series. In this course, seniors in Electrical Engineering develop their creativity through developing a project under the close supervision of a project advisor from the engineering faculty. The design project must be open-ended, whereas the design approach must employ modern design techniques and methodologies in the related fields. Completion of the design project entails (1) formulation of a design problem statement including realistic constraints such as economic factors, safety, and reliability issues, (2) design specifications, (3) consideration of alternative solutions, (4) manufacturing procedures, and (5) operation instructions. A research topic and proposal must be approved by the project advisor. The student must follow the project guidelines throughout the period of research, implementation, testing, report writing, and related procedures, and meet with the advisor regularly. The format of the report must be in accordance with NPU’s Project Style Guide and be approved by the advisor and tech writer. In this first part of the series, the student must complete the specification and the initial design with sufficient detail to estimate the effectiveness of the project, and the initial draft of the project report.

**Prerequisites:** Graduating senior standing and Advisor’s approval.

EE495 Senior Design Project - II  
(3 units)

This is the second part of a 2-trimester senior design project series. The student continues the design and construction of the project, system, or device, and completes the final report, including the design, implementation, and management of the project. Upon completion of the project, the student is required to conduct an open-forum presentation of the project.

**Prerequisite:** EE494

EE501 Advanced Engineering Analysis  
(3 units)

This course is designed to give graduate students in Electrical Engineering the mathematics background and modeling techniques to analyze electronic circuits and other engineering systems used in contemporary technology. In addition, methods will be introduced to describe and analyze systems of importance in emerging technologies, e.g. nanotechnology. Analytical, numerical, and computational approaches will be used. The emphasis throughout this course will be on applications. Topics will include: Laplace transform, Dirac delta function, orthonormal functions, Fourier analysis, partial differential equations, Z transform, probability, stochastic methods, random input, Monte Carlo simulation, wave equations (including Schrodinger equation), and application of wave functions in nanotechnology.

**Prerequisites:** Graduate standing or instructor’s consent.
EE504 Advanced Computer Organization and Structure (3 units)
This course is designed to further investigate modern computer design. Topics include an in-depth study of multiprocessor architecture and interconnection networks, pipeline, data flow, algorithm structures, memory system design, cache memory design, and a comparison of the performance and design among various computer architectures. Hands-on project experience is required.
Prerequisite: EE481 or EE488

EE505 Digital IC Design (3 units)
This is the first of the VLSI design series. The course begins with an introduction to state-of-the-art CMOS VLSI engineering with emphasis on the basic CMOS VLSI design principles and methodologies. Topics include basic MOSFET theories and characteristics, CMOS semiconductor fabrication processes, sub-micron design rules, combinational and sequential CMOS logic gate design styles, datapath, interconnection, power and clock distribution, array and memory design. Widely-used industry standard tools, such as Cadence’s Opus, Composer, Virtuoso, Avant’s HSPICE and Mentor’s Calibre will be used for all homework assignments and design projects.
Prerequisites: PHYS301 and EE323, or instructor’s consent.

EE506 Advanced Digital IC Design (3 units)
This course is a continuation of the course EE505 and is designed to cultivate students’ ability to design a Standard Cell Library, Datapath and other special circuits that can be used as intellectual properties (IP) building blocks for ASIC, SOC (system on chip) and DSP (digital signal processing) applications. In addition to the design subject, student also learn how to generate different views of the circuits to facilitate system integration with various CAD tools for logic synthesis and physical implementations. Topics include standard cell design and characterization, technology mapping, design rules, layout, datapath synthesis, memory compiler, IP development and architecture trade-off. Modern CAD tools such as Synopsys, OPUS, Composer, Virtuoso, HSPICE and Mentor’s Calibre will be introduced and used for homework assignments and design projects.
Prerequisite: EE505

EE507 Analog/Mixed Signal IC Design (3 units)
This course is designed to cultivate the students’ ability to design CMOS analog integrated circuits. Topics include review of op-amp networks, frequency response to linear integrated circuits, level sensing amplifiers, phase detectors, voltage-controlled oscillators, charge pumping techniques, and A/D, D/A converters. HSPICE, Cadence Artist, Virtuoso, OPUS, and DRACULA are used for the assigned homework and projects.
Prerequisites: EE506

EE508 VLSI Physical Design- Place and Route (3 units)
This course is the third in the VLDI Design series and it introduces ASIC place and route. The course introduces the students to state-of-the-art physical design automation tools and techniques. Topics include design flow, library review, tool graphical interface, floor planning, power planning, timing driven placement, static time analysis (STA), CT-Gen, special routing, final routing, engineering change order (ECO), and run batch mode jobs. Hands-on exercises and projects are required.
Prerequisites: Senior standing or instructor’s consent.

EE510 Logic Synthesis (3 units)
This is the second of the series – EE461, EE510, EE512 – for logic design implementation. This course covers both the algorithmic aspect and the practical application aspect of logic synthesis. The focus is on the use and applications of Verilog HDL in logic synthesis with high-technology industry EDA tools. The course intends to develop the students’ abilities to execute large and complicated digital design using behavioral Verilog modeling and logic synthesis. Topics include Verilog HDL constructs for logic synthesis, resource sharing, Verilog HDL coding style for synthesis, special case handling, synthesizable Verilog HDL for commonly used logic building blocks, generic module generation, notation and basic concepts in logic synthesis, two-level logic optimization, Heuristic minimization of two-level logic, binary decision diagram (BDD) and related topics, and multi-level synthesis. Cadence Verilog-XL, Mentor Leonardo for HDL Synthesis, and Synopsys Design Compiler are used for all assigned homework and projects.
Prerequisite: EE461

EE512 Application Specific Integrated Circuit Design (ASIC) (3 units)
In connection with EE461 and EE510, this course is designed for students who intend to become logic designers using HDL based design methodologies. Topics include ASIC/CPLD/FPGA Library modeling, cell characterization, static timing analysis, place and route algorithms, design for testability, fault modeling, industry standard formats for design information interchange, and a survey of the most popular EDA tools. Industry grade design tools such as Synopsys Design Compiler, Cadence Verilog-XL, Synopsys DesignTime (under dc_shell), Synopsys Prime Time, Cadence Silicon Ensemble, Mentor Calibre LVS/DRC, and Synplicity Synplify are used for homework assignments and projects.
Prerequisite: EE510 or instructor’s consent

EE525 High-speed Digital System Design (3 units)
This course offers the concepts of advanced technology in high-speed digital system design. It focuses on the issue of signal integrity which is most critical in such system design. Topics include
EE526 Power/Signal Integrity in Advanced IC
Packaging and PCB Design (3 units)
This course is an extension of the subjects covered in EE525. It covers the concepts of advanced technology in high-speed digital system design with emphasis on the applications of advanced PCB and high-speed packaging design. The course objective is to develop the students’ abilities to work on high speed PCB and packaging design.
Prerequisite: EE525

EE529 Integrated Circuit Design Project (3 units)
This course is designed for the EE graduate students choosing the Chip Design and VLSI concentration to gain hands-on design experience after acquiring the knowledge and design simulation skills from courses taken in this concentration area. This course is a capstone project which enables the students to apply their knowledge and skills in IC design to a practical project which requires the students to connect the IC design processes and thoroughly understand the essence in IC design technology.
Prerequisite: EE506 or instructor’s consent.

EE531 Data Compression (3 units)
This course surveys current image, data and voice compression standards and studies key components in image, data and voice compression. The course emphasizes minimum redundancy coding, Huffman coding, arithmetic coding, statistical modeling, dictionary-based compression, sliding window compression, LZ78 compression, speech compression, lossy graphics compression, JPEG, wavelet methods, and archiving package. Matlab programming will also be introduced.
Prerequisite: EE452

EE532 Image Processing and Applications (3 units)
This course offers the fundamentals of image processing. Besides introducing basic concepts and principles, the course takes a practical approach to emphasize various applications of digital image processing. Topics include image fundamentals, image transformations, image enhancement, image restoration, information theory, data compression, image segmentation, image presentation and description, and pattern recognition and interpretation. Matlab software is employed for implementing numerous algorithms.
Prerequisite: EE531

EE537 DSP Design Project (3 units)
This course is designed for the EE graduate students choosing the Digital Signal Processing concentration to gain hands-on experience after acquiring the knowledge and design simulation skills from courses taken in this concentration area. This course is a capstone course with emphasis on the design and implementation aspects of DSP algorithms, compression techniques, as well as adopting the popular industry standards such as JPEG2000 and MPEG.
Prerequisite: EE533 or instructor’s consent.

EE539 Digital Signal Processor Design and Implementation (3 units)
This course is designed to give advanced graduate students in engineering a thorough examination of all the design considerations of fixed-point (integer) digital signal processors as well as develop their abilities to design a general fixed-point digital signal processor. Topics include a review of general DSP algorithms (FIR, IIR, DFT, IDFT, DCT, IDCT, wavelet), processor architectures, address generation schemes, memory structures, instruction set definition and encoding, single and multiple instruction repetitions, and minimum and maximum searching. Students will design a 16-bit fixed-point digital signal processor which requires incorporation of all design considerations taught in this course.
Prerequisite: EE506

EE555 Embedded Design in Data Communication Systems (3 units)
This course is intended for students who are interested in the design aspect of embedded systems, particularly for applications in the data/telecommunication industry. Topics include an overview of logic and analog design, VHDL and C language, embedded system architecture, RTOS, communication protocols used in embedded systems, Bus structures and logic translation, designing an embedded system for ATM NIC, programming the embedded system, development tools, debugging the design, and advanced design concepts.
Prerequisites: EE322 and EE323

EE580 Introduction to Nanotechnology (3 units)
This course is a general introduction to nanotechnology, open to all graduate students. The course will begin with an overview of the field of nanotechnology. The following general areas of nanotechnology, illustrating the scope and depth of the field, will be introduced: electronics and systems, life sciences and medicine, materials and technologies, and business and ventures. Within these general areas, specific topics will be introduced, at a basic level, including: nano electronics, photonics, fabrication, and systems; biosensors, nanotechnology in health and medicine; imaging; nano materials and devices, energy technology and applications, environment and society, nanoscale characterization; business, investment, and intellectual property. Extensive use will be made of audio-visual presentations. The course will include class field trips to nanotechnology companies and research laboratories in the San Francisco Bay Area.
EE582 Nanotechnology (3 units)
This course is designed for Electrical Engineering students with interests in the emerging field of nanotechnology. Topics in this part will include an introduction to the nanoworld, overview of nanotechnology, early discovered quantum phenomena, waves and particles, wave function and interpretation, Schrodinger equation, quantum confinement, quantized energy levels, quantum tunneling, and 2D, 1D, 0D quantum structures. It also emphasizes applications of quantum phenomena in nanotechnology. Topics include quantum well, quantum wires, quantum dots; semiconductor, magnetic, and photonic nanostructures; photon polarization, electron spin and interactions, spintronics, spin polarized currents, spectroscopic characterization, spin detection in molecules, magnetic tunnel junction, magnetoresistive random access memory, resonant tunneling devices, single-electron tunneling devices, superconducting quantum interference devices, and aspects of quantum computation. Assignments will include modeling and simulation, employing analytical, numerical, and computational approaches, as appropriate.
Prerequisite: PHYS450 or instructor’s consent.

EE583 Introduction to Nanoelectromechanical Systems (NEMS) (3 units)
The marriage of semiconductor processing to mechanical engineering at a very small scale — MEMS — has now shrunk towards the nanoscale. Nanomechanical devices promise to revolutionize measurements of extremely small displacements and extremely weak forces, particularly at the molecular scale. The small mass and size of NEMS gives them a number of unique attributes that offer immense potential for new applications and fundamental measurements. This fascinating research and development area has become one of the major focuses which the local high-tech industry as well as businesses are turning to. This course provides an overview of the background technology and promises of NEMS.
Prerequisite: EE582

EE587 Nanophotonics (3 units)
This course is designed for graduate students of Electrical Engineering with interests in the areas of optics, electro-optics, and fiber-optic communications. Developments in nanophotonics can lead to high bandwidth, high speed, and ultra-small optoelectronic components, with the potential to revolutionize telecommunications, computation, and sensing. Topics will include: photonic nanostructures; slowing down, confinement, enhancement, and manipulation of light; waveguides, photonic crystals; external control of optical properties by optical or electro-optical methods; integration of passive, active components onto a single chip, integrated optical circuits, optics on chip; quantum dot photonics; external control of energy levels and radiative lifetime in photonic devices; optical switching; optoelectronic integrated circuits; electro-optic switching; nanophotonic applications in biosensing, use of high-throughput lab-on-chip for single molecule detection and DNA sequencing. Assignments will include modeling and simulation, employing analytical, numerical, and computational approaches, as appropriate.
Prerequisite: EE582 or instructor’s consent.

EE588 Quantum Computation (3 units)
This course is designed for engineering students with nanotechnology interests in the emerging field of quantum computation. Topics will include: fundamentals of quantum computing, qubits, quantum gates and circuits, quantum algorithms, physical realization (silicon-based nuclear spin, single photons, ion traps, NMR, quantum dots, cavity QED), quantum cryptography, entanglement, and coherence/decoherence.
Prerequisite: EE582 or instructor’s consent.

EE589 Special Topics (3 units)
Special topics courses are offered to graduate students in electrical engineering program by current faculty members or invited guest speakers to expose the students to emerging technologies related to their studies. These courses are conducted the same way as regular courses.
Prerequisites: Graduate standing or instructor’s approval.

EE597 Master’s Project (3 units)
This course is designed to develop the creativity of graduate students in Electrical Engineering. Students will design a project under the close supervision of a project advisor from the engineering faculty. The design project must be open-ended, and the design approach must employ modern design techniques and methodologies. Completion of the design project entails (1) formulation of a design problem statement including realistic constraints such as economic factors, safety, and reliability issues, (2) design specifications, (3) consideration of alternative solutions, (4) manufacturing procedures, and (5) operation instructions. The research topic and proposal must be approved by the project advisor. Format of the report must be in accordance with NPU’s Project Style Guide and be approved by the advisor and tech writer. Upon completion of the project, the student is required to conduct an open-forum presentation of the project.
Prerequisites: EE589A Master’s Thesis - I (3 units)
This is the first part of a 2-part master’s thesis course designed for a graduate student in the Electrical Engineering program who plans to pursue his/her research interests in depth. Each part requires one trimester’s effort to complete half of the entire project work. In this first part, the advisor will assist the student to identify the research topic, shape research ideas, and define the research
objectives and scope. The student then performs the following: topic studies, identifying software and/or hardware requirements, defining the project objectives and procedures, writing a project proposal and submitting it to the administration after obtaining his/her advisor’s approval, working on research and implementation of the project, and documenting findings. Regular meetings with the advisor are required.

Prerequisite: Advanced graduate standing.

EE599B Master’s Thesis - II (3 units)
This is a continuation of the first part of the master’s thesis course. At the beginning of the semester, the student should draw a conclusion on the research and development work for the project and begin to write a thesis report following the required format. The student should make an analysis of the project work and results. Through this process, the student will gain in-depth knowledge of the selected subject and develop independent thinking and research capabilities. The report must be approved by the advisor and a tech writer. Upon completion of the project, the student is required to conduct an open-forum presentation of the project.
Prerequisite: EE599A

EE614 Advanced VLSI Physical Design- Physical Synthesis and Low Power Design (3 units)
This course is designed to further investigate ASIC front-to-back design automation. The course aims to develop the students’ design ability in ASIC by using state-of-the-art EDA backend design tools and methodology (such as Cadence SE-PKS). It also introduces concepts in advanced industrial deep sub-micro backend design. Topics include library review, floor planning in SE, physical synthesis, CTPKS, timing closure, RC extraction, back annotated from back to front, non-default routing rule implementation, double-cut-via implementation for 0.13u and below technology, shielding, and route. Hands-on practices are required.
Prerequisites: EE508 or instructor’s consent.

EE615 System On Chip (SOC) Design Overview (3 units)
System on Chip (SoC) is composed of many functional modules such as processor, memory, digital IPs, analog/mixed signal modules, RF and interfaces on a single chip. This course will focus on ARM based on-chip bus platform, digital IP verification, and the trend and integration of SoC.
Prerequisite: EE461; EE504 preferred.

EE616 Design Verification (3 units)
This course is designed to cover the design verification methodologies commonly used in system-on-chip (SOC) design. Topics include design verification basics, introduction of various verification strategies, verification of soft and hard IP blocks, verification for networking/communication ASIC, verification for audio/video signal processing ASIC, how to build an efficient and effective verification platform, automation of verification flow, test case coverage, how to create design models using PLI routine, and formal verification, etc. The students will also be informed that design verification is becoming the bottleneck in modern ASIC design cycle, especially in system on chip (SOC) design. The verification cycle could take up to 70% of the design cycle.
Prerequisites: EE461

EE626 Advanced Data Compression (3 units)
This course focuses on advanced topics in data compression with emphasis on JPEG 2000 still image compression and MPEG2, MPEG3 audio compression and MPEG4 video compression standard. Each of these standards will be discussed and students will learn about details of these algorithms by implementing them in high level software language such C or simulation packages such as MATLAB. Topics such as zero-tree coding, sample data partitions and file formats as well as coding standards for both natural and synthetic video are covered. Each student will demonstrate his/her knowledge of these algorithms by doing a term project in the specified area.
Prerequisite: EE531

EE630 Advanced Digital Signal Processing (3 units)
Stochastic signal processing plays a central role in telecommunications and is employed in a range of applications from speech technology, audio and radar signal processing to pattern analysis and data forecasting. This course provides a coherent and structured representation of the theory and practice of stochastic signal processing and its application to digital noise reduction and equalization. Topics include signal processing methods, stochastic processes, Bayesian estimation and classification, hidden Markov models, Wiener filters, Kalman and adaptive least squared error filters, linear prediction models, power spectrum estimation, spectral subtraction, interpolation, impulsive noise, transient noise, echo cancellation, and blind deconvolution and channel equalization.
Prerequisite: EE452

EE635 Audio Processing and Applications (3 units)
This course provides detailed technical information on audio storage, processing, and compression. Topics include discrete Fourier transformers, audio digital filter structures, audio DSP algorithm implementation, finite word-length effects in audio processing, oversampling D/A and A/D conversion, real-time filtering, FFT power spectrum estimation, dual-tone multifrequency signal detection, digital FM stereo generation, speech processing, music processing, pulse-coded modulation, differential PCM and adaptive DPCM code, linear prediction coding, and general audio file formats. International Telecommunication Unit G.711, G.722 and G.723.1 standards will be introduced as case studies.
Prerequisite: EE533 or EE539.
EE682 Advanced Image Processing (3 units)

This course introduces advanced concepts in the image processing area to students interested in digital signal processing area. Ideas in fractal image processing and wavelet image processing will be introduced. Topics include fractal imaging model, image partition, spatial transforms, clustering, multi-resolution decomposition, filter banks, wavelet basis construction and wavelet packets. Students will master these topics through a term project individually assign to each.

Prerequisite: EE532

EE681 Magnetoresistive Random Access Memory (MRAM) (3 units)

This course is intended for advanced graduate students of Electrical Engineering. In this course the specific example of a leading candidate for next-generation non-volatile memory, MRAM (magnetoresistive random access memory), is chosen for detailed study. The emphasis in this course will be study of the quantum phenomena underlying the physical performance of MRAM storage-cell devices. The interaction of the electron spin with a magnetic field and the collective tunneling across the thin insulating layer of a multilayer magnetic nanostructure are quantum phenomena which are key to the operation of a MRAM cell utilizing the MTJ (magnetic tunnel junction). Study of these basic physical processes together with state-of-the-art spectroscopic and microscopic characterization techniques is the main thrust of this course. This course is intended to complement the student’s effort in courses on engineering design of MRAM devices. Topics will include: multilayer magnetic nanostructures, exchange bias, ferromagnet and antiferromagnet materials, magnetic domains, magnetic thin films; electron magnetic moment interaction with the applied magnetic field, spin and orbital magnetic moments; magnetic hysteresis, magnetic switching; spintronics, material magnetization switching and control by spin currents, ultra-fast manipulation of magnetization in the multilayer magnetic nanostructure by spin polarized electron currents; quantum tunneling; synchrotron photons; microscopic characterization, probing at nanometer resolution and femtosecond time scales by time-dependent photoemission electron microscopy; spectroscopic characterization, magnetic linear dichroism and magnetic circular dichroism techniques. Assignments will include modeling and simulation, employing analytical, numerical, and computational approaches, as appropriate.

Prerequisite: EE582 or instructor’s consent.

EE682 Nanotechnology Seminar (3 units)

This course is designed for engineering students with broad interests in the emerging and rapidly growing field of nanotechnology. The course content will be guided by the instructor, but will largely depend on the students’ interests. A seminar format will be adopted. The seminar format will seek to encourage open and interactive discussion in class. Lead discussions / lectures will be given by the instructor on topics of interest. Although not required, students may give presentations on topics of their own choice, if they wish to do so. The nanotechnology seminar will also be an excellent forum for students who wish to prepare for research/thesis projects on specific topics of interest. For student research, opportunities are available, on a selected basis, to use laboratory and/or fabrication facilities at the NASA Center for Nanotechnology (NASACNT), the Stanford Nanofabrication Facility (SNF), Stanford Laboratory for Advanced Materials, and also at the University of California, located at Berkeley.

Prerequisite: EE582 or instructor’s consent.

EE685 Experimental Studies of Magnetic Nanostructures (3 units)

This course is a study in the area of the nanotechnology of spintronics, focusing on the application of synchrotron photons to the study of magnetic nanostructures. Topics include: a review of the electron and photon, spintronics, electron interactions, photon interactions, principle of magnetic structure, magnetic nanostructures, spatial scales in magnetism, temporal scales in magnetism; Why use synchrotron photons to probe magnetic nanostructures? linear dichroism, circular dichroism; a powerful, high performance imaging tool, elemental sensitivity, magnetic sensitivity, natural imaging contrast, imaging with electrons, imaging in air, and magnetic fields.

Prerequisite: EE582 or instructor’s consent.

EE689 Special Topics (3 units)

Special topics courses are offered to advanced graduate students in the Electrical Engineering program by current faculty members or invited guest speakers to expose the students to emerging technologies related to their studies. These courses are conducted the same way as regular courses.

Prerequisites: Advanced graduate standing or instructor’s consent.

English

ENGL101 Expository Writing (3 units)

This course, while at the fundamental level of college writing, is based on a systematic approach to address students' needs to acquire knowledge and skills in written communication. It covers a full range of basic concerns in writing, going from its processes to its forms, to the popular techniques writers have used to make their works outstanding. With this course, students will learn to write as well as write to learn. By the end of the semester, the students should be able to use grammar and punctuations correctly and to write effective essays in both academic and professional settings.

(GE - Area A)
ENGL102 Critical Thinking (3 units)
This course focuses on learning to be an effective provider and consumer of ideas in our information-saturated society. Students will learn to identify the intent of the message, to judge the soundness of the argument, and to evaluate the validity of the evidence. Rigorous training will help learners go beyond feelings and personal biases to clear, impartial, and accurate problem solving and decision making that are essential to all human communication: speaking, writing, debating, and persuading.
(GE - Area A)
Prerequisite: ENGL101

ENGL110 Public Speaking (3 units)
This course is designed to develop effective skills in extemporaneous speaking, formal presentations, and listening. Students will learn about nonverbal communication, cultural differences in communication, and research methodology.
(GE - Area A)
Prerequisite: Placement by exam or successful completion of advanced ESL classes.

ENGL310 Advanced Reading (3 units)
It is widely acknowledged that reading not only leads to knowledge but also serves as a foundation for other important communication activities such as writing and speaking. This course seeks to build students’ reading skills in a comprehensive and systematic way. It trains them to quickly capture an essay’s, or a book’s thesis, follow its development, and recognize its arguments. Being equipped with advanced reading methods, and through exposure to materials from a wide range of subject areas, the student will be trained to become a total consumer of information. That is, they will be able not only to comprehend the literal message of an essay, to judge its validity, but also to get emotionally involved in the content.
(GE - Area A)
Prerequisite: ENGL101 or instructor’s consent.

ENGL350 Advanced Writing (3 units)
This writing course is aimed at helping students respond to what they read, observe, or create, by writing clear, effective, and powerful prose in essays, reports, white papers, analysis studies, and other documents and presentations. It focuses on subjects of cultural character that includes language, literature, philosophy, history, science, and other fundamental humanities subjects of different breadth and contents. For each assigned paper, the class focuses on the paper's specific subject requirements regarding content and breadth of information, and concentrates on the development of the paper's central idea, from its beginning through its conclusion. Students will undertake the preliminary preparations that are necessary for writing, such as research, note taking, journal writing, documenting, argument support, paragraph development, transitions, introductions, summaries, and other fundamentals. All participants are expected to participate in discussions of their own and other’s homework assignments in class as in a writing workshop. Class engagement in discussions will be the principal measure for each person's final grade.
(GE - Area A)
Prerequisite: ENGL101 or instructor’s consent.

ENGL420 Intercultural Communication (3 units)
This course introduces theories and practices regarding intercultural relationships and communication. It helps students adapt to a rapidly diversified workforce both in Silicon Valley and in other parts of the world. From the vantage point of this course, students will see the forces that shape cultures and influence intercultural contacts. They will be enabled to build harmonious and productive relationships with individuals from all national, ethnic, and linguistic backgrounds.
(GE - Area A)
Prerequisite: ENGL101 or instructor’s consent.

ENGL430 Small Group Communication (3 units)
This course is designed to accomplish the following learning goals: 1) to help the students understand theories and principles of small group decision making and problem solving, 2) to provide students with hands-on experiences working in small groups, the most powerful tool in modern industry, and 3) to offer students opportunities to observe the development and operation of real-life task-oriented groups.
(GE - Area A)
Prerequisite: ENGL101 or instructor’s consent.

Finance

FIN310 Fundamentals of Finance (4 units)
This course introduces the student to the world of finance. Financial management is concerned with the efforts of the corporation’s managers to raise and allocate capital in a manner that will maximize and stabilize the firm’s future cash flows. This course examines the concepts and techniques available to financial managers as they address various aspects of the financing and investment questions. Topics include financial background, a review of accounting, financial statements, and taxes; cash flow and financial analysis, the financial system and interest, time value of money, the valuation and characteristics of bonds, the valuation and characteristics of stocks, risk and return, capital budgeting, and international finance. A case study will be applied to assist students’ learning.
Prerequisite: ACC201

FIN450(G) Financial Markets and Institutions (3 units)
This course is to give the students an exposure to the operational principles of financial markets as well as to the primary roles of financial institutions.
Topics include flow of funds and interests-price movements in money and capital markets; supply of loanable funds and demand for funds in the mortgage market, consumer credit markets, corporate security markets, and market for government securities, and municipal obligations; and consideration of the effects on financial markets of the federal reserve and treasury policies.

**Prerequisite:** FIN310

**FIN501 Financial Management (3 units)**
This course is designed to further introduce modern financial theories, tools, and methods used to the analysis of financial problems. The point of view of corporate financial managers will be taken to interact with efficient capital markets. Therefore, while making the best use of constrained resources is necessary, maximizing shareholders’ equity is also vitally important. The primary focus is on analysis and forecast of internal operations and the use of short-term and long-term capital.

**Prerequisite:** FIN310 or instructor’s consent.

**FIN510 Investments (3 units)**
This course covers the foundations of investment management. Topics include theory and empirical evidence related to portfolio theory, market efficiency, assess pricing models, factor models, and option pricing theory. Students are expected to combine market research results and electronic information sources to create optimal investment strategies.

**Prerequisite:** FIN501

**FIN522 International Trade and Investment (3 units)**
This course covers the theories of international trade, through comparative advantage and related corporate strategies, the impacts of emerging regional economic blocks, the institutions of the multilateral trading system, and trade barriers. Students will learn the mechanics of international payment, shipping, and distribution.

**Prerequisite:** FIN310

**FIN568 Corporate Finance (3 units)**
This course belongs to the accounting/finance concentration area of study. The first part of the course covers essential corporate finance subjects including executive compensation, corporate governance, and bankruptcy law. Lectures, discussions, and case studies will be the form used for this part of study. The second part of the course consists of discussions of corporate financing such as mergers, acquisitions, valuations; corporate restructuring, LBOs’, MBOs’, and merchant banking.

**Prerequisite:** FIN501

**FIN620 Portfolio Management (3 units)**
This course teaches advanced portfolio decision making. Topics include index models, portfolio performance measures, bond portfolio management and interest immunization, stock market anomalies and market efficiency.

**Prerequisites:** FIN501

**FIN670 International Finance (3 units)**
This course prepares the students for a career in international finance. The course discusses the financial environment in which the multinational firm and its managers must function. The course focuses on foreign exchange management and financial management in a multinational firm. It points out to the students the basic principles of profit-seeking and risk avoidance practices in the volatile global financial markets.

**Prerequisites:** FIN501

**Humanities**

**HU210 Introduction to Philosophy (3 units)**
This course is an introduction to the great questions of philosophy, using an historical approach. The class covers Western and non-Western traditions from the pre-Socratic and Confucius to modern times.

**(GE - Area A)**
**Prerequisite:** ENGL101 or equivalent.

**HU220 Elementary Spanish (3 units)**
This course focuses on the development and practice of elementary speaking, listening, reading, and writing skills in targeted language functions, with Spanish as the primary language of instruction. The course also introduces the basic culture and history of Spanish and Hispanic countries. Approximately two hours each week will be required for language lab video and CD-ROM exercises in listening, speaking, and writing.

**(GE - Area A)**

**HU225 Fundamental Drawing (3 units)**
This course is designed to give students an important foundation in fine art study. It covers the basic techniques and concepts in pencil and charcoal drawings. The techniques include line, shading, structure, and quick sketching. The concepts cover form, value, light, composition, perspective, etc. Hands-on practice topics include plaster geometrical shapes, still life, simple landscape and figures. Artist professional techniques are shared in class with many step-by-step demonstrations.

**(GE - Area A)**

**HU230 Language of Brush Painting (3 units)**
This course covers the history, philosophy, basic strokes, and the art of ancient Chinese brush painting; changes in contemporary Chinese brush painting; traditional and contemporary media for brush painting, sources of supply and services for Chinese paintings. The course also cultivates the spiritual side of life by extending the philosophy of this art to elevate the quality of personal lives. The students are encouraged to share the joy of painting with their families and the community.

**(GE - Area A)**
HU240 Fundamental Brush Painting  (3 units)
This course is designed to give students an important foundation in the study of Chinese painting. It covers the basic techniques and concepts in brush strokes, black ink, patterns, forms, and composition. Hands-on practice topics include bamboo, orchids, plum blossoms, chrysanthemums, and other flowers. Painting creation method is also studied. Artist professional techniques are shared in class with many step-by-step demonstrations. Students who have taken HU230 are especially recommended to take this class.
(GE - Area A)

HU250 Watercolor Painting for Beginners  (3 units)
This class is designed for the student who wants to make a picture that would express his/her ideas and feelings but is too intimidated to try. It teaches how to relax the mind and release the creative self. The format will take the student through a series of easy to understand classroom exercises in composition, color mixing and controlling the brush. The class aims to open the student up to the pleasure of bringing his/her ideas to life with watercolors
(GE - Area A)

HU305 Advanced Drawing  (3 units)
This course focuses on techniques and methods of figure and landscape drawings. The techniques include detailed drawing, expression drawing, and quick drawing. Topics cover portraits, figures, gestures, and action drawings, trees, rocks, mountains, houses, composition, and creation. Different drawing and illustration styles are shared in class with many step-by-step demonstrations.
(GE - Area A)
Prerequisite: HU225 or instructor’s consent.

HU310 Western Watercolor  (3 units)
This course offers a hands-on approach to learning Western watercolor. Topics include the critical theory and practices of free-form water base painting, color mixing, and choosing color to enhance the mood and self-expression of the work. Students will explore different techniques: wet on wet painting, resist, spraying and salting, collage, off-set printing, ink and color mixing; study a variety of exercises in composition; use different materials such as paper, silk, and canvas; explore outdoor landscape painting and alternate with studio still lives. Student works will be regularly critiqued and final projects framed for presentation.
(GE - Area A)

HU330 Fundamental Painting  (3 units)
This course is designed to give students a training in painting of Western and Eastern styles. It covers basic techniques and theories in watercolor and brush paintings. It teaches methods in strokes, colors and ink, lighting, composition, painting creation, styles, etc. Hands-on practice topics include still lives, flowers, landscapes, figures, postcards in watercolor, and floral and animals in brush painting. Professional artist techniques are shown in class with step-by-step demonstrations. This course helps students to learn how to create and complete paintings in various themes and topics.
(GE - Area A)

HU350 Art Appreciation  (3 units)
A crash course in western art aesthetic from ancient art to post-modernism, this course gives the student a historical western art background that makes comparisons to the East, as well as the tools to analyze paintings through their own cultural point of view.
(GE - Area A)

HU360 Advanced Brush Painting  (3 units)
This course focuses on advanced theory and techniques in Chinese painting through studying floral and landscape subjects. It covers theories on brush stroke and ink expression, semi-free style, forms, and composition. Hands-on practice topics include lotus, peony, wisteria, grapes, birds, and landscapes. Artist professional techniques are shared in class with many step-by-step demonstrations.
(GE - Area A)
Prerequisites: HU230 or HU240 or instructor’s consent.

HU410 Introduction to Contemporary American Art and Culture  (3 units)
A hands-on comparative course illustrating how visual art has influenced cultural change in America from 1950 to the present. The American Century is a record of the evolution and growth of modern visual culture from film to television to the visual computer. Modern American artists have a tradition of standing in the vanguard of tackling tough issues and creating new visual language that force us to look at how new technology impacts our society.
(GE - Area A)
Prerequisite: ENGL101 or equivalent.

HU425 Principles of Ethics  (3 units)
This course is designed to teach students ethical principles and problems applicable to their lives. Topics include application of ethical principles, background and philosophical principles of ethics, ethical practices, and practical ethical problems and solutions.
(GE - Area A)
Prerequisite: ENGL101 or equivalent.

Information Technology

IT310 Introduction to Information Technology  (4 units)
This is the first of a sequence of IT courses designed to provide students the fundamental knowledge and training in the following areas: (1) concepts and basic principles of management information systems and current information technology for business, and (2) basic business
programming and database concept. Topics of this course include an introduction to current information technology and a tour of computer systems, the Internet, and World Wide Web; electronic spreadsheets, database applications for personal productivity, multimedia presentations, developing single-user systems, fundamentals of programming, multi-user and network computing, shared and distributed data, developing shared IT applications, business information systems and IT in industry, issues in information technology, and the information age: next steps. Students will receive assignments for practice on networked PC systems to learn the covered subjects and programming.

**Prerequisites:** Basic computer experience.

**IT320 Computer Art Design – I** (4 units)
The Computer Arts series provides interested students with professional training in both computer art principles and design techniques to develop unique skills that may be incorporated in their personal portfolios. IT320 is a foundation level course which introduces the principles of graphics design and explores some leading industry-standard graphics software packages to be used as design tools in this course. Assignments and exercises will be given according to real-world applications, such as digital imaging, basic user interface design, Web graphics optimization and portfolio presentations. Specific graphics design topics include elements of graphic design, proportion and balance, unity/contrast, continuity, clarity of design, specifications of type, color and basic typography as design elements. Current graphics tools, such as Photoshop and Illustrator, will be used for exercises and projects. Hands-on practice is required.

**Prerequisite:** CS150

**IT330 Computer Art Design – II** (4 units)
This is the second of the Computer Arts series. The students learn to use more sophisticated graphics design tools to develop industry grade Web sites. Topics include reviewing standard graphics tools such as Photoshop, the Illustrator Web editing tool such as Dreamweaver, as well as the animation tool Flash. The course emphasizes more on Macromedia Flash – the most popular Web animation tool. The course further prepares the students to coordinate, produce and maintain commercial grade Web sites. Students also gain knowledge of graphics creation and optimization using HTML. Hands-on practice is required.

**Prerequisite:** IT320 or instructor’s consent.

**IT370 Database Design and Development For Business** (4 units)
This is the second of the IT sequence and offers a more in-depth study of database systems. Technical concepts are presented within a managerial context. Students will learn the impact of the database environment on the decision-making process. Topics include introduction to database systems, elements of database systems, data modeling, a framework for database systems design, normalized database design, the relational database model, the structured query language, the technical aspects of database design, and database systems for management decision making. Hands-on exercises and projects are required. SAP R/3 will be used as the live example for IT system.

**Prerequisite:** IT310

**IT450(G) Enterprise Information System Fundamentals** (3 units)
This course provides a general introduction to information systems for electronic enterprise with emphasis on system functions, deployment planning, integration technologies, and administration basics. Topics include enterprise information system categories, Portals, ERP, CRM, application integration, industry standards, and system platforms. In addition, students will also receive an overview of enterprise IS applications such as CMS, ERP, CRM, KM, SCM, and related technologies including Java, XML, etc. Case studies and hands-on practice are required. SAP is introduced to the students.

**Prerequisite:** IT310 or instructor’s consent.

**IT453(G) Web Site Design and Programming with JavaScript** (3 units)
This course teaches the fundamentals of web site design and creation: designing, encoding, and maintaining a web site on the World Wide Web using HTML and web page tools (MS FrontPage 2000); fundamentals of client-side programming for web pages requiring data collection or other user interactions. Students will create web pages that execute on the client machine using JavaScript.

The students also learn to use the UNIX Operating System. Hands-on exercises are required.

**Prerequisite:** CS150 or IT310 or instructor’s consent.

**IT500 Advanced Management Information Systems (SAP)** (3 units)
This course studies business operations by managing a large information system. SAP R/3 system is introduced to the students for real-world applications. The course begins with an overview of ERP and SAP system, followed by applications to sales and distribution, customer services, production planning and execution, purchasing, finance and reporting, process steps, and team formation and development. Case study form will also be employed in the class. Hands-on practice is required.

**Prerequisites:** IT370 or CS457

**IT510 Advanced e-Business Programming and Design** (3 units)
This course is designed for the students to learn details of Perl and CGI programming and applications. Topics include client/server concept, Perl programming, mechanism of CGI, Apache Web server, and creating CGI applications with Perl, HTML, JavaScript, and database. Hands-on exercises throughout the course are required.
IT530 Enterprise Networking Fundamentals (3 units)
This course is designed for graduate students in business administration to gain further insight into the role of telecommunications and electronics technology in business, with an emphasis on information technology management. Topics include fundamentals of data communication, communications media- servers-clients, communication equipment, data transmission, protocols, network concepts, wide area and metropolitan area networks, communication services, the Internet, e-business applications and the business data communication industry, local area networks, network security, and network management and software.
Prerequisite: IT310

IT553 Business Intelligence and CRM (3 units)
A major challenge to a business in the information age is to turn mountains of data into useful information that can help business managers analyze sales trends, customer behavior, and other key performance metrics to make the best decisions. This course introduces students to the effective methodology and a wide range of techniques used to generate business intelligence (BI) and applications to customer relationship management (CRM). Topics include: data warehouse and data mart, extraction, transformation, and loading (ETL) process, Ad hoc query and reporting, data mining, and CRM systems. The students will explore new software and tools provided by companies such as Oracle, Teradata, SAS, and Business Objects, and gain hands-on experience in BI and CRM applications. Real case studies in this course will also help the students gain business insight. Taking this course should sharpen students' abilities to advance their professional career with this IT trend. The students will explore SAP R3 software and gain hands-on experience in BI and CRM applications.
Prerequisite: IT310

IT560 Enterprise Resource Planning (ERP) (3 units)
This course teaches the students to use SAP software for enterprise resource planning. Students will learn the mySAP technology and how it applies new Web computing and e-business philosophy to help the different market segments solve their business issues and processes. The following will be discussed: cross-industry solution- CRM, e-procurement and business intelligence; Internet Transaction server, mySAP workplace, marketplace, security within mySAP environment, Web application server, mySAP.com projects implementation, solution in different industries, and SAP future and challenge. Case studies will also assist the students’ learning in this course.
Prerequisite: Either IT370 or CS457 or instructor’s consent.

IT589 Special Topics on Information Technology (3 units)
Special topics courses are offered to graduate students in the MBA program by current faculty members or invited guest speakers to expose the students to emerging information technologies. These courses are conducted the same way as regular courses.
Prerequisites: Advanced graduate standing or instructor’s consent.

IT602 Emergent Information Technologies for Business (3 units)
This course is a study of the emergent information technology that will impact future business practices and the business decision making processes. The most recent technology development and trend will be covered. The course will be conducted through formal lectures, seminars given by invited speakers as well as students’ own research findings and reporting.
Prerequisites: IT450

IT605 Decision Support Systems (3 units)
This course teaches systems for supporting individual and group decision making and collaborative work. It covers expert and other knowledge-based systems and their applications as well as fundamentals of human-computer interaction.
Prerequisites: IT450

IT665 Advanced Business Application Programming (ABAP/4) in SAP (3 units)
ABAP (Advanced Business Application Programming) is the language used for application development of the SAP R/3 system. SAP uses ABAP as a full-featured application development tool. After taking this course, the student will learn how to program with ABAP and develop applications using ABAP.
Prerequisites: Either IT500 or IT560

Law

LAW310 Introduction to Business Law (4 units)
This course is designed as an introductory-level course in U.S. business law. The focus will be on preparing students to spot potential legal issues in the operation of businesses so they can operate legally and know when to consult an attorney before taking action. The course begins with an overview of the U.S. legal system, its fundamental structures and processes. Emphasis is placed on basic tort and contract law principles. Students will also be exposed to several substantive areas of law affecting business, including employment, corporate, securities, bankruptcy, and intellectual property law.
Prerequisite: ENGL101 or instructor’s consent.
**MBA597 Master’s Project (3 units)**
This course teaches legal issues in formation, operation, and dissolution of corporations, partnerships, and sole proprietorships; emphasis is on advantages and disadvantages of each in terms of taxation, finance, obligations to third parties, and operating problems.
**Prerequisite:** LAW310 and advanced graduate standing.

**LAW670 Intellectual Property Law (3 units)**
This course is intended to offer the fundamental knowledge of intellectual property (IP) pertaining to inventors’ rights, patent rights, copyrights, trademark, etc. The importance of IP relevant to technological business development is also introduced. The patent law segment will give an overview of the requisites of patentability, including eligible subject matter, utility, novelty, nonobviousness, and disclosure. Enforcement issues such as claim interpretation, the doctrine of equivalents, and remedies will be covered. Subjects covered in the trademark area include trademark, trade dress, trade secrets, and trade libel law. A brief introduction to trade related aspects of IP (TRIPS) adopted by WTO will also be made. Journal reading and reports are required in this course.
**Prerequisite:** Advanced graduate standing or instructor’s consent; LAW310 preferred.

**MBA**

**MBA597 Master’s Project (3 units)**
This course is designed to develop research and development ability of graduate students in Business Administration. The student or project group will conduct the project under the close supervision of a project advisor. The research and development approach must employ up-to-date information and methodologies. Completion of the project entails: (1) decision on a subject and formulation of the objective, (2) planning the research and development procedures and practical approach, (3) setting a time table and operation instructions, and generating a proposal, (4) carrying out the plan, and (5) examining the results at the end. The project topic and proposal must be approved by the project advisor. The format of the report must be in accordance with NPU’s Project Style Guide and be approved by the advisor and tech writer. Upon completion of the project, the student is required to conduct an open-forum presentation of the project.
**Prerequisite:** Advisor’s consent.

**MBA599A Master’s Thesis - I (3 units)**
This is the first part of a 2-part master’s thesis course designed for a graduate student in the Business Administration program who plans to pursue his/her research interests in depth. Each part requires one trimester’s effort to complete half of the entire project work. In this first part, the advisor will assist the student to identify the research topic, shape research ideas, and define the research objectives and scope. The student then performs the following: topic studies, defining the project objectives and procedures, writing a project proposal and submitting it to the administration after obtaining his/her advisor’s approval, working on research and implementation of the project, and documenting findings. Regular meetings with the advisor are required.
**Prerequisite:** Advanced graduate standing.

**MBA599B Master’s Thesis - II (3 units)**
This is a continuation of the first part of the master’s thesis course. At the beginning of the semester, the student should draw a conclusion on the research and development work for the project and begin to write a thesis report following the required format. The student should make an analysis of the project work and results. Through this process, the student will gain in-depth knowledge of the selected subject and develop independent thinking and research capabilities. The report must be approved by the advisor and a tech writer. Upon completion of the project, the student is required to conduct an open-forum presentation of the project.
**Prerequisite:** MBA599A

**Management**

**MGT201 Principles of Management (4 units)**
This course is designed for the students to learn the foundations of management and the basic skills and applications of management. Specifically, students learn organizational structure and environment, and develop skills in setting objectives in planning, organizing, leadership, controlling and motivation, decision making, communication and negotiation, and managing information for decision making.
**Prerequisite:** ENGL101 or instructor’s consent.

**MGT450(G) Organizational Behavior and Management (3 units)**
This course explores the complex dimension of organizational behavior including examination of experiential and conceptual approaches to communication, self-awareness, perception, motivation, problem solving and culture. Students apply interpersonal and intrapersonal exploration to management of change, leadership theories and organizational issues. Real case projects are required.
**Prerequisite:** MGT201 or instructor’s consent.

**MGT460(G) Production and Operations Management (3 units)**
New technologies, competition from emerging industrialized nations outside North America, and the productivity and quality demands from the consumers continue to shape production and operations management. This course is designed as
an introductory-level course in production and operations management. Emphases will be on planning, organizing, controlling, and a balance between the quantitative aspects and behavioral applications in production/operations management; operations strategy will be the guide for topical integration. The students will learn management process, resource conversion, and concepts, models, behavior, and behavioral applications within production/operations. Specific topics include operations management, operations strategies for competitive advantage, forecasting in operations, product and process design choices, facility and layout planning, scheduling, inventory control and quality control. The PP, MM, and QM modules of SAP R/3 may be used as demo software.

Prerequisite: Senior standing or instructor’s consent.

MGT480(G) Entrepreneurship and Venture Business (3 units)
This course explores the full range of the entrepreneurial process including the evaluation, development, and creation of a successful business. It will help the potential entrepreneurs and professionals visualize and experience entrepreneurial development. The course explores the entrepreneurial approach to resources such as the development of an organizational structure, market analysis, financing entrepreneurial ventures, and screening venture opportunities. Individuals will experiment and evaluate what it takes to be an entrepreneur including developing the plan for a new business.

Prerequisites: Senior standing and MGT450, or instructor’s consent.

MGT501 Project and Risk Management (3 units)
This is the first of a sequence of courses designed for graduate students who are interested in pursuing the project management concentration area of study. Principles of project and program management will be introduced, followed by the roles of project management, matrix organization in both private and public segments, and project management techniques leading to the efficient execution and completion of projects. Students also learn to identify and analyze project risks, plan for risk reduction or elimination, control of risk-related factors, and to manage projects under risk conditions. These techniques are useful in project proposal development, in project planning, and in project operational management. Methods for ongoing risk assessment and project performance evaluation are included. Proposal development, case studies, and independent projects are required.

Prerequisites: MGT450 or instructor’s consent.

MGT503 Competitive Strategy (3 units)
This course focuses on the problems affecting both the character and success of the entire corporate organization. Problems and decisions are analyzed from the point of view of the general manager or chief executive who has responsibility for the strategy of the entire organization. By focusing on strategy decisions, concern will be focused on the choice of goals as well as the organization and management of scarce resources to pursue these goals within the context of an imperfect, changing, and competitive environment. This process requires the successful focusing of the distinctive strengths of a company on market opportunities through an internally consistent competitive strategy. Students will also learn how firms formulate strategy in order to create a sustainable competitive advantage.

Prerequisite: MGT201.

MGT505 Supply Chain Management for E-Business (3 units)
This course is about applying evolving methods in more closely integrating the processes of product distribution and supply chain management using the power of the electronic business. This course introduces specific methods that will allow you to profitably and efficiently fulfill customer demand through the Internet. At the completion of the course you should be able to demonstrate understanding and abilities in this arena.

Prerequisite: IT310 and MGT460.

MGT520 Managing for Quality Improvement (3 units)
This course introduces the principles of quality management in the context of organizational and cultural change dedicated to the continuous improvement of products and services. It is intended for graduate students who are interested in pursuing management concentration area and need an introduction and deeper understanding of Total Quality and Organization Management. The course will focus on total quality practice in project execution and on-going operation environment. Quality management, organizational behavior and strategic management will be discussed throughout the course. Students will learn quality planning and quality management through hands-on practice, including quality plan development and execution, quality management processes and implementation. “Six Sigma” concept and other quality management techniques and methodologies will be introduced during the course; ISO 9000 and other quality standards will be introduced.

Prerequisite: Advanced graduate standing or instructor’s consent.

MGT530 Logistics and Operations Management (3 units)
This course is designed to prepare students with the ability in logistics and operations management. Topics include how managers plan and control operations to achieve optimum productivity, top quality, and customer satisfaction, qualitative and quantitative methods of managing production and operations, methods of total quality management (TQM) and continuous improvement in the service industries and in production operations. Students will also learn to plan for and operate under
changing technologies in international operations and in integrated operations.

Prerequisite: MGT460 or instructor’s consent.

MGT531 Human Resources Management (3 units)
This course provides students and practicing managers with a comprehensive overview of essential personnel management concepts and techniques. The focus is on essential topics such as job analysis, candidate screening, interviewing, testing, hiring, evaluating, training, motivating, promoting, compensating and their associated legal constraints. Additional topics covered include global HR, diversity awareness and training, and sexual harassment legal requirements. Practical applications such as how to appraise performance and benefits and handle grievances are explored. Additionally, developing independent work teams that foster creativity and innovation will be discussed.

Prerequisite: MGT450 or instructor’s consent.

MGT538 International Business Management (3 units)
This class reviews the classic five functions of management: planning, organizing, staffing, leading, and controlling. Students will compare managerial practices of Europe, Asia, and Latin America. The class also covers the importance of quality and continuous improvement for gaining a competitive edge. Students will learn practical aspects of management from actual case studies, the strategic considerations for management in the international environment, and the roles of the latest information technologies, including computer networks, telecommuting, decision support systems, and CAD, CAM, CAE.

Prerequisite: Advanced graduate standing or instructor’s consent.

MGT540 Management of Innovation (3 units)
This course is designed to equip the students with the knowledge and management skills to address the needs of new and innovative enterprises in a changing and uncertain environment. Topics include technology forecasting and assessment, program or product selection and control, market development, financial management, and regulations and ethics.

Prerequisite: Advanced graduate standing or instructor’s consent.

MGT542 Technology Product Management and Marketing (3 units)
This course is designed to give students a practical experience in product development, and focuses on the management of engineering and technology activities. Topics include technology product design, planning, production, marketing, sales, and maintenance; technological product life cycle from research and development through new product introduction, marketing requirement documentation (MRD), product positioning, channel inventory management, outbound communications, and the organizational role of the product marketing manager. Case study and project presentations are required.

Prerequisite: Advanced graduate standing or instructor’s consent.

MGT601 Strategic Management (3 units)
This is an advanced-level case study course that integrates the technical skills and concepts of accounting, finance, marketing management, statistics, and computer applications among others. The course first covers the concepts and techniques of strategic management, followed by case studies. Topics cover an overview of the strategic management process, the three strategy-making tasks, industry and competitive analyses, evaluating company resources and competitive capabilities, strategy and competitive advantages, matching strategy to a company’s situation, evaluating the strategies of diversified companies, implementing strategy, and case studies.

Prerequisites: Advanced graduate standing or instructor’s consent.

MGT603 Manpower Planning (3 units)
This course begins with the discussion of the need for manpower planning and gives samples of plans developed for various types of organizations such as manufacturing, high-tech, small business, etc. This course would give students an opportunity to learn about and develop a manpower plan which is part of the Business Plan and also an ongoing dynamic document developed as a part of the Strategic Planning component of the organization. It also has to do with scheduling, rosters and succession planning which is a process of identifying a long-term plan for the orderly replacement of key employees. The course also explores SAP applications of developing a manpower plan including developing a Gap Analysis to determine manpower needs and budgeting for the manpower needs. Developing new HR manpower configurations such as self-managed teams, telecommuting, outsourcing, temps-to-hire and other methods to make companies more flexible and offer economical solutions to the high cost of knowledge workers. The course includes case studies and actual writing of several manpower plans for various sizes of organizations.

Prerequisite: MGT531

MGT605 Managing Nonprofits (3 units)
This course focuses on similarities and differences between for-profit and nonprofit organizations, with emphasis on the management of nonprofits. Topics include marketing, fundraising, staffing, management/director relationships, use of volunteers, and emerging career opportunities.

Prerequisite: MGT450
MGT610  Business Policy (3 units)
The course will require students to integrate all of their core areas, including accounting, finance, marketing, operations management, information systems, and human resources management. The course begins with an introduction to business strategy analysis and tools, followed by an intensive series of in-class discussions using actual case histories and supplemental readings. The students learn to apply their previous learning in the analysis of business policy in real firms, using the case study and additional readings as the primary starting point for discussions. Case studies will include some that are topical to current business situations or conditions (e.g. globalization, etc.) Students will be introduced to a number of business strategy methods and tools. They are expected to engage the instructor and each other, and class participation is a significant portion of the final grade. Students organize themselves into small teams, and each team will submit a final project by the end of the semester, a Business Strategy Analysis paper comparing two companies in a specific area. The course will also include two additional individual "short" papers, and one in-class examination, and will also require that each team make a short presentation in the last week of class.
Prerequisite: Completion of graduate foundation courses

MGT635 Advanced Operations Management (3 units)
This course delves more deeply into topics that are currently influencing advances in practice of operations management in both manufacturing and service industries. Topics include modeling and analysis of manufacturing systems, yield management, and workforce scheduling.
Prerequisite: MGT530

MGT645 Venture Partnerships, IPO and Acquisition (3 units)
This course introduces the fundamental issues and practices related to venture investments, as well as the legal process of IPO. Topics include venture funds and venture capital market and sources, and private equity market; IPO process - the applicable statutory framework, pre-offering corporate preparation (such as implementation of poison pills and stock option plans), the due diligence process, the implementation of corporate governance policies appropriate for a public company, the offering registration process, liability under federal security laws, the Securities and Exchange Commission review process, underwriting arrangements, pricing, selection of a trading forum (i.e., NYSE, NASDAQ, or AMEX), and the consequences of going public. Regarding acquisitions, the course will explore financing alternatives, accounting treatment, due diligence, choosing an appropriate transaction (i.e. stock vs. asset sale), and crucial aspect of acquisitions, such as letter of intent, continuity of employees, anti-takeover strategies, and non-competition agreements.
Prerequisite: MGT480.

MGT670 Entrepreneurship and High Technology Business (3 units)
This course involves the students in an investigation and discussion of the cause and effect of entrepreneurship and Silicon Valley’s high technology industry. Success of entrepreneurship in Silicon Valley has changed the economy not only locally, but also globally. Topics include theory and practice of venture business, formulation and development of start-up business, and effective management of start-up business. The course emphasizes case study. The students are expected to develop a visionary statement or a start-up business briefing document as part of the overall learning objective.
Prerequisite: MGT480 and graduate standing.

MGT685 Organizational Learning in Global Businesses (3 units)
Rapid changes in the economic environment caused by globalization and technology has forced organizations from around the world to make significant transformations in order to adapt, survive, and to succeed in the new millennium. The changes include not only visible elements such as products, structures, and organizational activities, but also its intrinsic elements of operation such as values, mindset, and even objectives. Adding to the traditional business practices of making products and profits, continual organizational learning has become the new requirement which determines an organization’s chance of success in global businesses. This course makes an analysis of the changing technology and global economy, identifies key issues in organizational learning, presents world-class theories and models of organization learning, emphasizes the essence of practical actions, suggests a means of approach for organizational learning, and offers real examples and procedural actions for organization learning which a global business can adopt for implementation.
Prerequisite: Advanced graduate standing or instructor’s consent.

Marketing

MKT310 Principles of Marketing (4 units)
This course introduces the major principles of marketing, marketing’s role within the company and in the global economy. Studies will focus on how to find marketing opportunities with market segmentation, how to get information for marketing decisions, the elements of product planning and new product development, wholesalers and retailers and their strategies, pricing, and promotion.
Prerequisite: Junior standing or instructor’s consent.
MKT450(G) Marketing Management (3 units)
This course studies marketing management by analyzing real-world cases. Students will learn to implement and execute the marketing process through situation assessment, strategy formulation, marketing planning, marketing implementation and evaluation.
Prerequisite: MKT310

MKT541 Strategic Marketing (3 units)
This course will teach the students fundamental concepts and practices in marketing research and marketing data analysis, and use of the data and financial analysis to set strategic positioning strategies. Emphasis will be on practical marketing research skills development and basic analysis mechanisms leading to strategic marketing. Students will learn both the primary source (such as surveys) as well as secondary sources (Internet, publications, etc.) in research techniques. Students will also engage in their own marketing research projects. Although statistical analysis will be covered in the course, quantitative analysis skills will be the main focus. The course also covers an overview of quantitative and qualitative tools for strategic marketing, market segmentation process, strategic positioning, and channel marketing issues. Case studies and marketing requirements reports are required.
Prerequisite: MKT450

MKT542 International Marketing (3 units)
This course considers how culture and environment of different countries affect marketing strategy, how to perform a comprehensive analysis of a country to support marketing plan formulation, the strategic implications of different market groups around the world, and special insights on international marketing from a study of special cases.
Prerequisite: MKT450 or instructor’s consent.

MKT545 International Trade and Operations (3 units)
This course is a study of the fundamentals of international merchandise trade – importing and exporting opportunities and operations. The course provides a comprehensive coverage of the mechanics of international trade payment methods, risk analysis, modes of transportation, import/export documentation, and other related key topics.
Prerequisite: Graduate standing or instructor’s consent.

MKT611 Advertising Management (3 units)
This course considers advertising management issues within the framework of an integrated marketing communications scheme. Some of the topics covered include elements of a marketing communications plan, marketing information and research, creating brand value, and media strategies.
Prerequisite: MKT450

MKT630 Consumer Behavior (3 units)
This course examines consumer decision-making process with emphasis on application of concepts and research findings from behavioral science for solution of marketing problems. Topics include models of consumer decision making, information processing theories, and sociological influences on consumer decision making.
Prerequisite: MKT310

MKT632 New Product Development (3 units)
This course is designed to introduce the new product development process and techniques to identify markets, develop new product ideas, measure consumer preferences, position and design new products, as well as test them prior to launch.

Analytical thinking and techniques are emphasized.
Prerequisite: MKT450 or instructor’s consent.

MKT650 e-Commerce Marketing (3 units)
This course is designed to introduce students to what it takes to market and promote a successful e-commerce solution. Students will learn how e-commerce fits into the marketing mix, analyze market trends, what it takes to maintain a successful e-commerce program, and how to measure results vs. marketing objectives. The learning methods also include case studies and a discussion of strategies for acquiring and retaining target customers online.
Prerequisite: MKT450 or instructor’s consent.

Mathematics

MATH201 Calculus - I (4 units)
This course is the first of a series in calculus designed for students to build up the fundamental background of calculus and to learn its applications to very basic problems. Topics include functions, limits, continuous functions, derivatives and applications, antiderivatives, composite functions and chain rule, graphing techniques using derivatives, implicit differentiation, finite integrals, and fundamental theorems of calculus.
(GE - Area B)
Prerequisite: pre-calculus subjects.

MATH202 Calculus - II (4 units)
This course is the second of the calculus series designed for students to understand integration techniques and extend the differentiation notion and methods to functions of multiple variables. Topics include logarithmic and exponential functions and their derivatives, inverse trigonometric functions and derivatives, L’Hospital’s rule, integration techniques and their applications, sequence, series, partial derivatives, improper integrals, and basic differential equations.
(GE - Area B)
Prerequisite: MATH201

MATH203 Differential Equations and Linear Algebra (4 units)
The concentration of this course is in the area of Ordinary Differential Equations and Linear Algebra with emphasis on concepts and theory and the
applications in engineering. In differential equations, topics include first and second order differential equations, higher order linear differential equations, systems of differential equations; series solution of differential equations, special functions, approximate solutions, applications of boundary value problems, Laplace transformation, and initial value problems. In linear algebra, topics include linear systems, matrices, vectors, determinants, matrix theory, vector spaces, linear transformations, Eigenvalues, Eigenvectors and examples of scientific and engineering applications. 

(\textit{GE - Area B})

\textbf{Prerequisite:} MATH202

\textbf{MATH208 Statistics} \hspace{1cm} (4 units)

This course is designed for students to understand the concepts, theory, and applications of probability and statistics. Topics include permutation, combination, random variables, distribution, means and variance, normal distribution, random sampling, estimation, confidence interval, hypothesis testing, linear correlation and regression 

(\textit{GE - Area B})

\textbf{Prerequisite:} Freshman standing or instructor’s consent.

\section*{Physics and Physical Sciences}

\textbf{PHYS201 Physics - I} \hspace{1cm} (4 units) 

\textit{(3-hour lecture and 2-hour laboratory)}

This course is designed to be the first of a series in physics for engineering students. Topics include vectors, motion and Newton’s laws, gravitation, work and energy, momentum, mechanics of rigid bodies, oscillations, kinetic theory of gases, and thermodynamics. Laboratory practices are conducted formally each week. 

(\textit{GE - Area B})

\textbf{Prerequisites:} MATH202 (may be taken concurrently).

\textbf{PHYS202 Physics - II} \hspace{1cm} (4 units) 

\textit{(3-hour lecture and 2-hour laboratory)}

This course is the second of a series in physics for engineering students. Topics include Coulomb’s law and electric fields, currents and DC circuits, magnetic fields, time-varying EM fields, AC circuits, waves and sound, optics, interference, and diffraction. Laboratory practices are conducted formally each week. 

(\textit{GE - Area B})

\textbf{Prerequisite:} PHYS201

\textbf{PHYS301 Introduction to Device Physics} \hspace{1cm} (4 units)

This course provides a basis for understanding the characteristics, operation, and limitations of semiconductor devices. The course covers the fundamental concepts of quantum mechanics, the quantum theory of solids, semiconductor material physics and semiconductor device physics. All of these components are vital to the understanding of both the operation of present day devices and future development in the field. 

\textbf{Prerequisite:} PHYS202

\textbf{PHYS411 Electromagnetic Theory} \hspace{1cm} (3 units)

This course is designed to give students a foundation in the basic theory of electromagnetic fields with emphasis on Maxwell’s Equations and their practical applications in electrical engineering. Topics include electrostatics, magnetostatics, electro-dynamics, electromagnetic waves, and electromagnetic radiation. Specific topics include Coulomb’s Law, Gauss’s Law, electric energy and potential, currents and Ohm’s Law, conductors and dielectric, Poisson’s Equation, Laplace’s Equation, magnetic fields, and Maxwell’s Equations. Effects of electromagnetic radiation, EMI, and radiation safety in electronic systems will also be discussed. 

\textbf{Prerequisites:} PHYS202 and MATH203.

\textbf{PHYS450(G) Modern Physics} \hspace{1cm} (3 units)

This course is designed for engineering and other interested students to learn the very important concepts, theories, and discoveries in modern physics. Topics include introduction to relativity, quantum phenomena, atomic structure, quantum mechanics, condensed matter physics, quantum optics, nuclear physics, elementary particles, and anti-particles. 

\textbf{Prerequisite:} PHYS202

\section*{Social Science}

\textbf{SOC201 California History} \hspace{1cm} (3 units)

This course is designed to expose the students to the uniqueness of California history and its evolution. Topics include social, economic, and political development of the “Golden State” over the last three centuries, spanning the Native-American, Spanish, Mexican, and American periods. Lectures, case studies, and field trips for research are the forms of study in this course. 

(\textit{GE – Area C})

\textbf{Prerequisite:} ENGL101 or equivalent.

\textbf{SOC215 Introduction to Sociology} \hspace{1cm} (3 units)

This course provides a study of culture, social organization, and social relations. Additional topics include the major social problems in society, with an emphasis on how those problems are interrelated and the role of society in their creation and perpetuation. Issues and problems related to cross culture and diversity will also be addressed. 

(\textit{GE – Area C})

\textbf{Prerequisite:} ENGL101 or equivalent.

\textbf{SOC220 Introduction to the American Government} \hspace{1cm} (3 units)

This course will introduce students to the structure and operation of the U.S. national government and the government of California. Subjects covered will include the Constitution, the political institutions created by it, the influences of various actors on
those institutions, and the policies pursued by the institutions.

*Prerequisite:* ENGL101 or equivalent.

**SOC230 Introduction to Comparative Political Systems and Foreign Policies (3 units)**
This course is an introduction to various types of political systems, foreign policies, and critical issue areas for nations of the world community in the contemporary international environment. This course should enhance the students’ capacity to function effectively in the increasingly interdependent and multicultural global society, economy, and workforce of the 21st century.

*Prerequisite:* ENGL101 or equivalent.

**SOC310 International Relations (3 units)**
This course provides an introduction to several theories and policy issues in international relations. The course examines the major paradigms in international relations including Realism, Idealism, and Marxism. The students will study the theoretical literature concerning the role of the international system, nation-states and individuals in international politics. Students will explore contending perspectives concerning critical contemporary policy issues including weapons proliferation, information revolution, global economic interdependence, environmental security and so forth. The course focuses on the political, economic, social and cultural forces that shape the contemporary international environment. The course should help to equip professionals to function in the increasingly globalized and diversified international society and economy of the 21st century.

*Prerequisites:* ENGL101 or equivalent.

**SOC320 Modern Asian Comparative Politics (3 units)**
This course is a survey of differing strategies for social, economic, and political development set amid the backdrop of 20th century East Asian politics. The comparative method is also used to draw parallels from the historical experience of Western European modernization.

*Prerequisites:* ENGL101 or equivalent.

**SOC330 Introduction to Psychology (3 units)**
This course is designed to provide students with an overview of some major topics in the field of psychology. It will introduce psychological concepts, terminology, and basic principles of behavior, thought and emotion. The course will cover such topics as learning, perception, intelligence, personality, and social behavior. Case studies and applied research help describe some of the ways in which students can use psychology to improve aspects of their own lives.

*Prerequisites:* ENGL101 or equivalent.

**SOC340 Health Psychology (3 units)**
This survey course will ask: What is health, how do you know you are well, when should you seek professional services, where do I find the right doctor, why should I take good care of myself, and whom do I go to and for what? Concepts and facts will be given to understand and apply to: the body and its systems, the brain and the mind, physical diseases, chronic pain, mental illnesses, personality disorders, sleep and relaxation, positive thinking, emotional intelligence, behavioral health, nutrition, exercise, health care treatments, alternative and complementary medicine, medications and adverse side effects, medical specialties, national costs, insurance, programs, aging and longevity, quality of life, dying with dignity, and healthcare providers ethics.

*Prerequisites:* ENGL101 or equivalent.

**SOC350 Public Administration (3 units)**
This course serves as an introduction to Public Administration. Early key thinkers in the development of Public Administration will be examined. During the semester, topics such as public policy formation, public management, human resources, reinvention, privatization, e-Government, public finance, performance measurement, and ethics will be reviewed. Students will become familiar with the primary issues and challenges facing public administrators today.

*Prerequisites:* ENGL101 or equivalent.

**SOC400 Early American History (3 units)**
This course is designed to lead the students to examine the early periods of American history that shaped the development of the nation, including America before Columbus, European expansion, the founding era and Revolution, the Constitution and the new republic, and subsequent periods of civic and political growth up to the Civil War.

*Prerequisite:* ENGL101 or equivalent.

**SOC410 The American Experience (3 units)**
This course is designed to lead the students to examine the 20th century rise of the United States as a modern multiethnic society with emphasis on the socioeconomic and political forces that have shaped its development.

*Prerequisite:* ENGL101 or equivalent.
Cross-listed Courses

Students enrolled in different programs may be required to take the same course to fulfill their degree requirements. However, they may earn credit by taking the courses under their own program designations for credit tracking purpose.

The following is a list of the cross-listing courses.

**BUS398/CE398/CS398/EE398 Professional Development** (2 Units)
This course instructs the student to develop his/her professional career. Topics cover personality assessment, professional ethics, understanding the business professional world, recognizing company culture and organizational structure, how to survive office politics, career paths and pitfalls, resume writing and cover letters, and interview techniques.
*Prerequisite:* Junior or senior standing.

**DBA601/DCE601 Research Methodology** (3 units)
This course focuses on how to conduct research as well as how to prepare research plan or proposal for a scholarly journal article, dissertation, or thesis. The course will be conducted through formal lectures, seminars given by invited speakers, and the student’s engagement in practical research work. The student will be required to complete an applied research project.
*Prerequisite:* Advanced graduate standing or instructor’s consent.

**DBA602A/DCE602A Research Seminar-I** (1 unit)
In this course the students are exposed to a series of seminar topics to gain broad knowledge of subjects related to the advanced study areas of the program. Forum for invited speakers as well as presentations, criticisms, and problem analyses by students of research work in progress will be the form of this course. The students will be required to write topic reports on selected subjects and participate in discussions and presentations.
*Prerequisite:* Advanced graduate standing or instructor’s consent.

**DBA602B/DCE602B Research Seminar-II** (1 unit)
This course is similar to DBA602A/DCE602A; the purpose is to expose the students to a series of seminar topics to gain broad knowledge of subjects related to the advanced study areas of the program. Forum for invited speakers as well as presentations, criticisms, and problem analyses by students of research work in progress will be the form of this course. The students will be required to write topic reports on selected subjects and participate in discussions.
*Prerequisite:* Advanced graduate standing or instructor’s consent.

**DBA603/DCE603 Teaching/TA Training Seminar** (1 unit)
This course is to provide an opportunity for graduate students to develop and practice teaching and instruction skills. Topics cover lecture preparation, recitation techniques, individual and small group communication, and classroom management.
*Prerequisite:* Advanced graduate standing or instructor’s consent.

**CE453/CS453 Compiler Design** (3 units)
This course is designed to give students a fundamental knowledge of compilers and interpreters for modern computer languages. Topics include a study of modern computer languages, regular expressions, lexical analysis, parsing techniques, context-free grammars, and syntax-directed translation. Hands-on exercises and trimester projects are required.
*Prerequisite:* CS380

**CE470/CS470 Computer Networks** (3 units)
This course is designed to give students a global picture of computer networks. Topics include network-layered models (OSI, TCP/IP), data communication basics, circuit switching, packet switching, routing, and internetworking. Hands-on exercises are required.
*Prerequisite:* CS380

**CE502/CS502 Software Engineering** (3 units)
This course is designed to demonstrate the engineering approach to the development of large, high-quality software projects. Topics include software life cycle, development process, requirement specifications, design and testing techniques, verification and validation, and software management. Students learn to use project management tools, principles, and environment to facilitate development of software programs/systems. Hands-on exercises and projects are required.
*Prerequisites:* CS360 for students in Computer System Engineering program and solid programming experience, such as programming in Windows, Unix, C++, Java, networks, database, etc.

**CE506/CS506 Operating System Design** (3 units)
This course offers graduate students an in-depth understanding and hands-on experience in modern operating system design and implementation. Topics include process, memory, file system, I/O, deadlocks, case studies of operating system implementations, modern distributed and network system architectures, communication and synchronization in distributed systems, threads and processor allocation, scheduling in distributed operating systems, distributed file systems, and case studies of modern distributed operating system design. Projects are required.
*Prerequisite:* CS380
Online Courses

The following courses may be offered periodically with online mode of instructions. Refer to page 17 for instructions for taking online courses.

BUS501 - ON Quantitative Methods for Business (3 units)

This course is designed to introduce the contemporary business decision-making methodology and develop students’ ability to analyze complex systems. Quantitative methods of management science and operations research, using quantitative analysis software for management problems are the focus of this class. The students learn how to format models from real-world problems so they can be solved using computer techniques, how to check for errors in problem formulation and data input to minimize erroneous solutions, and how to apply the techniques to real-world problems.

Prerequisite: Graduate standing or instructor’s consent

FIN450 – ON Financial Markets and Institutions (3 units)

This course is to give the students an exposure to the operational principles of financial markets as well as to the primary roles of financial institutions. Topics include flow of funds and interests-price movements in money and capital markets; supply of loanable funds and demand for funds in the mortgage market, consumer credit markets, corporate security markets, and market for government securities, and municipal obligations; and consideration of the effects on financial markets of the federal reserve and treasury policies.

Prerequisite: FIN310

FIN501 – ON Financial Management (3 units)

This course is designed to further introduce modern financial theories, tools, and methods used to the analysis of financial problems. The point of view of corporate financial managers will be taken to interact with efficient capital markets. Therefore, while making the best use of constrained resources is necessary, maximizing shareholders’ equity is also vitally important. The primary focus is on analysis and forecast of internal operations and the use of short-term and long-term capital.

Prerequisite: FIN310 or instructor’s consent.

IT450 – ON Enterprise Information System Fundamentals (3 units)

This course provides a general introduction to information systems for electronic enterprise with emphasis on system functions, deployment planning, integration technologies, and administration basics. Topics include enterprise information system categories, Portals, ERP, CRM, application integration, industry standards, and system platforms. In addition, students will also receive an overview of enterprise IS applications such as CMS, ERP, CRM, KM, SCM, and related technologies including Java, XML, etc. Case studies and hands-on practice are required. SAP is introduced to the students.

Prerequisite: IT310 or instructor’s consent.

MGT450 - ON Organizational Behavior and Management (3 units)

This course explores the complex dimension of organizational behavior including examination of experiential and conceptual approaches to communication, self-awareness, perception, motivation, problem solving and culture. Students apply interpersonal and intrapersonal exploration to management of change, leadership theories and organizational issues. Real case projects are required.

Prerequisite: MGT201 or instructor’s consent.

MGT501 – ON Project and Risk Management (3 units)

This is the first of a sequence of courses designed for graduate students who are interested in pursuing the project management concentration area of study. Principles of project and program management will be introduced, followed by the roles of project management, matrix organization in both private and public segments, and project management techniques leading to the efficient execution and completion of projects. Students also learn to identify and analyze project risks, plan for risk reduction or elimination, control of risk-related factors, and to manage projects under risk conditions. These techniques are useful in project proposal development, in project planning, and in project operational management. Methods for ongoing risk
assessment and project performance evaluation are included. Proposal development, case studies, and independent projects are required.

**Prerequisites:** MGT450 or instructor’s consent.

**MGT503 – ON Competitive Strategy (3 units)**

This course focuses on the problems affecting both the character and success of the entire corporate organization. Problems and decisions are analyzed from the point of view of the general manager or chief executive who has responsibility for the strategy of the entire organization. By focusing on strategy decisions, concern will be focused on the choice of goals as well as the organization and management of scarce resources to pursue these goals within the context of an imperfect, changing, and competitive environment. This process requires the successful focusing of the distinctive strengths of a company on market opportunities through an internally consistent competitive strategy. Students will also learn how firms formulate strategy in order to create a sustainable competitive advantage.

**Prerequisite:** MGT201.

**MGT530 – ON Logistics and Operations Management (3 units)**

This course is designed to prepare students with the ability in logistics and operations management. Topics include how managers plan and control operations to achieve optimum productivity, top quality, and customer satisfaction, qualitative and quantitative methods of managing production and operations, methods of total quality management (TQM) and continuous improvement in the service industries and in production operations. Students will also learn to plan for and operate under changing technologies in international operations and in integrated operations. Students will learn to design optimal system modules using SAP R/3.

**Prerequisite:** MGT460 or instructor’s consent.

**MGT531 – ON Human Resources Management (3 units)**

This course provides students and practicing managers with a comprehensive overview of essential personnel management concepts and techniques. The focus is on essential topics such as job analysis, candidate screening, interviewing, testing, hiring, evaluating, training, motivating, promoting, compensating and their associated legal constraints. Additional topics covered include global HR, diversity awareness and training, and sexual harassment legal requirements. Practical applications such as how to appraise performance and benefits and handle grievances are explored. Additionally, developing independent work teams that foster creativity and innovation will be discussed. Students will use SAP R/3 for projects.

**Prerequisite:** MGT450 or instructor’s consent.

**MGT542 – ON Technology Product Management and Marketing (3 units)**

This course is designed to give students a practical experience in product development, and focuses on the management of engineering and technology activities. Topics include technology product design, planning, production, marketing, sales, and maintenance; technological product life cycle from research and development through new product introduction, marketing requirement documentation (MRD), product positioning, channel inventory management, outbound communications, and the organizational role of the product marketing manager. Case study and project presentations are required.

**Prerequisite:** Advanced graduate standing or instructor’s consent.

**MKT450 – ON Marketing Management (3 units)**

This course studies marketing management by analyzing real-world cases. Students will learn to implement and execute the marketing process through situation assessment, strategy formulation, marketing planning, marketing implementation and evaluation.

**Prerequisite:** MKT310
Although the writing, editing, and publishing of this catalog have been guided by an effort to attain total accuracy, no responsibility can be assumed for editorial, clerical, or typographical errors or an error occasioned by an honest mistake. All information contained in this catalog is subject to change, without prior notice, by the officials of the University, and does not constitute an agreement between the University and the student.

University Milestones

Northwestern Polytechnic University (NPU) was founded on January 2, 1984 and incorporated as a California nonprofit, public-benefit institution. Because of the strong demand in Silicon Valley for qualified engineers, the School of Engineering began granting Bachelor of Science degrees in Electrical Engineering in November 1984, followed by the Master of Science in Electrical Engineering in 1985. NPU opened the Computer Systems Engineering programs at both the bachelor’s and master’s levels in 1987. Under high-spirited teamwork, NPU grew quickly from a budding school of a few students and faculty in 1984 to a well-established school by 1989. February 23, 1989 marked a milestone for the University as NPU attained full institutional approval from the California Department of Education. When the entrepreneurial spirit in Silicon Valley demanded students with business training, NPU established the School of Business and began to offer the Master of Business Administration and Bachelor of Business Administration and Information Sciences degrees in 1995. At the same time, the School of Engineering continued to expand its programs by offering bachelor's and master's degrees in Computer Science. In January 1998, the Accrediting Council for Independent Colleges and Schools (ACICS) accredited NPU to award bachelor’s and master’s degrees. In April 2005, the ACICS accredited NPU to award Two doctorate degree programs: Doctor of Business Administration and Doctor of Computer Engineering.

Modern information technology has greatly impacted the administrative and instructional environment of higher education as well over the last 20 years and has steadily been providing ever-increasing benefits to the campus operational management and program instruction. The embracing and careful incorporation of information technology has become a clear and vital operational goal for many institutions of higher education as they move steadily toward the digital campus of tomorrow. As an institution with its research and educational focus primarily on the instruction of business and technology, the vision of the digital campus has taken on an added importance. Northwestern Polytechnic University (NPU) launched its digital campus initiatives in the late nineties using a systematic approach to achieve its intended goals. Four phases of development activities were defined and pursued. In April 2005 the school reached its goal of digital campus as the last phase was successfully implemented.

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Director

Sam Liu
IT specialist

Yan He
IT specialist

Paul Wu
IT Specialist

NPU Faculty

Michael Bailey
Degree of Engineer, Stanford University, CA, 1992
M.B.A., Santa Clara University, CA, 2001
M.S., Physics, UC-Santa Barbara, CA, 1981
B.A., Physics, UC-San Diego, CA, 1979
RF and microwave device and component design, optical data communications, wireless technology, business strategy, leadership development, accounting/finance.

Michael Chen
Ph.D., Physics, University of Pittsburgh, PA, 1988
M.S.E.E., University of Pittsburgh, PA, 1980
M.S., Physics, University of Pittsburgh, PA, 1984
B.S., Physics, Beijing University, China, 1982
Object-oriented analysis and design, distributed systems, Internet and Java technology, and MS Windows programming.

Ken Cheung
M.S.C.S.E., Northwestern Polytechnic University, CA, 1997
B.S., Industrial Engineering, Hong Kong Polytechnic University, Hong Kong, 1991
Algorithms analysis and design, computer systems design and simulations, e-commerce, database design, networking applications, MS Windows system and.NET applications.

Bette Daoust
Ph.D., Business Management, Northcentral University, AZ, 2004
M.A., Ed. Technology, Simon Fraser University, British Columbia, Canada, 1989
B.Ed., University of British Columbia, British Columbia, Canada, 1975
Knowledge management, strategic planning, project management, instructional design, computing science.
Manuel S. Gaspay  
Ph.D., Economics Development, Stanford University, CA, 1993  
M.A., Economics, Stanford University, CA, 1988  
M.E., IE, University of the Philippines, Q.C., Philippines, 1980  
B.S., Geodetic Engineering, University of the Philippines, Q.C., Philippines, 1972  
Economics, project evaluation and management, quantitative analysis, public policy analysis.

Ben Liu  
Ph.D., Biophysics, University of Alabama, Birmingham, AL, 1979  
M.A., Physics, Dartmouth College, NH, 1974  
B.S.E.E., National Taiwan University, Taiwan, 1969  
Instrumentation and physical measurements, electronic computation, mathematical analysis, physics, brush painting.

Jahan Ghofraniha  
Ph.D. E.E., University of British Columbia, Vancouver, Canada, 1997  
M.S.E.E., University of British Columbia, Vancouver, Canada, 1990  
B.S.E.E., Sharif University of Technology, Tehran, Iran, 1985  
DSP, wireless systems, digital communications, algorithm development and implementation in digital and wireless communication systems.

Jason Han  
Ph.D., C.S., University of Illinois at Urbana-Champaign, Urbana, IL, 1992  
M.S.C.S., Purdue University, IN, 1988  
B.S.E.E., National Taiwan University, Taiwan, 1984  
Internet technology, Microsoft .NET technology; software applications in server systems, wireless systems, and real-time distributed systems; software project management.

Tai Hsu  
Ph.D. C.S., Oregon State University, OR, 2003  
M.S.C.S., University of Missouri-Rolla, MO, 1994  
B.A.C.S., Wartburg College, Iowa, 1992  
Unix system programming and administration, Windows system and administration, biocomputing, bioinformatics, supercomputing.

Hungman Paul Kim  
Ph.D., System and Industrial Engineering, University of Arizona, AZ, 1995  
M.A., Operational Research, National Defense University, R.O.K, 1986  
B.A., Operational Research, Naval Academy, R.O.K, 1981  
System engineering and analysis, Mathematical modeling and simulation. Physics and mechanical analysis; statistics analysis and decision theory.

Yeong-Sheng Lee  
Ph.D., E.E., University of California at Los Angeles, LA, CA, 1987  
B.S.E.E., National Taiwan University, Taipei, Taiwan, 1976  
Mixed signal IC design, analog IC, CMOS design.

Yi Liu  
Ph.D., Civil Engineering, Colorado State University, 1998  
M.S., Computational Mechanics, Southeast University, China, 1986  
B.S., Applied Mechanics, Southeast University, China, 1983  
UNIX/NT system and network management, Internet technologies.

Timour Paltashev  
Doctor of Science, Computer Engineering, Institute of Fine Mechanics and Optics, St. Petersburg, Russia, 1994  
Ph.D. Computer Engineering, IFMO, Leningrad, Russia, 1987  
B.S. Computer Engineering, Kazakhstan Polytechnic Institute, Alma-Ata, Russia, 1978  
Computer architecture, graphics architecture design, system on chip (SOC), multi-media technology, 3D graphics.

Glen Qin  
Ph.D., E.E.C.S., University of California at Berkeley, CA, 1996  
M.E. University of California at Berkeley, CA, 1995  
M.S. University of California at Berkeley, CA, 1993  
B.E., E.E., Tsinghua University, China, 1984  
Wireless communication, embedded engineering, computer networks.

Yingli Ren  
M.S.E.E., Santa Clara University, CA, 1995  
B.S.E.E., Stanford University, CA, 1987  
Logic design and synthesis, CAD tools, Verilog and HDL, ASIC and PLD design techniques, and software design tools development.

Valerie Schulthies  
J.D., Stanford Law School, CA, 1994  
M.A. International journalism, University of Southern California, CA, 1988  
B.A. Communication and Russian, Brigham Young University, Utah, 1977  
Corporate law, tax and security law, business communication, legal and technical writing.
Raj Shea
M.B.A., International Marketing, Business School of Lausanne, Lausanne, Switzerland, 1990
B.S., Industrial Management, San Jose State University, 1981
International trade and operations, import/export administration, international marketing, industrial management.

Yi Sun
Ph.D., Optics, University of Alabama, AL, 2000
M.S.E.E., University of Alabama, AL, 1998
B.S., Optical Engineering, Huazhong University of Science and Technology, China, 1988
Biomedical imaging, application of optical system in medical instruments, application of laser in fiber communication, electro-optical devices, photonics, MEMS, microfabrication, nanofabrication.

Mohamed Zait
Ph.D. C.S., University Pierre and Marie Curie (Paris 6), Paris, France, 1994
M.S.C.S., University Pierre and Marie Curie (Paris 6), Paris, France, 1990
B.S.C.S., University of Science and Technology of Algiers, Algiers, Algeria, 1988
Database design and applications, large scale database and database management, information technology and MIS. Computer science and computer logic.

Danhua Zhao
Ph.D., Biomedical Engineering, Duke University, NC, 1992
B.S.E.E., University of Science and Technology of China, China, 1982
DSP and image processing, transducer technology, medical imaging systems, and noise reduction algorithms design and implementation.

Adjunct Faculty

Jun Chen
M.S.C.E., University of Southern California, CA, 1998
Communication networks, distributed systems, embedded systems, UNIX, software development.

Flora Chu
M.B.A., Chadwick University, Alabama, 1996
B.S. Accounting, Biola University, CA 1990
Accounting, payroll services, human resources management.

John Fan
M.S.E.E., Memphis State University, TN, 1989
B.S.E.E., National Taiwan College of Education, Taiwan, 1985
Computer networks, embedded systems, wireless systems, IP routing, SNMP.

Kenneth Fung
M.B.A., University of Hawaii at Manoa, HI, 1999
B.B.A., University of Hawaii at Manoa, HI, 1997
Accounting, finance, auditing, information system administration.
ChesTer He
M.S.C.S., Northwestern Polytechnic University, CA
  2001
B.S.E.E., Northeast Electric Power Institute, China,
  1986
Computer networks and network security, web
technology and database applications, software
testing.

WIlliam Hess
M.B.A., Ball State University, Muncie, IN, 1965
B.S., Mathematics, Purdue University Lafayette,
  IN, 1962
Marketing and sales management, strategic
marketing and analysis. Business management,
product and operational management. Macro/Micro
economics.

Geoge Jen
M.S.C.S., Wayne State University, Detroit, MI
  1989
B.S.C.S., Shanghai University, China, 1983
Database design and administration, ERP system
design, Internet application programs, software
development.

Christopher Jing
Ph.D., Managerial Economics, Rensselaer
Polytechnic Institute, NY, 1994
M.B.A., University of Hawaii, USA, 1990
Financial management, marketing, strategic
management, technology entrepreneurship.

Jane L. King
J.D., University of Illinois Law School, Urbana-
Champaign, IL
B.A., English, University of Illinois Law School,
Urbana-Champaign, IL
Corporate law, international law for business,
expository writing.

Geoge Li
M.S. Systems Science, Louisiana State University,
LA, 1993
B.S.C.S., South China Institute of Technology,
China, 1991
Database architecture and administration, Internet
applications and programming, database
applications in financial and manufacturing
systems, ERP systems.

Yihmin Liou
M.S.E.E., University of Florida, FL 1994
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VLSI/chip design, VLSI tools evaluation and
design.

Eddie Liu
M.B.A., Taxation, California State University-
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B.S., Accounting, San Jose State University, CA,
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Financial accounting, business law, taxation.

Elsa Marley
M.A., English, Holy Names College, CA, 1997
M.F.A., Painting, San Francisco Art Institute,
1985
Special Study: National Art Academy of Art,
Guangzhou, China, 1986
B.A., Painting, Vancouver School of Art, Canada,
1956
Contemporary watercolor, English

Quoc D. Ngo
M.B.A., Marketing, Golden Gate University, CA,
1996
M.S.E.E., Texas Tech University, TX 1980
B.S.E.E., Texas Tech University, TX 1976
Marketing and financial analysis, business and
operation management, quality, and yield
improvement in integrated circuit manufacturing,
design and testing of integrated circuits.

Kevin Oskovich
M.A., TESOL, Monterey Institute of International
Studies, CA, 1993
ESL teaching methodology, public speaking,
communication skills development, expository
writing, American history.

David Paul
M.B.A., California State University at Hayward,
CA, 1998
B.S.E., Chemical Engineering, Princeton
University, NJ, 1967
Systems engineering management, strategic
business management, venture business consulting,
engineering process optimization.

Ching J. Shyu
M.S.E.E., University of New Mexico, NM, 1987
B.S., University of New Mexico, NM, 1985
ASIC design, communication electronics, computer
simulation; large scale fine art projects, watercolor,
oil painting, brush painting, art design.

Hua-Yu Su
M.S.E.E., University of Maryland, MD, 1980
M.S.E.E., National Taiwan University, Taiwan,
1975
B.S.E.E., National Cheng-Kung University,
Taiwan, 1971
Integrated circuit design, analog circuits, digital
circuits, mobile systems.

Nik Tehrani
M.B.A., Pepperdine University, CA, 1999
B.S.E.E., Cogswell Polytechnical College, CA,
1996
Business development, entrepreneurship, sales,
marketing, management.
Siu Ming Tong  
M.S.C.S., San Jose State University, CA, 1998  
B.S.C.E., Hefei Technology Univ., China, 1982  
DSP firmware for real-time video conferencing in Windows NT environment, designing Windows NT audio device drivers, designing SCSI and IDE drivers, designing BIOS, VGA driver, algorithm design.

M.S.C.S., Santa Clara University, CA, 1990  
M.S.M.E., University of Akron, OH, 1988  
B.S.M.E., Zhejiang University, China, 1984  
Internet Web multi-media development, real-time operating systems, distributed computing, object-oriented design and programming.

Tom Xian  
M.S.C.S., Santa Clara University, CA, 1990  
M.S.M.E., University of Akron, OH, 1988  
B.S.M.E., Zhejiang University, China, 1984  
Internet Web multi-media development, real-time operating systems, distributed computing, object-oriented design and programming.

Jesse Tsao  
Ph.D., Mass Communication, Southern Illinois University at Carbondale, IL, 1990  
M.A., Communication, California State University at Chico, CA, 1983  
B.A., Journalism, Fu Shing Kong College, Taiwan, 1969  
Interpersonal/ small group /organization/mass intercultural communication, communication theory.

Yuh-Sheng E. Tsuei  
M.S., M.E., University of Arizona, AZ, 1989  
B.S., Engineering Science, National Cheng-Kung University, 1981  
Networking and real-time embedded systems network protocol, inter-process communication and distributed database in cross platform environments.

Directions to the NPU Facilities in Fremont

► From I-880: Exit I-880 at Mission Blvd.-Warren Ave. and take Mission Blvd East (towards the hills). Turn right onto Warm Springs Blvd. Drive past Warren Ave. to Fourier Ave. Turn right onto Fourier Ave. to go to the learning facility. Fourier Avenue turns into Westinghouse Dr. where the NPU administration office is located.

► From I-680: Exit I-680 at Mission Blvd.–Warm Springs District and drive west on Mission Blvd. (towards the Bay) to Warm Springs Blvd. Turn left onto Warm Springs Blvd. Drive past Warren Ave. to Fourier Ave. Turn right onto Fourier Ave. to go to the learning facility. Fourier Avenue turns into Westinghouse Dr. where the NPU administration office is located.

- See area map on next page -
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