If you have any questions or concerns, please call the university administration office. Tel: (510) 592-9688; 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 at http://www.npu.edu/contact_us/departments.shtml. Also see Academic Counseling on pages 12-13.

- **What courses do I need to complete for my major?**
  See Curriculum under various degree programs:
  - School of Engineering - pages 37-52
  - School of Business and Information Technology – pages 53-61

- **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, and the Internet?**
  See Facilities and Learning Resources on pages 30-35.

- **Where can I find the directions to NPU?**
  See page 116 or on our web site at http://www.npu.edu/contact_us/directions.shtml.
# 2010 Academic Calendar

<table>
<thead>
<tr>
<th>Spring Semester (1/11 – 4/24)</th>
<th>Summer Semester (5/10 – 8/21)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>January</strong></td>
<td><strong>May</strong></td>
</tr>
<tr>
<td>1 New Year holiday; campus closed</td>
<td>8 New student orientation and registration. (10:00 AM)</td>
</tr>
<tr>
<td>2-9 Administration office observes semester break office hours</td>
<td>10 Semester and classes begin.</td>
</tr>
<tr>
<td>4 Spring semester application deadline for local students</td>
<td>- Registration continues for new students.</td>
</tr>
<tr>
<td>9 New student orientation and registration. (10:00 AM)</td>
<td>- Late registration for current students.</td>
</tr>
<tr>
<td>11 Semester and classes begin.</td>
<td>- Add/Drop</td>
</tr>
<tr>
<td>- Registration continues for new students.</td>
<td>15 Orientation on project/thesis courses (1:00 PM)</td>
</tr>
<tr>
<td>- Late registration for current students.</td>
<td>- Last day to add/drop without records</td>
</tr>
<tr>
<td>16 - Orientation on project/thesis courses (1:00 PM)</td>
<td><strong>June</strong></td>
</tr>
<tr>
<td>- Last day to add/drop without records</td>
<td>7-12 First faculty evaluation - by peers</td>
</tr>
<tr>
<td><strong>February</strong></td>
<td>21-26 Mid-term exams.</td>
</tr>
<tr>
<td>8-13 First faculty evaluation - by peers</td>
<td>29 - Deadline for graduation petition for fall semester (without late fee)</td>
</tr>
<tr>
<td>22-27 Mid-term exams.</td>
<td>- Deadline for changing program or catalog requirement (without late fee)</td>
</tr>
<tr>
<td><strong>March</strong></td>
<td><strong>July</strong></td>
</tr>
<tr>
<td>1 - Deadline for graduation petition for summer semester (without late fee)</td>
<td>4 Independence Day holiday; campus closed.</td>
</tr>
<tr>
<td>- Deadline for changing program or catalog requirement (without late fee)</td>
<td>5 Check point – student counseling</td>
</tr>
<tr>
<td>8 Check point – student counseling</td>
<td>19 Fall class schedule and registration packages ready</td>
</tr>
<tr>
<td>18 Summer class schedule and registration packages ready</td>
<td>26 - Begin registration for the fall semester*.</td>
</tr>
<tr>
<td>29 - Begin registration for the summer semester*.</td>
<td>- Second faculty evaluation - by students.</td>
</tr>
<tr>
<td>- Second faculty evaluation - by students.</td>
<td>31 Fall registration ends (for current students).</td>
</tr>
<tr>
<td><strong>April</strong></td>
<td><strong>August</strong></td>
</tr>
<tr>
<td>3 Summer registration ends (for current students).</td>
<td>2 - Late registration begins (current students).</td>
</tr>
<tr>
<td>5 - Late registration begins (current students).</td>
<td>- Fall semester application deadline for international students</td>
</tr>
<tr>
<td>- Summer semester application deadline for international students</td>
<td>16-21 Course review and final exams.</td>
</tr>
<tr>
<td>19-24 Course review and final exams.</td>
<td>23-31 Administration office observes semester break office hours.</td>
</tr>
<tr>
<td>26-30 Administration office observes semester break office hours.</td>
<td>28 - Faculty in-service training workshop</td>
</tr>
<tr>
<td>28 Faculty in-service training workshop</td>
<td>- Posting final grades for summer semester.</td>
</tr>
<tr>
<td><strong>May</strong></td>
<td>- Check point – student counseling</td>
</tr>
<tr>
<td>1 Graduation ceremonies (for students graduating from 2009 fall to 2010 summer semesters)</td>
<td>30 Fall semester application deadline for local students</td>
</tr>
<tr>
<td>1-8 Administration office observes semester break office hours.</td>
<td><strong>September</strong></td>
</tr>
<tr>
<td>3 - Posting final grades for spring semester.</td>
<td>1-4 Administration office observes semester break office hours.</td>
</tr>
<tr>
<td>- Check point – student counseling</td>
<td>6 Labor Day holiday; campus closed.</td>
</tr>
<tr>
<td>- Summer semester application deadline for local students.</td>
<td><strong>------------------------</strong></td>
</tr>
</tbody>
</table>

*Online registration* normally starts several days earlier than the on-site registration. Please check the registration instructions published each semester for detailed information.
2010 Academic Calendar

September
3 New student orientation and registration. (10:00 AM)
7 Semester and classes begin.
   - Registration continues for new students.
   - Late registration for current students.
   - Add/Drop
11 Orientation on project/thesis courses (1:00 PM)
13 Last day to add/drop without records

October
4-9 First faculty evaluation - by peers
18-23 Mid-term exams
25 - Deadline for graduation petition for next spring semester (without late fee)
   - Deadline for changing program or catalog requirement (without late fee)

November
1 Check point – student counseling
15 2011 spring class schedule and registration packages ready
22 - Begin registration for the 2011 spring semester*.
   - Second faculty evaluation - by students
25 Thanksgiving holiday; campus closed.
27 Spring registration ends (for current students).
29 Late registration for 2011 spring semester begins (current students).

December
6 2011 Spring semester application deadline for international students
14-20 Course review and final exams.
21-23 Administration office observes semester break office hours.
21 Faculty in-service training workshop
23 - Posting final grades for 2010 fall semester.
   - Check point – student counseling
24-31 Christmas holidays; campus closed.

January
1 New Year holiday; campus closed
3-8 Administration office observes semester break office hours
3 2011 Spring semester application deadline for local students
8 New student orientation and registration. (10:00 AM)
10 Semester and classes begin.
   - Registration continues for new students.
   - Late registration for current students.
   - Add/Drop
15 Orientation on project/thesis courses (1:00 PM)
   - Last day to add/drop without records

February
7-12 First faculty evaluation - by peers
21-26 Mid-term exams

March
1 - Deadline for graduation petition for summer semester (without late fee)
   - Deadline for changing program or catalog requirement (without late fee)
7 Check point – student counseling
14 - Summer class schedule and registration packages ready
21 - Begin registration for the summer semester*.
   - Second faculty evaluation - by students
26 Summer registration ends (for current students).
28 - Late registration for summer term begins (current students).
   - Summer semester application deadline for international students

April
18-23 Course review and final exams.
25-30 Administration office observes semester break office hours.
27 Faculty in-service training workshop
30 - Posting final grades for spring semester.
   - Check point – student counseling
30 Graduation ceremonies (for students graduating from 2010 fall to 2011 summer semesters)

May
1-7 Administration office observes semester break office hours.
2 Summer semester application deadline for local students
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 training grounds for high-technology as well as global business development needed to help each individual meet the impending 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
2010 Catalog
(Effective 2010 spring semester)

CONTENTS

Academic Calendar
A Message from the President

Introduction
- Educational Philosophy
- Mission
- Faculty
- Accreditation
- Corporate Status
- Community Involvement

Admission Policies
- Application Requirements
- Official Transcripts
- English Proficiency Requirement
  - English Placement Examination (EPE)
  - American Language Classes (ESL)
  - College English Course Requirement for Graduate Students
- Entrance Assessment Tests
- General Background Requirements
- Notification of Admission
- Cancellation of Admission and Readmission
- Returning Students
- NPU Institution Codes for Standardized and International Tests

Transfer of Credit from Other Institutions
- Grades Required for Transfer Credit
- Transfer of Credit in the Bachelor’s Degree Programs
- Transfer of Credit in the Master’s Degree Programs

Enrollment Agreement

Tuition and Fees
- Undergraduate Program Tuition
- Graduate Program Tuition
  - Programs in Business Administration
  - Programs in Engineering or Computer Science
- Estimated Trimester Cost
- Admission Fees
- Service Fees

Refund Policy

Minimum Terms for Tuition Payments

Debts Owed to the University

State of California Tuition Recovery Fund

Financial Aid
- Practicum and Industrial Cooperative Projects

CONTENTS – to be continued
Academic Information 12

- Study Plan 12
- Academic Advising and Counseling 12
- Class Schedule 13
- Registration 1 3
- Full-time Students 14
- Part-time Students 14
- Non-degree Students 14
- Adding and Dropping Courses 14
- Grading Policy and Academic Standards 15
  - Grades 15
  - Grade Point Average 16
  - Incomplete 16
  - Auditing Courses 16
  - Repetition of Courses 17
- Attendance 17
- Taking Online Courses 17
- Standards of Satisfactory Progress 18
- Examinations 2 0
  - Course Examinations 20
  - Challenge Examination 20
  - Proficiency Examination 20
  - Entrance Assessment Examinations 21
- Graduation 21
  - Bulletin Requirements 21
  - Petition to Graduate 21
  - Completion of A Program 21
- Withdrawal from the University 22
  - International Students Transferring Out 22

Educational Records 22

Student Discipline 23

- Inappropriate Conduct 23
- Appeal of Dismissal 24
- Student Grievance Procedures 24

Policy on Sexual Harassment 25

Student Life 26

- University Orientation 27
- Housing Assistance 27
- Transportation Service 27
- Nonacademic Counseling 27
- Cultural Immersion Workshops 27
- Professional Development Seminars 28
- Intercollegiate Activities 28
- Career Placement Services 28
- Student Handbook 28
- The Student Association 28
- Affiliation to Professional Societies 29
- NPU Student Branch of IEEE 29
- On-campus Clubs 29
- Alumni Association 29
• International Student Health Insurance 30

❖ Donations to the University 30

❖ Facilities 30
  • Campus Description 30
  • Teaching and Research Facilities 31
    ➢ Learning Resources and Laboratories 31
    ➢ The University Library and Learning Resource Facility 34
  • Audio/Video Taping 36

ACADEMIC PROGRAMS 36

❖ School of Engineering 37
  • Objectives 7
  • Undergraduate Programs 37
    ➢ Graduation Requirements 37
    ➢ Lower-division Study Flow 39
    ➢ Bachelor of Science in Electrical Engineering Curriculum 40
    (BSEE)
      ➢ Bachelor of Science in Computer Systems Engineering Curriculum (BSCSE) 42
      ➢ Bachelor of Science in Computer Science Curriculum (BSCS) 44
  • Master’s Degree Programs 46
    ➢ Graduation Requirements 46
    ➢ Master of Science in Electrical Engineering Curriculum 47
    (MSEE)
      ➢ Master of Science in Computer Systems Engineering Curriculum (MSCSE) 49

❖ School of Business & Information Technology 53
  • Objectives 3
  • Undergraduate Program 53
    ➢ Bachelor of Business Administration and Information Sciences Curriculum (BBAIS) 55
  • Master’s Degree Program 58
    ➢ Master of Business Administration Curriculum (MBA) 60

❖ Doctorate Degree Programs 62
  • Mission 62
  • Objectives 62
  • Doctoral Advisory Committees 62
  • Applicant Qualifications 62
  • Admission Policies 62
  • Graduation Requirements 64
  • Doctor of Business Administration Curriculum (DBA) 66
  • Doctor of Computer Engineering Curriculum (DCE) 68

❖ Course Descriptions 70
  ❦ University Milestones 109
  ❦ Board of Trustees 109
  ❦ Advisory Board 110
  ❦ NPU Administration 110
  ❦ NPU Faculty 111
  ❦ Location Map 116
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 2010 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, service professionals in healthcare service management and hospitality management, and 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 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.

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, (3) official transcripts from previously attended colleges and/or high school (for freshmen only) to the NPU Admissions Office and certified degree documents (if applicable), (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 assessment 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 and the doctorate degree programs. The scores are for reference purpose and will not affect the admission evaluation for the applicants. Those who are required to enroll in ESL classes will be allowed to take the entrance assessment tests after they have passed the advanced ESL classes. Applicants are also encouraged to submit their resumes.

Veteran students: Currently the CSAAVE is the state agency responsible for approving veterans education.

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 $24,000 is available for the applicant to pursue his/her study in the first academic year at NPU, (7) a transfer student (from a U.S. institution) is required to submit a photocopy of his/her previous I-20 form and request the other school’s international student advisor to complete the International Student Transfer Record form for NPU and conduct the required SEVIS transfer process, and (8) upon reporting 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. Late submissions are permitted only with the approval of the Admissions Committee. 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. Failure to submit official transcript on time may result in placement of the applicant in a non-degree status.

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).
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.

English Proficiency Requirement

Applicants who have completed high school education or an undergraduate degree program in an English speaking country or school are considered meeting the entrance English requirement for enrolling in degree courses at NPU. Those who fall into the following two categories will be assessed of their English background by the admission evaluators based on the official transcripts received by NPU’s Admissions office: (1) Having taken college English courses without earning a degree in an English speaking country or school and (2) International students who have earned a graduate degree (not an undergraduate degree) in an English speaking country or school.

English Placement Examination: All other applicants must be assessed for their English proficiencies by either taking a standardized test, such as TOEFL or IELTS, or NPU’s on-campus English Placement Examination (EPE) before or upon reporting to NPU. The exam results indicate the student’s English proficiency level in listening, grammar, reading, conversation, and writing. NPU also accepts the English assessment reports from several English Language Institutions in the U.S. Applicants whose standardized test scores do not include writing or conversation assessment will be assessed in these areas at NPU.

TOEFL has been administered by the Educational Testing Service (ETS) in various forms – paper based, computer based and, most recently, Internet based. The scoring systems for the three forms are different. The TOEFL passing scores in the three forms for the undergraduate and master’s degree applicants are 525, 195, and 70 respectively. The TOEFL passing scores for the doctoral applicants are 550, 213, and 79 respectively. The passing IELTS score for the undergraduate and master’s degree applicants is 6.0 while the score for the doctoral applicants is 6.5.

The TOEFL institution code for NPU is 9626.

An applicant is allowed to take the on-campus 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)

English as A Second Language classes (ESL or American language classes) are offered to those students whose English assessment results require them to take the classes to improve their English proficiencies. The classes are offered at the following levels: high-beginner, intermediate, and advanced. The students are placed into these classes based on their placement examination results.

The ESL classes are offered at NPU with the same trimester schedule as the degree courses. The subjects cover listening comprehension, grammar, pronunciation and accent reduction, vocabulary development, reading, conversation, writing, and presentation skills. The instructor for each class assesses each student’s performance in the class and at the end of each semester; the instructor determines whether to promote the student to the next higher level of ESL courses or not. Students placed in the highest levels of ESL classes may be allowed to concurrently take a limited number of degree classes at NPU, provided that this optimizes their learning objectives. Students passing the English placement exam or the highest ESL classes are considered meeting the entrance English requirement for degree programs.

- 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 such as: (a) a business communication course (BUS300),
or (b) a professional development course (courses numbered at 398) or (c) a college-level English course after meeting the course prerequisite requirement. Students planning to enroll in online courses must have passed the expository writing class (ENGL101).

**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 either the GMAT or the on-campus equivalent test before the new semester starts. Those who are required to enroll in ESL classes are allowed to take the test after passing the advanced ESL classes. NPU’s **Institution code for reporting the GMAT scores is 5485**. The cost for taking the on-campus GMAT-equivalent assessment test is $50.

**Applicants for the DCE degree program** are required to take either the GRE or the on-campus equivalent test before the new semester starts. Those who are required to enroll in ESL classes are allowed to take the test after passing the advanced ESL classes. NPU’s **Institution code for reporting the GRE scores is 5485**. The cost for taking the on-campus GRE-equivalent assessment test is $50.

**Freshman applicants** are required to take either the SAT-I or the on-campus equivalent test before the new semester starts. Those who are required to enroll in ESL classes are allowed to take the test after passing the advanced ESL classes. NPU’s **Institution code for reporting the SAT scores is 4335**. The cost for taking the on-campus SAT-I-equivalent assessment test 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 before taking graduate level courses.**

  **How to clear deficiencies?** The graduate student may clear each background deficiency by taking and passing the subject course (an undergraduate course) at NPU. With advance approval by the academic review committee, the student may be allowed to clear a deficiency by taking a **proficiency exam** on the subject. Graduate students in the business programs have the option to take the **preparatory module** studies to clear their deficiencies.

  Courses taken elsewhere after joining the degree program at 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 three 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
A returning student must submit a new application form (online or hardcopy) and pay an admission 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**

  - SAT 4335 | GMAT 5485
  - GRE 5485 | TOEFL 9626
  - CLEP 7569 | DANTES 9670

**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;
  - = 30 laboratory clock hours.

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

- **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 will be based upon documented evidence of current relevance to the program and of current individual competency. A student may be required to demonstrate proficiency in a subject taken 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 can not be transferred for general education credit.
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. A grade of at least B is required for courses transferred. The Admissions Committee decides on graduate transfer credits at the time of the application evaluation. Without pre-approval, 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 $300.00 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 $420.00 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 Audited

Not all courses can be taken with “audit” status. For courses audited (without earning credit), the tuition 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) $3,600

B. Graduate Business Program Tuition:
    (MBA/DBA) $3,780

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

- Textbook is estimated at $80-$130 per book.
- All international students are required to purchase a health insurance plan. The annual cost is estimated at $950.

II. Admission Fees

| Application for admission (one-time fee) | $60 |
| Readmission fee | $30 |
| Late fee | $50 |

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.

| Registration fee (per semester) | $ 50 |
| Student Assoc. fee (per semester) | $ 20 |
| Add/Drop request processing fee (1st) | $ 10 |
| Late registration fees (2nd) | $ 20 (2nd) |
| Payment Plan service fee |
| - 2-payment plan | $ 25 |
| - 3-payment plan | $ 50 |
| Change major/new study program | $ 50 |
| Change to current catalog requirement (new study plan) | $ 50 |
| Each placement test (SAT-I/GMAT/GRE equivalency) | $ 50 |
| 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 | $300 |
| Each re-petition for graduation | $ 50 |
Transcript Fees
- First 2 copies
- Additional copies
Replacement of lost student ID card
Returned/bad check fee
Express service fee
Int’l student transfer-out fee (not for NPU alumni)
OPT Extension Service
International student special service fees

free of charge
$ 5 each
$ 10
$ 20
$ 20
$150
$ 20
Specified on request forms

$20/month will be debited to the student’s financial account until his/her obligation is fulfilled. In addition, late fee and automatic withdrawal rule will also apply.

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 and withdrawal period each semester. The students will receive email notices for receiving refund checks within three weeks from the add/drop or withdrawal deadline. The following policy applies to these students:

1. For courses dropped before the end of the second 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 second week of instruction but within the first 75% 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 (effect. 5/1/10):

<table>
<thead>
<tr>
<th>Before the end of week</th>
<th>% Refund</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>80%</td>
</tr>
<tr>
<td>4&amp;5</td>
<td>70%</td>
</tr>
<tr>
<td>6</td>
<td>60%</td>
</tr>
<tr>
<td>7&amp;8</td>
<td>50%</td>
</tr>
</tbody>
</table>

No withdrawal is allowed in 15th week

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 75% 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.

Withdraw from NPU

A student is considered “withdrawing” from NPU when either of the following occurs: (1) the student drops/withdraws from all courses enrolled in a semester when the student is required to remain enrolled to maintain his/her academic status, (2) the student submits an online “Request for Withdrawal from NPU”, 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. No withdrawal is allowed in the last week of the semester.

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 second 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 second 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 (or online request) 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.

**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 seven 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.

**Penalty**: For any student whose tuition/fees is past due, a penalty of $20/month will be debited to the student’s financial account until his/her obligation is fulfilled.

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 Administrative Code, Sections 42380 and 42381). The University will withhold issuance of official transcripts of grades to any person owing a debt. If a student believes that he or she does not owe all or part of an unpaid obligation, the student should contact the campus Business Office. The Business Office will review the pertinent information, including any information the student may wish to present, and will advise the student of its conclusions with respect to the debt.

State of California Student Tuition Recovery Fund

California law requires that, upon enrollment, a fee be assessed in relation to the cost of tuition. This fee supports the Student Tuition Recovery Fund (STRF), a special fund established by the California Legislature to reimburse students who might otherwise experience a financial loss as a result of untimely school closure. Students may be reimbursed by STRF only for prepaid but unused tuition. Institutional participation is mandatory (Education Code Section 94342). It is mandatory that enrollees keep a copy of any enrollment agreement, contract, or application to document enrollment; tuition receipts or canceled checks to document the total amount of tuition paid; and records which will show the percentage of the program which has been completed. Such records would substantiate a claim for reimbursement from the STRF, which, to be considered, must be filed within one year following school closure. If a student has obtained a judgment against the institution for any violation of the law and the student certifies that the judgment cannot be collected after diligent effort, a claim can be made to the STRF within two years after the date upon which the judgment became final. For further information or instructions, contact: Bureau for Private Postsecondary and Vocational Education, P. O. Box 980818, West Sacramento, CA 95798. Phone: (916) 445-3427.

Financial Aid

Currently the financial aid programs available to the students at NPU are limited to the following:

- **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.

- **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 administrating 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.

- **Student On-campus Work-study Opportunities**

  Limited openings in NPU’s work-study programs are available to highly qualified degree-seeking candidates. Applications are made via the NPU Online Service Center.

  The students may apply for grader, Teaching Assistantship (TA), or Laboratory Assistantship (LA). These assistantships are offered primarily on the basis of outstanding academic and professional achievement. Students chosen to perform these services must have the heart for helping fellow students in addition to meeting the academic qualification. Each semester the administrative staff works with the faculty to assign graders, TAs, and LAs to assist faculty and students in a group of classes.
Practicum and Industrial Cooperative Projects

Practicum is a supervised practical experience that is the application of previously studied theory. Normally, three hours of work in a practical setting has the credit equivalency of one hour of classroom lecture. Under the supervision of a faculty or staff member, a written agreement shall be developed that outlines the arrangement between the institution and the practicum site, including specific learning objectives, course requirements, and evaluation criteria.

Industrial Cooperative Projects: Highly selective internship opportunities with a number of local companies are available for qualified students. Available internship project information is posted on the Job Posting Board on the controlled NPU Online Service Center web site.

International students must observe additional rules required by the U.S. Immigration & Customs Enforcement on Curricular Practical Training (CPT).

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 should 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 an online request, via the NPU Online Service Center, to “Request for Substitution of A Required Course” 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.

As online registration has become available to the students, each student is encouraged 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 also encourage students to explore their academic options and study personal goals related 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 January, May, and September of the year. An applicant may apply for entrance in any of the three semesters.

Many degree program classes, especially graduate courses, are conducted on weekday evenings and on weekends to allow both non-working students and working professionals to pursue their studies during after-work hours. A number of degree courses and most ESL classes (English as A Second Language) are conducted on weekdays in the daytime. Since the Learning Resource Center and the Student Center are open both day and evening, full-time students may use weekdays’ daytime to study, conduct research, do homework, practice hands-on exercises in the labs or work on projects in the practicum labs, or get involved in extracurricular activities.

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 Learning Resource Center. 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.
3. New students who have received their acceptance documents are encouraged to register during the same registration period as for the on-going students.
4. Current students may register online or in-person. Designated staff advisors are ready to offer assistance to the students for course selections or counseling.
5. 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.
6. Working professionals who enjoy education benefits offered by their employers and receive tuition reimbursements may follow NPU’s special payment plan by submitting supporting documents to the NPU administration office prior to registration.
7. An undergraduate student wishing to enroll in more than 16 units in a given semester must obtain a 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 contracted 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.

**Full-Time Students**

Undergraduate students taking 12 or more units per semester and graduate students taking 9 or more units per semester are considered full-time students.

All international students must be enrolled as full-time students. See an international student advisor in the administration office for information on how to maintain “full-time” status at NPU. The international students must observe the NPU class attendance policy and maintain normal progress towards completion of the degree objective.

**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 for 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 a deadline which is specified in the school calendar. Adding courses is allowed in the first week of the semester and is on a space available basis. Only two requests of Add/Drop (each for one or multiple courses) are 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 – end of the first week of the semester.

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 last week of the semester.

To add/drop courses, a student must:

1. If the online registration program is available, the student may add/drop courses online. Otherwise, meet with a staff advisor to add/drop courses. 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/$20 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 or failing in a graduate course.
D = Performance is less than adequate in an undergraduate course and failing in a graduate course or a required undergraduate 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/practicum 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 project/thesis/practicum courses, 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.

- **Passing Grades**

1. **Undergraduate Programs**

   In each undergraduate program, the passing grade for courses taken at NPU to meet the requirements in General Education and Major areas must be C- or better; the passing grade for courses taken to meet the elective requirements is D- or better.

2. **Master’s Degree Programs**

   In each master’s degree program, the passing grade for required courses and courses taken to meet the concentration area requirements must be B- or better; the passing grade for courses taken to meet the elective requirements is C- or better.

3. **Doctorate Degree Programs**

   In each doctorate degree program, the passing grade for all courses taken to meet the degree requirements must be B- or better.

- **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>
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<tr>
<td>C</td>
<td>2.0</td>
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<tr>
<td>C-</td>
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<tr>
<td>D+</td>
<td>1.3</td>
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<tr>
<td>D</td>
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<tr>
<td>D-</td>
<td>0.7</td>
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<tr>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td>U</td>
<td>0</td>
</tr>
<tr>
<td>NP</td>
<td>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 online “Request for Incomplete Grade” 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 office, 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

A student may repeat a course due to several reasons: (a) To meet the graduation requirements, (b) To earn a better grade, or (c) To gain a better understanding of the subject. In any of such cases, only the latest grade earned for the same course will be kept in the student’s permanent records. When repeating a course, the student pays at the regular tuition rate.

1. Undergraduates

For purposes of academic renewal, any required general education or major course in which a grade of D+ or lower was earned must be repeated.

2. Graduates

Master’s degree students who receive a grade of C+ or below in a required or concentration area course must repeat the course. Such a repetition is permitted for purposes of academic renewal. Doctoral students who receive a grade of C+ or lower for any graduate course taken towards their doctoral degrees must repeat the course.

Taking online courses: Students taking online courses must follow the course requirements to participate in the weekly activities, including but not limited to reading assigned materials, communicating with the instructor and classmates, doing homework and/or projects, and conducting research. All online activities are recorded for evaluation purposes.

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.

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 individual Interview is a face-to-face or telephone interview of the student by 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.

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:

<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>

- **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 master’s degree students.
3. 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 online petition, via the Online Service Center, for challenge must be submitted to the Records Office at the time of registration, which must be before the beginning of the semester. 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 five.

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 5 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 submit 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 by the Records Office either online via the NPU Online Service Center or in writing.

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 follow the transfer rules published 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.
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.

**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 may also be 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 the 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 housing units with a full-semester commitment. Residents of student housing must be regularly enrolled, full-time NPU students. Room reservation is effective only after the required rent and deposit have been received by NPU.

The NPU Housing Services also provides information on a variety of well-maintained apartment options. The NPU website provides the housing service information and online application form.

New applicants to NPU who require housing assistance should submit their housing applications (online) at least two months before they report to NPU. Current students are also eligible to receive housing services by submitting requests online.

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 early 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 cultural, communicative, and technical aspects. The seminar information is posted on the NPU website every semester. The weekly seminar information is also e-mailed to the students.

Intercollegiate Activities

To broaden students’ learning experiences and interactions with other institutions, there have been exchange student activities with the School of Business and Information Management of Oulu University of Applied Sciences in Finland and several universities in Kazakhstan and South Korea. 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 help the students in the following areas: (1) Prepare resumes and sharpen interview skills, (2) Conduct career seminars and job fairs, (3) Identify the students’ strengths and interests and provide career advice, (4) Provide internship opportunities to the students (5) Provide library materials and an online tool (via the NPU Online Service Center) for the students to gain access to various sources of job information. 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 information can be found on the online job posting board through the eCareer Center in the NPU Online Service Center.

The service provides career planning and job search assistance prior to and after students’ graduation.

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 information in the most current editions of both the Student Handbook and the University Catalog. Both documents are also available online.

The Student Association

The Student Association is the voice of the student body at NPU; it 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 a number of 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 extracurricular 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 the ones held in Silicon Valley. Several faculty members serve as senior advisors to enroll the students.

Students in the School of Business and Information Technology are encouraged to join at least one of the following professional organizations or others:

- Institute of Management Accountants
- American Institute of CPAs
- California Society of CPAs
- United States Association for Small Business and Entrepreneurship
- Project Management Institute

Refer to the NPU web site for more information.

- **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 participating in events held 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
- Tai Chi Club
- Soccer Club
- Culture Exchange Club
- Computer Games Club
- Volleyball Club
- Hiking Club
- Badminton Club
- Music Club
- Dance Club
- Softball Club
- Speech Club

Refer to the web sites maintained by the NPU Student Association for information on the student clubs 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.

**International Student Health Insurance**

A health insurance plan is mandatory for all international students. An international student must carry a valid health insurance plan while enrolled at NPU. NPU contracts an experienced provider to carry a health insurance plan for international students. However, an international student is also allowed to carry a valid outside plan.

**Facilities**

**Campus Description**

In accordance with the University's curricular 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 five modern research and development building complexes and their surrounding areas.

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. The facilities 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, several reading areas, 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 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. Security monitor systems have been installed on campus to increase campus security.

**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.
Teaching and Research Facilities

NPU’s 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 students 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. Wireless and wired network connection for high-speed Internet access are provided to the students on campus. The campus networks are connected to the Internet via multiple T1 lines, 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.

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

Examples of available computer science teaching and learning software tools and packages include Oracle server/client tools, Microsoft .NET Framework, Microsoft SQL server/client tools, Microsoft Visual Studio, JDK, MS Office, and various popular software QA and testing programs such as TUTOS, RTH, etc.. In addition to MS Windows system, Linux/Unix systems are 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, QuickBooks, Peachtree, Electronic Auditor, MS Project, SAS, etc..

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

Examples of 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), Design of an Enterprise Voice Over IP System, 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, bioengineering research and product development, intelligent robotic vehicles, and humanoid system design and 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
- Intelligent robotic vehicles
- Humanoid systems design and development
- 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.

✦ 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:

✦ 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.

✦ 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 – physical and electronic collections and facilities, 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 are assigned in many courses each semester to provide after-class assistance to the students. Additional training and workshops are offered to 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 subscribes to commercially available digital libraries as well as incorporates information conveniently provided by the vast world-wide-web into the library’s online services. For gaining access to other 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 has been awarded “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 librarians serves on the advisory committee for our doctorate degree programs.

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 commercially available digital libraries and 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 collections are steadily 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 visitors to the library.

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 other 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 conduct in-depth research.

✦ Online Course Management Programs

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

Faculty members use the online course management program to post/update their course syllabi and handout materials, manage their students’ academic and attendance records, and post assignments and instructions to their students. 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. Faculty members and the teaching assistants can also communicate with their students through this online 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, financial records, and attendance records. The student may also update his/her personal contact data.

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 managed by designated 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 and they work to determine the TA’s 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 improving student services.

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 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 electrical engineering, computer engineering, computer science, and business administration at a professional level. In addition to courses teaching the fundamentals, each degree curriculum is designed to incorporate 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 the 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. Jahan Ghofraniha, Ph.D., Dean
Dr. Tai Hsu, Ph.D., Associate 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 the 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,
(2) Major study, and
(3) Electives.

An overall G.P.A. of 2.0 or better and a “C-“ grade 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 41 semester units in general education (GE). Among all GE courses: (a) 23 units are in “Mathematics, Natural Sciences, and/or Physical Sciences” including MATH201, MATH202, MATH205, MATH206, MATH208, PHYS201 & Lab, PHYS202 & Lab, (b) 6 units in humanities (course numbers with prefix “HU” and “ENGL”) and 6 units in English and communications (course numbers with prefix “ENGL”), and (c) 6 units in social sciences (course numbers with prefix “SOC”; economics subjects – course numbers with prefix “ECON” – can count for social sciences credit).

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

A. Humanities and Communications: Expository Writing, Speech, Communication, Literature, Foreign Languages (excluding native language), Philosophy, Music, Fine Art, Religion, Composition, Creative Writing.


2. Major Study Requirements

Each undergraduate program is designed to include a series of major study coursework. The courses provide the student the foundation and training in electronics and circuits, computer technology, and science areas.

Professional Development and Senior Design Project: The professional development courses, EE398 (for BSEE only)/CE398 (for BSCSE only)/CS398 (for BSCS only), prepare the engineering students for their professional careers.

A major design experience – senior design project, built upon the fundamental concepts and training in the concentration area, humanities, social sciences, and communication skills, gives the student 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 semester.

A project course orientation meeting is conducted twice each semester: once shortly after the pre-registration activity and the second time in the first week of the new semester. Each student attending the meeting receives a package containing the course requirements and guidelines. The information is also posted on the school website via the NPU Online Service Center. In the orientation meeting, the staff coordinator and a designated technical writer conduct the workshop for the students.

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.

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

- CS150 Computer Fundamentals and CS150L the Lab course
- CS200 Discrete Logic: for BSCS only
- MATH201 Calculus - I
- ENGL101 Expository Writing
- A Humanities course
- CS204 Program Design and Analysis in C Language and
  CS204L the Lab course
- MATH202 Calculus – II
- A College English/communications course
- A Humanities course
- A Social Sciences course
- CS230 Introduction to Unix/Linux and CS230L the Lab course
- PHYS201 Physics – I and PHYS201L the Lab course
- MATH205 Differential Equations
- MATH206 Linear Algebra
- PHYS202 Physics – II and PHYS202L the Lab course
- EE205 Fundamentals of Digital Electronics and EE205L the Lab course
- MATH208 Statistics
- A Social sciences course
- EE210 Circuit Theory-I for BSEE and BSCSE only
- Elective courses:
  - At least 7 units for BSEE program
  - At least 8 units for BSCSE program
  - At least 4 units for BSCS program
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 are 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. **41 units of general education courses**, including both lower- and upper-division general education courses:
   - **Humanities and Communications**: 12 units in humanities and English, including 6 units in humanities (HU, ENGL) and 6 units in English and communications (ENGL).
   - **Mathematics and Physics**: 23 units in mathematics and physics, including MATH201, MATH202, MATH205, MATH206, MATH208, PHYS201 & Lab, PHYS202 & Lab, and
   - **Social Sciences**: 6 units in social sciences (SOC, ECON).

2. **67 major unit requirements**, including
   - 19 lower-division units: CS150 & Lab, CS204 & Lab, CS230 & Lab, EE205 & Lab, EE210, and
   - 48 upper-division units: EE301, EE302 & Lab, EE323 & Lab, EE398, PHYS301, CE470, EE450, EE451, EE461, EE468 & Lab, EE481, EE488, EE491, EE494, and EE495.

3. At least **28 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 69 units with the general education and elective coursework combined, including both lower- and upper-division courses. To meet the graduation requirements, the 69 units must include at least 41 units in general education; among the 69 units, at least 21 units must be in upper-division.

**BSEE Curriculum** (Total 136 units)

1. **General Education (minimum 41 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, ENGL) and 6 units in English and communications (ENGL),
(b) **Mathematics and Science:** 23 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>(3)</td>
</tr>
<tr>
<td>MATH202</td>
<td>Calculus - II</td>
<td>(3)</td>
</tr>
<tr>
<td>MATH205</td>
<td>Differential Equations</td>
<td>(3)</td>
</tr>
<tr>
<td>MATH206</td>
<td>Linear Algebra</td>
<td>(3)</td>
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<tr>
<td>MATH208</td>
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<td>(3)</td>
</tr>
<tr>
<td>PHYS201</td>
<td>Physics - I</td>
<td>(3)</td>
</tr>
<tr>
<td>PHYS201L</td>
<td>Physics Lab – I</td>
<td>(1)</td>
</tr>
<tr>
<td>PHYS202</td>
<td>Physics – II</td>
<td>(3)</td>
</tr>
<tr>
<td>PHYS202L</td>
<td>Physics Lab – II</td>
<td>(1)</td>
</tr>
</tbody>
</table>

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

2. **Major Requirements (minimum 67 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>
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<tbody>
<tr>
<td>CS150</td>
<td>Computer Fundamentals</td>
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<tr>
<td>CS150L</td>
<td>Computer Fundamentals Lab</td>
<td>(1)</td>
</tr>
<tr>
<td>CS204</td>
<td>Program Design and Analysis in C Language</td>
<td>(3)</td>
</tr>
<tr>
<td>CS204L</td>
<td>C Programming Lab</td>
<td>(1)</td>
</tr>
<tr>
<td>CS230</td>
<td>Introduction to Unix/Linux</td>
<td>(3)</td>
</tr>
<tr>
<td>CS230L</td>
<td>Unix/Linux Lab - I</td>
<td>(1)</td>
</tr>
<tr>
<td>EE205</td>
<td>Fundamentals of Digital Electronics</td>
<td>(3)</td>
</tr>
<tr>
<td>EE205L</td>
<td>Digital Electronics Lab – I</td>
<td>(1)</td>
</tr>
<tr>
<td>EE210</td>
<td>Circuit Theory - I</td>
<td>(3)</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>(3)</td>
</tr>
<tr>
<td>EE302</td>
<td>Fundamentals of Analog Electronics</td>
<td>(3)</td>
</tr>
<tr>
<td>EE302L</td>
<td>Analog Electronics Lab - I</td>
<td>(1)</td>
</tr>
<tr>
<td>EE323</td>
<td>Logic Design</td>
<td>(3)</td>
</tr>
<tr>
<td>EE323L</td>
<td>Digital Electronics Lab – II</td>
<td>(1)</td>
</tr>
<tr>
<td>EE398</td>
<td>Professional Development</td>
<td>(3)</td>
</tr>
<tr>
<td>PHYS301</td>
<td>Introduction to Device Physics</td>
<td>(3)</td>
</tr>
<tr>
<td>CE470</td>
<td>Computer Networks</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>EE468</td>
<td>Analog Circuit Design</td>
<td>(3)</td>
</tr>
<tr>
<td>EE468L</td>
<td>Analog Electronics Lab – II</td>
<td>(1)</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>EE491</td>
<td>Electronic Systems Design &amp; Implementations</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 28 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 the Course Descriptions section of this catalog. When applicable, the student may take Curricular Practicum courses and engage in practical training to work on company projects which are directly related to the student’s course of study.
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 are 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. 41 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, ENGL) and 6 units in English and communications (ENGL),
   (b) Mathematics and Physics: 23 units in mathematics and physics, including MATH201, MATH202, MATH205, MATH206, MATH208, PHYS201 & Lab, PHYS202 & Lab, and
   (c) Social Sciences: 6 units in social sciences (SOC, ECON).

2. 67 major unit requirements, including
   (a) 19 lower-division units: CS150 & Lab, CS204 & Lab, CS230 & Lab, EE205 & Lab, EE210, and
   (a) 48 upper-division units: CE398, CS350 & Lab, CS360, CS380, CS385 & Lab, EE323 & Lab, PHYS301, CE450, CE453, CE470, CE494, CE495, EE461, EE481, and EE488.

3. At least 26 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 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 41 units in general education; among the 67 units, at least 18 units must be in upper-division.

BSCSE Curriculum
(Total 134 units)

1. General Education (minimum 41 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, ENGL) and 6 units in English and communications (ENGL),

(b) Mathematics and Physics: 23 units in mathematics and science, including:

<table>
<thead>
<tr>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>MATH201</td>
<td>Calculus - I (3)</td>
</tr>
<tr>
<td>MATH202</td>
<td>Calculus - II (3)</td>
</tr>
</tbody>
</table>
MATH205 Differential Equations (3)  
MATH206 Linear Algebra (3)  
MATH208 Statistics (3)  
PHYS201 Physics - I (3)  
PHYS201L Physics Lab – I (1)  
PHYS202 Physics – II (3)  
PHYS202L Physics Lab – II (1)

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

2. Major Requirements (minimum 67 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)

Lower-division

CS150 Computer Fundamentals (3)  
CS150L Computer Fundamentals Lab (1)  
CS204 Program Design and Analysis in C Language (3)  
CS204L C Programming Lab (1)  
CS230 Introduction to Unix/Linux (3)  
CS230L Unix/Linux Lab - I (1)  
EE205 Fundamentals of Digital Electronics (3)  
EE205L Digital Electronics Lab – I (1)  
EE210 Circuit Theory - I (3)

Upper-division

CE398 Professional Development (3)  
CS350 Data Structures (3)  
CS350L Data Structures Lab (1)  
CS360 Object-oriented Programming in C++ (3)  
CS380 Introduction to Operating Systems (3)  
CS385 Unix/Linux Shell Scripting (3)  
CS385L Unix/Linux Lab – II (1)  
EE323 Logic Design (3)  
EE323L Digital Electronics Lab – II (1)  
PHYS301 Introduction to Device Physics (3)

CE450 Fundamentals of Embedded Systems (3)  
CE453 Compiler Design (3)  
CE470 Computer Networks (3)  
CE494 Senior Design Project - I (3)  
CE495 Senior Design Project - II (3)  
EE461 Verilog HDL and Digital Design (3)  
EE481 Microcomputer Structure and Programming (3)  
EE488 Computer Architecture (3)

3. Electives (minimum 26 units - at least 18 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 Descriptions section in this catalog. When applicable, the student may take Curricular Practicum courses and engage in practical training to work on company projects which are directly related to the student’s course of study.
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 are 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. 41 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, ENGL) and 6 units in English and communications (ENGL),
   (b) Mathematics and Physics: 23 units in mathematics and physics, including MATH201, MATH202, MATH205, MATH206, MATH208, PHYS201 & Lab, and PHYS202 & Lab, and
   (c) Social Sciences: 6 units in social sciences (SOC, ECON).

2. 66 major unit requirements, including:
   (a) 19 lower-division units: CS150 & Lab, CS200, CS204 & Lab, CS230 & Lab, and EE205 & Lab, and
   (b) 47 upper-division units: CS350 & Lab, CS360, CS380, CS385 & Lab, CS398, CE305, CE450, CS453, CS455, CS457, CS470, CS494, CS495, and 6 units in major elective courses.

3. At least 22 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 63 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 63 units must include at least 41 units in general education; among the 63 units, at least 18 units must be in upper-division.

BSCS Curriculum

(Total 129 units)

1. General Education (minimum 41 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, ENGL) and 6 units in English and communications (ENGL),
2. Major Requirements (minimum 66 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]

I. Lower-division

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS150</td>
<td>Computer Fundamentals</td>
<td>3</td>
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<tr>
<td>CS150L</td>
<td>Computer Fundamentals Lab</td>
<td>1</td>
</tr>
<tr>
<td>CS200</td>
<td>Discrete Logic</td>
<td>3</td>
</tr>
<tr>
<td>CS204</td>
<td>Program Design and Analysis in C Language</td>
<td>3</td>
</tr>
<tr>
<td>CS204L</td>
<td>C Programming Lab</td>
<td>1</td>
</tr>
<tr>
<td>EE205</td>
<td>Fundamentals of Digital Electronics</td>
<td>3</td>
</tr>
<tr>
<td>EE205L</td>
<td>Digital Electronics Lab – I</td>
<td>1</td>
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</tbody>
</table>

II. Upper-division

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE305</td>
<td>Computer Organization</td>
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</tr>
<tr>
<td>CS350</td>
<td>Data Structures</td>
<td>3</td>
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<tr>
<td>CS350L</td>
<td>Data Structures Lab</td>
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</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 Scripting</td>
<td>3</td>
</tr>
<tr>
<td>CS385L</td>
<td>Unix/Linux Lab – II</td>
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<tr>
<td>CS398</td>
<td>Professional Development</td>
<td>3</td>
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<tr>
<td>CE450</td>
<td>Fundamentals of Embedded Systems</td>
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<td>CS453</td>
<td>Compiler Design</td>
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<tr>
<td>CS455</td>
<td>Structured Programming and Algorithms</td>
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<tr>
<td>CS457</td>
<td>Database Design</td>
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<td>CS470</td>
<td>Computer Networks</td>
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<td>CS494</td>
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</tr>
<tr>
<td>CS495</td>
<td>Senior Design Project - II</td>
<td>3</td>
</tr>
</tbody>
</table>

III. Upper-division major electives

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 22 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 Descriptions section in this catalog. When applicable, the student may take Curricular Practicum courses and engage in practical training to work on company projects which are directly related to the student’s course of study
■ 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.

✦ Graduation Requirements

A minimum of 36 units of graduate-level course work are required for each master’s degree program. 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 three categories of course requirements:

1. Area of Concentration courses,
2. Courses for breadth of study,
3. 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 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.

✦ 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. Before or upon completing 12 units in graduate course work, 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.

✦ 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 project/thesis instruction package is 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)

Background 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 (except PREE01). The student must clear all deficiencies before attempting to enroll in graduate level courses.

1. Mathematics and English/Communication:
   - Engineering mathematics (MATH201, MATH202, MATH205, MATH206, and MATH208);
   - English/communication (One of the following: EE398, BUS300 or a College English course);

2. Engineering Sciences: PHYS201 & Lab, PHYS202 & Lab, PHYS301;

3. Electrical Engineering Subjects:
   - Circuit theory and analysis (EE210, EE301);
   - Digital electronics and logic design (EE205 & Lab, EE323 & Lab);
   - Analog electronics (EE302 & Lab);
   - Software techniques for electrical engineers (PREE01): covering basics of Unix/Linux, logic of structured programming, basics of shell script, Hspice for circuit simulation, and MatLab Script programming.

4. Computer Science Subjects:
   Students choosing Embedded Engineering concentration are required to be proficient in a structured programming language (CS204 & Lab), data structures (CS350 & Lab), object-oriented programming (CS360), and operating systems (CS380).

MSEE Curriculum

A minimum of 36 semester units of graduate study are required for the MSEE program. A maximum of five (5) 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 course.

I. Area of Concentration

A student must select an area of concentration and complete the courses required for the concentration as listed below. 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

EE461G Verilog HDL and Digital Design
EE488G Computer Architecture
EE505 Digital IC Design
EE506 Advanced Digital IC Design
EE507 Analog/Mixed Signal IC Design
EE508 VLSI Physical Design – Place and Route
EE510 Logic Synthesis
EE512 Application Specific Integrated Circuit Design (ASIC)
Area B. Embedded Engineering

(*Background requirements: **CS350** Data Structures and **CS350L**, **CS360** Object-oriented Programming in C++, and **CS380** Operating Systems)

- CE450G Fundamentals of Embedded Systems
- EE461G Verilog HDL and Digital Design
- EE481G Microcomputer Structure and Programming
- EE488G Computer Architecture
- CE521 Real-time Systems and Programming
- CE523 Embedded Design in Device Driver Environment

and at least one of the following three courses:

- CE527 Embedded Systems in Windows CE Environment
- CE528 Embedded Systems in VxWorks Environment
- CE530 Embedded Software Design in Linux

Area C. Communication Systems

- EE450G Signals and Systems
- EE451G Introduction to Communication Systems
- EE530 Analytical Methods for Electrical Engineering
- EE531 Data Compression
- CE504 Introduction to Wireless Communication
- CE505 Wireless Networks and Architecture
- CE507 Wireless Communication Systems

Area D. Nanotechnology and NEMS

- EE466G Introduction to Nanotechnology
- EE501 Advanced Engineering Analysis
- EE581 Electrons, Photons, and Nanotechnology
- EE583 Introduction to Nanoelectromechanical Systems (NEMS)
- EE590 Nanotechnology Project

II. Courses for Breadth of Study (minimum 6 units)

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 embedded engineering. 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.

III. Electives

The student may elect graduate-level courses in any discipline, in or outside the chosen concentration area, to meet the elective requirements. The student must observe the limits on the number of 400 level courses with a “G” designation.

Practicum: When applicable, the student may take Curricular Practicum courses and engage in practical training to work on company projects which are directly related to the student’s course of study. The student must observe the rules required for taking the practicum courses.

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

Background 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 must clear all deficiencies before attempting to enroll in graduate level courses.

1. Mathematics and English/Communication:
   - Engineering mathematics (MATH201, MATH202, MATH205, MATH206, MATH208);
   - English/communication (One of the following: CE398, BUS300 or a College English course);

2. Electrical Engineering Subjects:
   - Circuit theory (EE210);
   - Digital electronics and logic design (EE205 & Lab, EE323 & Lab);
   - Fundamentals of Analog Electronics (EE302 & Lab) when choosing either of the following two concentration areas: Embedded Engineering, Wireless Communications.

3. Computer Science Subjects:
   - Programming languages and data structures (CS204 & Lab, CS350 & Lab, CS360);
   - Operating systems (CS230 & Lab, CS380);
   - Students choosing Computer Networks concentration area are required to be proficient in Unix/Linux Scripting (CS385 & Lab).

MSCSE Curriculum

A minimum of **36 semester units of graduate study** are required for the MSCSE program. A maximum of five (5) 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 course.

I. Area of Concentration

A student must select an area of concentration and complete the courses required for the concentration area as listed below. 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
(The student must also have a background in CE470G Computer Networks.)

CE450G Fundamentals of Embedded Systems
EE481G Microcomputer Structure and Programming
CE506 Operating System Design
CE521 Real-time Systems and Programming
CE523 Embedded Design in Device Driver Environment

and at least one of the following three courses:

CE527 Embedded Systems in Windows CE Environment
CE528 Embedded Systems in VxWorks Environment
CE530 Embedded Software Design in Linux
Area B. Computer Networks and Network Security
(The student must also have a background in CE470G Computer Networks.)

CE506 Operating System Design
CS503 Advanced Computer Networks
CS510 UNIX/Linux System Programming
CS515 Linux/UNIX Network Programming
CS535 Network Security Fundamentals
CS575 Network Analysis and Testing

Area C. Communication Systems

EE450G Signals and Systems
EE451G Introduction to Communication Systems
EE530 Analytical Methods for Communications Engineers
EE531 Data Compression
CE504 Introduction to Wireless Communication
CE505 Wireless Networks and Architecture
CE507 Wireless Communication Systems

Area D. Bioengineering
(Students are encouraged to take IT510 to gain practical skills required in bioengineering projects.)

BE450G Introduction to Bioengineering
BE505 Fundamentals of Bioinformatics
BE510 Biometrics and Computer-Aided Detection (CAD) Technology
BE515 Bioinformatics Methodologies

Area E. Nanotechnology and NEMS

EE466G Introduction to Nanotechnology
EE501 Advanced Engineering Analysis
EE581 Electrons, Photons, and Nanotechnology
EE583 Introduction to Nanoelectromechanical Systems (NEMS)
EE590 Nanotechnology Project

II. Courses for Breadth of Study (minimum 6 units)

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.

III. Electives

The student may elect graduate-level courses in any discipline, in or outside the chosen concentration area, to meet the elective requirements. Credit earned from taking CE470G to meet the background requirement for the concentration areas can be counted as electives. The student must observe the limits on the number of 400 level courses with a “G” designation.

Practicum: When applicable, the student may take Curricular Practicum courses and engage in practical training to work on company projects which are directly related to the student’s course of study. The student must observe the rules required for taking the practicum courses.

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

Background 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 must 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 & Lab, CS350 & Lab, CS360);
   - Operating systems (CS230 & Lab, CS380, CS385 & Lab);
   - Software Techniques for Computer Engineers (CS464: The course focuses on the design methodology for algorithm development. The objective is to develop the students’ programming ability through proper logical and object-oriented thinking processes);

3. Electronics Subjects: (EE205 & Lab, either CE305 or EE323 & Lab);

MSCS Curriculum

A minimum of 36 semester units of graduate study are required for the MSCS program. A maximum of five (5) 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 course.

I. Area of Concentration

A student must select an area of concentration and complete the courses required for the concentration area as listed below. 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. Database Technology
(The student must also have background in CS457G Database Design and CS470G Computer Networks.)

CS503 Advanced Computer Networks
CS506 Operating System Design
CS540 Database Administration
CS547 Advanced Database Design and Development

Area B. Computer Networks and Network Security
(The student must also have background in CS457G Database Design and CS470G Computer Networks.)

CS503 Advanced Computer Networks
CS506 Operating System Design
CS510 UNIX/Linux System Programming
CS515 Linux/UNIX Network Programming
CS535 Network Security Fundamentals
Area C. Internet Technology and Digital eBusiness Systems
(The student must also have background in CS457G Database Design and CS470G Computer Networks.)

CS480G Java Programming and Internet Applications
CS503 Advanced Computer Networks
CS506 Operating System Design
CS526 .NET Web Programming
CS532 Advanced Java Programming

Area D. Bioengineering
(The student must also have background in CS457G Database Design and CS470G Computer Networks. The student is also encouraged to take IT510 to gain practical skills required in bioengineering projects.)

BE450G Introduction to Bioengineering
BE505 Fundamentals of Bioinformatics
BE510 Biometrics and Computer-Aided Detection (CAD) Technology
BE515 Bioinformatics Methodologies

II. Courses for Breadth of Study (minimum 6 units)

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.

III. Electives

Required elective course: CS453G Compiler Design

The student may elect other graduate-level courses in any discipline, in or outside the chosen concentration area, to meet the elective requirements.

Credit earned from taking CS464G, CS470G, and/or CS457G to meet the background or the concentration areas requirements can be counted as electives. The student must observe the limits on the number of 400 level courses with a “G” designation.

Practicum: When applicable, the student may take Curricular Practicum courses and engage in practical training to work on company projects which are directly related to the student’s course of study. The student must observe the rules required for taking the practicum courses.

MSCS Total Requirements: 36 units
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, business law, 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. A number of 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 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 are required for graduation. An overall G.P.A. of 2.0 or better and a “C-” grade 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.

The program requires coursework in three areas:
1. General Education Requirements

All students must complete at least 36 semester units in general education with at least 18 units in “Humanities and Communications” (course numbers with prefix “HU” and “ENGL”), 9 units in “Natural Sciences and Mathematics” including “Statistics”, and 9 units in “Social Sciences” (course numbers with prefix “SOC”).

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 BBAIS curriculum aims to provide the student the foundation and training in business management and information technology:

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

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

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.

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. The project/thesis instruction package is posted online in the NPU Online Service Center.

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.

### 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.

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)*

#### Graduation Requirements:

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

2. **66 units in major requirements**, including:
   - 21 lower-division units: CS150 & Lab, ACC201& Lab, ACC202 & Lab, ECON201, ECON202, and MGT201,
   - 45 upper-division units: BUS300, BUS398, FIN310, IT310, IT370, LAW310, MKT310, ACC490, IT450, MGT450, MGT460, MGT480, MKT450, BUS494 and BUS495.

3. **At least 23 elective units including at least 18 in upper-division course work**:

   The student may choose courses in any subject area (in- or outside business and IT area).

**Notice:** There are a total of 59 units with the general education and elective coursework combined, including both lower- and upper-division courses. To meet the graduation requirements, the 59 units must include at least 36 units in general education; among the 59 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, ENGL) and 9 units in English and communications (ENGL).

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

   
   | Units         |  
   |---------------|---|
   | MATH208 Statistics | (3) |
   | Other science and mathematics courses | (6) |

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

   AN ACC201 Principles of Accounting I and ACC201L the Lab course

   Either ECON201 Macroeconomics or ECON202 Microeconomics

   MGT201 Principles of Management

   A English/communications course

   ACC202 Principles of Accounting II and ACC202L the Lab course

   Either ECON202 Microeconomics or ECON201 Macroeconomics

   A math or science course

   For the next couple of semesters (may concurrently take certain upper-division courses, such as IT310, MKT310, BUS300, IT370, MGHT450, etc.):

   - A math or science course
   - Two humanities courses
   - Three social science courses
   - Electives
2. Major Requirements (minimum 66 units)

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

I. Lower-division

- CS150 Computer Fundamentals (3)
- CS150L Computer Fundamentals Lab (1)
- ACC201 Principles of Accounting - I (3)
- ACC201L Basic Accounting Lab – I (1)
- ACC202 Principles of Accounting - II (3)
- ACC202L Basic Accounting Lab – II (1)
- ECON201 Macroeconomics (3)
- ECON202 Microeconomics (3)
- MGT201 Principles of Management (3)

II. Upper-division

- BUS300 Business Communication (3)
- BUS398 Professional Development (3)
- FIN310 Fundamentals of Finance (3)
- IT310 Introduction to Information Technology (3)
- IT370 Database Design and Development for Business (3)
- LAW310 Introduction to Business Law (3)
- MKT310 Principles of Marketing (3)
- ACC490 Federal Taxation of Individuals (3)
- IT450 Enterprise Information System Fundamentals (3)
- MGT450 Organizational Behavior and Management (3)
- MGT460 Production and Operations Management (3)
- MGT480 Entrepreneurship & Venture Business (3)
- MKT450 Marketing Management (3)
- BUS494 Senior Project - I (3)
- BUS495 Senior Project - II (3)

3. Electives (minimum 23 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 Descriptions section in this catalog. When applicable, the student may take Curricular Practicum courses and engage in practical training to work on company projects which are directly related to the student’s course of study. The student must observe the rules required for taking the practicum courses.

BBAIS Total: 125 Units
Officials: 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 are 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 graduate students in the MBA program at NPU are advised to plan for their studies and choose a concentration area early. Before or 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. The project/thesis instruction package is posted online in the NPU Online Service Center. A student taking a master’s project or 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.

MBA Background Preparation

Students admitted into the MBA degree program are required to have proper business background preparation for taking the graduate level coursework. The student must clear all deficiencies before taking the degree required courses. The student may choose to clear each deficiency by either (1) taking the subject course for credit at NPU and earning a grade of at least C- or higher, or (2) taking and passing the appropriate business preparatory module of study. With advance approval by the academic review committee, the student may be allowed to take a proficiency exam to clear each individual subject. In addition, English proficiency is also required. Refer to the section on “English Proficiency Requirement” in the chapter of Admission Policies for details.

The following are the business preparatory module courses covering the required background subjects:

- **Preparatory Module A (PBUS01): Essentials of Management and Business Law**
- **Preparatory Module B (PBUS02): Essentials of Economics and Marketing**
- **Preparatory Module C (PBUS03): Essentials of Accounting and Finance**
- **Preparatory Module D (PBUS04): Essentials of Quantitative Analysis and Information Technology**

Module A corresponds to the individual courses of MGT201 and LAW310, Module B for ECON201 and MKT310, Module C for ACC201 and FIN310, and Module D for MATH208, IT310, and IT370.

Students choosing the Accounting concentration must also have the background in **ACC202 and ACC202L**. In addition, these students must gain hands-on experience with popular accounting tools, such as QuickBooks and Peachtree.

**Mezzanine courses** (*The student may earn graduate credit by taking these courses at NPU):* The student is also required to have background in the following subjects in order to take the foundation courses in the MBA curriculum:

a. **MGT450G Organizational Behavior and Management**

b. **MGT460G Production and Operations Management**
A minimum of **36 semester units of graduate study** are 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.

**MBA Curriculum**

**(units)**

**I. Foundation 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 Foundation Courses requirement. As new courses are also offered between publications of the university 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 requirement: IT450G*)

Required courses:

- IT553  Business Intelligence and CRM
- IT560  Enterprise Resource Planning (ERP)

Select two other graduate courses in this concentration area.

**Area B. Accounting**

(*Background requirement: ACC451G*)

Required courses:

- ACC501  Advanced Accounting
- ACC512  Federal Taxation of Business Enterprises

Select two other graduate courses in this concentration area.

**Area C. Project Management**

(Background requirement: Advanced graduate standing)

Required courses:

- MGT501  Project and Risk Management
- MGT542  Technology Product Management and Marketing

Select two other graduate courses in this concentration area.
Area D. Global Business and Marketing
(*Background requirement: MKT450G Marketing Management)

Required courses:
MKT541 Strategic Marketing
MKT542 International Marketing

Select two other graduate courses in this concentration area.

III. Electives

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 of “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 areas: 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 and Marketing): MKT450G.

Practicum: When applicable, the student may take Curricular Practicum courses and engage in practical training to work on company projects which are directly related to the student’s course of study. The student must observe the rules required for taking the practicum courses.

MBA Total Requirements: 36 units
Doctorate Degree Programs

NPU offers two doctorate degree programs:

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

■ 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 higher degree 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; independent research ability,
3. English proficiency,
4. Previous work experience in related field is preferred.

* A DBA Applicant without a previous degree in a related field may be accepted based on the level of degree earned and years of work experience. Acceptable degree qualifications are: (a) a combination of a doctorate degree and at least two years of work experience and (b) a combination of a master’s degree and at least three years of work experience.

■ 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 and certified degree document(s). 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, Failure to observe this requirement will result in placement of the student in a non-degree status.
4. Evidence of English proficiency: Refer to the section on English Proficiency Requirement on page 4 for detailed description on the requirement. For international students, TOEFL or IELTS scores are acceptable; the passing TOEFL scores for the doctoral applicants are: 550, 213, and 79 for paper based, computer based and Internet based tests respectively; the passing IELTS score is 6.5.

5. Entrance exam: Applicants to the Doctor of Business Administration degree program are required to take either the GMAT or the on-campus equivalent test before or on the New Student Orientation Day. For taking the GMAT administered by the ETS, NPU’s Institution code for reporting the GMAT scores is 5485. Applicants to the Doctor of Computer Engineering degree program are required to take either the GRE or the on-campus equivalent test before or on the New Student Orientation Day. For taking the GRE administered by the ETS, NPU’s Institution code for reporting the GRE scores is 5485. The score is primarily used for reference and analysis purposes.

6. A professional work history or a professional vita preferred; the document is required for the DBA applicants without a previous degree in a related field. In this case, an employment certification letter issued by the applicant’s employer is required.

7. Each applicant to the DCE program is required to submit a Statement Of Purpose (SOP). The SOP must describe the applicant’s background preparation, motivation, and reason why he/she considers him/herself having the qualifications to pursue the DCE degree; it must also describe the applicant’s research interest. Applicants to the DBA program are encouraged to also submit their SOP.

8. An international applicant is also required to submit the following additional documents: 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 $24,000 available for the applicant to pursue his/her study in the first academic year at NPU. A transfer student is required to submit (a) 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) photocopies of the student’s passport, visa, and I-94 (admission & departure) document upon arrival at NPU.

- **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. The minimum required grade is B- or better.

  **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 “Background 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 $420/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 are required to complete the study of a doctoral degree program, including 90 units of course work plus a minimum of 12 units in doctoral dissertation 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 or nine (9) semesters 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. In each doctoral degree program, there are four categories of course requirements listed in the following sequence:

   (a) Foundation courses
   (b) Core courses
   (c) Advanced major studies and elective courses
   (d) Doctoral dissertation/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 at NPU.

   The doctoral student must take the required courses following the specified sequence unless the student receives permission from the registration advisor.

   Near the beginning of a student’s study in the DCE program, the student is required to **select a concentration area.**

4. All courses require appropriate usage of research and learning resources.

5. **Checkpoint:**

   (a) **Doctor of Business Administration (DBA):**
   
   Upon completing 54 units towards the degree requirements, including the foundation requirements, the Research Methodology course as well as part of the core courses, the student is required to submit a Statement of Proposal and give an oral presentation to a committee organized by the program administrator or the Doctoral Advisory Committee. The proposal 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.  The student’s proposal and presentation will be evaluated by the appointed committee.  Students unable to make a satisfactory statement of proposal will be given a second chance to repeat the process. Failure in the second time will prohibit the student from continuing his/her study in the DBA program.

   (b) **Doctor of Computer Engineering (DCE):**
   
   Upon completing 18 units towards the degree requirements, including the Foundation Requirements and the Required Elective Courses, the DCE program administrator will conduct a review of the student’s academic records. If the student has made satisfactory progress by maintaining at least a 3.0 GPA, he/she will be notified to take three (3) written Qualifying Examinations (QE). The QE consists of three (3) subject areas: Two subjects are among the Foundation Requirements subjects and the third subject is in the area of the student’s Required Electives.

   A student failing the QE the first time may be given a second chance to take the exams after six (6) months. Failing the QE the second time will disqualify the student from a pursuit of the DCE degree.

6. Each doctoral student’s dissertation or comprehensive capstone project must be reviewed, evaluated, and assessed by a Dissertation Committee (DC) appointed by the Doctoral Advisory Committee of the doctorate degree program; the DC must include at least one individual from another appropriately accredited institution within the subject area. A dissertation advisor closely monitors the student’s dissertation work. 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 doctoral dissertation/project course is taken by the student.

7. The doctoral 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.

8. Students enrolled in the doctoral dissertation or project courses must follow the requirements specified in the Doctoral Student Handbook for the program that the students are pursuing. A student unable to complete the dissertation or project after earning 12 units in the dissertation/project course is required to continue to enroll in the 6-unit doctoral dissertation course part-II in the following semester and pay at the regular unit tuition rate until completion of the dissertation/project. Extra credits earned for repeatedly taking the dissertation/project cannot substitute other course requirements.


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

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 “Doctorate Degree Programs”.

Faculty

All faculty members serving as doctoral dissertation/project 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 learning resources.

Library & Instructional Resources

Library and instructional resources are vital to the faculty as well as the doctoral students in their teaching/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 the university’s information management systems and development services to support the doctorate degree program students in their course work studies and research activities.

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

Background Preparation

Students admitted into the DBA degree program are required to have proper business background preparation for taking the graduate level coursework. The student must clear all deficiencies before being allowed to take the degree required courses. A student with deficiency in any required background subject must clear it before enrolling in graduate level courses and may clear the subject by choosing any of the following options: (1) Taking and passing the appropriate preparatory module course, (2) Taking and passing the individual subject course and earning a grade of at least C- or higher, or (3) With advance approval by the academic review committee, the student may be allowed to take a proficiency exam to clear each deficiency subject. The student must also follow the English requirement described in the chapter on Admission Policies.

The following are the four business preparatory modules covering all the required background subjects:
Preparatory Module A (PBUS01): Essentials of Management and Business Law
Preparatory Module B (PBUS02): Essentials of Economics and Marketing
Preparatory Module C (PBUS03): Essentials of Accounting and Finance
Preparatory Module D (PBUS04): Essentials of Quantitative Analysis and Information Technology

Module A corresponds to the individual courses of MGT201 and LAW310, Module B for ECON201 and MKT310, Module C for ACC201 and FIN310, and Module D for MATH208 and IT310 and IT370.

**D.B.A. Curriculum**

A minimum of 102 semester units of graduate study are 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.

**(units)**

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.

- IT450G Enterprise Information System Fundamentals (3)
- MGT450G Organizational Behavior and Management (3)
- MGT460G Production and Operations Management (3)
- MGT480G Entrepreneurship and Venture Business (3)
- MGT545G Marketing Management (3)
- BUS501 Quantitative Methods for Business (3)
- FIN501 Financial Management (3)
- FIN510 Investments (3)
- MGT530 Logistics and Operations Management (3)
- MGT531 Human Resources Management (3)

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

In addition to the first year foundation coursework, the student must take advanced level graduate courses (courses at 500 level and above), a series of two research methodology 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), especially the Research Methodology courses, should be taken by the student immediately following the required foundation courses described in section I. The student must also submit and present his/her Statement of Proposal to the DBA Academic Review Committee and receive the committee’s approval to proceed in the program.

- FIN568 Corporate Finance (3)
- IT560 Enterprise Resource Planning (ERP) (3)
- LAWS70 Modern Law of Corporations (3)
- MGT501 Project and Risk Management (3)
- MKT541 Strategic Marketing (3)
- DBA601 Research Methodology - I (3)
- DBA602 Research Methodology - II (3)
- IT602 Emergent Information Technology for Business (3)
- MGT601 Strategic Management (3)
- MGT603 Strategic Workforce Planning (3)
III. Advanced Studies and Electives (Third year of study) ....................(30)

A. Advanced Studies:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAW670</td>
<td>Intellectual Property Law</td>
<td>(3)</td>
</tr>
<tr>
<td>MGT635</td>
<td>Advanced Operations Management</td>
<td>(3)</td>
</tr>
<tr>
<td>MGT685</td>
<td>Organizational Learning in Global business</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>
</tbody>
</table>

B. Electives: (15)

The student may take any advanced graduate courses to meet the elective requirements. However, doctoral candidates are encouraged to take concentrated course work to address their career development plan or research interests. With the assistance and approval by an adviser, the student takes a minimum of 15 units of coursework at 500 level or above to fulfill this requirement.

IV. Doctoral Dissertation .......................................................... (12)

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBA698</td>
<td>Dissertation – I</td>
<td>(6)</td>
</tr>
<tr>
<td>DBA699</td>
<td>Dissertation – II</td>
<td>(6)</td>
</tr>
</tbody>
</table>

Practicum: When applicable, the student may take Curricular Practicum courses and engage in practical training to work on company projects which are directly related to the student’s dissertation research or course of study. The student must observe the rules required for taking the practicum courses.

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

Background Preparation

A previous background in computer engineering or a related field is required. The DCE Admissions Committee is responsible for making an evaluation of each applicant’s academic background to determine whether and what deficiencies the applicant is required to clear.

D.C.E. Curriculum

A minimum of 102 semester units of graduate study are 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 dissertation or capstone research project work. Courses at 4xxG level in the Foundation Requirements must be taken at NPU in order to earn graduate credits. The student must meet prerequisite requirements when taking any of the following courses.

Near the beginning of the student’s study in the DCE program, the student must select a concentration area of study which will lead to his/her future dissertation research effort. The following are the available choices:

- Wireless Communications
- VLSI Design
- Nanotechnology
- Computer Networking
- Embedded Systems Design
- Internet Technology

The Foundation Requirements are the first group of courses that the student is required to take.

I. Foundation Requirements (First year of study) ................. (18)

(Computer systems, engineering mathematics, required electives)

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

A. Required Courses (9)

- CE450 Fundamentals of Embedded Systems (3)
- CE470 Computer Networks (3)
- EE488 Computer Architecture (3)

B. Required Mathematics Course (3)

Students choosing the following concentration areas are required to take EE530: Wireless Communications, VLSI Design, or Nanotechnology.

- EE530 Analytical Methods for Electrical Engineering (3)

Students choosing the following concentration areas are required to take CE501: Computer Networking, Embedded Systems Design, or Internet Technology.

- CE501 Mathematical Modeling (3)
C. Required Electives (6)

The student is required to take 6 units of required elective courses based on the student’s selection of concentration area.

- Wireless Communications
  
  EE452 Digital Signal Processing (3)  
  CE507 Wireless Communication Systems (3)  

- VLSI Design
  
  EE466 Introduction to Nanotechnology (3)  
  EE505 Digital IC Design (3)  

- Nanotechnology
  
  EE466 Introduction to Nanotechnology (3)  
  EE505 Digital IC Design (3)  

- Computer Networking
  
  CE506 Operating System Design (3)  
  CS535 Network Security Fundamentals (3)  

- Embedded Systems Design
  
  CE506 Operating System Design (3)  
  CE528 Embedded Systems in VxWorks Environment (3)  

- Internet Technology
  
  CE506 Operating System Design (3)  
  CS532 Advanced Java Programming (3)  

When the student has passed the Qualifying Examinations (QE), he/she is allowed to continue in the DCE program and begin to take courses listed in the following Core Requirements section. The student is now a DCE candidate.

II. Core Requirements (Second year of study) ............................... (15)

(Research methodology, emergent information technology for business, technical management subjects)

Courses described in this section (II), especially the Research Methodology courses, should be taken immediately after the student has passed the QE.

A. Research Methodology (6)

  DCE601 Research Methodology - I (3)  
  DCE602 Research Methodology - II (3)  

B. Courses Preparing Technical Management Professionals (9)

  IT602 Emergent Information Technologies for Business (3)  
  LAW670 Intellectual Property Law (3)  
  MKT632 New Product Development (3)
III. **Advanced Studies** (Third year of study) ........................................... (18)

The student must take at least **six** 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. The student is advised to take a sufficient number of topics at this level to gain knowledge and skills beneficial to the student’s dissertation research work.

IV. **Electives and Courses for Breadth of Study** (Fourth year of study) ... (39)

The student is encouraged to take 500/600 level elective courses in- or outside the concentration area to promote breadth as well as depth in his/her study program.

V. **Doctoral Dissertation** ................................................................. (12)

A Dissertation Committee (DC) 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 Dissertation to meet the graduation requirement.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>DCE698</td>
<td>Dissertation – I</td>
<td>6</td>
</tr>
<tr>
<td>DCE699</td>
<td>Dissertation – II</td>
<td>6</td>
</tr>
</tbody>
</table>

Practicum: When applicable, the student may take Curricular Practicum courses and engage in practical training to work on company projects which are directly related to the student’s dissertation research or course of study. The student must observe the rules required for taking the practicum courses.

**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>
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<th>Description</th>
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</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-490G</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, Biological Science and Bioengineering, Business (general courses), Computer Engineering, Computer Science, Curricular Practicum, Economics, Electrical Engineering, English, Finance, Health Service Management, 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.

Each 1-unit Lab requires at least 2 hours of lab work each week.

Cross-listed courses and courses periodically offered with online mode of instructions can be found at the end of this section. Online courses are normally offered concurrently with the standard in-class sessions.

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**Accounting**

ACC201 Principles of Accounting - I (3 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 QuickBooks, for homework and exercises. Other PC-based accounting software may also be introduced to the students for practice. Lab work is required.

*Prerequisite:* ACC201 and ACC201L

ACC201L Basic Accounting Lab – I (1 unit)

This lab course is designed to be taken concurrently with the course of ACC201 Principles of Accounting- I. Topics include an introduction to QuickBooks and using QuickBooks to manage the sales process, tracking revenue, expenses, bank reconciliation, reports and graphs, company file set up, and maintenance Hands-on practices are required.

*Prerequisites:* CS150 or IT310

ACC202 Principles of Accounting - II (3 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 QuickBooks and PeachTree, for homework and exercises. Other PC-based accounting software may also be introduced to the students for practice. Lab work is required.

*Prerequisites:* ACC201 and ACC201L

ACC202L Basic Accounting Lab – II (1 unit)

This lab course is designed to be taken concurrently with the course of ACC202 Principles of Accounting- II. Topics include company file setup and maintenance, inventory, sales tax, time and billing, payroll setup, payroll processing, adjustments, and the yearend procedures. Hands-on practices are required.

*Prerequisites:* ACC201 and ACC201L

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
ACC542(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: ACC202 and FIN310

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 or PBUS03

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: ACC451 or ACC452

ACC510 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 ACC202 or instructor’s consent

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

ACC520 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

ACC530 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

ACC540 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 or equivalent
Prerequisite: ACC202

Bioengineering and Biological Science

BIO300 Introduction to Biological Science (3 units)
This course introduces the fundamental concepts of modern biology on science and medicine. Topics include fundamentals of biology, cell biology, 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.
(Prerequisite: Upper-division GE in Area B- Science)
Prerequisites: Basic biology concepts, chemical reactions and pH concepts, and algebra.

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: BIO300 or instructor’s consent.

BE505 Fundamentals of Bioinformatics (3 units)
This course introduces the fundamental concepts of how present-day bioinformatics applications are employed to enhance the understanding of biological information encoded in genetic or macromolecular sequences. The emphasis is on using easily accessible text to illustrate how computational methods work is invaluable to those who have only basic computational backgrounds. All key topics are covered, including biological databases, sequence alignment, gene prediction, molecular phylogenetics, structural bioinformatics, genomics, and proteomics. To gain hands-on experience, projects using current bioinformatics tools are provided.
Prerequisite: BE450 or equivalent
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

BE515 Bioinformatics Methodologies (3 units)
This course provides insights into how computer science procedures and techniques are solving bioinformatics problems. Internal workings of modern bioinformatics methodologies are discussed in the context of analytical models, computational methodologies, and graph theories. Simple modeling concepts are used to explain how popular bioinformatics tools and databases are developed to extract biological information from DNA, RNA, and protein sequences. To gain better understanding of such technical information, students are also encouraged to work on bioinformatics projects.
Prerequisites: CS204 and BE450

BE530 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.
Prerequisite: BE450

BE550 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: Placement by English exam or successful completion of advanced ESL classes.

BUS398 Professional Development (3 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: Placement by English exam or successful completion of advanced ESL classes.

BUS494 Senior Project - I (3 units)
(Research and lab work)
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 project, 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.
Prerequisites: Senior standing and advisor’s approval.

BUS495 Senior Project - II (3 units)
(Research and lab work)
This is the second half of a 2-trimester senior project series. The student continues the research, development and implementation of the project and completes the work including finalizing the project report. Upon satisfactory completion of the project, the student is required to conduct an open-forum presentation of the project.
Prerequisite: BUS494

BUS501 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: Either IT310 or PBUS04 and graduate standing or instructor’s consent.

Computer Systems Engineering

CE305 Computer Organization (3 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 how 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 (3 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: Placement by English exam or successful completion of advanced ESL classes.

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 and 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: CS350

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: CS204 or equivalent

CE494 Senior Design Project - I (3 units) (Research/development and lab work)
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.

Prerequisites: Advanced senior standing and Advisor’s approval.

CE495 Senior Design Project - II (3 units) (Research/development and lab work)
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

CE501 Mathematical Modeling (3 units)
This course is designed to teach the students the principles and techniques of modeling and simulation with software tools. Examples will be given and the students will work on problems to apply modeling skills to conduct analysis and validation of the problems.

Prerequisite: CS204 and MATH205 and MATH206

CE502 Software Project Management (3 units)
This course focuses on understanding the fundamentals of applying current software development approaches to managing modern complex software projects. Practical strategies, tactics, and designs are discussed together with realistic exercises. Topics include software development process, project planning, requirements definition, design specification, verification and validation, project and change
management, and process quality improvement. Students are required to participate in all activities to develop a real-world software product. 

Prerequisites: CS150 or equivalent

**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: CE470

**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 3Gnetwork. 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: CE470 or CE504

**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: EE451 or equivalent

**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 Environment (3 units)**
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 multitasking 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:** CE450

**CE525 Linux Device Drivers Development (3 units)**
This course covers the design and implementation of device drivers for the latest Linux operating systems. Topics include Linux kernel configuration and build, kernel modules programming, Kernel debug techniques, concurrency and race conditions; time, delays, and deferred work; interrupt handling, interface with hardware; memory allocation, mapping, and DMA; PCI drivers and other bus technologies; driver development for character, block, network, and USB devices. The course also covers case studies. Hands-on exercises are emphasized throughout the course.

**Prerequisites:** CE506 and CS510

**CE527 Embedded Systems in Windows CE Environment (3 units)**
This is a project-oriented course emphasizing hands-on practice. Students will learn how to create and develop embedded applications in Windows CE environment. Through extensive hands-on lab work and programming exercises, students learn how to use Windows CE on a new hardware board, install and develop applications in a cross-platform development environment, load an image on the target system, and verify the applications on the target system.

**Prerequisite:** CE450

**CE528 Embedded Systems in VxWorks Environment (3 units)**
This is a project-oriented course emphasizing hands-on practice. Students will learn how to create and develop embedded applications in VxWorks environment. Through extensive hands-on lab work and programming exercises, students learn how to use VxWorks on a new hardware board, install and develop applications in a cross-platform development environment, load an image on the target system, and verify the applications on the target system.

**Prerequisite:** CE450

**CE530 Embedded Software Design in Linux (3 units)**
This course prepares students to enter the challenging world of embedded Linux. It covers the following key topics: comparing Linux and traditional embedded environments, comparing leading embedded Linux processors, understanding the details of the Linux kernel initialization process, learning the basic concepts about Linux drivers, learning about the special role of bootloaders in embedded Linux systems - with specific emphasis on U-Boot, using embedded Linux file systems, understanding the Memory Technology Devices subsystem for flash (and other) memory devices, mastering debugging tools such as gdb, KGDB, learning many tips and techniques for debugging within the Linux kernel, learning how to maximize productivity in cross-development environments, learning to prepare an entire development environment, including TFTP, DHCP, and NFS target servers; and learning to configure, build, and initialize BusyBox to support a set of unique requirements. Hands-on exercises are required.

**Prerequisites:** CS230 or EE450

**CE574 Network Security in Wireless Systems (3 units)**
Wireless communication has been one of the few fast growing industries in recent years. The growth of wireless communication has been in both LAN and WAN. On the LAN side, it evolves from 802.11b to 802.11a/b/g, and 802.11n. On the WAN side, 3G/4G are becoming reality. The growth of wireless communication also brings new challenges in security. This course will teach students the fundamentals in cryptography, the concept of wireless security, and focus on wireless security for 802.11. Mobile security for Cellular/PCS systems, GSM, GPRS, Bluetooth, and UMTS are also covered. The wide use and increasing capabilities of smart phones and PDAs introduce security risks to the enterprise that parallel those for laptop computers. Data-centric mobile devices will become a major target for virus writers, hackers, as well as pose a risk to data confidentiality. This course will cover as much as possible of these new emerging security threats and the solutions.

**Prerequisite:** CS503

**CE589 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)**
(Research/development and lab work)
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)  
(Research/development and lab work)
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)  
(Research/development and lab work)
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

CE673 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: CS503.

CE676 Network Security Design and Implementations (3 units)
This course is designed for students who have an interest in learning network security technology and wish to become information security professionals. The course covers the fundamentals of network security, for example, firewall, VPN, NIDS, Anti-Virus, and Content-filtering; it also covers the cutting-edge technologies, like Phishing and Malware fighting. In addition, the course 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

CE689 Advanced Topics (3 units)
Advanced topics courses are offered to advanced graduate students in the Computer Systems 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.

Computer Science

CS150 Computer Fundamentals (3 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.

CS150L Computer Fundamentals Lab  (1 unit)
This course is designed to be taken with the course of CS150 Computer Fundamentals. The students learn the basic personal computer components and their functions. Topics include number conversion digital circuits, assembly language programming using Pep7, high-level language programming using Visual Basic, operating systems using DOS and GUI-based Windows, file systems, application software using Microsoft Office suite; introductory database using Microsoft Access, Internet skills, and basic HTML web page design.

CS200 Discrete Logic  (3 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 subjects.

CS204 Program Design & Analysis in C  (3 units)
Language
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 (either CS200 or EE205)

CS204L C Language Lab  (1 unit)
This course is designed to be taken with the course of CS204 Program Design & Analysis in C Language. The students learn to design and program in C language through practical hands-on exercises. They also learn to debug the codes, document programs, and test applications using Visual C++ tools.
Prerequisites: CS150 and (either CS200 or EE205)

CS230 Introduction to UNIX/Linux  (3 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 editor, 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: CS150.

CS230L Unix/Linux Lab – I  (1 unit)
This course is designed to be taken with the course of CS230 Introduction to UNIX/Linux. The students gain hands-on experience with Unix/Linux commands, vi editor, Unix/Linux utility, Shell programming, security issues, and managing long files and customization of user environment.
Prerequisite: CS150

CS350 Data Structures  (3 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

CS350L Data Structures Lab  (1 unit)
This course is designed to be taken with the course of CS350 Data Structures. C language - a structured programming language - is further investigated. Topics include pointer structure, structure and union, stack, queue, linked list, sort, binary tree, and heaps.
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:** CS204 and either CE305 or EE323.

**CS385 UNIX/Linux Shell Scripting (3 units)**

This course covers the fundamentals of and techniques involved in UNIX/Linux shell programming. Topics include UNIX/Linux shells (Bourne, Korn, C shell and bash), shell programming and environments, basic UNIX/Linux file system, and resource management. The students will be able to write shell scripts to accomplish routine tasks for software development and testing.

Intensive hands-on practice is required.

**Prerequisite:** CS230

**CS385L Unix/Linux Lab – II (1 unit)**

This course is designed to be taken with the course of CS385 Unix/Linux Shell Scripting. The students gain hands-on experience with Shell programming. Topics include Unix/Linux Shells – Bourne, Korn, C Shell, and bash, Shell programming, and network environment.

**Prerequisite:** CS230

**CS398 Professional Development (3 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:** Placement by English exam or successful completion of advanced ESL classes.

**CS430 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:** 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

**CS464(G) Software Design and Implementations (3 units)**

This course is designed to use C/C++ to achieve the goal of teaching the students the design methodology for algorithm development. The objective is to develop the students’ programming ability with proper logical and object-oriented thinking processes. The course covers two main topics: (1) Problem specification and analysis - understand the problem, analyze it, and translate the human thinking into a computer program; (2) Object-oriented design and analysis- understand data abstraction, encapsulation, aggregation, and inheritance. These concepts are the foundation for modern object-oriented programming languages such as C, C#, and Java. Hands-on practices are required.

**Prerequisites:** CS204

**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.

**Prerequisites:** CS204

**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

**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) (Research/development and lab work)
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) (Research/development and lab work)
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 Project Management (3 units)
This course focuses on understanding the fundamentals of applying current software development approaches to managing modern complex software projects. Practical strategies, tactics, and designs are discussed together with realistic exercises. Topics include software development process, project planning, requirements definition, design specification, verification and validation, project and change management, and process quality improvement. Students are required to participate in all activities to develop a real-world software product.
Prerequisites: CS150 or equivalent

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, OSI 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 Advanced UNIX/Linux 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: CS230 and CS380.

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: CS385 and CS503

CS526 .NET Web Programming (3 units)
This course provides students with the knowledge and skills needed to build websites with ASP.NET 2.0. and gain an understanding of the new architecture behind ASP.NET. Topics cover using system types and collections to help manage data, and create and configure Web applications; using Microsoft ADO.NET, XML, and data-bound controls; creating custom Web controls; using ASP.NET state management; caching; customizing and personalizing a Web application; implementing authentication and authorization; creating ASP.NET
mobile Web applications; tracing, configuring, and deploying applications; and Web services. Hands-on practice is required.

Prerequisite: CS360 or CS480.

CS527.NET Windows Programming (3 units)
The goal of this course is to provide students with the knowledge and skills needed to develop C# applications and components for the Microsoft .NET Platform. Topics cover using system types, collections, and generics to help manage data; developing services, application domains, and multithreaded applications; creating a UI for a Windows forms application by using standard controls; using ADO.NET and XML; implementing printing and reporting functionality; enhancing usability; implementing asynchronous programming techniques to improve the user experience; developing Windows forms controls; and configuring and deploying applications. Hands-on practice is required.

Prerequisite: CS360; CS480 preferred.

CS528 Programming with .NET - WPF and WCF (3 units)
Windows Presentation Foundation (WPF) is the next generation platform for creating user interfaces (UIs) with the Microsoft .NET Framework. WPF effectively permits the separation of user interface design from the underlying functionality. You also learn how to target your WPF applications for multiple platforms with Silverlight. Windows Communication Foundation (WCF) is another new platform for building connected systems on the Windows platform. WCF makes it possible to build secure, reliable, and transacted systems through a simplified programming model that unifies and improves many of the previous .NET technologies including ASMX, WSE, .NET Remoting, .NET Enterprise Services (COM+), and System.Messaging. This course provides students with an understanding of the Windows Presentation Foundation and the Windows Communication Foundation. And students will gain the skills required to create WPF stand-alone, browser-based and Silverlight projects using the latest Visual Studio, and leverage WCF to build Web services, and ensure reliability with transactions, message queues and durable services.

Prerequisite: CS480 or CS526 or CS527

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, generic programming concepts of JDK-1.5 and beyond, 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

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

Prerequisites: CS457 and CS480

CS537 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: CS360 or CS480

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: CS547

CS548 Database and Internet Server Programming (3 units)
This course 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. In addition, the students will learn the best practice development approach using Sprint Framework to achieve MVC model as well as Hibernate on how to map business domain object model to underline relational database. At the end of this course, the students shall have a fresh view on both the fundamental and advanced skills to implement large scale enterprise systems. Hands-on exercises are an integral part of the course.
Prerequisites: CS547 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

CS574 Network Security in Wireless Systems (3 units)
Wireless communication has been one of the few fast growing industries in recent years. The growth of wireless communication has been in both LAN and WAN. On the LAN side, it evolves from 802.11b to 802.11a/b/g, and 802.11n. On the WAN side, 3G/4G are becoming reality. The growth of wireless communication also brings new challenges in security. This course will teach students the fundamentals in cryptography, the concept of wireless security, and focus on wireless security for 802.11. Mobile security for Cellular/PCS systems, GSM, GPRS, Bluetooth, and UMTS are also covered. The wide use and increasing capabilities of smart phones and PDAs introduce security risks to the enterprise that parallel those for laptop computers. Data-centric mobile devices will become a major target for virus writers, hackers, as well as pose a risk to data confidentiality. This course will cover as much as possible of these new emerging security threats and the solutions.
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)
(Research/development and lab work)
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 - 1 (3 units)
(Research/development and lab work)
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)
(Research/development and lab work)
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

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, JAAAS, Language-Level Security, Java Virtual Machine-level Security, API-Level Security Features, Using the Security Packages, Browser-level Security, and Signing Java Programs.
Prerequisite: CS503.

CS676 Network Security Design and Implementations (3 units)
This course is designed for students who have an interest in learning network security technology and wish to become information security professionals. The course covers the fundamentals of network security, for example, firewall, VPN, NIDS, Anti-Virus, and Content-filtering; it also covers the cutting-edge technologies, like Phishing and Malware fighting. In addition, the course 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

Curricular Practicum

CPT401 Curricular Practicum (1 unit)
Curricular Practicum, or curricular practical training, is a supervised practical experience that is the application of previously studied theory. It is defined as alternative work/study, internship, cooperative education, or any other type of required internship or practicum that is offered by sponsoring employers through cooperative agreements with the school and the course is an integral part of an established curriculum. At least three hours of work in a practical setting has the credit equivalency of one hour of classroom lecture (1 unit). To be eligible to take this course, the
student must have completed at least two semesters of coursework required in his/her degree program, obtained a written agreement that outlines the arrangement between the institution and the practicum site (including specific learning objectives, course requirements, and evaluation criteria), and received approval by a designated advisor. International students must follow additional rules required by the U.S. Immigration and Customs Enforcement. The student must use NPU’s online tool to submit his/her application for taking this course before meeting with a designated advisor for an assessment of eligibility. Information and instructions concerning this course are provided in the application form. This is a part-time practicum course taken by the undergraduate student to work no more than twenty hours each week during the approved practicum period. Failure in this course will prevent the student from taking any curricular practicum course afterwards.

**Prerequisites:** Refer to the instructions on the application and Agreement documents.

**CPT402 Curricular Practicum (2 units)**
Curricular practicum, or curricular practical training, is a supervised practical experience that is the application of previously studied theory. It is defined as alternative work/study, internship, cooperative education, or any other type of required internship or practicum that is offered by sponsoring employers through cooperative agreements with the school and the course is an integral part of an established curriculum. At least three hours of work in a practical setting has the credit equivalency of one hour of classroom lecture (1 unit). To be eligible to take this course, the student must have completed at least two semesters of coursework required in his/her degree program, obtained a written agreement that outlines the arrangement between the institution and the practicum site (including specific learning objectives, course requirements, and evaluation criteria), and received approval by a designated advisor. International students must follow additional rules required by the U.S. Immigration and Customs Enforcement. The student must use NPU’s online tool to submit his/her application for taking this course before meeting with a designated advisor for an assessment of eligibility. Information and instructions concerning this course are provided in the application form. This is a full-time practicum course taken by the graduate student to work no more than twenty hours each week during the approved practicum period. Failure in this course will prevent the student from taking any curricular practicum course afterwards.

**CPT502 Curricular Practicum (2 units)**
Curricular practicum, or curricular practical training, is a supervised practical experience that is the application of previously studied theory. It is defined as alternative work/study, internship, cooperative education, or any other type of required internship or practicum that is offered by sponsoring employers through cooperative agreements with the school and the course is an integral part of an established curriculum. At least three hours of work in a practical setting has the credit equivalency of one hour of classroom lecture (1 unit). To be eligible to take this course, the student must have completed at least two semesters of coursework required in his/her degree program, obtained a written agreement that outlines the arrangement between the institution and the practicum site (including specific learning objectives, course requirements, and evaluation criteria), and received approval by a designated advisor. International students must follow additional rules required by the U.S. Immigration and Customs Enforcement. The student must use NPU’s online tool to submit his/her application for taking this course before meeting with a designated advisor for an assessment of eligibility. Information and instructions concerning this course are provided in the application form. This is a full-time practicum course taken by the graduate student to work more than twenty hours each week during the approved practicum period. Failure in this course...
will prevent the student from taking any curricular practicum course afterwards.

**Prerequisites:** Refer to the instructions on the application and Agreement documents.

### DBA

**DBA601 Research Methodology - I**  
*(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:** Graduate standing or instructor’s consent.

**DBA602 Research Methodology - II**  
*(3 units)*

This course focuses on research methods, particularly using advanced statistical analysis methods to prepare research papers for publication as scholarly journal articles or submission as dissertations or theses. The students may be required to submit their research papers for publication in various journals. The course will introduce various statistical analysis methods for testing hypotheses. The course will be conducted with various forms, including formal lectures, seminars given by invited speakers, and each student’s engagement in practical research work. The student will be required to complete an applied research project.

**Prerequisite:** DBA601

**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:** Advanced graduate standing and Instructor’s consent.

**DBA698 Dissertation - I**  
*(6 units)*

This is the first of a two-part dissertation course series required for each doctorate student. The research and dissertation work serve as the capstone project by which the student demonstrates his/her ability of independent research 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 almost all other required course work. A dissertation committee (DC) for monitoring the dissertation must be formed and approved by the Doctoral Advisory Committee before the student begins his/her dissertation work. The student works with his/her dissertation advisor throughout the project. Effort must involve practical research which provides a first exposure to some fundamental issues in the domain of knowledge relevant to the student’s study fields.

**Prerequisites:** See Doctoral Student Handbook.

**DBA699 Dissertation – II**  
*(6 units)*

This is the second of the two-part dissertation course series required for each doctorate student. The student must submit his/her dissertation for a review by the DC; the student should also give an open forum dissertation defense to the DC members and other invited faculty members and outside guests. The student must receive the DC’s final approval for completing the dissertation course series. If the student fails to complete the dissertation by the end of the semester in which this course was registered, the student must retake this course.

**Prerequisite:** DBA698

### DCE

**DCE601 Research Methodology - I**  
*(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 each student’s engagement in practical research work. The student will be required to complete an applied research project.

**Prerequisites:** Graduate standing or instructor’s consent.

**DCE602 Research Methodology - II**  
*(3 units)*

This course focuses on research methods, particularly using advanced statistical analysis methods to prepare research papers for publication as scholarly journal articles or submission as dissertations or theses. The students may be required to submit their research papers for publication in various journals. The course will introduce various statistical analysis methods for testing hypotheses. The course will be conducted with various forms, including formal lectures, seminars given by invited speakers, and each student’s engagement in practical research work. The student will be required to complete an applied research project.

**Prerequisites:** Graduate standing or instructor’s consent.

**DCE609 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 new subjects related to their studies. These courses are conducted the same way as regular courses.

**Prerequisites:** Advanced graduate standing and Instructor’s consent.

**DCE602 Research Methodology - II**  
*(3 units)*

This course focuses on research methods, particularly using advanced statistical analysis methods to prepare research papers for publication as scholarly journal articles or submission as dissertations or theses. The students may be required to submit their research papers for publication in various journals. The course will introduce various statistical analysis methods for testing hypotheses. The course will be conducted with various forms, including formal lectures, seminars given by invited speakers, and each student’s engagement in practical research work. The student will be required to complete an applied research project.

**Prerequisites:** DCE601

**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 emergent technologies
related to their studies. These courses are conducted the same way as regular courses.

**Prerequisites:** Instructor’s consent

**DCE698 Dissertation - I** (6 units)
(Research/development and lab work)
This is the first of a two-part dissertation course series required for each doctorate student. The research and development and dissertation work 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 almost all other required course work. A doctoral dissertation committee (DC) for monitoring the dissertation must be formed and approved by the Doctoral Advisory Committee before the student begins his/her dissertation work. The student works with his/her dissertation advisor throughout the project. The project 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.

**Prerequisites:** See Doctoral Student handbook.

**DCE699 Dissertation – II** (6 units)
(Research/development and lab work)
This is the second of the two-part dissertation course series required for each doctoral student. The doctoral 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 project. Upon completing the project, the student must submit his/her dissertation for a review by the DC; the student should also give an open forum dissertation defense to the DC members and other invited faculty members and outside guests. The student must receive the DC’s final approval for completing the doctoral dissertation course series. If the student fails to complete the dissertation by the end of the semester in which this course was registered, the student must retake this course.

**Prerequisite:** DCE698

**Economics**

**ECON201 Macroeconomics** (3 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)**

**ECON202 Microeconomics** (3 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 Fundamentals of Digital Electronics** (3 units)
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:** CS150

**EE205L Digital Electronics Lab – I** (1 unit)
This course is designed to be taken with the course of EE205 Fundamentals of Digital Electronics. Topics include introduction to power and ground, basic IC chips with enable/disable control, implementing a 1-bit adder and connecting two 1-bit adders to create a 2-bit adder, measuring voltage and current and power, connecting multiple outputs; divide by 2, 4 circuit; using the oscilloscope, design an oscillator using the 555, design a programmable mod-8 up/down counter, digital clock, IC UP decade counter with LS7447 and 7-segment display, D/A conversion design, memory writing and reading, and night rider design.

**Prerequisite:** CS150

**EE210 Circuit Theory - I** (3 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; Kirchoff’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:** CS150 and PHYS202 (may be taken concurrently)

**EE301 Circuit Theory - II** (3 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 Fundamentals of Analog Electronics (3 units)**

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

**EE302L Analog Electronics Lab – I (1 unit)**

This is the first of a 2-lab series on analog circuit design. The objective of the analog electronics lab series is to develop the student’s ability to analyze and design analog electronic circuits. This lab covers practices of device operation, bipolar junction transistor operation characteristics, computer simulation tools PSpice, and basic analog circuit design such as linear circuits and Opamps.

**Prerequisite:** EE301

**EE323 Logic Design (3 units)**

This course is a sequel of EE205 Fundamentals of Digital Electronics. 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

**EE323L Digital Electronics Lab – II (1 unit)**

This course is designed to be taken with the course of EE323 Logic Design. Topics in cluded introduction to Altera simulation tool and Verilog, decoder designs with various In/Out active levels, creating functional test patterns, BCD-7 Segment converter design and test in Verilog, download to PLD H/A and test, 1-bit adder design, 4-bit adder design, design a 4-bit ALU, design a parallel-in, serial-out shifter, Up/Dn counter designs, timing analysis using simulation, data encryption circuit, simple state machines, pure synchronous state machine design, clock counter, state-machine driving 7-segment output, and a final project design.

**Prerequisites:** EE205

**EE398 Professional Development (3 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:** Placement by English exam or successful completion of advanced ESL classes.

**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, LTl 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:** MATH205, MATH208, and CS204; MATH206 (may be taken concurrently).

**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

**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 and PREE01 (may be taken concurrently)

EE466(G) Introduction to Nanotechnology (3 units)
This course is an introduction to the science of nanotechnology, tools, and applications of nanotechnology to various fields. Topics include: nano-electronics, spintronics and quantum computer, novel man-made materials such as carbon nano-tube, nano-characterization and nano-fabrication; applications to medicine, health, defense, security, green energy technology, and electronics; impact to environment and society, business, investment, and intellectual property. 
Prerequisite: PHYS202 or instructor’s consent

EE468(G) Analog Circuit Design (3 units)
This course is a sequel of EE302 Fundamentals of Analog Electronics. 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

EE468L Analog Electronics Lab – II (1 unit)
This course is designed to be taken with the course of EE468 Analog Circuit Design and it continues to develop the student’s ability to analyze and design analog electronic circuits. This lab covers analog IC design concepts, use Cadence design tool, Hspice, for circuit design, switched capacitor circuit and Opamp IC design. 
Prerequisite: EE302

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

EE488(G) Computer Architecture (3 units)
This course is intended to lay a solid foundation for the design of modern computer systems. The topics covered include instruction set design, computer arithmetic, basic ALU functional blocks, control and datapath of a simple CPU, the concept of pipelining and hazards, memory hierarchy and cache design, I/O and introduction to parallel processing. Several hands-on labs require a background in an HDL language such as Verilog, and the MIPS assembly instruction simulator such as SPIM. 
Prerequisite: EE323 and EE461 (can be taken concurrently)

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.

EE491(G) Electronic Systems Design & Implementations (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 EE481.

EE494 Senior Design Project - I (3 units)
(Research/development and lab work)
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: Senior standing and Advisor’s approval.

EE495 Senior Design Project - II (3 units)
(Research/development and lab work)
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 provide graduate students in Electrical Engineering, Computer Systems Engineering, and Computer Science with the analytical background and modeling techniques relevant to and useful for application in contemporary technologies, including VLSI chip design, nanotechnology, telecommunications, and biotechnology. Analytical, numerical, and computational approaches will be used. The emphasis throughout the course will be on applications. Topics will include: applications of linear transforms, partial differential equations; memristor element in nano-electronics; the nanoscale in space and time, Schrödinger wave equation, quantum tunneling, application to quantum dots in photonic crystals; approaches in quantum computing; computational simulation in nanoscale solar energy devices; LLG methods in nanoscale spintronics; Monte Carlo simulation; FTDT methods in nano-optics, and diffusion processes in bio-nanotechnology.

Prerequisites: MATH205 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: 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: EE488

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, students 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 projects.

Prerequisite: EE505

EE507 Analog/Mixed Signal IC Design (3 units)
This course offers students extensive exposure to concepts and techniques in analysis and design of
analog IC, including device modeling, basic circuit building blocks, feedback system, frequency response and noise. EDA tools may be used in homework assignments and projects.

Prerequisites: EE468 and EE505

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: EE 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: EE461

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 an overview of digital system engineering, modeling and analysis of interconnections, circuit analysis, power distribution in high-speed systems, noise in high-speed digital systems, Buffering model, digital timing analysis, and design methodologies.

Prerequisites: EE302, PHYS301, and EE505.

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.

Prerequisites: EE506 or instructor's consent.

EE530 Analytical Methods for Electrical Engineering (3 units)
This course focuses on basic and advanced concepts in probability and random processes and introduction of some advanced topics in matrix theory with application to electrical engineering. The course covers many topics including: random variables, sum of random process and long-term averages, random processes, analysis of random signals. Applications of these concepts to a variety of electrical engineering problems are discussed. Topics on discrete random processes and Markov chains are introduced. Monte Carlo simulation as one of the application of concepts discussed in this course is introduced. MATLAB software will be used throughout the course to enhance learning and give students a hands-on experience. Topics in advanced matrix theory such as multi-input multi-output representation of systems and singular value decomposition are introduced.

Prerequisites: MATH206 and MATH208

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

89
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: EE452

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 emphases 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: 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

EE581 Electrons, Photons, and Nanotechnology (3 units)
Electrons and photons play a key role in nanotechnology. This course introduces the basics of the application of electrons and photons to nanotechnology. Topics include: Rationale - Why are electrons and photons so important in nanotechnology? The electron: basic electron properties, electrons as waves and their description and application. The photon: basic photon properties, particle and wave aspects. Hands-on computer simulation in nanotechnology. Renewable energy: sources of renewable energy, solar cell basics, use of nanotechnology to harvest solar energy. Memristors: new nanotechnology approaches to information storage. Spintronics: basic concepts, application to magnetic memory, characterization and manipulation of magnetic nanostructures. Nano-optics: overcoming the diffraction limit; use of subwavelength light localization to detect, image, and investigate individual nanostructures. Protein crystallography: use of synchrotron photons to probe the structure of biological molecules. Student participation in mini-projects and a final written report will be required. The course will include class visits to nanotechnology companies, and to state-of-the-art nanotechnology centers at the national research laboratories and universities in the San Francisco Bay area.
Prerequisite: (EE466 or equivalent) and EE501 or instructor's consent.

EE583 Introduction to Nanoelectromechanical Systems (NEMS) (3 units)
Nanotechnology plays a vital role in the 21st Century. Nanoparticles and nanostructures represent a scale of matter where radically different phenomena are manifested. The unique mechanical, electronic, magnetic, optical, and chemical properties open the door to an enormous new domain of engineered nanostructures and integrated nanodevices with the prospect of various innovative applications in every aspect of life. The NEMS is a broad field which includes integrated nano-sensors, nano-actuators, nano-instruments, nano-optics, nano-fluidics, etc. Its applications range from automobile’s airbag deployment system, ink jet printer heads, movable mirror array for color projection displays, to atom probes for imaging and transporting atoms, and many more. Students will also learn the context of nanomanufacturing: fabrication, analysis and synthesis processes, instrumentation for characterization, and integration of nanodevices and systems.
Prerequisite: EE466 or equivalent.

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.

EE590 Nanotechnology Project (3 units)
(Research/development and lab work)
This course is designed for the EE graduate students choosing the Nanotechnology concentration to gain hands-on experience after acquiring the knowledge and design simulation skills from courses taken in this concentration area. The San Francisco Bay Area has extraordinary resources in its unique combination of national laboratory facilities, universities, and high-technology companies. Graduate students at NPU may draw upon these extensive resources to engage in a nanotechnology project. This affords a splendid opportunity for students to obtain exposure to research and development at the frontier of nanotechnology, and to acquire experience interacting with professionals.
working in the field. The project topic will be selected in consultation with a faculty advisor from NPU, who must approve a project proposal. The Nanotechnology Project requires completion of a written project report, to be submitted to the faculty advisor at the conclusion of the semester.

Prerequisite: EE581.

EE597 Master’s Project (3 units) (Research/development and lab work)

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.

Prerequisite: Advisor’s consent.

EE599A Master’s Thesis - I (3 units) (Research/development and lab work)

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) (Research/development and lab work)

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.

Prerequisites: 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.

Prerequisites: 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:** EE539.

**EE638 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 assigned 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:** EE581 or instructor’s consent.

**EE686 Advanced Nanotechnology Project (3 units)**  
(Research/development and lab work)  
This course is intended for advanced graduate students of Electrical Engineering, Computer Systems Engineering, and Computer Science. It is primarily intended for advanced Master or Doctoral students who have already acquired experience in frontier research and development in an area of nanotechnology. The areas could include any combination of: nanostructure synthesis, fabrication, or characterization (experiment/data analysis) or the theory, modeling, or computational simulation of nanostructure interactions. The R&D and/or lab work for the project may be carried out at state-of-the-art facilities at the national research laboratories, universities, or high-tech companies in the San Francisco Bay Area. The project topic will be selected in consultation with a faculty advisor from NPU, who must approve a project proposal. The Advanced Nanotechnology Project requires completion of a written project report, to be submitted to the faculty advisor at the conclusion of the semester.  

**Prerequisite:** EE590 or advisor’s consent.

**EE689 Advanced Topics (3 units)**  
Advanced 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)

Prerequisite: Placement by exam or successful completion of advanced ESL classes.

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)
This course is designed to enhance students' reading ability and to familiarize them with American language and culture through topics and materials covering various areas of contemporary American popular culture. It is structured to encourage students to bring their own backgrounds, interests and experiences to the class meetings and to generate lively discussions and create a community of avid readers. This course also intends to improve and polish students' abilities to establish cogent analyses of various issues and topics, to offer insightful interpretations, to show critical thinking, and to present persuasive arguments.

(GE - Area A)

Prerequisite: ENGL101 or equivalent.

ENGL320 Modern English Grammar (3 units)
This course is a study of rules that allow English users to combine words in English into larger units. The objectives are (1) to help the students to have a better understanding of English grammar in order to develop proficiency in proper word usage, sentence mechanics, and the formation and structuring of logical sentences and paragraphs, and (2) to cultivate the students’ critical thinking skills in speaking, reading, and writing. Topics include word classes, structures of phrases, parts of a sentence, sentences with clauses, applications such as usage problems, punctuation, and style.

(GE - Area A)

Prerequisite: Has taken any degree course at NPU.

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

ENGL420 Intercultural Communication (3 units)
This is a course taught with lecture, readings, discussion, video viewing and guest speakers. It will turn you into a better communicator in an increasingly diversified workforce. With globalization becoming such a universal trend, everyone needs to know how to interact and stay in harmony with people of different cultural, ethnic and linguistic origins. Indeed, how to communicate in a "melting pot" like U.S.A. today is an urgent concern both in theory and in practice. Much of the tension among countries, races and ethnic groups is caused by a lack of mutual understanding. This course will give you the kind of knowledge needed for this understanding. It will cover many interesting theories that will help you establish and
maintain good social and work relationships across the borderlines of cultures and nationalities.

**(GE - Area A)**

**Prerequisite:** ENGL101 or ENGL110 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 ENGL110 or instructor’s consent.

**Finance**

**FIN310 Fundamentals of Finance** (3 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

**FIN501 Financial Management** (3 units)

This course is designed to further introduce modern financial theories, tools, and methods with financial risks. Financial risk management has become an extremely important discipline for corporations, financial institutions, and many government enterprises, particularly in challenging economical times.

**Prerequisite:** FIN501 or instructor’s consent

**FIN512 Financial Risk Management** (3 units)

This course is designed to further introduce modern financial theories, tools, and methods in dealing with financial risks. Financial risk management has become an extremely important discipline for corporations, financial institutions, and many government enterprises, particularly in challenging economical times.

**Prerequisite:** FIN501 or instructor’s consent

**FIN515 Economic Evaluation and Investment Decision Methods** (3 units)

This course introduces the value of money, concept of present worth, future worth, and annual worth; rate of return and break–even analysis are applied to world investments. Related topics emphasize proper handling of (1) inflation and escalation, (2) leverage (borrowed money), (3) risk adjustment of analysis using expected value concepts, and (4) mutually exclusive, alternative analysis and service producing alternative.

**Prerequisite:** FIN310 or PBUS03

**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 or PBUS03

**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.

**Prerequisite:** 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

**Health Service Management**

**HSM520  Healthcare/Hospital Management for Executives and Managers  (3 units)**
This course integrates up-to-date Continuous Quality Management, information technology, business administration, and public health methods into traditional fundamentals of hospital administration. The course provides knowledge, skills, and attitude of the “Team of Three” in hospitals and other health/medical institutions including the governing board, the executive committee, and the medical staff. Health/medical care professionals and graduate students are guided and prepared to build a challenging, growing, and rewarding career both in the United States and in developing countries where hospital/health care/medical executives and managers with graduate health/hospital management degree are critically needed. The core curriculum covers major areas including strategic and tactical management, organization and leadership, administrative functions and structure, planning and evaluation, and the tool box.

Prerequisite: MGT450 or instructor’s consent.

**Humanities**

**HU105  Chinese Speaking for Beginners  (3 units)**
This course is designed for non-Chinese speaking students. It introduces fundamentals of standard Chinese with emphasis primarily on language speaking. Drills in Mandarin pronunciation (pin-yin,) language usage, and cultural notes help students build a solid foundation, and communication-oriented exercises prepare students to communicate in the real world.

(GE - Area A)

**HU110  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)

**HU130  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)

**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 ENGL110 or instructor's consent.

**HU305  Drawing  (3 units)**
This course is designed to give students a training in basic techniques and concepts in pencil drawing. The techniques include strokes, shapes, lighting, surface, texture, and other basic techniques. Higher level drawing techniques, such as quick sketching, portraits illustrations, etc., are also introduced. The theories cover perspective and composition. Hands-on practice topics include plaster models, still life, landscapes, and figures. Artist professional techniques are shared with the students by a series of step-by-step demonstrations in class.

(GE - Area A)

**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 beginning painting creation. It covers basic techniques and concepts in transparent and opaque watercolors. The techniques include strokes, color mixing, texture, lighting, and other techniques. Higher level painting techniques for trees, buildings and portraits, etc. are also introduced. The theories cover color and composition. Hands-on practice topics include still life, floral, simple landscapes and figures. Artist professional techniques are shared with the students by step-by-step demonstrations in class.

(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 Brush Painting (3 units)
This course is designed to give students a beginner’s training on Chinese brush watercolor painting. It covers the basic concepts of brush painting styles, stroke techniques, black-ink technique, colors, patterns, and compositions. The hands-on practice topics include orchid, bamboo, lotus, peony, panda, etc. The study of each topic starts from shape sketch, stroke expression, pattern and form, and finally finishes with a completed painting. Professional artists’ techniques are shared with the students. The students will learn from live demonstrations with easy-to-follow steps.
(GE - Area A)

HU390 News Reading (3 units)
This course will give students a skill that they will be able to use and benefit from for the rest of their lives: the ability to read and understand an English-language newspaper, magazine or other journalistic materials. It will enable the students to launch into the history, culture, and other important aspects of American 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 ENGL110 or instructor’s consent.

HU440 Music Appreciation (3 units)
This course is designed for students to explore the fundamentals of music through easy listening examples from all aspect of sound: tone, color, harmony, rhythm, mood, dynamics, tempo, themes, and forms. Students will analyze music in respect to the historical and cultural context as well as to daily life.
(GE - Area A)

Information Technology

IT310 Introduction to Information Technology (3 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.

IT370 Database Design and Development For Business (3 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 or PBUS04

**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 PBUS04 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 PBUS04 or instructor’s consent.

**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.

**Prerequisite:** IT453 or equivalent.

**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 or PBUS04.

**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 trend, 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:** IT450 and either IT370 or CS457

**IT560 Enterprise Resource Planning** (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, 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:** IT450 and either IT370 or CS457

**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 or instructor’s consent.

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: IT560

Law

LAW310 Introduction to Business Law (3 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, environmental, corporate, securities, bankruptcy, intellectual property, and antitrust law.
Prerequisite: ENGL101 or equivalent.

LAW570 Modern Law of Corporation (3 units)
This course teaches legal issues in formation, operation, and dissolution of corporations, partnerships, and sole proprietorships; emphasis are on advantages and disadvantages of each in terms of taxation, finance, obligations to third parties, and operating problems.
Prerequisite: LAW310 or PBUS01

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.
Prerequisite: Advanced graduate standing or instructor’s consent.

MBA

MBA597 Master’s Project (3 units)
(Research/development and lab work)
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 approval.

MBA599A Master’s Thesis - I (3 units)
(Research/development and lab work)
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.

MBA599B Master’s Thesis - II (3 units)
(Research/development and lab work)
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 (3 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 ENGL110 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 PBUS01 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. Emphasis 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: MGT201 or PBUS01 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: 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.

Prerequisites: MGT201 or PBUS01

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: MGT450 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. The instructor may demonstrate SAP R/3 operations module.
Prerequisite: MGT409 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 studies and project presentations are required.
Prerequisite: Advanced graduate standing or instructor’s consent.

MGT560 Green Business Management  
(3 units)
This course aims to provide the student an understanding of the mounting demand for business management practices to create not just financial value but to effectively respond as well to the environmental sustainability and social responsibility concerns of society; a knowledge of the current “best practices” of businesses in responding to this demand to create “sustainable value” and an understanding of the basic principles behind them, and to develop in the student an appreciation and a sense of commitment to practice “greener” business management practices in their future professional careers.

MGT572 Leadership  
(3 units)
This course gives the students an in-depth understanding of leadership. Throughout the course, students will acquire basic knowledge on classical theory of leadership and practical skills of leadership practice. There will be a final section on
Basic and Advanced Leadership Skills. Topics include empirical studies, interesting anecdotes, stories and findings, and leadership skills. The course intends to create a setting that is personally relevant and interesting and helps the students apply the theory and research to their real-life experiences.

**Prerequisite:** MGT450

**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, 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 Strategic Workforce 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 cases 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.

**Prerequisites:** BUS501, FIN501, MGT530, and MGT531.

**MGT620 Strategic Management for Customer Relations (3 units)**

Based on business point of view, students will learn the basic concepts, terminologies, principles, frameworks, and techniques of Customer Relationship Management (CRM); they also learn the popular CRM solutions from the major market players. CRM today is well accepted by most of the Fortune 1000 and thousands of other companies. Lecture topics will cover the 6Ws of CRM (i.e., What, Why, Who, How, Where, and When). Given that “Customer” is the key element of the eight basic marketing components – 4Ps and 4Cs, it is obvious that good customer relationship management is critical to the success of any business.

**Prerequisite:** MGT450

**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

**MGT685 Organizational Learning in Global Businesses (3 units)**

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. This course also explores the relationship between organizational learning and leadership and strategy, paying particular attention to questions related to leadership.

**Prerequisite:** Advanced graduate standing or instructor's consent.

### Marketing

**MKT310 Principles of Marketing (3 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.

**Prerequisites:** ENGL101 or ENGL110 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 or PBUS02

**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)**
The course is designed to develop the knowledge and understanding of the global marketing environment and of the concepts, tools, and theory that will prepare the students to take the responsibility for successful global market penetration for his/her business organization. The perspective of the course is managerial, i.e., the ability to identify opportunity, resolve problems, and implement solutions and programs.

**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 or PBUS02

**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:** MKT310 or PBUS02
Mathematics

MATH201 Calculus - I (3 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 (3 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'Hopital's rule, integration techniques and their applications, sequence, series, partial derivatives, and improper integrals.
(GE - Area B)
Prerequisite: MATH201

MATH205 Differential Equations (3 units)
This course is designed for engineering students to learn differential equations and their applications. Topics include ordinary differential equations at first, second, and higher orders; applications of ordinary differential equations in electrical circuits and motions, partial differential equations and boundary problems, eigenvalues and eigenfunctions, Green's function, and applications of partial differential equations in electromagnetic waves and scalar and vector potential problems.
(GE - Area B)
Prerequisite: MATH202

MATH206 Linear Algebra (3 units)
This course is designed for engineering students to learn linear algebra and its applications. Topics include systems of linear equations, matrices, vector spaces and vector analysis, transformation and representation theories including Laplace transform, Fourier transform, Z-transform etc.; applications in circuit analysis and signal analysis, numerical methods, optimization, probability and random processes, and discrete mathematics.
(GE - Area B)
Prerequisite: MATH202

MATH208 Statistics (3 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

Physics and Physical Sciences

PHYS201 Physics - I (3 units)
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, waves and sound, and thermodynamics. Laboratory practices are conducted formally each week.
(GE - Area B)
Prerequisites: MATH202 (may be taken concurrently).

PHYS201L Physics Lab – I (1 unit)
This course is designed to be taken with the course of PHYS201 Physics - I. The student first learns to use the general measuring equipment, the proper experimental procedures, and lab safety issues. The student is expected to gain skills in data analysis and lab report writing throughout the semester. Lab topics include measurements of position and velocity, kinematics, Newton's laws of motion, energy, momentum, conservation laws of energy and momentum, collisions, torque, rotational dynamics, waves, and thermodynamic behaviors.
Prerequisites: MATH202 (may be taken concurrently).

PHYS202 Physics - II (3 units)
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, optics, interference, diffraction, and an introduction to modern physics. Laboratory practices are conducted formally each week.
(GE - Area B)
Prerequisite: PHYS201

PHYS202L Physics Lab – II (1 unit)
This course is designed to be taken with the course of PHYS202 Physics - II. The student learns to use electrical measuring equipment to conduct the first several experiments related to electromagnetism. Lab safety as well as skills in data analysis and lab report writing are stressed. Lab topics include measurement of electric field and potential, simple circuits, resistors, DC circuits, Kirchhoff's laws, capacitors, RC circuits, magnetic effects, inductors, AC circuits, electromagnetic induction, RLC circuits, geometrical optics, lenses, and light as a wave.
Prerequisite: PHYS201

PHYS301 Introduction to Device Physics (3 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. 

Prerequisite: PHYS202

**Social Science**

**SOC201 California History** (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.  
(GE – Area C)  
Prerequisite: ENGL101 or ENGL110.

**SOC215 Introduction to Sociology** (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.  
(GE – Area C)  
Prerequisite: ENGL101 or ENGL110.

**SOC220 Introduction to the American Government** (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.  
(GE – Area C)  
Prerequisite: ENGL101 or ENGL110.

**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.  
(GE – Area C)  
Prerequisites: ENGL101 or ENGL110.

**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.  
(GE - Area C)  
Prerequisites: ENGL101 or ENGL110.

**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.  
(GE - Area C)  
Prerequisites: ENGL101 or ENGL110.

**SOC360 Civilization and Urbanization** (3 units)  
This is an introductory course designed to cover the 5,000 year shift from rural to urban throughout the world. The city is civilizations greatest work of art but has many challenges. The ancient walled cities, utopian writings, urban theories, religious experiments, English Garden Cities and new towns, American Greenbelt Towns, company towns, flight to the suburbs, Neo-traditional planning, the New Urbanism, and current sustainable development, Smart Growth, to the more recent Greening and Healthy Cities will be described and the actual city and regional planning practices are shown.  
(GE - Area C)  
Prerequisite: ENGL101 or ENGL110

**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.  
(GE - Area C)  
Prerequisite: ENGL101 or ENGL110.

**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.  
(GE - Area C)  
Prerequisite: ENGL101 or ENGL110.

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Preparatory Module Courses for Business Graduate Students
(Non-credit)

PBUS01 Essentials of Management and Business Law (3 hr/wk)
This course is designed as an introductory-level course in management and U.S. business law. Students learn about and apply the most important aspects of current management theories and techniques, together with relevant related business law. Specifically, students learn about the U.S. legal system; the types of business organizations; the types of managers; and the organizational environment. Students explore, discuss, and debate business ethics. They learn and apply the basic rules of contracts, e-commerce, and intellectual property law. Human resources and operations management (including operational regulation and liabilities) are covered.
Prerequisite: ENGL101 or ENGL110 or instructor's consent.

PBUS02 Essentials of Economics and Marketing (3 hr/wk)
This course provides the student a good understanding of the economic terms and concepts used in the analysis of macro-economic and market conditions as used in a business and marketing plan, the marketing terms and concepts used to analyze consumer and market behavior for creating marketing strategies, the basic marketing strategies described in marketing plans, and a good starting point for creating and developing marketing strategy and business operation ideas.
Prerequisite: ENGL101 or ENGL110 or instructor's consent.

PBUS03 Essentials of Accounting and Finance (3 hr/wk)
The student is introduced to the world of finance and basic accounting principles in this course. Various topics will be covered such as the basic elements of financial accounting, recording and analyzing financial transactions, internal control and cash, accounting principles, 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. The student will also examine the concepts and techniques available to financial managers.
Prerequisites: Pre-calculus subjects.

PBUS04 Essentials of Quantitative Analysis and Information Technology (3 hr/wk)
This MBA/DBA preparatory course is designed to provide the student with the fundamental knowledge and training in the following two areas: (1) concepts and basic principles of various information technologies for businesses, and (2) concepts and applications of probability and statistics in businesses. Topics of this course include, but not limited to, a perspective view on information technology; an overview of computer systems, the Internet, and World Wide Web; a review of database and it’s applications in the business world; some basic programming techniques; a review of networking systems; an introduction to business information systems and related IT issues in the information era; an overview of probability and statistics fundamentals such as random variables, distribution, means and variance, normal distribution, random sampling, and estimation in business usage. The student will receive assignments weekly to learn the covered subjects.
Prerequisites: Pre-calculus subjects

Preparatory Module Course for MSEE Students
(Non-credit)

PREE01 Software Techniques for Electrical Engineers (3 hr/wk)
This course is designed to provide the MSEE students with a hands-on experience in Unix/Linux environment and necessary skills in C/C++ programming languages. This course will cover the essentials of the logic of a structured computer language, Unix/Linux shell programming, the basic Matlab script programming and Hspice for circuit simulation. This course will be taught with extensive practical applications in hardware design.
Prerequisite: EE205

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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 (3 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: Placement by English exam or successful completion of advanced ESL classes.

CE453/CS453 Compiler Design (3 units)
This course is designed to give students a fundamental knowledge of compilers and interpreters for modern
CE/CS574 Network Security in Wireless Systems
(3 units)
Wireless communication has been one of the few fast growing industries in recent years. The growth of wireless communication has been in both LAN and WAN. On the LAN side, it evolves from 802.11b to 802.11a/b/g, and 802.11n. On the WAN side, 3G/4G are becoming reality. The growth of wireless communication also brings new challenges in security. This course will teach students the fundamentals in cryptography, the concept of wireless security, and focus on wireless security for 802.11. Mobile security for Cellular/PCS systems, GSM, GPRS, Bluetooth, and UMTS are also covered. The wide use and increasing capabilities of smart phones and PDAs introduce security risks to the enterprise that parallel those for laptop computers. Data-centric mobile devices will become a major target for virus writers, hackers, as well as pose a risk to data confidentiality. This course will cover as much as possible of these new emerging security threats and the solutions.
Prerequisite: CS503

CE/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: CS503.

CE/CS676 Network Security Design and Implementations
(3 units)
This course is designed for students who have an interest in learning network security technology and wish to become information security professionals. The course covers the fundamentals of network security, for example, firewall, VPN, NIDS, Anti-Virus, and Content-filtering; it also covers the cutting-edge technologies, like Phishing and Malware fighting. In addition, the course 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
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:** (IT310 or BUS504 and graduate standing) or instructor's consent.

**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 BUS503 or instructor’s consent.

**IT450(G)-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 BUS504 or instructor’s consent.

**LAW310-ON Introduction to Business Law (3 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, environmental, corporate, securities, bankruptcy, intellectual property, and antitrust law.
**Prerequisite:** ENGL101 or equivalent.

**LAW570-ON Modern Law of Corporation (3 units)**
This course teaches legal issues in formation, operation, and dissolution of corporations, partnerships, and sole proprietorships; emphasis are on advantages and disadvantages of each in terms of taxation, finance, obligations to third parties, and operating problems.
**Prerequisite:** LAW310 or BUS501

**LAW670-ON Intellectual Property Law (3 units)**
This course is designed 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.
**Prerequisite:** Advanced graduate standing or instructor’s consent.

**MGT450(G)-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 BUS501 or instructor’s consent.

**MGT460(G)-ON 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. Emphasis 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:** MGT201 or BUS501 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 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 or PBUS01

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. The instructor may demonstrate SAP R/3 operations module.

Prerequisite: MGT460 or instructor’s consent.

MKT450(G)-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: 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 approach performance and benefits and handle grievances are explored. Additionally, developing independent work teams that foster creativity and innovation will be discussed.

Prerequisite: MGT542-ON Technology Product Management and Marketing (3 units)
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 with curricula emphasizing computer software applications in various fields based on the industry trend. 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 over the last 20 years and has steadily been providing ever-increasing benefits to the campus operational management and program instructions. Incorporating information technology in campus infrastructure has become a clear and vital operational goal for many institutions of higher education as they move steadily towards the digital campus of tomorrow. As an institution with its research and educational focus primarily on the instructions of business and technology, Northwestern Polytechnic University (NPU) has taken the vision of digital campus as one of its primary development goals. NPU formulated its digital campus initiatives in the late nineties. Four phases of development activities were defined then and has been pursued. In April 2005 the school reached its goal of digital campus as the last phase of web-based operation tools was successfully launched. The NPU IT team has been maintaining this platform and its tools to satisfy the needs of faculty, students, and administrative staff.

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Behavioral health psychology, drug prevention counseling, public health, city planning, architecture and public administration.

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Network security, embedded engineering, wireless engineering, image processing, object-oriented design and analysis, and Internet software development and applications.

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Operations management, project management, technology transfer, innovation management, strategic management, entrepreneurship, systems engineering, and quality management.

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Data mining, RFID in logistic applications, intelligent production scheduling, SAP solution architecture.

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Economics, project evaluation and management, quantitative analysis, public policy analysis.

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DSP, wireless systems, digital communications, algorithm development and implementation in digital and wireless communication systems.

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Internet technology, Microsoft .NET technology; software applications in server systems, wireless systems, and real-time distributed systems; software project management.

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Medical chemistry, chemistry analysis, electronic materials and process control.

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High performance digital systems design, high performance CMOS system interface, microelectronics, VLSI systems.

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Unix system programming and administration, Windows system and administration, biocomputing, bioinformatics, supercomputing, robotic systems.

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M.B.A., Global Management, University of Phoenix, AZ, 2002
B.S., Telecommunication and Electronics Engineering, University of Helwan, Egypt, 1978
Organizational theory and behavior, operations management, global business, operations management, marketing and global competitive strategies.

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Corporate law, international law for business, expository writing.

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Ph.D., Mineral Economics, Colorado School of Mine, CO, 1980
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B.S., Mining, Metallurgy & Materials Engineering, National Cheng Kung University, Taiwan, 1970
Economics, quantitative analysis, investment decision and methods, advertising management, environmental economics, resource economics, and international trade.

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Doctor of Public Health, Tulane University, LA, 1998
Master of Health Service Administration, China Medical College, Taiwan, 1994
Business Administration, Fu Jen Catholic University, Taiwan, 1992
Data analysis, modeling, health service administration, health science research

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Navigation systems software and hardware, signal processing, circuit design.

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Mixed signal IC design, analog IC, CMOS design.

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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.

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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.

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Ph.D., Engineering, UC- Davis, CA, 1990
Master of Journalism, UC- Berkeley, CA, 1993
M.S., Engineering, UC- Davis, CA, 1985
B.S., Chemical Engineering, UC- San Diego, CA, 1983
Technology management, project management, product management, business management, business communication.

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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.

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M.E. University of California at Berkeley, CA, 1995
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Wireless communication, embedded engineering, computer networks.

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B.S., Nuclear Physics, Fudan University, China, 1985
Nanotechnology, fiber-optic communication technology, nanoelectromechanical systems (NEMS), computational physics, device physics.

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M.B.A., Tulane University, LA, 1994
B.S., Industrial Engineering, Tunghai University, Taiwan, 1980
Marketing management, sales, customer relations management (CRM), e-marketing, technology systems applications in business.

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Ph.D., Computer Science and Engineering, University of Michigan, MI, 1987  
M.S., E.E., University of Illinois at Urbana-Champaign, IL, 1978  
B.S., E.E., Wayne State University, MI, 1974  
Computer architecture, parallel processing and multiprocessors, cryptography and security, high-speed I/O, RAID storage systems, system-on-chip design & verification.

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Doctor of Business Administration, Golden Gate University, CA, 2006  
M.B.A., University of Allahabad, India, 1988  
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Business development, marketing, finance, strategic management

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Business development, entrepreneurship, sales, marketing, management.

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Ph.D., Journalism, Southern Illinois University at Carbondale, IL, 1991  
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B.A., Journalism, Fu Shing Kong College, Taiwan, 1970.  
Interpersonal/ small group /organization/mass intercultural communication, communication theory, journalism.

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Software design and development, hardware/software co-design automation, microarchitecture optimization, and VHDL synthesis.

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Ph.D., Electrical Engineering, McGill University, Canada, 1991  
M.T., E.E., Indian Institute of Technology, India, 1983  
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Logic design, logic synthesis, and technology mapping tools for both FPGA and ASIC architecture.

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Ph.D. Physics, Harvard University, MA, 1968  
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Nanotechnology, spintronics, quantum mechanics and applications to technology, THz waves, synchrotron photons, engineering mathematics, analytical and computational approaches to modeling.

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Finance, investment, international business management, economics, organizational management.

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Internet technology, data communication, IP networks, networked storages with embedded software, client-server computing, database enterprise application integration, operating systems and network management; innovative high-tech product development, project management.

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VLSI design and simulation, digital signal processing, control, and system engineering, wireless engineering.

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Database design and applications, large scale database and database management, information technology and MIS. Computer science and computer logic.

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DSP and image processing, transducer technology, medical imaging systems, and noise reduction algorithms design and implementation.

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Embedded Linux device, Internet technology, object-oriented design and programming.

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Software engineering, software system design and development for business applications, RFID and supply chain management software development, object-oriented database and programming.

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Bioinformatics, magnetic resonance spectroscopy and imaging, nucleic acid and protein structure function relationship, and software testing.

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Algorithms analysis and design, computer systems design and simulations, e-commerce, database design, networking applications, MS Windows system and .NET applications.

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Musical theory, music composing, piano technology and performance, computer music.

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Accounting, payroll services, human resources management.

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Master of Divinity, Trinity Theological Seminary, IN, 2004
B.S., Business Administration, University of South Dakota, SD, 1976
Business operations, corporate finance, human capital development, strategic marketing, regulatory affairs, financial accounting.

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Computer networks and network security, web technology and database applications, software testing.

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Marketing and sales management, strategic marketing and analysis. Business management, product and operational management. Macro/Micro economics.

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Database design and administration, ERP system design, Internet application programs, software development.

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VLSI/chip design, VLSI tools evaluation and design.

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IC systems, circuits, device, and process.

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M.B.A., Taxation, California State University-Hayward, CA 1992
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Financial accounting, business law, taxation.
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Special Study: National Art Academy, Guangzhou, China, 1986  
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Contemporary watercolor, English

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Organizational behaviors, contract writing, organization and administrative services.

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Financial management, taxation, treasury operation system.

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Business development, marketing, business management, teaching English as A Second Language.

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ESL teaching methodology, public speaking, communication skills development, expository writing, American history.

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Logic design and synthesis, CAD tools, Verilog and HDL, ASIC and PLD design techniques, and software design tools development.

Raj Shea  
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International trade and operations, import/export administration, international marketing, industrial management.

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Ph.D., Engineering Science, University of Toledo, OH, 1982  
M.S., Industrial Engineering, University of Toledo, OH, 1977  
M.B.A., Operations Analysis, University of Toledo, OH, 1976  
B.S., Mathematics, University of Toledo, OH, 1972  
Systems analysis, simulation, manufacturing process methodology, software applications in business.

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  
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Integrated circuit design, analog circuits, digital circuits, mobile systems.

Kevin Sung  
M.B.A., Northwestern Polytechnic University, CA, 2005  
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Project and program management, logistic and operations management, strategic analysis and implementation in systems and product quality improvement.

Siu Ming Tong  
M.S.C.S., San Jose State University, CA 1998  
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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.

Chris White  
M.S.E.E., Northwestern Polytechnic University, CA 1999  
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Logic design, microprocessor and digital systems, EDA tools, logic synthesis.

Lee Winters  
M.B.A., University of Washington, Seattle, WA 1974  
B.A., Government, Chapman University, Orange, CA 1967  
Human resource management, organizational behavior, human communication, Spanish, ESL.

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

115
Internet Web multi-media development, real-time operating systems, distributed computing, object-oriented design and programming.

**Bin Zhang**  
M.S.C.S., Fudan University, China, 1988  
B.S.C.S., Fudan University, China, 1985  
Networking and real-time embedded systems network protocol, inter-process communication and distributed database in cross platform environments.

**Charles Zhi**  
Master of Accountancy, Golden Gate University, CA, 1997  
Bachelor of Economics, Central Institute of Finance & Economics, China, 1989  
Accounting, taxation, and finance.

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**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.

- **Administration Office**: 47671 Westinghouse Drive, Fremont, CA 94539  
  Tel: 510-592-9688; Fax: 510-657-8975
- **School of Business & Information Technology**: 47655 Warm Springs Blvd., Bldg. A, Fremont, CA 94539
- **School of Engineering**: 105-119 Fourier Avenue, Fremont, CA 94539
- **NPU Innovation Center**: 47655 Warm Springs Blvd., Bldg. B, Fremont, CA 94539