

**Electrical and Computer Engineering Department  
Strategic Plan  
Summary**

**By**

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## Departmental Vision

To be recognized internationally for engineering education and research, and for leadership to the profession.

The following strategic characteristics and aspirations will enable the Department to realize its vision:

- Environment that facilitates personal commitment to the educational success of students in a comprehensive college and university
- Undergraduate curricula that emphasize *breadth and depth of education*, which link to areas contiguous to engineering and hands-on laboratory experiences and research.
- Graduate education that prepares students for *research and advanced problem solving* needed to address complex engineering problems
- Foster in our students a sense of innovation and creativity
- *Internationally recognized research programs* with strong support from professional constituencies
- Demonstrable *leadership, service, and outreach* in advancing engineering professionalism to meet society's needs
- Educational and research *partnerships* with agencies, universities, and industries
- Highly *successful alumni* who contribute to the profession in the global society

## ECE Department Mission (Abridged)

The mission of the Electrical & Computer Engineering (ECE) Department is threefold:

1. To provide educational programs in Electrical Engineering and Computer Engineering and related fields at the bachelor's, master's and doctoral levels of high quality and sufficient breadth and depth to serve industry, government and academic institutions of our State and Nation.
2. To conduct research and pursue scholarship to advance knowledge and apply that knowledge in areas relevant to our State and Nation in order to meet the demands of the information age and global competition.
3. To serve the State and Nation by making available the accumulated expertise, knowledge and experience of the faculty to industry and government.

The EE and CE programs endeavor to provide a firm foundation in fundamentals, while also giving students exposure to current technologies for design and implementation. They strive for a balance between theory, laboratory and design experience. Furthermore, the programs foster teamwork and project management skills.

The graduate ECE program offers studies leading to the degrees of Master of Science in Electrical Engineering and the Doctor of Philosophy in Engineering with an option in Electrical Engineering. Creative research/scholarship is an integral part of the ECE Department's mission and directly impacts undergraduate and graduate education. The importance of research is equal and complementary to the function of teaching.

Externally supported research and equipment funding are necessary means for supporting ECE research endeavors, and therefore, success in obtaining external research and equipment grants is essential.

### **Department Strengths**

- Core Strengths in Signal Processing, Control and Embedded Systems Engineering, Mobile Computing, and Applied Electromagnetics
- Faculty directly involved with Hands-on Laboratory experiences
- Knowledge base and leadership in Distance Learning
- Solid Programs at the MS and PhD levels with opportunities for research funding (student and faculty) through CCOM, IOL, and Project 54
- Largest graduate program in CEPS

### **Objective I: Efficient Use of Faculty Resource**

#### **Accomplishments**

- ECE Workload Policy has been implemented as of Fall Semester 2007 that is equitable for faculty and fulfills our programmatic needs.
- Through new funding lines the computer cluster has been updated along with all laboratories requiring computers. Equipment housed in the freshman, sophomore, and junior laboratories have been updated and/or replaced with new models. The communication and fiber optics laboratory still requires equipment.
- Teaching assistants are all assigned laboratory responsibilities. Grading is done by students paid hourly.

#### **Continuing Tasks**

- *Hire two to three new faculty members*  
Faculty are required to replace a junior faculty member that resigned and in anticipation to near-term retirements. The Chairman will hold department meetings to develop research directions taking into account the competencies of the existing professoriate to build a base for team-directed research activities.
- *Continue to evaluate and restructure outdated courses and course with low population to reduce course offerings*  
Assign the Undergraduate Committee and the Graduate Committee to review all courses that have a history of low enrollment and/or require restructuring seeking to insure technical currency.
- *Continue to identify and remove outdated and unnecessary laboratory experiences*  
Assign the UGC, the EE Program Chair, and the CE Program Chair to identify outdated and unnecessary laboratory experiences seeking to insure technical currency.
- *More efficient use of staff (including graduate students)*  
Establish responsibilities by function and timeline for the technical staff to maintain the laboratories and equipment; thereby reducing faculty time on maintenance and calibration activities in the laboratory. Provide advanced and qualified students the opportunity to team teach or teach classes under the direction of a faculty member; thereby reducing time commitment to on-site teaching.

- *Flexible/Strategic Course Release Program to promote research interests*  
Establish a plan and process to allow faculty to be released from teaching on a course basis or semester basis to strategically advance research opportunities. The release may consist of doubling the teaching load for one semester to be relieved of the teaching load the following semester. The use of this program requires an unusual opportunity, a major research initiation, collaborative in nature with a highly likelihood of success.
- *Develop core research areas*  
Realign or streamline existing research laboratories into core thrust areas to increase critical faculty/staff mass for obtaining research funding and student interest.
- *Conduct periodic dialogue between faculty, industry, and government to research opportunities*
  - Conduct an “ECE Research Review” workshop with invitations to the ECE-IAB, industrial and governmental representations every two years later. Include a session on emerging technologies and feedback from attendees.
  - Develop a current profile of faculty expertise for distribution to current and potential industrial and government “clients”.
  - Assess the feasibility of establishing an annual research review to keep others informed of our programs and encourage formal relationships with our faculty and centers.

## **Objective II: Unify and Expand the Graduate Program**

### **Accomplishments**

- The ECE Department is in process of establishing a Non-Thesis MSEE degree program to be effective by Fall Semester 2008.
- The ECE Department is in the process of establishing a Five Year BSEE/MSEE degree program to be effective by Fall 2008.
- The ECE Department is in the process of establishing a PhD Program in Electrical Engineering to be effective by Fall 2008.

### **Continuing Tasks**

- *Streamline the graduate program by providing uniform standards and making course offerings more regular*
  - Assign the Graduate Committee to identify a limited number of graduate areas of concentration and identify core course requirements.
  - Assign the Graduate Coordinator to establish uniform candidacy requirements for doctoral students through standardized written examinations.
  - Develop guidelines and procedures to encourage students to complete their graduate studies more rapidly, including policies on using departmental TA and lecturer funds for recruiting and supporting graduate students.
  - Seek industrial sponsorship of graduate fellowships to support relevant research.

- *Continue to promote FarView graduate classes*  
Classes taught through distance education allow archiving lectures for future offerings and also allows a greater attendance by non-traditional students. Assign the Graduate Committee to list possible courses to be taught as FarView.
- Develop a relationship between ECE Department and the IOL, CCOM, and Project 54 to strengthen the graduate program

### **Objective III: Enhance the Undergraduate Experience**

#### **Accomplishments**

- Curricula modifications have been completed for both the EE and CE Program bringing general education courses earlier in the curricula.

#### **New Tasks**

- *Consider expanding its undergraduate offerings*  
The Chairman will hold faculty and stakeholder meetings to explore new undergraduate offerings. A major in Bioengineering and minors in “green energy”, biotechnology, communication technology, for example could be considered.
- *Add a laboratory based experience outside of the Department for the computer engineering program*  
With the concurrence of ABET and the External Review Committee upon a laboratory-based experience for the computer engineering program students, the Chairman directs the ECE Undergraduate Committee to discuss and recommend a suitable laboratory-based experience for computer engineering students.
- *Enhance the Honors-in-Major Program within the ECE Department*
- Develop a relationship between ECE Department and the IOL, CCOM, and Project 54 to strengthen the senior projects.

#### **Continuing Tasks**

- *Continue to seek research programs and student projects with State industry at undergraduate and graduate levels by announcements and visitations to industry.* Primary the program envisioned is a summer internship program.
- *Continue to promote FarView undergraduate classes*  
Classes taught through distance education allow archiving lectures for future offerings and also allows a greater attendance by non-traditional students. Assign the Undergraduate Committee to list possible courses to be taught as FarView.
- *Restructure the use of software tools in the undergraduate curriculum*  
Examine the use of software tools in the curriculum. Based on the availability of hardware and software, more fully incorporate vertically integrated software packages (i.e., MATLAB, MATHEMATICA) in courses as appropriate to augment useful tools.
- *Increase international education opportunities*
  - *Integrate a dual degree program with the Budapest University of Technology and Economics and the University of New Hampshire*  
The Department of Computer Science and the Department of Electrical and Computer Engineering have been designated as pilot Departments from the UNH side for the dual degree program. Assign the

Undergraduate Committee to work with the above named group to provide course match to guarantee ABET compliance.

- *Establish a formal undergraduate student exchange relationship between UNH and University of Novi Sad*

**Objective IV: Continually Increase the Awareness of Industry, State Leaders, Alumni and University Leaders Concerning the ECE Departments' Accomplishments and Excellence; and thus, Obtain their Financial Support and Enhance our Image**

- Identify major donors, get to know them, understand their interests, present gift proposals, and obtain their gifts with support of the Foundation.
- Continue a close relationship with past donors, continually thanking them and emphasizing the importance of their gift.
- Host events including alumni reunions, pre-game activities, and regional alumni activities and meetings.
- Publish an annual alumni magazine (Signals and Noise).
- Web-based information is standard.
- Establish an "ECE Capstone Engineering Society" to create an atmosphere of family.
- Ask advisory boards to 1) provide assistance in identifying individual and corporate prospects, 2) serve as advocates for the department, and 3) provide direction and guidance.

**Objective V: General Activities to Enhance the ECE Department**

**New Tasks**

- Develop a comprehensive equipment upgrade and replacement plan.
- Develop a "Diversity Plan" coupled to the University's Strategic Plan for Diversity keyed on the efforts to increase the size of the student body and faculty.