

*Electrical and Computer Engineering  
Department*

*Strategic Plan*

*2000-2005*



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## *Department Head's Introduction to the Strategic Plan* *January 2001*

This document is the final version of the ECE Department's Strategic Plan, including the details of the Implementation Plan. We have been developing the Strategic Plan since the summer of 1999, and it is the product of the combined efforts of the ECE Planning and Development Committee, headed by Dr. Oleh Tretiak, the ECE faculty and students, and the ECE Advisory Council members.

The Strategic Plan sets ambitious goals for the department as well as the University administration. We aspire to reach the very top levels of innovation and research in electrical and computer engineering and to be ranked among the best departments. We believe that these goals are worthwhile and achievable.

We will now begin to put the Strategic Plan into effect and further define our strategies for achieving our objectives. We plan to meet every six months to present the results of our efforts to the ECE Advisory Council and our constituencies. We look forward to continuing the tradition of excellence in research and education in the ECE Department.

Dr. Nihat Bilgütay  
Professor and Head  
Electrical and Computer Engineering Department

# **Drexel University**

## **Department of Electrical and Computer Engineering**

### **STRATEGIC PLAN 2000-2005**

The Electrical and Computer Engineering Department of Drexel University has served the Delaware Valley region and advanced the University's reputation. The objective of this Strategic Plan is to pursue our mission, enhance our academic and scholarly activities, and improve our department's and our University's eminence and national rankings.

#### **Mission Statement**

**The ECE Department prepares men and women to lead productive and rewarding professional lives at the forefront of Engineering in the 21st century and pursues research to advance the state-of-the-art in Electrical and Computer Engineering and Engineering Education.**

#### **Who We Are and Who We Want To Be**

We are national leaders in engineering education. Our undergraduate curriculum is nationally recognized for its excellence and innovation, and it is widely emulated.

Our research enterprise has earned international recognition and leadership positions in Power, Microwave-Photonics, Telecommunications, and Image Processing.

Our department provides an outstanding education to students from diverse backgrounds and with varying levels of preparation.

Our cooperative education program allows students to establish good industrial connections and to embark quickly on their professional paths.

We are located in Philadelphia, a city with a great history and a bright future.

We have a highly professional and supportive staff and a collegial and nationally recognized faculty.

Our students and faculty have an entrepreneurial spirit.

#### **Vision Statement**

**The ECE Department aspires to be ranked first in the Delaware Valley and among the top 25 national departments.**

The attainment of this vision will require hard work on the part of faculty, staff, and students. This effort will require collaboration with our administration, alumni, industrial friends, and other universities.

## Goals of the ECE Department

- 1. Strengthen the Graduate Program by enhancing recruitment, retention, technical relevance, time to graduation, and its effectiveness in supporting ECE research.**

*Impact:* Increase quality and quantity of graduate enrollment. Enhance national and international reputation and visibility.

- 2. Strengthen research by innovating in areas relevant to society, increasing the amount of research activity, and enhancing our research facilities.**

*Impact:* Enhance our relevance, reputation, visibility, and increase our resources.

- 3. Become more student-centered, create and motivate a community of learners that includes students and faculty. We will develop an environment supportive of learning, both within ECE and in programs across the campus.**

*Impact:* Improve our student body, increase student retention and satisfaction, and develop loyal alumni.

- 4. Continually evaluate and revise ECE undergraduate curricula to effectively address changes in technology, society, and the world.**

*Impact:* Improve our competitiveness in attracting undergraduates, and advance our national/international reputation.

- 5. Develop and improve ways to continuously nourish and enhance our faculty and staff, who are the department's main assets.**

*Impact:* Achieve our strategic goals in a timely fashion.

## **Objectives for Goal 1 Strengthen the Graduate Program**

1. Enhance quality and size of the doctoral program through effective recruitment. In five years, achieve 3 doctoral students per tenure track faculty.

*Needs:* Funds to improve student stipends and effective methods for attracting students

*Action Items:*

- Acquire departmental resources to support 20 research fellows
- Effective outreach and networking program for student recruitment
- Attract national graduate fellowships (NSF, DOD, NASA, etc.)

*Responsible Individuals:* Graduate Committee Chair, Department Head, Dean, Institutional Advancement

2. Overhaul and enhance the graduate curriculum.

*Needs:* A new, modern graduate curriculum

*Action Items:*

- Review and revise graduate areas, course offerings, and program requirements

*Responsible Individuals:* Graduate Committee Chair, Department Head

3. Improve our competitive position in attracting part-time graduate students.

*Needs:* Curriculum enhancement and graduate tuition adjustment

*Action Items:*

- Survey potential part-time students to assess program features and needs
- Revise graduate program to introduce courses that address student interests
- Support asynchronous and/or distance learning initiatives
- Ensure competitive graduate tuition

*Responsible Individuals:* Graduate Committee Chair, Department Head, Dean

## **Objectives for Goal 2**

### **Enhance the Research Enterprise**

1. Over five years, increase average annual research expenditures to \$350,000 per tenure-track faculty.  
*Needs:* Recruitment of faculty in “hot areas,” reduction in average faculty teaching load, greater support from the Research Office.  
*Action Items:*
  - Identify targets for new research areas
  - Increased rate of proposal submission
  - Leadership and coordination for large projects*Responsible Individuals:* Department Head, Faculty, Senior Vice President for Research
  
2. Establish and recruit three additional endowed chairs.  
*Needs:* Endowment funds  
*Action Items:*
  - Fundraising*Responsible Individuals:* Institutional Advancement, President
  
3. Increase faculty scholarly productivity and Ph. D. awards.  
*Needs:* Research funds, reduced teaching loads, Ph. D. student recruitment and retention  
*Action Items:*
  - Increase publication submission
  - Increase Ph. D. enrollment*Responsible Individuals:* Faculty, Graduate Admissions, Senior Vice President for Research
  
4. Strengthen and broaden research areas.  
*Needs:* Increased number of faculty active in strategically important areas  
*Action Items:*
  - Focused faculty recruitment
  - Support for current faculty to develop new areas of expertise*Responsible Individuals:* Faculty, Department Head

## **Objectives for Goal 3 Strive to be Student-Centered**

1. Improve the undergraduate advising system with more personalized attention.

*Needs:* Well trained and committed faculty advisors

*Action Items:*

- Assign and train individual advisors to monitor student progress and provide regular feedback
- Integrate regular advisory meetings into academic procedures

*Responsible Individuals:* Department Head and Undergraduate Curriculum Committee Chair

2. Improve student retention and graduation.

*Needs:* Well-prepared students

*Action Items:*

- Re-define admission criteria
- Enhance outreach and networking efforts to attract talented high-school students
- Support special programs to assist students with gaps in preparation

*Responsible Individuals:* Department Head, Dean, Admissions Office

3. Improve assessment process and utilize feedback for continuous program improvement.

*Needs:* Effective faculty/course assessment process and student feedback

*Action Items:*

- Regularly perform student surveys and use results to improve programs

*Responsible Individuals:* Department Head and Undergraduate Curriculum Committee Chair

4. Enhance the Co-op experience.

*Needs:* Process to monitor student's progress during Co-op assignments.

*Action Items:*

- Develop process for integrating Co-op with educational programs

*Responsible Individuals:* Undergraduate Curriculum Committee Chair, Co-op Director

## **Objectives for Goal 4**

### **Maintain a State-of-the-Art Undergraduate Curriculum**

1. Continuously review curriculum goals and content.  
*Needs:* Mechanism for coordinating curriculum content and development opportunities  
*Action Items:*
  - The Curriculum Committee will perform annual reviews, obtaining feedback from students, faculty, and employers*Responsible Individuals:* Undergraduate Curriculum Chair, Department Head
  
2. Use novel technologies and methodologies for teaching.  
*Needs:* Faculty support to learn and apply advances in teaching technology  
*Action Items:*
  - Allocate funds for faculty training
  - Support University initiatives in distance and asynchronous teaching*Responsible Individuals:* Assistant DH for Planning and Development, Department Head
  
3. Enhanced support of laboratories and curricular development.  
*Needs:* Equipment and renovation funds and faculty time  
*Action Items:*
  - Develop focused goals for laboratory enhancement*Responsible Individuals:* Director of Labs, Assistant DH for UG Affairs, Department Heads, Faculty fundraising efforts
  
4. Enhance and support entrepreneurial training.  
*Needs:* Programs and resources to support student entrepreneurship  
*Action Items:*
  - Support and facilitate a University-wide entrepreneurial program
  - Adapt the ECE curriculum to support this activity*Responsible Individuals:* Director of Entrepreneurial Programs

## **Objectives for Goal 5**

### **Support Faculty and Staff Enhancement**

1. Support Faculty development efforts. Provide the opportunity for faculty training and study to achieve the department's teaching and research goals.  
*Needs:* Reduced teaching load and/or financial resources  
*Action Items:*
  - Develop a competitive program for identifying faculty goals in teaching and research development
  - Enhance the Sabbatical Leave program*Responsible Individuals:* Faculty, Department Head
  
2. Support staff efforts to maintain and enhance their skills.  
*Needs:* Release time and/or financial resources  
*Action Items:*
  - Identify key staff development interests and needs, particularly those in support of ECE goals*Responsible Individuals:* Staff, Department Head
  
3. Revise the Faculty Annual Report (FAR) to reflect the department's strategic goals and priorities.  
*Needs:* A FAR mechanism that reflects departmental needs  
*Action Items:*
  - Develop new Faculty Annual Report form*Responsible Individuals:* Assistant D. H. for Planning and Development, Department Head
  
4. Develop department-coordinated Industrial Liaison program.  
*Needs:* Improved communications between our department and industry  
*Action Items:*
  - Develop and implement Industrial Liaison processes*Responsible Individuals:* Assistant D. H. for Planning and Development, ECE Advisory Council, Department Head, Institutional Advancement staff

# *Implementation Plan*

*for the Electrical and Computer Engineering*

*Strategic Plan*

*2000-2005*

**Planning and Development Committee:** William Freedman, Allon Guez, Peter Herczfeld, Wayne Hill, Kambiz Pourrezaei, Harish Sethu, Oleh Tretiak (Chair), and Nihat Bilgutay (ex officio).

**Tasks and Leaders:**

- I. Proposal for Structuring Department Research, S. Personick
- II. Plan for undergraduate advising and retention, K. Scoles
- III. Plan for graduate program, M. Shankar
- IV. Develop graduate recruiting plan, M. Kam
- V. Plan for Industrial Liaison, O. Tretiak
- VI. Funds for additional endowed chair, N. Bilgutay
- VII. Four graduate fellowships, B. Eisenstein
- VIII. Faculty and staff enhancement program, K. Pourrezaei
- IX. Revise Faculty Annual Report, F. Cohen

## **Introduction**

The Implementation Plan supplements the ECE Department's Strategic Plan developed during the spring and summer of 2000, and it is intended to chart the department's path from 2000 to 2005. The goals of the Strategic Plan, which are summarized in the Mission and Vision Statements, are translated into concrete implementation plans in this document.

The Implementation Plan consists of two parts: a set of quantitative benchmarks and a list of action items. The benchmarks define the endpoints of the plan, while action items enumerate specific tasks to be completed in approximately half a year.

The Implementation Plan will be reviewed by the department's Advisory Council twice a year to compare the department's achievements with the benchmarks, evaluate the completion of the pending action items, and define new action items. In the intervening period, the plan will be under the oversight of the Planning and Development Committee.

# Benchmarks

## Major Institutional Investment in Department

To achieve the goals of the Strategic Plan, the following major institutional development needs must be met:

- |   |         |
|---|---------|
| 1. <i>Acquire Endowed Chair Professorships</i><br>Three @ 2.5 M                         | \$7.5 M |
| 2. <i>Renovation of Commonwealth Hall</i>   | \$10 M  |
| 3. <i>Departmental Endowment</i>  | \$2.5 M |
| 4. <i>Annual Fundraising for Graduate Fellowships</i><br>Twenty @ 25,000 annual stipend | \$500 K |

## Enrollment, Degree Awards, and Research Funding Goals

The following goals will be met by 2005. Year-by-year benchmarks are given in the appendix.

Undergraduate students enrolled in ECE Department	800
MS Students	172
PhD Students	135
Tenure-track Faculty	45
Undergraduate Student/Faculty Ratio*	18
PhD Student/Faculty Ratio	3.0
BS Degrees awarded per year	160
MS Degrees	86
PhD Degrees	17
PhD Degrees/Faculty	0.38
Fellowship income	\$500,000
Department research expenditures	\$15,750 K
Research Expenditures/Faculty	\$350 K

\* Adjusted for students away from campus on Co-op.

## **Action Items** **January 2001**

### I. Structuring Department Research

<p><b>Leader:</b> Stewart Personick, chair of an ad-hoc subcommittee of the Planning &amp; Development committee</p>
<p><b>Task:</b> Develop a proposal for structuring the ECE Department research enterprise. Identify key research areas for strategic support and development. Identify “cluster” research labs.</p>
<p><b>Completion:</b> January 2001</p>
<p><b>Comment:</b> This is an urgent task because it is crucial for planning the Research Building and Faculty Recruitment.</p>

### II. Undergraduate Program

<p><b>Leader:</b> Kevin Scoles, Assistant Department Head for Undergraduate Studies</p>
<p><b>Task:</b> Develop plan for student advising and improvement of retention and graduation rates.</p>
<p><b>Completion:</b> March 2001</p>
<p><b>Comment:</b> This is the initial task of the Strategic Plan, goal 3: “Become more student-centered, create and motivate a community of learners...” The Advisory Council has placed great emphasis on this activity.</p>

### III. Graduate Program

<b>Leader:</b> M. Shankar, Assistant Department Head for Graduate Studies
<b>Task:</b> Develop plan for revising graduate program.
<b>Completion:</b> March 2001
<b>Comment:</b> This is the initial task of the Strategic Plan, goal 1: “Strengthen Graduate Program ...” A vibrant graduate program is at the heart of our goals.

### IV. Graduate Student Recruitment

<b>Leader:</b> Moshe Kam
<b>Task:</b> Develop and implement doctoral student recruitment program.
<b>Completion:</b> March 2001
<b>Comment:</b> This is a long-standing issue for the department, much discussed by the Graduate Committee. Because of the long recruitment cycle, plans must be started as soon as possible.

## V. Industrial Liaison Program

<b>Leader:</b> O. Tretiak, Assistant Department Head for Planning and Development
<b>Task:</b> Develop Plan for Industrial Liaison Program.
<b>Completion:</b> March 2001
<b>Comment:</b> This task will involve the Advisory Council and interactions with Industry.

## VI. Endowed Chair

<b>Leader:</b> Nihat Bilgutay, Department Head
<b>Task:</b> Develop funds for an additional endowed chair.
<b>Completion:</b> October 2001
<b>Comment:</b> This will interface with the Drexel capital campaign, announced in October 2000.

## VII. Graduate Fellowships

<b>Leader:</b> Bruce Eisenstein
<b>Task:</b> Initiate four graduate fellowships.
<b>Completion:</b> March 2001
<b>Comment:</b> This requires additional fundraising and the development of a plan for recruiting candidates, as well as a rationale for awarding the fellowships.

## VIII. Faculty and Staff Enhancement

<b>Leader:</b> Kambiz Pourrezaei
<b>Task:</b> Develop Faculty and Staff enhancement program.
<b>Completion:</b> March 2001
<b>Comment:</b> This is to be an on-going program of the department, part of the fifth goal of the Strategic Plan.

## IX. Annual Report

<b>Leader:</b> Fernand Cohen
<b>Task:</b> Revise Faculty Annual Report.
<b>Completion:</b> March 2001
<b>Comment:</b> This is to implement the objective “Revise the Faculty Annual Report (FAR) to reflect the department’s strategic goals and priorities.”

# Appendix

## Benchmarks Year-By-Year

### Enrollments and Faculty Count Actual data 96-00, projections 00-05

	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05
UG	702	685	754	761	800	800	800	800	800
MS	186	164	139	134	132	142	152	162	172
PhD	48	39	47	33	48	65	85	107	135
Tot	936	888	940	928	980	1007	1037	1069	1107
Faculty	30	27	31	29	32	35	38	41	45
UG SFR*	23	25	24	26	25	23	21	20	18
PhD Stud/ Faculty	1.60	1.44	1.52	1.14	1.49	1.86	2.24	2.62	2.99

Assumptions: UG levels off at 800 to limit SFR. SFR is adjusted for co-op. MS (part time graduate students) grow to 172. Ph. D. student count = Tot. research expenditures/117,000. PhD students = res exp /117,000.

### Degrees Awarded Actual data 96-00

	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05
BS	112	113	97	123	160	160	160	160	160
MS	49	65	48	59	66	71	76	81	86
Ph.D.	14	9	7	6	10	10	13	13	17
Totals	166	192	175	188	236	241	249	254	263

PhD Degrees/ Faculty	0.47	0.33	0.23	0.21	0.31	0.29	0.34	0.32	0.38
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Assumptions: BS degrees = BS students/5. MS degrees = MS students/2. PhD degrees = PhD students/5 (with lag).

### Fellowships and Research Revenues Actual data 96-99

Fiscal Year	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05
Fellowship Income					100,000	200,000	300,000	400,000	500,000
Expenditures \$	2,817,939	2,406,672	2,665,461	3,769,580	5,567,629	7,629,696	9,955,780	12,545,881	15,750,000
Exp/Fac \$	93,931	89,136	85,983	129,986	173,988	217,991	261,994	305,997	350,000

Assumption: Expenditures per faculty rise linearly, from 98-99 figure to \$350,000 in 04-05.