

Strategic Plan

THE COLLEGE OF NEW JERSEY

Department of Electrical and Computer Engineering



“A Premier Educational and
Undergraduate Research
Experience”

Version 2.0

THE COLLEGE OF NEW JERSEY

Strategic Plan of the Department of Electrical and Computer Engineering

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Electrical and Computer
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From the Chair

If engineering is the science and art of solving problems, then these are exciting times! The department provides a personalized and caring learning environment for its students, enhanced by high quality faculty, staff, facilities, and equipment. Highly qualified professors provide individualized attention, there are no teaching assistants, and class sizes are small. The environment includes exceptional instruction, frequent opportunities for relevant laboratory experience, practicing of communication and teamwork skills, research, and challenges to undertake realistic engineering projects.



We believe in preparing our students for the future by providing up-to-date curricula and teaching methods. The senior design projects, the hands-on nature of the laboratories, and practical experience have earned TCNJ graduates the reputation of being work-ready. Senior projects compete at regional or national level. Some of these projects and competitions are the IEEE Micromouse, Intelligent Ground Vehicle, Artificial Intelligence/Mobile Robot, Unmanned Aerial Vehicle, and the IEEE High Efficiency Power Amplifier Design Competition.

The program also provides a base for both graduate study and lifelong learning in support of evolving career objectives. A very large percentage of our graduates attend graduate school. Our students' participation in high quality and challenging undergraduate research projects opens the doors of the most prestigious graduate schools. Our graduates have been accepted into graduate programs at Drexel, Penn State, University of New Mexico, Princeton University, Georgia Tech, and Yale University.

Our vision demonstrates the department's long-standing commitment to providing an exemplary, high quality undergraduate program in a vibrant project and research based environment.

Orlando Hernandez, Ph.D.



Vision

“A Premier Educational and Undergraduate Research Experience”

Through its vision, the Electrical and Computer Engineering (ECE) Department demonstrates its long-standing commitment to providing exemplary, high quality undergraduate programs in a vibrant project-based academic environment, with the best faculty that conducts and provides opportunities for nationally and internationally recognized research, of which undergraduate students form an integral part.



Mission Statement

The Mission of the ECE Department is to teach, prepare, and develop technically skilled graduates, who are creative, articulate, and socially responsible engineers with strong problem solving and leadership abilities.

As a department of highly dedicated and committed faculty and staff, we are well positioned to carry out our mission. Furthermore, the ECE Department seeks to assume strong leadership roles within the School of Engineering, the College, and the community.



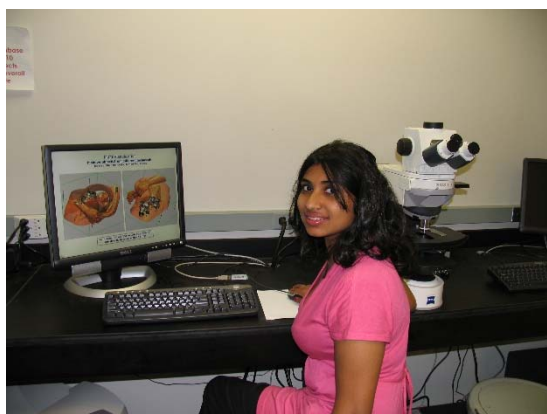


Teaching-Scholarship

The ECE Department embraces the model of a professor as a teacher-scholar. The Department recognizes the need for faculty to actively engage in research projects relevant to their field, and to publish scientific findings in respected refereed journals.

A key facet of the teacher-scholar model is the role of a faculty member as a teacher of scholarship to undergraduate students. Engagement of students in undergraduate scholarly activities not only enhances a research project by allowing more efficient and consistent execution of its tasks, but also affords the students a learning experience that is not attainable in typical classroom settings. Our faculty thus strives to serve as mentors who pass their knowledge and expertise to their student apprentices, who can gain a sense of fulfillment from contributing to new knowledge or pedagogy. Such experiences take place throughout the year, including the summer.

The quality of the research is of more importance than mere quantity; although faculty is expected to consistently engage in new research and to bring new projects to fruition. The quality of the scholarly research is defined by its significance to one's field of study, and requires peer-review to validate the significance of the work; hence, the importance of the publication of research in refereed journals.



The following list is not all-encompassing, but does represent several endeavors in which the faculty engages as paths for the continuous fulfillment of scholarly activities. All Department faculty strive to excel in a combination of the following endeavors.

- Faculty maintains sustainable research programs in fields of study relevant to the Department. Integral to these programs are the involvement of undergraduates as

active participants, who learn new skills and gain insight into current topics of research and development. Adequate infrastructure to support both student and faculty research has been established.

- Faculty publish relevant research in high-impact refereed journals; always trying to target publishing venues with as high a reputation as possible according to the work being presented.
- Faculty publish relevant research in conference proceedings; always trying to present at an as prestigious event as possible for the work being presented.
- The faculty involves students in their research as evidenced by students being co-authors in publications and presenters at conferences.
- The faculty actively seeks external funding for equipment, research, and curriculum enhancement and development. Sources include not-for-profit organizations, government sources, and private companies.
- The faculty is active in the consulting and/or professional arenas.
- The faculty engages in the development of book materials with reputable publishing entities.



Service

The ECE Department is committed to providing quality service to our students and other constituents. We take a holistic approach to service that reaches far and wide beyond the department, and encompasses the School, the College, and the surrounding community in which we live. Our service oriented strategies include:

- Providing students with quality advisement.
- Encouraging opportunities for entrepreneurship to our graduates, thus fostering further economic development in New Jersey.
- Providing resources to our community.
- Promoting activities in professional societies, among faculty and students, at local, regional, national, and international levels.
- Encouraging alumni to provide mentoring to students.
- Identifying key companies to hire our graduates, doing needs assessment with these companies to identify the skills they desire in new graduates.
- Providing mentorship and advise for graduates seeking graduate school enrollment.





Core Values

The ECE Department is proud of its shared departmental values and recognizes that these values are essential to realizing our strategic plan. These values constitute the foundation of our strategic goals and objectives, and provide a compass for the direction we take in all our actions, at all levels, and in all circumstances.

Highest professional standards in teaching, research, and service

We value integrity, fairness, and trust for all individuals.

We value creativity and innovation.

Adherence to the IEEE and ACM Professional Codes of Ethics

We pursue the highest standards of ethical conduct in teaching, research, and service.

Teamwork

We encourage interaction and collaboration among faculty, students, and staff to promote a strong sense of team spirit.

Respect for individuals

We strive to maintain a stimulating academic environment for students, faculty, and staff.

We recognize and value the diversity of our students, faculty, and staff.

Fostering life-long learning

We embrace life-long learning for our students and ourselves.

We provide life-long learning opportunities to the community.



Three to Five Years Goals and Strategies

The ECE Department has identified the following three to five years goals and strategic initiatives to aid in carrying out its mission. These goals span three broad synergistic and symbiotic areas; recruitment, faculty development, and academic excellence. Furthermore, the ECE Department's goals are rooted on its foundational beliefs in personalized instruction, making learning meaningful and rigorous, improving student achievement, and developing positive student-faculty relationships. Furthermore, the ECE Department is committed to a culture of continuous assessment, as it makes progress in the execution of its mission.

Recruitment Action Plan

20/20 Vision: To improve the profile of the entering freshmen cohort by 20% in less than 20 quarters (5 years).

Relationship to School's Strategic Plan (see Appendix II for more information)

1. Academic Excellence
2. Cultivation of Community, Goals #1 and #4

<i>Objective</i>	<i>Action Items</i>
Investigate why high profile students come here.	<ol style="list-style-type: none"> 1. Identify pool of high profile ECE students. 2. Run focus group. 3. Develop action plan based on findings.

<i>Objective</i>	<i>Action Items</i>
Investigate why high profile students do not come here.	<ol style="list-style-type: none"> 1. Identify pool of high profile non ECE students. 2. Run focus group. 3. Develop action plan based on findings.
Geographical targeting of High Schools.	<ol style="list-style-type: none"> 1. Determine High Schools which have historically provided the greatest number of incoming students. 2. Visit these High Schools during early fall to present ECE opportunities at TCNJ and distribute literature. 3. Involve alumni of those High Schools in those visits. 4. Make this activity part of the Community Engaged Learning program and requirements.
Enhance recruitment related public relations, and implement perception management strategies to become the first choice ECE Department for High School graduates.	<ol style="list-style-type: none"> 1. Showcase accomplishment of recent graduates in the Department web site. 2. Revive the HAM Radio Club. 3. Distribute literature and present ECE opportunities at TCNJ at High School related events held at the School of Engineering. 4. Implement ECE Summer Camps for High School students. 5. Make this activity part of the Community Engaged Learning program and requirements.

<i>Objective</i>	<i>Action Items</i>
<p>Implement Faculty/High School personnel relationship building activities.</p>	<ol style="list-style-type: none"> 1. Determine High Schools which have historically provided the greatest number of incoming students. 2. Hold a yearly reception and exhibition for the faculty and staff of those High Schools at TCNJ. 3. Involve alumni of those High Schools in this event. 4. Make this activity part of the Community Engaged Learning program and requirements.

Faculty Development Action Plan

20/20 Vision: To increase intra-department collaboration by 20% in less than 20 quarters (5 years).

Relationship to School’s Strategic Plan (see Appendix II for more information)

1. Academic Excellence, Goals #1 and #2
2. Cultivation of Community, Goals #3 and #4

Action Items

1. Benchmark quantity of intra-department faculty collaboration.
2. Implement discussions of faculty research into Department meeting agenda.
3. Implement faculty research fora.

Academic Excellence Action Plan

20/20 Vision: To implement an MS and a five-year program in a heterogeneous area that capitalizes on the expertise of the faculty (e.g. “Unmanned Autonomous Systems”, “IoT”, etc.), and attain a program enrollment of 20 students in less than 20 quarters (5 years).

Relationship to School’s Strategic Plan (see Appendix II for more information)

1. Academic Excellence, Goals #1 and #2
2. Cultivation of Community, Goals #1, #3 and #4

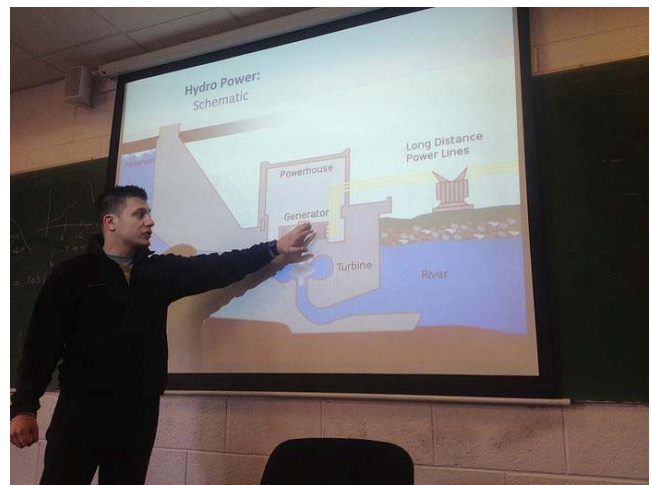
<i>Objective</i>	<i>Action Items</i>
Conduct market analysis.	<ol style="list-style-type: none"> 1. Develop survey to junior and senior students to assess the level of interest in the program. 2. Develop survey to the industry to assess the level of interest in the program. 3. Develop survey to students in other institutions to assess the level of interest in the program.
Develop Business Plan and Program Proposal.	
Forge stronger nexuses with companies in the area.	<ol style="list-style-type: none"> 1. Increase the number and diversity of the companies with whom the ECE Departments collaborates. 2. Increase the number of collaborative research projects with companies or agencies. 3. Increase the number of collaborative outreach projects with companies or agencies.



Implementation

The ECE Department is committed to following a rigorous, assessment based, and results oriented path in the implementation of our action plans. To this end, we will take the following yearly actions:

- Assess achievements and shortcomings during the preceding twelve months.
- Evaluate overall plan and make revisions if necessary.
- Assign financial resources to specific objectives.
- Identify individuals to lead current and new actions.
- Establish committees to monitor progress and review outcomes.





Appendix I: History

Version	Year
1.0	2007
2.0	2015



Appendix II: Mapping of School Goals

Mapping of School of Engineering Strategic Goals to College’s Strategic Priorities

School of Engineering Strategic Theme	School of Engineering Strategic Goal	College Strategic Initiatives/ CPP Areas of Focus
Academic Excellence	ABET Systems Enhancement	CPP – Plan and Assess for Continuous Improvement
	Goal #1: Enhance curricular experiences and flexibility for students	SI/ CPP – Diversify and Enhance Revenue Streams CPP - Improve Learning Environment CPP - Impart Institutional Identity
	Goal #2: Enhance support for the teacher-scholar model	SI – Faculty and Staff Development CPP - Improve Learning Environment CPP - Impart Institutional Identity
	Goal #3: Establish the Biomedical Engineering Department	SI – Faculty and Staff Development CPP - Improve Learning Environment

School of Engineering Strategic Theme	School of Engineering Strategic Goal	College Strategic Initiatives/ CPP Areas of Focus
		CPP – Plan and Assess for Continuous Improvement (ABET Systems)
	Goal #4: Integrate international issues into the curriculum, recognizing the global nature of the engineering field	SI/ CPP – Diversify and Enhance Revenue Streams CPP - Improve Learning Environment
Premier Facilities		
	Goal #1: Enhance and expand research space to support the teacher-scholar model	SI – Facilities Support for Transformation CPP - Improve Learning Environment CPP - Impart Institutional Identity
	Goal #2: Create additional facilities to support students	SI – Facilities Support for Transformation CPP - Improve Learning Environment
	Goal #3: Develop and update laboratory facilities to enhance the curricula	CPP - Improve Learning Environment
	Goal #4: Develop equipment and instrumentation centers, emphasizing integration of facilities	SI – Facilities Support for Transformation SI/ CPP – Diversify and Enhance Revenue Streams CPP - Improve Learning Environment
Cultivation of Community		

School of Engineering Strategic Theme	School of Engineering Strategic Goal	College Strategic Initiatives/ CPP Areas of Focus
	Goal #1: Enhance the community experience for students and faculty	CPP - Improve Learning Environment
	Goal #2: Increase interaction with alumni	CPP - Impart Institutional Identity CPP - Improve Learning Environment SI/ CPP – Diversify and Enhance Revenue Streams
	Goal #3: Increase traditions	CPP - Impart Institutional Identity
	Goal #4: Enhance engineering education outreach	SI – Leadership Throughout the P-20+ Continuum CPP - Impart Institutional Identity

