Undergraduate Program

Mel Gomez
Associate Chair for Undergraduate Education

Spring 2014 Graduation

179* students received

Bachelor of Science in Electrical Engineering

Bachelor of Science in Computer Engineering

*pending university verification

Clark School Confirmed Incoming Freshmen Students (Fall 14)

- Academic Credentials:
- · Average GPA: 4.33
- · Math/Critical Reading SAT Scores: Ave: 1407 25th %: 1348 75th %: 1470
- · SAT Math Scores: Ave: 730; 25th %: 700 75th %: 770
- · 109 Underrepresented Minorities-15% 191 Women-26%
- (51%) have been selected for the Honors College.

Confirmed students by major:

Aerospace Engineering:	68	Bioengineering:	91
Chem & Bio-mol Engineering:	62	Civil Engineering:	31
Computer Engineering:	**88**	**Electrical Engineering:**	**59**
Fire Protection Engineering:	10	Matls Sci & Engineering:	20
Mechanical Engineering:	114	Undecided Engineering:	190

Historical Freshman and External Admits

Freshmen Fall Admitted

- Fall 2009 - 103 students
- Fall 2010 - 125 students
- Fall 2011 - 126 students
- Fall 2012 - 137 students
- Fall 2013 - 138 students
- **Fall 2014 - 147 students**

- External Transfer Fall Admits
- Fall 2009 - 28 students
- Fall 2010 - 31 students
- Fall 2011 - 41 students
- Fall 2012 - 37 students
- **Fall 2013 - 61 students**

New Courses Offered

Spring 2014

- **ENEE 148A - Programming Elements for Electrical Engineers**
- **ENEE 459E - Introduction to Cryptology**
- **ENEE 489A - Lab for Antennas for Wireless Personal Communication**

Fall 2014

- **ENEE459C - Computer Security**
- **ENEE459P – Parallel Algorithms**

SMD-EE

- Starting Fall 2015, the ECE department will offer an EE program for students from Southern Maryland.
- It will be in partnership with the NAWCAD* center.
- Basic Structure:
- 1st and 2nd year taken at CSM or ASE degree from Community Colleges
- 300-level courses will be taught primarily by UMD ECE faculty
- 400-level courses will be ‘navalized’ and jointly taught by NAVCAD staff scientists, with syllabus developed by ECE faculty and NAVCAD scientists.
- USM Funded for 2 Years, Additional Funding Pending

***Naval Air Warfare Center Aircraft Division, PAX River**

Faculty Teaching Retreat

- Held on April 25, 2014 – Marriot Inn and Conference Center
- 47 faculty and 2 staff members in attendance
- Core focus topics:
  - Best Teaching Practices
  - Modernizing ECE Education
  - Increasing Graduation Rates

- Steering Committee: Abshire, Goldhar, Marcus, Yeung, Ramirez, Papamarcou and Gomez, Chair

Agenda

8:30 a.m.	Breakfast	
9: 00-9:15	2020 Vision and Challenges	Chellappa
9:15-9:45	Summary of EE and CpE curriculum	Gomez/Yeung
9:45-10:00	Curriculum from Peer/Aspirational Institutions	Ramirez
10:00-10:15	Ideas on Best Teaching Practices	Marcus
10:30-10:45	Data on Retention and Graduation Rates	Fourney
11:00-12:30	Breakout sessions I*	
	- Best Teaching Practices	
	- Modernizing UG education and Delivery	
	- Increasing Retention and Graduation Rates	
12:30 Lunch speaker	"Teaching as a Performance"	
	Leslie Felbain, Asso. Prof. of Theater, Dance and Performance Studies	
1:30-2:30	Presentation of Breakout Sessions II	
2:30-2:45	Campus Facilities for Offering MOOCs and FLIPs	Zahniser
2:45-3:00	Operation of ECE UG labs	Quinn
3:00	Break	
3:15	Open Discussions and Action items	Chellappa
4:00	Wine and Cheese Reception	

Retreat Outcome: Faculty voted to replace ENEE 200 with ENEE 100

- Starting Fall 2015, the ECE curriculum include ENEE100 – Introduction to Electrical and Computer Engineering (foundational engineering distribution).
- will replace the requirement for ENEE 200 – Ethics and Society Course (humanities and social sciences distribution), with

ABET Ethics Requirements

To be satisfied in ENES 100, ENEE 100, ENEE 408-capstone courses

ENEE 100

- Class meets (2) 50 minute lectures and (1) 2h 50 minute laboratory per week.
- Focus on discovery by hands-on and experimentation, reinforced by basic theory concepts
- A set of 7 modules illustrating ECE will be offered in the semester
- Will be team taught

Sample Modules

1. **Audio transmission using light**

Students will build transmitter and receiver to transmit audio information over 10 meters. (basic electronics, photonics, communication system, filter, signal modulation, amplification and conditioning)

2. **Hidden Message Encoding in PDF**

Students will develop algorithms on how to embed and reconstruct messages in images (digital image processing, coding, Matlab)

3. **Inverted Pendulum System or Magnetic Levitation**

Students will build a computer controlled car that can balance a pole, or a electromagnetic system to suspend a magnetic ball in the air (feedback control system, PID, microprocessor programming, magnetostatic theory)

Sample Modules

- **4. Web-enabled remote monitoring and actuation** Students will integrate a remote camera system on a gimbal actuator, accessible on the web. (IP protocols, electronics, actuation and image processing)
- **5. Nano-actuation.** Students will build linear motors using piezo actuation, with submicron/nanometer accuracy. (electrostatics, nanopositioning, control systems)
- **6. Digital lock using FPGA** (digital circuits, FPGA's, programming)
- **7. Energy Harvesting from Motion** (energy storage, conversion, electronics, electromechanical systems)
- **8. Ethics**, case studies of ethics issues on academic honesty, copyright, IP issues, engineering design failures