

# 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 25<sup>th</sup> %: 1348 75<sup>th</sup> %: 1470
  - SAT Math Scores: Ave: 730; 25<sup>th</sup> %: 700 75<sup>th</sup> %: 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
<b>Computer Engineering:</b>	<b>88</b>	<b>Electrical Engineering:</b>	<b>59</b>
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:
- 1<sup>st</sup> and 2<sup>nd</sup> 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 <u>CpE</u> curriculum	<u>Gomez/Yeung</u>
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	<u>Fourney</u>
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 <u>Felbain</u> , <u>Asso.</u> 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	<u>Zahniser</u>
2:45-3:00	Operation of ECE UG labs	Quinn
3:00	Break	
3:15	Open Discussions and Action items	<u>Chellappa</u>
4:00	Wine and Cheese Reception	





# Retreat Outcome:

## Faculty voted to replace ENEE 200 with ENEE 100

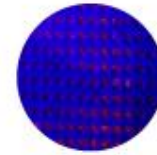
- Starting Fall 2015, the ECE curriculum include ENEE100 – Introduction to Electrical and Computer Engineering (foundational engineering distribution).
- will replace the requirement for ENEE 200 – Ethics and Society Course (humanities and social sciences distribution), with



# 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