“An Academic Perspective”

David McLaughlin
Professor, Elec. & Computer Engineering
Engineering Associate Dean
NSO Parents & Family Orientation
A proud UMass Amherst alumnus ...

- Born in Haverhill, MA 1962
- UMass ECE Undergraduate (1980-84)
- UMass ECE Grad Student (1984-89)
- Northeastern Univ Faculty (1989 – 2000)
- UMass ECE Faculty (2000 - present)
  Research Area: Phased Array Weather Radar
- Director, CASA ERC (2003 - present)
- Professor of Elec & Comp Eng (2006 – present)
- Associate Dean, College of Eng (2015 – 2018)

Back to full-time faculty August 2018
Something to think about

"Faculty members agree almost unanimously that teaching students to think critically is the principal aim of undergraduate education" – Derek Bok

VS.

"Many students … embraced a collegiate culture … little to do with academic learning…sharply at odds with that of the faculty…embraced a college life…defined by a peer culture oriented to nonacademic endeavors.”

Quoted from Academically Adrift, Arum & Roksa, 2011
110 majors in 60 departments

College
- Accounting; Architecture; Astronomy (BS & BA); Biochemistry & Molecular Biology (BS & BA); Biology (BS & BA); Chinese; Early Childhood Education; Elec. Engineering; Linguistics; Women, Gender, Sexuality Studies; Theater Anthropology; Classics; Economics; Dance; Bachelor's Degree with Individual Concentration
- Education, Engineering, Humanities & Fine Arts, Info & Computer Sciences; Natural Sciences; Nursing, Social & Behavioral Sciences; Isenberg School of Management, Public Health & Health Sciences; Agriculture; Com Honors

University
- 22,748 UGrad students
- 6,521 Grad students
- 1,321 Full Time Faculty
- 314 Part Time Faculty
- 120 credits, 10 semesters, max 2.0 min GPA, Gen. Ed requirements

<table>
<thead>
<tr>
<th></th>
<th>FIRST YEAR</th>
<th>SECOND YEAR</th>
<th>THIRD YEAR</th>
<th>FOURTH YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGIN 112 Intro. to ECE</td>
<td>CMPSCI 121 Intro. Problem Solving w/Comp (Java) [4cr] [Note 1]</td>
<td>ECE 211 Circuit Analysis I [4 cr]</td>
<td>ECE 212 Circuit Analysis II [4 cr]</td>
<td>ECE 313 Signals &amp; Systems [4 cr]</td>
</tr>
<tr>
<td>Social World Elective [4cr] [Note 2]</td>
<td>ECE 197SA ECE Systems Appreciation [1cr] [Note 2] [Highly recommended, see Note 3]</td>
<td>Social World Elective [4cr] [Note 2]</td>
<td>ECE 344 Semiconductor Devices and Materials [3 cr]</td>
<td>ECE 303 Junior Seminar [1cr]</td>
</tr>
<tr>
<td>ENGLWRIT 112 College Writing [3cr] [Note 2]</td>
<td>Thematic Elective</td>
<td>BIOLOGY 110 [4 cr]</td>
<td>ECE 351 Writing in Engineering [3 cr]</td>
<td>Social World Elective [4 cr] [Note 2]</td>
</tr>
<tr>
<td></td>
<td>(Take ENGIN 112, Intro. to ECE, unless it was taken previously. See advisor to adjust schedule [3 cr] [Note 1])</td>
<td>See Notes 4 &amp; 5 for details</td>
<td>ENGIN 351 Writing in Engineering [3 cr]</td>
<td>Social World Elective [4 cr] [Note 2]</td>
</tr>
</tbody>
</table>

**Notes:**
1. [Note 1]
2. [Note 2]
3. [Note 3]
4. [Note 4]
5. [Note 5]
6. [Note 6]
7. [Note 7]

The curriculum notes can be found on the reverse side of this worksheet.

UNIVERSITY OF MASSACHUSETTS AMHERST • DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

/ece.umass.edu/ Updated March 2013
EE 14-16

The abbreviations "ECE" and "E&CE-ENG" are equivalent. They are both abbreviations of "Electrical and Computer Engineering." "ECE" tends to be used in departmental publications and "E&CE-ENG" is used on SPIRE and on official schedules and transcripts.

It is important that the Undergraduate Catalog posted on SPIRE (http://spire.umass.edu) be consulted for course descriptions and course requisites. It is the student's responsibility to retum from enrolling in any course for which she or he does not have all of the published requisites.

Note 1

In the Fall semester, choose one of the following:
- ENG 110: Intro. to Chemical Engineering
- ENG 111: Intro. to Civil & Environmental Engineering
- ENG 112: Intro. to Electrical & Computer Engineering
- ENG 113: Intro. to Mechanical & Industrial Engineering

ENG 112 is a required course for all CSE and EE majors.*

In the Spring semester, choose one of the following:
- CHE 120: Fundamentals of Chemical Engineering
- CSE 121: Intro to Civil & Environmental Engineering
- CSE 122: Intro to Mechanical & Industrial Engineering

Note that CMPSCI 121 is required for CSE and EE majors. It is a prerequisite for ECE 242.

* A student who is admitted to CSE or EE after meeting the first year admission requirements but that has taken ENG 110, 111, or 113 instead of ENG 112 in the first year must take ENG 112 in the full semester of the second year. (This will require either the Thematic Elective or the Social World Elective to be postponed.) A student who earns a C or better in ENG 112 and taking ENG 111, 110, or 113 will be allowed to count ENG 110, 111, or 113 as a Thematic Elective.

Note 2 • Social World Electives

Choose four Social World electives (four credits each) consisting of:
1. One Literature or Art elective: AL or AT
2. One Historical Studies elective: HS
3. One Social and Behavioral elective: SB
4. One Science elective: AL, AT, AB, or SI

One of the four Social World electives must carry the G designation and another must carry the U designation.

Note 3 • ECE 197SA • ECE Systems Appreciation

It is highly recommended and expected that all ECE first year students enroll in ECE 197SA • ECE Systems Appreciation. Spring Semester, 1 cr. This optional course focuses on the basic functionality of example ECE systems and explores the technological and scientific principles on which they are based. The goal is to provide a deeper understanding of the operation of these systems and to spark interest in some of the more advanced topics in ECE.

Note 4 • Biology

CSE and EE students must take either BIOLOGY 110 or BIOLOGY 115. BIOLOGY 151 is the appropriate choice for students who plan to pursue further studies in Biology, Biochemistry or Bioengineering.

Note 5 • Thematic Elective

Thematic Elective is required. There are five approved Thematic Elective subject areas: (1) Biology; (2) Chemistry; (3) Physics and Astronomy; (4) Mathematics; and (5) Engineering Management.

(Note: This track is only for students who intend to complete the Engineering Management minor.) The official Thematic Electives document is posted on the department website http://ece.umass.edu, under "Undergraduate Students" >> "Thematic Electives".

Note 6 • EE Electives

Choose five EE electives. The electives must include at least two 500-level courses that may be used to fill the requirements for any other major.

EE electives
- ECE 354: Computer Systems Lab II (2nd sem) 4 cr
- ECE 373: Software Engineering (1st sem) 4 cr
- ECE 374: Computer Networks & the Internet (3rd sem) 4 cr
- ECE 544: Trustworthy Computing (1st sem) 4 cr
- ECE 558: Intro to VLSI Design (1st sem) 4 cr
- ECE 559: VLSI Design Project (2nd sem)
- ECE 563: Intro. to Comm. & Signal Processing (1st sem) 4 cr
- ECE 564: Communication Systems (2nd sem) 4 cr
- ECE 575: Digital Signal Processing (2nd sem) 4 cr
- ECE 578: Introduction to Computer Architecture (1st sem) 4 cr
- ECE 579: System Software Design (1st sem) 4 cr
- ECE 571: Microelectronic Fabrication (2nd sem) 4 cr
- ECE 572: Optoelectronics (1st sem) 4 cr
- ECE 575: Intro. to Analog IC Design (1st sem) 4 cr
- ECE 580: Feedback Control Systems (1st sem) 4 cr
- ECE 581: Digital Control of Feedback Systems (2nd sem)
- ECE 584: Microwave Engineering I (1st sem) 4 cr
- ECE 585: Microwave Engineering II (1st sem) 4 cr

All ECE 597 Special Topics courses and all 600-level ECE courses are allowed as well. Consult SPIRE for more information.

Note 7 • Five-Year B.S./M.S. in Electrical & Computer Engineering

The Department of Electrical and Computer Engineering offers a five-year program through which students can obtain a Bachelor of Science degree in Electrical Engineering or Computer Systems Engineering as well as a Master of Science degree in Electrical and Computer Engineering within a five-year time frame. During the senior year, two graduate-level courses are taken that are later transferred into the M.S. program. More information is posted at http://ece.umass.edu/ece/five-year-program.
## Mechanical Engineering Curriculum

<table>
<thead>
<tr>
<th>1st Sem</th>
<th>2nd Sem</th>
<th>3rd Sem</th>
<th>4th Sem</th>
<th>5th Sem</th>
<th>6th Sem</th>
<th>7th Sem</th>
<th>8th Sem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phys 151 (4)</td>
<td>Phys 152 (4)</td>
<td>MIE 230</td>
<td>MIE 310</td>
<td>MIE 340</td>
<td>MIE 354</td>
<td>ME TechE (4)</td>
<td>ME TechE (4)</td>
</tr>
<tr>
<td>Engin 113</td>
<td>MIE 124</td>
<td>Math 233</td>
<td>Math 331</td>
<td>ECE 361</td>
<td>ME TechE (4)</td>
<td>ME TechE (4)</td>
<td>MIE Elec (4)</td>
</tr>
<tr>
<td>Math 131 (4)</td>
<td>Math 132 (4)</td>
<td>MIE 210</td>
<td>MIE 211</td>
<td>MIE 375</td>
<td>MIE 397B</td>
<td>MIE 402 (4)</td>
<td>MIE 415</td>
</tr>
<tr>
<td>Englwp 112</td>
<td>Chem 111 (4)</td>
<td>MIE 201</td>
<td>MIE 273</td>
<td>MIE 302</td>
<td>MIE 313</td>
<td>MIE 413</td>
<td></td>
</tr>
<tr>
<td>AL/AT G/U (4)</td>
<td>HS G/U (4)</td>
<td>SB G/U (4)</td>
<td>Engin 351</td>
<td>SW G/U (not HS) (4)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes:
- **Note on reverse**: Courses offered vary from year to year and from semester to semester. The sequence of courses shown is only a sample. Students will plan their individual programs after consulting the University Registration Materials and the MIE Department Registration Notes.
- **Scheduling Note**: Students who do not enroll in MIE 302 in their 5th semester may choose to take MIE 313 instead. In subsequent semesters, those students can take MIE 302 in place of an ME Tech Elective; MIE 413 in place of MIE 313; MIE 415 in place of MIE 413 and an ME Tech Elective in place of MIE 415.
- **Graduation Clearance**: Both University and Department Cumulative GPAs of 2.0 are required for graduation.
- **Prerequisites**: Not all prerequisites are shown. Consult SPIRE Course Descriptions for complete listings. Students must satisfy prerequisites or obtain instructor permission, irrespective of SPIRE enrollment.

### Total Credits: 126

Revised 7/6/2010
Catalog 2010-11
“Google: UMass Amherst Guide to Undergraduate Programs”

Official Description of all majors, departments, and colleges.

All requirements listed herein.
Useful Numbers

- Credits to graduate: 120
- 30 courses @ 4 credit/course
- 30 courses/8 semesters ~ 4 courses/semester
- Freshman to Sophomore retention 91%
- 4 year graduation rate 66%
- 6 year graduation rate 77%
- Then, a 45+ year career
The Faculty Workload Model

**Research: (40%)**
- Weather Radar
- Inclusion in engineering education

**Service: (20%)**
- Committee work

**Teaching: (40%)**
- Fundamentals of Electrical Engineering
  - 300 students
- Queer Lights
  - Intro to Computing & Electronics
- Experience of LGBTQ+ Individuals in STEM
Introducing: Caitlin, Deanna, Aaron, & Max

• **4 students, out of 175, in ECE361**

• Winter 2014 Research Internship: Re-designing the labs for ECE361

• Paper & presentation at ASEE Zone 1 Conference, Bridgeport, CT

“electronic earring night”
And that led to…

• Collaboration with UMass Boston & Glasgow Caledonian
• Caitlin & DeAnna to London & Glasgow
• Student-led Makerspace
• McLaughlin’s Freshman Seminar on “Physical Computing for Everyone”
My freshman year was so confusing!

First off, I was living in Southwest (Pierpont) with a roommate who hit my every nerve (in the worst way).

My biggest struggle was learning and understanding what my professors expected out of me.

Each professor had a way of teaching things, and you were kind of supposed to adapt to that.

I learned the hard way how to study for classes (1st semester I had a 2.1 GPA, yikes!!)
DeAnna: Sophomore Year

I stayed in Southwest – most of my friends and my roommate were there. I lived in Washington tower on the 3rd floor.

I really picked up intramurals (flag football, volleyball, softball)

I was beginning to understand how to handle my course load and how to communicate with professors.

I started sitting in the first couple rows of my classes. I noticed that this not only made me focus more, but I made a of friends with the “smart people” in class.

My GPA increased (2.49) and I was happier.
DeAnna: Junior Year

I decided to live off campus (best thing I ever did!). I moved into Puffton with some friends and my boyfriend. The rent was cheaper and I had more room and freedom to do what I pleased.

My classes were very difficult, definitely the most difficult year I’ve had at UMass. Despite this, I’ve emerged with a 2.7 GPA – a huge improvement from my freshman year.

My junior year I was fortunate to be hired to an REU improving the robot cars in ECE361. This led to a great connection with professors at Umass Boston and Glasgow Caledonian. I was able to travel to London and Scotland. These experiences have helped me get an internship at PTC.
DeAnna: What I wish I knew as a freshman

I wish I knew to talk with my professors, that it wasn’t embarrassing or stupid to get help, and that anything I wanted to do was OK.

Advice:
- If you’re living in dorms, realize you aren’t going to have your own space.
- Talk to your professors! Get their advice! You’ll make good connections that way too.
- Find a hobby or something that makes you happy.
- Join clubs and intramurals and all that cool junk.
- Don’t be afraid to explore anything.
Aaron’s experience: freshman year

• You are affected not only by yourself and actions, but the actions of your roommates, people of your floor, and cumulative residence hall..

Struggles:
• You will feel alone, and you might feel like no one cares. Everyone has their own work to do and everyone is in the new environment.
• Your first bad grade it will come and do not feel down.
I wish I knew that sometimes, the class you do the worst in is the class you will learn most from.
Caitlin’s experience: freshman year

What did I do wrong?
• I thought I didn’t need to go to classes (I was wrong!)
• I brought WAY too much stuff!!! The clutter hampered my ability to be organized.

What did I do right?
• I learned to say YES! I opened my mind to trying new experiences.
My parents checked in on me, but didn’t really ask about grades....

I knew grades mattered, and they praised good grades, but they seemed more interested in my life-style and well-being.
Advice to parents:
• Don’t try to revert back to normal parent mode when your kid comes home from school:
  • They may be in your house again, but they are changed people now!
  • They will not so easily succumb to parental authority after living independently.
  • They should be respectful to you and help you out, but they also need to rest and get taken care of a bit too.
Max

My freshman year was tough. I lived in Van Meter at the top of Orchard Hill. I met friends on my floor and the floor above me, although none of those friends lasted to sophomore year.

I did well in my classes but struggled in physics due to lack of a strong science background.

I started going to the parkour club and met friends that I still have today. Joining an RSO was the best decision I made freshman year.

My sophomore year I enjoyed fully and had a busy and fulfilling schedule. I had a terrible roommate...

My junior year was the worst year of my life..I managed a 3.8 my junior year but I hated it, questioned my choice of major and priorities.
Where are they now?

• *DeAnna*: Accepted full-time position as Product Manager at PTC
• *Aaron*: Accepted full-time position as Systems Engineer at Raytheon. Now, UMass PhD Student
• *Caitlin*: Summer Internship at Apple, Cupertino, CA; was graduation speaker in May, graduated the following Fall, joined Apple full time
• *Max*: entered the PhD program at Stanford in September, Aerospace Engineering
“10 technology leaders under 40 help pave the way for a more connected society.”

DeAnna Robear
Partner Enablement Engineer
PTC
www.ptc.com
Dorms & room-mates
Making friends
Classwork & grades
Choice of major
Talking to professors
Dining commons
Parents
Joining an RSO or intramurals
Changing Gears ....

Top 5 pieces of advice from the academic perspective.
Top 5 Tips for a Successful UMass Student Experience

# 5. Grades Matter

(They’re important. But they’re not the only thing.)

Engineering students:

- 5% > 3.9
- 5% 3.8 – 3.9
- 15% 3.6 – 3.8
- 75% < 3.6
“Your grades, whatever is your GPA, rapidly becomes irrelevant in your life.”
Top 5 Tips for a Successful UMass Student Experience

#4. **Discipline yourself to do your homework and your required reading and writing from day one.**

(Don’t expect someone to keep after you to do it.)

---

Vanity Fair Magazine
July 2010

“If you could go back in time and give your younger self one piece of advice, what would it be?”

- Take school seriously: 45%
- Eat better: 15%
- Have more fun: 12%
- Marry differently: 9%
- Learn about ancestry: 7%
- Be nicer: 7%
Top 5 Tips for a Successful UMass Student Experience

#3. Get to know your professors.

(Go to office hours, sit up front in class, and ask questions. Form a discussion group and invite the professor. Get involved in a research project & experience both the research and academic sides of this place.)
Top 5 Tips for a Successful UMass Student Experience

#2. pursue experiential education

- Context
- Confidence
- Narrative

Internships (paid or unpaid)
Entrepreneurship/Startups
Leadership in organizations
Research assistantships
Conference publications
Study abroad
Service learning
Teaching assistantships
#1. Remember why you're here.

(Take advantage of all that UMASS Amherst has to offer, but get your academic situation solid. Then enjoy the rest of the place from a position of academic strength.)
#5. Remember that your student can be very successful here.

(They’ve got the academic stuff, otherwise we wouldn’t have let them in. Remind them of this whenever they need to hear it.)
#4. Discipline yourselves to let them make their own decisions.

(Listen to them when they need to talk, but don’t feel you need to try and fix all of their problems.)
Top 5 Tips for a Successful UMass Student Experience

#3 Problems? Encourage them to see their academic dean.

Office of Student Affairs

NSO Program
“Nearly one in six college students has been diagnosed with or treated for anxiety within the last 12 months, according to the annual national survey by the American College Health Association.”

“Causes? Schoolwork … Money. Relationships… mounting academic pressure at earlier ages to overprotective parents to compulsive engagement with social media.”

“Anxiety is an umbrella term for several disorders, including social anxiety disorder and agoraphobia. It can accompany many other diagnoses, such as depression, and it can be persistent and incapacitating. More often, anxiety is mild, intermittent or temporary, the manifestation of a student in the grip of a normal developmental issue — learning time management, for example, or how to handle rejection from a sorority.”
Top 5 Tips for a Successful UMass Student Experience

#2 Call them, and encourage them to call you.

(Or write, or use email or text messages or twitter or whatever, but however you do it, be sure to open and maintain lines of communication with your students. By the way: you may be paying all or most of the bill, but the law and the policy is that grades and all other information are sent to the students, not the parents.)
#1. **Trust Them** -- Realize that this is a time of great social and intellectual growth for your students.

- Their opinions, viewpoints, and attitudes may change.
- They may come home at thanksgiving wearing weird clothes or they may be tattooed or have a pierced body part.
- *Have the courage to trust your student and give him or her the autonomy she needs to develop.*
#0. Don’t worry so much.
Welcome to UMass Amherst!

David J. McLaughlin
413-896-8618 (mobile)

dmclaugh@umass.edu

Feel free to call, email, or text me any time!
Aaron’s experience: freshman year

What did I do wrong?
• Did not get enough sleep
• Felt pressured to fool around with roommates/friends; adhere to other’s schedules
• Did not get to know professors and their areas of expertise
• Did not get involved with an extra-curricular
• Did not give myself enough relaxing time

What did I do right?
• Focused on school work as a priority
• Experienced the rowdy side of campus
• Got decent grades
• Developed & learned from mistakes as the year progressed
• Did not feel pressured to go out and get stupid-drunk to fit in
• Kept high school friends close.