



WPI

Academic Advising Day:

Advice for ECE Freshmen Students

Ted Clancy, ECE Faculty

February 2016

What is Academic Advising at WPI?

- Advice about majors, courses, project selection
- Broader educational mentoring, career counseling
- An advocate to help you succeed, learn about opportunities
- A designated contact—***paid by your tuition***—to help you ...
 - ... find educational, social services on campus
 - ... learn good study habits, form study groups
 - ... deal with problem students, student teams, faculty!
 - ... find resources for personal problems (roommates, partners, mental/emotional health)
- Someone who might write recommendation letter

High School vs. University Advising

- High School advisors/counselors
 - Tend to seek out students in need
 - Often dedicated to the task of advising/counseling
- “Academic” Advisors at WPI
 - Primarily classroom teachers and researchers—in ECE
 - Usually do **NOT** seek out students in need
 - Trained to **RESPOND** to student needs (but not find the students in the first place!)
 - Non-academic issues: **Refer** students to campus expert staff
 - Student Development & Counseling Center, Office of Disability Services, MASH, etc.

– **YOU MUST ADVOCATE FOR YOURSELF!!!!**



Worcester Polytechnic Institute

Mental/Emotional Health Awareness

- Mental/emotional health disorders increasingly common in college students
 - Better child, high school supports allow more diverse students to succeed into college
- College students at common age for initial/ongoing mental health needs
 - Depression, anxiety, etc.
- Mental health counseling & consultation can be integral to many student's education
 - **Paid by your tuition!!!! Use it !!!!**



Academic Advising is **MORE IMPORTANT** at WPI !!!

- WPI: More course flexibility than most schools
 - Less prescribed curriculum
 - More opportunity to tailor your own curriculum, and
 - More opportunity to make *really bad course selections!!*
- Freshman Academic Advice #1
 - Understand the meaning of: “WPI courses have no prerequisites” (Hint: It’s a myth)
- Freshman Academic Advice #2
 - Most should follow our general ECE “Entry Sequence”

WPI Course Prerequisites

- Prerequisite definition:
 - “**required**” as a prior condition”
- Most colleges: Computer registration system prevents registration if prerequisites not satisfied
 - Can be over-ridden manually by administration
- WPI: Computer registration not restricted
 - In WPI catalog must learn WPI-speak:
 - “**Recommended background**” translates to “**REQUIRED**”
 - “Suggested background” translates to “HELPFUL” (not required)

WPI Course Background Philosophy

- WPI “Recommended” translates to **REQUIRED**
- Faculty will teach course as if you understand the “recommended” background
 - In the same way other colleges do so for “prerequisite” courses
- WPI permits exceptions without administrative approval
 - For students who attained background from other means
 - Course in another department, work experience, project experience, life experience, previous NR (occasionally !), etc.
 - **Wield this power wisely !!!**
 - Consult with course instructor

ECE Course Selection—Tracking

- Start with the **ECE Tracking Sheet**, from:
 - Academic Advising web
 - <http://www.wpi.edu/offices/advising/student-resources.html>
 - ECE Web (fillable ?)
 - <http://www.wpi.edu/academics/ece/resources.html>
- Major Areas:
 - Humanities/Arts
 - Phys. ed., Social science
 - Save one SS for IQP!
 - Math/Science
 - IQP
 - ECE & MQP
 - Electives

ELECTRICAL AND COMPUTER ENGINEERING MAJOR
Program Tracking Sheet Based on AY 2013–2014 Degree Requirements and Course Offerings

Name: Last, First (Middle)		Class Year: 20??	Expected Graduation Date: Month 20??
Student ID # ?	Advisor: ?		2 nd Major: ?

NOTES: Minimum total academic credit = 15 units
Residency Req.: Min. of 8 units must be completed at WPI

HUMANITIES AND ARTS REQUIREMENT (2 units)

—Breadth Component: Students must take at least one course outside the grouping in which they complete their depth component. To identify breadth, courses are grouped in the following manner:
i. art/art history, drama/theatre, and music (AR, EN/TH, MU);
ii. foreign languages (SP, GN, AB, CN);
iii. literature and writing/rhetoric (EN, WR, RH);
iv. history and international studies (HI, HU);
v. philosophy and religion (PY, RE)
Exception: May take all six courses in a foreign language

Course	Year-Term	Grade	Units
1. Course (Brief Name)	Year-?	?	1/3
2. ?	Year-?	?	1/3

—Depth Component: Three thematically-related courses prior to Inquiry Seminar or Practicum in the same thematic area. Must include at least one course at 2000-level or above.

3. ?	Year-?	?	1/3
4. ?	Year-?	?	1/3
5. ?	Year-?	?	1/3
6. HU 3900 / HU 3910	Year-?	?	1/3

PHYSICAL EDUCATION (4 PE classes = 1/3 unit)

7.1 ?	Year-?	?	1/12
7.2 ?	Year-?	?	1/12
7.3 ?	Year-?	?	1/12
7.4 ?	Year-?	?	1/12

SOCIAL SCIENCE (2/3 unit) SS Courses, may include ID2050

8. ?	Year-?	?	1/3
9. ?	Year-?	?	1/3

MATHEMATICS AND BASIC SCIENCE REQUIREMENT (4 units)

MATHEMATICS (7/3 units) Courses with prefix: MA

10. MA 1021 (Differential Calc)	Year-?	?	1/3
11. MA 1022 (Integral Calc)	Year-?	?	1/3
12. MA 2051 (Differential Eqs)	Year-?	?	1/3
13. MA 2621 (Probability)	Year-?	?	1/3
14. ?	Year-?	?	1/3
15. ?	Year-?	?	1/3
16. ?	Year-?	?	1/3

PHYSICS (2/3 unit) Courses with prefix: PH

17. ?	Year-?	?	1/3
18. ?	Year-?	?	1/3

CHEMISTRY or BIOLOGY (1/3 unit) Course with prefix: CH or BB

19. ?	Year-?	?	1/3
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MATH or BASIC SCIENCE (2/3 unit) Prefix: MA, PH, CH, BB, or GE

20. ?	Year-?	?	1/3
21. ?	Year-?	?	1/3

ENGINEERING SCIENCE AND DESIGN REQUIREMENT (6 units)

ELECTRICAL AND COMPUTER ENGINEERING (12/3), Prefix: ECE
—Must include 1 unit Electrical Engineering (‘EE’) from: ECE 2112, 2201, 2305, 2312, 3113, 3204, 3308, 3311, 3501, 3503, 4011, 4023, 4305, 4703, 4902, 4904 and ES 3011.

22. ?	Year-?	?	1/3
23. ?	Year-?	?	1/3
24. ?	Year-?	?	1/3

—Must also include 2/3 unit Computer Engineering (‘CE’) from: ECE 2029, 2049, 3829, 3849 and 4801.

25. ?	Year-?	?	1/3
26. ?	Year-?	?	1/3

—Other 2000-level ECE (Exclude ECE 3601, 1799, Include ES3011)

27. ?	Year-?	?	1/3
28. ?	Year-?	?	1/3
29. ?	Year-?	?	1/3
30. ?	Year-?	?	1/3
31. ?	Year-?	?	1/3
32. ?	Year-?	?	1/3
33. ?	Year-?	?	1/3

MAJOR QUALIFYING PROJECT (3/3 unit) [↓ Usually 3 grades]
34–36. eCDR Completed→ Year-? ? ? ? 3/3

COMPUTER SCIENCE (1/3 unit) Course with prefix: CS

37. ?	Year-?	?	1/3
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Must be 2000 level or above, excluding CS 2011, CS 2022, and CS 3043

ENGINEERING SCIENCE (1/3 unit) Course with prefix: ES

38. ?	Year-?	?	1/3
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Must be at the 2000 level or above, excluding ES 3011

ADDITIONAL ENGINEERING SCIENCE AND DESIGN (1/3 unit)

39. ?	Year-?	?	1/3
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Must be 2000 level or above from: AREN, BME, CE, CHE, CS, ECE, ES, FP, ME or RBE, excluding CS 2011, CS 2022, CS 3043

OTHER REQUIREMENTS (2 units)

INTERACTIVE QUALIFYING PROJECT (3/3 unit) [↓ Usually 3 grades]
40–42. eCDR Completed→ Year-? ? ? ? 3/3

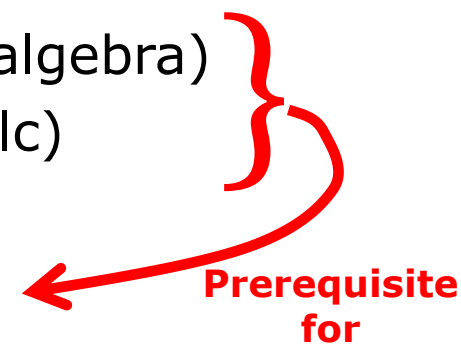
FREE ELECTIVES (3/3 unit) [List all additional credit here.]

43. ?	Year-?	?	1/3
44. ?	Year-?	?	1/3
45. ?	Year-?	?	1/3
Other. ?	Year-?	?	?
Other. ?	Year-?	?	?

Notes:

- Credit above 15 units is not used on the undergrad degree.
- No areas of “concentration” are formally listed on the WPI ECE degree.

ECE Course Selection—Math Core

- Recommend all ECE students sequence directly through:
 - **Differential Calculus*** (e.g., MA 1021)
 - **Integral Calculus*** (e.g., MA 1022)
 - Calculus III (e.g., MA 1023; series, vector algebra)
 - Calculus IV (e.g., MA 1024, Multivariate Calc)
 - **Differential Equations*** (e.g., MA2051) 
- Sequence directly → Take as sequence, starting earliest course first semester at WPI
 - Many students start at 2nd, 3rd, course (AP credit/placement)
- * → Required course (yes, we have a few!!)

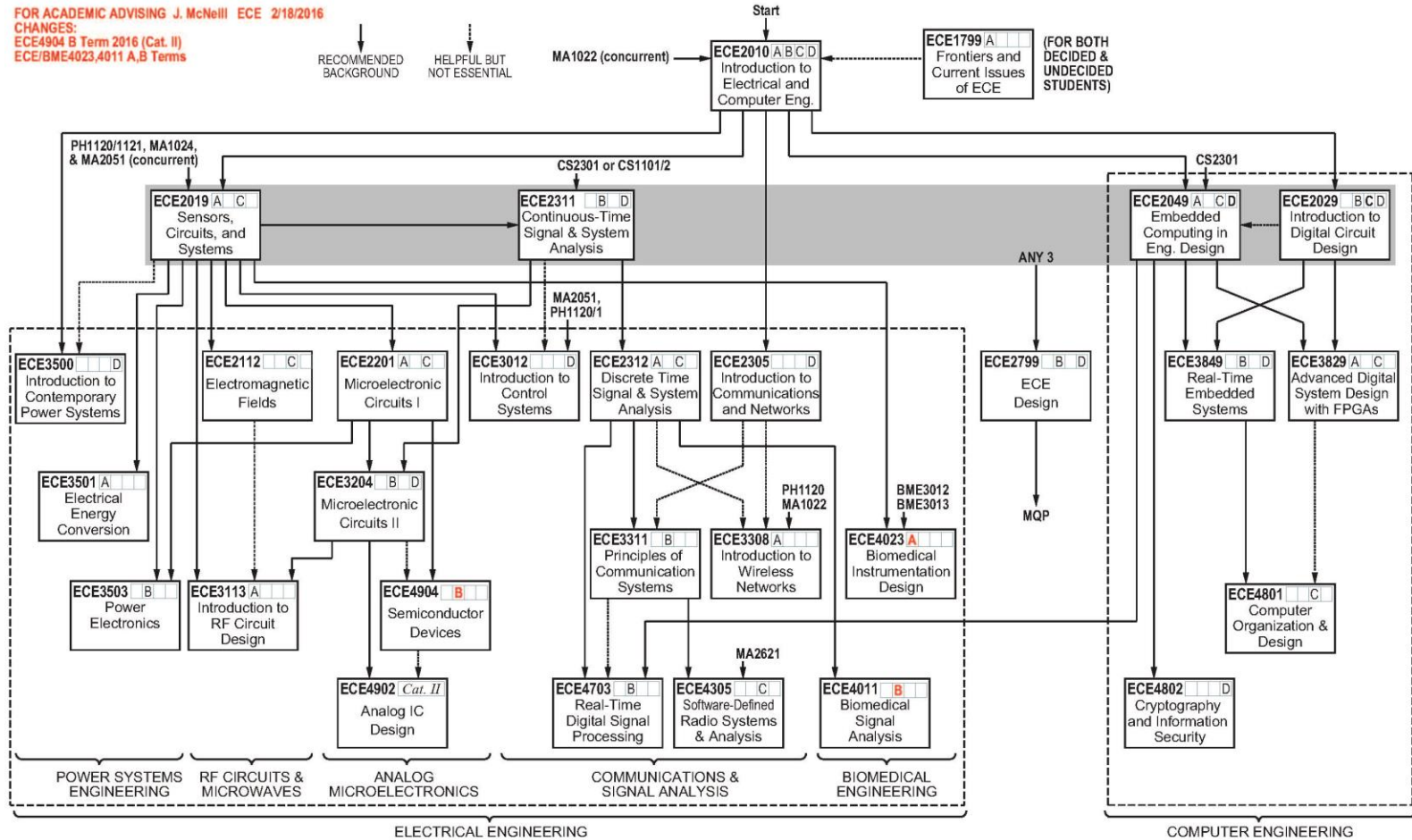
ECE Course Selection—General

- **Physics core:** Again, recommend sequence directly:
 - PH 1110/1111, Mechanics
 - PH 1120/1121, Electricity & Magnetism (E&M)
 - Helps to complete E&M 1st semester, prior to initial ECE courses
- Plan to complete **CS requirement** early
 - Increasing (introductory) software use in early ECE classes
 - One, 2000-level CS course required (usually CS 2301)
 - Note: CS 2301 requires CS 1101/1102/equivalent
- Complete at least one **phys. ed.** per year
- Save (most) electives for future years

ECE Course Chart

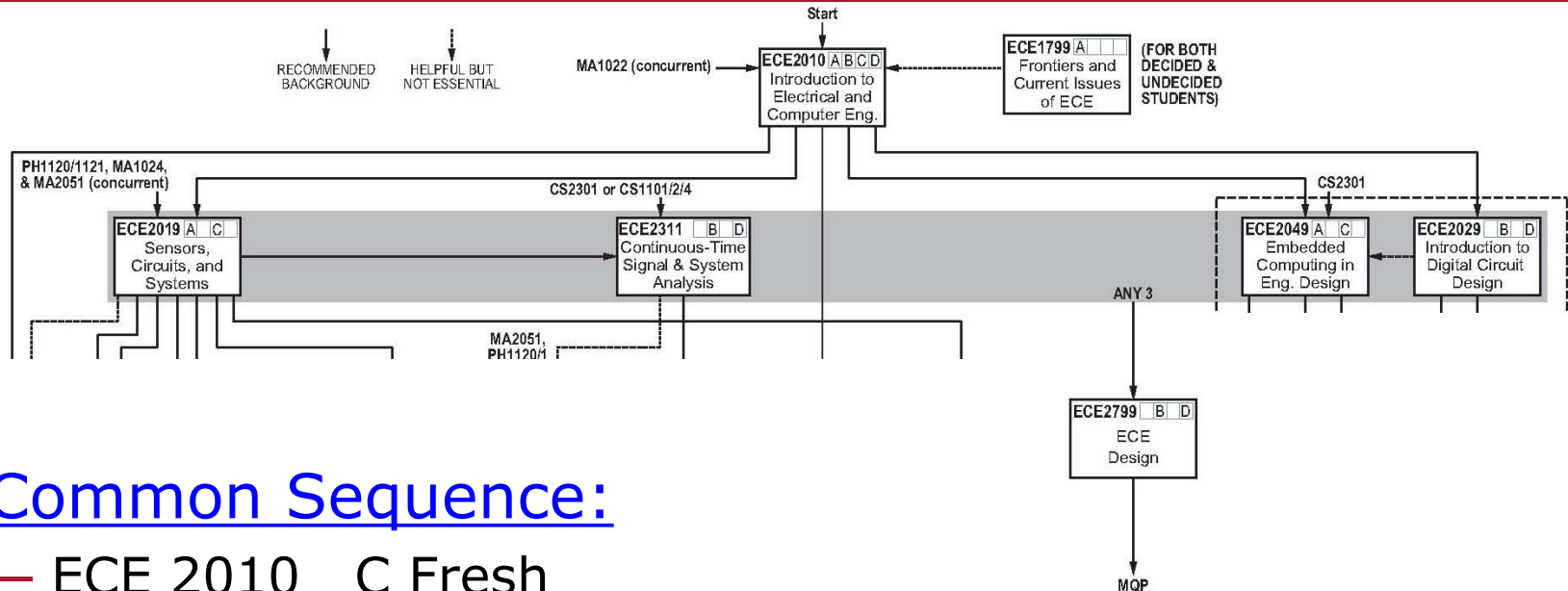
FOR ACADEMIC ADVISING J. McNeill ECE 2/18/2016
 CHANGES:
 ECE4904 B Term 2016 (Cat. II)
 ECE/BME4023,4011 A,B Terms

RECOMMENDED
 BACKGROUND
 HELPFUL BUT
 NOT ESSENTIAL



Solid lines → Required background

ECE Entry Sequence



- Common Sequence:

- ECE 2010 C Fresh
- ECE 2029 D Fresh
- ECE 2019 A Soph
- ECE 2311 B Soph
- ECE 2049 C Soph
- ECE 2799 D Soph

Note the math, physics, CS prerequisites

Other ECE courses branch off of this entry sequence

WPI Project-Based Curriculum

- **Great Projects Seminar**—Usually as Freshman
- **Humanities/Arts**—Six courses (last=practicum)
 - Many complete sophomore year (not required)
 - Plan practicum enrollment (limited terms per topic)
 - Off-campus opportunities possible
- **IQP**—Usually junior year
 - **NOT** related to your major
 - Off-campus:
 - A-term IGSD Project Fair
 - Apply B-term, sophomore year
 - Each site has own character, strengths, culture
 - ~70% of WPI students complete off-campus
 - Also many on-campus opportunities



WPI Projects—ECE MQP

- Recruiting starts fall of junior year
- Off-campus:
 - IGSD-coordinated recruiting (A-term Project Fair)
 - One term (3/3 units)
 - MIT Lincoln Lab (A), MITRE (A), Silicon Valley (C), China (E, B), Wall Street (B)
- On-campus:
 - Faculty- and corporate-sponsored
 - Student initiated
 - Sponsored by other WPI majors

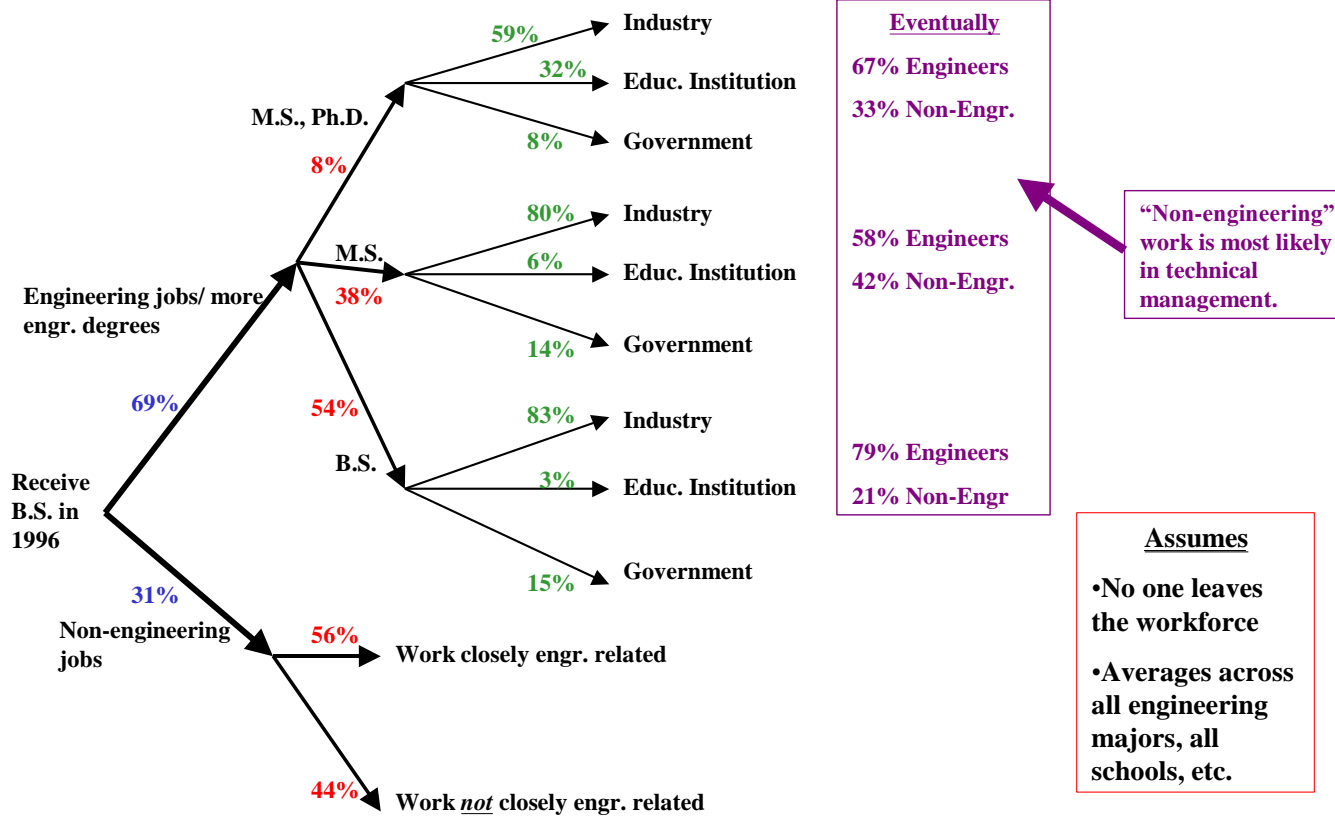


Shahil Kantesaria and Nathan Olivarez
assemble a software-defined radar (2011).

- **ECE MQP REQUIRES AN ECE-APPROVED ADVISOR**

Possible Career Paths

Possible Career Paths of U.S. Citizens and Permanent Residents Receiving a B.S. in Engineering in 1996
 (Adapted from Shepard and Silva, FIE Conference, 2001)



ECE BS/MS and “More in Four”

- **BS/MS:** Complete BS & MS in five years
 - For academically “strong” students
 - Double-count up to 40% of BS towards MS
 - Three 4000-level courses (6 grad credits), two grad courses
 - Or, three grad courses
 - Other unused grad credit from BS is applicable
 - Meet full BS and MS requirements

- **More in Four**
 - Complete BS/MS requirements in four years
 - More common when student enters with AP credit

What to Bring on Advising Day

- Updated ECE Program Tracking Sheet
- Proposed schedule—For at least the next year
- Questions: About ECE major, academic success strategies, career paths, etc.

Other

- Get to know your peers—Can be your best learning resources
- Department IEEE student branch is very active
 - Consider joining
- Many students make use of summer session (E-term)