Welcome to Your ECE Major

Welcome!

Worcester Polytechnic Institute

NAE “Grand Challenges”

Health Care

Sustainability

Safety / Security

What is ECE?

Health Care
Sustainability
Safety / Security

Solving Important Problems
Being Creative
Making a Difference

What is ECE?

Health Care
Sustainability
Safety / Security

ECE: Solving
Important Problems
Being Creative
Making a Difference

Find Your Path!

Finding Your Path

- Strategy for Planning your Courses
  - "I'm not sure what I like best in ECE …"
    - Sample different areas
    - Build breadth to inform decision
    - Eventually go in depth for good MQP background
  - "I know I want to do …"
    - Go in depth as soon as possible!
    - Fill in breadth later for solid ECE-wide background
- Tools
  - Program Flowchart
    - Find courses, paths in areas of interest
  - Program Tracking Sheet
    - Meet all catalog requirements for graduation

ECE Program Tracking Sheet

- Use with advisor to make sure you meet all catalog requirements
- Take advantage of flexibility to tailor program to your interests!

ELECTRICAL AND COMPUTER ENGINEERING MAJOR
Program Tracking Sheet Based on AY 2014-15 Degree Requirements and Course Offerings

Name:	Class Year:	Expected Graduation Date:
Student ID #:	Advisor:	2nd 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	Term	Grade	Units
1.			1/3
2.			1/3

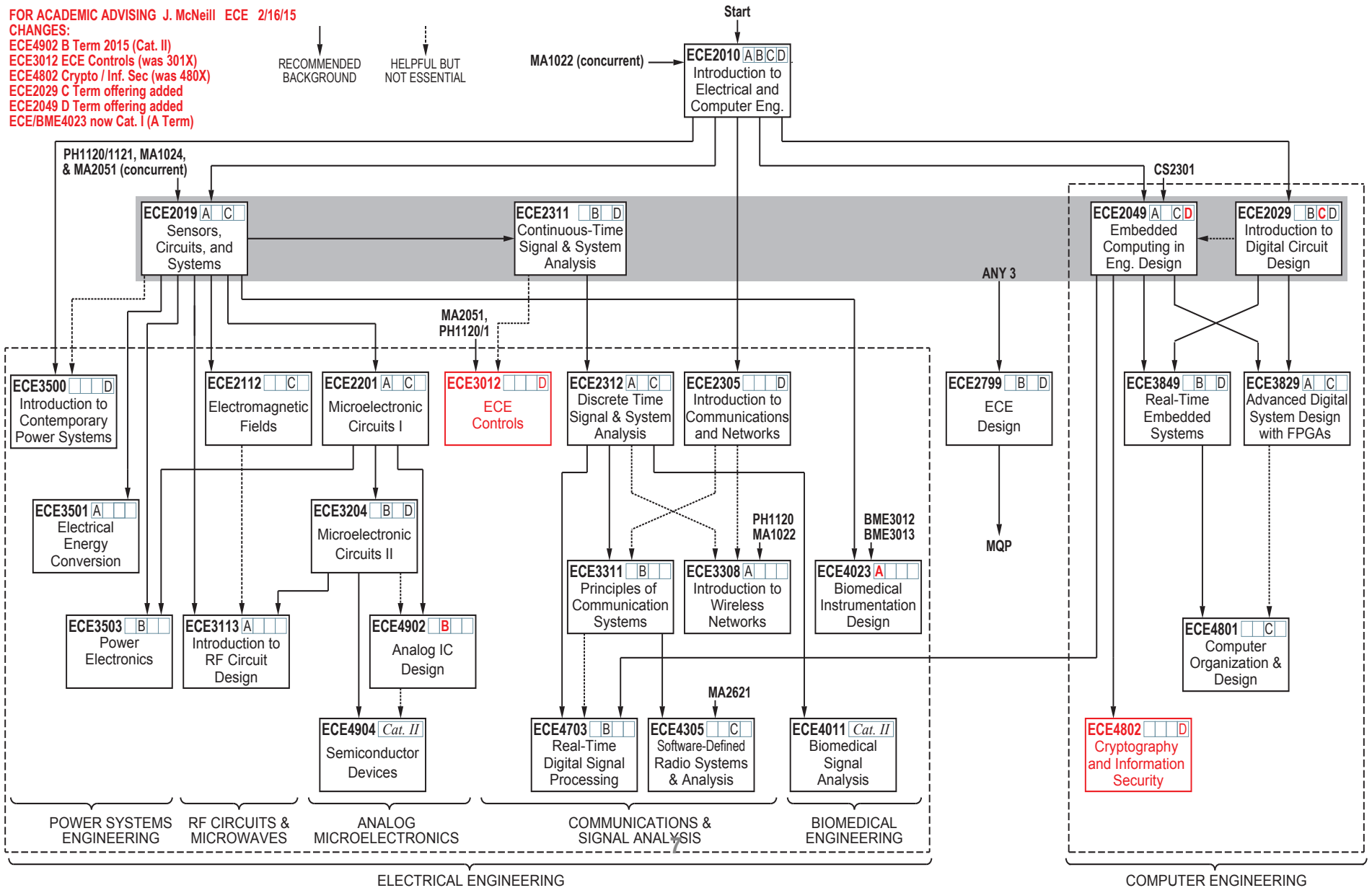
--Depth Component: Students must complete at least three thematically-related courses prior to a culminating Inquiry Seminar or Practicum in the same thematic area. At least one of the three

ENGINEERING SCIENCE AND DESIGN REQUIREMENT (6 units)

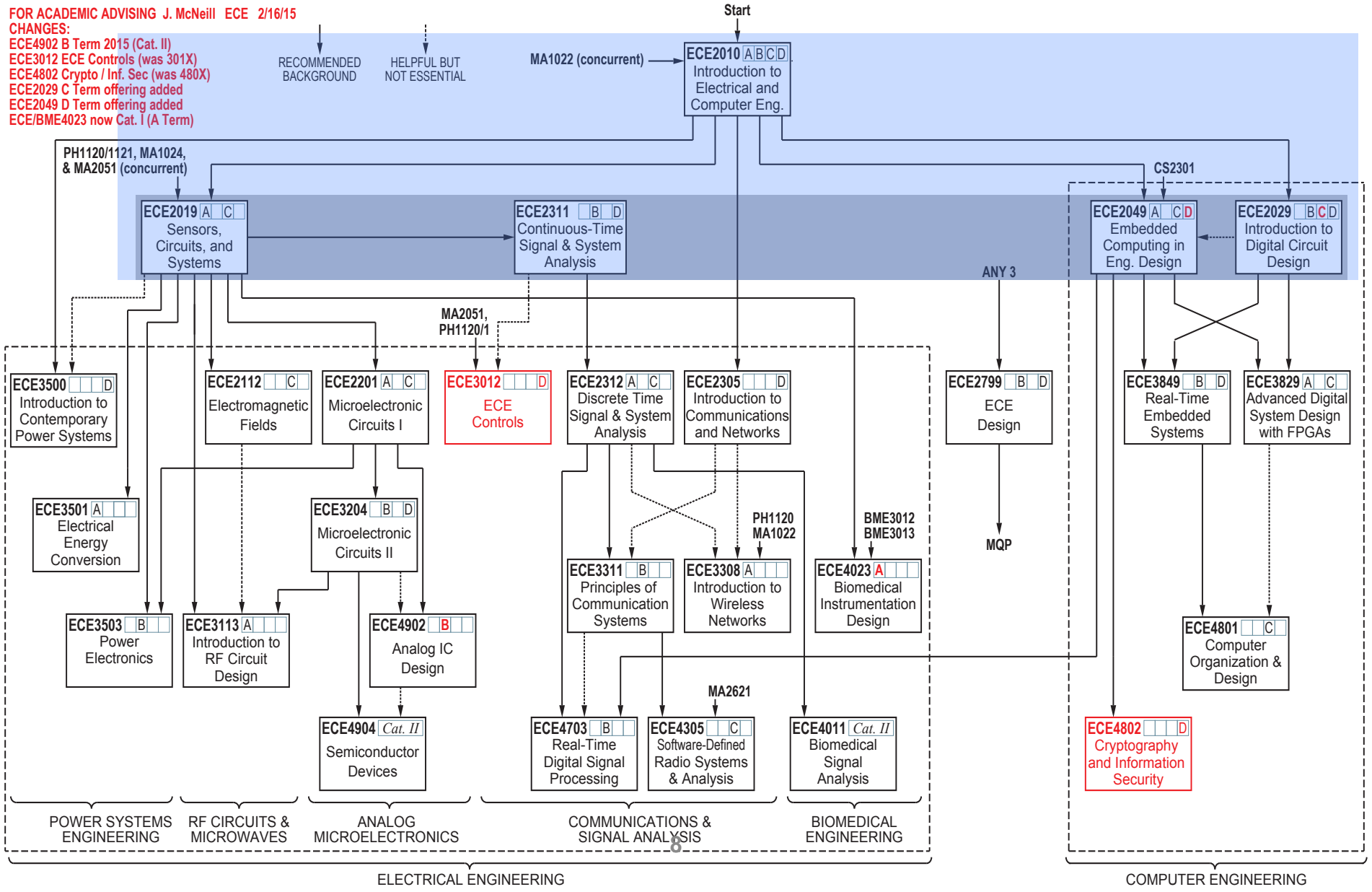
ELECTRICAL AND COMPUTER ENGINEERING (12/3 units)
Courses with prefix ECE (except ECE 3601) and ES 3011

22.			1/3
23.			1/3
24.			1/3
25.			1/3
26.			1/3
27.			1/3
28.			1/3
29.			1/3
30.			1/3
31.			1/3
32.			1/3
33.			1/3

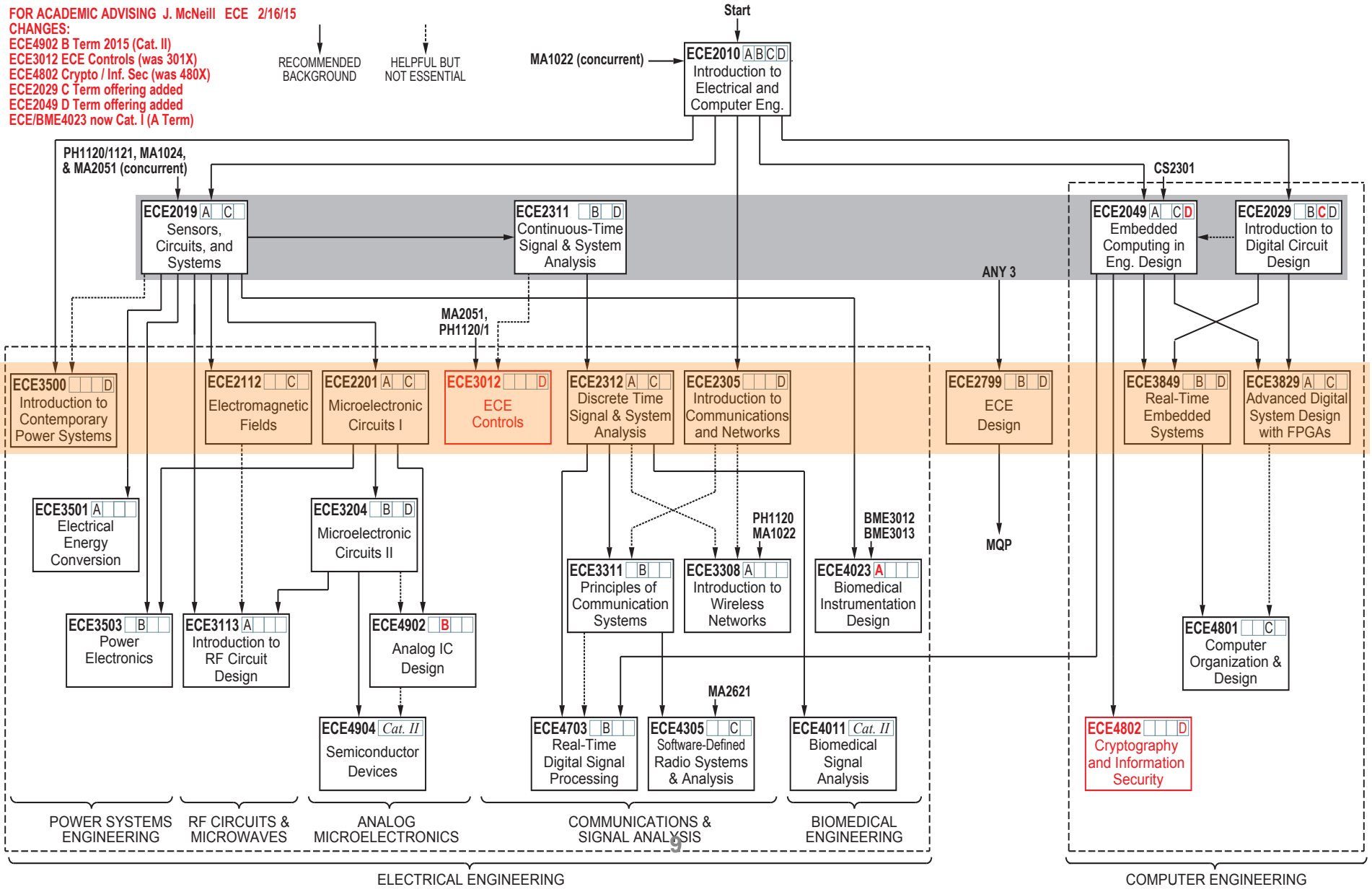
ECE Program Flow Chart



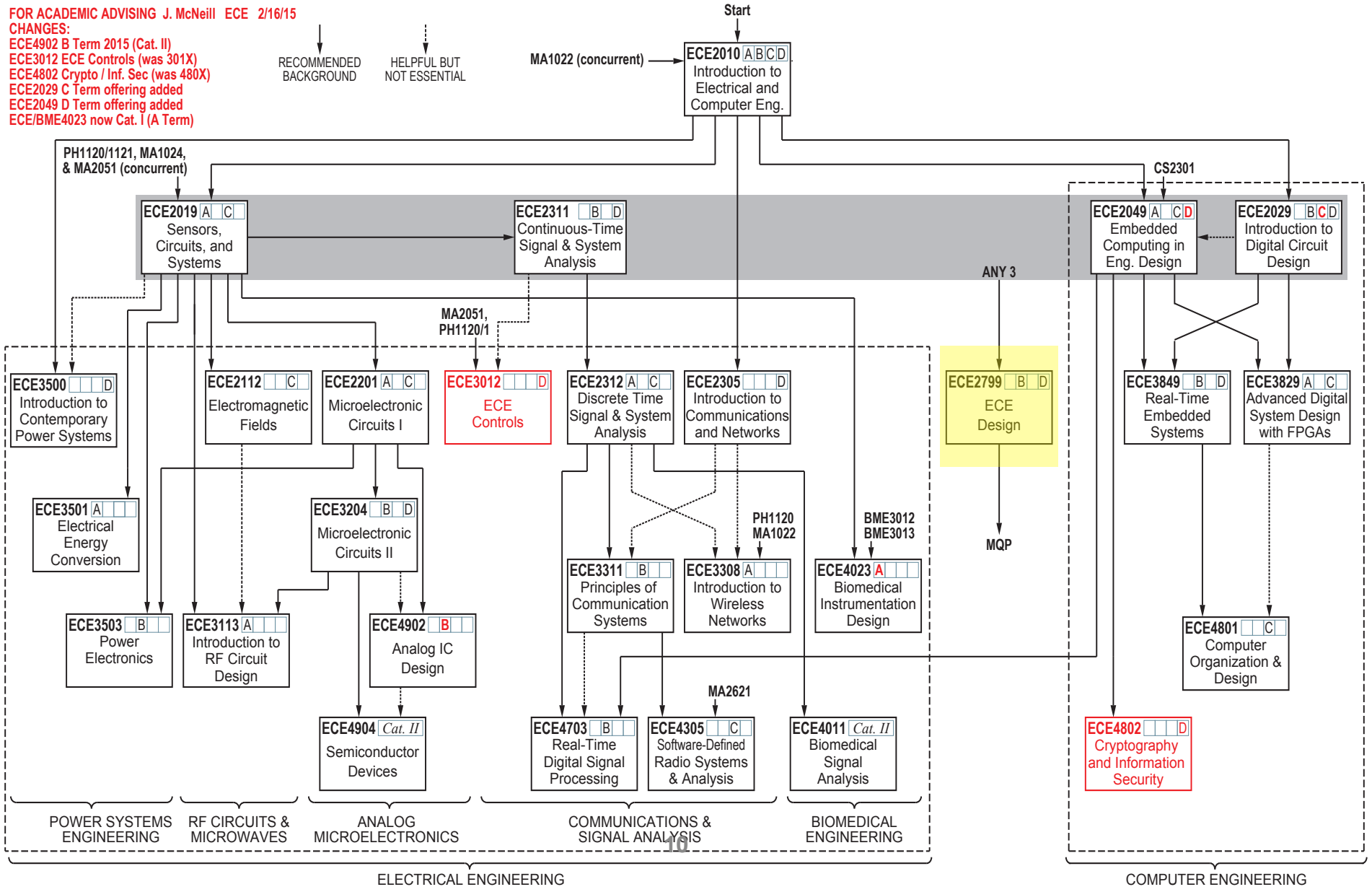
Basic Courses



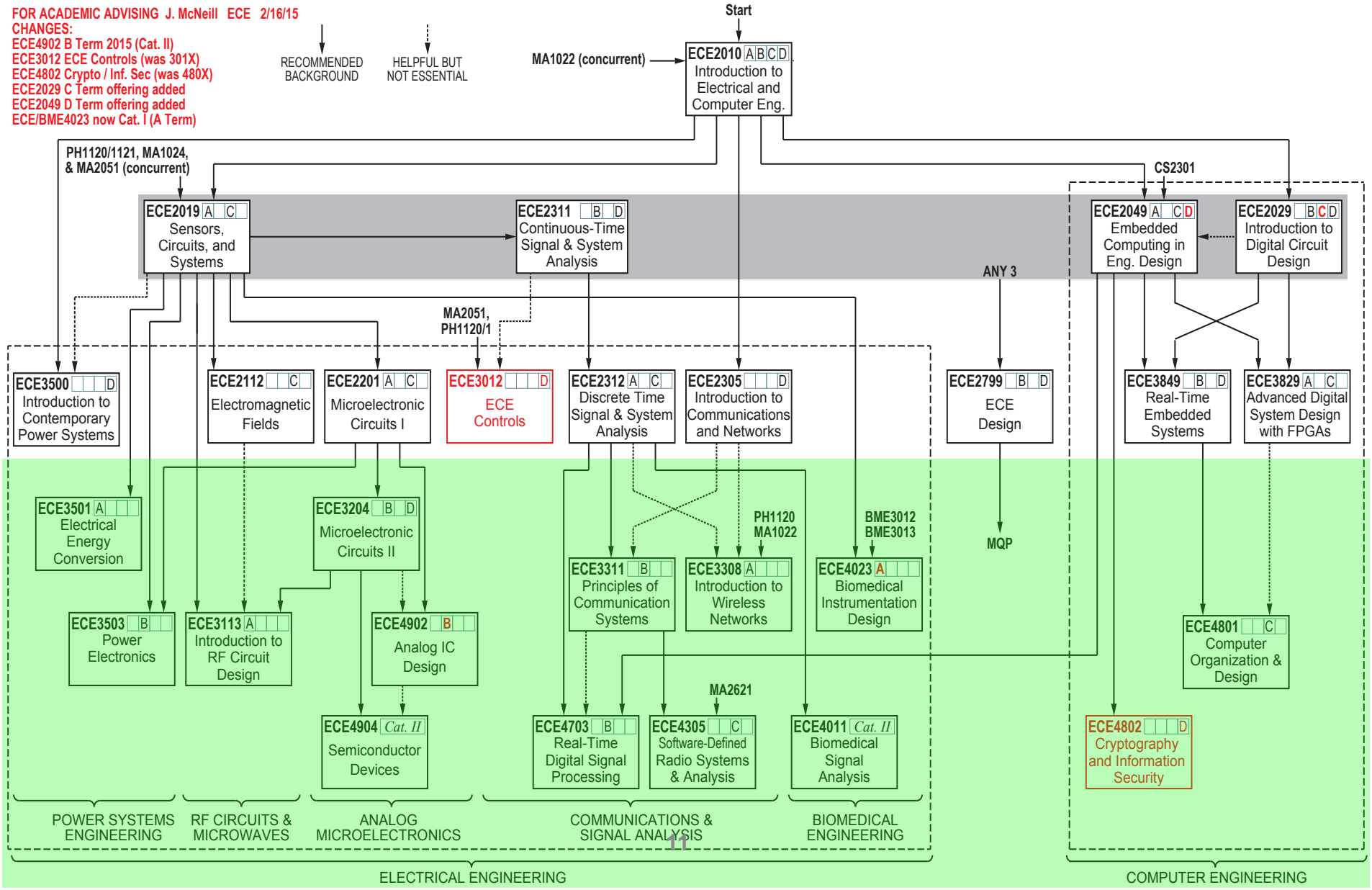
The Next Level



MQP Preparation



Advanced Courses



ECE Courses

Basic Courses

- ECE 2010 – Intro to ECE
- ECE 2019 – Sensors, Circuits, and Systems
- ECE 2029 – Intro to Digital Circuits and Computer Systems
- ECE 2049 – Embedded Computer Systems
- ECE 2311 – Continuous-Time Signal and System Analysis

Prep for MQP

- ECE2799 - Electrical and Computer Engineering Design

Next Level

- ECE 3501 – Electrical Energy Conversion
- ECE 2201 – Microelectronic Circuits I
- ECE 2112 – Electromagnetic Fields
- ECE 3012 – ECE Control Engineering (replaces ES 3011 for ECE majors)
- ECE 2312 – Discrete-Time Signal and System Analysis
- ECE 3849 – Real Time Embedded Systems
- ECE 3829 – Advanced Digital System Design with FPGAs

First Year

- Suggested ECE Courses
  - Start with ECE2010: Overview of all aspects of ECE
  - Option to follow interest immediately or continue sampling different areas within ECE
  - Examples on following slides
- Suggest filling in Math, Science, CS necessary for ECE courses
- Suggest making progress toward your Humanities & Arts (HUA) Requirement
- Social Science requirement: If you go off-campus for IQP, you will take ID2050 which counts as 1 of 2 courses for social science requirement.

Required Math, Science

Total of 12 math, science courses required for ECE major:

- **Math (at least 7)**
  - MA1021-4 Calc I – IV
  - MA2051 Differential Equations
  - MA2621 Probability
  - MA2071 Matrices and Linear Algebra
- **Physics (at least 2)**
  - PH1110/1111 Mechanics
  - PH1120/PH1121 Electricity and Magnetism
  - PH1130 Modern Physics
  - PH1140 Oscillations and Waves
- **Chemistry or Biology (at least 1 of either)**
- **And any 2 math/science course (MA, PH, CH, BB, GE)**

Required Engineering

Total of 15 ECE course equivalent required for major:

- **MQP (3 course equivalents)**
  - Usually includes capstone design (covered separately in case of research MQPs; check with MQP advisor)
  - Must take ECE2799 as preparation for MQP
- **12 ECE Courses at 2000-level or above**
  - At least 3 “EE” courses; at least 2 “CE” courses

Plus 3 additional engineering courses ...

Required Engineering

Plus 3 additional engineering courses:

- **1 Computer Science (2000-level or above)**
  - Usually CS2301 (C programming)
  - Some CS courses excluded; check catalog
- **1 "ES" course at 2000 level or above**
  - Usually ES2001 (Materials) or ES2501 (Static Systems)
  - Not ES3011 [Controls] which was an ECE course; replaced for ECE majors by ES3012
- **1 course at 2000 level or above from any engineering**
  - AREN, BME, CE, HE, CS, ECE, ES, FP, ME, RBE
  - Some courses excluded; check catalog

Second Year

- Suggested ECE Courses
  - Depend on path in 2010, basic courses; examples follow
- Suggest completing your Humanities & Arts (HUA) Requirement
- Suggest completing CS Requirement
  - Usually CS2301 (System Programming; prep for ECE2049)
- If you are interested in an off-campus IQP during your junior year, you must apply by September of your second year.
- If you are interested in a summer internship, start looking during your second year
- ECE2799 ECE Design: “Mini-MQP” in 7 weeks
  - Can be taken as early as D term of second year
  - OK to wait until junior year; MUST complete before MQP
  - Key: ≥ 3 of ECE2019, 2311, 2029, 2049 to contribute to project

Sample First / Second Year Plans (ECE)

- **Possible ECE Courses**

Year	Term	Course(s)
First	A	
	B	
	C	2010
	D	2029
Soph	A	2019
	B	2311
	C	2049
	D	2799

Prefer "EE" side

Year	Term	Course(s)
First	A	
	B	
	C	2010
	D	2029
Soph	A	2049
	B	3849
	C	3829 / 2019
	D	2799

Prefer "CE" side

Sample First / Second Year Plans (ECE)

- **Possible ECE Courses**

Year	Term	Course(s)
First	A	
	B	
	C	
	D	2010
Soph	A	2019
	B	2311
	C	2049
	D	2799

Prefer "EE" side

Year	Term	Course(s)
First	A	
	B	
	C	
	D	2010
Soph	A	2049
	B	2029
	C	3829 / 2019
	D	2799

Prefer "CE" side

Sample First / Second Year Plans (ECE)

- **Possible ECE Courses**

Year	Term	Course(s)
First	A	
	B	2010
	C	2019
	D	2311
Soph	A	2312 / 2201
	B	2029
	C	2049 / 2201
	D	2799

Prefer "EE" side

Year	Term	Course(s)
First	A	
	B	2010
	C	2049 / 2019
	D	2029
Soph	A	2049 / 2019
	B	3849
	C	3829
	D	2799

Prefer "CE" side

Junior Year & IQP

- Suggest depth in one or more ECE areas to contribute on MQP:
  1. Power System Engineering (3501, 3503, 3500)
  2. Analog Microelectronics (3204, 4902, 4904)
  3. RF Circuits & Microwave (2112, 3113)
  4. Signals & Communications (2305, 3308, 3311, 4305, 4703)
  5. Biomedical Engineering (BME courses; 4011, 4023)
  6. Computer Engineering & Security (3829, 3849, 4801, 4802)
- Suggest completing your IQP
- If you are interested in off-campus MQP, apply by the beginning of November in your junior year.
  - Lincoln Lab; Silicon Valley; Mitre; Wall St; etc.
  - Sample opportunities at MQP event early B term
  - Or, make sure you have an on-campus MQP scheduled.
- **Consider BS/MS program**: Apply before first 4000-level course.

Senior Year & MQP

- MQP, MQP, MQP
  - It usually takes 1 full term for an off-campus project.
  - It usually takes 3 terms for an on-campus project.
- Check with your advisor on your ECE requirements
  - At least 12 ECE courses plus MQP
  - At least 3 courses in Electrical Engineering
  - At least 2 courses in Computer Engineering
- Check with advisor on overall degree requirements
  - 15 units total (including everything)
  - HUA (2 units), Math & Basic Science (4 units), IQP (1 unit), Engineering Science and Design (6 units), PE (1/3 unit), SS (2/3 unit), Free Elective (1 unit)
- Ready for walking across the stage on graduation day …

www.wpi.edu/academics/ece/resources.html

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DEPARTMENT OF
Electrical & Computer Engineering

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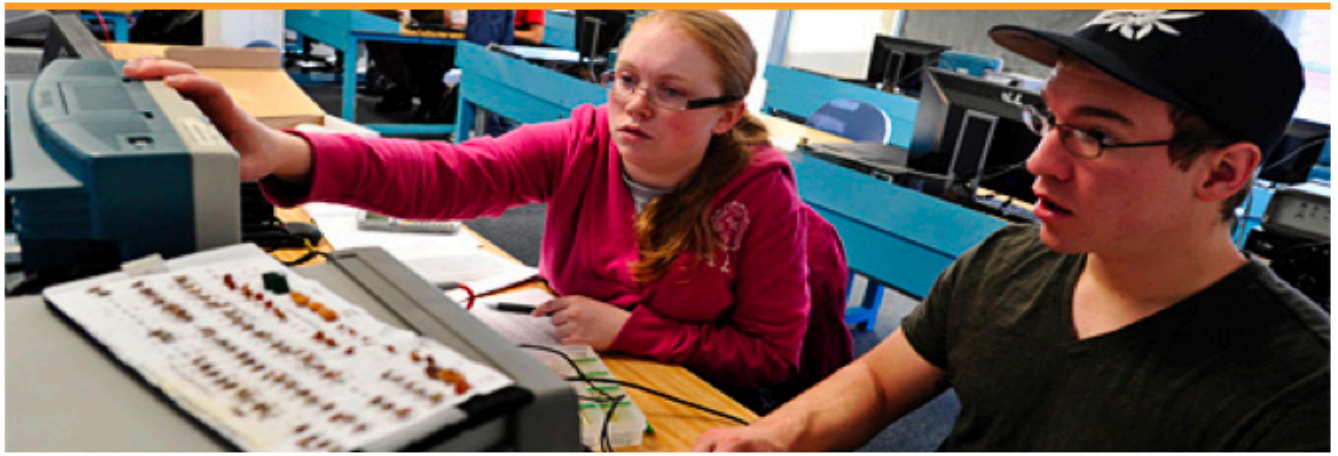
Resources



Academic Resources

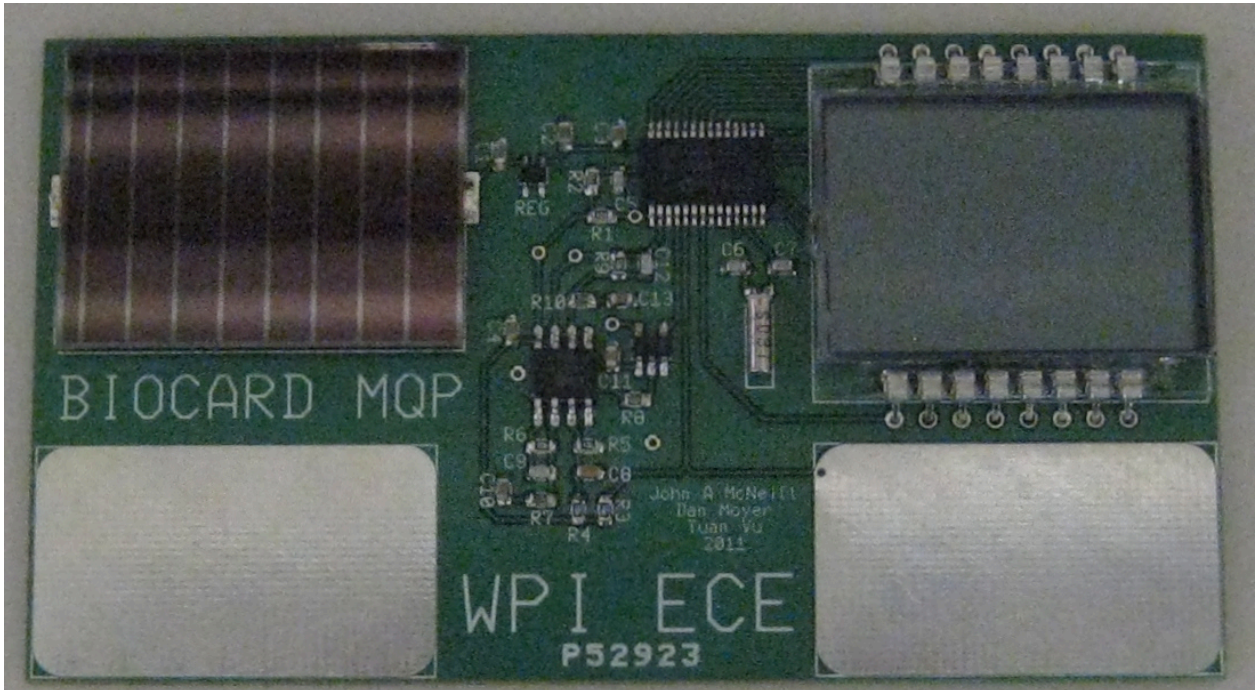
- Current Class Schedules
- myWPI Portal
- Department Honesty and Ethics
- ECE Program Tracking Sheet AY 2012-2013
- ECE Course Chart Guide AY 2012-2013
- ECE Minor Form

Computing Resources

- SET YOUR ECE COMPUTER PASSWORD
- ECE Intranet (Passwords, Printing, Help)
- ECE Poster Printing Work Order *(226 KB PDF)*
- ECE Knowledge Base

Questions - Feel Free to Contact Us

- **Prof. John McNeill, mcneill@ece.wpi.edu**
- **Ms. Shannon Cotter, scotter@ece.wpi.edu, UG Admin, AK202**
- **These slides will be posted in "Resources" section of ECE website**
- **And feel free to contact any ECE faculty member at anytime**



WPI

John. A. McNeill, Ph.D.
Associate Professor

508-831-5567
Fax 508-831-5491
mcneill@ece.wpi.edu

Department Of Electrical and Computer Engineering
100 Institute Road • Worcester, MA 01609-2280 • USA
www.wpi.edu