Welcome to Your ECE Major
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

<table>
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<tr>
<th>Name:</th>
<th>Class Year:</th>
<th>Expected Graduation Date:</th>
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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

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--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

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The Next Level
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.
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)**
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

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Prefer “EE” side

Prefer “CE” side

Worcester Polytechnic Institute
### Possible ECE Courses

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Sample First / Second Year Plans (ECE)

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**Prefer “EE” side**

**Prefer “CE” side**

Worcester Polytechnic Institute
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)
- 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 ...
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