ECE MS Program Orientation

09/2022

Boston University
Department of Electrical & Computer Engineering
Getting to know each other!

- Name & hometown
- Identify one key phrase below that is closest to your interest:

  - Machine Learning, Big Data and Analytics
  - Computational Imaging
  - Decision and Estimation Theory
  - Signal, Image and Video Processing
  - Medical Informatics
  - Sensor Networks
  - Communication and Information Theory
  - Computer Architecture and Design
  - Digital and Analog VLSI
  - Embedded and Reconfigurable Computing
  - Mobile Computing
  - Networking for Communication
  - Computer and Network Security
  - Software/Design Automation
  - Multimedia Systems
  - Cybersecurity
  - Quantum Optics and Communications
  - Fiber, Laser and Nonlinear Optics
  - Solid-state Circuits, Devices
  - Nano- and Bio-Photonics
  - Space Physics
Welcome!

Prof. Clem Karl - Chair of the ECE Department

- Oversees the Undergraduate and Graduate Programs
Introduction

Prof. Chen Yang
ECE Associate Chair for Master’s Programs

Molly Clark
MS Academic Program Manager
ecems@bu.edu
PHO324 (ECE Main office)
Faculty with National Recognitions

- 54 Faculty Members
  - 3 National Academy Members
  - 36 Society Fellows
  - 26 NSF/Doe/DoD Young Investigators
  - 3 Former IEEE Society Presidents

- Information and Data Sciences
  - Machine Learning, Big Data and Analytics
  - Computational Imaging and Inverse Problems
  - Decision and Estimation Theory
  - Signal, Image and Video Processing
  - Medical Informatics
  - Sensor Networks
  - Communication and Information Theory
  - Network Security

- Computer Engineering
  - Computer Architecture and Design
  - Digital and Analog VLSI
  - Embedded and Reconfigurable Computing
  - Mobile Computing
  - Networking for Communication
  - Computer and Network Security
  - Software/Design Automation
  - Multimedia Systems
  - Cybersecurity

- Electro-Physics
  - Quantum Optics and Communications
  - Fiber, Laser and Nonlinear Optics
  - Solid-state Circuits, Devices
  - Nano- and Bio-Photonics
  - Space Physics

CSranking.org ranks BU as 16th for ML (4 of top 5 BU faculty are ECE faculty)
Large and Diversified Student Body

Each MS class

- ~1000 Applications from ~300 Universities and ~30 countries
- 65-90 Matriculants
- 50 Universities
- 27 Majors

Source: ENG GPO annual report 2021

Department of Electrical & Computer Engineering
Degree Requirement and Personalized Curriculum

**Software requirement:** (1 course)
- EC602 – Design by Software in ECE

**Practicum requirement:** (1 course)
- EC601 – Product Design in ECE
- OR (if exempted)
  - MS/MEng project
  - MS thesis

**ECE graduate electives (4 courses)**
- Graduate ECE courses
- CAS CS courses generally count as well

**General electives (2 courses)**
- Graduate college of engineering (ENG) courses
- ECE-related CAS technical courses (CS, math, physics, …)
- MS project, thesis, and independent study

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32 graduate-level credits or more (or 8 courses)
No grade lower than C can be counted for degree.
Degree Average GPA $\geq 3.0$.


Multiple Elective Tracks

- Computational and Cyberphysical Systems
- Computer Communications and Networks
- Cybersecurity
- Data Science and Intelligent Systems
- Electromagnetics, Photonics, and Nanotechnology
- Bio-ECE and Digital Health
- Mobile and Cloud Computing
- Sensing and Information
- Signal Processing and Communications
- Software
- Solid-State Circuits, Devices, and Materials
- Systems and Control
- Hardware
Fall 2022 Courses Schedule

Link to the Fall Courses

Required:
EC601 Product Design ECE
EC602 Design by Software

Electives: (examples)
- EC 500 Intro Online Learning
- EC 500 Principles of Software
- EC 503 Learn from Data
- EC 504 Adv Data Structure
- EC 505 Stochastic Proc
- EC 516 Dig Signal Processing
- EC 521 Cybersecurity
- EC 524 Optimize Theory
- EC 525 Optimization for Machine Learning
- EC 528 Cloud Computing
- EC 533 Adv Discrete Math
- EC 545 Cyber Physical System
- EC 555 Intro Bio Optic
- EC 562 Fourier Optics
- EC 571 Digital VLSI Circuit Design
- EC 573 Solar Energy Sys
- EC 574 Phy Smcndct Mat
- EC 577 E/O/M Prop Mat
- EC 578 Fabric Tech Integrated Circuits
- EC 605 Comp ENG Fund
Research Opportunity through MS project and Thesis

MS Project Course
- Optional
- Advised by a faculty advisor.
- Formulating an idea through a 3-5 page proposal:
- Conduct over one semester **only** (4 credit)
- End-of-Semester MS Project presentation.

MS Thesis Course
- Optional
- Advised by a faculty advisor and committee with 3 ECE faculty
- Formulating an idea through a 3-5 page proposal:
- Conduct at least one semester (4 credit)
- Defend in front of your thesis committee
MS Academic Conduct

BU Academic Conduct Code: [http://www.bu.edu/academics/policies/academic-conduct-code](http://www.bu.edu/academics/policies/academic-conduct-code)

Violations: You are responsible to read the Code and know what are violations.
- Exams: Cheating, Unauthorized Communication, Theft
- Homework/papers:
  - Violating collaboration policy
  - Plagiarism
  - Misrepresentation/falsification of data

Process:
- **First offense, undisputed:**
  - Faculty member may request authorization for specific penalty.
- **Second offense or disputed:**
  - Academic Misconduct Committee

Potential penalties:
- Reprimand, Grade Reduction, Failure, Probation, Suspension, Expulsion

BU Department of Electrical & Computer Engineering
ENG Specialization

https://www.bu.edu/eng/programs/masters-degree-specialization-programs/

• Courses taken can be counted toward ECE MS degree and specialization

• You do not need to take additional courses to complete a specialization
Internships (Optional)

• NOT required for the Master in Science (MS)
• Required for the MS with Engineering Practice:
  • First get an internship offer before applying for “with practice”

• DOES NOT satisfy the practicum requirement.

• You must first complete two academic semesters before you can enroll in an internship.
A Structured Advising System

1. MS Ambassadors (available in Fall semesters for first year students)
2. MS Academic Program Manager
3. Faculty Academic Advisor
4. Associate Chair of MS programs
1. MS Ambassadors

Consult Ambassadors for:

- *Peer Advising* (course interests, field interests, specializations, internships, research, MS Projects/Thesis)
- *Adjusting* to the US/New England/Boston Area (cultural/ regional/ social differences, transportation, food)
- Always feel free to contact them in person or via email
- Two-hour office hours every other week (posted online)
- Available in EC601 Sections
MS Ambassadors – Harshit Agrawal

- e-mail harshit@bu.edu
- Available at EC 601 A1 Wednesdays 4:30 – 6:15 pm (EPC 209)
- Areas:
  - Cybersecurity, IoT, Threat Intel
MS Ambassadors – Saraja Kadambari

• e-mail saraja@bu.edu
• Available at
  EC 601 A2 Mondays 12:20 – 2:05 pm (PSY B33)
• Areas:
  VLSI, Hardware Security, Power Aware Circuit Design
MS Ambassadors – Jinzhou Zhao

• Email: jinzhou@bu.edu
• Available at
  EC 601 A2 Wednesdays 12:20 – 2:05 pm (PSY B33)
• Areas:
  Robotics, Point Cloud Processing
MS Ambassadors – Jiahui Zhu

• Email: buzjhcs@bu.edu
• Available at
  EC 601 A1 Mondays 4:30 – 6:15 pm (EPC 209)
• Areas:
  Machine Learning, Deep Learning
2. MS Academic Program Manager

Molly Clark (ecems@bu.edu)

Can assist with:
- Program questions
- Registration changes and questions
- MS Project/MS Thesis registration
3. Faculty Advisors

• You need to know who your advisor is.
• You can view your advisor on the Studentlink.

When to consult your Advisor

– Questions not answered by
  • Academic Program Manager
– Broader, strategic questions of program
– Technical academic questions
4. Associate Chair for Masters Programs

Prof. Chen Yang

Consult for:
- Department-wide issues
- Problems not resolved by Advising Resources 1-3
## Suggestions for Academic and Professional Success

<table>
<thead>
<tr>
<th><strong>Active engagement</strong></th>
<th><strong>Work toward your career goal</strong></th>
<th><strong>Build a community</strong></th>
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</thead>
<tbody>
<tr>
<td>• Attend classes</td>
<td>• Identify your interest and your career goal early</td>
<td>• Make friends</td>
</tr>
<tr>
<td>• Actively participate class discussion</td>
<td>• Understand what is needed to be competitive</td>
<td>• Work in study groups</td>
</tr>
<tr>
<td>• Timely completing of homework, project assignment</td>
<td>• Seek support and help</td>
<td>• Discuss with peers</td>
</tr>
<tr>
<td>• Seek help from instructors (before, after lectures, office hour, scheduled appt with instructors)</td>
<td>• Take actions</td>
<td>• Support others</td>
</tr>
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</table>
Placement after MS program

30% Internship during the program in the relevant areas.
- BU Software & App Lab
- Amazon
- Fidelity Investment
- Philips
- Accenture
- MIT Lincoln Lab

90% of our MS graduates take positions in industry and research institutes.
- Accenture – Security Analyst
- Amazon – Software Development Engineer
- Bose – Embedded Software Engineer
- ByteDance – Back End Developer
- Draper – Embedded Software Engineer
- Harvard University – Research Associate
- Intel – SoC Design Engineer; Assembly Engineer
- Johns Hopkins University Applied Physics Lab
- MIT Lincoln Lab – Associate Staff
- MITRE Corp – Signal Processing Engineer
- Onto Innovation
- Raytheon Tech – Mechanical Engineer
- Reddit – Software Engineer
- Snapchat – Software Engineer
- Vitec Production Solution – Embedded Software Engineer

10% accepted admission to a Ph.D. program
- BU ECE Ph.D. Program
- UC Riverside
- University of Rochester
- Northeastern University

Average Salaries
US $111,833
International (China) $50,500

* Data is based on the Exit Survey conducted in February, 2022. Salary data is based on the survey conducted by CDO in May, 2022.
Career Development Office in ENG

https://www.bu.edu/eng/careers/

• Stay tuned for upcoming events through Handshake
  ➢ Career Fairs & Career Events
  ➢ Handshake: CDO's online system for job and internship listings

➢ Get connected with Alumni through BU CONNECTS

➢ Grad School Preparation

➢ Appointment with an advisor to discuss anything career related
International Students & Scholars Office (ISSO)

• ISSO Advisor for ENG graduate students: Julianne Cabour (jcabour@bu.edu)

• ISSO Workshop for ECE graduate students in early October (dates TBD)
  ✓ CPT/OPT questions
  ✓ Travel during the application process
  ✓ Any questions you have!
ECE Trivia!

1. What is the document needed for graduation application and where can we find it?
ECE Trivia!

1. What is the document needed for graduation application and where can we find it?
   - Program Planning Sheet
   - ECE Resources Page
     - [https://www.bu.edu/eng/departments/ece/resourcesforcurrentstudent/msmen g-planning-sheets/](https://www.bu.edu/eng/departments/ece/resourcesforcurrentstudent/msmen g-planning-sheets/)
ECE Trivia!

2. How many credit hours are required to complete the ECE MS Program and what are two core courses?
ECE Trivia!

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- 32
- EC601 Product Design in ECE
- EC602 Design by Software
ECE Trivia!

3. What are the grade requirements for graduation?
3. What are the grade requirements for graduation?

Average GPA needs to be greater or equal to 3.0 (a letter grade of B)

Course grades lower than C can’t count toward MS degree
Assignment Today

• Read MS handbook
• Read MS planning sheet and start to fill it (planning!)
• Read BU academic conduct code
• Find out who your faculty advisor is
Questions?