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

- 51 Faculty Members
  - 4 National Academy Members
  - 45 Society Fellows
  - 30 Early Career Awards
  - 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 19th for ML
Large and Diversified Student Body

Each MS class

- ~800 Applications from ~300 Universities and ~30 countries
- ~90 Matriculants
- ~60 Universities
- ~30 Majors

Source: ENG GPO Fall 2022
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

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

32 graduate-level credits or more (or 8 courses)
No grade lower than C can be counted for degree.
Degree Average GPA >= 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 2023 Courses Schedule

Link to the Fall Courses

Required:
EC601 Product Design ECE
EC602 Design by Software

Electives: (examples)
- EC 500 Principles of Software
- EC 501 Dynamic System Theory
- EC 503 Learning from Data
- EC 504 Advanced Data Structure
- EC 505 Stochastic Proc
- EC 516 Digital Signal Processing
- EC 517 Intro to Information Theory
- EC 518 Robot Learning
- EC 521 Cybersecurity
- EC 523 Deep Learning
- EC 524 Optimization Theory and Methods
- EC 525 Optimizing Machine Learning
- EC 528 Cloud Computing
- EC 533 Advance Discrete Mathematics
- EC 545 Cyber-Physical Systems
- EC 555 Intro to Biomedical Optics
- EC 562 Fourier Optics in Engineering
- EC 565 Intro to Electromagnetics and Photonics
- EC 571 Digital VLSI Circuit Design
- EC 573 Solar Energy Systems
- EC 574 Physics of Semiconductor Materials
- EC 577 E/O/M Properties of Materials
- EC 578 Fabrication Tech for Integrated Circuits
- EC 579 Nano/microelectronic Device Tech
- EC 580 Analog VLSI Circuit Design
- EC 591 Photonics Lab 1
- EC 605 Computer Engineering Fundamentals
EC 605: Computer Engineering Fundamentals

For MS students who want Computer Engineering focus … but don’t have Computer Engineering undergrad degree

• Background/prereq for many courses, including:
  • EC 513: Computer Architecture
  • EC 521: Cybersecurity
  • EC 527: High Performance Programming with Multicore and GPUs
  • EC 535: Introduction to Embedded Systems
  • EC 541: Computer Communications and Networks
  • EC 545: Cyber Physical Systems
  • EC 551: Advanced Digital Design with Verilog and FPGA
  • EC 571: Digital VLSI Circuit Design

Understanding the underlying hardware makes you a better programmer!

Essential for writing efficient code

BU Department of Electrical & Computer Engineering
Research Opportunities: 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 credits)
• 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 two semesters (4 credits per semester)
• 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
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
I. 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

• One hour office hours every week (posted online)

• Available in EC601 Sections
MS Ambassadors – Saurabh Singh

• e-mail saurabh2@bu.edu

• Available at EC 601 A1 Wednesdays 4:30 – 6:15 pm (CAS B20)

• Areas of Interest: Machine Learning
MS Ambassadors – Ye Zhou

- e-mail ninazhou@bu.edu

- Available at EC 601 A1 Mondays 4:30 – 6:15 pm (CAS B20)

- Areas of Interest: Operating Systems
MS Ambassadors – Priyank Negi

- e-mail priyankn@bu.edu

- Available at EC 601 A2 Mondays 12:20 – 2:05 pm (CAS 203)

- Areas of Interest: Data science and analytics
MS Ambassadors – Kshitij Duraphe

• e-mail kshitijd@bu.edu

• Available at EC 601 A2 Wednesdays 12:20 – 2:05 pm (CAS 203)

• Areas of interest: Plasma physics
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>Active engagement</th>
<th>Work toward your career goal</th>
<th>Build a community</th>
</tr>
</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>
</tbody>
</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

Average Salaries
US $112,333
International (China) $50,000

* Data is based on the Exit Survey conducted in February, 2022. Salary data is based on the survey conducted by CDO in May, 2020.
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
One credit Career Development course

Career Lab: Job & Internship Search for Master's Students

EK 690 | FALL 2023 | 1 CREDIT

- Learn job search techniques
- Build application materials
- Practice interview strategies

Register now!

- Offered for the first seven weeks of the Fall 2023 semester
- Fridays 2:30 – 4:15pm
- Does not count toward ECE MS degree requirements

Department of Electrical & Computer Engineering
International Students & Scholars Office (ISSO)

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

• ISSO Workshop for ECE graduate students on October 16th via Zoom
  ✓ 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/academics/departments-and-divisions/electrical-and-computer-engineering/resources/resources-current-students/ece-mspp/
ECE Trivia!

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

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

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

3. What are the grade requirements for graduation?
ECE Trivia!

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?