A Master of Science Degree in Electrical Engineering (MSEE) will provide the student with the knowledge and skills needed to pursue many new and different careers in modern society, including careers that have yet to be invented. We have placed graduates in traditional careers (for example, electronics designer, information technology troubleshooter, forensic lab analyst, and others) and in not so traditional careers (government procedural analyst). Our program of study is designed with several important features. First, each student picks their own concentration, based on what they hope to become after graduation. Students choose courses from a list of over 50 different courses with the intention of developing the skills and competencies necessary for their concentration. Our courses are diverse and range from nuclear-electric energy to fiber optics to networks to power generation, and beyond. We have strong ties to the Biomedical Engineering (BME) program at UB and many BME courses are cross listed in EE. Also, we allow up to 4 courses to be taken in the departments of Computer Engineering and Computer Science.

Electrical Engineering Overview

We have over 50 courses that offer a wide variety of topics, ranging from pure electronics to fiber optics/networks, to medical machines, to wireless (cell) communications to renewable energy, to machine automation, and to power plant fundamentals.

Recent graduates have gotten jobs in information technology, machine control, cell phone troubleshooting, power plant design, working for banks, manufacturing companies, engineering companies and politicians, and other jobs as well.

Some examples of the concentrations that EE offers are discussed below.

The School of Engineering at the University of Bridgeport offers a new program in Biomedical Engineering, which is growing rapidly. It should be noted that EE supports this program, and it has offered medical engineering courses dating back 20 years, with many successful graduates getting jobs as engineers in health related fields from as far back as the 1980’s.

The EE department has an electronics design program that is state-of-the-art, with emphasis on very large scale integrated circuits design (VLSI) on a microscopic scale and with a new emphasis of VLSI design on a nanometer-scale as well. A series of VLSI courses (i) design (Analog and Digital VLSI, radio frequency VLSI, low power VLSI), (ii) fabrication (microelectronic fabrication and nanotechnology), and (iii) testing (VLSI testing) are available. A closely related field is micro- and nano-technology MEMS (microelectromechanical systems). Micro-MEMS designs systems of electronics and motion the size of microns. The smaller nano-MEMS builds systems the size of individual molecules. Nano-MEMS is used to create the next generation of VLSI components, including single-electron-transistors, nano-wires, and quantum computers.

Our department has a strong concentration in signal analysis, including the analysis of human speech vs. noise and the transmission of signals via satellite or cable or cell tower.

The EE department has a large PLC lab. Programmable Logic Control consists of 2 parts. You build an assembly line to move products and to do things to these products; for example, a robot arm will sort products or load them on to a platform. To control this assembly line, you need to implement the necessary computer code.
To obtain the MSEE, one must start with a valid BS degree in Electrical Engineering or related science (such as Computer Engineering or Biomedical Engineering). In the event that the BS is in another discipline (Computer Science, Physics, etc.) the new student will be required to take additional, remedial courses, specified by their academic advisor. Additional courses can total 3, 6, 9 or 12 credits, and these are determined on a case-by-case basis.

The MSEE is obtained by completing 9 courses or 27 academic credits followed by a 3 credit project. Alternatively, the project can be waived if the student takes 8 courses plus a 6 credit thesis. The courses taken must include at least 5 from Electrical Engineering. The remainder can come from Electrical Engineering, Computer Engineering, or Computer Science, without specifying the exact number. Also, the student may elect to choose one course from Mechanical Engineering or Technology Management. All courses are at the graduate level (400-level), but there may be cases where an undergraduate course may be allowed.

The lowest grade accepted in any course or project is a “C”. The total grade point average of all courses upon completion of the program must be at least 3.0 (i.e. a “B” average).

Co-op work is encouraged but not required for obtaining the MSEE. By taking co-op (Engineering 500 for one credit), a student works part time at a company developing their engineering skills and earning a salary, while taking courses for the MSEE.

There are no core courses. Since the MSEE leads in many directions, the student is encouraged to develop his/her own concentration, with the help of their academic advisor. The list below is comprised of suggested courses for the various concentrations we offer, but it is not intended as a complete list.

### Electronics Circuits Designer
- Digital VLSI
- Analog VLSI
- Microfabrication
- Modern Electronics
- Digital IC analysis
- Analog IC analysis
- Semiconductors
- Low Power VLSI
- VLSI testing
- Analog/Digital Systems VLSI
- Radio Frequency VLSI

### Micro- and Nanotechnology Engineer
- MEMS (micromechanical systems)
- BioMEMS
- Nanotechnology
- Microelectronics Fabrication

### Communications Engineer
- Fiber Optics
- Fiber Optics Lab
- Radio Frequency Communications
- Digital Communications
- Wireless Communications
- Satellite Communications
- Digital Signal Processing (DSP)
- DSP lab
- Wavelets and Filter Banks
- Microwaves
- Wireless Sensor Networks

### Assembly Line Designer
- Industrial Controls
- Programmable Logic Control
- Advance PLC’s
- Controls
- Controls Lab
- Mechatronics
- Robotics

### Medical Engineering
Student may take this concentration in EE or change to a Biomedical Engineering major and take other courses as well.
- Medical Machines
- Biomedical Sensors
- Audio Signal Analysis
- Audio Signal Lab
- Bioinformatics
- Bioelectronics
- Biomedical Image Processing
- Biosignal Processing
- BioMEMS

### Power Engineering
- Power distribution
- Power Electronics
- Power Analysis
- Modern Electronics
- AC/DC motor drives

### Green Energy
- Sustainable Energy
- Solar Energy
- Hybrid Cars
- Fuel Cells