# ELECTRICAL ENGINEERING - MASTER OF SCIENCE IN ELECTRICAL ENGINEERING (ONLINE)

## Requirements and Options for the MSEE degree

The Program Educational Objectives for the Master of Science in Electrical Engineering are:

1. That graduates successfully apply advanced skills and techniques in one or more areas of emphasis.
2. That graduates obtain relevant, productive employment with the private sector or in government and/or pursue additional advanced degrees.

Note--the following degree requirement tables outline the **minimum** requirements for an MSEE. As many students must register for a minimum of 9 credits each semester to remain full time, a student will often take more than the minimum of 6 credits of E E 599 Master's Thesis or 3 credits of E E 598 Master's Technical Report to complete their degree.

### Thesis Option:

| Prefix | Title | Credits |
|---|---|---|
| **Graduate Core Courses (choose 2-3 from 2-3 different areas) [1]** | | **6-10** |
| *Electromagnetics* | | |
| E E 515 | Electromagnetic Theory I | |
| *Microelectronics/VLSI* | | |
| E E 523 | Analog VLSI Design | |
| *Photonics/Optics* | | |
| E E 528 | Fundamentals of Photonics | |
| *Electric Energy Systems* | | |
| E E 543 | Power Systems III | |
| *Digital Signal Processing* | | |
| E E 545 | Digital Signal Processing II | |
| or E E 596 | Digital Image Processing | |
| *Computer Engineering* | | |
| E E 562 | Computer Systems Architecture | |
| *Communications* | | |
| E E 571 | Random Signal Analysis | |
| *Controls & Robotics* | | |
| E E 551 | Control Systems Synthesis | |
| **Graduate Breadth Elective (choose 1-0 courses) from a third area [1]** | | **4-0** |
| *Electromagnetics* | | |
| E E 541 | Antennas and Radiation | |
| *Microelectronics/VLSI* | | |
| E E 512 | ASIC Design | |
| *Electric Energy Systems* | | |
| E E 537 | Power Electronics | |
| *Digital Signal Processing* | | |
| E E 565 | Machine Learning I | |
| E E 587 | Deep Learning for Image Processing | |
| E E 588 | Advanced Image Processing | |
| E E 598 | Master's Technical Report | |
| *Communications* | | |
| E E 581 | Digital Communication Systems I | |
| *Controls & Robotics* | | |
| E E 576 | Geometric Algebra | |
| **Graduate Electives [2]** | | **13-15** |
| **Master's Thesis** | | |
| E E 599 | Master's Thesis | |
| **Complete and defend master's thesis [3]** | | |
| **Total Credits** | | **30** |

1. Students must take at least two core courses from two different areas of emphasis. In addition, either a third graduate core course OR one graduate breadth elective must be taken from a third area of emphasis. Students pursuing the MSEE who wish to pursue the Ph.D. in the future are encouraged to select three courses from the graduate core courses to satisfy one of the requirements for the Ph.D. Qualifying exam (see https://ece.nmsu.edu/grad-study/phd-qualifying.html) for more information.
2. E E courses must be numbered 500 or higher. Non-E E courses must be numbered 450 or higher. The total number of E E credits, including the graduate core and/or graduate breadth electives and excluding credits of E E 599 Master's Thesis must be at least 12. Credits of E E 590 Selected Topics which are not subtitled are limited to a total of 6.
3. The thesis must be completed and orally defended.

Other limitations and requirements that apply to all master's degrees are described elsewhere in this catalog.

### Technical Report Option:

| Prefix | Title | Credits |
|---|---|---|
| **Graduate Core Courses (choose 2-3 from 2-3 different areas) [1]** | | **6-10** |
| *Electromagnetics* | | |
| E E 515 | Electromagnetic Theory I | |
| *Microelectronics/VLSI* | | |
| E E 523 | Analog VLSI Design | |
| *Photonics/Optics* | | |
| E E 528 | Fundamentals of Photonics | |
| *Electric Energy Systems* | | |
| E E 543 | Power Systems III | |
| *Digital Signal Processing* | | |
| E E 545 | Digital Signal Processing II | |
| or E E 596 | Digital Image Processing | |
| *Computer Engineering* | | |
| E E 562 | Computer Systems Architecture | |
| *Communications* | | |
| E E 571 | Random Signal Analysis | |
| *Controls & Robotics* | | |
| E E 551 | Control Systems Synthesis | |
| **Graduate Breadth Elective (choose 1-0 courses from a third area [1]** | | **4-0** |
| *Electromagnetics* | | |
| E E 541 | Antennas and Radiation | |
| *Microelectronics/VLSI* | | |
| E E 512 | ASIC Design | |
| *Electric Energy Systems* | | |
| E E 537 | Power Electronics | |
| *Digital Signal Processing* | | |
| E E 565 | Machine Learning I | |

| | | |
|---|---|---|
| E E 587 | Deep Learning for Image Processing | |
| E E 588 | Advanced Image Processing | |
| E E 597 | Neural Signal Processing | |
| *Communications* | | |
| E E 581 | Digital Communication Systems I | |
| *Controls & Robotics* | | |
| E E 576 | Geometric Algebra | |
| **Graduate Electives** [2] | | **16-18** |
| **Master's Technical Report** | | |
| E E 598 | Master's Technical Report | |
| **Complete and defend master's technical report** [3] | | |
| **Total Credits** | | **30** |

1 Students must take at least two core courses from two different areas of emphasis. In addition, either a third graduate core course OR one graduate breadth elective must be taken from a third area of emphasis. Students pursuing the MSEE who wish to pursue the Ph.D. in the future are encouraged to select three courses from the graduate core courses to satisfy one of the requirements for the Ph.D. Qualifying exam (see https://ece.nmsu.edu/grad-study/phd-qualifying.html) for more information.

2 E E courses must be numbered 500 or higher. Non-E E courses must be numbered 450 or higher. The total number of E E credits, including the graduate core and/or graduate breadth electives and excluding credits of E E 598 Master's Technical Report must be at least 12. Credits of E E 590 Selected Topics which are not subtitled are limited to a total of 6.

3 The technical report must be completed and orally defended.

Other limitations and requirements that apply to all master's degrees are described elsewhere in this catalog.

## Included Prefixes

Graduate course work credits from the following prefixes are permitted for the MSEE degree. If a graduate course outside this list of prefixes logically fits into the MSEE program, see your graduate advisor about requesting an exception.

| Prefix | Title | Credits |
|---|---|---|
| *College of Agriculture/Consumer/Environmental Sciences* | | |
| AEEC | | |
| ENVS | | |
| GENE | | |
| *College of Arts and Sciences* | | |
| ASTR | | |
| BCHE | | |
| BIOL | | |
| C S | | |
| CHEM | | |
| GEOL | | |
| GPHY | | |
| LING | | |
| MATH | | |
| MOLB | | |
| PHYS | | |
| STAT | | |
| *College of Business* | | |
| ECON | | |
| MGMT | | |
| *College of Engineering* | | |
| A E | | |
| A EN | | |
| CHME | | |
| E E | | |
| ENVE | | |
| I E | | |
| M E | | |
| SUR | | |