



# ECU

## MASTER OF SCIENCE IN MECHANICAL ENGINEERING

The Masters of Science in mechanical engineering (MSME) is a research oriented degree program that is administered by the Department of Engineering in the College of Engineering and Technology. The program has two focus areas of research – i) advanced energy systems: research includes sustainable and efficient energy systems, wind-energy, ocean wave energy generation and storage, energy harvesting, and energy transport and conversion processes, and ii) mechanics of biomaterials: research includes mechanical behavior of structural tissues, cellular materials, metals for medical implants and biological tissues.

ECU MSME is a two-year program with a minimum of 32 semester hours of coursework and thesis. At least fourteen (14) semester hours of the coursework will come from the Department of Engineering, with an additional 6 semester hours of thesis credit and additional courses from the Departments of Mathematics, Physics, Biology, Biostatistics and other disciplines as required to support the interests and research of individual students and faculty. In addition to the course work each student must complete a research-based thesis, a comprehensive defense of thesis proposal, a seminar based on thesis research, and a thesis defense.

Core Courses	Elective Courses
Introduction to Engineering Research Finite Element Analysis of Solids and Fluids Advanced Thermodynamics Advanced Mechanics of Materials Thesis Research Six (6) semester hours of thesis are required for this program. Students must complete a graduate level course in advanced mathematics.	Thermal Systems Design Renewable and Sustainable Energy Systems Advanced Engineering Design Advanced Vibration and Structural Dynamics Mechanical Behavior of Materials Advanced Composite Materials Theory of Elasticity Bioheat and Mass Transfer Selected Topics in Mechanical Engineering

### ADMISSION STANDARDS

Applicants for study in mechanical engineering are expected to have a bachelor's degree in engineering with a minimum 3.0/4.0 grade point average in the last two years of undergraduate study. The following preparatory courses are recommended:

<ul style="list-style-type: none"><li>▪ Engineering - one course in basic thermodynamics, materials science and electrical engineering</li><li>▪ Engineering - one course in three of the following five areas: biomaterials, fluid mechanics, heat and/or mass transfer, mechanics of materials, energy systems</li><li>▪ Engineering research or design experience</li></ul>	<ul style="list-style-type: none"><li>▪ Physics - one semester</li><li>▪ Chemistry - one semester</li><li>▪ Biology- one semester</li><li>▪ Mathematics- calculus through differential equations, probability and statistics</li></ul>
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### ADMISSION PROCEDURE

1. Complete and submit a graduate application from the ECU Office of Graduate Studies website at [www.ecu.edu/gradschool](http://www.ecu.edu/gradschool).
2. Submit any required forms such as the Statement of Legal Residence, Statement of Purpose, resume, official copies of all transcripts, and three letters of reference to the ECU Office of Graduate Studies.

### CONDITIONAL ADMISSION

Applicants may be granted conditional admission if they do not qualify for regular admission. Students entering from disciplines other than engineering may find it necessary to take preparatory undergraduate and/or graduate level courses that serve as prerequisites. Preparatory courses that are for undergraduate credit only may not be applied toward credit hours required for a graduate degree.

*All information provided in this flyer is subject to change without notification. Students and applicants are required to review the Graduate Catalog ([www.ecu.edu/catalog](http://www.ecu.edu/catalog)) to learn about the current requirements, regulations, and policies.*

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**For more information contact:** Department of Engineering | [www.ecu.edu/engineering](http://www.ecu.edu/engineering)

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