The Master of Science in Applied Engineering (MSAE) degree program at Georgia Southern integrates state-of-the-art technology and interdisciplinary and conceptual science with hands-on, operational skills preparation. Graduates gain valuable knowledge and are placed in a unique position to make an immediate impact on their career and their employers. The undergraduate Manufacturing Engineering program was launched in the fall semester 2015. With a projected program rollout over four years, the first program graduates are expected in spring semester 2019. Graduate level courses in the areas of Lean and Six Sigma, Additive Manufacturing, NanoManufacturing, and Packaging will be offered as the rollout process progresses. These graduate courses are applicable as electives in MSAE concentrations as determined in consultation with the major advisor. MSAE concentrations are Electrical and Electronic Systems, Energy Science, Engineering Management, Information Technology, or Mechatronics. Thesis or Non-thesis tracks are available within the program. Research conducted through the thesis or independent study project provides opportunity for individualized in-depth study within the concentration.

**MFGE 5131G Lean and Six Sigma Green Belt-1**

3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.

This introductory course will emphasize communication using Six Sigma principles. It will help relate six sigma principles to the overall business mission and objectives. The Five step DMAIC model for organizational and process improvement will be emphasized. A wide range of process improvement techniques with the DMAIC model will be employed. Graduate students will be expected to independently research an additional topic, write a summary report, and present their findings to the class.  
Prerequisite(s): A minimum grade of "C" in MFGE 3132 or permission of the instructor for graduate students.

**MFGE 5132G Lean and Six Sigma Green Belt-2**

3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.

Graphic and numerical tools to implement DMAIC procedure will be introduced. This includes introduction to Normal distribution, process capability analysis, measurement systems analysis, correlation and regression analysis, statistical process control, value stream mapping as well as the use of six sigma in service based industries. Graduate students will be expected to independently research an additional topic, write a summary report, and present their findings to the class.  
Prerequisite(s): A minimum grade of "C" in MFGE 5131.

**MFGE 5238G Facilities Maintenance**

3 Credit Hours. 2 Lecture Hours. 2 Lab Hours.

An advanced topic course in the area of scheduled and preventative maintenance of automated manufacturing systems. Graduate students will be expected to independently research an additional topic, write a summary report, and present their findings to the class.  
Prerequisite(s): A minimum grade of "C" in MFGE 3337 and MFGE 3423 and MFGE 4533 or permission of instructor for graduate students.

**MFGE 5333G Additive Manufacturing Studio**

3 Credit Hours. 2 Lecture Hours. 2 Lab Hours.

A comprehensive overview of additive manufacturing, spanning from fundamentals to applications and technology trends. Students will learn the principles of additive manufacturing of polymers, metals, and ceramics and how process capabilities (rate, cost, quality) are determined by the material characteristics, process parameters, and machine designs. Graduate students will be expected to independently research an additional topic, write a summary report, and present their findings to the class.  
Prerequisite(s): A minimum grade of "C" in all of the following: MFGE 2421 and MFGE 3131 or ENGR 2112 and MENG 3135 and MENG 3333 or permission of instructor for graduate students.

**MFGE 5534G Packaging**

3 Credit Hours. 2 Lecture Hours. 2 Lab Hours.

This course will introduce functions of packaging and its fundamental characteristics; materials, processes, and technology used in package development; applications of various materials and systems used to package manufactured products. Graduate students will be expected to independently research an additional topic, write a summary report, and present their findings to the class.  
Prerequisite(s): A minimum grade of "C" in MENG 5138 and MFGE 3531 or permission of the instructor for graduate students.

**MFGE 5535G NanoManufacturing**

3 Credit Hours. 2 Lecture Hours. 2 Lab Hours.

This course provides a survey introduction of nano-science and technologies of micro-fabrication and nano-manufacturing. Graduate students will be expected to independently research an additional topic, write a summary report, and present their findings to the class.  
Prerequisite(s): A minimum grade of "C" in MFGE 3531 and MENG 5138 or permission of the instructor for graduate students.

**Cross Listing(s):** MFGE 5535.