Department of Manufacturing Engineering

The Department of Manufacturing Engineering offers students an applied laboratory oriented Bachelor of Science educational experience in Manufacturing Engineering. The Manufacturing Engineering curriculum is theoretical yet hands-on and career oriented. Students gain expertise and practical knowledge in Manufacturing Engineering (MfgE) in the major areas of Manufacturing Processes and Materials, Design for Manufacturability, Lean Manufacturing, Quality and Process Control, Automation and Robotics. Students have the opportunity to individually select a focus area of specialization in manufacturing. The specialization areas are: Lean and Six Sigma Black Belt, Manufacturing Automation, Materials Processing, SAP, and Occupational Health and Safety.

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 other MSAE concentrations as determined in consultation with the major advisor.

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 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 MFGE 2421 and MFGE 3131 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.