MANUFACTURING ENGINEERING (MFGE)

MFGE 5110. Advanced Manufacturing Quality Control. (3 Credits)
Concepts and techniques of real time statistical process control. Statistical analysis will primarily be conducted using software like Excel/Minitab/R. Students will be introduced to measurement system analysis and hypothesis testing techniques to obtain and test for quality data. These techniques will be applied using design of experiments. Process optimization methods like the Taguchi method will be implemented and control charts will be studied.
Enrollment Requirements: Department consent required.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MFGE%205110)

MFGE 5120. Advanced Manufacturing Processes and Products. (3 Credits)
Integrated analysis of traditional and non-traditional manufacturing processes. Topics include tolerance/ precision, surface finish/roughness, material properties of products such as hardness, and specific processes such as cutting, welding, metal deformation, ceramic processing, powder processing/metallurgy, and additive manufacturing.
Enrollment Requirements: Department consent required.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MFGE%205120)

MFGE 5130. Manufacturing Automation and Industry 4.0. (3 Credits)
Theory of automation as related to manufacturing and design integration, including hardware, software, and algorithm issues involved in fast and flexible product development cycles. Topics cover automated manufacturing systems, CAD-CAM and integration, programming and simulation, robotics, reverse engineering virtual reality, and sensor fusion for machine tool monitoring.
Enrollment Requirements: Department consent.
May be repeated for a total of 3 credits
View Classes (https://catalog.uconn.edu/course-search/?details&code=MFGE%205130)

MFGE 5140. Manufacturing Systems Planning. (3 Credits)
Decision making in production, process, and warehouse environments. Topics include analysis of production flows, bottlenecks and queuing, types of manufacturing operations, aggregate production planning, lot sizes and lead times, and pull production systems, warehouse layout, and inventory management.
Enrollment Requirements: Department consent.
May be repeated for a total of 3 credits
View Classes (https://catalog.uconn.edu/course-search/?details&code=MFGE%205140)

MFGE 5210. Data Science for Materials and Manufacturing. (3 Credits)
(Also offered as ME 5702.) This course will provide students with data analytics skills for knowledge discovery and design optimization. The students will also learn how to apply data mining and machine learning techniques to tackle the challenges in manufacturing and computational materials engineering. Topics include basic concepts of supervised/unsupervised learning, design of experiments and data collection, material image processing, surrogate modeling, optimization and model calibration, multi-fidelity modeling, and applications of data analytics in manufacturing and computational materials engineering problems.
Enrollment Requirements: Undergraduate degree in engineering or computer science, departmental or unit consent required. Recommended preparation: Knowledge or coursework in probability and statistics. Ability to read, interpret and modify Python and MATLAB code. Ability to use Python and MATLAB for analyzing data for the course project.
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MFGE 5220. Composites Manufacturing. (3 Credits)
(Also offered as ME 5443.) This course will provide an overview of multiple manufacturing methods for a select group of material types. Manufacturing methods will focus on production and process qualification for Aerospace Components. Students will have the opportunity to survey multiple materials, methods, and processes for part fabrication. Part evaluation methods will also be covered (destructive and non-destructive). There will be entry level exposure to manufacturing risk analysis through the use of industry standard tools (Manufacturing Flow, PFMEA, Control Plan, and PPAP).
View Classes (https://catalog.uconn.edu/course-search/?details&code=MFGE%205220)