

MANUFACTURING ENGINEERING TECHNOLOGY (MFGE)

MFGE 120 Basic Electricity 3 Hours

Basic concepts of AC and DC current, various types of circuits, electron theory and electrical laws.

Prerequisite(s): (MATH 116 (may be taken concurrently) with a minimum grade of C or MATH 116E (may be taken concurrently) with a minimum grade of C or MA 116C (may be taken concurrently) with a minimum grade of C) or (MATH 117 (may be taken concurrently) or MA 117C) or MATH 118 or MATH 119 or MATH 127 or MATH 121 or MATH 136 or MATH 137 or MATH 206 or MATH 237 or MATH 240 or MATH 275 or MATH 304 or MATH 305 or MATH 306

Recent Term(s) Offered: fall 2022; fall 2023; fall 2024

MFGE 205 CADD for Manufacturing 3 Hours

A solids modeling course designed to develop skills on the use of a PC based mechanical design software to build feature-based, parametric solid models of parts and assemblies. Manufacturing drawings - orthographics - of those parts and assemblies are produced.

Recent Term(s) Offered: fall 2023; fall 2024

MFGE 217 Industrial Materials 3 Hours

Survey of materials concepts and their applications to the production of manufactured items. Included will be basic procedures for testing manufacturing materials and discussions of materials processing concepts and cautions.

Prerequisite(s): (MATH 117 or MA 117C) or MATH 118 or MATH 119 or MATH 127 or MATH 121 or MATH 136 or MATH 137 or MATH 206 or MATH 237 or MATH 240 or MATH 304 or MATH 305 or MATH 306 or (MATH 116 with a minimum grade of C or MATH 116E with a minimum grade of C or MA 116C with a minimum grade of C) and (CHEM 105 and CHEM 106) or CHEM 109 or CHEM 116 or (CHEM 120 and CHEM 121)

Recent Term(s) Offered: spring 2022; fall 2022; spring 2023; fall 2023; spring 2024; fall 2024

MFGE 227 Introduction to Manufacturing Methods 3 Hours

A descriptive study of manufacturing processes using production equipment with laboratory experiences in forming and separating processes.

Prerequisite(s): (MATH 115 with a minimum grade of C or MA 115C with a minimum grade of C or MATH 116 with a minimum grade of C or MATH 115E with a minimum grade of C or MATH 116E with a minimum grade of C or MA 116C with a minimum grade of C or MATH 117 or MA 117C or MATH 118 or MATH 119 or MATH 127 or MATH 121 or MATH 136 or MATH 137 or MATH 206 or MATH 237 or MATH 240 or MATH 275 or MATH 304 or MATH 305 or MATH 306)

Recent Term(s) Offered: spring 2022; fall 2022; fall 2023; fall 2024

MFGE 271 Industrial Statistics 3 Hours

A study of statistical techniques typically used in industry for purposes of Statistical Process Control, material science research, and system planning and operation.

Prerequisite(s): (MATH 116 with a minimum grade of C or MATH 116E with a minimum grade of C or MA 116C with a minimum grade of C) or (MATH 117 or MA 117C) or MATH 118 or MATH 119 or MATH 127 or MATH 121 or MATH 136 or MATH 137 or MATH 206 or MATH 237 or MATH 240 or MATH 275 or MATH 304 or MATH 305 or MATH 306

Recent Term(s) Offered: spring 2022; fall 2023; spring 2024; fall 2024

MFGE 301 Introduction to Food Science and Technology 3 Hours

A comprehensive introduction to the basic concepts and principles of food science and the role of science in food processing and manufacturing.

Recent Term(s) Offered: None

MFGE 303 Food Laws and Regulations 3 Hours

History, development, and enforcement of major federal food statutes and regulations, with emphasis on the Federal Food, Drug, and Cosmetic Act (FDCA), the Food and Drug Administration (FDA) and the US Department of Agriculture (USDA) regulations. **Colonnade/Statewide General Education Code K-SY**

Prerequisite(s): 21 hours of Foundations and Explorations Courses, or junior status

Recent Term(s) Offered: spring 2022; summer 2022; fall 2022; spring 2023; summer 2023; fall 2023; spring 2024; summer 2024; fall 2024

MFGE 310 Safety in Industry 3 Hours

Safety and management techniques necessary to address the unique interaction of how industrial issues relate to safety in the workplace will be identified and regulated. This includes a study of applicable standards and methods of recognition, avoidance and prevention of potential hazards.

Prerequisite(s): (MATH 116 with a minimum grade of C or MATH 116E with a minimum grade of C or MA 116C with a minimum grade of C) or (MATH 117 or MA 117C or MATH 118 or MATH 119 or MATH 127 or MATH 121 or MATH 136 or MATH 137 or MATH 206 or MATH 237 or MATH 240 or MATH 304 or MATH 305 or MATH 306)

Recent Term(s) Offered: spring 2022; fall 2023; spring 2024; summer 2024; fall 2024

MFGE 328 Robotics and Machine Vision 3 Hours

Introduction to capabilities and limitations of robotic and machine vision systems, as well as fundamentals of programming. Laboratory activities are focused toward manufacturing applications.

Prerequisite(s): (MATH 116 with a minimum grade of C or MA 116C with a minimum grade of C or MATH 116E with a minimum grade of C) or (MATH 117 or MA 117C) or MATH 118 or MATH 119 or MATH 127 or MATH 121 or MATH 136 or MATH 137 or MATH 206 or MATH 237 or MATH 240 or MATH 275 or MATH 304 or MATH 305 or MATH 306

Recent Term(s) Offered: spring 2022; fall 2022; fall 2023; fall 2024

MFGE 342 Manufacturing Operations 3 Hours

Survey of methods for designing products for improved quality and manufacturability in industry, and designing manufacturing processes for improved reliability.

Prerequisite(s): (MATH 116 with a minimum grade of C or MA 116C with a minimum grade of C or MATH 116E with a minimum grade of C) or (MATH 117 or MA 117C) or MATH 118 or MATH 119 or MATH 121 or MATH 127 or MATH 136 or MATH 137 or MATH 206 or MATH 237 or MATH 240 or MATH 275 or MATH 304 or MATH 305 or MATH 306

Recent Term(s) Offered: spring 2022; spring 2023; spring 2024

MFGE 343 Automated Systems 3 Hours

Techniques of automated systems dealing with material handling, PLC, and off-the-shelf computer control systems. Programming the microprocessor for control applications may be included. Lecture and laboratory. Note: Permission of instructor may be required.

Prerequisite(s): MFGE 120 or EE 180 or EE 210

Recent Term(s) Offered: spring 2022; spring 2023; spring 2024; fall 2024

MFGE 352 Food Processing: Unit Operations 3 Hours

An overview of unit operations and processing techniques used in food processing industry. Topics include thermal processing, low temperature preservation, dehydration, irradiation, enzyme technology, separation and concentration, evaporation and distillation, and high-pressure and minimal processing methods.

Prerequisite(s): (MATH 116 with a minimum grade of C or MATH 116E with a minimum grade of C or MA 116C with a minimum grade of C) or (MATH 117 or MA 117C) or MATH 118 or MATH 119 or MATH 127 or MATH 121 or MATH 136 or MATH 137 or MATH 206 or MATH 237 or MATH 240 or MATH 275 or MATH 304 or MATH 305 or MATH 306

Recent Term(s) Offered: spring 2022; summer 2022; fall 2022; spring 2023; summer 2023; fall 2023; spring 2024; summer 2024; fall 2024

MFGE 355 System Design 3 Hours

A study of manufacturing facilities layout, work systems, forecasting and decision making. Applications of planning for facilities and equipment determining and controlling inventory, and goods.

Prerequisite(s): MATH 116 with a minimum grade of C and (MFGE 271 (may be taken concurrently) or ECON 206 (may be taken concurrently) or MATH 183 (may be taken concurrently) or STAT 301 (may be taken concurrently))

Restriction(s): Students with a semester level of Academy Junior or Freshman may **not** enroll.

Recent Term(s) Offered: None

MFGE 356 Systems Design and Operation 3 Hours

A study of manufacturing organizations and their administration, facilities layout, work systems, forecasting and decision making. Applications of resource planning determining product demand, controlling inventory, goods and services.

Prerequisite(s): ECON 206 or MATH 183 or STAT 301 or MFGE 271

Recent Term(s) Offered: spring 2022; fall 2022; fall 2023; fall 2024

MFGE 365 Systems Operation 3 Hours

A study of manufacturing organizations and their funding sources, determining product demand, time studies and production scheduling. Applications of resource, acquiring capital, determining product demand, and services.

Prerequisite(s): MFGE 271 or ECON 206 or MATH 183 or STAT 301

Restriction(s): Students with a semester level of Academy Junior or Freshman may **not** enroll.

Recent Term(s) Offered: None

MFGE 370 Computer Numerical Control 3 Hours

Computer-aided manufacturing techniques including manual and computer-assisted numerical control. Students program and operate CNC machining centers. Lecture and Laboratory. Note: Consent of instructor may be required.

Prerequisite(s): MFGE 227

Recent Term(s) Offered: spring 2022; spring 2023; spring 2024

MFGE 371 Quality Assurance 3 Hours

A study of quality assurance techniques. Application of Statistical Process Control (SPC), acceptance sampling, military standards 105D & 414. Quality organizations and standards.

Prerequisite(s): MATH 116 with a minimum grade of C or MATH 116E with a minimum grade of C or MA 116C with a minimum grade of C or MATH 117 or MA 117C or MATH 118 or MATH 119 or MATH 127 or MATH 121 or MATH 136 or MATH 137 or MATH 206 or MATH 237 or MATH 240 or MATH 275 or MATH 304 or MATH 305 or MATH 306

Recent Term(s) Offered: spring 2022; fall 2023; spring 2024; summer 2024; fall 2024

MFGE 381 Food Quality Assurance 3 Hours

Theory and application of quality assurance programs for the food processing industry, with emphasis on good manufacturing practices, sanitation programs and audits.

Prerequisite(s): (MFGE 301 or BIOL 207)

Recent Term(s) Offered: None

MFGE 390 Project Management 3 Hours

Core concepts of project management based on processes of initiating, planning, executing, controlling, and closing projects. Topics include project proposals, project selection, scope definition, CPM and PERT scheduling, budgeting, control techniques, and project manager skills.

Prerequisite(s): (MATH 116 with a minimum grade of C or MATH 116E with a minimum grade of C or MA 116C with a minimum grade of C) or (MATH 117 or MA 117C)

Restriction(s): Enrollment is limited to students in Manufacturing Engineering Tech (5006), Engineering Technology Mgmt (5007), Advanced Manufacturing (506), Architectural Science (518), Construction Management (533), Computer Information Tech (555) or Industrial(Voc,Career,Tech)Ed (599)

Recent Term(s) Offered: fall 2023; winter 2024; spring 2024; fall 2024

MFGE 394 Lean 3 Hours

Applications of lean principles across disciplines. This is the enhancement of customer value, elimination and reduction of all forms of waste from supplier to end user.

Prerequisite(s): (MATH 116 with a minimum grade of C or MATH 116E with a minimum grade of C or MA 116C with a minimum grade of C) or (MATH 117 or MA 117C) or MATH 118 or MATH 119 or MATH 127 or MATH 121 or MATH 136 or MATH 137 or MATH 206 or MATH 237 or MATH 240 or MATH 275 or MATH 304 or MATH 305 or MATH 306

Recent Term(s) Offered: spring 2022; fall 2023; spring 2024; summer 2024; fall 2024

MFGE 395 Food Safety 3 Hours

Development and implementation of the Hazard Analysis and Critical Control Point (HACCP) system and its application in the food processing industry.

Recent Term(s) Offered: spring 2022; summer 2022; fall 2022; spring 2023; summer 2023; fall 2023; spring 2024; summer 2024; fall 2024

MFGE 396 Introduction to Supply Chain Management 3 Hours

Introduction to supply chain management and risk pooling, logistics network configuration, the value of information, customer value and decision support systems.

Prerequisite(s): (MATH 116 with a minimum grade of C or MATH 116E with a minimum grade of C or MA 116C with a minimum grade of C) or (MATH 117 or MA 117C) or MATH 118 or MATH 119 or MATH 127 or MATH 121 or MATH 136 or MATH 137 or MATH 206 or MATH 237 or MATH 240 or MATH 275 or MATH 304 or MATH 305 or MATH 306

Recent Term(s) Offered: spring 2022; summer 2022; fall 2022; spring 2023; summer 2023; fall 2023; spring 2024; summer 2024; fall 2024

MFGE 430 Technology Management / Supervision / Team Building 3 Hours

This course will provide an introduction to the fundamentals of industrial supervision. Students will develop the skills, knowledge, and philosophies required to function in a highly technical, industrial environment in a supervisory capacity. Content includes a study of leadership, management, management-labor relations, supervisory intuition, and various legal issues.

Restriction(s): Students with a semester level of Freshman or Sophomore may **not** enroll.

Recent Term(s) Offered: spring 2022; fall 2023; spring 2024; summer 2024; fall 2024

MFGE 462 Commodity Food Processing 3 Hours

Principles of food processing, stages and operations, and product formulations for processing and manufacturing different categories of food products such as beverages, cereals, dairy, meats and poultry, and fruits and vegetables.

Prerequisite(s): MFGE 352

Recent Term(s) Offered: None

MFGE 490A Senior Research for Manufacturing Engineering Technology 3 Hours

Students work on capstone research projects utilizing skills and knowledge from prior courses in the Manufacturing Engineering Technology program. This is a lecture lab course that will incorporate all aspects of manufacturing in a simulated facility.

Prerequisite(s): (MFGE 356 (may be taken concurrently) with a minimum grade of C or MGT 314 (may be taken concurrently) with a minimum grade of C) and MFGE 390 with a minimum grade of C and MFGE 394 (may be taken concurrently)

Recent Term(s) Offered: spring 2022; spring 2023; spring 2024

MFGE 490B Senior Research for Engineering Technology Management 3 Hours

Students work on capstone research projects utilizing skills and knowledge from prior courses in the Engineering Technology Management program. Projects performed when possible will be for a specific client or industry. This course will require an approved course proposal prior to being able to register.

Prerequisite(s): (MFGE 356 (may be taken concurrently) with a minimum grade of C or MGT 314 (may be taken concurrently) with a minimum grade of C) and MFGE 390 with a minimum grade of C and MFGE 394 (may be taken concurrently)

Recent Term(s) Offered: spring 2022; spring 2023; spring 2024