Manufacturing Engineering Courses

Courses

MFG 5191. Individual Studies.
Individual Studies (0-0-1) Individual variable-credit for non-thesis related research, design or analysis on advance phases of manufacturing engineering problems conducted under the direct supervision of a faculty member. A maximum of 3 credit hours may be applied towards the M.S. degree.
Prerequisite: department approval.
Department: Manufacturing Engineering
1 Credit Hour
1 Total Contact Hour
0 Lab Hours
0 Lecture Hours
1 Other Hour

MFG 5195. Graduate Seminar.
Graduate Seminar (1-0) Lectures and discussions of various topics in Manufacturing Engineering by faculty, graduate students, and speakers from industry and other institutions. Required for all non thesis graduate students during each semester of full-time enrollment they are in the graduate program. This seminar will be counted only once toward graduate degree requirements.
Department: Manufacturing Engineering
1 Credit Hour
1 Total Contact Hour
0 Lab Hours
1 Lecture Hour
0 Other Hours

MFG 5291. Individual Studies.
Individual Studies (0-0-2) Individual variable-credit for non-thesis related research, design or analysis on advanced phases of manufacturing engineering problems conducted under the direct supervision of a faculty member. A maximum of 3 credit hours may be applied towards the M.S. degree.
Prerequisite: Department approval.
Department: Manufacturing Engineering
2 Credit Hours
2 Total Contact Hours
0 Lab Hours
0 Lecture Hours
2 Other Hours

MFG 5311. Design for Manufacturability.
Design for Manufacturability (3-0) Theoretical and practical aspects of the implications that the manufacturing process has on the design activities will be studied. Issues such as rapid prototyping, tolerancing, geometric modeling, capabilities of manufacturing processes, design for quality and maintainability and others will be covered. The course will consist of lectures, class discussions, and student projects.
Department: Manufacturing Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

MFG 5312. Strategic Design-Mfg Processes.
Strategic Design of Manufacturing Processes (3-0) Strategic and tactical aspects of the design of manufacturing processes will be covered in this course. Techniques such as concurrent engineering, quality function deployment, group technology, process planning and others will be covered. The course will consist of lectures, class discussions, and student projects.
Department: Manufacturing Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
**MFG 5313. Integration of Mfg Systems.**
Integration of Manufacturing Systems (3-0) This course will focus on the theoretical and practical issues of the integration of independent components of the manufacturing systems. Deterministic and stochastic modeling techniques will be used to analyze the interaction of the different components of a discrete manufacturing system. Special emphasis will be placed on the effects of automation on scheduling strategies and materials flow. The course will consist of lectures, class discussions, and student projects. Prerequisites: IE 4392 and IE 4391.

**Department:** Manufacturing Engineering

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

**MFG 5314. Robotics & Flexible Automation.**
Robotics and Flexible Automation (3-0) Modern concepts of robotics and flexible automation including power and control mechanisms, flexible material handling systems, programmable controllers, interfacing and end-of-arm tooling.

**Department:** Manufacturing Engineering

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

**MFG 5315. Analysis-Mat'l Handling System.**
Analysis of Material Handling Systems (3-0) Study of the most recent developments in research and applications of material handling systems. Special emphasis will be placed on models and techniques that allow a good design of integrated material handling systems in a discrete production environment. The course will consist of lectures, class discussions, and student projects.

**Department:** Manufacturing Engineering

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

**MFG 5320. Tooling Engineering.**
Tooling Engineering (3-0) Design of tooling for various manufacturing processes such as plastic injection, metal casting, stamping, forming, etc. Materials properties, tolerances, cost and tool interchange ability are covered.

**Department:** Manufacturing Engineering

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

**MFG 5321. Modeling/Analysis-Mfg Process.**
Modeling and Analysis of Manufacturing Processes (3-0) This project-oriented course is designed to be a capstone course for the graduate students of manufacturing engineering. The student will be expected to use the analytical tools to formulate, model, and solve real-life manufacturing problems. At the end of the course the student will give and open presentation of the results of the term project. Prerequisites: MFG 5312 and MFG 5313.

**Department:** Manufacturing Engineering

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

**Prerequisite(s):** (MFG 5312 w/C or better) AND (MFG 5313 w/C or better)
**MFG 5322. Materials in Mfg Processes.**
Materials in Manufacturing Processes (3-0) This course will focus on the selection of materials for manufacturing processes. In particular it will cover the properties of different materials as they apply to manufacturing such as: Formability, machinability, hardening, weldability. It will also cover different types of materials such as: Metal alloys, plastics, composites, ceramics and adhesives. The course will consist of lectures, class discussions, and student projects. Prerequisite: CE 2324 and MME 2303.

**Department:** Manufacturing Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

**MFG 5330. Concepts in Adv Manufacturing.**
Concepts in Advanced Manufacturing (3-0) Introduction to modern concepts in manufacturing systems with special emphasis on discrete production systems. Production control systems such as MRP, KANBAN and just-in-time are covered. The advantages of group technology and FMS will be studied.

**Department:** Manufacturing Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

**MFG 5350. Reliability & Maintainability.**
Reliability and Maintainability (3-0) This course deals with the application of reliability theory in engineering design. In particular, the course covers reliability functions and gives broad guidelines for designing reliability into a given situation and for determining the appropriate level of reliability. Accelerated testing, reliability management, the relationship between reliability and quality and maintainability and it's management will also be covered.

**Department:** Manufacturing Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

**MFG 5359. Computer-Aided Manufacturing.**
Computer-Aided Manufacturing (3-0) Modern concepts of using computers for manufacturing, including the theory of computer numerical control (CNC) and direct numerical control (DNC), CNC mailing, CNC turning and computer-aided process design.

**Department:** Manufacturing Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

**MFG 5360. Computer Vision.**
Computer Vision (3-0) Fundamental concepts associated with the construction of meaningful descriptions of physical objects from images; including image segmentation, two-dimensional and three-dimensional representations, knowledge representations, matching and inference.

**Department:** Manufacturing Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

**MFG 5362. Graph Elem Comp-Aid Design/Mfg.**
Graphical Elements of Computer-Aided design and Manufacturing (3-0) Modern concepts of using computer graphics for engineering design and manufacturing, including computer graphics standards such as core graphics and GKS, graphics input/output devices, software design and programming techniques for computer-aided design and manufacturing (CAD/CAM). Prerequisite: MFG 5359 or IE 5359.

**Department:** Manufacturing Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
The course introduces fundamental concepts of green energy and environmentally conscious (benign) manufacturing. This course also acquaints students with the energy and environmental issues surrounding product and process design decisions. Identification and development of strategies, techniques, and methods that can be used to make more environmentally responsible decisions are discussed. The life cycle assessment of (LCA) is implemented and illustrated with software and case studies.

Department: Manufacturing Engineering

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

MFG 5390. Special Topics.
Special Topics (3-0) Advanced topics of contemporary interest in mechanical engineering. May be repeated for credit when topic varies. Prerequisite: Department approval.

Department: Manufacturing Engineering

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

MFG 5391. Individual Studies.
Individual Studies (0-0-3) Individual variable-credit for non-thesis related research, design or analysis on advanced phases of manufacturing engineering problems conducted under the direct supervision of a faculty member. A maximum of 3 credit hours may be applied towards the M.S. degree. Prerequisite: Department approval.

Department: Manufacturing Engineering

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours

MFG 5394. Graduate Research.
Graduate Research (0-0-3) Individual variable-credit research of contemporary topics in manufacturing engineering. Prerequisite: Department approval.

Department: Manufacturing Engineering

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours

MFG 5396. Graduate Projects.
Graduate Projects (0-0-3) Individual research, design, or analysis on advanced phases of manufacturing engineering problems conducted under the direct supervision of a faculty member. The courses, including a written report, are required of all students in the non-thesis option. Prerequisite: Department approval.

Department: Manufacturing Engineering

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours

MFG 5397. Graduate Projects.
Graduate Projects (0-0-3) Individual research, design or analysis on advanced phases of manufacturing engineering problems conducted under the direct supervision of a faculty member. The courses, including a written report, are required of all students in the non-thesis option. Prerequisites: MFG 5396 and department approval.

Department: Manufacturing Engineering

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours
MFG 5398. Thesis.
Thesis (0-0-3) Initial work on the thesis.
Department: Manufacturing Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours

MFG 5399. Thesis.
Thesis (0-0-3) Continuous enrollment required while work on the thesis continues. Prerequisite: MFG 5398.
Department: Manufacturing Engineering
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours
Prerequisite(s): (MFG 5398 w/P or better)

MFG 5694. Graduate Research.
Graduate Research (0-0-6) Individual variable-credit research of contemporary topics in mechanical engineering. Prerequisite: Department approval.
Department: Manufacturing Engineering
6 Credit Hours
6 Total Contact Hours
0 Lab Hours
0 Lecture Hours
6 Other Hours