TOOL AND DIE MAKING (439)

439-306 - Basic Machining - Turning
Introduces basic instruction for turning operations on a lathe. Emphasis will be given on lathe setup, controls, tooling, workholding, safety and general operational guidelines. Students learn about different materials, machinability and cutting tool terminology. (Prerequisites: 439-307 Basic Machining; 439-399 2D CAD Mold and Die Print Reading; 444-302 CNC Controls; 444-350 Basic Programming)
2 Credit hours
18 Lecture hours
54 Lab hours

439-307 - Basic Machining
Introduces machine tools and how they are applied in today's manufacturing environment. Students will begin with machining basics such as tramming in milling machine and machine vises. Concepts of squaring up blocks, drilling operations, and milling simple features are applied. Students will learn the skills to use precision measuring equipment and different measuring techniques. Machining strategies, speeds and feeds, and shop safety are explained. (Corequisite: 439-399 2D CAD Mold and Die Print Reading)
3 Credit hours
36 Lecture hours
72 Lab hours

439-308 - Manual Manufacturing
Focuses on machining with multiple setups used in a manufacturing environment. Surface grinding is introduced by squaring blocks, and grinding angles using sine plates on manual and automatic surface grinders. Process planning will be introduced by examining different approaches to completing their projects. Students will work with milling machines, drill presses, and surface grinding machines and perform the various operations involved in the use of manual machines. (Prerequisites: Completion of or concurrent enrollment in 439-307 Basic Machining, 439-399 2D CAD Mold and Die Print Reading)
3 Credit hours
36 Lecture hours
72 Lab hours

439-314 - EDM Control Operations
Introduces students to the sinker and wire Electrical Discharge Machine (EDM) process. Students will learn basic machine components, maintenance, part layout, part alignment, part programming and operations of the Electrical Discharge Machines (EDM's). (Prerequisites: 439-307 Basic Machining; 439-399 2D CAD Mold and Die Print Reading; 444-302 CNC Controls; 890-101 College 101)
1 Credit hours
18 Lecture hours
18 Lab hours

439-324 - Pierce and Die Making
Introduces basic die making principles and theory to provide a basis for the construction of a pierce and blank die. Students build, assemble and run a stamping die using various tool room equipment including milling machines, surface grinders and CNC lathes. (Prerequisites: 439-306 Basic Machining – Turning; 439-314 EDM Control Operations; 444-311 Tooling and Workholding; 444-342 Advanced CAM 2D; 444-346 Design for 3D Machining; 444-365 CNC Machining Center Operation)
3 Credit hours
36 Lecture hours
72 Lab hours

439-329 - Industrial Die Making
Focuses on the construction of stamping dies used in industry such as: compound, progressive, forming and hand transfer dies. Students develop skills using various tool room equipment including milling machines, surface grinders, CNC mills, and wire/sinker EDM machines to build various die components. Current 3D and CAM softwares are used to toolpath and manipulate different components of the die. Students are exposed to a team building atmosphere using problem solving and communication skills to overcome die making issues as they arise. (Prerequisite: 439-324 Pierce and Die Making)
3 Credit hours
36 Lecture hours
72 Lab hours

439-334 - Single Cavity Mold Making
Introduces students to fundamental theory of single-cavity mold making construction. Explores basic construction principles, molding processes and molding terminology. Students will develop skills using various tool room equipment including milling machines, surface grinders, CNC mills, and wire and conventional EDM machines. CNC software is used to construct tool paths needed to machine molding components. Emphasis is on plastic injection molding. Exposes students to team building and problem-solving strategies used in industry. (Prerequisites: 439-306 Basic Machining-Turning; 439-314 EDM Control Operations; 444-311 Tooling and Workholding; 444-342 Advanced CAM 2D; 444-346 Design for 3D Machining; 444-365 CNC Machining Center Operation)
3 Credit hours
36 Lecture hours
72 Lab hours

439-339 - Industrial Mold Making
Focuses on the theory of multi-cavity mold making construction. Students will develop skills using various tool room equipment including milling machines, surface grinders, CNC machining centers, and wire and conventional EDM machines. CNC software is used to construct tool paths needed to machine molding components. Emphasis is placed on plastic injection molding. Exposes students to team building and problem-solving strategies used in industry. (Prerequisite: 439-334 Single-Cavity Mold Making)
3 Credit hours
36 Lecture hours
72 Lab hours

439-399 - 2D CAD Mold and Die Print Reading
Emphasizes the fundamentals of mold and die print reading for the tool and die making industry. Reviews basics of measuring systems and methods. Emphasizes orthographic and visual perception of drawings. Stresses areas of dimensioning, tolerancing, detail and assembly drawings. Introduces CAD 2D and its applications in producing two-dimensional prints. Students will use CAD to reproduce part drawings used in industry. (Corequisite: 439-307 Basic Machining)
2 Credit hours
72 Lecture hours