MORAINE PARK
TECHNICAL COLLEGE
1-800-472-4554 | TTY/VP. Use Relay/VRS

NUMERICAL CONTROL (444)

444-100 - CNC Internship
144 hour on the job training paid internship for students participating in CNC boot camp. Interns are hired by companies as probationary employees during the boot camp training period with the goal of placing all candidates who successfully complete the program into regular full-time employment.
2 Credit hours
144 Other hours

444-302 - CNC Controls
Introduces CNC control applications, functions and features. Emphasizes creating, editing, saving and retrieving CNC programs across a variety of communication platforms and controls. Students will learn MDI (Manual Data Input) functions, tool and work piece data settings. Proper program formatting and execution of programs in auto mode as well as DNC will be performed. It is recommended (but not required) that students complete 103-189 Microsoft Windows or 103-159 Computer Literacy - Microsoft Office before enrolling in this course.
2 Credit hours
18 Lecture hours
54 Lab hours

444-311 - Tooling and Workholding
Introduces tooling and workholding applications as it applies to the manufacturing process. Focuses on the selection of tooling and workholding for end use application. Areas of study are general use tooling, tooling specific to end application, open setup fixturing, hard tooling fixtures and soft jaw machining. Emphasizes efficiency and waste elimination will be studied. (Prerequisite: 439-308 Manual Manufacturing)
2 Credit hours
18 Lecture hours
54 Lab hours

444-312 - Product Engineering - Lean Manufacturing
Applies the principles of lean manufacturing for continuous improvement to the manufacturing setting. Students explore standardized work, workplace organization, visual controls, setup reduction, batch size reduction, point-of-use storage, quality at the source, workforce practices, and pull systems. This course is restricted to CNC Tool and Die Technologies program students. It is recommended that 444-313 Product Manufacturing be taken the semester after completing this course. (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)
1 Credit hours
36 Lab hours

444-313 - Product Manufacturing
Students will simulate a manufacturing environment by producing a product. Emphasizes implementation of a project plan, teamwork, problem solving and decision making. This course is restricted to CNC Tool and Die Technologies program students. It is recommended that this course be taken the semester after completing 444-312 Product Engineering - Lean Manufacturing. (Prerequisite: 444-312 Product Engineering - Lean Manufacturing)
2 Credit hours
72 Lab hours

444-340 - Beginning CAM - Mastercam
Introduces students to the advanced dimensional (2D) Computer-Aided Machining (CAM) utilizing Mastercam software. Students run CAM software on a computer to generate a 2D CNC program. Students develop skills in the generation of 2D geometry; generation of 2D toolpath; CNC machine code generation; programming, editing and manipulation; speed and feed calculation; and optimization of programs for maximum efficiency. Working knowledge of CNC programming language is desired. (Prerequisite: 444-350 Basic Programming)
2 Credit hours
18 Lecture hours
54 Lab hours

444-342 - Advanced CAM 2D
Applies advanced techniques to 2-D CAM such as feature recognition, multiple parts and offsets, and the creation of tool and material libraries. Selection of tooling and machining parameters for end use will be emphasized. (Prerequisites: 103-159 Computer Literacy - Microsoft Office; 444-340 Beginning CAM - Mastercam)
2 Credit hours
18 Lecture hours
54 Lab hours

444-343 - Beginning CAM 3D
Demonstrates the methods of machining 3-D geometry. Students apply cutting methods using various CAM software to machine desired parts. Students generate tool paths and analyze the posting. (Prerequisites: 444-342 Advanced CAM 2-D; 444-346 Design for 3D Machining)
2 Credit hours
18 Lecture hours
54 Lab hours

444-344 - Advanced CAM 3D
Introduces advanced multi-surface machining applications in CAM environment. Emphasizes proper multi-surface machining techniques including: tooling selection, piece-part workholding, proper cutting speeds and feeds and process flow. Four- and five-axis techniques and concepts will be explored. A working knowledge of CNC language is helpful but not required. (Prerequisite: Completion of or concurrent enrollment in 444-343 Beginning CAM 3D)
2 Credit hours
18 Lecture hours
54 Lab hours

444-346 - Design for 3D Machining
Demonstrates the methods of constructing 3-D geometry to be used for generating tool path. Students create geometry, create surfaces and analyze surfaces for dimensional accuracy and usability. Students create tool path and a machined part. Experience with 2-D desirable. Course is designed for the 2011-12 CNC/Tool and Die curriculum. (Prerequisites: 103-159 Computer Literacy - Microsoft Office; 439-307 Basic Machining; 439-399 2D CAD Mold and Die Print Reading)
2 Credit hours
18 Lecture hours
54 Lab hours

444-350 - Basic Programming
Exposes manufacturing students to the field of manual programming of Computer Numerical Control (CNC) machine tools. Studies types of CNC controls, machinery, programming formats and basic terminology. Applies programming technique, print interpretation, applied math, computer skills and measuring techniques. (Prerequisite: Completion of or concurrent enrollment in 103-159 Computer Literacy - Microsoft Office; 439-307 Basic Machining; 439-399 2D CAD Mold and Die Print Reading; 444-302 CNC Controls)
3 Credit hours
36 Lecture hours
72 Lab hours

444-355 - CNC Machining Center Programming
Exposes the manufacturing students to advanced manual programming of machining centers. Types of CNC controls, machinery, programming formats and basic terminology will be studied. Advanced programming techniques, print interpretation, applied math, computer skills and measuring techniques will be applied. Working knowledge of CNC programming and CAM is helpful. (Prerequisite: 444-350 Basic Programming)
2 Credit hours
36 Lecture hours
36 Lab hours

444-365 - CNC Machining Center Operation
Develops an understanding of the complete operation of a three-dimensional machining center. Includes setup, fixturing, operation and troubleshooting of the program. (Prerequisite: 444-355 CNC Machining Center Programming)
2 Credit hours
36 Lecture hours
36 Lab hours

444-375 - Turning Center Operation
Exposes the manufacturing students to the field of turning center operation. Types of CNC communication, programming formats and basic terminology will be studied. Programming technique, print interpretation, applied math, computer skills and measuring techniques will be applied. (Prerequisite: 444-385 Turning Center Programming)
2 Credit hours
36 Lecture hours
36 Lab hours

444-385 - Turning Center Programming
Applies the knowledge received in Computer-Aided Machining 2-D and Computer-Aided Machining 3-D to a practical application on a turning center and CNC chucker. Covers direct computer control, editing, and speed and feed control overwrite. Working knowledge of CNC programming and CAM desirable. (Prerequisite: 444-350 Basic Programming)
2 Credit hours
36 Lecture hours
36 Lab hours

444-386 - Advanced Machining Center
Introduces advanced machining center applications in the manufacturing environment. Emphasizes proper cutting speeds and feeds, and process flow is applied. Advanced control features such as scaling, mirror imaging, local coordinate setting, offset pre-setting, background editing and parametric family-of-parts programming will be explored. Multi-side "tombstone" and pallet changing methods will be explored. (Prerequisite: 444-355 CNC Machining Center Programming)
2 Credit hours
36 Lecture hours
36 Lab hours

444-391 - Coordinate Measuring Machine
Introduces Brown and Sharpe Programmable CMM with PC-DMIS inspection software. Students receive hands-on exposure to Coordinate Measuring Machine programming techniques. Students will conduct laboratory experiments using the Coordinate Measuring Machine. (Prerequisites: 439-399 2-D CAD Mold and Die Print Reading; 804-361 Occupational Math 2)
3 Credit hours
36 Lecture hours
72 Lab hours

444-394 - Advanced Turning Center
Introduces advanced turning center applications in the manufacturing environment. Emphasizes proper cutting speeds and feeds and process flow is applied. Advanced control features such as automated stock feeding, live tooling and "C" axis contouring, background editing and parametric family-of-parts programming will be explored. (Prerequisite: 444-385 Turning Center Programming)
2 Credit hours
36 Lecture hours
36 Lab hours