COMPUTERIZED MANUFACTURING & MACHINING (CMM)

CMM 110 (3 credit hours)
Fundamentals of Machine Tools - A
Provides the basic principles needed for a solid foundation in machine tool technology. Covers shop safety, bench work, drill press, power saw, measurement, and mills. Lecture:1 credit (15 contact hours). Lab: 2 credits (60 contact hours).
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

CMM 112 (3 credit hours)
Fundamentals of Machine Tools - B
Provides the basic principles needed for a solid foundation in machine tool technology. Includes shop safety, bench work, drill press, power saw, measurement, and lathes. Laboratory: 3 credits (90 contact hours).
Pre-requisite: (CMM 110 with a grade of C or greater) or Consent of Instructor.
Attributes: Technical
Components: LAB: Laboratory

CMM 114 (6 credit hours)
Fundamentals of Machine Tools
Provides the skills and knowledge that is needed to progress through the machine tool program. Includes safety and bench work. Introduces the basic power equipment and machine tools that are used in the machine trades which include: drill presses, power saws, measurement instruments, mills and lathes. Lecture: 1 credits (15 contact hours). Lab: 5 credits (150 contact hours).
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

CMM 118 (2 credit hours)
Metrology/Control Charts
Provides the basic principles in using precision measurement instruments and their application to inspection and quality control. Lecture/Lab: 2.0 credits (45 contact hours).
Attributes: Technical
Components: LEC: Lecture

CMM 120 (3 credit hours)
Applied Machining I
Consists of intermediate level skills using machining machines and surface grinders. Includes the selection of grinding wheels. Lecture: 1 credit (15 contact hours). Lab: 2 credits (60 contact hours).
Pre-requisite: ((CMM 110 and 112) or (CMM 114) with a grade of C or greater) or Consent of Instructor.
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

CMM 122 (3 credit hours)
Applied Machining II
Carries the student to higher levels in the operation of machine tools. Lab: 3.0 credits (90 contact hours).
Pre-requisite: (CMM 120 with a grade of C or greater) or Consent of Instructor.
Attributes: Technical
Components: LAB: Laboratory

CMM 124 (6 credit hours)
Applied Machining
Allows the student to begin performing skills that will combine the use of different types of machine and begin to give them a complete picture of the machine tool career. Lecture/Lab: 6.0 credits (165 contact hours).
Pre-requisite: ((CMM 110 and CMM 112) or (CMM 114) with a grade of C or greater) or Consent of Instructor.
Attributes: Technical
Components: LEC: Lecture

CMM 130 (3 credit hours)
Manual Programming
Introduces the student to CNC codes and programming, set-up and operation of CNC machine tools. Lecture: 1.0 credit (15 contact hours). Lab: 2.0 credits (60 contact hours).
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

CMM 132 (3 credit hours)
CAD/CAM/CNC
Introduces the student to CAD/CAM/CNC systems which includes CAM software. Lecture: 1 credit (15 contact hours). Lab: 2 credits (60 contact hours).
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

CMM 134 (6 credit hours)
Manual Programming CAD/CAM/CNC
Introduces the student to CAD/CAM/CNC systems, CNC format, the Cartesian Coordinate System, CNC codes and programming, set-up and operation of CNC machine tool. Lecture: 2.0 credits (30 contact hours); Laboratory: 4.0 credits (120 contact hours).
Pre-requisite: ((CMM 110 and CMM 112) or CMM 114) with a grade of C or greater] or Consent of Instructor.
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

CMM 138 (6 credit hours)
Intro. to Programming & CNC Machines
Introduces CAD/CAM and CNC equipment. Covers program codes and set up operations used on a variety of machine tools including technologies like waterjet. Lecture/Lab: 6.0 credits (150 contact hours).
Pre-requisite: ((CMM 110 and CMM 112) or (CMM 114) with a grade of C or greater) or Consent of Instructor.
Attributes: Technical
Components: LEC: Lecture

CMM 150 (2 credit hours)
Shop Theory
Covers shop theory, processes, and basic concepts of machine tool applications utilized in the tool and die field. Includes areas and machine concepts: safety, measurement, layout work, bench work, saws, drills, drilling machines, mills and lathes. Lecture: 2.0 credits (30 contact hours).
Attributes: Technical
Components: LEC: Lecture

CMM 151 (3 credit hours)
Machinery's Handbook and Metallurgy
Introduces the Machinery's Handbook as a reference source for solving manufacturing problems and provides a working knowledge of the principles and concepts contained in the Handbook. Explores processes involved in heat-treating steels to a specific hardness, toughness, wear capability. Covers the identification, classification, application, and processing of Tool Steels. Lecture: 3.0 credits (45 contact hours).
Attributes: Technical
Components: LEC: Lecture

CMM 152 (3 credit hours)
Jigs, Fixtures and Gaging
Introduces jigs, fixtures and work holding devices, including separate uses and principles. Applies machining processes to design jigs and fixtures. Uses print knowledge to identify part datums for gaging points. Lecture: 3.0 credits (45 contact hours).
Attributes: Technical
Components: LEC: Lecture

CMM 153 (3 credit hours)
Mold Theory
Presents mold-making including thermoplastic and thermosetting materials, compression mold, transfer mold, injection molds and mold components, the heating and cooling of molds and the methods of producing cores and cavities. Lecture: 3.0 credits (45 contact hours).
Attributes: Technical
Components: LEC: Lecture

CMM 154 (3 credit hours)
Die Theory
Presents basic die making including die sets, punch presses, blanking dies, piercing dies, screw and dowell holes, punch and punch blocks, die life, bending dies, pilots, die block construction, stock strippers, stock guides, progressive dies, stock strips and secondary operations of notch, trim, and shave. Lecture: 3.0 credits (45 contact hours).
Attributes: Technical
Components: LEC: Lecture

CMM 210 (3 credit hours)
Industrial Machining I
Covers the classification of metals, identification of tool steels and their applications. Requires the student to perform advanced milling machine operations that simulate industry standards. Lecture: 1.0 credit (15 contact hours). Lab: 2.0 credits (60 contact hours).
Pre-requisite: ((CMM 122 or 124) with a grade of C or greater) or Consent of Instructor.
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

CMM 212 (3 credit hours)
Industrial Machining II
Permits the student to receive instruction in any area where advanced work is needed or an area where there is student interest. Lab: 3.0 credits (90 contact hours).
Pre-requisite: (CMM 210 with a grade of C or greater) or Consent of Instructor.
Attributes: Technical
Components: LAB: Laboratory

CMM 214 (6 credit hours)
Industrial Machining
Covers the classification of metals, identification of tool steels and their applications. Requires the student to perform advanced milling machine operations that simulate industry standards. Includes special projects in this course so the student will receive instruction in a specific area. Lecture/Lab: 6.0 credits (165 contact hours).
Pre-requisite: ((CMM 122 or CMM 124) with a grade of C or greater) or Consent of Instructor.
Attributes: Technical
Components: LEC: Lecture

CMM 218 (8 credit hours)
Advanced Machining Techniques for Manufacturing
Allows for construction of sinker electrodes in the production of die and mold forms. Includes wire electrodischarge machines (edm) machining of die sections, punch retainers, stripper plates, punch forms and use of cylindrical grinder ID and OD and angular grinding on die and mold components. Lecture: 2.0 credits (30 contact hours). Laboratory: 6.0 credits (180 contact hours).
Pre-requisite: CMM 216 with a grade of C or greater.
Components: LAB: Laboratory, LEC: Lecture

CMM 220 (4 credit hours)
Advanced Industrial Machining I
Allows for construction of electrodes and the production of parts by the use of an Electrical Discharge machine. (National Standards require EDM and cylindrical grinder training. Colleges lacking this equipment can only present theory only. KCTCS is presently trying to acquire EDM and cylindrical grinders.) Laboratory: 4 credits (120 contact hours).
Pre-requisite: ((CMM 130 and CMM 132) or (CMM 134) and (CMM 212 or CMM 214) with a grade of C or greater) or Consent of Instructor.
Attributes: Technical
Components: LAB: Laboratory

CMM 222 (2 credit hours)
Advanced Industrial Machining II
Advances students to a higher level of industrial standards by exposing them to additional tasks using a cylindrical grinder. **National Standards require EDM and cylindrical grinder training. Those programs lacking this equipment can only present theory. KCTCS is presently trying to acquire EDM and cylindrical. Lab: 2.0 credits (60 contact hours).
Pre-requisite: (CMM 212 or CMM 214 with a Grade of C or greater) or Consent of Instructor.
Attributes: Technical
Components: LAB: Laboratory

CMM 224 (6 credit hours)
Advanced Industrial Machining
Designed to allow for the construction of electrodes and the production of parts by the use of an Electric Discharge Machine (EDM), cylindrical grinder, and other type of grinders. **National Standards require EDM and cylindrical grinder training. Colleges lacking this equipment can only present theory. KCTCS is presently trying to acquire EDM and cylindrical grinders. Laboratory: 6.0 credits (180 contact hours or 270 Clinical Contact).
Pre-requisite: (CMM 134 and (CMM 212 or CMM 214) with a grade of C or greater) or Consent of Instructor.
Attributes: Technical
Components: LAB: Laboratory

CMM 230 (6 credit hours)
Conversational Programming
Introduces the student to conversational programming of CNC machine tools. Lecture/Lab: 6.0 credits (150 contact hours).
Pre-requisite: Consent of Instructor.
Attributes: Course Also Offered in Modules, Technical
Components: LEC: Lecture

CMM 234 (6 credit hours)
CNC Machines & Coding Practices
Introduces the student to conversational programming of CNC machine tools to include conversational setup and run options found on a CNC water jet machine. Lecture/Lab: 6.0 credits (150 contact hours).
Pre-requisite: ((CMM 130 and CMM 132) or (CMM 134 or CMM 138) with a grade of C or greater) or Consent of Instructor.
Attributes: Technical
Components: LEC: Lecture

CMM 240 (6 credit hours)
Introduction to 3-D Programming
Introduces 3-D Programming using CAM systems to effect engineering changes that enhance productivity. Uses CAM system to create and produce complex 3-D parts. Lecture: 2.0 credits (30 contact hours). Lab: 4.0 credits (120 contact hours or 180 clinical contact).
Pre-requisite: ((CMM 130 and CMM 132) or (CMM 134 or CMM 138) with a grade of C or greater) or Consent of Instructor.
Attributes: Course Also Offered in Modules, Technical
Components: LEC: Lecture

CMM 244 (6 credit hours)
Advance Programming/Setup Practices
Uses CAM systems to effect engineering changes that enhance productivity to create and produce complex shapes on the CNC mill, lathe, EDM and water jet machines. Lecture/Lab: 6.0 credits (150 contact hours).
Pre-requisite: ((CMM 2301 and CMM 2302) or (CMM 230) with a grade of C or greater) or consent of instructor.
Attributes: Technical
Components: LEC: Lecture

CMM 298 (1 credit hours)
Practicum
Provides supervised on-the-job work experience related to the student's educational objectives. (Students participating in the Practicum do not receive compensation.) Practicum: 1.0 credit (75 contact hours).
Pre-requisite: Permission of the Instructor.
Attributes: Technical
Components: PCM: Practicum

CMM 299 (1 credit hours)
Cooperative Education Program
Provides supervised on-the-job work experience related to the student's educational objectives. (Students participating in the coop do receive compensation.) Co-Op: 1.0 credit (75 contact hours).
Pre-requisite: Permission of Instructor.
Attributes: Technical
Components: COP. Co-op

CMM 2301 (3 credit hours)
Introduction to Conversational Programming
Introduces students to conversational programming guidelines which will include program preparation, conversational input, and minor editing. Lecture: 1.0 credit (15 contact hours). Lab: 2.0 credits (60 contact hours).
Pre-requisite: Consent of Instructor.
Components: LEC: Lecture

CMM 2302 (3 credit hours)
Conversational Editing and Subroutines
Introduces students to performing editing routines, to subroutines, and to programs that contain loops. Requires students to interpret error messages from the control. Lecture: 1.0 credit (15 contact hours). Lab: 2.0 credits (60 contact hours).
Pre-requisite: CMM 2301 or Consent of Instructor.
Components: LEC: Lecture

CMM 2401 (3 credit hours)
Introduction to 3D Code Sequencing and Tool Path Production
Introduces students to creation of 3-D models and allows use of those models to be used in creation of tool paths for CNC machine tools. Lecture: 1.0 credit (15 contact hours). Lab: 2.0 credits (60 contact hours).
Pre-requisite: ((CMM 130 and CMM 132) or (CMM 134) with a grade of C or greater) or Consent of Instructor.
Components: LEC: Lecture

CMM 2402 (3 credit hours)
Advanced 3D Code Sequencing and Macro Systems
Introduces 3-D Programming using CAM systems to effect engineering changes that enhance productivity. Uses the CAM system to create and produce complex 3-D parts. Lecture: 1.0 credit (15 contact hours). Lab: 2.0 credits (60 contact hours).
Pre-requisite: ((CMM 130 and CMM 132) or (CMM 134 or CMM 138) and (CMM 2401) with a Grade of C or greater) or Consent of Instructor.
Components: LEC: Lecture