MACHINE TECHNOLOGY

Division: Technology and Engineering

Division Dean

Ken Starkman

Faculty

George Bonnand
Dan O'Brien

- CNC Operator Certificate (https://catalog.nocccd.edu/fullerton-college/degrees-certificates/machine-technology/cnc-operator-certificate/)
- Computer Numerical Control (CNC) Certificate (https://catalog.nocccd.edu/fullerton-college/degrees-certificates/machine-technology/computer-numerical-control-cnc-certificate/)
- Conversational Programming Skills Certificate (https://catalog.nocccd.edu/fullerton-college/degrees-certificates/machine-technology/conversational-programming/)
- Electronic Imaging Certificate (https://catalog.nocccd.edu/fullerton-college/degrees-certificates/machine-technology/electronic-imaging-certificate/)
- Machine Technology Level I Certificate (https://catalog.nocccd.edu/fullerton-college/degrees-certificates/machine-technology/machine-technology-level-i-certificate/)
- Machine Technology Level II Certificate (https://catalog.nocccd.edu/fullerton-college/degrees-certificates/machine-technology/machine-technology-level-ii-certificate/)
- Mastercam Skills Certificate (https://catalog.nocccd.edu/fullerton-college/degrees-certificates/machine-technology/mastercam-skills-certificate/)
- Metrology Certificate (https://catalog.nocccd.edu/fullerton-college/degrees-certificates/machine-technology/metrology-certificate/)
- Metrology Mini Skills Certificate (https://catalog.nocccd.edu/fullerton-college/degrees-certificates/machine-technology/metrology-mini-skills-certificate/)
- Surfcam Skills Certificate (https://catalog.nocccd.edu/fullerton-college/degrees-certificates/machine-technology/surfcam-skills-certificate/)
- Swiss Lathe Certificate (https://catalog.nocccd.edu/fullerton-college/degrees-certificates/machine-technology/swiss-lathe-certificate/)

MACH 101 F Introduction to Machine Tools (formerly MACH 091 F)
5 Units

54 hours lecture and 108 hours lab per term. This is an introductory course designed to teach the fundamental skills used in the set up and operation of the engine lathes, milling machines, and surface grinders. Safety, shop mathematics, basic blueprint reading, cutting tool use and theory, selection of cutting speeds and feeds, and measurement techniques will also be included. Students entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication, and production management. (CSU) (Degree Credit)

MACH 102 F Intermediate Machine Tools (formerly MACH 092 F)   5 Units
Prerequisite(s): MACH 101 F with a grade of C or better.
54 hours lecture and 108 hours lab per term. This intermediate level course is designed to advance the basic set up and operational skills developed in an introductory level machine tools course. Work will be performed on engine lathe, vertical milling machines, surface grinder, and sawing equipment. Students will also advance their skills in the use of various measuring tools, blueprint reading, shop mathematics and general machining techniques. Students entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication and production management. (CSU) (Degree Credit)

MACH 103 F Advanced Machine Tools (formerly MACH 093 F)   5 Units
Prerequisite(s): MACH 102 F with a grade of C or better.
54 hours lecture and 108 hours lab per term. This advanced level course is designed to further the set up and operational skills developed in an intermediate level machine tools course. Work will be performed on engine lathes, vertical milling machines, surface grinders, and sawing equipment. Students will also advance their skills in the use of various measuring tools, blueprint reading, shop mathematics, and general machining techniques. Computer numerical control (CNC) machines will also be utilized to complete laboratory assignments. Student entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication and production management. (CSU) (Degree Credit)

MACH 104 F Advanced Topics in Machine Technology   5 Units
Prerequisite(s): MACH 103 F with a grade of C or better.
54 hours lecture and 108 hours lab per term. This advanced level course is designed to further the skills developed in the advanced level machine tools course. Work will be performed on engine lathes, vertical milling machines, surface grinders, and sawing equipment. Students will also advance their skills in the maintenance and repair of equipment used in machine and manufacturing facilities. Various machine and hand tools will also be utilized to complete laboratory assignments. CNC machines will also be utilized to complete laboratory assignments. Students entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication and production management. (CSU) (Degree Credit)

MACH 105 F Conversational Programming I   3 Units
Prerequisite(s): MACH 101 F with a grade of C or better.
45 hours lecture and 27 hours lab per term. This is an introductory course designed to teach the fundamental skills related to the setup and operation of conversational program-equipped computer numerically-controlled machine tools. Safety, tool selection, machine and controller functions, calculation and input of offsets, are also included. Students entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication, and production management. (Degree Credit) (CSU)

MACH 106 F Conversational Programming II   3 Units
Prerequisite(s): MACH 105 F with a grade of C or better.
45 hours lecture and 27 hours lab per term. This course is designed to teach the advanced setup and operation of conversational program-equipped computer numerically-controlled machine tools. Safety, tool selection, machine and controller functions, calculation and input of offsets, are also included. Students entering this program may enter a variety of manufacturing related fields such as machining; quality control; engineering; fabrication; and production management. (Degree Credit) (CSU)

MACH 110 F CNC Machine Set-Up and Operation (formerly MACH 086 F)
                                                                    3 Units
Advisory: MACH 101 F.
45 hours lecture and 27 hours lab per term. This is an introductory course designed to teach the fundamental skills related to the setup and operation of computer numerically-controlled machine tools. Safety, tool selection, machine and controller functions, calculation and input of offsets are also included. Students entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication and production management. (CSU) (Degree Credit)

MACH 115 F CNC Parts Programming (formerly MACH 087 F)   3 Units
Advisory: MACH 110 F.
45 hours lecture and 27 hours lab per term. This course covers manual programming techniques, calculations, and program development for CNC mills, machining centers and lathes. Three axis controllers will be discussed. Students will test part programs on CNC machines during lab hours. Students entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication, and production management. (CSU) (Degree Credit)

MACH 116 F Machine Tools   2 Units
18 hours lecture and 54 hours lab per term. This course is for students majoring in mechanical drawing, industrial arts, engineering, and for students who wish to familiarize themselves with the machine tools of industry. Fundamentals of the machinist trade are taught. Students are taught the use of lathes, grinders, milling machines and measuring instruments. Methods planning for efficient machining is emphasized. (CSU) (Degree Credit)

MACH 120 F Advanced CNC Machining (formerly MACH 088 F)   3 Units
Prerequisite(s): MACH 115 F with a grade of C or better
45 hours lecture and 27 hours lab per term. This course provides the student with advanced instruction and practice in the concepts and practices associated with the successful programming and set up of CNC mills and lathes. Students will build upon prior experience with CNC machines to complete finished parts on CNC mills and lathes having various control types. Students will run programs and practice set-up processes during lab time. Student entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication, and production management. (CSU) (Degree Credit)

MACH 130 F Multiple Axis CNC Set and Operation (formerly MACH 090 F)
                                                                    3 Units
Prerequisite(s): MACH 120 F with a grade of C or better
45 hours lecture and 27 hours lab per term. This course provides the student with instruction associated with the successful programming and set up of CNC mills with four and five axis of control. Students will build upon prior experience with CNC machines to complete finished parts on CNC mills with four and five axis of control. Students will run programs and practice set-up processes during laboratory time. Students will test part programs on CNC machines during laboratory hours. Students entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication, and production management. (CSU) (Degree Credit)

MACH 140 F Basic CNC Swiss Style Lathe Set-Up and Operation   3 Units
Advisory: MACH 110 F.
45 hours lecture and 27 hours lab per term. This introductory course is designed to teach the fundamental skills used in the set up and operation of a basic CNC Swiss Style Lathe (screw machine). Safety, cutting tool use and theory, selection of cutting speeds/feeds will also be included. Students entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication and production management. (CSU) (Degree Credit)

MACH 142 F Advanced CNC Swiss Style Lathe Set-Up and Operation
                                                                    3 Units
Prerequisite(s): MACH 140 F with a grade of C or better.
45 hours lecture and 27 hours lab per term. This is an advanced course designed to teach the skills used in the set up and operation of the CNC Swiss Style Lathe (screw machine). Safety, cutting tool use and theory, selection of cutting speeds/feeds will also be included. Students entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication, and production management. (CSU) (Degree Credit)

MACH 145 F Basic CNC Swiss Style Lathe Programming and Applications
                                                                    3 Units
Prerequisite(s): MACH 142 F with a grade of C or better
45 hours lecture and 27 hours lab per term. This is a programming and applications course designed to teach the fundamentals used to program a basic CNC Swiss Style Lathe (screw machine). Safety, cutting tool use and theory, selection of cutting speeds/feeds will also be included. Students entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication and production management. (CSU) (Degree Credit)

MACH 150 F CNC Programming Using Mastercam (formerly MACH 050 F)   3 Units
45 hours lecture and 27 hours lab per term. This course provides the student with instruction in the concepts and practices associated with using Mastercam software to prepare CNC machine programs for both mills and lathes. Students will process programs that demonstrate the features and functions of the software. Students entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication and production management. (CSU) (Degree Credit)

MACH 152 F Advanced CNC Programming Using Mastercam (formerly MACH 052 F)   3 Units
Prerequisite(s): MACH 150 F with a grade of C or better
45 hours lecture and 27 hours lab per term. This course provides the student with advanced instruction in the concepts and practices associated with using Mastercam software to prepare CNC machine programs for both mills and lathes. Students will build upon prior experience with Mastercam to develop 3D wireframe models, surface models, derived models, and composite surface models. Students will process programs that demonstrate the features and functions of the software. Students entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication, and production management. (CSU) (Degree Credit)

MACH 154 F CNC Programming Using Surfcam (formerly MACH 060 F)
3 Units

45 hours lecture and 27 hours lab per term. This course provides the student with instruction in the concepts and practices associated with using SURFCAM software to prepare CNC machine programs for both mills and lathes. Students will process programs that demonstrate the features and functions of the software. Students will process programs that demonstrate the features and functions of the software. Students entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication and production management. (CSU) (Degree Credit)

MACH 156 F Advanced CNC Programming Using Surfcam (formerly MACH 062 F)
3 Units

Prerequisite(s): MACH 154 F with a grade of C or better or industry experience using Surfcam in a 2D environment.

45 hours lecture and 27 hours lab per term. This course provides the student with advanced instruction in the concepts and practices associated with using Surfcam software to prepare CNC machine programs for both mills and lathes. Students will build upon prior experience using Surfcam to develop 3D wireframe models, surface models, derived models and composite surface models. Students will process programs that demonstrate the features and functions of the software. Students entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication and production management. Computer lab fee required. (CSU) (Degree Credit)

MACH 157 F Computer-Aided Manufacturing
3 Units

Advisory: MACH 115 F or MACH 150 F or MACH 154 F or industry experience with 2-3 axis CAM systems and CNC machine setup.

45 hours lecture and 27 hours lab per term. This course explores new and advanced CAM programs. Students will program CNC machines with 4-5 axis capabilities. Students will develop programs that demonstrate the features and functions of the software. Students entering this program may enter a variety of manufacturing-related fields such as machining, quality control, engineering, fabrication, and product management. (CSU) (Degree Credit)

MACH 180 F Introduction to Metrology
3 Units

45 hours lecture and 27 hours lab per term. This course is an introduction to metrology and measurement as it applies to the technical trades of machining, welding, fabrication, construction and drafting. This course covers the origins of measurements and standards that are commonly in use throughout industry. This course also covers applications and uses of several types of measurement systems from traditional tools still commonly used in advanced computer-driven inspection devices. (CSU) (Degree Credit)

MACH 182 F Introduction to CMM Inspection and Romer Arms
3 Units

Advisory: Ability to read and write in English.

Corequisite: MACH 180 F with a grade of C or better. 45 hours lecture and 27 hours lab per term. This course will introduce the student to Coordinate Measuring Machines and Romer Arm fundamentals which utilize inspection software such as PC- DMIS or equivalent. This course covers the basics of set-up and operation of CMM machines including alignments, geometric feature definitions and calibrations. (CSU) (Degree Credit)

MACH 184 F Advanced CMM and Romer Arm Inspection
3 Units

Prerequisite(s): MACH 182 F with a grade of C or better.

Advisory: Ability to read and write in English.

45 hours lecture and 27 hours lab per term. This course is an advanced course using CMMs and Romer Arms which utilize PC-DMIS inspection software or equivalent. This course covers model-based definition inspection, advanced alignment, auto features, advanced dimensioning, fixturing/workholding for CMMs and CMM programming. (CSU) (Degree Credit)

MACH 185 F CMM and Romer Arm Applications
2 Units

Advisory: Ability to read and write in English.

Corequisite: MACH 184 F with a grade of C or better. 18 hours lecture and 54 hours lab per term. This course will cover common applications that are utilized with Coordinate Measuring Machines (CMM) and Romer Arms Fixturing and advanced methods of inspection will be reviewed. (CSU) (Degree Credit)