

Machine Technology

Description

The Machine Technology program offers a variety of instruction in the process of modern manufacturing. Emphasis is placed on CAD/CAM and C.N.C. technology.

Program Emphasis

The Machine Technology program prepares students for C.N.C. machining and is also ideal for students who need to upgrade prior machine shop training to comply with the current needs of industry.

Faculty	Office	Telephone
John Bollinger	T-103	619-388-3659

Career Options

CAD/CAM technician, C.N.C. machining technician

Academic Programs

The certificates of performance and achievement and the associate degrees in Machine Technology require completion of the courses listed below.

Certificate of Performance: C.N.C. Operator Option*

Courses:	Units
MACT 140, Machine Technology.....	4
MACT 150, Intro/Computer Num Control (CNC) and Elec Dis Mach	4
MACT 170, Introduction to CNC Controlled Vertical Machining	4
MACT 171, Application of CNC Controlled Vertical and Electrical Discharge Machining (EDM) I.....	2
MACT 172, Application of CNC Controlled Vertical Machining and Electrical Discharge Machining (EDM) II.....	2
	Total Units = 16

*This is a department award in recognition of information on the transcript and does not imply that a graduation requirement has been met.

Certificate of Performance: C.N.C. Technology Option*

Courses:	Units
MACT 140, Machine Technology.....	4
MACT 150, Intro/Computer Num Control (CNC) and Elec Dis Mach	4
MACT 160M, Introduction to CAD/CAM or MACT 160S, Introduction to CAD/CAM	4
	Total Units = 12

*This is a department award in recognition of information on the transcript and does not imply that a graduation requirement has been met.

Certificate of Achievement: Machine Technology

C.N.C. Technology Option

Courses Required for the Major:	Units
Certificate of Performance, C.N.C. Operator Option...16	
MACT 160M, Introduction to CAD/CAM or	
MACT 160S, Introduction to CAD/CAM	4
Total Units = 20	

Certificate of Achievement: Machine Technology

Computer Aided Manufacturing Option

Courses Required for the Major:	Units
Certificate of Achievement, C.N.C. Technology Option	20
MACT 161M, Applications of CAD/CAM I or	
MACT 161S, Applications of CAD/CAM I.....	2
MACT 162M, Applications of CAD/CAM II or	
MACT 162S, Applications of CAD/CAM II	2
MACT 180M, Advanced CAD/CAM or	
MACT 180S, Advanced CAD/CAM	4
MACT 181M, Application in Advanced CAD/CAM I or	
MACT 181S, Application in Advanced CAD/CAM I	2
MACT 182M, Application in Advanced CAD/CAM II or	
MACT 182S, Application in Advanced CAD/CAM II.....	2
Total Units = 32	

Associate in Science Degree: Machine Technology

Computer Aided Manufacturing Option

An Associate in Science Degree may be earned in Computer Aided Manufacturing Option. Complete the Computer Aided Manufacturing Option Certificate of Achievement as specified above (32 units).

Courses Required for the Major:	Units
Certificate of Achievement, Computer Aided Manufacturing Option	32
Total Units = 32	

Additional general education and graduation requirements for the associate degree are listed in the catalog ACADEMIC REQUIREMENTS section. **The associate degree requires a minimum of 60 units.**

Recommended electives: Machine Technology 290.

Courses

Machine Technology (MACT)

140 Machine Technology

**3 hours lecture, 3 hours lab, 4 units
Grade Only**

Advisory: English 51 and English 56, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5; and completion of or concurrent enrollment in Mathematics 95 with a grade of "C" or better, or equivalent, or Assessment Skill Level M40. This course is an introduction to the Machine Technology field. Emphasis is placed on safety, measurements, common formulas, machining applications, drawings, and career opportunities in the field. This course is designed for students planning to major in the occupational field of machine technology. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

150 Introduction to Computer Numerical Control (CNC) and Electrical Discharge Machining (EDM)

**3 hours lecture, 3 hours lab, 4 units
Grade Only**

Advisory: English 51 and English 56 and Mathematics 95, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5 and M40. This course is a study of advanced machining techniques including numerically controlled mills and lathes and electro-discharging machining. Emphasis is placed on introducing the student to Computer Numerical Control (CNC) programming using "G" and "M" codes. This course is designed for students majoring in Machine Technology and with previous machine laboratory experience. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

160M Introduction to CAD/CAM

**3 hours lecture, 3 hours lab, 4 units
Grade Only**

Advisory: English 51 and English 56 and Mathematics 95, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5 and M40; and concurrent enrollment in Machine Technology 161M. This course is an introductory, hands-on study of Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) theory and applications using Mastercam software. Emphasis is placed on generating programs at

a basic level for both the Computer Numerical Control (CNC) Mill and CNC Lathe. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

160S Introduction to CAD/CAM

**3 hours lecture, 3 hours lab, 4 units
Grade Only**

Advisory: English 51 and English 56 and Mathematics 95, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5 and M40; and concurrent enrollment in Machine Technology 161S. This course is an introductory, hands-on study of Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) theory and applications using Surfcam software. Emphasis is placed on generating programs at a basic level for both the Computer Numerical Control (CNC) Mill and CNC Lathe. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

161M Applications of CAD/CAM I

**6 hours lab, 2 units
Grade Only**

Advisory: English 51 and English 56 and Mathematics 95, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5 and M40; and completion of or concurrent enrollment in Machine Technology 160M with a grade of "C" or better, or equivalent.

This course presents students with intermediate-level Computer Aided Design/Computer Aided Manufacturing CAD/CAM projects dealing with Computer Numerical Control (CNC) program generation for the CNC Mill and CNC Lathe using Mastercam software. Students at this level work under moderate instructor supervision to increase efficiency and quality of work. This course may be taken four times to enhance skills or proficiencies by supervised repetition and practice within class periods. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

161S Applications of CAD/CAM

**6 hours lab, 2 units
Grade Only**

Advisory: English 51 and English 56 and Mathematics 95, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5 and M40; and concurrent enrollment in Machine Technology 160S. This course presents students with intermediate-level Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) projects dealing with Computer Numerical Control (CNC) program generation for the CNC Mill and CNC Lathe using Surfcam software. Students at this level work under moderate instructor supervision to increase efficiency and quality of work. This course may

be taken four times to enhance skills or proficiencies by supervised repetition and practice within class periods. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

162M Applications of CAD/CAM II

**6 hours lab, 2 units
Grade Only**

Advisory: English 51 and English 56 and Mathematics 95, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5 and M40; and completion of or concurrent enrollment in Machine Technology 161M with a grade of "C" or better, or equivalent.

This course presents students with advanced-level Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) exercises dealing with Computer Numerical Control (CNC) program generation for the CNC Mill and CNC Lathe using Mastercam. Students at this level work with minimal instructor supervision to increase efficiency and quality of work. This course may be taken four times to enhance skills or proficiencies by supervised repetition and practice within class periods. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

162S Applications of CAD/CAM II

**6 hours lab, 2 units
Grade Only**

Advisory: English 51 and English 56 and Mathematics 95, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5 and M40; and completion of or concurrent enrollment in Machine Technology 161S with a grade of "C" or better, or equivalent.

This course presents students with advanced-level Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) exercises dealing with Computer Numerical Control (CNC) program generation for the CNC Mill and CNC Lathe using Surfcam software. Students at this level work with minimal instructor supervision to increase efficiency and quality of work. This course may be taken four times to enhance skills or proficiencies by supervised repetition and practice within class periods. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

170 Introduction to CNC Controlled Vertical Machining

**3 hours lecture, 3 hours lab, 4 units
Grade Only**

Advisory: English 51 and English 56 and Mathematics 95, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5 and M40; and

completion of or concurrent enrollment in Machine Technology 150 with a grade of "C" or better, or equivalent.

This course is an introductory, hands-on study Computer Numerical Control (CNC) Vertical Machining theory and techniques. Emphasis is placed on Vertical Machining basic operations and Electrical Discharge Machining (EDM). (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

171 Application of CNC Controlled Vertical and Electrical Discharge Machining (EDM) I

**6 hours lab, 2 units
Grade Only**

Advisory: English 51 and English 56 and Mathematics 95, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5 and M40; and completion of or concurrent enrollment in Machine Technology 170 with a grade of "C" or better, or equivalent.

This laboratory course provides exercises in Computer Numerical Control (CNC) Vertical Machining techniques and Electrical Discharge Machining (EDM) at an intermediate level. Students at this level work under moderate instructor supervision to increase efficiency and quality of work. This course may be taken four times to enhance skills or proficiencies by supervised repetition and practice within class periods. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

172 Application of CNC Controlled Vertical Machining and Electrical Discharge Machining (EDM) II

**6 hours lab, 2 units
Grade Only**

Advisory: English 51 and English 56 and Mathematics 95, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5 and M40; and completion of or concurrent enrollment in Machine Technology 171 with a grade of "C" or better, or equivalent.

This laboratory course provides exercises in Computer Numerical Control (CNC) Vertical Machining techniques and Electrical Discharge Machining (EDM) at an advanced level. Students at this level work under minimal instructor supervision to increase efficiency and quality of work. This course may be taken four times to enhance skills or proficiencies by supervised repetition and practice within class periods. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

180M Advanced CAD/CAM

**3 hours lecture, 3 hours lab, 4 units
Grade Only**

Advisory: English 51 and English 56 and Mathematics 95, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5 and M40; and completion of or concurrent enrollment in Machine Technology 160M with a grade of "C" or better, or equivalent.

This course is an advanced, hands-on study of Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) theory and applications using Mastercam software. Emphasis is placed on generating programs using advanced modeling surface techniques for both the Computer Numerical Control (CNC) Mill and CNC Lathe at a beginning level under direct instructor supervision. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

180S Advanced CAD/CAM

**3 hours lecture, 3 hours lab, 4 units
Grade Only**

Advisory: English 51 and English 56 and Mathematics 95, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5 and M40; and completion of or concurrent enrollment in Machine Technology 160S with a grade of "C" or better, or equivalent.

This course is an advanced, hands-on study of Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) theory and applications using Surfcam software. Emphasis is placed on generating programs using advanced surface modeling techniques for both the Computer Numerical Control (CNC) Mill and CNC Lathe at a beginning level under direct instructor supervision. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

181M Application in Advanced CAD/CAM I

**6 hours lab, 2 units
Grade Only**

Advisory: English 51 and English 56 and Mathematics 95, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5 and M40; and completion of or concurrent enrollment in Machine Technology 180M with a grade of "C" or better, or equivalent.

This course is an advanced, hands-on study of Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) theory and applications using Mastercam software. Emphasis is placed on generating programs using advanced modeling techniques for both the Computer Numerical Control (CNC) Mill and CNC Lathe at an intermediate level under moderate instructor

supervision. This course may be taken four times to enhance skills or proficiencies by supervised repetition and practice within class periods. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

181S Application in Advanced CAD/CAM I

**6 hours lab, 2 units
Grade Only**

Advisory: English 51 and English 56 and Mathematics 95, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5 and M40; and completion of or concurrent enrollment in Machine Technology 180S with a grade of "C" or better, or equivalent.

This course is an advanced, hands-on study of Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) theory and applications using Surfcam software. Emphasis is placed on generating programs using advanced modeling techniques for both the Computer Numerical Control (CNC) Mill and CNC Lathe at an intermediate level under moderate instructor supervision. This course may be taken four times to enhance skills or proficiencies by supervised repetition and practice within class periods. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

182M Application in Advanced CAD/CAM II

**6 hours lab, 2 units
Grade Only**

Advisory: English 51 and English 56 and Mathematics 95, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5 and M40; and completion of or concurrent enrollment in Machine Technology 181M with a grade of "C" or better, or equivalent.

This course is an advanced, hands-on study of Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) theory and applications using Mastercam software. Emphasis is placed on generating programs using advanced surface modeling techniques for both the Computer Numerical Control (CNC) Mill and CNC Lathe at an advanced level under minimal instructor supervision. This course may be taken four times to enhance skills or proficiencies by supervised repetition and practice within class periods. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

182S Advanced CAD/CAM II

**6 hours lab, 2 units
Grade Only**

Advisory: English 51 and English 56 and Mathematics 95, each with a grade of "C" or better, or equivalent, or Assessment Skill Levels W5 and R5 and M40; and completion of or concurrent enrollment in Machine Technology 181S with a grade of "C" or better, or equivalent.

This course is an advanced, hands-on study of Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) theory and applications using Surfcam software. Emphasis is placed on generating programs using advanced surface modeling techniques for both the Computer Numerical Control (CNC) Mill and CNC Lathe at an advanced level under minimal instructor supervision. This course may be taken four times to enhance skills or proficiencies by supervised repetition and practice within class periods. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

290 Independent Study in Machine Technology

**Hours by Arrangement, 1 - 3 units
Grade Only**

Limitation on Enrollment: Must obtain an Add Code from instructor for registration.

For advanced students in machine technology who wish to pursue problems and projects relating to their particular subject area. The student meets with the instructor at specific intervals and is expected to do primary research, analyze problems and submit reports. This course may be taken four times with different content for a maximum of six units. (FT) Associate Degree Credit & transfer to CSU and private colleges and universities.

This discipline may offer specialized instruction in one or more of the following areas: Supervised Tutoring (044), Experimental Topics (265), Independent Study (290), Individualized Instruction (296), Service Learning (277), or Work Experience (270). Detailed course descriptions are listed on page page 108. Please refer to the class schedule and/or see the dean or department chair for availability.