COMPUTER ASSISTED MANUFACTURING TECHNOLOGY (CAMT)

Ummel Technology Building 119, 417.625.9327

Faculty Duggal, Howe, Schultz

The Department offers an Associate of Science degree in Computer Assisted Manufacturing Technology. The requirements of this degree will provide a progressive and flexible technical education, which will assist in securing employment in rapidly changing technological fields.

A variety of courses in this program emphasize the use of computers and various software, which enrich the skills acquired by the students to compete in this ever-changing age of modern technology. These include: Computer Numerical Control, Introduction to 3D CADD, Fundamentals of Robotics, Computer Animation in Industry, Computer Assisted Manufacturing and Computerized Production Planning and Control Systems. Core Curriculum course work in Mathematics, Physical Science, English, History, and Communications will give the student the additional knowledge and skills employers are seeking.

The courses in the Computer Assisted Manufacturing Technology curriculum are designed to provide the students with applications-oriented training in both basic and advanced aspects of technology. Lectures followed by Lab training on equipment such as a computer numerical control machining center and an industrial robot enable the student to apply information learned in lecture and also allow for individual innovation. Students have received recognition in world-class competition for innovative developments in robotics.

Professional faculty interact with local industry to insure that instruction is current with the latest technological developments. This interaction of faculty and involvement of an individual in the Society of Manufacturing Engineers Student Chapter provides students with excellent contacts for internships and employment.

Baccalaureate Options

Students who complete the A.S. degree in CAMT may continue their education by pursuing a baccalaureate degree in one of three areas:

- Manufacturing Information Management Systems (MIMS)
- Management Technology
- Industrial Technology Education

The first option is designed to equip the manufacturing technologist with vital management skills in areas such as TQM, SQC/SPC, EDI and Computerized Manufacturing Applications. The second option would provide management and marketing skills that would lead to an entry level management position in manufacturing. The third option is offered in conjunction with the Education Department to prepare students for middle or secondary certification in the Industrial Technology teaching field.

We also offer a one-year certificate program in Manufacturing Applications. For additional information contact the CAMT department.

Associate of Science Degree
Computer Assisted Manufacturing Technology
Major Code 5399

		Semester Hours
Core Requirements (p. 33)		**26**
Computer Assisted Manufacturing Technology Requirements		**15**
CAMT 100	Introduction to Machine Tool Processes	3
CAMT 105	Precision Machining	3
CAMT 160	Inspect & Gaging	3
CAMT 200	Computer Numerical Control	3
CAMT 250	Computer Assisted Manufacturing	3
Manufacturing Technology Electives		**24**
CAMT 110	Fundamentals of Cutting Tools	1
CAMT 150	Materials & Processes	3
CAMT 202	Tool Design for Manufacturing	3
CAMT 240	Industrial Materials	3
CAMT 220	Fundamentals of Robotics	1
CAMT 298	Selected Topics in Manufacturing	1-8
CAMT 330	Quality Control and Reliability	3
CAMT 490	Internship in Manufacturing Tech	3
CAMT 498	Seminar in Manufacturing Tech.	3
CAMT 499	Independent Study in Manufacturing Technology	1-3
CADD 110	Engineering Graphics I	3
CADD 115	Introduction to 3D CAD	3
CADD 130	Engineering Graphics II	3
CADD 260	Engineering Graphics III	3
CADD 298	Selected Topics Drafting & Design Engineering Technology	1-8
CADD 498	Seminar in Drafting & Design Engineering Technology	1-3
CADD 499	Independent Study in Drafting & Design Engineering Tech.	1-3
MIMS 305	Basic Electricity & Electronics	3
MIMS 310	Computer Production/ Planning Control	3
MIMS 315	Statics for Engineering Technology	3
MIMS 320	Applied Statistical Quality Control	3
MIMS 325	Dynamics & Kinematics for Engineering Technology	3
MIMS 350	Industrial Supervision (WI)	3
MIMS 410	International Trends in Manufacturing (WI)	3
MIMS 425	Design of Experiments	3
MIMS 435	Professional Internship	3

Suggested Order of Study

Associate of Science Degree
Major Code 5399
Computer Assisted Manufacturing Technology Major

Freshman Year

1st Semester		
Course		Hours
CAMT 100	Introduction Machine Tool Processes	3
CAMT 160	Inspect & Gaging	3
CORE	[Math 30 or Math 114 or Math 130]	3
CORE	[Psy 120 College Orientation]	1
Manufacturing Technical Elective		6
		16

2nd Semester		
CAMT 105	Precision Machining	3
CORE	[Eng 101 Comp I]	3
CORE	[Comm 100 Oral Communication]	3
CORE	[Kine 101 Physical Activity]	1
Manufacturing Technical Electives		6
		16

Sophomore Year

1st Semester		
CAMT 200	Computer Numeric Control	3
CORE	(Phys 100 Fund of Phys Sci)	5
CORE	(Hist 110/Hist 120)	3
Manufacturing Technical Elective		6
		17

2nd Semester		
CORE	[Econ 201Econ-Macro]	3
CAMT 250	Computer Assisted Manufacturing	3
CORE	[Humanities/Fine Arts]	3
CORE	[Kine 103 Lifetime Wellness]	2
Manufacturing Technical Elective		6
* MO Const. Test	OR PSc 120	3
		17-20

See department faculty for information on college credit for work experience through the development of an employment portfolio.

For additional information contact:
Mr. Don Schultz
Office: Ummel Technology Building 115
Phone: 417.625.9327
Email: schultz-d@mssu.edu

Course Descriptions

CAMT 100 (F, S) 3 hrs. cr.
Introduction to Machine Tool Processes
The theory and safe operation of basic machine tools. Fundamental practices include: safety, basic mathematics, blueprint reading, benchwork, precision measurement, metal sawing, drills and drilling, pedestal bench grinding, engine lathes, mills. One hour lecture, four hours lab.

CAMT 105 (S) 3 hrs. cr.
Precision Machining
An introduction to the operation of surface, cylindrical, tool, and cutter grinders. Principles of inspection and gaging, applied trigonometry, tooling geometry, and advanced lathe and milling practices will be covered. One hour lecture, four hours of lab. Prerequisites: CAMT 100, CADD 110, Math 130, or consent of instructor.

CAMT 110 (F, S) 1 hr. cr.
Fundamentals of Cutting Tools
Introduction to tool geometry, chip formation, and effects of coolants and tool design on tool life. Instruction on the sharpening of standard cutting tools for drilling, formed relieved end mills and mill cutters, and the applications of various factors on machinability. The use of carbides and ceramics as cutting tools. One hour lecture, four hours of lab. Prerequisite: It is also recommended that students take CAMT 100 as a prerequisite or concurrently.

CAMT 150 (F, S) 3 hrs. cr.
Materials and Processes
A survey of manufacturing materials and processes. Properties of ferrous metals and nonferrous metals and plastics. Introduction and application of the principles of casting, welding, molding, hot working, cold working, stamping, forming and material removal processes. One hour lecture, four hours of lab. Prerequisite: It is also recommended that students take CAMT 100 as a prerequisite or concurrently.

CAMT 160 (F) 3 hrs. cr.
Inspection and Gaging
Inspection, gaging, and precision measurement procedures utilizing mechanical, electronic, and optical measuring equipment and related math. Geometric dimensioning and tolerancing emphasized. Computer assisted process control methods are introduced and applied to specific inspection procedures. One hour lecture, 4 hours of lab.

CAMT 200 (F, S) 3 hrs. cr.
Computer Numerical Control
Basic numerical control concepts and applications, the operation and setup of numerical control machines, including Vertical machining centers and turning centers, numerical control programming as applied to machining applications using MDI. One hour lecture, four hours of lab. Prerequisites: CAMT 100, CADD 110, Math 30 or 135, or consent of instructor.

CAMT 202 (S) 3 hrs. cr.
Tool Design
Tool design and manufacturing is an advanced course on the designing, machining, and manufacturing of production tools, dies, jigs and fixtures. Prerequisites: CAMT 105 and CADD 110. One hour lecture and four hours lab.

CAMT 210 (Demand) 3 hrs. cr.
Computer Animation For Industry
Fundamentals of computer animation on a personal computer focusing on industrial applications, such as product promotion and marketing, motion simulation of machine elements and mechanisms, and its use in presentation, training, and instruction. Involves imparting movement and photorealistic appearance to geometric shapes and models. One hour lecture, four hours of lab. Prerequisites: CADD 115 or CIS 105 or permission of the department.

CAMT 220 (Demand) 1 hr. cr.
Fundamentals of Robotics
Fundamental concepts underlying robot programming and its applications in the manufacturing industry. Covers operation of an industrial robot arm, both lead through and textual programming, end effect or design, interfacing with computers and CNC machines and control systems. Class meets for five weeks. One hour lecture, four hours of lab. Prerequisite: Take concurrently with CAMT 110 and CAMT 150 as a three-hour block. It is also recommended that students take CAMT 100 as a prerequisite or concurrently.

CAMT 240 (S) 3 hrs. cr.
Industrial Materials
Introduction to metallurgy and nonmetallic materials currently used in today's manufacturing settings. Theory and application of principles for identifying, producing, conditioning, and testing materials. Laboratory activities involve both manual and computer assisted testing. One hour lecture, four hours of lab. Prerequisite: CAMT 150.

CAMT 250 (S) 3 hrs. cr.
Computer Assisted Manufacturing
Advanced techniques of CNC & N/C programming using a completely integrated environment. Concepts of manufacturing programs being an integral part of a dynamic environment as compared to being in an isolated system. One hour lecture, four-hour lab per week. Prerequisites: CAMT 200 or consent of instructor.

CAMT 298 (Demand) 1-8 hrs. cr.
Topics in Manufacturing Technology
Special topics in new or emerging manufacturing technology not normally included in another course. Prerequisites specified by the department in a course syllabus.

CAMT 310 (Demand) 4 hrs. cr.
Manufacturing Data Processing
Designed to teach overall data processing techniques as relating to the manufacturing environment. A solid foundation of manufacturing processes and departmental structuring is required in addition to knowledge of microcomputer usage. Two hours lecture, six hours lab. Prerequisites: CAMT 100, CIS 105, CADD 115, Acct 201, or consent of instructor.

CAMT 330 (Demand) 3 hrs. cr.
Quality Control and Reliability
The concept of quality control and its applications. The importance of quality control, tools, and techniques of SPC/SQC covering control charts used in quality control analysis, inspection and testing for quality control, process variability, product reliability, and maintainability. Two hours lecture, four hours lab. Prerequisites: CAMT 100 & 160, CIS 105, Math 310 or GB 321 or GB 405, or consent of instructor.

CAMT 490 (Demand) 1-8 hrs. cr.
Internship in Manufacturing Technology
A structured work experience in manufacturing technology at an institution, facility, or industry not directly related to Missouri Southern. Practical application of the students' majors under the direct supervision of an on-site professional who is not an MSSU faculty or staff member. A faculty member will be responsible for approving the placement site and supervising the overall activities of the internship. Prerequisite: 15 hours of CAMT courses and permission of a committee.

CAMT 498 (Demand) 1-3 hrs. cr.
Advanced Topics in Manufacturing Technology
Covers specialized knowledge and skills related to new developments in manufacturing technology. Topics will vary by the semester and situation. Prerequisite: Senior standing in management-technology or an associate degree in manufacturing technology.

CAMT 499 (Demand) 1-3 hrs. cr.
Independent Study in Manufacturing Technology
Individually directed reading, research, and report preparation in selected areas of contemporary manufacturing technology, for advanced majors. Scope, depth, and area of concentration and credit will be arranged when enrolling in the course. Offered by arrangement. Prerequisite: Completion of required manufacturing technology courses with minimum 3.0 GPA and permission of instructor, department head, and school dean.

INDUSTRIAL TECHNOLOGY EDUCATION

Ummel Technology Building Room 112, 417.625.9567

Faculty Bartholet

The Industrial Technology Education degree has certifications for both middle school (grades 5-9) and secondary (grades 9-12). The middle school certification in Industrial Technology is one of two areas of concentration that a student may select from to complete their education degree. The student who desires to teach in a secondary school will have a single teaching field. Technology education is an applied discipline designed to promote technological literacy at all levels. It is the intent of such study to provide students with an understanding of their technological culture so they can become intelligent consumers of their technology. Therefore, the program is designed to produce individuals who can solve problems involving the technical means humans use for their survival. Technology education capitalizes on the needs humans have for expressing themselves with tools and materials. Technology literacy is considered a basic and fundamental study for all persons regardless of educational or career goals. As a result of these goals, the discipline is both academic and laboratory oriented.

Bachelor of Science in Education Middle School Education Grades 5-9 Certification in Industrial Technology

(This degree is 1/2 of a dual degree for Middle School Certification.)

Bachelor of Science in Education with a major in Industrial Technology Grades 5-9 Certification One of Two Teaching Fields

	Semester Hours
Core Requirements (p.32) [51*]	**48***
Education Certification Requirements	**51**
Educ 347 Industrial Technology Methods	3
Industrial Technology Requirements:	**21**
Communications	6
CADD 110 Engineering Graphics (3)	
CADD 271 Graphic Information Technology (3)	
Energy & Power	3
MIMS 381 Basic Energy & Power (3)	
Materials & Process	9
CAMT 100 Introduction Machine Tool Processes (3)	
CAMT 150 Materials and Process (3)	
MIMS 391 Wood Working & Plastic (3)	
Organization and Administration	3
MIMS 350 Industrial Supervision (3)	
Second Teaching Field	**25-28**
TOTAL	**145-148**

*Required course in psychology satisfies the requirement for three hours of the Core Curriculum.