

**Junior Year**

1st Semester

Candidate must be tentatively admitted to the Teacher Education Program before courses with an "Educ" prefix can be taken (Exceptions: Educ 100, Educ 200, Educ 301, and Educ 302).

Educ 329	Ped Theory, Methods, & Practices	4
Educ 321	Microteaching	2
Educ 423	Classroom Management	2
CORE 4a	[PSc 120 Gov't: US/St/Loc]	3
MIMS 350	Industrial Supervision	3
CORE 2b	[Humanities/Fine Arts (2B)]	3
		<b>17</b>

Follow departmental recommendations for teaching specialty courses. If recommended by Junior Block instructors and by the teacher education faculty, receive full admission to teacher education.

2nd Semester

Follow departmental recommendations for teaching specialty courses.

Psy 310	Educational Psychology	3
CADD 271	Graphics Information Technology	3
MIMS 305	Basic Electricity & Electronics	3
MIMS 393	Woods & Plastic Science	3
MIMS 383	Power Generation	
	Pneumatics And Hydraulics	3
		<b>15</b>

**Senior Year**

1st Semester

Follow the departmental recommendations for teaching specialty courses. Apply for student teaching during the second week of the semester.

Educ 422	Content Area Lit: Sec. (WI)	2
Psy 412	Measurement & Evaluation	
OR		
Educ 412	Mid School Curriculum	
OR		
Educ 420	Introduction to Counseling	2-3
MIMS 310	Production Planning & Control	3
CORE 5a	[IB 310 International Bus]	3
CORE 4a	[Econ 180 American Economic Sys]	3
		<b>13-14</b>

2nd Semester

Educ 402	Foundations of Education (WI)	2
Educ 432	Critical Issues	2
Educ 330	Industrial Technology Meth.	3
Educ 462	Student Teaching Sec	8
		<b>15</b>

(Prerequisite)

[Department Recommendations]

\*Candidate must have speech evaluation filed in the Education Dean's Office.

\*\* This is a certification requirement and must be taken by all teacher education candidates prior to Junior Block or concurrently.

**For additional information contact:**

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# Course Descriptions

Educ 337 (S) 3 hrs. cr.

**Industrial Technology Methods**

This is a required education course, which is an introduction to the instructional planning, materials, philosophy, rationale, and methods of teaching Industrial Technology. It is a part of the professional semester. Prerequisites: Advanced standing in major field and admission to teacher education program. (Junior Block)



**Faculty** Bartholet, Duggal, Howe, Schultz

This degree program blends the management, design, and manufacturing application aspects in a unique way to produce a graduate that is functional at floor level manufacturing and management environment. Students must have completed an associate degree in a technical field in order to complete the Manufacturing Information Management Systems (MIMS) program.

## Management Information Management Systems (MIMS)

	Semester Hours
<b>Core Requirements (p. 32)</b> . . . . .	<b>45</b>
<b>(6 hours core included in major)</b>	
<b>Associate of Science in Technical Field.</b> . . . . .	<b>36</b>
<b>Required MIMS Curriculum.</b> . . . . .	<b>45</b>
MIMS 310 Computer Production Plan/Control . . . . .	3
MIMS 350 Industrial Supervision (WI) . . . . .	3
MIMS 305 Basic Electricity & Electronics . . . . .	3
MIMS 420 Manufacturing Computer Applications. . . . .	3
CAMT 240 Industrial Materials . . . . .	3
CIS 305 Microcomputer Applications . . . . .	3
MIMS 320 Applied Statistical Quality Control . . . . .	3
MIMS 450 Graphics Information Technology II. . . . .	3
MIMS 415 Mechanical Design . . . . .	3
MIMS 425 Design of Experiments . . . . .	3
IB 310 International Business . . . . .	3
(core requirement Area 5)	
GB 321 Business Statistics I . . . . .	3
GB 405 Statistical Quality Control . . . . .	3
MM 350 Principles of Marketing (WI) . . . . .	3
Econ 202 Principles of Economics-Micro . . . . .	3
(Core requirement Area 4)	

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***Suggested Order of Study***

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**Bachelor of Science**

Major Code 4997

**Management Technology with an emphasis in  
Manufacturing Information Management Systems (MIMS)****Junior Year**

1st Semester

Course		Hours
MIMS 310	Computer Production Plan/Control	3
MIMS 350	Industrial Supervision (WI)	3
GB 321	Business Statistics I	3
MM 350	Principles of Management (WI)	3
CORE	[Eng 102 Comp II]	3
CORE	[Area 3C]	3
		<b>18</b>

2nd Semester

MIMS 305	Basic Electricity & Electronics	3
GB 405	Statist Quality Control	3
MIMS 420	Manufacturing Computer Applications	3
CAMT 240	Industrial Materials	3
Econ 202	Principles of Economics (Micro)	3
CORE	[Bio 101 General Biology]	4
		<b>19</b>

**Senior Year**

1st Semester

CIS 305	Microcomputer Applications	3
CORE	[Area 2C] (WI)	3
MIMS 320	Applied Statistical Quality Control	3
MIMS 450	Graphics Information Technology II	3
CORE	[PSc 120 Gov't: U.S., State, Local]	3
		<b>15</b>

2nd Semester

MIMS 415	Mechanical Design	3
MIMS 425	Design of Experiments	3
CORE	[Area 2B]	3
CORE	[IB 310] (Area 5)	3
CORE	[Hist 120/320]	3
		<b>15</b>

\*Students in the MIMS program will need Math 125 or higher to meet Core requirements for a Bachelor's degree.

Students should consult the Department faculty in the Design Manufacturing Information Technologies at the earliest possible date in order to incorporate the correct sequence into the appropriate Associate of Science degree program.

**For additional information contact:**

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***Course Descriptions***

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**MIMS 305 (S)** 3 hrs. cr.**Basic Electricity and Electronics**

An integrated study of DC and AC circuits in which the sinusoidal system is introduced and safety with the use of lockout and tagout procedures and methodology. Topics covering the concepts of Ohm's Law, Kirchoff's Laws, and DC circuits such as series circuits, parallel circuits, and series-parallel circuits. The study of capacitors and inductors serves as an introduction to the sinusoidal system and the behavior of R, L, and C in a sinusoidal system. The laboratory component includes the use of test instruments dealing with Ohm's Law, series circuits. Lab also includes a study of internal resistance and loading as well as basic circuit design including single and three phase circuits as well as control voltage circuits. Two hours lecture, two hours lab. Prerequisite: Phys 100 or higher and Math 125 or above or consent of the instructor.

**MIMS 310 (F)** 3 hrs. cr.**Computer Production/Planning Control**

Theory and application of production and inventory management philosophies and techniques as they relate to the study of computer-integrated manufacturing (CIM). Students will address such areas as material handling, scheduling, MRP, JIT, inventory control models, lean manufacturing, flexible manufacturing systems, shop-floor control, etc. Two hours lecture, two hours lab. Prerequisites: Math 130, CIS 105 or CIS 305, or consent of instructor.

**MIMS 315 (Demand)** 3 hrs. cr.**Statics for Engineering Technology**

Practical aspects of statics and strength of materials with emphasis on comprehension of underlying principles and their applications. Topics include: vector algebra, force equilibria, moments, trusses, static, and kinetic friction, mechanical properties of materials, stress and strain, thin-walled vessels, beams, shear and bending moment, and torsion. Two hours lecture, two hours lab. Prerequisites: Phys 100 or higher and Math 125 or higher.

**MIMS 320 (F)** 3 hrs. cr.**Applied Statistical Quality Control**

Concepts and applications of Statistical Process Control (SPC). Students get a solid foundation in control charts, analyzing process capability, and modern problem-solving techniques. A wealth of real data examples from manufacturing settings as well as services are used to link all learning to the implementation of SPC in the workplace. Computer based solution techniques are used where appropriate. Two hours lecture, two hours lab. Prerequisites: GB 321, GB 405, or permission of the instructor.

- MIMS 325 (Demand) 3 hrs. cr.  
**Dynamics and Kinematics for Engineering Technology**  
Second part of a two semester course in mechanics. Includes: Kinematics, rectilinear and angular motion, plane motion, principles of work, energy and power, impulse and momentum with practical applications to engineering technology, basic motion analysis, rotary motion, cams, gears, and introduction to automation devices. Two hours lecture, two hours lab. Prerequisites: Phys 100 or higher and Math 125 or higher.
- MIMS 350 (F) 3 hrs. cr.  
**Industrial Supervision** *(Writing Intensive)*  
A dynamic look at the interrelationship between work assignments, work performance, and performance outcomes within an industrial work environment. Skills focused introduction to supervision. The job of supervisor is explained and examples of how supervisors operate in real situations are discussed. The focus is on key skills needed for effective supervision – e.g., goal-setting, delegating, budgeting, interviewing, motivating, counseling, and coaching. An examination of group dynamics, presentations, and basic interpersonal skills will be combined to establish an understanding and to develop a sense of commitment to a positive and progressive work ethic. Prerequisite: Junior standing, six hours English Composition, or permission of department.
- MIMS 381 (F) 3 hrs. cr.  
**Introduction to Power and Energy**  
This is a required technology course which is an introduction to the methods used in industry for the use of creating force / power and the generation of this energy/power. Emphasis is placed on the investigation and conceptual understanding of methods of power generation as well as the distribution and use of the energy developed. Two-hours lecture and two-hours lab per week.
- MIMS 383 (F) 3 hrs. cr.  
**Power Generation including Pneumatic and Hydraulics**  
This is a required technology course which is an advanced study in the methods used in industry for the use of creating force/power and the generation of power. Emphasis is placed on the advanced investigation and conceptual understanding of the methods of power generation as well as the distribution as it relates to pneumatics and hydraulics. Two-hours lecture and two-hours lab per week.
- MIMS 391 (S) 3 hrs. cr.  
**Wood Working and Plastics for Shop**  
This is a required technology course which is an introduction to the methods used in industry in the processing and production of wood and plastic products. The student will develop an appreciation for and knowledge of materials, products, tools, and process. Emphasis is placed on the proper and safe use of wood and plastic machines, tools, and chemicals as well as pride in workmanship. Students will be given an opportunity to design and build wood and plastic products throughout the course. Two-hours lecture and two-hours lab per week.
- MIMS 393 (F) 3 hrs. cr.  
**Wood and Plastic Science**  
This is a required technology course, which is an introduction to the science of wood and plastic and the processing and production of wood or plastic components as well as basic cabinet construction. The student will develop an appreciation for and knowledge of materials, products, tools, and process as required in shop and industrial applications. Emphasis is placed on the proper and safe use of wood and plastic machines, tools, and chemicals in the processing or production of wood and plastic components. Students will be given an opportunity to investigate their knowledge of design and building of wood and plastic products throughout the course. Prerequisite of technical math or equivalent and MIMS 391. Two-hours lecture and two-hours lab per week.
- MIMS 405 (Demand) 3 hrs. cr.  
**Mechanics of Materials**  
Calculations of material strength and deformation are complemented with principles and practice of mechanical testing including instrumentation and measurement in the areas of loads, stresses, deformations, thermal stresses, and other quantities. Two hours lecture and two hours lab a week. Prerequisite: MIMS 315, MIMS 325.
- MIMS 410 (Demand) 3 hrs. cr.  
**International Trends in Manufacturing** *(Writing Intensive)*  
Discussion of issues and trends in U.S. manufacturing and technology with special emphasis on the causes and consequences of its internationalization in the face of global competition. Course content may vary to ensure that contemporary or latest developments are highlighted. Prerequisites: Junior standing, six hours of English Composition, or permission of the department.
- MIMS 415 (S) 3 hrs. cr.  
**Mechanical Design**  
Machine elements in mechanical design, design for different modes of failure, tolerances and fits, shaft design, keys and couplings, springs, spur gears, belts and chains, clutches and brakes, and rolling contact bearing. Two hours lecture, two hours lab. Prerequisite: Phys 100 or higher and Math 125 or above.
- MIMS 420 (S) 3 hrs. cr.  
**Manufacturing Computer Applications**  
Introduces problem solving and analysis in the application of integrated manufacturing information systems software. Includes: design, production routing, project planning and tracking, material handling and inventory control, coding and classification using current integrated manufacturing software.
- MIMS 425 (S) 3 hrs. cr.  
**Design of Experiments**  
The course objective is to learn how to plan, design, and conduct experiments efficiently and effectively as well as analyze the resulting data to obtain objective conclusions. Industrial applications (manufacturing as well as non-manufacturing) rather than theoretical developments are emphasized. Computer based solution techniques are used where appropriate. Two hours lecture, two hours lab. Prerequisite: Senior standing.
- MIMS 435 (F,S,S) 3 hrs. cr.  
**Professional Internship**  
An eight-week supervised industrial training experience in a design manufacturing engineering environment. The intern will be placed with a cooperating company to work under the guidance of the University and the company on various product design manufacturing activities. This experience should greatly expand and support the educational experience provided to the student. Prerequisite: Completion of junior year coursework, CIS 305, MIMS 310.
- MIMS 450 (F) 3 hrs. cr.  
**Graphical Information Technology II**  
A seminar class designed to apply the advanced applications of data transfer and manipulations within industrial environments. Topics could include advanced Internet applications, advanced Web page design, data formatting, and other topics as the technology changes. One hour lecture, four hours lab. Prerequisite: CADD 271. *(Cross listed in CADD.)*
- MIMS 490 (S) 3 hrs. cr.  
**Manufacturing Applications** (Capstone)  
Allows the student to build on all the skills and knowledge gained in prior coursework and creative implementation of the concepts learned through projects or internships pertaining to various manufacturing applications. Will work in teams on project(s) that will take

them from ideas through various aspects of design, development and manufacturing to conclusion. Prerequisites: Senior standing.

### One Year Certificate In Manufacturing Applications

One year certificate program in Manufacturing Applications is offered through Computer Aided Drafting and Design (CADD) and Computer Assisted Manufacturing Technology (CAMT). Refer to the individual departments CADD (page 204) and CAMT (page 207) for course descriptions.

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## ***Suggested Order of Study***

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### Certificate Manufacturing Applications

1st Semester		Hours
Course		
CAMT 100	Introduction to Machine Tools	3
CAMT 110	Fund of Cutting Tools	1
CAMT 160	Inspection & Gaging	3
CADD 115	Introduction to CAD	3
CADD 110	Engineering Graphics I	3
CAMT 150	Materials & Processes	1
Technical Elective		3
		<b>17</b>

2nd Semester		Hours
Course		
CAMT 105	Precision Machining	3
CADD 130	Engineering Graphics II	3
CADD 202/CAMT 202	Tool Design and Manufacturing	3
CAMT 200	Computer Numerical Control	3
Math 30	Intermediate Algebra	
OR		
Math 114		3
Technical Elective		3
		<b>18</b>

### Certificates of Competencies

The competency certificate programs in Manufacturing Applications are offered through Computer Aided Drafting and Design Engineering Technologies (CADD) and Computer Assisted Manufacturing Technology (CAMT) programs. These certificates can be earned by completing four course sequences.

The student has four options to choose from:

- CADD Operator
- CNC Operator
- Reverse Engineering Technician
- Quality Technician

### CADD Operator

The program is structured to prepare individuals to perform Computer Aided Drafting and Design work in CADD laboratories. The trained individual will have the skills to prepare drawings for manufacture and make design amendments to existing drawings using CADD programs. The program will prepare the individual to work as a CADD operator, as well as a drafting technician and a detailer.

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## ***Suggested Order of Study***

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### Certificate of Competency CADD Operator

Course		Hours
CAMT 100	Introduction to Machine Tool Processes	3
CADD 110	Engineering Graphics I	3
CADD 115	Introduction to 3D Computer Aided Drafting	3
CADD 130	Engineering Graphics II	
OR		
CADD 220	Architectural Drafting	
OR		
CADD 230	Elementary Surveying	3
		<b>12</b>

### CNC Operator

The program is designed to provide skills in the operation of Computer Numerical Controlled (CNC) lathe and milling machines. The student will be equipped to be a CNC Technician upon completion of the program.

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## ***Suggested Order of Study***

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CNC Operator		Hours
Course		
CAMT 100	Introduction to Machine Tool Processes	3
CADD 110	Engineering Graphics I	3
CAMT 160	Inspection and Gaging	3
CAMT 200	Computer Numerical Control	3
		<b>12</b>

### Reverse Engineering Technician

The program is structured to prepare individuals to perform work related to re-creating drawings from parts in existence and modifying the drawings for retooling for manufacture. The trained individual will have skills to operate equipment such as a 3D Scanner, CMM, and Faro Arm in recreating 2D and 3D drawings. The individual will also transform the drawings to meet the needed specifications for manufacture. The program will prepare the individual to work as a Reverse Engineering Technician, Coordinate Measuring Technician, and a CADD Interface Technician.

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## ***Suggested Order of Study***

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### Reverse Engineering Technician

Course		Hours
CAMT 100	Introduction to Machine Tool Processes	3
CADD 110	Engineering Graphics I	3
CAMT 160	Inspection and Gaging	3
CAMT 298	Reverse Engineering Tools & Practices	3
		<b>12</b>

## Quality Technician

The program is structured to prepare individuals to perform inspection techniques and assure quality in manufacturing and service industries. The trained individual will have the skills to assist a Quality Engineer in inspecting, gathering, and analyzing data pertinent to products and services to maintain the desired quality. The program will prepare the individual to work as a Quality Technician, Quality Inspector, and Quality Analyst.

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## Suggested Order of Study

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### Quality Technician

Course		Hours
Math 030	Intermediate Algebra*	3
Math 130	College Algebra	3
CAMT 160	Inspection and Gaging	3
GB 321	Business Statistics I	3
MIMS 320	Applied Quality Control	3
		<b>15</b>

\* or Placement Test or acceptable ACT Score

### For additional information contact:

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**Faculty** Oakes - Head, Collins, Earney, Herr, Mays, Pinet, Schiavo, Tunnell

The Computer Information Science (CIS) Department provides opportunities for a broad undergraduate education in the many aspects of computer hardware and software. The faculty's main objective is to offer courses of instruction that develop a thorough understanding of methods for utilizing computer technology in the design and implementation of solutions to complex management, scientific, and engineering problems. Within this context, the Department offers the following curricula options:

- Bachelor of Science in CIS - Information Technology
- Bachelor of Science in CIS - Information Systems
- Bachelor of Science in CIS - Computational Mathematics
- Bachelor of Science in CIS - Bioinformatics
- Bachelor of Science in CIS - Computer Forensics
- Bachelor of Science in CIS - Computer Technology

- Minor in CIS - Network Systems Administration
- Minor in CIS - Information Systems
- Minor in CIS - Website Administration
- Associate of Science in CIS - Network Systems Administration
- Associate of Science in CIS - Information Systems
- Associate of Science in CIS - Website Administration

The six **Bachelor of Science in CIS** alternatives prepare the student for graduate school or entry-level positions such as systems programmer, systems analyst, applications programmer, database administrator, bioinformatics specialist, computer forensics analyst, user support specialist, network administrator, or website administrator. **Information Technology** and **Information Systems** are distinguished by selected courses that develop the student's understanding of an organization's information requirements and procedures for designing and implementing an information system that will facilitate its management.

**Computational Mathematics** meets the requirements for a double major in Computer Information Science and Mathematics. The student takes CIS and mathematics classes that develop an expertise in applied mathematics and the theoretical foundations of computer science. Such knowledge is required to design and implement computer solutions for a wide range of problems encountered in science and engineering.

**Bioinformatics** provides for a double major in Computer Information Science and Biology. Bioinformatics is an emerging discipline that is concerned with designing and implementing computational algorithms for managing, processing, and analyzing databases of genetic sequences.

**Computer Forensics** fulfills the requirements for a double major in Computer Information Science and Criminal Justice Administration. Cyber attacks, hacking, and other computer-based criminal activities cost businesses and government organizations billions of dollars each year. Computer Forensics involves techniques for securing computer networks as a precaution against criminal threat. In addition, it includes the identification, extraction, preservation, and documentation of computer evidence for the purpose of identifying and prosecuting perpetrators of computer-based crime.

The **Computer Technology** option not only meets the requirements for a Bachelor of Science in CIS, but also qualifies the student for an Associate of Science degree in Computer Aided Drafting and Design (CADD).

A **Minor** or **Associate of Science** provides the student pursuing some other major with a credential and expertise in computing, an enhancement that is becoming increasingly important in almost every area of science, education, business, and the arts. The **Network Systems Administration** alternatives are designed to provide the student with the knowledge base necessary for managing local/wide area computer networks, as well as being able to provide user support and training in the area of personal computer hardware and