

**CADD 271 (S)** 3 hrs. cr.  
**Graphic Information Technology I**  
 Basic applications of data transfer and manipulations within industrial environments. Topics could include basic Internet applications, basic Web page design, introduction to data formatting for the Internet, and other topics as the technology changes. One hour lecture, four hours of lab.

**CADD 272 (F)** 3 hrs. cr.  
**3D Computer Animation**  
 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. This involves imparting movement and photo-realistic appearance to geometric shapes and models. One hour lecture, four hours of lab. Prerequisites: CADD 270 or permission of the department.

**CADD 274 (S)** 3 hrs. cr.  
**Digital Animation Applications**  
 Integration of real life forms with computer generated images, using state of the art scanning, digital touch probe, and motion capturing systems. One hour lecture, four hours of lab. Prerequisites: CADD 272 or permission of the department.

**CADD 276 (S)** 3 hrs. cr.  
**Computer Animation Studio**  
 Capstone course to enable students to develop professional material for their portfolio. Using the latest, state of the art computer animation tools to complete their studio requirements. One hour lecture, four hours of lab. Prerequisites: CADD 274 or permission of the department.

**CADD 450 (F)** 3 hrs. cr.  
**Graphical Information Technology II**  
 A seminar class applying 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 of lab. Prerequisite: CADD 271. (Cross listed in MIMS.)

**Land Surveyor in Training Program of Study**

Completion of the following classes will allow a person who has the necessary field experience and work related hours to sit for the Land Surveyor in Training licensing test in the State of Missouri. The Missouri Board of Architecture, Professional Engineering and Land Surveyors has approved this sequence of courses to meet statute Section 327.312.1(3) RSMo.

**Suggested Order of Study**

**Land Surveyor in Training Program of Study**

Course	Core Requirements	Hours
CADD		15
<b>Spring</b>		
1st Semester		
CADD 230	Elementary Surveying*	3
		3
<b>Summer</b>		
2nd Semester		
CADD 231	Advanced Surveying	3
CADD 234	Land & Survey Descriptions	3
		6

**Fall**  
 3rd Semester  
 CADD 232 Surveying Computations 3  
 CADD 233 Boundary Control and Legal Principles 3  
 6

\*Trigonometry (Math 135) is a prerequisite to CADD 230. Course descriptions page 118.

**For additional information contact:**  
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**Faculty** Duggal - Head, Bartholet

Computer Aided Drafting and Design Engineering Technology curriculum leads to an Associate of Science degree in CADDET. The curriculum prepares individuals to enter employment as drafters/designers in the fields of manufacturing, civil, architecture, or construction.

The requirements for the Associate of Science degree in CADDET provide a broad base of analytical, technical, and Core Curriculum courses. Computer Aided Drafting and Design hardware and software are used to enhance traditional instruction methods in all courses. Built into the curriculum is an emphasis on both the study and application of engineering design technology. The documents and drawings produced by the CADDET graduate would be based upon sketches, specifications, and calculations made by scientists, engineers, architects, and designers. Material specification is an essential part of the CADDET program of study.

Also, students are exposed to the latest CAD technology and the application of international standard systems of A.N.S.I. and I.S.O. Professional faculty maintain close ties with area industries to assure that high quality and currently used technology is taught.

**Accredited by the Technology Accreditation Commission (TAC) of the Accreditation Board for Engineering and Technology (ABET), 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, Telephone: 410.347.7700.**

## Baccalaureate Options

Students who complete the A.S. degree in CADDET may continue their education by pursuing a baccalaureate degree in the following areas:

- Manufacturing Information Management Systems (MIMS)
- Computer Information Science
- Management Technology
- Industrial Technical Education

## Associate of Science Degree

Major Code 5303

### Computer Aided Drafting and Design Engineering Technology Major

	Semester Hours
<b>Core Requirements (p. 33)</b> .....	<b>22</b>
<b>CADD Requirements</b> .....	<b>48</b>
CADD 110 Engineering Graphics I .....	3
CADD 115 Introduction to 3D Computer Aided Drafting .....	3
CADD 120 Descriptive Geometry .....	3
CADD 130 Engineering Graphics II .....	3
CADD 204 Industrial Statics & Strength of Material ..	3
CADD 210 Technical Illustration** .....	3
CADD 220 Architectural Drafting .....	3
CADD 230 Elementary Surveying .....	3
CADD 260 Engineering Graphics III .....	3
CAMT 100 Intro to Machine Tool Processes .....	3
CAMT 150 Materials & Processes .....	3
Phys Elementary Physics 151 .....	5
Phys Elementary Physics 152 .....	4
CORE Math 135 Trigonometry .....	3
Math 302 Applied Calculus .....	3

\*\*Offered only in the summer.

## Suggested Order of Study

### Associate of Science Degree

Major Code 5303

#### Computer Aided Drafting and Design Engineering Technology Major

##### Freshman Year

1st Semester		Hours
Course		
CADD 110	Engineering Graphics I	3
CAMT 100	Introduction Machine Tool Processes	3
CAMT 150	Materials & Processes	3
CORE	[Math 30 or higher]	3
CORE	[Psy 120 College Orientation]	1
CORE	[Humanities/Fine Arts]	3
		<b>16</b>

##### 2nd Semester

CADD 115	Intro to 3D Computer Aided Drafting	3
Math 135	Trigonometry	3
CORE	[Hist 110/120 U.S. History]	3
CORE	[Eng 101 Comp I]	3
CORE	[Oral Communication]	3
		<b>15</b>

Summer		
CADD 210	Technical Illustration	3
CORE	[Kine 103 Lifetime Wellness]	2
		<b>5</b>

##### Sophomore Year

1st Semester		
CADD 120	Descriptive Geometry	3
CADD 130	Engineering Graphics II	3
CADD 204	Statics/Strength of Materials	3
Phys 151	Elementary Physics	5
CORE	[Econ 201 Economics-Macro]	3
*MO Const. Test	OR PSc 120	3
		<b>20</b>

2nd Semester		
CADD 220	Architectural Drafting	3
CADD 230	Elementary Surveying	3
CADD 260	Engineering Graphics III	3
Phys 152	Elementary Physics	4
Math 302	Applied Calculus	3
CORE	[Kine 101-Physical Activity]	1
		<b>17</b>

[Department Recommendation]

#### For additional information contact:

Dr. J. S. Duggal  
Office: Ummel Technology Building 153  
Phone: 417.625.9305 or 417.625.9757  
Email: duggal-j@mssu.edu

## Course Descriptions

CADD 110 (F, S) 3 hrs. cr.  
**Engineering Graphics I**

Preparation of drawings by using state-of-the-art CADD. Spreadsheet, word-processing are incorporated along with geometric construction, lettering, orthographic projection, dimensioning, sections, pictorial drawing, graphs, and diagrams. One hour lecture, four hours lab per week. Corequisite: Math 30.

CADD 115 (S) 3 hrs. cr.  
**Introduction to 3D Computer Aided Drafting**

Computer aided drafting and the design of basic 3D wireframe and 3D models. Individuals who have a background in CADD should take the course for personal or professional improvement. One hour lecture, four hours lab per week. Prerequisite: CADD 110 & Math 30.

CADD 120 (F) 3 hrs. cr.  
**Descriptive Geometry**

Practical applications of advanced projection techniques to problems in civil, structural, mechanical, and architectural engineering. Manual and computer assisted projects on methods are introduced. One hour lecture, four hours lab per week. Prerequisite: CADD 110, CADD 115, Math 135, or instructor's permission.

CADD 130 (F) 3 hrs. cr.  
**Engineering Graphics II**

Detail and assembly drawings of machines and machine elements. Survey of the use of machine tools, processes, and materials in the design and fabrication of machine parts. The use of 3D and parametric design software enhance the industrial applications within this course. One hour lecture, four hours lab per week. Prerequisite: CADD 110, Math 135.

CADD 204 (F) 3 hrs. cr.  
**Industrial Statics and Strength of Material**

Introductory survey of selected topics of statics and strength of materials, with emphasis on equilibrium friction, summation of forces, and moments. The strength of materials will concentrate on simple stress

and strain, basic beam relationships, and torsional load carrying members. Two hours lecture, three hours lab per week. Prerequisites: CADD 110, Math 135, Corequisite: Phys 151 or instructor's permission.

**CADD 210 (Sum)** 3 hrs. cr.  
**Technical Illustration**

Pictorial drawing with an emphasis on mechanical and architectural applications. Major topics include mechanical illustrations, exploded views, and perspectives drawn with a computer aided drafting system. Drawings will involve 2D and 3D illustration, lettering styles and computer generated rendering and animation. One hour lecture, four hours lab per week. Prerequisite: CADD 115, Math 135.

**CADD 220 (S)** 3 hrs. cr.  
**Architectural Drafting**

Principles of architectural design, preparing sets of working drawings, building details, and use of modern construction materials for residential building. Manual and computer aided design techniques used throughout the course. One hour lecture, four hours lab per week. Prerequisite: CADD 110, Math 135.

**CADD 230 (S)** 3 hrs. cr.  
**Elementary Surveying**

Use and care of surveying instruments, fundamental surveying methods, traverse measurements, area computations, precise equipment, and topographic mapping. 1 hour lecture-problems, 4 hour laboratories. Required background or experience: Math 135, CADD 115.

**CADD 231 (Su Demand)** 3 hrs. cr.  
**Advanced Surveying**

Precise equipment, astronomical observations. Theory of hydrographic, geodetic, and control surveys. City and land surveys. Route location and layout. Simple, transition, and vertical curves. Earthwork computation. Introduction to electronic and photogrammetric methods. One hour lecture-problems, four hour labs. Required background or experience: Prerequisite: CADD 230, Elementary Surveying.

**CADD 232 (F Demand)** 3 hrs. cr.  
**Surveying Computations**

Introduction to the theory of measurements in surveying. Error propagation in horizontal and vertical position. The analysis of surveying measurement error. Error propagation in rectangular coordinate systems. Introduction to the techniques of compass rule adjustment and least squares for the adjustment of surveying data. Least squares adjustment of triangulation, trilateration, and traverse network. Least squares adjustment of level networks. The use of surveying software will be utilized. Three one-hour lectures. Required background or experience: Prerequisite: Math 135

**CADD 233 (F Demand)** 3 hrs. cr.  
**Boundary Control and Legal Principles**

Boundary retracement principles based on common laws. Emphasis on simultaneous conveyances, rancho lands, resurvey problems, and legal descriptions. Three one-hour lectures. Required background or experience: CADD 230.

**CADD 234 (S,S Demand)** 3 hrs. cr.  
**Land and Survey Descriptions**

History of land ownership and transfer of title; types of document of land conveyance; forms of legal descriptions of public and private lands; the bureau of land management; interpretation of maps and documents for the physical survey location of land boundaries; principles of writing precise land boundary descriptions; study of easements; value of monuments rectangular surveys; monumentation, restoration of lost corners, subdivision of sections, special surveys, plats and patents, meander lines, and riparian rights. Three one hour lecture-problem sessions per week. Required background or experience. Prerequisite CADD 230.

**CADD 260 (S)** 3 hrs. cr.

### **Engineering Graphics III**

Topics not covered in lower CADDET courses, including Vector Graphics and CADD Applications pertaining to Descriptive Geometry. Geometric Dimensioning and Tolerancing and working drawings and CAM Design will be reemphasized. Engineering design and problem solving will be an essential aspect of this course. Special topics in CADDET. Finite elements will be introduced. Drafting facility management concepts will also be covered. Three hours lecture per week, open labs as required. Prerequisites: CADD 110, CADD 120, 130, 204, Math 135, Phys 151. Corequisite: Math 302, Phys 152, or instructor's permission.

**CADD 298 (Demand)** 1-8 hrs. cr.  
**Special Topics Draft/Design Engineering Technology**

A special topic or topics not normally included in another drafting/design course. Prerequisites determined by the department and stipulated in a course syllabus.

**CADD 330 (Demand)** 3 hrs. cr.  
**Computer Machine Design Engineering Technology**

Principles, theory and applications of machine design utilizing the CAD workstation. Special emphasis on solid modeling FEM and design analysis. Three hours lecture labs are arranged. Prerequisite: CADD 115, Math 135, or above.

**CADD 490 (Demand)** 1-8 hrs. cr.  
**Internship in Drafting and Design Engineering Technology**

A structured work experience in drafting/design at an institution, facility, or industry not directly related to Missouri Southern. The work experience will be a practical application of the students major field of study under the direct supervision of an on-site professional who is not a Southern faculty or staff member. The on-site professionals will supervise the students activity in the field. A faculty member will be responsible for approving the placement site and supervising the overall activities of the internship. Prerequisite: 15 hours of CADD.

**CADD 498 (Demand)** 1-3 hrs. cr.  
**Advanced Topics in Drafting & Design Engineering Technology**

Specialized knowledge and skills related to new developments in drafting and design. Topics will vary by the semester and situation. Prerequisite: An associate degree in drafting & design or senior standing in management-technology or industrial technology.

**CADD 499 (Demand)** 1-3 hrs. cr.  
**Independent Study in Drafting & Design Engineering Technology**

Individually directed reading, research, and discussions in selected areas of drafting and design for advanced majors. Scope, depth, area of concentration, and credit hours will be arranged when registering for the course. Offered by arrangement. Prerequisite: 15 hours of CADD with a 3.0 GPA and permission of instructor, department head, and school dean.