ARCHITECTURAL & ENGINEERING TECHNOLOGY

The Architectural and Engineering Technology (AET) Program provides entry-level skills, continuing education, and advanced technical skills in several specialized fields, including computer-aided design and drafting (CADD), 3-D modeling, and rendering. The AET program offers an Occupational Endorsement Certificate in CAD for Building Construction, four Undergraduate Certificates in the specialized areas of Architectural Drafting, Civil Drafting, Mechanical & Electrical Drafting, and Structural Drafting, and an Associate of Applied Science (AAS) degree in Architectural and Engineering Technology which encompasses all of these fields.

Students are trained to become skilled workers on architectural and engineering design teams. AET certificate and degree graduates are employed as drafters or technicians and work in private industry as well as municipal, state, or federal agencies. Drafters and technicians work in support of professional architects and engineers to produce the technical drawings used by construction workers to build everything from roads and bridges, to homes and office buildings, to oil and gas pipelines. Their drawings provide the visual guidelines that show the technical details of the products and structures to be constructed. These drawings specify dimensions, materials to be used, and procedures to be followed. Drafters and technicians fill in technical details by using drawings, rough sketches, specifications, codes, and calculations previously made by engineers, surveyors, or architects. Drafters and technicians use technical handbooks, tables, calculators, and computers to do this. Because many drafters and technicians may assist in design work, creativity is desirable. Good communication skills and the ability to work well with others is also important as they are part of a team of architects, engineers, and other technicians.

Although courses taken may apply to the first two years of the four year degree program (i.e., BS in Technology), the AET AAS degree should not be considered preparatory or a substitute for professional degree programs in architecture or engineering. Students pursuing a four-year degree in engineering should contact the School of Engineering at UAA. Those students who anticipate pursuing a degree in architecture should contact the AET faculty for academic counseling prior to registration.

In addition to tuition and fees, students should expect to purchase books and equipment required for each course. However, other than required textbooks, supplies should not be purchased before the first class. Students are encouraged to use any resource to acquire texts before any class.

The AET Associate of Applied Science (AAS) degree at Mat-Su College requires a minimum of three years to complete. AET Certificates require 2 years to complete.

STUDENT LEARNING OUTCOMES

1. Demonstrate skill and proficiency in computer-aided drafting and design.
2. Demonstrate knowledge of drafting conventions including symbols, linetypes, linewidths, and dimension styles as applicable to the design profession.
3. Visualize and translate drawing information to actual physical objects and completed construction components.
4. Understand the role and purpose of building codes and standards as they pertain to the life, health, and safety of the public.
5. Understand the elements of the construction document set and the role of construction documents as communication tools for the construction contract.
6. Understand the construction process from the transformation of an idea or need into a completed project.
7. Understand the role, duties, and responsibilities of the members of the design team, including the working relationship between technicians and professionals.
8. Demonstrate communication skills to be successful in the employment environment.
9. Demonstrate critical thinking and problem solving skills in the employment environment.

ADVISORY

All students should meet with an academic counselor prior to their first semester and each subsequent semester for the purpose of reviewing their academic status and planning future courses.

Attention should be specifically directed to the proof of eligibility for placement in MATH A105 and ENGL A111 as a non-coded registration restriction, checked during the first day of class, for the introductory classes within the programs. It is particularly important for students to meet with their advisor whenever academic difficulties arise.

Students are encouraged to consult the faculty in the AET program for assistance in designing their course of study to ensure all prerequisites have been met and that university and major degree requirements are understood and followed.

Students should expect to spend at least 1 hour on outside work for each hour in the class. Computer lab facilities are available for students’ use. Course offerings vary between fall and spring semesters with occasional short courses offered during the summer. Certain courses require prerequisites or faculty permission.

RECOMMENDED COURSE SEQUENCE

Not all AET courses are offered every semester. Students should consult the faculty in the AET program for assistance in designing their course of study to ensure that university and major degree requirements are understood and followed.

▲ OCCUPATIONAL ENDORSEMENT CERTIFICATE

CAD for Building Construction

Attention should be specifically directed to the proof of eligibility for placement in MATH A105 and ENGL A111 as a registration restriction for the introductory classes within the programs.

OCCUPATIONAL ENDORSEMENT CERTIFICATE OUTCOMES

At the completion of this program students are able to demonstrate:

1. Proficiency in the use of computer-aided design and drafting software in the creation and modification of construction documentation.
2. Proficiency in the management of the computer-aided design and drafting software environment for the accurate application and integration of industry standards.

ADMISSION REQUIREMENTS

See Occupational Endorsement Certificate admissions in chapter 6 of this Catalog.

OCCUPATIONAL ENDORSEMENT CERTIFICATE REQUIREMENTS

In order to receive the occupational endorsement certificate offered by the Architectural and Engineering Technology program, students must achieve a grade of C or better in all courses required for the Occupational Endorsement Certificate.

1. Complete the following courses:
   - AET A101 Fundamentals of CADD for Building Construction
   - AET A181 Intermediate CADD for Building Construction
   - AET A282 Advanced CADD Techniques
   - or AET A283 CADD Software Customization

2. A minimum of 11 credits are required for the Occupational Endorsement Certificate.
The choice of AET A282 Advanced CADD Techniques is for students who wish to pursue skills for advanced rendering and animation within the software environment, while the AET A283 CADD Software Customization is for students who wish to pursue skills for developing and managing unique software environments, tools, and solutions outside of the default capabilities of the software.

**UNDERGRADUATE CERTIFICATES**

The AET program offers four Undergraduate Certificates in the specialized areas of Architectural Drafting, Civil Drafting, Mechanical & Electrical Drafting, and Structural Drafting. While the introductory course work for all certificates is the same to establish a common theoretical foundation, the majority of the course work is specific and focused for standards and professional practice of each industry.

**ADMISION REQUIREMENTS**

Satisfy the Admission Requirements for Certificate and Associate Degree Programs Requirements on page 38.

**COURSE REQUIREMENTS**

Certain courses require prerequisites or faculty permission.

**GRADUATION REQUIREMENTS**

In order to receive a certificate offered by the AET Program, students must achieve a grade of C or better in all courses required for the certificate.

**Architectural Drafting**

**PROGRAM OUTCOMES**

The specific educational outcomes that support the program objectives are to produce graduates who are able to:

- Demonstrate skill and proficiency in computer-aided drafting and design.
- Demonstrate knowledge of drafting conventions including symbols, linetypes, linewidths, and dimension styles as applicable to architectural drafting.
- Visualize and translate drawing information to actual physical objects and completed architectural projects.
- Understand the role and purpose of building codes and standards as they pertain to the life, health, and safety of the public.
- Understand the role, duties, and responsibilities of the members of the design team, including the working relationship between technicians and architects.
- Understand the architectural elements of the construction document set and the role of construction documents as communication tools for the construction contract.
- Understand the construction process from the transformation of an idea or need into a completed architectural project.
- Demonstrate communication skills to be successful in employment environment.
- Demonstrate critical thinking and problem solving skills in the employment environment.

**ARCHITECTURAL DRAFTING CERTIFICATE REQUIREMENTS**

1. Complete the following required courses:
   - AET A101 Fund of CADD for Bldg Constr (4)
   - AET A102 Methods of Building Constr (3)
   - AET A121 Architectural Drafting (3)
   - AET A123 Codes and Standards (3)
   - AET A181 Intermediate CADD for Bldg Constr (4)
   - AET A286 Design Project (4)
   - ENGL A111 Methods of Written Communication (3)
   - MATH A105 Intermediate Algebra (3)
   - Oral communication Course (3) Choose from one of the following: COMM A111, COMM A235, COMM A237, or COMM A241

2. A total of 30 credits is required for the certificate.

**Civil Drafting**

**PROGRAM OUTCOMES**

The specific educational outcomes that support the program objectives are to produce graduates who are able to:

- Demonstrate skill and proficiency in computer-aided drafting and design.
- Demonstrate knowledge of drafting conventions including symbols, linetypes, linewidths, and dimension styles as applicable to civil drafting.
- Visualize and translate drawing information to actual physical objects and completed civil construction projects.
- Understand the role and purpose of building codes and standards as they pertain to the life, health, and safety of the public.
- Understand the role, duties, and responsibilities of the members of the design team, including the working relationship between technicians and civil engineers.
- Understand the civil elements of the construction document set and the role of construction documents as communication tools for the construction contract.
- Understand the construction process from the transformation of an idea or need into a completed civil project.
- Demonstrate communication skills to be successful in employment environment.
- Demonstrate critical thinking and problem solving skills in the employment environment.

**CIVIL DRAFTING CERTIFICATE REQUIREMENTS**

1. Complete the following required courses:
   - AET A101 Fund of CADD for Bldg Constr (4)
   - AET A102 Methods of Building Constr (3)
   - AET A111 Civil Drafting (3)
   - AET A181 Intermediate CADD for Bldg Constr (4)
   - AET A213 Civil Technology (4)
   - AET A286 Design Project (4)
   - ENGL A111 Methods of Written Communication (3)
   - MATH A105 Intermediate Algebra (3)
   - Oral communication Course (3) Choose from one of the following: COMM A111, COMM A235, COMM A237, or COMM A241

2. A total of 31 credits is required for the certificate.

**Mechanical & Electrical Drafting**

**PROGRAM OUTCOMES**

The specific educational outcomes that support the program objectives are to produce graduates who are able to:

- Demonstrate skill and proficiency in computer-aided drafting and design.
- Demonstrate knowledge of drafting conventions including symbols, linetypes, linewidths, and dimension styles as applicable to the mechanical/electrical drafting.
- Visualize and translate drawing information to actual physical objects and completed mechanical/electrical construction projects.
- Understand the role and purpose of building codes and standards as they pertain to the life, health, and safety of the public.
- Understand the role, duties, and responsibilities of the members of the design team, including the working relationship between technicians and mechanical and electrical engineers.
- Understand the mechanical/electrical elements of the construction document set and the role of construction documents as communication tools for the construction contract.
- Understand the construction process from the transformation of an idea or need into a completed mechanical/electrical project.
- Demonstrate communication skills to be successful in employment environment.
- Demonstrate critical thinking and problem solving skills in the employment environment.

**MECHANICAL & ELECTRICAL DRAFTING CERTIFICATE REQUIREMENTS**

1. Complete the following required courses:
   - AET A101 Fund of CADD for Bldg Constr (4)
   - AET A102 Methods of Building Construction (3)
   - AET A142 Mechanical & Electrical Technology (4)
   - AET A143 Mechanical & Electrical Drafting (3)
   - AET A181 Intermediate CADD for Bldg Constr (4)
   - AET A286 Design Project (4)
   - ENGL A111 Methods of Written Comm (3)
   - MATH A105 Intermediate Algebra (3)
   - Oral communication Course (3) Choose from one of the following: COMM A111, COMM A235, COMM A237, or COMM A241

2. A total of 31 credits is required for the certificate.
• Structural Drafting

PROGRAM OUTCOMES
The specific educational outcomes that support the program objectives are to produce graduates who are able to:
• Demonstrate skill and proficiency in computer-aided drafting and design.
• Demonstrate knowledge of drafting conventions including symbols, linetypes, lineweights, and dimension styles as applicable to structural drafting.
• Visualize and translate drawing information to actual physical objects and completed structural construction projects.
• Understand the role and purpose of building codes and standards as they pertain to the life, health, and safety of the public.
• Understand the role, duties, and responsibilities of the members of the design team, including the working relationship between technicians and structural engineers.
• Understand the structural elements of the construction document set and the role of construction documents as communication tools for the construction contract.
• Understand the construction process from the transformation of an idea or need into a completed structural project.
• Demonstrate communication skills to be successful in employment environment.
• Demonstrate critical thinking and problem solving skills in the employment environment.

STRUCTURAL DRAFTING CERTIFICATE REQUIREMENTS
1. Complete the following required courses:
   AET A101 Fund of CADD for Bldg Constr (4)
   AET A102 Methods of Building Constr (3)
   AET A131 Structural Drafting (3)
   AET A181 Intermediate CADD for Bldg Constr (4)
   AET A231 Structural Technology (4)
   AET A286 Design Project (4)
   ENGL A111 Methods of Written Comm (3)
   MATH A105 Intermediate Algebra (3)
   Oral communication Course (3) Choose from one of the following: COMM A111, COMM A235, COMM A237, or COMM A241
2. A total of 31 credits is required for the certificate.

ASSOCIATE OF APPLIED SCIENCE
Architectural & Engineering Technology

PROGRAM OUTCOMES
The specific educational outcomes that support the program objectives are to produce graduates who are able to:
• Demonstrate skill and proficiency in computer-aided drafting and design.
• Demonstrate knowledge of drafting conventions including symbols, linetypes, lineweights, and dimension styles as applicable to the design discipline.
• Visualize and translate drawing information to actual physical objects and completed construction components.
• Understand the role and purpose of building codes and standards as they pertain to the life, health, and safety of the public.
• Understand the role, duties, and responsibilities of the members of the design team, including the working relationship between technicians and professionals.
• Understand the elements of the construction document set and the role of construction documents as communication tools for the construction contract.
• Understand the construction process from the transformation of an idea or need into a completed project.
• Demonstrate communication skills to be successful in employment environment.
• Demonstrate critical thinking and problem solving skills in the employment environment.

ADMISSION REQUIREMENTS
Satisfy the Admission to Undergraduate Certificate and Associate Degree Programs requirements in Chapter 6, page 38.

FACULTY
Diane Jardel, Instructor
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COURSE REQUIREMENTS
Certain courses require prerequisites or faculty permission.

GRADUATION REQUIREMENTS
In order to receive the AAS degree offered by the AET Program, students must achieve a grade of C or better in all courses required for the AAS degree.

ADVISING
Certain courses require prerequisites or faculty permission.

ACADEMIC PROGRESS
In order to receive the AAS degree offered by the AET Program, students must achieve a grade of C or better in all courses required for the AAS degree.

GENERAL UNIVERSITY REQUIREMENTS
1. Complete the General University Requirements for Associate Degrees on page 68.
2. Complete General Degree Requirements for AAS degrees (15 credits). As part of the general course requirements, GEOL A111 is recommended.
   Oral Communication Skills ........................................... 3
   COMM A111 Fundamentals of Oral Communication (3)
   COMM A235 Small Group Communication (3)
   COMM A237 Interpersonal Communication (3)
   COMM A241 Public Speaking (3)
   Written Communication Skills ..................................... 6
   ENGL A111 Methods of Written Comm (3)
   and one of the following:
   ENGL A211 Academic Writing About Lit (3)
   ENGL A212 Technical Writing (3)
   ENGL A213 Writing in the Social & Natural Sciences (3)
   ENGL A214 Persuasive Writing (3)
   CIOS A260A Business Communication (3)

   General Requirements .................................................. 6
   MATH A105 (3 credits counted under Major Requirements) and choose 3 credits from Humanities*, Math, Natural Sciences, or Social Sciences courses from the General Course Requirement Classification List for AAS Degrees. Courses chosen must be at the 100-level or above. GEOL A111 is recommended.
   * Any English course used to satisfy the Humanities general requirement must be different from the Written Communications Skills requirement and have a course number higher than ENGL A111.

MAJOR REQUIREMENTS
1. Complete the following required courses
   AET A101 Fund of CADD for Bldg Constr 4
   AET A102 Methods of Building Constr 3
   AET A111 Civil Drafting 3
   AET A121 Architectural Drafting 3
   AET A123 Codes & Standards 3
   AET A131 Structural Drafting 3
   AET A142 Mechanical & Electrical Technology 4
   AET A143 Mechanical & Electrical Drafting 3
   AET A181 Intermediate CADD for Bldg Constr 4
   AET A213 Civil Technology 4
   AET A231 Structural Technology 4
   AET A286 Design Project 4
   MATH A105 Intermediate Algebra * 3
2. Electives ................................................................. 3
   AET A295 is strongly recommended.
3. A total of 60 credits is required for the degree.
   * This course satisfies the General Course Requirements.