

COMPUTER AIDED DESIGN (ENGINEERING) TECHNOLOGY AREA OF CONCENTRATION WITHIN STEM TECHNOLOGY A.A.S. (CAREER)

Program website ([https://www.frederick.edu/programs/science,-technology,-engineering,-and-math-\(stem\)/computer-aided-design.aspx](https://www.frederick.edu/programs/science,-technology,-engineering,-and-math-(stem)/computer-aided-design.aspx))

Program Manager: Nick Morgan

Email: nmorgan@frederick.edu

Phone: 240.629.7902

Program Description

Teaches a full array of industry standard design skills and technologies including Computer Aided Drafting and Solid Modeling, enabling students to assist and work with engineers and related professionals. This program prepares students to pursue paraprofessional positions in engineering industries.

Program Learning Outcomes

- Solve engineering problems with the use of CAD software and technology.
- Communicate the geometry of the motion of particles and plane motion of rigid bodies through the use of Mechanical, Architectural and Engineering focused technology.
- Create 3D parametric models from simple 2D drawings using methods such as revolving, lofting, and extruding.
- Create Multiview drawings from three-dimensional models. Create designs using various AutoCAD 3D modeling methods.
- Create and modify drawings in pictorial views and create and modify three-dimensional drawings.
- Describe basic finite stress analyses. Conduct Simulations.
- Demonstrate the ability to calculate load and the effect of forces and interpret outcomes. Analyze compression and tensile forces within structural elements.
- Describe experimental design and evaluate evidence to develop hypotheses.
- Describe the basic concepts of force, mass and acceleration, of work and energy, and of impulse and momentum.
- Demonstrate the ability to use observational techniques to measure and collect data and to prepare moment and shear diagrams.

Program Requirements

- Students must complete their credit **English and Mathematics** within the first 24 credits.
- One course must meet the cultural competence graduation requirement (<https://frederick-public.courseleaf.com/general-education-core/#cultural>).
- **CORE: The General Education CORE** is that foundation of the higher education curriculum providing a coherent intellectual experience for all students. Students should check with an advisor or the transfer

institution (ARTSYS) before selecting General Education CORE requirements. <http://artsys.usmd.edu/>

- In some General Education categories (Mathematics, Biological & Physical Sciences), a 4-credit course selected from the GenEd course list will satisfy the requirement in place of a 3-credit course. Students should check with an advisor before selecting these courses.
- For the Physical Education, Health, or Nutrition requirement, a 3-credit PHED, HLTH, or NUTR course may satisfy the requirement in place of a 1-credit course. Students should check with an advisor before selecting this course.
- Students must earn a grade of "C" or better in ENGL 101 English Composition.
- Students must complete a minimum of nine credits at the 200-level.

| Code | Title | Credits |
|---|------------------------------------|---------|
| English | | |
| ENGL 101 | English Composition | 3 |
| Mathematics | | |
| MATH 165 | Precalculus | 4 |
| Social & Behavioral Sciences | | |
| Social & Behavioral Sciences Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#social-behavioral) | | 3 |
| Arts & Humanities | | |
| Arts Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#arts) | | 3 |
| Humanities Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#humanities) - Recommended course(s) below: | | 3 |
| PHIL 208 | Business Ethics | |
| Communication Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#communication) - Recommended course(s) below: | | 3 |
| COMM 107 | Career Communication | |
| Biological & Physical Sciences | | |
| Biological & Physical Sciences Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#biological-physical) - Recommended course(s) below: | | 3 |
| PHYS 101 | Survey of Physics (Spring) | |
| PHSC 101 | Survey of Physical Science | |
| PHSC 121 | Physical Geology (Fall) | |
| Physical Education, Health, or Nutrition Requirement | | |
| Select one PHED, HLTH, or NUTR course | | 1 |
| Concentration Courses | | |
| CADT 101 | AutoCAD I | 3 |
| CADT 102 | AutoCAD II | 3 |
| CADT 110 | Introduction to SolidWorks | 3 |
| CADT 250 | Statics and Strength of Materials | 4 |
| CADT 255 | Dynamics | 4 |
| CMIS 105 | Introduction to Programming | 2 |
| CMTE 100 | Occupational Safety & Health | 2 |
| ENGR 100 | Introduction to Engineering Design | 3 |
| Electives | | |
| Select 13 credits of the following: | | 13 |
| Any BLDT, CADT, CMIS, CMTE, ENGR, GISA, MATH, or SPAN courses | | |
| INTR 103 | Internship | |
| Total Credits | | 60 |

Transfer Note

For more information on careers and transfer, contact the Career and Academic Planning Services office at 301.846.2471 or visit Transfer Services (<https://www.frederick.edu/student-resources/counseling-advising/transfer-services.aspx>).

Guided Pathway to Success (GPS)

Suggested schedules map your path to degree completion.

Students should meet with an advisor each semester to carefully select and sequence courses based on their specific academic goals and interests. Visit Jefferson Hall or call 301.846.2471 for advising.

| Recommended First Semester | | Credits |
|---|--|---------|
| ENGL 101 | English Composition | 3 |
| MATH 165 | Precalculus | 4 |
| CADT 101 | AutoCAD I (1 st 7 1/2 week) | 3 |
| CADT 102 | AutoCAD II (2 nd 7 1/2 week) | 3 |
| CMIS 105 | Introduction to Programming | 2 |
| CMTE 100 | Occupational Safety & Health | 2 |
| Credits | | 17 |
| Recommended Second Semester | | Credits |
| Social & Behavioral Sciences Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#social-behavioral) | | 3 |
| Biological & Physical Sciences Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#biological-physical) - Recommended course(s) below: | | 3-4 |
| PHYS 101 | Survey of Physics (Spring) | |
| PHSC 101 | Survey of Physical Science | |
| PHSC 121 | Physical Geology (Fall) | |
| CADT 110 | Introduction to SolidWorks (7 1/2 week) | 3 |
| ENGR 100 | Introduction to Engineering Design ¹ | 3 |
| Any BLDT, CADT, CMIS, CMTE, ENGR, GISA, MATH, or SPAN course | | 3 |
| Credits | | 15-16 |
| Recommended Third Semester | | Credits |
| Communication Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#communication) - Recommended course(s) below: | | 3 |
| COMM 107 | Career Communication | |
| CADT 250 | Statics and Strength of Materials (15-week) ² | 4 |
| Physical Education, Health, or Nutrition Requirement | | 1,3 |
| Any BLDT, CADT, CMIS, CMTE, ENGR, GISA, MATH, or SPAN course | | 3 |
| Credits | | 11-13 |
| Recommended Fourth Semester | | Credits |
| Humanities Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#humanities) - Recommended course(s) below: | | 3 |
| PHIL 208 | Business Ethics | |
| Arts Elective (Gen Ed course list) (https://frederick-public.courseleaf.com/general-education-core/#arts) | | 3 |
| CADT 255 | Dynamics (15-week) ³ | 4 |
| Select one of the following: | | 7 |
| Any BLDT, CADT, CMIS, CMTE, ENGR, GISA, MATH, or SPAN course | | |
| INTR 103 | Internship | |
| Credits | | 17 |
| Total Credits | | 60-63 |

1

Prerequisite: MATH 165 Precalculus

2

Prerequisite: ENGR 100 Introduction to Engineering Design

3

Prerequisite: CADT 250 Statics and Strength of Materials

Part-time Students

Part-time students should complete courses in the order listed on the pathway. Please contact program manager for questions about part-time status.

Students who take fewer than 15 credits each semester or who require developmental English or Math coursework will need additional semesters to complete their degrees. Summer term and January session classes may help students to make faster progress.

Pathway Legend

Milestone - courses with the Milestone notation should be taken within the recommend credit range to stay on track for program completion.

Fall, Spring, Summer - courses with a Fall, Spring, or Summer notation indicate the course is offered in the specified semester only.