The interdisciplinary Advanced Manufacturing Sciences (AMS) Digital Security in Manufacturing IDP program mirrors the Manufacturing USA® Cybersecurity Manufacturing Innovation Institute (CyManII). The program combines the fields of advanced manufacturing, computer science, mechanical engineering, and electrical engineering and introduces a cybersecure energy-ROI for energy efficient manufacturing and supply chains to secure and sustain American leadership in global manufacturing competitiveness. With hands-on laboratory classes and sound theoretical coursework, this four-year professional undergraduate program will prepare you for an innovative career in advanced manufacturing.

This is an extended major that does not require a minor.

RECOMMENDED GENERAL STUDIES COURSEWORK & UNIVERSITY REQUIREMENTS

All students must complete the standard General Studies requirements for their catalog year.

General Studies as required by the university. The student should work with the faculty advisor or IDP advisor to carefully choose these courses

   Total of required credits for General Studies   **33 credits**

Degree/Graduation Requirements:

   Multicultural and Global Diversity Requirements: **3 credits each**

   Students may fulfill the multicultural and global diversity requirements by taking approved courses within one of the following categories: arts and humanities; historical; natural and physical sciences; or social and behavioral sciences.

   Senior Experience: **3 credits**

     Please work with faculty advisor and IDP advisor to choose an appropriate course.

Contact:
Center for Individualized Learning
1027 9th Street Park
303-615-0525
msudenver.edu/individualized-degrees/

Advanced Manufacturing Sciences, Digital Security in Manufacturing
IDP Recommended Coursework

General Studies Courses

Students must take approved courses that fulfill the following distribution and credit requirements. Refer to the current MSU Denver University Catalog to review approved General Studies coursework and completion requirements.

Written Communication (6 Credits Required)

  Recommended Course: ENG 1010 - Composing Arguments (3)

  Recommended Course: ENG 1020 - Research & Argument Writing (3)

Oral Communication (3 Credits Required)

  Select one course from Oral Communication course list (3)

Quantitative Literacy (3 Credits Required)

  Recommended Course: MTH 1110 College Algebra for Calculus (4)

Arts and Humanities (6 Credits Required)

  Select one course from the Arts and Humanities course list (3)

  Select one course from the Arts and Humanities course list (3)

Historical (3 Credits Required)

  Select one course from the Historical course list (3)

Natural and Physical Sciences (6 Credits Required)

Select one course from the Natural and Physical Sciences List

Select one course from the Natural and Physical Sciences List

Social and Behavioral Sciences (6) Credits Required)

  Select one course from Social and Behavioral Sciences course list (3)

  Recommended Course: CET 3120 Engineering Economy (3)

Multicultural and Global Diversity Requirements:

Students may fulfill the multicultural and global diversity requirements by taking approved courses within one of the following categories: arts and humanities; historical; natural and physical sciences; or social and behavioral sciences.

Digital Security in Manufacturing Courses

AMS 1010 - Survey of Advanced Manufacturing and Workplace Preparation (3)

AMS 3010 - Additive Manufacturing Stratasys Certification Preparation (3)

AMS 4950 - Senior Experience Professional Internship (3)

CS 1030 - Computer Science Principles (4)

CSS 2751 - Principles of Cybersecurity (3)

CSS 2752 Information Assurance (3)

CSS 2753 Network Security (3)

CSS 2754 Host Security (3)

CSS 3751 Application Security (3)

CSS 3752 Computer Forensics (3)

CSS 3753 Computing & Security for Manufacturing (3)

EET 1001 - Electronics: An Introduction (3)

JMP 2610 - Introduction to Technical Writing (3)

MET 1010 - Manufacturing Processes (3)
_OR_ IND 2830 - Manufacturing Materials and Processes (3)

MET 1200 - Technical Drawing I (3)
_OR_ IND 1450 - Technical Drawing and CAD (3)
_OR_ CET 1215 - Engineering Graphics (3)

MET 1310 - Principles of Quality Assurance (3)

MET 2010 - CNC Machining and Inspection (3)

MET 3000 - Manufacturing Analysis (4)

MET 3630 - Lean Manufacturing Systems Engineering (3)

MTH 1120 - College Trigonometry (3)

Electives

You may choose (25) credit hours of Electives

(15) credit hours must be Upper Division courses to fulfill the University requirement of (40) upper division credit hours.

> **General Studies Courses:**
> **(34) Credit Hours; (3) Upper Division**

> **Digital Security in Manufacturing Courses:**
> **(87) Credit Hours; (37) Upper Division**

> **TOTAL UPPER DIVISION HOURS: 40**
> **TOTAL CREDIT HOURS: 121**

Academic Plan – Digital Security in Manufacturing

Semester 1 - Fall

- ENG 1010 Composing Arguments (3) (GS)
- Oral Communication (3)(GS)
- Art and Humanities (3) (GS)
- Quantitative Literacy **Recommended Course:** MTH 1110 College Algebra for Calculus (4)
- AMS 1010 Survey of Advanced Manufacturing & Workplace Prep (3)

Total Credit Hours 16

Semester 2 - Spring

- ENG 1020 Research and Argument Writing (3) (GS)
- Historical (3) (GS)
- CS 1030 Computer Science Principles (4)
- MET 1010 (3) Manufacturing Processes (3)
  OR IND 2830 Manufacturing Materials & Processes (3)
- MTH 1120 College Trigonometry (3)

Total Credit Hours 16

Semester 3 - Fall

- Art and Humanities (3)(GS)
- Natural & Physical Sciences (3) (GS)
- CSS 2751 Principles of Cybersecurity (3)
- MET 1200 Technical Drawing I (3)
  OR IND 1450 Technical Drawing and CAD (3)
  OR CET 1215 Engineering Graphics (3)
- EET 1001 Electronics: An Introduction (3)

Total Credit Hours 15

Semester 4 - Spring

- Social & Behavioral Sciences (3)(GS)
Recommended Course: CET 3120 Engineering Economy
- Natural & Physical Sciences (3) (GS)
- CSS 2752 Information Assurance (3)
- JMP 2610 Introduction to Technical Writing (3)
- MET 1310 Principles of Quality Assurance (3)

Total Credit Hours 15

Semester 5 - Fall

- CSS 2753 Network Security (3)
- MET 2010 CNC Machining and Inspection (3)
- MET 3000 Manufacturing Analysis (4)
- *Elective (1)* **Recommended Course:** IND 1000 Introduction to Industrial Design (1)
- *Elective (3)*
- *Elective (3)*

Total Credit Hours 17

Semester 6 - Spring

- Social & Behavioral Sciences (3)(GS)
- CSS 2754 Host Security (3)
- *Elective (3)*
- *Elective (3)*
- *Elective (3)*

Total Credit Hours 15

Semester 7 - Fall

- AMS 3010 Additive Manufacturing Stratasys Certification Preparation (3)
- CSS 3751 Application Security (3)
- CSS 3752 Computer Forensics (3)
- MET 3630 Lean Manufacturing Systems Engineering (3)
- *Elective (3)*

Total Credit Hours 15

Semester 8 - Spring

- AMS 4950 Senior Experience Professional Internship (3)
- CSS 3753 Computing & Security for Manufacturing (3)
- *Elective (3)*
- *Elective (3)*

Total Credit Hours 12