Bachelor of Science Individualized Degree Program
Advanced Manufacturing Sciences, Additive Manufacturing

Background and Rationale

In December 2014, Congress passed the Revitalize American Manufacturing and Innovation Act (RAMI Act) into law, which gave Congressional authorization to establish a network of manufacturing innovation institutes with technology emphasis of highest importance to the nation. Today, these breakthrough technologies are leading us into a Fourth Industrial Revolution that is fusing the physical and digital worlds.

Manufacturing USA® is the national network created by 16 manufacturing innovation institutes (sponsored by either the U.S. Department of Commerce, Defense, or Energy) which bring together member organizations from manufacturers of all sizes, academia and government to work on major research and development projects relevant to industry and train people on advanced manufacturing skills.

This large-scale approach to manufacturing innovation is paving the way for the adoption of advanced manufacturing technologies and processes across the U.S. industrial base, giving rise to new industries and creating exciting, well-paid manufacturing jobs.

Description

The interdisciplinary Advanced Manufacturing Sciences (AMS) Additive Manufacturing IDP program mirrors the Manufacturing USA® additive manufacturing institute, combining the fields of advanced manufacturing, computer science, mechanical engineering, and electrical engineering. 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.

Contact:

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Advanced Manufacturing Sciences, Additive 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 1120 Trigonometry (3)

Arts and Humanities (6 Credits Required)

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

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Historical (3 Credits Required)

Select one course from the Historical course list (3)

Natural and Physical Sciences (6 Credits Required)

Select one course from Natural and Physical Sciences course list (3)

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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.

Additive 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)

CS 1050 - Computer Science I (4)

CS 2050 - Computer Science II (4)

CS 3510 - Computer Graphics (4)

CSS 2751 - Principles of Cybersecurity (3)

CSS 3753 Computing & Security for Manufacturing (3)

EET 1001 - Electronics: An Introduction (3)

IND 3000 - Design Thinking (3)

IND 3660 - Computer Aided Modeling (3)

IND 3950 - History of Industrial Design (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 1210 - 3D Modeling (3)

MET 1310 - Principles of Quality Assurance (3)

MET 2010 - CNC Machining and Inspection (3)

MET 3000 - Manufacturing Analysis (4)

MET 3260 - Direct Digital Manufacturing (3)

MET 3410 - Geometric Dimensioning and Tolerancing (3)

MET 3630 - Lean Manufacturing Systems Engineering (3)

MET 3735 - Computer Integrated Manufacturing (3)

MTH 1410 - Calculus I (4)

MTH 2140 - Computational Matrix Algebra (2)

MTH 2410 - Calculus II (4)

General Studies Courses:
(33) Credit Hours; (3) Upper Division

Additive Manufacturing Courses:
(87) Credit Hours; (38) Upper Division

TOTAL UPPER DIVISION HOURS: 41
TOTAL CREDIT HOURS: 120

Academic Plan – Additive Manufacturing

Semester 1 - Fall	**Semester 2 - Spring**
○ ENG 1010 Composing Arguments (3) (GS) ○ Oral Communication (3)(GS) ○ Art and Humanities (3) (GS) ○ Quantitative Literacy **Recommended Course:** MTH 1120 College Trigonometry (3) ○ AMS 1010 Survey of Advanced Manufacturing & Workplace Prep (3) **Total Credit Hours 15**	○ ENG 1020 Research and Argument Writing (3) (GS) ○ Historical (3) (GS) ○ Art and Humanities (3)(GS) ○ MET 1010 (3) Manufacturing Processes (3) ***OR*** IND 2830 Manufacturing Materials & Processes (3) ○ MTH 1410 - Calculus I (4) **Total Credit Hours 16**
Semester 3 - Fall	**Semester 4 - Spring**
○ Natural & Physical Sciences (3) (GS) ○ CS 1030 Computer Science Principles (4) ○ MET 1200 Technical Drawing I (3) ***OR*** CET 1215 Engineering Graphics (3) ***OR*** IND 1450 Technical Drawing and CAD (3) ○ EET 1001 Electronics: An Introduction (3) ○ MTH 2140 Computational Matrix Algebra (2) **Total Credit Hours 15**	○ Natural & Physical Sciences (3) (GS) ○ CS 1050 Computer Science I (4) ○ JMP 2610 Introduction to Technical Writing (3) ○ MET 1310 Principles of Quality Assurance (3) ○ MTH 2410 Calculus II (4) **Total Credit Hours 17**
Semester 5 - Fall	**Semester 6 - Spring**
○ CS 2050 Computer Science II (4) ○ MET 1210 3D Modeling (3) ○ MET 2010 CNC Machining and Inspection (3) ○ MET 3000 Manufacturing Analysis (4) ○ IND 3000 Design Thinking (3) **Total Credit Hours 17**	○ CS 3510 Computer Graphics (4) ○ IND 3660 Computer Aided Modeling (3) ○ IND 3950 History of Industrial Design (3) ○ MET 3260 Direct Digital Manufacturing (3) ○ MET 3410 Geometric Dimensioning and Tolerancing (3) **Total Credit Hours 16**
Semester 7 - Fall	**Semester 8 - Spring**
○ AMS 3010 Additive Manufacturing Stratasys Certification Preparation (3) ○ CSS 2751 Principles of Cybersecurity (3) ○ CET 3120 Engineering Economy (3)(GS) ○ MET 3630 Lean Manufacturing Systems Engineering (3) **Total Credit Hours 12**	○ AMS 4950 Senior Experience Professional Internship (3) ○ CSS 3753 Computing & Security for Manufacturing (3) ○ MET 3735 Computer Integrated Manufacturing (3) ○ Social & Behavioral Sciences (3) (GS) **Total Credit Hours 12**