BACHELOR OF APPLIED SCIENCE IN INTEGRATED DIGITAL MANUFACTURING ENGINEERING TECHNOLOGY

Integrated Digital Manufacturing Technology (IDM), often referred to as Smart or Data-Driven Manufacturing, is an engineering field dedicated to improving manufacturing productivity, quality, safety, uptime, and optimization. IDM achieves improved manufacturing by controlling, analyzing, and implementing new sensor technologies designed to enhance all aspects of production through gathering data, analyzing data, and providing solutions based on information modeling. Integrated Digital Manufacturing Technology seeks to solve manufacturing issues by implementing data-driven decision-making.

Students completing this degree will gain a comprehensive knowledge of manufacturing and automated systems, mechanical devices, electrical issues, industrial information technology and networking. This program will guide students to gain an operational knowledge base to complement acquired information technology skills. This is accomplished thorugh a combination of learning skills in Human Data Input (HDI), robotics, programmable logic controllers (PLC), smart and wireless sensors and devices, utilizing the Industrial Internet of Things (IIoT), and supervisory control and data acquisition (SCADA) software and hardware. Graduates will design or use a system of software and hardware elements that allow industrial organizations to control industrial processes locally or at remote locations as well as monitor, gather, and use real-time process data while directly interacting with devices from anywhere in the world. Students in the IDM program will acquire knowledge of electrical, mechanical, networking engineering, cybersecurity, cloud security, enterprise security, and design knowledge as essential parts of this program.

Financial Assistance funds cannot be applied towards this program. Request for eligibility to utilize Financial Assistance funds for this program is currently pending.

Related Programs/Training

Smart Manufacturing - Mechatronics, Associate of Applied Science

Program Admission Requirements

Applications may be submitted after meeting the following requirements:

- High School Diploma/GED
- Complete ENG-1010 College Composition I or ENG-101H Honors College Composition I
- MATH-0965 Intermediate Algebra with grade of "C" or higher; or appropriate score on Math placement test.

Program Learning Outcomes

This program is designed to prepare students to demonstrate the following learning outcomes:

a. Demonstrate knowledge of manufacturing processes, technologies, and operations.
b. Ability to perform rapid prototyping, complex part manufacturing, and spare part creation.
c. Ability to perform troubleshooting activities and aid manufacturing in future machine learning activities when combined with big data initiatives
d. Demonstrate ability to enable IIoT applications with edge computing such as predictive analytics and maintenance, digital twin, and machine learning and optimization.
e. Demonstrate knowledge of connectivity for IACS devices, including sensors, actuators, and controllers and assets such as robots.
f. Ability to use plant-wide applications such as manufacturing execution systems, supervisory control and data acquisition (SCADA), historians, and asset managers.
g. Implement, evaluate, and provide securely integrated to IIoT, enterprise, and cloud services.

First Year

First Semester		**Credit Hours**
EET-1220	Circuits and Electronics for Automation	3
ENG-1010	College Composition I	3
MET-1120	Computer Applications and Programming	2
MET-1230	Drawing & AutoCAD	3
MET-1640	Robotics and Programmable Logic Controllers in Process Automation	5
	Credit Hours	**16**
Second Semester		
HUM-1020	The Individual in Society	3
ISET-1301	Mechanical/Electrical Print Reading	3
MATH-1530	College Algebra	4
MET-1340	Introduction to Industry 4.0 and Vision Systems	4
MET-2601	3D Solid Modeling	3
	Credit Hours	**17**

Second Year

First Semester		
EET-1600	Industrial Routers, Switches, and Operating Systems for Smart Manufacturing	2
ISET-1320	Fundamentals of Fluid Power	2
ISET-2200	Industrial Motor Controls	3
MET-1410	Computer Aided Manufacturing Processes	3
ENG-2151	Technical Writing	3
DEGR-XXXX	Natural Science Requirement (lecture) [1]	3
	Credit Hours	**16**
Second Semester		
EET-1620	Industrial Protocols and Machine Connectivity for Smart Manufacturing	3

MET-2450	Robotics and Automation in Smart Manufacturing	4
MET-2460	Applied Programmable Logic Controllers and Mechatronic Systems	5
PSY-1050	Introduction to Industrial/Organizational Psychology	3
	Credit Hours	**15**
Third Year		
First Semester		
CHEM-1010	Introduction to Inorganic Chemistry	4
MATH-1480	Modern Mathematics for Business and Social Sciences II	4
MET-3830	Smart Manufacturing Internship I	1
DEGR-XXXX	Ohio Transfer 36 Elective	3
ISET-3100	Electrical and Mechanical Systems for Smart Manufacturing	3
	Credit Hours	**15**
Second Semester		
MET-3100	Applied Smart Manufacturing Processes	3
EET-3100	Manufacturing Network Devices	3
EET-3200	Industrial IoT Fundamentals and Cybersecurity	4
EET-3210	CyberOps for Manufacturing	4
Select one of the following:		3
PHIL-2020	Ethics	
PHIL-202H	Honors Ethics	
	Credit Hours	**17**
Fourth Year		
First Semester		
MET-3840	Smart Manufacturing Internship II	1
EET-4200	Cloud Security for Manufacturing	3
EET-3300	Applications Programming for Smart Manufacturing	3
EET-3310	Industrial Software Applications Development	4
Ohio Transfer 36 Social and Behavioral Sciences Requirement		3
	Credit Hours	**14**
Second Semester		
EET-4100	Network Security for Manufacturing	4
MET-4210	Smart Manufacturing ERP Systems	4
MET-4990	Integrated Digital Manufacturing Project	3
EET-4210	Big Data Analytics for Smart Manufacturing	3
	Credit Hours	**14**
	Total Credit Hours	**124**

[1] Highly Recommend PHYS-1210 College Physics I.

MATH-1140, MATH-1141, MATH-1200, MATH-1270, and MATH-1280 can no longer count towards fulfilling the college-level mathematics requirement. These courses were re-classified as developmental mathematics by the state of Ohio in 2016. Tri-C established a 5-year transitioning window for students who had completed these courses prior to 2016 to apply them towards meeting graduation requirements, which expired in Summer 2021. It is highly recommended to see a counselor to determine the appropriate math required for your current major.