

Introduction to Analytics for Intelligent Manufacturing (i-AIM)

10hr Course | Earn an ASU Micro-badge

Instructors:

Dr. Giulia Pedrielli (gpedriel@asu.edu), Dr. Daniel McCarville (drmccarv@asu.edu)

What is analytics for intelligent manufacturing?

Over the last decade, technologies available in new generation factories (IIoT, robotics) have enabled automation to reach new potentials in terms of operations flexibility, rapid reaction to changes on the shop floor, increased observability of the system at different spatial and temporal scales. As a result, in addition to traditional engineering knowledge, the ability to use data and feed decision models with these is becoming a key asset to a successful operations of these systems. This course covers the basis of simulation and data driven methods for analysis and improvement of manufacturing systems. The course will feature engaging hands-on experiments to understand the use of data for process improvement. To close the course, we will have an industry talk by collaborators from the largest companies in Arizona.

For who, when and where is the program being offered?

This course will be offered in-person to Barrett, The Honors College, students, at the Tempe campus starting Monday, April 24, 2023, through Friday, April 28, 2023. There will be one class offered on each day, totaling five classes and each class will be two hours in length, totaling 10 hours.

What do I need to know to take this class?

The content of the class is designed in such a way that any Barrett, The Honors College, student in science or business programs will be able to take this class. Students are not required to write computer code for this class.

How do I earn a micro-badge for this class?

To earn a micro-badge, the student must attend all 10 hours of the class, including lab-based assignments. All activities will be performed during class time and there will be no additional work at home. This class does not qualify for credit transfer requirements.

Will more courses be offered for the Manufacturing Analytics Certification Badge?

This course is part of the Analytics for the Digital Factory: From Models to Data to Decisions. New 10-hour modules will be offered that enable a student to continuously stack up micro-badge certifications. Please contact the instructor for more details.

How much does the program cost?

For those who meet Arizona residency requirements, the course will be offered at no charge. The program fee and any materials required to successfully perform laboratory assignments will be covered. The class will be filled on a first come, first-served basis with any additional students being waitlisted until seats are available.

Introduction to Analytics for Intelligent Manufacturing

What is covered in this 10-hour class module?

This 10-hour module introduces the student to the terminology related to manufacturing analytics, simulation and data analysis techniques and software vendors. Moreover, the course will feature hands on collaborative experiences for learners to appreciate the importance of modeling and designing appropriate experiments to achieve diagnostics and performance improvement goals. The module offers a lecture and three hands-on laboratories to achieve understanding of data driven decision making.

Lecture	Content	Day
1-2) Intro to modeling and Simulation Analytics	Lecture (2h): What is simulation and computer design of experiments? When is simulation successful.	4/24/2023 6:30pm-8:30pm
	Laboratory: In this first lab, we build a simple simulation for a basic production systems. We will guide you to use a simulation software.	4/25/2023 6:30pm-8:30pm
3-4) Quality Control	Lecture: We introduce fundamental topics in quality control and how we use observations to understand issues in the system.	4/26-4/27, 2023 6:30pm-8:30pm
	Laboratory: The M&M's experience will teach the learners, while having fun, how to spot potential challenges and diagnose roots causes for quality issues by performing rigorous analysis	
	Laboratory: The card drop experiment will bring us into the area of continuous improvement. We will understand how to define "what matters" and vary them sequentially and intelligently	
5) Industry Talk	Let's hear from industry experts in operations, modeling, optimization! Each cycle will bring in a new expert that learners can connect with.	4/28/23
Give us feedback!		

How do I earn a full badge in analytics for intelligent manufacturing?

The following courses can be taken by the students to earn a full badge in IIoT. Details regarding availability will be made available shortly.

- 1) Intro: Analytics for Intelligent Manufacturing (*This Course*)
- 2) Digital Twins in Smart Manufacturing
- 3) Analytics for Smart Quality
- 4) Experiments for Smart Production Improvement
- 5) Decision Making for Smart Manufacturing

Can I display this micro-badge on my LinkedIn profile?

Yes, students can display the micro-badge on their LinkedIn profile. Instructions will be provided to participants on how to do this integration. In addition, any prospective employer can review the content learned as part of the micro-badge attainment.