De-mystifying Industry 4.0 / Digital Manufacturing

It has been widely accepted that digital technologies are a key enabler to any manufacturing transformation. To sustain and improve manufacturing capability in Victoria, it is essential for manufacturing businesses to adopt digital technologies. This course aims to develop the basic understanding of Industry 4.0/ digital technologies, its benefits, applications and approach to adoption.

Created specifically for industry professionals in senior, middle management & front-line leadership wanting to gain a high-level understanding of Industry 4.0 technologies including Additive Manufacturing, Industrial Internet of Things (IIoT), Data Analytics, Cloud Computing, Artificial Intelligence / Machine Learning (AI/ML), Augmented & Virtual Reality (AR/VR) etc. More broadly, General Managers, Operations Managers, Production & Maintenance Managers, Innovation/ Continuous Improvement / Digital Transformation Managers, Production / Quality supervisors and team leaders from industrial and consumer goods manufacturing and processing industries including food & beverage manufacturing, agribusiness, defence, FMCG etc., can benefit from this course.

The course content is tailored to appeal to participants with a range of digital literacy from beginner to advanced levels. This course requires no prior learning.

RECOMMENDED SKILL LEVEL: Foundational to Intermediate

Foundational — Intermediate — Advanced

TOTAL COURSE LOAD:

40 hours total

3 – 5 hours hours/week

CLASS STYLE: Virtual and in-person (optional)

20.1 What are the entry requirements?

RECOMMENDED SKILL LEVEL: Foundational-intermediate

REQUIRED PRIOR LEARNING: Nil. There are no pre-requisites for this course other than basic digital literacy (as described in Section 1.1).

20.2 What will I study?

Delivered in two formats – virtual and in-person (optional) - the course takes a holistic approach towards introducing and educating participants about various Industry 4.0 technologies and associated concepts and considerations.

In a virtual setting, participants learn about Industry 4.0 and how it is transforming manufacturing. Various examples are used to explain the concept of Lean Industry 4.0 and how it accelerates operational excellence. Using a combination of open-source and proprietary simulation software, participants learn about manufacturing process optimisation. Participants are exposed to various other digital technologies, for example Industrial Internet of Things (IIoT), Digital Twins, Artificial Intelligence (AI), Cybersecurity, Vision systems, Robotics and Collaborative robots, Additive Manufacturing, Energy monitoring, Virtual and Augmented Reality (VR and AR). In the final virtual sessions, participants learn about Business Model Innovation through Servitization enabled by Industry 4.0 and emerging topics in Industry 5.0.

During the in-person, on-campus sessions (optional), participants can expect to get hands-on with various technologies to get an appreciation of their usage. For example, participants will experience developing IoT based application using relevant hardware and software, create a software simulation model/ Digital Twin, program collaborative robots, see demonstrations of additive

manufacturing/3D printing and various manufacturing case studies of AR/VR on VR headsets, Microsoft Hololens and other web based applications.

20.3 Study load

Virtual contact hours: 3 hours per week	
On-campus contact hours: 2 days x 8 hours (optional)	**Total course load:** - 40 hours total - 3 – 5 hours hours per week x 10 weeks
Non-contact hours: 8 weeks x 2 hours	

20.4 Assessments

Considering the participant profile, the assessments throughout the course will ask participants to draw from their workplace challenges and reflect on how a particular technology could help mitigate that challenge. The participants will be required to submit three learning reflections/ assignments (1-2 page) containing a plan, an outline and considerations of their solution. These reflections will be spread over the course duration of 10 weeks. By documenting the actions, we hope to encourage implementation of participants' learning within their business. A rubric with key task requirements will be provided to guide the participants in completing the assignment. To achieve a "Complete" grade, the assignment must clearly meet all the task requirements in the rubric.

20.5 Where will this take me?

At the completion of the 10 week course, the aim is to dispel any misconceptions about Industry 4.0 and help develop a positive mindset and outlook towards the benefits of Industry 4.0 adoption and in the process, create Industry 4.0/Digital transformation champions (change champions) for a business. Businesses can leverage the course as part of their change and transformation plans and utilise their champions to create and/or implement digital strategy, promote and lead Industry 4.0 adoption/Digital transformation programs/projects within their business.

Depending on the level/position of the participant in their business, they may become a sponsor of future projects/plans, or project manage future projects/plans.

20.6 Who will teach me?

The trainers and assessors for this course will be a mix of seasoned manufacturing professionals, academics and industry/technology partners. Each of the trainers will have extensive working experience in manufacturing and/or implementing Industry 4.0 technologies in the manufacturing sector and typically hold a Masters or higher qualification in an engineering discipline.

Some of the Industry partners will be invited as guest speakers or for delivering practical hands-on sessions of the course.

Manufacturing professionals, primarily from SMEs may be invited to share their learnings on their Digital transformation journey with participants.

20.7 What student support is available?

All hardware and software required during on-campus days will be provided by Swinburne University of Technology. Participants will not be required to purchase any software or equipment. Participants will have the option to download free software or subscribe to free trials for either advanced learning or for their ongoing learning beyond the course. Participants will need suitable computer/ laptop to access the course content virtually.

Participants will have access to manufacturing professionals, technology providers and Industry 4.0 subject matter experts from the research domain. They will have an opportunity to discuss their specific manufacturing challenges and needs in detail, seek advice on specific technology or approach to technology adoption.

20.8 Class schedule

Schedule: Virtual and in-person (optional). This is only an indication and not a confirmed schedule.

Week One:	Week Two:	Week Three:	Week Four:	Week Five:
M:	M:	M:	M:	M:
T:	T:	T:	T:	T:
W:	W:	W:	W:	W: 9AM-12PM Online
Th:	Th:	Th:	Th:	Th:
F: 9AM-12PM Online	F: 9AM-12PM Online	F: 9AM-12PM Online	F: 9AM-4PM On-Campus Optional	F:

Week Six:	Week Seven:	Week Eight:	Week Nine:	Week Ten:
M:	M:	M:	M:	M:
T:	T:	T:	T:	T:
W:	W:	W:	W:	W:
Th:	Th:	Th:	Th:	Th:
F: 9AM-12PM Online	F: 9AM-12PM Online	F: 9AM-12PM Online	F: 9AM-12PM Online	F: 9AM-4PM On-Campus Optional

20.9 Need more information?

Contact details:	industry4hub@swin.edu.au