Advanced Manufacturing: Internet of Everything

ICTC's WIL Advanced Manufacturing: Internet of Everything e-Learning course provides an introduction to the application of the Industrial Internet of Things (IIoT) in manufacturing business systems.   Students will gain a practical understanding of the scope of a simple IIoT project, from data collection to visualization and the delivery of insights for decision-makers. Students are   expected to have prior knowledge in Engineering or Computer science.

Modules		Lessons	Learning Objectives	
Module 1	IoT and IIoT: concepts and components	• History of IoT and IIoT • IIoT structure and technologies used • Benefits of IIoT • Main uses of IIoT • IIoT Challenges	• Define the concepts of IoT and IIoT • Explain the structure of high-level IIoT • Identify the main benefits and challenges related to IIoT	Padlet Discussion
Module 2	Industrial Data Sources	• Introduction to data sources (sensors, machines, processes) • Sensor technology and industrial application • Types of sensors • Calibration and veracity of sensors	• Contextualize the use of sensors • Identify the different types of sensors • Distinguish the characteristics of different types of sensors	Padlet Discussion
Module 3	IIoT Ecosystem: the transformation of industrial data	• Cloud Computing • IIoT Ecosystem • Gateways and other integrated systems • IIoT Implementation • Network security and other types of security	• Recognize the central role of cloud computing in the transformation of industrial data • Distinguish between public and private clouds • Identify the main functions of the Internet of Things (IoT) platforms • Identify the challenges in securing the Industrial Internet of Things (IIoT)	Quiz
Module 4	Industrial Data Life Cycle	• Databases (data, RDBMS/NoSQL, basic data architecture) • Data collection methods • Data Analysis	• Identify technologies to collect, store, and transmit data • Contextualize the use of these technologies • Identify beneficial approaches to the maintenance, cost, and operation of sensor systems • Discover Industry 4.0 business intelligence and artificial intelligence systems	Padlet Discussion
Module 5	Applications and intelligence of industrial data	• Presentation of basic knowledge • Data visualization • Connection and reports • Examples of IIoT usage	• Explain what is valuable information • Explain the communication process with the experience/user interface • Define the concept of a digital twin • Establish the role of augmented reality in IIoT	Padlet Discussion
Module 6	IIoT trends, career opportunities and future solutions	• Future Trends in IIoT • The Canadian labour market, jobs in demand • Ethics, laws and IIoT • Solutions to meet international goals and standards	• Identify some future trends in the IIoT • Identify the jobs in demand in the field of IIoT • Assess the consequences and risks of using shared data and infrastructure	Padlet