**Advanced Manufacturing & IIoT**

ICTC’s WIL Advanced Manufacturing (IIoT) 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.

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<th>Modules</th>
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| **Module 1** | **IoT and IIoT: concepts and components** | • History of IoT and IIoT  
• IoT 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 |
| **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 |
| **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) |
| **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 |
| **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 |
| **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 |