

**Part-time**  
Level 8  
**Online**



# Certificate in **Innovation, Design and Machine Learning**

## **About**

This certificate provide learners with an introductory understanding of innovative design principles and data science machine learning (ML) tools and techniques and how they can be employed ethically and legally in organisations.



## Overview

The course has two parts, the first element will provide an understanding of design thinking theory, strategic business processes and strategic design for innovation. The second element will introduce the learner to data science theories and best practice processes along with machine learning techniques. Both elements are introductory, requiring no prior knowledge in the area and learners will apply theories, techniques and processes towards provision of solutions for the insurance industry.

## Course Content

### Part 1

- **Design Thinking Theory:** Learners will gain an understanding of the principles that underpin actionable business processes. Learners will be guided through resource material on leading design theory and the most recent interpretations of the principles across the business landscape.
- **Strategic Business Processes:** Learners will focus on the multiple stages of strategic business processes and how the applications vary. Learners will be supported by facilitator in workshop environments to work in teams on the identification of business challenges and application of strategic processes. Facilitator will support groups with presentation preparation and critical feedback mechanisms. Learners will work on creating shared context and shared problem solving on defined, programme approved challenges.
- **Strategic Design for Innovation:** Learners will select a specific work-based challenge so they will be required to source a company to use as a case study for their work. All learners will participate in the professional development aspect of this module. Learners will apply the strategic design process and innovation toolkit to identify challenges/ opportunities, generate and evaluate new ideas

### Part 2

- **Introduction to Data Science, Data and Data Types:** Introduction to data science and analytics, descriptive, diagnostic, predictive, prescriptive analytics etc. Structured (tabular), unstructured (text), semi-structured data, qualitative and quantitative data, types of data, e.g. nominal, ordinal etc., proprietary, CSV files, text files etc.
- **Data Science Lifecycle/Process Models:** Data science process models such as CRISP-DM, ASUM-DM, TDSP, agile process models etc.
- **Data Pre-processing Data Post-processing:** Data cleaning data integration, data transformation, data normalisation and aggregation, data reduction. Interpretation, documentation, evaluation
- **Introduction to Machine Learning Techniques and Algorithms:** Introduction and overview of potential tools to use for implementation/ exploration such as RapidMiner, Weka, Jupyter notebooks, Python, R, etc.
- **Data Post-processing:** Interpretation, documentation, evaluation
- **Legal, Ethical and Compliance Issues:** GDPR, ethics etc.

## Who is this course designed for?

The programme is designed for those seeking to develop skills and design research methodologies and implementing findings into optimising user experience in an innovative organisation.

## Progression

Graduates of the certificate can progress to the Higher Diploma in Business in Innovative Data Generation, Analytics and Management.

## Start Date

January 2023

## Duration

12 weeks (2-hour classes)

## Fees

Free. This course is fully funded by CIRDAS.

## Entry Requirements

Level 8 degree with a minimum of Second Class Honours, Grade 2 in a related discipline or equivalent.

SETU Carlow Campus operates a Recognition of Prior Experiential Learning (RPL) scheme whereby applicants may be considered, based on relevant work and other experience, for exemptions from programme modules and advanced entry.

All applicants will be considered on a case-by-case basis. The Faculty of Lifelong Learning and CIRDAS reserve the right to require applicants to attend for an interview to determine their suitability for the programme.

## How do I apply?

Apply now by contacting CIRDAS Manager, Damian Rossiter, at [insurance.cw@setu.ie](mailto:insurance.cw@setu.ie) or call 053 917 5311.

## Further information

[setu.ie](http://setu.ie)  
[lll.cw@setu.ie](mailto:lll.cw@setu.ie)  
059 917 5280

**CIRDAS Manager**  
Damian Rossiter  
[insurance.cw@setu.ie](mailto:insurance.cw@setu.ie)  
053 917 5311



Rialtas na hÉireann  
Government of Ireland



**HEA** HIGHER EDUCATION AUTHORITY  
AN tÚDARÁS um ARD-OIDEACHAS