Module Title:	Data Engineering
Language of Instruction:	English

Credits:	5

NFQ Level:	8

Module Delivered In	3 programme(s)
Teaching & Learning Strategies:	This module is 100% delivered interactively within a laboratory setting (on online, as needed).
Module Aim:	To provide an overview of modern data engineering practices, tools, and methods.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Clean and wrangle data from multiple sources into a usable state.
LO2	Organize the collection, processing, and storage of data from different data sources.
LO3	Design and build ETL and ELT processes and pipelines.

Pre-requisite learning	
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*	
No recommendations listed	
Incompatible Modules *These are modules which have learning outcomes that are too similar to the learning outcomes of this module.*	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.*	
No requirements listed	

Module Content & Assessment

Indicative Content
Data Formats Understanding internet data-types: MIME, quoted-printable, Base64 (and others). Data Sources: TXT, CSV, JSON, Web Data, APIs, ERP, CRM, Databases. Structured data, Semi-structured data, and unstructured data.
Data Storage SQL Databases, Document Databases, Graph Databases, Data Warehouses, Data Lakes, Dataframes.
ETL/ELT Extract, Transform, and Load and Extract, Load, and Transform: data cleaning, munging, parsing, converting, mining, and saving.
Data Platforms Big Data, Map Reduce, Cloud-scale data, distributed data processing, Data pipelines, Parallel Computation Platforms, Scaling Issues/Concerns.

Assessment Breakdown	%
Project	100.00%

No Continuous Assessment

Project					
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*	
Project	TBD	1	35.00	n/a	
Project	TBD	2	20.00	n/a	
Project	TBD	3	45.00	n/a	

No Practical

No End of Module Formal Examination

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

DATA: Data Engineering

Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Laboratory	12 Weeks per Stage	2.00
Estimated Learner Hours	15 Weeks per Stage	6.73
	Total Hours	125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_KCCGD_B	Bachelor of Science (Honours) in Computer Games Development	8	Group Elective 1
CW_KCCYB_B	Bachelor of Science (Honours) in Cyber Crime and IT Security	8	Elective
CW_KCSOF_B	Bachelor of Science (Honours) in Software Development	8	Group Elective 1

Discussion Note:	First draft of one of the elective modules for final year undergrad offerings.

Module Delivered In

Programme Code	Programme	Semester	Delivery