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| 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 | |
| <i>On successful completion of this module the learner should be able to:</i> | |
| 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 | |
| <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i> | |
| No recommendations listed | |
| Incompatible Modules | |
| <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i> | |
| No incompatible modules listed | |
| Co-requisite Modules | |
| No Co-requisite modules listed | |
| Requirements | |
| <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i> | |
| 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

Module Workload

| Workload: Full Time | | |
|----------------------------|--------------------|--|
| <i>Workload Type</i> | <i>Frequency</i> | <i>Average Weekly Learner Workload</i> |
| 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.