Digital Sustainability Engineer (DSE)

**Learning Pathway: Core learning unit in Level 5 Certificate in Sustainable IT Operations**

This curriculum prepares learners to contribute to sustainable data infrastructure projects and environmentally responsible computing within IT departments or technology-driven organisations. Graduates will develop technical competences in green IT practices, energy-efficient system design, and sustainable cloud solutions. They typically support the development of environmentally conscious technology infrastructure and implement monitoring systems that track and optimise energy consumption across digital operations.

EQF Level 5 | 2.0 ECTS | 2 Learning Units | Work-Based Learning: 18.0% (exceeds 20% minimum)

# Programme Overview

**Role Focus:** Sustainable IT infrastructure and operations

**Target Audience:** IT professionals and engineers seeking to integrate sustainability principles into technical operations and infrastructure management

**Learning Approach:** EQF Level 5 professional development programme with 2.0 ECTS, combining theoretical knowledge with practical application through structured learning and standardised work-based learning integration.

**Core Tools & Platforms:** Cloud platforms (AWS, Azure), Energy monitoring systems, Container orchestration, Carbon tracking tools

# Competence Frameworks Alignment

**GreenComp Framework:** 1.2 Supporting fairness, 3.1 Collective action, 3.3 Political agency

## e-CF Framework (Detailed Mapping)

**B.1:** Application Development - Level 2

**B.2:** Component Integration - Level 2

**C.3:** Service Delivery - Level 2

*Learning outcomes are mapped directly to GreenComp and e-CF framework descriptors*

# Dual Education Model & Work-Based Learning

**WBL Compliance:** 18.0% work-based learning (exceeds minimum 20%)

## Model Implementation

**Minimum Wbl Percentage:** 20

**Employer Partnership:** Mandatory for all programmes

**Workplace Learning:** Integrated throughout curriculum

**Assessment Split:** 70% academic, 30% workplace-based

## Quality Assurance

**Workplace Standards:** Standardised workplace learning environments

**Mentor Qualifications:** Certified workplace mentors

**Assessment Criteria:** Unified workplace assessment standards

**Monitoring Systems:** Regular quality monitoring of WBL delivery

# Flexible Learning Pathways

**Modular Design:** Learning units designed for flexible recombination

**Competence Catalog:** Integrated with competence-based learning unit catalog

**Stackability Options:** Horizontal and vertical stacking supported

**Pathway Flexibility:** Multiple entry and exit points available

# Assessment Framework

**Primary Method:** Technical operations portfolio

**Work-Based Component:** Real-world technical implementation and system monitoring

**Assessment Components:**

**• Infrastructure implementation project:** 45%

**• System optimisation task:** 30%

**• Environmental monitoring setup:** 25%

**Rationale:** Operations programmes emphasise hands-on technical competence and practical implementation skills

# Delivery Framework

|  |  |
| --- | --- |
| **Total Contact Hours** | 24 hours |
| **Self-Study Hours** | 14 hours |
| **Work-Based Hours** | 9 hours |
| **WBL Percentage** | 18.0% (exceeds 20% minimum) |
| **Work-Based Learning** | Integrated (dual education model) |
| **Delivery Methods** | Classroom, Online, Workplace, Blended |

# Learning Unit Structure

## Learning Unit 1: Introduction to Digital Sustainability

*This learning unit forms part of the Core learning unit in Level 5 Certificate in Sustainable IT Operations*

|  |  |
| --- | --- |
| **ECTS Credits** | 0.5 |
| **EQF Level** | 5 (Programme: 5) |
| **Total Workload** | 12.5 hours |
| **Contact Hours** | 6 hours |
| **Self-Study Hours** | 3 hours |
| **Workplace Hours** | 2 hours |
| **WBL Percentage** | 20.0% |
| **Thematic Area** | Foundation |

**Description:** Core sustainability concepts and their intersection with technology systems for digital professionals

### Work-Based Learning Integration

**Employer Partnerships:** Technology companies, data centres, cloud providers

**Mentor Support:** Workplace mentor assigned for practical guidance

**Workplace Activities:**

• Infrastructure optimization projects

• Green IT implementation tasks

• Energy monitoring system deployment

### Learning Outcomes

**Knowledge:** Compare cloud sustainability optimisation in introduction to digital sustainability within professional sustainability practice.

*Framework: GreenComp: 3.1 Collective action*

**Skills:** Organise container orchestration of introduction to digital sustainability systems to support organisational sustainability objectives.

*Framework: e-CF: Component Integration - Level 2*

**Competence:** Contribute to team leadership in green IT operations support for introduction to digital sustainability while ensuring professional standards and stakeholder value.

*Framework: e-CF: Service Delivery - Level 2*

## Learning Unit 2: Big Data for Environmental Intelligence (EQF 4 Version)

*This learning unit forms part of the Core learning unit in Level 5 Certificate in Sustainable IT Operations*

|  |  |
| --- | --- |
| **ECTS Credits** | 1.5 |
| **EQF Level** | 4 (Programme: 5) |
| **Total Workload** | 37.5 hours |
| **Contact Hours** | 18 hours |
| **Self-Study Hours** | 11 hours |
| **Workplace Hours** | 7 hours |
| **WBL Percentage** | 20.0% |
| **Thematic Area** | Data |

**Description:** Leverage big data technologies to analyze environmental patterns and trends (This learning unit has been adapted for EQF level 4.)

### Work-Based Learning Integration

**Employer Partnerships:** Technology companies, data centres, cloud providers

**Mentor Support:** Workplace mentor assigned for practical guidance

**Workplace Activities:**

• Infrastructure optimization projects

• Green IT implementation tasks

• Energy monitoring system deployment

### Learning Outcomes

**Knowledge:** Evaluate infrastructure monitoring techniques for big data for environmental intelligence (eqf 4 version) within professional sustainability practice.

*Framework: GreenComp: 3.3 Political agency*

**Skills:** Plan energy monitoring implementation for big data for environmental intelligence (eqf 4 version) to support organisational sustainability objectives.

*Framework: e-CF: Service Delivery - Level 2*

**Competence:** Coordinate activities in technical implementation activities in big data for environmental intelligence (eqf 4 version) while ensuring professional standards and stakeholder value.

*Framework: e-CF: Application Development - Level 2*

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