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| Module Title: | Linux Infrastructure Engineering |
| Language of Instruction: | English |
| Credits: | 5 |
| NFQ Level: | 8 |
| Module Delivered In | 4 programme(s) |
| Teaching & Learning Strategies: | Learners will develop knowledge, understanding and practical skills primarily through labs with supporting lectures in a lab environment where appropriate. Delivery of technical content will promote discovery learning, where hands-on practical workshops will be utilised to enable learners to apply knowledge and skills, supported by an instructor led, peer learning environment. |
| Module Aim: | Effectively design and implement a flexible and scalable computing infrastructure, suitable for a wide variety of environments by integrating cluster and container technology. |
| Learning Outcomes | |
| <i>On successful completion of this module the learner should be able to:</i> | |
| LO1 | Summarise the functionality and benefits of cluster and container technology. |
| LO2 | Synthesise a range of emerging and industry standard tools, as used in cluster and container technology. |
| LO3 | Evaluate and implement an appropriate infrastructure using cluster and container technology in a given context. |
| 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> | |
| Learners should have good knowledge of Operating Systems, Networks and be comfortable working in a command line environment (Linux and Windows). | |

Module Content & Assessment

| Indicative Content |
|--|
| Clusters Intro to module and module content. Types of clusters, characteristics of clusters (fail-over, load balance, HPC) and tightly coupled nature of typical clusters. Task to build a POC cluster. |
| Private Cloud Introduction to private cloud technology. Building of private cloud technology to deploy a 'self service' infrastructure capability, using open source technology e.g. OpenStack/OpenNebula. |
| Containers Introduction to containers and container technology. Evolution of infrastructure/deployment environments to include containers. Container (e.g. Docker) on single node vs cluster environment to provision containers (Kubernetes). Examination of other implementations e.g. Linux containers (LXC/LXD). |
| Virtualisation and Orchestration Examination of various tools and techniques are available for virtualisation and orchestration, determination of which are appropriate for specific cases. |
| Infrastructure as Code Managing and provisioning compute resources through machine-readable definition files. Utilising IaC to deploy system infrastructure (IT Management), business continuity/disaster recovery (Cybercrime and IT Security) and rapid/scalable application hosting (Software Development). |

| Assessment Breakdown | % |
|-----------------------|--------|
| Continuous Assessment | 30.00% |
| Project | 70.00% |

| Continuous Assessment | | | | |
|-----------------------------|------------------------|-------------------|------------|-----------------|
| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
| Practical/Skills Evaluation | Practical Exam | 2 | 30.00 | Week 5 |

| Project | | | | |
|-----------------|------------------------|-------------------|------------|-----------------|
| Assessment Type | Assessment Description | Outcome addressed | % of total | Assessment Date |
| Project | Project | 1,3 | 70.00 | Week 12 |

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 | 3.00 |
| Independent Learning | 15 Weeks per Stage | 5.93 |
| 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_KCCIT_B | Bachelor of Science (Honours) in Information Technology Management | 8 | Group Elective 1 |
| CW_KCSOF_B | Bachelor of Science (Honours) in Software Development | 8 | Group Elective 1 |