WM3F8-15 Scalable Computing

26/27

Department
WMG
Level
Undergraduate Level 3
Module leader
Avleen Malhi
Credit value
15
Module duration
14 weeks
Assessment
40% coursework, 60% exam
Study locations
University of Warwick main campus, Coventry Primary
Distance or Online Delivery

Description

Introductory description

The mass availability of cloud computing has led to a reimagining of the software development lifecycle (SDLC) and inspired new patterns and approaches to managing portfolios of applications. There is need of software approach for building, deploying, and managing modern applications in cloud computing environments.
Modern companies want to build highly scalable, flexible, and resilient applications that they can update quickly to meet customer demands. The cloud-native technologies support fast and frequent changes to applications without impacting service delivery, providing adopters with an innovative, competitive advantage.

Module web page

Module aims

This module aims to cover the important need for apprentices to understand the fundamentals of building, deploying, and managing modern applications in cloud computing environments.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

1. What is scalable computing?
2. Scalable computing in practice
3. Containerisation and container orchestration
4. Data engineering practices
5. Scalable computing project

Learning outcomes

By the end of the module, students should be able to:

- Critically evaluate complex applications and services in cloud computing [CITP 2.2.5,C4]
- Critically evaluate software development lifecycle practices, and design conceptual and practical workflows [C5,C6]
- Devise and implement data engineering techniques for the cloud computing environments [CITP 2.1.9, 2.2.6, C3]
- Estimate systematic and operational risks associated with cloud native practices and how to mitigate them [C14]
- Analyse and Design scalable computing workflows as part of a team [CITP 2.1.4, 2.3.1, C16]

Indicative reading list

Reading lists can be found in Talis

Specific reading list for the module

Subject specific skills

This module contributes to the following Knowledge (K) and Skills (s) in the ST0119 occupational standard:
K5: A range of digital technology solution development techniques and tools.
K6: The approaches and techniques used throughout the digital and technology solution lifecycle and their applicability to an organisation’s standards and pre-existing tools.
K10: Management techniques and theories. For example, effective decision making, delegation and planning methods, time management and change management.
K13: Principles of data analysis for digital and technology solutions.
K16: Fundamental computer networking concepts in relation to digital and technology solutions. For example, structure, cloud architecture, components, quality of service.
K20: Sustainable development approaches as applied to digital and technology solutions such as green computing.
K54: How to critically analyse, interpret and evaluate complex information from diverse datasets.
K63: The benefits and risks of cloud computing and the common integration deployments (private, public, hybrid). Including the benefits and risks of virtualisation as a concept; key features of virtualisation and current cloud platforms available.
S24: Analyse client needs and determine how to advise them strategically through improved

business processes, new ideas, or technology solutions.
S49: Apply different types of Data Analysis, as appropriate, to drive improvements for specific business problems.
S54: Extract data from a range of sources. For example, databases, web services, open data.
S55: Analyse in detail large data sets, using a range of industry standard tools and data analysis methods.

Transferable skills

This module contributes to the following transferable Knowledge (K) and Skills (s) in the ST0119 occupational standard:
K56: Sources of data such as files, operational systems, databases, web services, open data, government data, news and social media.
K57: Approaches to data processing and storage, database systems, data warehousing and online analytical processing, data-driven decision making and the good use of evidence and analytics in making choices and decisions.
S10: Initiate, design, implement and debug a data product for a digital and technology solution.
S11: Determine and use appropriate data analysis techniques. For example, Text, Statistical, Diagnostic or Predictive Analysis to assess a digital and technology solutions.

Study

Study time

Type	Required
Lectures	8 sessions of 1 hour (5%)
Seminars	6 sessions of 1 hour (4%)
Project supervision	(0%)
Practical classes	9 sessions of 1 hour (6%)
Work-based learning	(0%)
Online learning (scheduled sessions)	7 sessions of 1 hour (5%)
Private study	60 hours (40%)
Assessment	60 hours (40%)
Total	150 hours

Private study description

- Online forum for discussing queries with course peers and tutor.
- `Exploring various cloud service providers and their products.`
- `Exploring high performance computing solutions available at University/work`

WBL hours to include:
Apprentices exploring the business/workplace and identifying areas where scalable computing

practices can be used improve efficiency or automate tasks.

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group D

	Weighting	Study time	Eligible for self-certification
Assessment component			
Design and develop any cloud native technology based project	40%	24 hours	No

The apprentices should design, develop and implement the cloud native technology based project in a group with executable project as well as a well-organised written report describing the project details. The group members will have peer assessment.

Reassessment component			
Design and develop any cloud native technology based project			No

The student should design, develop and implement the cloud native technology based project with executable project as well as a well-organised written report describing the project details.

Assessment component			
Exam	60%	36 hours	No

To check the core knowledge of the fundamentals of scalable computing.

Reassessment component is the same

Feedback on assessment

Feedback will be given as appropriate to the assessment type:

– verbal formative feedback on lab activities.
– written summative feedback on module assessments through Tabula

Past exam papers for WM3F8

Availability

Courses

This module is Core for:

- Year 3 of DWMS-H652 Undergraduate Digital and Technology Solutions (Data Analytics) (Degree Apprenticeship)
- Year 3 of DWMS-H654 Undergraduate Digital and Technology Solutions (Software Engineering) (Degree Apprenticeship)