

Module Details	
Module Title	Cloud AI
Module Code	COS7054-B
Academic Year	2022/3
Credits	20
School	Department of Computer Science
FHEQ Level	FHEQ Level 7

Contact Hours	
Type	Hours
Laboratories	24
Lectures	24
Directed Study	152

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 1

Module Aims
<p>In this module, you will learn key concepts for designing and developing cloud computing solutions, including relevant infrastructure, development approaches and cutting edge techniques for deploying them. The module will introduce current cloud services and providers such as Amazon Web Services (AWS) and the Cloud Adoption Frameworks. This course will give you a general conceptual understanding of cloud AI frameworks and services as well as more in depth practical knowledge of creating, deploying and maintaining cloud solutions.</p>

Outline Syllabus

This module will cover these topics:

- Introduction to AI and Cloud Infrastructure Services.
- Hands-on experience using python and cloud AI services.
- Cloud AI-Based Computing and Hosting Services.
- Cloud Big Data Analytics Services.
- Data exploration, pre-processing and modelling using machine learning pipeline on the Cloud.
- Cloud Machine Learning Services.
- Ethical principles, safety, risk of deploying and usage AI models on Cloud to solve real-life problems.
- Analysis and reproducibility of technical research papers through collaboration and engagement with colleagues within and outside the class.

Specific material covered may include: Background and history of cloud AI with more focus on Amazon Web Service AWS; current approaches and sub-fields machine learning, deep learning, reinforcement learning; data preparation and processing; software and tools for machine learning including Python programming.

Students will have the opportunity to develop enterprise skills by working in an environment similar to an industrial environment. Students will have a repository per project to maintain analysis and design documents, meeting notes, software code, debug code, deployment and user documentation.

Learning Outcomes

Outcome Number	Description
1	Evaluate computing and cloud infrastructure using relevant tools, technologies and programming tools.
2	Describe and critically assess AI services on the Cloud and understanding the spectrum of Cloud computing capabilities used to deploy them.
3	Demonstrate appropriate use of applicable Cloud data analytics and programming frameworks to implement AI applications.
4	Develop scalable AI Solutions on the Cloud.
5	Critically analyse and select appropriate techniques and algorithms depending on the context and problem.

Learning, Teaching and Assessment Strategy

Utilising current research and case studies on the topic of cloud AI, the students will participate in lectures, workshops, tutorials and independent study to explore concepts and solve real-world problems. This module will use case studies, practical demonstrations, and significant opportunities for students to design their own solutions.

In addition to the modules, academic skills workshops will be organised during the year to provide further support in self-regulation, persistence, and the development of essential skills such as digital literacy. To support accessibility, clarity and comprehension all teaching material is provided online wherever possible in advance of the teaching sessions. Throughout the programme, lots of opportunities are provided for students to design their own solutions and to express their own ideas, choosing from a variety of cloud AI frameworks, tools, and services.

To prepare the students ready for world of work, assessments are designed to measure industry ready skills such as presentation skills, report writing skills, team-work skills (using group coursework to strengthened students? ability to work effectively in teams) and peer evaluation. Throughout the module, students will be set formative assessment activities that will help develop confidence in tackling data analysis problems and in the use of the software tools that will support them. The timely constructive feedback during practical lab exercises and online support using TEL tools will support student learning throughout the module. This module will draw upon relevant topics and content aligned with Amazon Web Services Academy elements such as the Cloud Practitioner pathway through collaboration with certified practitioners from within the University, but will not directly integrate curricular content nor certification opportunities from the AWS Academy scheme itself.

Assessment is in the form of two coursework exercise that require students to select and solve problems in the fields of cloud AI and machine learning using both the knowledge gained in the module as well as independent research conducted during the completion of the coursework. Communication of research outcomes and key findings are tested both in written form and through a presentation.

If a student requires supplementary assessment for re-assessment, they will be set a range of tasks based on a supplementary scenario and data set to demonstrate evidence for the required learning outcomes, within a group where student numbers permit, and follow the form and specification of the original assessments closely.

Mode of Assessment

Type	Method	Description	Weighting
Summative	Presentation	Group mini project (2000 word report) and presentation (15 minutes); SUPP: group/individual mini project & presentation	50%
Summative	Coursework - Written	Individual research report (d>	50%

Reading List

To access the reading list for this module, please visit <https://bradford.rl.talis.com/index.html>

Please note:

This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.