

Econ625 : Cloud computing and MLOps

COURSE AIMS & OBJECTIVES, KEY SKILLS AND LEARNING OUTCOMES

Course Aims & Objectives: This course introduces cloud computing and MLOps. It covers the basics of cloud computing from a user point-of-view as well as the principles and practices of MLOps, including model training, deployment, and monitoring. The focus is on giving practical knowledge to participants which gives them the right tools to deploy, test and maintain data science models at scale and structure data science projects correctly.

Key Skills: By the end of this course, students should have some knowledge and understanding of:

- Cloud Computing Proficiency: Ability to utilise cloud computing services in data science projects.
- Deployment of Machine Learning Models: Skills to deploy, test, and maintain machine learning models.
- Cloud Service Utilisation: Proficiency in using cloud services for data science applications.
- Machine Learning Model Maintenance: Knowledge and skills to maintain machine learning models over time.
- Practical Application: Applying cloud computing and machine learning skills to real-world projects.
- Testing Machine Learning Models: Ability to rigorously test machine learning models for reliability.
- Cloud Resource Management: Efficiently managing and optimising resources in cloud environments.
- Data Science Project Implementation: Integrating cloud computing and machine learning into successful data science projects.

Desired Outcomes: By the end of this course, students should be able to:

- Understand the basics of cloud computing and its applications;
- Compare and contrast the different types of cloud computing services;
- Apply the principles and practices of MLOps to train, deploy, and monitor machine learning models in the cloud;
- Use popular cloud computing platforms, such as AWS and Azure, for MLOps;

- Communicate effectively about cloud computing and MLOps concepts and techniques.

COURSE STRUCTURE

Econ 625 is a 10 credits course and therefore students are expected to input approximately 100 hours of study into the course. The total number of contact hours on Econ 625 is 15 hours. This leaves 85 hours for private study. Course Delivery comes in the form of Lectures with 15 hours delivered over the first 3 weeks of the term (10 hours of lectures and 5 hours of tutorials). There will be optional clinics on the last day of the course.

During your private study you should strike a balance between reading the course material (which is the primary source of information) and the recommended textbooks, thinking critically about how these fit in to the body of knowledge on the subject and about how our level of knowledge can be improved, performing exercises, completing coursework and revising for examinations. You can expect to perform well on this course only if you work consistently through the year.

Prior to enrolment on the module, the student must have successfully completed Econ621

COURSE CONVENOR

LECTURERS CONTACT INFORMATION (Including Office Hours)

Dr

Office MS B68

Office hours:

email:

COURSEWORK ASSESSMENT

The CWA mark will be calculated as 100% coursework. The coursework will be assigned at the end of the course

The coursework will be delivered to students at the end of week 6 of each term and is due for submission at the end of week 10 of the term, allowing students 4 weeks for completion.

Coursework must be submitted electronically through the Moodle site for this course:

FEEDBACK ON COURSEWORK:

The coursework will be marked and returned to students within 4 weeks of the submission deadline. Feedback will consist of marker's notes appended to the pdf of your coursework.

MARKING CRITERIA AND PENALTIES

Marking criteria can be found in the Economics Undergraduate Handbook and the general course information paper. An electronic copy of this can be found via the Current Student page of the university website then follow the Academic Regulations link
<https://gap.lancs.ac.uk/ASQ/QAE/MARP/Documents/UG-Assess-Regs.pdf>

FINAL MARK INFORMATION

This course is assessed 100% by means of coursework. The final mark is the average of the marks obtained in the two pieces of coursework.

COURSE TEXT AND RECOMMENDED READING

Lecture notes and Lecture slides.

Practical MLOps. Noah Gift · Alfredo Deza - O'Reilly Media, Inc.

Introducing MLOps. Mark Treveil et al - O'Reilly Media, Inc

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COURSE OUTLINE/LECTURE SCHEDULE

Introduction to Cloud Computing

- Basics of cloud computing;
- Using cloud computing in data science projects.

Introduction to MLOps

- Basics of MLOps and its importance in data science projects;
- Key components of modern MLOps.

Cloud Computing and MLOps

- Building and deploying ML models in the cloud;
- Development and testing environments;
- Maintaining and monitoring ML models in the cloud;

- Versioning, continuous integration, and monitoring in the cloud.

Troubleshooting ML Models in the Cloud

- Challenges and solutions for troubleshooting models in the cloud;
- Debugging and ML models in the cloud.