

WM9QE-15 Applied Statistics for Artificial Intelligence

27/28

Department

WMG

Level

Taught Postgraduate Level

Module leader

Negar Riazifar

Credit value

15

Module duration

4 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

In the context of continuous improvement within Artificial Intelligence (AI) systems and processes, the utilisation of advanced statistical tools, tailored for the dynamic AI landscape, proves instrumental in facilitating progress from foundational enhancements to achieving excellence. This module covers statistical methods essential for effective data modelling in AI. It describes the application of statistical techniques for comprehensive data analysis and interpretation. Additionally, it explores some of the tools for investigating processes, aiming either to solve specific problems or to gain insights that can shape future development and enhancement strategies.

Module aims

This module aims to equip students with advanced statistical knowledge and skills to analyse, model, and solve problems in diverse real-life systems, in particular Artificial Intelligence scenarios. By developing proficiency in creating and applying statistical models effectively in problem-solving and decision-making contexts, students gain a profound understanding of the applicability of different statistical techniques to common problems and best practices for AI. The module strives to expand basic tools, enabling students to navigate complexities within data

analytics.

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.

Statistical models and "real world" systems.

Statistical Distributions (Continuous and Discrete).

Exploratory Data Analysis.

Sampling and Inference.

Analysis of Variance (ANOVA).

Regression (linear and non-linear) and Correlation.

Time-series Analysis.

Learning outcomes

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

- Collaboratively apply statistical tools and methods tailored to specific scenarios, present robust statistical solutions, identify and address challenges and provide insightful recommendations for decision making.
- Evaluate the assumptions and assess the appropriateness of different statistical models for diverse scenarios, incorporating AI techniques to enhance model selection and performance evaluation.
- Apply advanced statistical tools and techniques to solve problems in real-world systems.
- Critically interpret the quantitative data analysis results, present them in a meaningful way for decision making and provide practical recommendations.
- Demonstrate advanced practical skills in implementing statistical analyses using applicable software packages and AI-driven tools to automate data processing and analysis, and illustrate the outcomes through clear visualisations.

Indicative reading list

[Reading lists can be found in Talis](#)

[Specific reading list for the module](#)

International

Topics are of high international demand

Subject specific skills

Students are expected to gain/improve on the following:

Data management and statistical analysis.

Clear mathematical communication.

Advanced quantitative reasoning.
Statistical modelling.
Use of software to support decision making.

Transferable skills

Analytical skills, Problem-solving, Communication, Organisation, Teamwork, Flexibility

Study

Study time

Type	Required
Lectures	20 sessions of 1 hour (13%)
Seminars	10 sessions of 1 hour (7%)
Online learning (independent)	15 sessions of 1 hour (10%)
Private study	45 hours (30%)
Assessment	60 hours (40%)
Total	150 hours

Private study description

Private study will include preparing for lectures and seminars, reviewing lecture notes, and engaging with required readings and multimedia resources.

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A1

	Weighting	Study time	Eligible for self-certification
Assessment component			
Group Assessment	30%	18 hours	No

	Weighting	Study time	Eligible for self-certification
Group presentation of visualisation and analysis of case study data. Peer Marking Process will be adopted in this assessment.			
Reassessment component			
Individual Presentation			No
Presentation of visualisation and analysis of case study data and a reflection of the work. Students will reflect on the possible impacts of collaboration in developing a solution. This presentation will be recorded and submitted.			
Assessment component			
Assignment	70%	42 hours	Yes (extension)
Discussion and analysis based on a given project. The statistical report in essay format includes figures, tables, and screenshots to present the obtained results.			

Reassessment component

Assignment		No
Discussion and analysis based on a given project. The statistical report in essay format includes figures, tables, and screenshots to present the obtained results.		

Feedback on assessment

Written feedback for Group Assessment and Individual Presentation. Written feedback for Assignment.

Availability

Courses

This module is Core for:

- Year 1 of TWMS-H60X MSc Applied Artificial Intelligence (Full Time)