

WM9I3-15 AI-driven Data Analytics for Industry

27/28

Department

WMG

Level

Taught Postgraduate Level

Module leader

Leonardo Alves Dias

Credit value

15

Module duration

4 weeks

Assessment

100% coursework

Study locations

University of Warwick main campus, Coventry Primary

Distance or Online Delivery

Description

Introductory description

This module prepares students to lead Artificial Intelligence (AI)-driven organisations as informed architects of data-driven decision-making by introducing the modern data landscape, including the infrastructure underpinning large-scale data management, and then moving decisively to how artificial intelligence and advanced analytics methods transform raw data into actionable organisational intelligence. Students will develop fluency across the full analytics pipeline, including emerging generative AI capabilities, anchored in the management and engineering contexts in which these methods are applied.

Where this module is delivered at an overseas centre, the module will be delivered over 1 week.

Module aims

This module aims to equip students with the conceptual foundations, applied analytical capabilities, AI skills, and critical judgment required to extract actionable intelligence from complex datasets, enabling them to lead data-driven decision-making within technology-led and engineering organisations

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.

Data in the Modern Enterprises

- The Data Landscape
- Core Data Concepts
- Big Data Management: Architecture and Technologies
- Modern Data Stack for Industry

Foundations of AI-Driven Analytics

- Types of Analytics: Descriptive, Diagnostic, Predictive, and Prescriptive
- Introduction to Artificial Intelligence (AI) and Machine Learning (ML)
- Applied Analytics in an Industry Context
- Introduction to Generative AI and Large Language Models (LLMs)
- Responsible AI in Analytics

Data Storytelling, Visualisation and Decision Communication

- Principles of Visual Communication
- Data Visualisation and Storytelling

AI-Driven Analytics in Engineering and Operations: Applied Capstone

- Capstone Consultancy Project

Learning outcomes

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

- Critically evaluate the capabilities, limitations, and strategic implications of modern data architectures and AI-driven analytical approaches relative to traditional methods, within engineering and technology-led business contexts (M1).
- Critically analyse complex, real-world engineering business scenarios and propose appropriate AI-driven analytical solutions with evidence-based justifications (M4).
- Critically evaluate visual communication principles and data visualisation design to construct analytical narratives that effectively translate complex findings for diverse stakeholder audiences (M17).
- Collaboratively analyse engineering business requirements and practically implement end-to-end AI-driven analytics pipeline to deliver actionable, evidence-based recommendations in realistic industry settings (M2, M3, M5, M7).
- Produce a critical reflection on the learning throughout the module, evaluating the development of analytical competence and the implications for continued professional practice in modern engineering business management (M16).

Indicative reading list

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

[Specific reading list for the module](#)

Interdisciplinary

A mixture of technology/computing topics and business topics

International

Topics are of high demand internationally

Subject specific skills

- Compare different data architectures.
- Use Big Data tools and frameworks to assess their value and impact in organisations.
- Design and run data analysis workflows.
- Apply and evaluate machine learning models for real-world datasets.
- Interpret the results of machine learning models.
- Use AI methods to support data analysis and decision-making.
- Apply data visualisation techniques and tools.
- Present data analysis results to different audiences.
- Recognise key issues in data governance, ethics, and regulation.

Transferable skills

- Apply statistical and quantitative methods to analyse data and draw conclusions.
 - Use programming tools to build, test, and present data solutions.
 - Critically assess methods, model results, and business problems using evidence.
 - Work effectively as part of a team.
 - Communicate complex ideas clearly to non-technical audiences.
 - Use structured approaches to solve problems and support decision-making in uncertain situations.
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Study

Study time

Type	Required
Lectures	20 sessions of 1 hour (13%)
Seminars	10 sessions of 1 hour (7%)
Supervised practical classes	(0%)
Online learning (independent)	30 sessions of 1 hour (20%)
Private study	30 hours (20%)
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 A

	Weighting	Study time	Eligible for self-certification
Assessment component			
Group Presentation	40%	24 hours	No
Students will collaboratively propose and implement a solution for a real-world data analytics case study, and present their findings with actionable recommendations in a professional presentation. This assessment includes a Peer Review Activity.			

Reassessment component

Individual Presentation	No
Students will propose and implement a solution for a real-world data analytics case study, and present their findings with actionable recommendations in a professional presentation. Additionally, the student will reflect on the possible impacts of collaboration in developing the proposed solution. This presentation will be recorded and submitted.	

	Weighting	Study time	Eligible for self-certification
Assessment component			
Individual Business Report	60%	36 hours	Yes (extension)
Students will produce a business-style report evaluating modern data architectures and AI-driven analytical solutions, and their strategy in engineering management. This assessment includes a reflection on the learning throughout the module.			

Reassessment component			
Individual Business Report			No
Students will produce a business-style report evaluating modern data architectures and AI-driven analytical solutions, and their strategy in engineering management. This assessment includes a reflection on the learning throughout the module.			

Feedback on assessment

Verbal feedback and a written summary will be provided for the group assessment. Written feedback will be provided for the individual assignment.

Availability

Courses

This module is Optional for:

- Year 1 of TWMS-H1S3 Postgraduate Taught Engineering Business Management (Full-time)