

Assessment Specification

Module Details

Module Code	UFCFUR-15-3
Module Title	Advanced Artificial Intelligence
Module Leader	Prof. Jim Smith and Qurat-UI-Ain Mastoi
Module Tutors	Jim Smith, Qurat-UI-Ain Mastoi, Elisa Covato
Year	2024-25
Task	Portfolio
Total number of assessments for this module	1
Weighting	100%

Dates

Date issued to students	1 st October 2024
Date to be returned to students	29 th May 2025
Submission Date	1 st May 2025
Submission Place	Online via Blackboard
Submission Time	14:00
Submission Notes	

Feedback

Feedback provision will be	Verbal feedback will be given to the group after their demonstration, using the agreed marking sheet. Further written feedback will be provided when marks are released.
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Section 1: Overview of Assessment

This assignment assesses the following module learning outcomes:

1. Critically appraise competing AI-based paradigms and algorithms in the context of the issues posed by particular problems
2. Select and tune appropriate state of the art machine learning and optimisation algorithms to realistic sized problems illustrating properties such as scale, noise, missing data.
3. Synthesise, design, and implement appropriate hybrid systems blending different paradigms for complex problems.
4. Demonstrate skills in evaluating systems and presenting findings in ways appropriate to different audiences.

The assignment is worth **100%** of the overall mark for the module.

Broadly speaking, the assignment requires you to work in a group to create, and robustly evaluate, an AI-based solution to a real-world problem based on a current industrial collaboration.

The assignment is described in more detail in section 2.

This is a group assignment.

Working on this assignment will help you to refine through practice your skills in:

- building solutions to real-world problems
- handling big data with missing and /or noisy features, imbalanced training sets, multi-modal data,
- demonstrating a duty of care with respect to Fairness, Accountability and Trust.

You should also use this as an opportunity to trial and evaluate the use of Generative AI for generating code, documents, and other artefacts.

If you have questions about this assignment, please

- Post them to the discussion board "Assessment FAQ" on Blackboard.
- Raise them with module tutors during one of the timetabled sessions
- Email Professor Smith or Dr Mastoi

Section 2: Task Specification

This is a group project in which you will create an AI-based solution to a problem that can be deployed as a service. You will be provided with a set of Case Studies that you can choose from.

- If your group has a different case study idea, this *may* be possible, but **only after obtaining specific written agreement** from the module team within 3 weeks of the start of the module.

The overall scenario for the work is that the group is working within an organization and has been tasked to solve a particular problem, or to critically appraise a technique that the organization is considering adopting. The task is to:

- Design an experimental methodology for solving the problem/evaluating the proposed technique.
- Implement and test AI-based solutions.
- Demonstrate a working implementation,
- Report your findings in ways suitable for different audiences.
- Include a recommendation of whether the technology is suitable to be adopted by the organisation: now, after further work, or never.

As part of this work (and relating to learning outcomes 1 and 4) you are expected to trial, critique and report on the usefulness of generative AI in conducting your task.

If you are taking the module UFCFTR-30-3, Distributed & Enterprise Software Development (DESD):

- To reduce your workload, you will do a single group project that addresses the learning outcomes of both modules.
- This means you will be in the same group for both modules, but you will do the AI-based case study rather than the default one for DESD. All other aspects of the DESD project and assessment are unchanged.
- The AI-based solution you develop should be deployable as a service with appropriate interfaces to be integrated into a wider system as required by DESD.

If you are NOT taking the module UFCFTR-30-3:

- You will be assigned to a group accordingly.
- It is acceptable for the interfaces to the system to be simpler where this does not compromise the 'AI' aspects. This might mean, using Jupyter Notebooks, simple dashboards, and reading/writing files to local storage

Section 3: Deliverables

The portfolio is made up of three parts, with maximum sizes/lengths as detailed in the table below.

Item	Detail	Date & Submission Mechanism
Video of no more than five minutes duration	A short 'Executive Summary' video describing the project in ways suitable for a non-technical audience (management). It should cover: <ul style="list-style-type: none">• The potential benefits to the organisation• Challenges presented by the problem characteristics.• Any ethical or legal concerns (such as transparency of decision making)	Online via Blackboard

	<ul style="list-style-type: none"> • The performance of the system you created. • A recommendation about adoption. 	
Demonstration of no more than 10 minutes. Followed by up to ten minutes for questions	<p>An in-class demonstration of the software solution produced, aimed at a more "AI-aware" audience.</p> <p>You may be asked questions on aspects such as:</p> <ul style="list-style-type: none"> • Implementation details • Candidate approaches considered. • The choice of metrics you used to evaluate your solution. • Project management issues • The use of generative AI 	In class, times tbc.
Technical Report of no more than 2500 words (UWE Bristol Assessment Content Limit Policy.)	<p>This should be written in a style suitable for a more technical audience - for example, the team maintaining the system you have developed.</p> <p>The report should have sections that critically review:</p> <ul style="list-style-type: none"> • Challenges presented by the problem characteristics • Candidate approaches considered. • Design choices – such as choice of specific libraries/frameworks • How you have used Generative AI throughout the project • The design, implementation, testing and evaluation of the system. • Your approach to legal, ethical and profession issues such as data access, privacy, and "Fairness, Accountability and Trust" <p>As this is a group project, it is expected that this report will be accompanied by an online git repository containing your source and test code. The repository should demonstrate good practice in terms of content, structure and 'signposting' (readme's etc.).</p>	Document online via Blackboard, including link to repository

Section 4: Marking Criteria

Element Weighting (% of total mark) <i>Learning Outcomes (LO)</i>	<40	40-50	50-60	60-70	70+
Video: 20% <i>LO: 1, 4</i>	Little or no description of either technical problem or relevance. Findings difficult to understand and not placed in context.	Basic description of problem and findings. Mostly text based. Poorly tailored to non-technical stakeholders	Good description of problem and summary of findings. Mostly text-based and/or uses overly technical language in places	Excellent description of problem, context and findings. Some discussion of future implications. Reasonably well described to a non-technical audience,	Excellent description of problem, findings, and potential implications. Good use of metaphor, images or video to explain technical aspects.
Demonstration: Working Code 20% <i>LO: 2, 3</i>	No working code available for demonstration	Working code but with some essential functionality missing. Aspects hard-coded.	Most of essential functionality demonstrated. Basic user interfaces and/or use of config files.	All functionality demonstrated. User interfaces allow configuration and show results	Fully working code with all relevant appropriate interfaces.
Demonstration: Complexity of technical solution 20% <i>LO: 2, 3</i>	Solution implemented has no or few learning or adaptive capabilities.	Solution primarily applies simple technology or well documented examples or existing algorithms.	Solution incorporates a range of relevant pre-existing techniques to deliver a coherent solution / framework.	Solution incorporates a range of relevant techniques with some original or recently published elements in a well justified framework.	Solution displays outstanding understanding of a range of paradigms and approaches, with selected components integrated into a coherent framework with some novelty.
Report: Quality of code and writing 5% <i>LO: 2, 3</i>	Poorly structured and documented. Code missing tests.	Reasonably structured code with some documentation and/or design diagrams. Poor or incomplete test strategy	Well-structured code presented in online repository with sufficient documentation to allow use by others.	Well -structured code presented in online repository with sufficient documentation to allow use and ongoing development by others.	Excellent documented code presented in repository with appropriate tools used for code style and testing. Clear roadmap for future extension.
Report: Use of Generative AI (genAI) 5% <i>LO: 1</i>	Little or undocumented use of genAI	Some use of genAI for creating code or artefacts but poorly evaluated.	Report shows good (and appropriately cited) use of genAI for some aspects, with reasonable evaluation	GenAI used, cited, and appropriately tested for significant parts of project. Some reflection of its usefulness	Coherent strategy for using and evaluating products of genAI in all aspects of project.

Report: Problem complexity and technical challenges 20% <i>LO: 2, 3</i>	Simple problem and/or solution requiring little Artificial Intelligence OR poorly justified choice of approach.	Well-designed solution to a problem with significant complexity. Results inconclusive and/or weak justification for approach taken.	Good analysis of complex problem leading to a well justified selection of approach.	Good analysis of a complex problem, with consideration of different techniques leading to identification and implementation of a suitable solution.	Excellent analysis of a complex problem, with consideration of different techniques and a well justified choice of solution, possibly with comparison of alternatives.
Report: Evaluation of findings 10% <i>LO: 1, 4</i>	Little evaluation or consideration of relevant metrics. Little or no analysis of findings. Little or no attention to problem context or legal/ethical issues	Solution evaluated on some metrics, but with little attention to risks to findings and limited analysis of findings. Some consideration of relevant legal or ethical issues.	Reasonably justified methodology. Solution evaluated with some attention paid to sources of risk to findings. Limited further analysis of conclusions. Consideration of relevant legal, ethical, & professional issues.	Well justified methodology. Results, and risks to findings well described. Some further analysis of findings. Clear analysis of legal, ethical and profession issues.	Thoroughly justified methodology, with potential risks to findings identified and addressed. Good summary and further analysis of results and legal/ethical/professional issues.

- The marking scheme above will be used to derive a score for the group.
- You will also be asked to submit a peer-evaluation form assessing the contributions made by members of your group to the design, implementation, reporting and management of the project.
- Your average peer-assessed mark (relative to the rest of the group) will be used as a weighting factor when we generate your individual mark from the group mark.
- Tutors reserve the right to cap weightings, and/or apply other forms of moderation. For example, we will do this in the unlikely case of conflicts within a group.

Section 5: Feedback mechanisms

Informal feedback will be made available from the module tutors during scheduled sessions. The schedule on Blackboard and the module's github site [here](#) lists the assessment-based activities and formative feedback opportunities on a weekly basis. This will be updated regularly as the module progresses and (for example) external speakers are scheduled.

Your group's submission will be assessed according to the marking criteria in the table above. Marks will be awarded to the group for each of the criteria (rows), then combined using the weightings shown to give an overall mean score for the group.

We strongly advise groups to use this grid to self-assess their work prior to submission, as part of their regular project planning activities.

Verbal feedback will be given to the group after their demonstration, and further written feedback will be provided when marks are released.

Section 6: Appendices

6.1 Completing your assessment

Where should I start?

- Read through the case study description files provided online and note where more information is needed. Use the time allocated in timetabled classes to discuss any questions you have with the module tutors. This is a normal part of the process of creating AI-based solutions.
- As soon as the group have been allocated:
 - Agree with the other members which case study you will do.
 - Decide how you will organise work, communications, and file management.
 - Decide your initial project schedule.
 - **Contact your module tutors** if personal or work commitments mean you cannot attend scheduled informal feedback sessions.
- Use the module resources and your self-directed study to identify:
 - Requirements for your case study.
 - Problem characteristics likely to cause issues. For example, whether evaluations might be subject to noise, subjective judgements, or be time-varying.
 - What data may be available for you to learn from.
 - Relevant AI-based algorithms and toolkits for the problem you are tackling.
 - One or more approaches you intend to try.
 - A strategy for exploring the potential of Generative AI to assist in your project.

What do I need to do to pass?

To pass the module you need to get an individual mark of 40% or above. This is a group project, but we recognise that individual circumstances may vary, so peer assessment will be used to affect the allocation of marks within a group [as described above](#). In other words:

- It is possible for a student to **fail** the module, even if the group mark is over 40%, if they do not contribute to the group's portfolio.

Equally:

- It is possible for a student to **pass** the module even if the group mark is under 40%, if they have contributed substantially to a group's portfolio submission.

How do I achieve high marks in this assessment?

Firstly, you must contribute to the group project.

Secondly, take advantage of the module teams' experience. For example, they may offer informal feedback, and pointers to algorithms or techniques that may be relevant to your chosen approach.

Read the marking grid above. Make sure you understand the criteria that will be used to assess different parts of the portfolio, and the characteristics of high-scoring submissions.

It would be a good idea for the group to undertake a self-assessment of their portfolio and use that as part of planning effort – especially towards the end of the project.

How does the learning and teaching relate to the assessment?

Each week's learning materials cover different topics, but all within a common theme of 'AI in context' which emphasises practical aspects of implementing AI-based solutions, and communicating findings.

Weekly lectorials blend presentations to introduce ideas with hands-on activities that typically involve contrasting different approaches, and online resources to improve their skills in critically appraising competing paradigms and technologies and practice in presenting their findings to peers. As noted above, they also include a number of opportunities for gathering feedback.

What additional resources may help me complete this assessment?

The 'Assessments' folder on Blackboard hosts a discussion group for 'Frequently Asked Questions' that students are encouraged to visit and contribute to.

Tutors will be available in the weekly timetabled sessions for discussions with groups and formative feedback. Groups may also email tutors to request either a face-to-face or Teams meeting if they prefer to do this outside the timetabled slot.

For help with time-management, and with writing in a suitable academic style, you will find useful resources here: <https://www.uwe.ac.uk/study/study-support/study-skills>

What do I do if I am concerned about completing this assessment?

UWE Bristol offer a range of Assessment Support Options that you can explore through [this link](#), and both Academic Support and Wellbeing Support are available.

For further information, please see the [Academic Survival Guide](#).

6.2 Assessment Content

In line with UWE Bristol's [Assessment Content Limit Policy](#) (formerly the Word Count Policy), word count includes all text, including (but not limited to): the main body of text (including headings), all citations (both in and out of brackets), text boxes, tables and graphs, figures and diagrams, quotes, lists.

6.3 Assessment Offences

How do I avoid an Assessment Offence on this module? ²

Use the support above if you feel unable to submit your own work for this module.

The most common form of Assessment Offence would be for two groups to submit work that contains significant amounts of common elements. In those case an assessment offence would be flagged and

potentially both groups penalised. It is acceptable to discuss your project with your peers, but you must avoid sharing any code, documentation or other resources.

Another common form of Assessment Offence is the use of materials created by others without proper acknowledgment and attribution. It is acceptable – some would say good practice - to reuse some resources. However:

- If parts of your portfolio include materials from other sources, then these **must** be properly acknowledged (see below)
- You should discuss how you assessed the quality and 'fit-for-purpose' of what you have used.
- **NOTE that is applies equally to the inclusion of materials created by Generative AI.** In that case you also include details of what service/URL you used, the date of access, and the specific prompt that you used to generate materials.

UWE Bristol's [UWE's Assessment Offences Policy](#) requires that you submit work that is entirely your own and reflects your own learning, so it is important to:


- Ensure you reference all sources used, using the <https://www.uwe.ac.uk/study/study-support/study-skills/referencing/uwe-bristol-harvard> system) and the guidance available on [UWE's Study Skills referencing pages](#).
- Avoid copying and pasting any work into this assessment, including your own previous assessments, work from other students or internet sources
- Develop your own style, arguments and wording, so avoid copying sources and changing individual words but keeping, essentially, the same sentences and/or structures from other sources
- Never give your work to others who may copy it

When submitting your work, you will be required to confirm that the work is your own, and text-matching software and other methods are routinely used to check submissions against other submissions to the university and internet sources. Details of what constitutes plagiarism and how to avoid it can be found on UWE's Study Skills [pages about avoiding plagiarism](#).

6.4 Use of Generative AI (ChatGPT or similar)

This is a module in Advanced AI so we expect that groups will take full advantage of a range of generative AI techniques when generating code, documents, and videos.

5% of the marks are allocated to the maturity of their approach to using and evaluating the artefacts produced by generative AI.

	In this assignment you are actively encouraged to use Generative AI in the generation of artefacts and we explicitly expect you to evaluate and report on the utility of these tools
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6.5 Guidance on Referencing (inc AI):

Please note that the aim of referencing is to demonstrate you have read and understood a range of sources to evidence your key points. You need to list the references consistently and in such a way as to ensure the reader can follow up on the sources for themselves.

[Referencing - Study skills | UWE Bristol](#)

[Using generative AI at UWE Bristol - Study skills | UWE Bristol](#)

