University of Westminster
School of Computer Science and Engineering

6COSC020W Applied AI – Coursework (2025/26)
(Subject to moderation)

Module leader	Artie Basukoski
Unit	Coursework 1
Weighting:	50%
Qualifying mark	30%
Description	Research, justify and implement one or a combination of AI techniques to achieve the stated goal.
Learning Outcomes Covered in this Assignment:	This assignment contributes towards the following Learning Outcomes (LOs): - LO2 Implement and use AI techniques across a broad range of AI sub-fields. - LO3 Evaluate when and under what conditions it is appropriate to use an AI technique. - LO4 Prepare data and ensure requirements are met to apply AI techniques correctly, and critically evaluate whether the results are sound.
Handed Out:	16th October 2025
Due Date	7th January 2026. Submission by 1:00pm
Expected deliverables	Deliverables will be an implementation as a Jupiter notebook report, and a presentation video, demonstrating the use of the implementation and justifying the rationale behind the choice of technique/s. Ensure that data and any required libraries are included in your notebook file so that the notebook can be run without modification. Demonstrations will be held online or in person. A penalty of 50% will be applied if you fail to demonstrate your work.

Method of Submission:	Electronic submission of Jupiter notebook uploaded as .ipynb fle on BB via a provided link close to the submission time. The file you upload should have the following naming format:
	      <Cw1_StudentNumber_FullName.ipynb>
	       E.g. Cw1_w123456_HamzaAbada.ipynb

Type of Feedback and Due Date:	Feedback and marks 15 working days (3 weeks) after the submission deadline. All marks will remain provisional until formally agreed by an Assessment Board.

Assessment regulations

Refer to section 4 of the "How you study" guide for undergraduate students for a clarification of how you are assessed, penalties and late submissions, what constitutes plagiarism etc.

Coursework Description

Problem Statement

Choose one of the domain areas from the list in Part A below. State a goal and then research, justify and implement one or a combination of AI techniques to achieve the stated goal. Deliverables will be a jupyter notebook report (or equivalent) detailing all the sections described in Part A – Part E below. You will also be required to do a presentation, demonstrating the application, and justify the rationale behind the choice of technique/s. It is important that you include references for any work that is not your own.

Part A – Application area review. 10 Marks

Choose one of the problem domains from the list below. For example, 'Algorithmic trading'. Do a brief and focused literature review (500-1000words) exploring **how AI has been applied within this problem domain**. Include references and state clearly if and how ChatGPT was used. **[10]**

Market analysis, Algorithmic trading, personal portfolio management, Education, Games, Robotics, Hospitals and medicine, Human resources and computing, Transportation, Chatbots, News publishing and writing, Marketing, Music recognition and composition, Speech and text recognition, Data mining, E-mail and spam filtering, Gesture recognition, Voice recognition, Scheduling, Traffic control, Robot navigation, Obstacle avoidance, Object recognition.

Part B – Compare and evaluate AI techniques. 12 Marks

Select three AI techniques that can be applied to the problem. We prefer if you used the techniques taught in the module: Search techniques, Minimax and alpha-beta pruning, ML techniques such as Neural Networks, clustering, regression, Deep Learning, CNN's (Computer Vision), etc. You may choose other techniques but please provide some justification for why you chose that specific technique.

State your goal clearly. For example, if your chosen domain is "Algorithmic Trading", you could choose to explore

Stock price prediction using Neural Networks, Regression, and Bayesian Networks.

Discuss the strengths and weaknesses, advantages, and disadvantages of each of your chosen techniques. Give examples of how each technique can be applied to your specific problem. Compare and evaluate the type of input data required and expected output from each technique. Then select a specific technique to explore in-depth for your prototype implementation in part C. 4 **marks for each technique [12]**

Part C – Implementation. 48 marks

Select one technique from part B to explore in depth and implement it as a prototype using **jupyter notebook**. Please ensure that the domain and AI technique you implement is different from the domain and technique you chose for your FYP, or you will be susceptible to self-plagiarism.

a.   Create a high-level diagram describing how all the elements of your project work together to achieve the desired result. **[5]**

b.   Describe the input required for your implementation: graph, time series, etc. Where will you get the data? Does the data need to be prepared in a specific format? Describe the format of the input data [4] and any pre-processing required [4].

c.   Include a working example prototype in your jupyter notebook. The prototype should include input data and preprocessing, the implementation of the technique, and the output and visualisation of your results. The implementation must be done as a Jupiter notebook. Marks will be awarded based on data handling [5], code quality [5], technique implementation [20], output and visualisation [5]

Part D – Software Testing and Evaluation. 20 Marks

Verify the correctness of your AI implementation. Compare expected/correct results with those produced by your implementation.
Describe the appropriate testing methods for your chosen technique. Compare expected/correct results with those produced by your implementation (5).

Assess the effectiveness and performance of your AI implementation in solving the stated problem. Discuss and evaluate your results.
How do you interpret the results in the context of your chosen domain. What insights does your solution give and how can your insights be used to improve the situation [10]. What are the strengths and limitations of your implementation. (5).

Part E – Equity, Diversity, Inclusion (EDI) and Sustainability (10 Marks)

Critically evaluate your AI implementation considering its broader societal and environmental impact. This section demonstrates your awareness of responsible AI development practices.
EDI: Bias and Fairness, Accessibility and Inclusion, Ethical Implications. (5).
Environmental Sustainability: Computational resource analysis, Data storage requirements. Suggestions for reducing environmental impact in production deployment. (5).

Coursework Marking scheme

The Coursework will be marked via the following rubric and your viva performance based on the marking criteria following this table:

Criteria	Marks	Comments
PART A Application area review.	10	Choose a domain and write a review of between 500-1000 words on how AI is applied to the problems in your chosen application domain. List relevant techniques and describe any notable results from using the techniques. (LO1)
PART B Compare and evaluate three AI techniques.	12	Choose 3 relevant techniques from part A and describe how each has been applied to your chosen problem domain. Focus on data availability, time to setup, time to produce results, and output. 4 marks each (200-400 words per technique described) (LO3)
PART C Implementation (notebook)		Choose one technique and implement prototype demonstrating its use. (Working notebook file)(LO2,LO4)
- Diagram	5	- A diagram or flowchart showing the architecture and data flows, transformation, and outputs of the system.
- Input/Data	8	- Include the input data in the notebook. Significant data points, eg > 1000 data points for ML algorithm. Describe the format of the input data(4) and any pre-processing required (4).
- Prototype	35	- A jupyter notebook of your prototype. This must be self contained and runnable by the marker with clear output and description of the results. *(Marking based on the grade descriptors at the end of this document).* Data handling [5], code quality [5], technique implementation [20], output and visualisation [5]
PART D Testing and evaluation	20	Describe the appropriate testing methods for your chosen technique. Compare expected/correct results with those produced by your implementation (5). How do you interpret the results in the context of your chosen domain. What insights does your solution give and how can they be used to implement improvements [10]. What are the strengths and limitations of your implementation. (5).
PART E EDI and sustainability	10	EDI: Bias and Fairness, Accessibility and Inclusion, Ethical Implications. (5). Environmental Sustainability: Computational resource analysis, Data storage requirements. Suggestions for reducing environmental impact in production deployment. (5).
Total	**100**	

80-100   An outstanding piece of work: All assessment criteria have been met at an exceptionally high standard

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- Demonstrates exceptional independent thought and reflection in relation to complex ideas andconcepts.
- Provides creative analysis of techniques/knowledge.
- Critically analyses information sources, techniques and approaches to analysis.
- Demonstrates extensive research across a range of sources.
- Communicates ideas and complexity with confidence, using appropriate format and excellent presentation.

70-79   An excellent piece of work: All assessment criteria have been met at a high standard.

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- Takes a confident approach to critical analysis/reflection across a range of techniques/knowledge.
- Shows in-depth understanding of ideas and concepts.
- Demonstrates insightful/independent contextualisation and implications of theories/practices.
- Synthesises independent research across a range of authoritative sources.
- Communicates with clarity using appropriate format and excellent presentation.

60-69   A good piece of work: All assessment criteria have been met at a good standard.

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- Demonstrates systematic understanding across a range of techniques/knowledge in specialisedarea.
- Demonstrates confident analysis/reflection on key concepts/frameworks.
- Explores relationship of theories/practices within the wider context.
- Provides additional independent research across a range of authoritative sources.
- Communicates clearly, using appropriate format and with sound presentation.

50-59   A sound piece of work: All assessment criteria have clearly been met.

- Demonstrates clear understanding of techniques/knowledge in specialised area.
- Demonstrates some independent synthesis and reflective analysis across key techniques.
- Provides evidence of research across a range of resources provided within the module.
- Communicates using appropriate format with satisfactory presentation.

40-49   An adequate piece of work: All assessment criteria have just been met.

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- Demonstrates descriptive understanding of techniques/knowledge.
- Provides limited evaluation of ideas and concepts.
- Undertakes minimal research within module content.
- Communicates work using appropriate format with some weaknesses of presentation.

30-39   FAIL: An inadequate piece of work: One or more relevant assessment criteria are not met

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- Applies techniques/knowledge with limited with some weaknesses/omissions.
- Demonstrates inadequate knowledge of key concepts and principles.
- Uses a minimal amount of relevant information from within the module.
- Communication is unclear with poor standard of presentation.

0-29   FAIL: A poor piece of work: Most of the relevant assessment criteria area not been met.

- Applies techniques/knowledge with significant weaknesses and omissions.
- Demonstrates major inaccuracies and/or misunderstandings flaws of key concepts and principles.
- Uses inadequate information sources from within the module.
- Communication is unclear with poor standard of presentation.