# Course Outline

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| **Course title: Applied Artificial Intelligence** | **Instructor name: Jun Albert Pardillo** |
| **Credit units: 3** | **Total hours: 54** |

## Course Description:

Applied Artificial Intelligence is a course designed to provide students with a practical understanding of artificial intelligence (AI) concepts and their applications in various fields. The course begins with a basic overview of what AI is, touching upon its history and how it has evolved into an essential aspect of modern technology. Students will learn about different forms of machine learning, including simple models that help computers learn from data. An exciting part of the course is exploring how AI can understand and process human language, making technologies like chatbots and automated translations possible. There's also a focus on how AI can interpret and understand images and videos, which is crucial in areas like social media and security. Students will get to see how AI is being used in real-world scenarios, like improving healthcare, making financial decisions, or even powering self-driving cars. Throughout the course, there will also be discussions on the latest trends in AI and what the future might hold for this fascinating field. This course aims to spark curiosity and provide the foundational skills needed for students to pursue more advanced studies in artificial intelligence and related areas.

## Course Learning Outcomes (CLOs)

* Understand the fundamental concepts and history of artificial intelligence (AI).
* Identify and apply different machine learning models and algorithms.
* Develop practical skills in natural language processing (NLP) and its applications.
* Comprehend the principles of computer vision and image recognition techniques.
* Analyze real-world applications of AI across various industries.
* Evaluate the ethical considerations and future trends in the field of AI.
* Design and implement simple AI models to solve practical problems.

## Topics / Modules and Intended Learning Outcomes

1. Overview of Artificial Intelligence

* Describe the history and evolution of AI, including its milestones and current status.
* Explain the basic concepts and terminologies related to AI.

1. Machine Learning Fundamentals

* Classify various machine learning models and understand their use cases.
* Demonstrate the ability to preprocess data for machine learning applications.

1. Natural Language Processing in AI

* Understand the theory and methods of representation learning in NLP.
* Apply NLP techniques to process and analyze text data.

1. Computer Vision and Image Recognition

* Describe the role of AI in computer vision and the technologies that enable image recognition.
* Implement basic computer vision tasks using AI tools.

1. Real-world Applications of AI

* Analyze the impact of AI applications in clinical practice and other industries.
* Assess the role of AI in addressing global challenges such as the COVID-19 pandemic.

1. AI in Healthcare

* Evaluate the use of AI in medical diagnostics and treatment plans.
* Discuss the potential of AI to transform healthcare delivery and patient outcomes.

1. AI in Finance and Business

* Understand the application of AI in financial decision-making and risk assessment.
* Explore AI-driven business intelligence and customer relationship management.

1. Ethical Considerations and Future of AI

* Discuss ethical issues and societal impacts associated with the deployment of AI technologies.
* Anticipate future trends and developments in AI and their potential implications.

## Weekly Activities

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| **Week No.** | **Topic** | **Activity Description** | **Expected Output** | **Assessment Tools** |
| Week 1 | **Overview of Artificial Intelligence** | Introduction to the course and an overview of AI. Students will engage in discussions on the history and evolution of AI and learn fundamental AI concepts through lectures and multimedia presentations. | Students will submit a reflection paper on the history and potential future developments in AI. | Reflection paper grading rubric |
| Week 2 | **Machine Learning Fundamentals** | Lecture on machine learning models followed by a hands-on lab session where students will preprocess a given dataset. | Students will complete a lab report detailing the steps taken in data preprocessing. | Lab report checklist |
| Week 3 | **Natural Language Processing in AI** | Interactive workshop on NLP techniques including tokenization, stemming, and lemmatization. Students will apply these techniques to a sample text corpus. | Students will submit a processed text dataset with an explanation of the applied NLP techniques. | Processed dataset submission and explanation grading rubric |
| Week 4 | **Computer Vision and Image Recognition** | Lecture on the role of AI in computer vision followed by a group project where students will use AI tools to implement basic image recognition tasks. | Group project report and a demonstration of the image recognition model. | Project report grading rubric and model demonstration checklist |
| Week 5 | **Real-world Applications of AI** | Case study analysis of AI applications in different industries and their societal impacts, including a focus on AI's role in the COVID-19 pandemic. | Individual case study analysis reports. | Case study analysis report grading rubric |
| Week 6 | **AI in Healthcare** | Discussion and presentations on the use of AI in healthcare, including diagnostics and treatment plans, followed by a debate on the potential transformation of healthcare delivery. | Written summary of the debate highlighting key points and personal stance. | Debate summary grading rubric |
| Week 7 | **AI in Finance and Business** | Lecture on AI in financial decision-making and risk assessment, and exploration of AI-driven business intelligence through case studies. | Group presentation on a selected case study related to AI in finance or business. | Case study presentation grading rubric |
| Week 8 | **Ethical Considerations and Future of AI** | Panel discussion on the ethical considerations in AI, followed by student presentations on anticipated future trends in AI. | Students will submit an essay on the ethical considerations in AI and its future implications. | Essay grading rubric |
| Week 9 | **Project Work** | Students will work on their final projects, applying AI concepts and tools to solve a practical problem. | A progress report on the final project. | Project progress report grading rubric |
| Week 10 | **Final Project Presentations** | Students will present their final projects to the class, demonstrating the AI models they have designed and implemented. | Final project presentation and a completed AI model. | Final project presentation grading rubric and AI model evaluation checklist |

## References

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