Subject code and title: ISY503 Intelligent Systems

Subject length: 12 weeks

Subject Description:

This subject aims to give a broad introduction of intelligent systems, that is, how technologically advanced machines perceive and respond to the world around them. Discussion will focus on how Artificial Intelligence (AI) concepts are used to design intelligent systems. Overview of AI topics such as representation, reasoning, search methods, intelligent agents, machine learning, uncertainties and probabilities, perception and action, and communication will be presented. It also includes discussions of AI topics such as Machine Learning, Natural Language Processing, Speech Recognition, Expert Systems, Computer Vision, and how they are used to develop intelligent systems. This subject also aims to address the particular ethical issues that AI presents and how it can be used to benefit society.

Subject Learning Outcomes (SLO):

SLO a)	Determine suitable approaches towards the construction of AI systems.
SLO b)	Determine ethical challenges which are distinctive to AI and issues that may arise with such rapidly developing technologies.
SLO c)	Apply knowledge based or learning based methods to solve problems in complex environments that attempt to simulate human thought and decision making processes, allowing modern society to make further advancements.
SLO d)	Communicate clearly and effectively using the technical language of the field and constructively engage with different stakeholders.
SLO e)	Apply the foundational principles of AI learnt throughout the course and apply it to the different areas of Natural Language Processing, Speech Recognition, Computer Vision and Machine Learning

Delivery Schedule: (2 page max)

	Module	Learning Activities	Assessment Progression & Due Date	SLOs addressed
1	The Nature and Purpose of Intelligent Systems	LA1: Introduce Yourself Discussion Forum LA2: Bank System LA3: Summarising Articles		a), b)
2	Introduction to Machine Learning	LA1: Metrics Suitability LA2: Metrics for Unsupervised Approaches		a), c)
3	Machine Learning Models	LA1: Extra Machine Learning Models LA2: K-Fold Cross Validation		c)
4	Introduction to Deep Learning	LA1: Deep Learning Discussion Forum LA2: ANN Details		c)
5	Machine Learning in Depth	LA1: A dive into Classification in Machine Learning	**Assessment 1 (25%)** Case study report	c)
6	Machine Learning in Practice	LA1: Metrics and Jupyter Notebook		e)
7	Deep Learning in Practice	LA1: CNN Modification LA2: RNN Visualisation		e)
8	Computer Vision	LA1: Image Processing Practices LA2: Transfer Learning	**Assessment 2 (35%)**	c), e)
9	Natural Language Processing	LA1: Bias in NLP trained applications Collaborative LA: Question and Answer		b), c), e)
10	Speech Recognition	LA1: Noise Reduction		b), c), e)
11	Emotional Intelligence when working with Intelligent Systems	LA1: Australia's Ethical Framework for AI		b), d),
12	Deploying Intelligent Systems	AIOps Discussion Forum	**Assessment 3 (40%)**	b), d),

Time Management:

Below outlines the minimum time management expectations for students.

12 Week Delivery:

- 10 Hours per module (one week): Facilitated study: 3 hours / week. Personal Study: 7 hours / week.
- 3 hours facilitated study consists of attending class, responding to facilitator feedback.
- Students are to allocate 7 hours of personal learning. This includes essential time spent on pre-reading and viewing materials, assessment progression and learning activities.

Learning Activities:

There are learning activities in each module with the types of activities listed in the delivery schedule above. These activities are an essential component of the subject and they are designed to prepare you for your graded assessment tasks. These learning activities will help you to build your understanding and skills whilst also collaborating with your peers.

*Detailed information of each activity can be found in their corresponding Module page in Blackboard.