

Study Scheme for Master in Intelligent Science

Course Code	Course Name	Credit Hour	Status
Semester 1			
CSM5203	Ethics in Artificial Intelligence Practice	3	CORE (YW)
CSM5304	Multimodal Interaction	3	CORE (YW)
CSM5604	Conversational Artificial Intelligence	3	CORE (YW)
CCS5090	Research Methods in Computer Science	3	CORE (YW)
CCS5603	Machine Learning	3	CORE (YW)
Total credits for Semester 1		15	
Semester 2			
CSM5606	Deep Learning	3	CORE (YW)
CSM5609	Vision Artificial Intelligence	3	CORE (YW)
	Elective 1	3	ELECTIVE (ELF)
	Elective 2	3	ELECTIVE (ELF)
*CSM5991	Project	2	CORE (YW)
Total Credits for Semester 2		12	
Semester 3			
CSM5991	Project	8	CORE (YW)
	Elective 3	3	ELECTIVE (ELF)
Total Credits for Semester 3		13	
TOTAL CREDITS		40	

Note: The 2-credit CSM5991 Project course in the second semester is for registration purposes only and is not included in the total credit count for that semester.

List of Courses and Study Scheme
Master in Intelligent Systems
Faculty of Computer Science and Information Technology
Universiti Putra Malaysia

No	Course Code	Course Name	Credit	Course Synopsis
1	CSM5203	Ethics in Artificial Intelligence Practice	3(3+0)	This course covers the ethical use of digital information and intelligent systems. Ways to navigate the digital world and engage in ethical behavior when interacting with digital information is also emphasized.
2	CSM5304	Multimodal Interaction	3(3+0)	This course covers the interaction that employs several modalities between humans, computers, and machines such as touch, gestures, gaze, speech, and immersive interaction. It also emphasizes the algorithm, social, aesthetic, and economic constraints in designing new interaction techniques with different modalities.
3	CSM5604	Conversational Artificial Intelligence	3(3+0)	This course covers current methods and recent advances in the development of conversational artificial intelligence systems. It includes the basic components of dialog systems, including automatic speech recognition, natural language understanding and speech synthesis, with an emphasis on task-oriented and conversational systems.
4	CSM5606	Deep Learning	3(3+0)	This course covers the mathematical techniques underlying deep learning architectures using artificial neural networks with multiple layers to learn patterns in data. Supervised and unsupervised deep network design strategies in several fields including computer vision, speech recognition, and/ or natural language processing are also emphasized.
5	CSM5609	Vision Artificial Intelligence	3(3+0)	This course covers the techniques of vision artificial intelligence and machine learning in classification and recognition tasks. A series of real-world problems and challenges will be exposed through case studies and projects to design an effective vision artificial intelligence system.

6	CCS5090	Research Methods in Computer Science	3(3+0)	This course includes research methods found in the field of computer science. Emphasis is given in giving ideas on how to plan, manage, and use available resources efficiently to help their research
7	CCS5603	Machine Learning	3(3+0)	This course covers the concepts and types of machines learning namely supervised, unsupervised, and reinforcement learning. Algorithms for pattern recognition, classification, optimization, and complex neural network architecture are emphasized.
8	CSM5991	Project	10(0+10)	This course covers the preparation of the original proposal implementation and project development related to intelligence systems. Suitable methodology for formulating, designing, and implementing the proposed project are also emphasized.
9	CSM5201	Digital Twin	3(3+0)	This course covers concepts and techniques related to the production of digital twins through digital simulation of physical objects or systems. It covers the skills of installing, configuring, managing internet of things infrastructure as well as the use of artificial intelligence over data to reflect real-world simulations on virtual objects.
10	CSM5605	Natural Language Processing with Deep Learning	3(3+0)	This course presents an overview of natural language processing. It focuses on the representation learning and deep neural networks to build advanced NLP systems using single end-to-end neural networks. The course also covers the main theory and cutting-edge research in NLP and emphasizes practical approach in modern NLP systems.
11	CSM5202	Multimodal Signal Processing	3(3+0)	This course covers signal processing techniques and information combinations from a variety of modalities to enhance the understanding, modelling, and performance of human-computer interaction devices or systems enhancing human-human communication. It also includes the application of signal processing and statistical machine learning techniques to problems arising in multi-disciplinary field.

12	CSM5302	Mixed Reality Technology	3(3+0)	This course covers the process of development and design of mixed reality interaction experiences based on the design, implementation, presentation, and report of a user-oriented project. It includes increasing students' knowledge in blended technologies by making it more intelligent, interactive, and personalized in creating a more realistic experience in fulfilling the market demand.
13	CSM5305	Visual Simulation	3(3+0)	This course covers the use of artificial intelligence methods in the development of a visual simulation system to assist decision making processes. It includes visual model construction, image formation, and interactive visual simulation to generate a realistic and immersive simulation experience.
14	CSM5607	Text Mining and Analytics	3(3+0)	This course covers the techniques of indexing, processing, and analyzing in intelligent text data analytics. Core text mining and analytics techniques which are important in the development of real-world applications are also exposed in this course.
15	CSM5608	Computer Audition	3(3+0)	This course covers machine learning and signal processing for computer audition. Audio understanding algorithms and sound recognition will be applied to design computer audition systems in speech, environmental sounds, bioacoustics, and music domains.
16	CSM5610	Game Artificial Intelligence	3(3+0)	This course covers the use of artificial intelligence in generating efficient and intelligent behavior in computer games. It includes incorporating artificial intelligence algorithms in computer game components to enhance the gaming experience.
17	CSM5611	Robotic Process Automation	3(3+0)	This course covers the concepts, software technology and techniques to automate digital tasks and its related business processes. It includes the adaptation and use of artificial intelligence in the development of robotic process automation applications and software robots or bots.

18	CSM5800	Selected Topics in Intelligent Systems	3(3+0)	This course covers selected topics in intelligent systems. The selected topics include aspects of theory, application, and implementation in the field of intelligent systems.
19	SWE5301	User Experience Design	3(3+0)	This course covers the use of theories and models in designing user experiences in software or application prototype development. The development and evaluation of software or application prototype processes using a user experience approach is emphasized.
20	CCS5102	Big Data Computing	3(3+0)	This course covers programming structures and algorithms for large-scale data processing and visualization. Emphasis is given to the use of big data eco-systems for large-scale data storage and computing. Machine learning algorithms and data analytics are discussed.