Information Technology A / T

Why study Information Technology?

When you study Information Technology, you are preparing yourself for the rapidly transforming landscape of work and society. Through Information Technology you will explore the systems that power our digital world, developing your Systems Thinking, Design Thinking and Computational Thinking skills to identify potential futures, and help create solutions for your preferred future. Studying Information Technology can help prepare you for careers of the future: careers involving Artificial Intelligence, Machine Learning, UX Design, Data Curation, Edge Computing, Robotics, and Cyber Ethics and Security.

Course Patterns

Students can choose from 3 new courses: **Data Science**, **Robotics and Mechatronics**, and **Digital Technologies**.
These courses can be studied independently as a major or minor, or units from these courses can be combined to complete a major or minor in Information Technology. All courses include Unit 5 Independent Study.

Recommended Pathways
A Courses

A Courses develop skills and knowledge required for entry into CIT courses and entry level employment.

T Courses

T Courses develop skills and knowledge for both CIT courses and university studies. These courses provide the assumed knowledge for Information Technology based courses at university.

Courses and Units

DATA SCIENCE A/T
Data Science will be one key to solving global problems such as climate change, mass consumerism, energy, health and poverty through data analysis, statistical inference, predictive modelling and related methods.

Unit 1 Data Representation and Analysis
This unit explores the ways that digital information is encoded, represented, manipulated, stored, compressed and transmitted. Students will understand where data comes from, develop intuitions about what could be learned or extracted from it, and be able to use computational tools to digitally manipulate data, visualise it, and identify patterns and trends. Students will be able use data to help inform decision-making.

Unit 2 Big Data Analysis and Techniques
The data-rich world that we live in introduces many complex questions related to public policy, law, ethics and social impact. The goal of this unit are to develop a well-rounded and balanced view about data in the world, including the positive and negative effects of it, and develop skills of how to use data analysis process, relevant algorithms and techniques and computational tools to analyse big data with multidisciplinary approach.

Unit 3 Machine Learning

This unit introduces the concepts of machine learning, and statistical pattern recognition, including Supervised learning, and Unsupervised learning. Students will learn how to apply learning algorithms to analyse datasets from a range of sources relevant to real life to build models or applications in order to predict or have social impacts.

Unit 4 Data Research Project

This practical unit develops skills that students need to acquire data to learn about the world that we are in and test hypotheses about patterns and relationships that might otherwise be invisible; how to use computational tools to quickly analyse vast amount of data and clearly present conclusion drawn from it and develop substantive complex computational artefacts, such as written, audio, video, web or robotics, which will be informative and maximise impact.
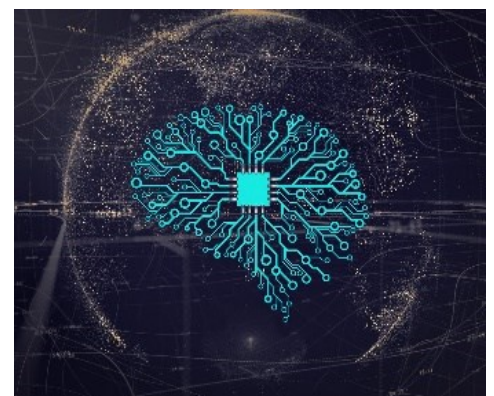
DIGITAL TECHNOLOGIES A/T

Digital Technologies transform the way we communicate, learn, collaborate and work within our world. Students will explore new ways of doing things, to generate new processes and create digital solutions to problems of individual, community and global interest.

Unit 1 Digital Assets

Students will develop the skills and knowledge required to interpret and create digital assets for a range of purposes and audiences. This could include the analysis of discrete components of existing processes and products and analysing how they interact within a system, as well as re-designing and developing assets. Students will learn about file system and content organisation architecture, design philosophies as well as fault finding and troubleshooting .

Unit 2 Programs and Platforms

Students will develop their algorithmic thinking skills in order to design and build systems that make use of the interconnected nature of various platform elements.

Unit 3 Digital Solutions

Students will develop their problem solving skills by working through the discovery process, interpretation, ideation, experimentation, visual and design thinking processes, and evaluation of design solutions.

Unit 4 Structured Project

Students will develop and refine their project management and design skills in order to develop and design solutions for projects that have a clearly defined structure.

The project should be in an authentic context and may take a variety of forms, such as a program, game or website built to a set of provided criteria.
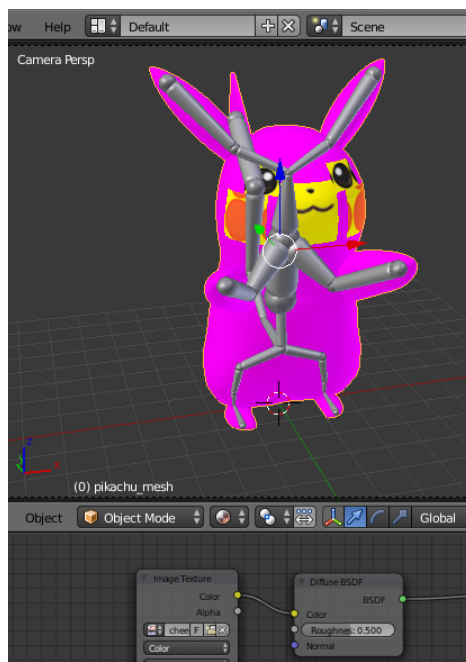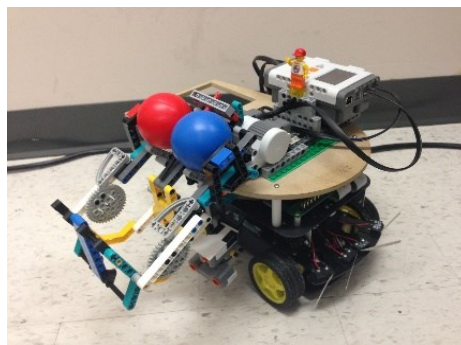
ROBOTICS and MECHATRONICS A/T

This course explores automation and physical computing through the engineering disciplines of robotics and mechatronics—examining how these technologies can address problems, needs and challenges faced by individuals and societies.

Unit 1 Building & Programming Circuits

Students will use design methodologies to investigate, strategise, prototype, evaluate and critically analyse the construction of electronic systems while practising Workplace Health and Safety compliance.

Students will gain the skills and knowledge to apply the design process using electronics to create innovative and sustainable systems.

Unit 2 Digital & Analog Interactions

Students will investigate and program microcontrollers and control systems. Students will apply the design process to design interface circuits, prototype and construct systems to receive input and collect data from sensors and provide meaningful output.

Unit 3 Robotics & Mechatronic Systems

Students critically analyse the effect that robotics and mechanised systems have on human society, built and natural environments and general well-being.

Student will use the design process to create and control a product/ solution incorporating mechanical, electrical and control systems.

Unit 4 Applications of Robotics

Students will use system architecture methodologies and the design process to complete a project; prototyping, constructing and evaluating an innovative system.

Students will analyse their results and present their findings with justification.

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