Project Title:	**YHJ22/23-01: Real-time Postural Risks Assessment System for Upper Body Ergonomics using Virtual Reality (VR) Technology**
Synopsis:	The idea of the project is to capture the motion of the workers while performing a task in real-time. The virtual skeleton will be used to superimpose to his/her motion in real-time. The captured data will be assessed to identify potential awful postures/motions and can be viewed in real-time using the virtual reality technology. The user can see performance and evaluation score. They will be alarmed by the indicator if their posture is incorrect, which able to correct/learn immediately.
Objectives:	1. to develop the digital human model in the Virtual Reality simulated environment 2. to integrate the RULA assessment in the VR-based digital human model
Equipment required:	HTC Vive Tracker, HTC Vive
Software required:	Unity3D
Supervisor (Department):	Assoc. Prof. Dr. Yap Hwa Jen (Mechanical Engineering)
Program:	Master of Mechanical Engineering
Duration:	Maximum 2 consecutive semesters

Project Title:	**YHJ22/23-02: Design and Development of an Image-guided Vision System for Robotics Palletizing**
Synopsis:	In this project, the student needs to design and develop an image-guided vision system using Raspberry-Pi with OpenCV. The vision system should be able to identify the incoming products and guide the robotics arm to pick the product in the correct orientation and place at the related pallet.
Objectives:	1. To develop an algorithm to be implemented in the Raspberry-Pi 2. To identify the orientation of the products for end-effector picking/grasping. 3. To integrate the vision system with a robotics arm for the palletizing process.
Equipment required:	myCobot, RP-4
Software required:	RoboDK, OpenCV
Supervisor(Department):	Assoc. Prof. Ir. Dr. Yap Hwa Jen (Mechanical Engineering)
Program:	Master of Mechanical/Electrical Engineering
Duration:	Maximum 2 consecutive semesters

Project Title:	**YHJ22/23-03: Development of a Robot Simulation & Command Generator Program for a Desktop Raspberry Pi-based Robot Arm**
Synopsis:	In this project, the student needs to develop 3D model of a desktop Raspberry Pi-based robot arm (myCobot). Next, the kinematics model need to be developed and integrated into the virtual model for the simulation purpose. The robot path can be taught in the simulation environment before generating the actual robot command. The validation of the generated command vs actual path need to be done with the palletizing process.
Objectives:	1. To develop the 3D model of the desktop-based robot arm 2. To integrated the kinematics model into the virtual robot. 3. To validate the generated robot command with the palletizing process.
Equipment required:	myCobot
Software required:	Solidworks, Unity3D
Supervisor (Department):	Assoc. Prof. Ir. Dr. Yap Hwa Jen (Mechanical Engineering)
Program:	Master of Mechanical/Electrical Engineering
Duration:	Maximum 2 consecutive semesters

Project Title:	**YHJ22/23-04: Development of a Gamified Virtual Reality-based Balancing Training for the Athletes**
Synopsis:	This project is aimed to design a VR-based balancing training module for the athletes. The gamified training module will facilitate practice and identify the key benefits in motivating and engaging athletes to effectively learn the balancing skills correctly and safely. By blending the gamification into the VR-based training, it is expected that the motivation and satisfaction of the trainees (athletes) can be improved compared to the conventional training method.
Objectives:	1. to develop a VR-based training module in a sport 2. to optimized the human-computer interface with the game theory 3. to investigate the effectiveness of the gamified VR-based sport training module.
Equipment required:	VR Glasses & tools
Software required:	Unity3D
Supervisor (Department):	Assoc. Prof. Ir. Dr. Yap Hwa Jen (Mechanical Engineering)
Program:	Master of Mechanical/Electrical Engineering
Duration:	Maximum 2 consecutive semesters

Project Title:	**YHJ22/23-05: Development of an Open-source 3D Printed Robotics Arm with Digital Twin Simulation Model**
Synopsis:	This project is aimed to develop a digital twin simulation model for an open-source 3D Printed Robotics Arm. The student is need to investigate various available open-source robotics arm to be fabricated/printed using additive manufacturing technology (3D Printer). The digital twin simulation model should be developed to communicate/control the developed robotics arm.
Objectives:	1. to develop an open-source 3D printed robotics arm. 2. to integrate the digital twin simulation model for the developed robotics arm.
Equipment required:	3D printer, Computer
Software required:	Unity3D
Supervisor (Department):	Assoc. Prof. Ir. Dr. Yap Hwa Jen (Mechanical Engineering)
Program:	Master of Mechanical/Electrical Engineering
Duration:	Maximum 2 consecutive semesters