MECHANICAL ENGINEERING – ROBOTICS SPECIALISATION + ELECTIVES (PRODUCT DESIGNER)
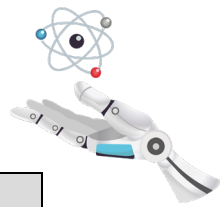
FOR COHORT AY2021/2022 ONWARDS		MC
Common Curriculum		**60**
Singapore Studies		4
Cultures and Connections		4
Communities and Engagement		4
Critical Thinking and Writing		4
Programming Methodology		4
Quantitative Reasoning with Data		4
Design Thinking^		4
Design and Make^		4
Systems Thinking and Dynamics		4
Introduction to Machine Learning		4
Liveable Cities		4
Creating Narratives		4
Fundamentals of Project Management		4
B.Eng. Dissertation <u>or</u> Mechanical Systems Design		8
Major Requirements		**60**
Mathematics I		4
Differential Equations for Engineering		2
Linear Algebra and Differential Equations		2
Engineering Professionalism		2
Industrial Attachment^		10
Engineering Principles & Practice I		4
Engineering Principles & Practice II		4
Strength of Materials		4
Engineering Thermodynamics		4
Fluids Mechanics I		4
Feedback Control Systems		4
Mechanics of Machines		4
Manufacturing Processes		4
Engineering Innovation and Modelling		4
Technical Elective (TE)		4
Specialisation in Robotics		**20**
(Up to 8 MCs can be double counted towards FYP / TE / UEM requirements.)		
From below basket of modules, select 5 modules <u>or</u> 3 modules and a B.Eng. Dissertation in Robotics.		20
• Robotic Systems Design	• Autonomous Robot Systems	
• Robot Mechanics and Control	• Robot Perception	
• Soft Robotics	• Robotics in Rehabilitation	
• Deep Learning for Robotics	• Human-Robot Interaction	
• Fuzzy/Neural Systems for Intelligent Robotics	• Intelligent Medical Robotics	
Other Unrestricted Electives^		**20**
Introductory Mathematics *(For direct poly intake only)*		4
Suggested Technical Electives:		
• Mechanics of Material	• Finite Element Analysis	
• Fundamentals of Product Development	• Materials Failure	
	• Computer-Aided Design and Manufacturing	
	TOTAL	**160**

^ If you have a diploma from an approved programme in the polytechnics, you may receive a total of 38 MCs of Advanced Placement Credits (APCs) in the following modules: Unrestricted Elective Modules (20 MCs), Industrial Attachment (10 MCs), Design and Make (4 MCs), Design Thinking (4 MCs).

List of Technical Elective modules:

- ME2114 Mechanics of Material
- ME2135 Intermediate Fluid Mechanics
- ME2143 Sensors and Actuators
- ME3122 Heat Transfer
- ME3211 Mechanics of Solids
- ME3221 Sustainable Energy Conversion
- ME3241 Microprocessor Applications
- ME3242 Automation
- ME3243 Robotic System Design
- ME3252 Materials Engineering Principles for Engineers
- ME3261 Computer-Aided Design and Manufacturing
- ME3263 Design for Manufacturing and Assembly
- ME3281 Microsystems Design and Applications
- ME3291 Numerical Methods in Engineering
- ME4105 Specialisation Study Module (Offshore Oil & Gas Technology)
- ME4212 Aircraft Structures
- ME4223 Thermal Environmental Engineering
- ME4225 Applied Heat Transfer
- ME4226 Energy and Thermal Systems
- ME4227 Internal Combustion Engines
- ME4231 Aerodynamics
- ME4232 Small Aircraft and Unmanned Aerial Vehicles
- ME4233 Computational Methods in Fluid Mechanics
- ME4241 Aircraft Performance and Stability
- ME4242 Soft Robotics
- ME4245 Robot Mechanics and Control
- ME4253 Biomaterials Engineering
- ME4255 Materials Failure
- ME4261 Tool Engineering
- ME4262 Automation in Manufacturing
- ME4263 Fundamentals of Product Development
- ME4291 Finite Element Analysis