

SECOND MAJOR IN SYSTEMS ENGINEERING

Course Requirements for Cohorts AY2022/2023 onwards

To be awarded a degree with Second Major in Systems Engineering, students must pass **at least 40 Units** of the following courses, which include:

CORE COURSES (24 Units)

Pass 5 core courses, which include:

IE2111 Industrial & Systems Engineering Principles & Practice II
IE2110 Operations Research I
IE2141 Systems Thinking and Dynamics
IE3105 Fundamentals in Systems Engineering & Architecture
IE3102 System Engineering Project (8 Units) ^{see Note 1}

ELECTIVES COURSES (8 Units)

Pass at least 8 Units from the following:

CS2113 Software Engineering & Object-Oriented Programming
IE3101 Statistics for Engineering Applications
IE3110R Simulation
IE4211 Modelling & Analytics
IE4243 Decision Modeling & Risk Analysis
IE4248 Energy and Green Economy
IE5231 Statistical Methods for Process Design & Control
PF1101 Fundamentals of Project Management/PF1101A Project Management and Finance

SYSTEMS COURSES (8 Units)

Pass at least 8 Units from the following:

Industrial Systems

IE3120 Manufacturing Logistics
IE4220 Supply Chain Modeling

Infrastructure Systems

CE3102 Socio-Economically Sustainable Developments
CE3121 Transportation Engineering
ESE3101 Solid and Hazardous Waste Management
ESE4406 Energy Systems and Climate Change Mitigation

Computer Systems

CS2102 Database Systems
CS4246 Reinforcement Learning and Sequential Decision Making

Electrical/ Electronic Systems

EE3331C Feedback Control Systems
EE4307 Control Systems Design & Simulation
EE4308 Autonomous Robot Systems
[EE4311 Fuzzy Logic and Neuro-Fuzzy Systems](#)
[EE4312 Artificial Neural Networks](#)
EE4501 Power System Management & Protection
EE4511 Renewable Generation and Smart Grid

Mechanical Systems

[ME3142 Feedback Control Systems](#)
ME4226 Energy & Thermal Systems
ME4263 Fundamentals of Product Development

Chemical Systems

CN4201R Petroleum Refining

Biomedical Systems

BN4203 Robotics in Rehabilitation

Note 1

IE3102 is a year-long course. The project work spans over a period of two semesters. Eligible students should contact ISEM Department at ug_isem@nus.edu.sg to indicate their intention to take the course before term starts.

- For project starting in Semester 1, please contact the Department by May.
- For project starting in Semester 2, please contact the Department by November.

Note 2

Students who complete the 5 core courses will be awarded a [Minor in Systems Engineering](#) if they do not wish to complete all the requirements for the Second Major in Systems Engineering.

Course requirements for Minor in Systems Engineering

Pass the following 5 courses:

IE2110 Operations Research I
IE2111 Industrial & Systems Engineering Principles & Practice II
IE2141 Systems Thinking and Dynamics
IE3105 Fundamentals in Systems Engineering & Architecture
IE3102A Systems Engineering Project