3.5.5.1 Second Major in Systems Engineering Programme

The Department of Industrial Systems Engineering & Management (ISEM) offers the Major in Systems Engineering (Sys Eng Major), a Second Major as part of NUS Special Undergraduate Programmes, for students from all other faculties and schools.

The programme is offered from August 2008. Students may be admitted to the programme based on the following criteria:

- Students can apply on admission or after they have completed their first year of study;
- Must apply no later than the 5th semester of their study;
- Must have a CAP score of at least 3.5

Applications should be submitted to the ISEM Department. Selection for admission will be on a competitive basis and subjected to the approval from ISEM Department as well as availability of quota.

To fulfil the requirements of the Second Major in Systems Engineering, students are required to complete 48 MCs.

Students may use up to a maximum of 16 MCs of their Second Major in Systems Engineering modules to double count towards other programmes.

Once admitted to the Second Major in Systems Engineering programme, students do not need to maintain any minimum academic performance threshold in order to remain in the programme. They are strongly encouraged to plan their modules well in order to be able to complete the programme requirements.

Students who complete the 24 MCs of core modules* 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.

Module Requirements for 2nd Major in Systems Engineering  AY2017/2018 Intake Onwards

<table>
<thead>
<tr>
<th>Modules</th>
<th>MCs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Seven Core Modules</strong></td>
<td>32</td>
</tr>
<tr>
<td>ST2334 Probability and Statistics*</td>
<td>4</td>
</tr>
<tr>
<td>IE1113 Introduction to Systems Analytics*</td>
<td>4</td>
</tr>
<tr>
<td>IE1114 Introduction to Systems Thinking and Dynamics*</td>
<td>4</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
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<tr>
<td>------------</td>
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</tr>
<tr>
<td>IE2110</td>
<td>Operations Research I*</td>
</tr>
<tr>
<td>IE2150</td>
<td>Human Factors Engineering*</td>
</tr>
<tr>
<td>IE3105</td>
<td>Fundamentals of Systems Engineering and Architecture*</td>
</tr>
<tr>
<td>IE3102</td>
<td>System Engineering Project</td>
</tr>
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<td></td>
<td><strong>Two Electives Modules</strong></td>
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<tr>
<td></td>
<td>Any two modules from the following:</td>
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<tr>
<td>CS2113T</td>
<td>Software Engineering</td>
</tr>
<tr>
<td>IE2130</td>
<td>Quality Engineering I</td>
</tr>
<tr>
<td>IE3101</td>
<td>Statistics for Engineering Applications</td>
</tr>
<tr>
<td>IE3110R</td>
<td>Simulation</td>
</tr>
<tr>
<td>IE4240</td>
<td>Project Management (or equivalent)</td>
</tr>
<tr>
<td>IE4243</td>
<td>Decision Modeling and Risk Analysis</td>
</tr>
<tr>
<td></td>
<td><strong>Two Systems Modules</strong></td>
</tr>
<tr>
<td></td>
<td>Any two modules from the following:</td>
</tr>
<tr>
<td><strong>Industrial Systems</strong></td>
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<tr>
<td>IE3120</td>
<td>Manufacturing Logistics</td>
</tr>
<tr>
<td>IE4220</td>
<td>Supply Chain Modeling</td>
</tr>
<tr>
<td>IE4221</td>
<td>Transport Demand Modeling and Economics</td>
</tr>
<tr>
<td>IE4244</td>
<td>Energy: Security, Competitiveness and Sustainability</td>
</tr>
<tr>
<td><strong>Infrastructure Systems</strong></td>
<td></td>
</tr>
<tr>
<td>CE3101</td>
<td>Integrated Infrastructure Project</td>
</tr>
<tr>
<td>CE3102</td>
<td>Engineering of Socio-Technical Systems</td>
</tr>
<tr>
<td>CE3121</td>
<td>Transportation Engineering</td>
</tr>
</tbody>
</table>
CE3132  Water Resources Engineering 4
CE4221  Design of Land Transport Infrastructures 4
CE4282  Building Information Modeling for Project 4
ESE3101  Solid and Hazardous Waste Management 4

**Computer Systems**

CS2102  Database Systems 4
CS4244  Knowledge Based Systems 4
CS4246  AI Planning and Decision Making 4

**Electrical/Electronic Systems**

EE3331C  Feedback Control Systems 4
EE3505C  Electrical Energy Systems 4
EE4214  Real Time Embedded Systems 4
EE4305  Introduction to Fuzzy/Neural Systems 4
EE4307  Control Systems Design and Simulation 4
EE4308  Advances in Intelligent Systems and Robotics 4
EE4501  Power Systems Management and Protection 4
EE4511  Sustainable Energy Systems 4

**Mechanical Systems**

ME4246  Modern Control Systems 4
ME4263  Fundamentals of Product Development 4
ME4266  Energy and Thermal Systems 4

**Chemical Systems**

CN4122  Process Synthesis and Simulation 4
CN4201R  Petroleum Refining 4
CN4238  Chemical and Biochemical Process Modelling 4
CN4245R  Data Based Process Characterization 4

**Biomedical Systems**

BN3101  Biomedical Engineering Design 4
BN4203  Rehabilitation Engineering 4

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<tr>
<td>Total</td>
<td>48</td>
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</table>

For queries on the Second Major in Systems Engineering, please email us at isebox1@nullnus.edu.sg.