4.2.7.2 Degree Requirements

The general requirements include at least 40 MCs, of which at least 30 MCs must be at graduate level within the subject or in related disciplines and the remaining credits may be from other levels in the same or other disciplines subject to the approval of the department.

To graduate with the MSc (Ind & Sys Eng) degree, a student must complete a minimum of 40 MCs in coursework with a minimum CAP of 3.00 for the best modules equivalent of 40 MCs (inclusive of foundation/core modules, where required). These must include the four ISE graduate foundation modules **IE5001, IE5002, IE5003 and IE5004** (16 MCs), and at least 16 MCs of ISE graduate elective modules. Subject to the department’s approval, up to 8 MCs may be from outside the department.

*New students are required to take CORE compulsory modules for the first two semester.*

*The department will help to pre-allocated the CORE module for new students.*

The graduate modules currently offered in the programme are listed in Table 4.2.7.2a. All modules are of 4 MCs. Some modules are offered in selected years only. See Modules Listings under Industrial and Systems Engineering at the Faculty of Engineering website for details.

Table 4.2.7.2a: Modules in Master of Science (Industrial & Systems Engineering)

<table>
<thead>
<tr>
<th>Foundation Modules</th>
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<tbody>
<tr>
<td>IE5001</td>
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<tr>
<td>IE5002</td>
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<td>IE5003</td>
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<td>IE5004</td>
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<table>
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<tr>
<th>Systems Engineering and Methodologies</th>
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<tbody>
<tr>
<td>IE5105</td>
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<td>IE5107</td>
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<td>IE5108</td>
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<td>IE5202</td>
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<td>IE5203</td>
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<td>IE5205</td>
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<td>IE5206</td>
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<td>IE5404</td>
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<td>IE5407</td>
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<td>IE5504</td>
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<table>
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<tr>
<th>Quality and Reliability Engineering</th>
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</thead>
<tbody>
<tr>
<td>IE5121</td>
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<tr>
<td>IE5122</td>
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</tbody>
</table>
IE5123    Reliability Engineering

Engineering Management
IE5208    Systems Approach to Project Management
IE5211    New Product Management
IE5213    Service Innovation and Management

Human Engineering
IE5301    Human Factors in Engineering and Design
IE5307    Topics in Human Factors Engineering

Advanced Modules
IE6001    Foundations Of Optimization
IE6002    Advanced Engineering Statistics
IE6004    Advanced Engineering Probability
IE6005    Stochastic Models and Optimization
IE6099    ISE Research Methodology
IE6107    Advanced Material Flow Systems
IE6108    Advanced Facility Layout and Location
IE6123    Advanced Reliability Engineering
IE6125    Advanced Software Quality Engineering
IE6126    Advanced Industrial Data Modelling and Analysis
IE6127    Six Sigma Methodologies
IE6199    Advanced Topics in Quality Engineering
IE6203    Advanced Decision Analysis
IE6211    Advanced New Product Management
IE6299    Advanced Topics in Engineering Management
IE6302    Advanced Ergonomics and Workplace Design
IE6399    Advanced Topics in Human Factors Engineering
IE6401    Advanced Topics in Industrial Logistics
IE6499    Advanced Topics in Systems Engineering
IE6503    Advanced Operations Research
IE6504    Advanced Systems Modelling and Simulation
IE6506    Advanced Computer Based Decision Systems
IE6511    Surrogate and Metaheuristic Global Optimization

Areas of Specialisation

Students may opt for one of the following optional areas of specialisation. Not all modules will necessarily be offered in one academic year:
**Operations Research - from January 2016 and onwards**

To be considered for the award of this specialisation, a student must complete a minimum of 40 MCs with a graduating CAP = 3.50 as follows:

- The four ISE graduate foundation modules: IE5001, IE5002, IE5003 and IE5004
- At least five of the following elective modules for specialisation:

  IE5105  Modelling for Supply Chain Systems  
  IE5107  Material Flow Systems  
  IE5108  Facility Layout and Location  
  IE5123  Reliability Engineering  
  IE5203  Decision Analysis  
  IE5504  Systems Modelling and Advanced Simulation  
  IE5907  Independent Study in Operations Research  
  IE5908A  Research Project in Operations Research I  
  IE5908B  Research Project in Operations Research II

- The remaining MCs in elective modules within or outside the Department subject to general degree requirements and Department’s approval.
- A candidate may offer projects in lieu of graduate modules regardless whether he has selected the area of specialisation. If a candidate opts for a project, he/she has to propose a suitable project and find an appropriate supervisor. The Department does not have a list of projects. The candidate’s experience and expertise in his/her workplace should help to identify a suitable project.
- Not more than 2 modules can be taken by a student for the project and independent study modules.

**Project Management - from August 2015 and onwards**

To be considered for the award of this specialisation, a student must complete a minimum of 40 MCs with a graduating CAP = 3.50 as follows:

- The four ISE graduate foundation modules: IE5001, IE5002, IE5003 and IE5004
- The compulsory module : IE5208 or IE5214.
- At least four of the following elective modules for specialisation:

  IE5121  Quality Planning and Management  
  IE5202  Applied Forecasting Methods  
  IE5211  New Product Management or MT5006 Strategic and New Product Management  
  IE5212  Management of Technological Innovation or MT5007 Management of Technological Innovation  
  IE5301  Human Factors in Engineering and Design  
  IE5404  Large Scale Systems Engineering  
  IE5407  Flexibility in Engineering Systems Design  
  IE5903  Independent Study in Project Management  
  IE5904A  Research Project in Project Management I  
  IE5904B  Research Project in Project Management II
The remaining MCs in elective modules within or outside the Department subject to general degree requirements and Department’s approval.

A candidate may offer projects in lieu of graduate modules regardless whether he has selected the area of specialisation. If a candidate opts for a project, he/she has to propose a suitable project and find an appropriate supervisor. The Department does not have a list of projects. The candidate’s experience and expertise in his/her workplace should help to identify a suitable project.

Not more than 2 modules can be taken by a student for the project and independent study modules.