### Second Major: Data Analytics

#### Applicable to cohort: AY 2017/2018

<table>
<thead>
<tr>
<th>Levels</th>
<th>Second Major Requirements</th>
<th>Cum MCs</th>
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</table>
| Level 1000 (10–12 MCs) | Pass  
– One of the following modules:  
+ CS1010/E—J/S/X Programming Methodology  
+ IT1007 Introduction to Programming with Python and C  
– One of the following modules:  
+ MA1101R Linear Algebra I  
+ MA1311 Matrix Algebra  
+ MA1508E Linear Algebra for Engineering  
+ MA1513 Linear Algebra with Differential Equations (2 MCs) †  
– One of the following modules:  
+ MA1102R Calculus  
+ MA1312 Calculus with Applications  
+ MA1505 Mathematics I  
+ MA1507 Advanced Calculus  
+ MA1511 Engineering Calculus (2 MCs) and MA1512 Differential Equations for Engineering  
+ MA1521 Calculus for Computing | 10–12 |
| Level 2000 (16 MCs) | Pass  
– CS2040 Data Structures and Algorithms  
– ST2131/MA2216 Probability  
– ST2132 Mathematical Statistics  
– One of the following modules:  
+ DSA2101 Essential Data Analytics Tools: Data Visualisation  
+ DSA2102 Essential Data Analytics Tools: Numerical Computation | 26–28 |
| Levels 3000 and 4000 (20–24 MCs) | Pass  
– ST3131 Regression Analysis  
– One of the following modules:  
+ DSA3102 Essential Data Analytics Tools: Convex Optimisation*  
+ DBA3701 Introduction to Optimisation  
+ MA3236 Nonlinear Programming*  
+ MA3252 Linear and Network Optimisation  
– One module from List I  
– One module from List II  
– One other module from List I or List II  
– One additional module from List I or List II † | 48–50 |

† Applicable only to students who use MA1513 Linear Algebra with Differential Equations (2 MCs) to fulfil the second major requirements.

This second major is not offered with the following primary majors: Applied Mathematics, Business Analytics, Computational Biology, Computer Engineering, Computer Science, Data Science and Analytics, Industrial and Systems Engineering, Information Security, Mathematics, Quantitative Finance, Statistics.

<table>
<thead>
<tr>
<th>List I</th>
<th>List II</th>
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<tr>
<td>DSA4211 High-Dimensional Statistical Analysis</td>
<td>CS3244 Machine Learning</td>
</tr>
<tr>
<td>DSA4212 Optimisation for Large-Scale Data-Driven Inference*</td>
<td>ST3240 Multivariate Statistical Analysis</td>
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</tbody>
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Students who participate in credit-bearing full-time internships/industrial...
attachments/professional placements as part of their degree requirements may be approved to double-count up to 8 MCs into List I if their internships/industrial attachments/professional placements have substantial data-analytics content, provided the limit of 16 MCs of double-counting in primary and second major requirements is not exceeded.

* Students may need to read additional modules outside the second major requirements to satisfy the pre-requisites of these modules.