## Major: Data Science and Analytics

### Levels Major Requirements Cum MCs

<table>
<thead>
<tr>
<th>Levels</th>
<th>Major Requirements</th>
<th>20 MCs</th>
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<tbody>
<tr>
<td>Levels 3000 and 4000 (56 MCs)</td>
<td>Pass – CS3244 Machine Learning Pass – CS3101 Data Science in Practice Pass – CS3102 Essential Data Analytics Tools: Convex Optimisation Pass – ST3131 Regression Analysis Either DSA4199 Honours Project in Data Science Or DSA4299 Applied Project in Data Science – Six additional modules from List A and List B subject to the following restrictions: + There must be at least two modules each from List A and from List B1/List B2 + A maximum of two DSA426X series modules can be used to fulfil this requirement + There must be at least four modules at level 4000</td>
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### List A — DSA modules
- DSA4211 High-Dimensional Statistical Analysis
- DSA4212 Optimisation for Large-Scale Data-Driven Inference
- DSA4261 Sense-Making Case Analysis: Logistics and Transport
- DSA4262 Sense-Making Case Analysis: Health and Medicine

### List A1 — DSA-recognised modules
- (no hidden pre-requisites)
- MA3236 Nonlinear Programming
- MA3252 Linear and Network Optimisation
- MA4270 Data Modelling and Computation
- ST3232 Design and Analysis of Experiments
- ST3233 Applied Time Series Analysis
- ST3239 Survey Methodology
- ST3240 Multivariate Statistical Analysis
- ST3247 Simulation
- ST3248 Statistical Learning I
- ST4231 Computer Intensive Statistical Methods
- ST4234 Bayesian Statistics
- ST4248 Statistical Learning II

### List B1 — DSA-recognised modules (with hidden pre-requisites)†
- CS3210 Parallel Computing
- CS3223 Database Systems Implementation
- CS3230 Design and Analysis of Algorithms
- CS3243 Introduction to Artificial Intelligence
- CS4224 Distributed Databases
- CS4225 Big Data Systems for Data Science
- CS4231 Parallel and Distributed Algorithms
- CS4234 Optimisation Algorithms
- CS4243 Computer Vision and Pattern Recognition
- CS4248 Natural Language Processing
- CS5340 Uncertainty Modelling in AI
- MA4230 Matrix Computation

### Changes and additions are shown in red.

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* Faculty requirements of 16 MCs are partially fulfilled through the reading of CS/MA/ST modules within the major. Students are required to fulfill the remaining 8 MCs of Faculty requirements from any two (2) of the following subject groups: Chemical Sciences, Life Sciences, Physical Sciences and Multidisciplinary & Interdisciplinary Sciences; but not from the following groups: Computing Sciences and Mathematical & Statistical Sciences.

† Students who wish to read these modules would have to read additional pre-requisite modules and should consult the Faculty/Department for academic advice on their study plans.