# Requirements for Major in Data Science and Analytics
**Applicable to cohorts AY2019/2020 to AY2020/2021**

| Levels | Major Requirements | Cumulative Major Units |
|---|---|---|
| Level 1000 (16 Units) | Pass<br> - CS1010/-E/J/S/X Programming Methodology<br> - DSA1101 Introduction to Data Science<br> - MA1101R/MA2001 Linear Algebra I<br> - MA1102R/MA2002 Calculus | 16 |
| Level 2000 (16 Units) | Pass<br> - CS2040 Data Structures and Algorithms<br> - DSA2101 Essential Data Analytics Tools: Data Visualisation<br> - DSA2102 Essential Data Analytics Tools: Numerical Computation<br> - MA2311 Techniques in Advanced Calculus<br>   *or* MA2104 Multivariable Calculus<br> - ST2131/MA2116/MA2216 Probability<br> - ST2132 Mathematical Statistics | 40 |
| Levels 3000 and 4000 (56 Units) | Pass<br> - CS3244 Machine Learning<br> - DSA3101 Data Science in Practice<br> - DSA3102 Essential Data Analytics Tools: Convex Optimisation<br> - ST3131 Regression Analysis †<br> - DSA4199 Honours Project in Data Science<br>   *or* DSA4299 Applied Project in Data Science<br> - Six additional courses from List A and List B subject to the following restrictions<br>   + There must be at least two courses each from List A and from List B1 and/or List B2<br>   + A maximum of two DSA426X series courses can be used to fulfil this requirement<br>   + There must be at least four courses at level 4000 | 96 |

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| **List A - DSA courses**<br>DSA4211 High-Dimensional Statistical Analysis<br>DSA4212 Optimisation for Large-Scale Data-Driven Inference<br>DSA4213 Natural Language Processing for Data Science<br>DSA4261 Sense-Making Case Analysis: Logistics and Transport<br>DSA4262 Sense-Making Case Analysis: Health and Medicine<br>DSA4263 Sense-Making Case Analysis: Business and Commerce<br>DSA4264 Sense-Making Case Analysis: Public Policy and Society<br>DSA4265 Sense-Making Case Analysis: Economics and Finance<br>DSA4266 Sense-Making Case Analysis: Science and Technology<br><br>**List B1 - DSA-recognised courses (no hidden pre-requisites)**<br>MA3252 Linear and Network Optimisation<br>MA4270 Data Modelling and Computation<br>ST3232 Design and Analysis of Experiments |

ST3233/ST4253 Applied Time Series Analysis
ST3239 Survey Methodology
ST3240/ST4250 Multivariate Statistical Analysis
ST3247 Simulation
ST3248 Statistical Learning I
ST4231 Computer Intensive Statistical Methods
ST4234 Bayesian Statistics
ST4248 Statistical Learning II

**List B2 - DSA-recognised courses (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 or Massive Data Processing Techniques in Data Science
CS4231 Parallel and Distributed Algorithms
CS4234 Optimisation Algorithms
CS4243 Computer Vision and Pattern Recognition
CS4248 Natural Language Processing
MA4230 Matrix Computation

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