Major: Data Science and Analytics

Applicable to cohort: AY 2016/2017

Levels	Major Requirements	Cum MCs
Level 1000 (20 MCs)	Pass – CS1010/—S/—X Programming Methodology – CS1020 Data Structures and Algorithms I – DSA1101 Introduction to Data Science – MA1101R Linear Algebra I – MA1102R Calculus	20
Level 2000 (24 MCs)	Pass – CS2010 Data Structures and Algorithms II – DSA2101 Essential Data Analytics Tools: Data Visualisation – DSA2102 Essential Data Analytics Tools: Numerical Computation – MA2311 Techniques in Advanced Calculus *Or* MA2104 Multivariate Calculus – ST2131/MA2216 Probability – ST2132 Mathematical Statistics	44
Levels 3000 and 4000 (56 MCs)	Pass – CS3244 Machine Learning – DSA3101 Data Science in Practice – DSA3102 Essential Data Analytics Tools: Convex Optimisation – 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	100

Summary of Requirements	MCs
University Requirements	20 MCs
Faculty Requirements *	8 MCs
Major Requirements	100 MCs
Unrestricted Elective Modules	32 MCs
Total	160 MCs

* Faculty requirements of 16 MCs are partially fulfilled through the reading of CS/MA/ST modules within the major. Students are required to fulfil 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.

List A — DSA modules

Note: The DSA426X series modules are pending University approval.

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 B1 — 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 B2 — 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

† 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.

Version: May 2019 Click on the module codes for information

Changes and additions are shown in red.