Requirements for Major in Data Science and Analytics
Applicable to cohorts AY2022/2023 and after

Levels	Major Requirements	Cumulative Major Units
Level 1000 (4 Units)	Pass • DSA1101 Introduction to Data Science[1]	4
Level 2000 (32 Units)	Pass • CS2040 Data Structures and Algorithms[2] • DSA2101 Essential Data Analytics Tools: Data Visualisation • DSA2102 Essential Data Analytics Tools: Numerical Computation • MA2001 Linear Algebra I • MA2002 Calculus • MA2311 Techniques in Advanced Calculus *or* MA2104 Multivariable Calculus • ST2131/MA2116/MA2216 Probability • ST2132 Mathematical Statistics	36
Level 3000 (16 Units)	Pass • CS3244 Machine Learning • DSA3101 Data Science in Practice • DSA3102 Essential Data Analytics Tools: Convex Optimisation • ST3131 Regression Analysis	52

Level 4000 (8 Units)	Choose either Option A or Option B
	
	Option A – Pass two courses as follows:
	• One course from DSA421x courses
	   or DSE4211 / QF4211 Digital Currencies
	   or DSE4212 / QF4212 Data Science in FinTech
	• One other course from DSA426x courses
	
	Option B – Pass one of the following Honours Project (8 Units) variants
	• DSA4288 Honours Project in Data Science and Analytics
	• DSA4288M Honours Project in DSA (Operations Research)
	• DSA4288S Honours Project in DSA (Statistical Methodology)
		60

==**To graduate with a Major in Data Science and Analytics, a student must have read and passed at least one of the following:**==
(1) DSA3288 / DSA3288R
(2) DSA4288 / DSA4288x*
(3) Any UPIP course**
(4) Any NOC Internship course

*DSA4288x can be double-counted (up to a maximum of 8 Units) towards major and specialisation requirements.
**Students who have passed a FASSIP course before switching to a primary major in Data Science and Analytics would be deemed to have fulfilled this requirement.

[1] DSA1101 will be read in fulfilment of the Data Literacy requirement under the College of Humanities and Sciences.
[2] CS1010S Programming Methodology, the pre-requisite of CS2040, will be read in fulfilment of the Digital Literacy requirement under the College of Humanities and Sciences.

Students majoring in Data Science and Analytics have the option to pursue **specialisations** in
(A) **Operations Research** or/and (B) **Statistical Methodology**.

(A) To be awarded a specialisation in **Operations Research**, a student must pass (at least) 20 Units from the following, with not more than 8 Units in Level 3000 courses:

MA3252 Linear and Network Optimisation
MA3227 Numerical Analysis II
MA3238/ST3236 Stochastic Processes I
MA4230 Matrix Computation
MA4251/ST4238 Stochastic Processes II
MA4260 Stochastic Operations Research
MA4268 Mathematics for Visual Data Processing
MA4270 Data Modelling and Computation
DSA4288M Honours Project in DSA (Operations Research) (8 Units)

(B) To be awarded a specialisation in **Statistical Methodology**, a student must pass (at least) 20 Units from the following, with not more than 8 Units in Level 3000 courses:

ST3232 Design and Analysis of Experiments
ST3239 Survey Methodology
ST3247 Simulation
ST3248 Statistical Learning I
ST4231 Computer Intensive Statistical Methods
ST4234 Bayesian Statistics
ST4248 Statistical Learning II
ST4250 Multivariate Statistical Analysis
ST4253 Applied Time Series Analysis
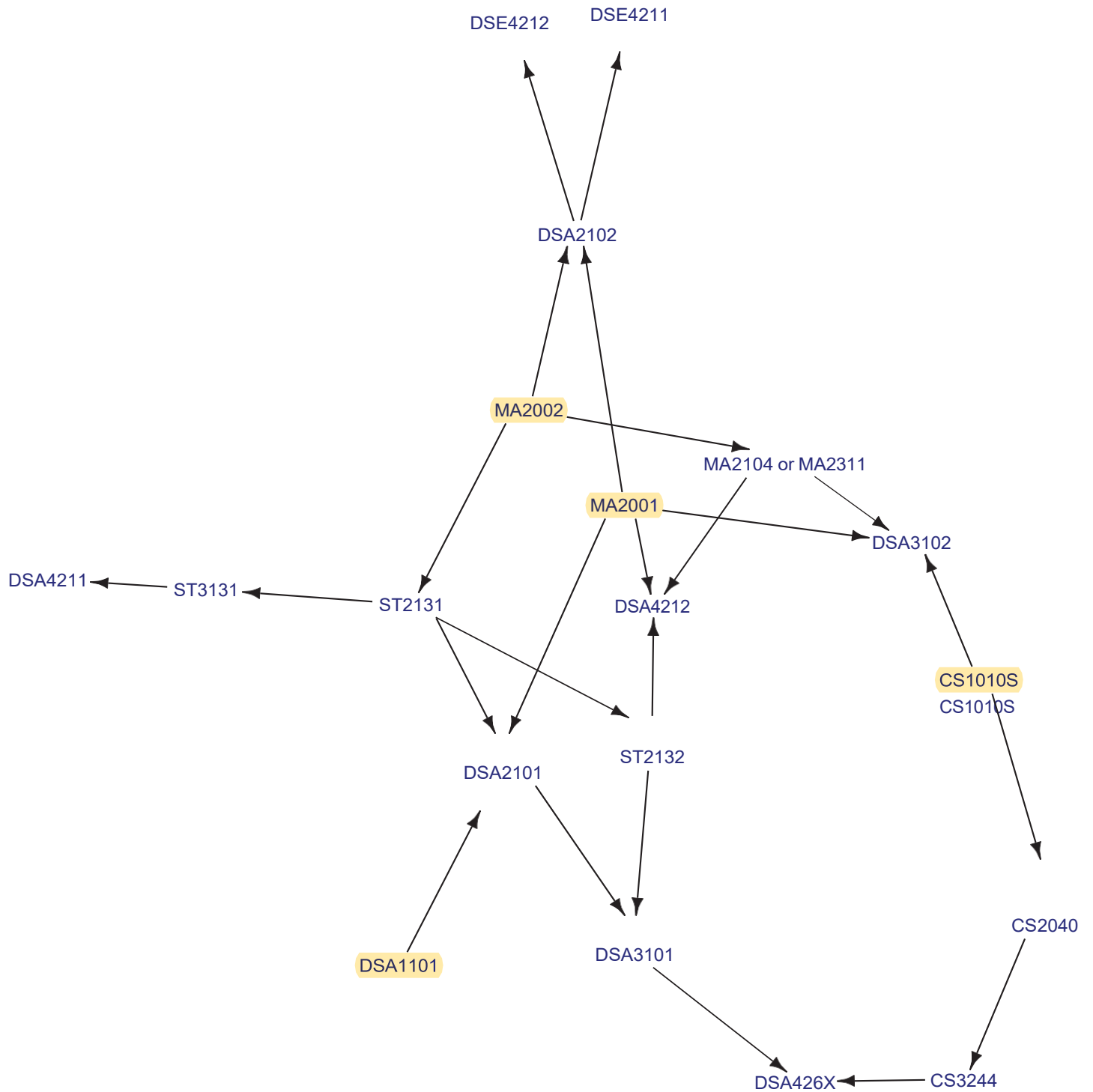DSA4288S Honours Project in DSA (Statistical Methodology) (8 Units)

updated 3-May-2025

Sample Study Plan — Data Science and Analytics

Year 1		Year 2		Year 3		Year 4	
Sem 1	Sem 2	Sem 1	Sem 2	Sem 1	Sem 2	Sem 1	Sem 2
Pair 1: Humanities Pair 2: Social Sciences	Pair 1: Social Sciences Pair 2: Humanities	Writing	Communities and Engagement	Interdisciplinary I	Interdisciplinary II	Major 14	Major 15
Pair 1: Scientific Inquiry I Pair 2: Asian Studies	Pair 1: Asian Studies Pair 2: Scientific Inquiry I	Scientific Inquiry II	Artificial Intelligence	DSA3101 Data Science in Practice <u>or</u> DSA3102	DSA3102 Essential Data Analytics Tools: Convex Optimisation <u>or</u> DSA3101	UE 6	UE 10
Pair 1: Digital Literacy (CS1010S) Pair 2: Design Thinking	Pair 1: Design Thinking Pair 2: Digital Literacy (CS1010S)	MA2311 Techniques in Advanced Calculus/ MA2104 <u>or</u> CS2040	CS2040 Data Structures and Algorithms <u>or</u> MA2104 Multivariable Calculus	CS3244 Machine Learning	UE 3	UE 7	UE 11
Pair 1: MA2001 Linear Algebra I Pair 2: DSA1101*	Pair 1: DSA1101* Introduction to Data Science Pair 2: MA2001	DSA2101 Essential Data Analytics Tools: Data Visualisation <u>or</u> DSA2102	DSA2102 Essential Data Analytics Tools: Numerical Computation <u>or</u> DSA2101	UE 1	UE 4	UE 8	UE 12
MA2002 Calculus	ST2131 Probability	ST2132 Mathematical Statistics <u>or</u> ST3131	ST3131 Regression Analysis <u>or</u> ST2132	UE 2	UE 5	UE 9	UE 13

* DSA1101 fulfils the Data Literacy requirement.

Pre-requisite Graph for Major in Data Science and Analytics

DSE4212   DSE4211

DSA2102

MA2002

MA2104 or MA2311

MA2001

DSA3102

DSA4211 ← ST3131 ← ST2131

DSA4212

CS1010S
CS1010S

DSA2101   ST2132

DSA1101   DSA3101

CS2040

DSA426X ← CS3244

<u>Notes on CHS Common Curriculum courses</u>:

1) Students are strongly encouraged to complete all CHS Common Curriculum courses in their first two years **<u>except</u>** for the following 3 courses:
  - ❖ Communities and Engagement course – can be taken from Years 2 to 4*****
  - ❖ Two Interdisciplinary courses – can be taken in Years 3 and 4

  *Important note on workload: Semester vs. Year-long C&E courses

  - Some C&E courses, usually the field/project-work courses, are regular intense 4-Unit courses with work completed within one semester.

  - Other C&E courses, especially the service-work courses, are spread out over two consecutive semesters, or up to one year, that is, **Semester 1 through Semester 2 to Special Term 2**; or **Semester 2 through the Special Terms to Semester 1 of following Academic Year (AY)**. You may click **here** for more details on the service-work courses.

  - For those students who read the year-long C&E courses which extend till Special Term (during the summer break) after their 8th semester, please note that grades are awarded at the end of Special Term 2, which means your degree will be conferred in end-Aug, and you will join the Commencement ceremony in the following year instead of the same AY of completion of the course. For more details, please check out the FAQ **here**.

  - As such, students who prefer to take such year-long C&E courses instead of semester-long courses (where the latter might have limited capacity in each semester) are encouraged to plan in advance. You may do so by including the C&E course in your study plan earlier in your candidature; for example, during Year 2 of study.

  - This would allow students to plan for other enrichment programmes (such as Student Exchange programmes, NOC and/or UPIP/Internships) during Year 3 instead of delaying this requirement to Year 4 when students will need to devote time for their job search in the final semester as they complete the remaining graduation requirements.

  - For more enquiries, please check out the **FAQ**, or email the C&E team at **AskCnE@nus.edu.sg**.

2) The actual pre-allocation may differ from the sample study plan. For the actual pre-allocation pairings, please click here.