B.Sc. (Hons) in Data Science and Applied AI

Requirements for Cohorts AY2026/27 and after

Levels	Major Requirements	Cumulative Major Units
Level 1000 (8 Units)	Pass: • CS1231 Discrete Structures • MA1531 Calculus for Data Science	8
Level 2000 (28 Units)	Pass: • CS2040/CS2040S Data Structures and Algorithms • DSA2101 Data Wrangling and Visualisation • DSA2111 Cloud-Based Data Science and Programming • DSA2112 Practical AI for Data Science Pipelines • MA2001 Linear Algebra I • ST2131/MA2116/MA2116T Probability • ST2133 Statistical Inference	36
Level 3000 (16 Units)	Pass: • CS3263 Foundations of Artificial Intelligence ***or*** CS3264 Foundations of Machine Learning • DSA3101 Data Science in Practice • DSA3111 Numerical Computation and Optimisation • ST3131 Regression Analysis	52
Level 4000 (8 Units)	Choose **either** Option A or Option B: Option A – Pass **one** course from List I **and one** course from List II: **List I** • DSA4211 High-Dimensional Statistical Analysis • DSA4212 Optimisation for Large-Scale Data-Driven Inference • DSA4213 Natural Language Processing for Data Science • DSA4214 Computer Vision **List II** • DSA4261 Applied AI in Logistics & Transport • DSA4262 Applied AI in Healthcare • DSA4263 Applied AI in Business • DSA4264 Applied AI in Public Policy • DSA4265 Applied AI in Finance • DSA4266 Applied AI in Scientific Discovery Option B – Pass **one** of the following Honours Project variants (8 Units) • DSA4288A Honours Project in Data Science and Applied AI • DSA4288OR Honours Project in DSAAI (Operations Research) • DSA4288SM Honours Project in DSAAI (Statistical Methodology)	60

To graduate with a Major in Data Science and Applied AI, a student must have passed at least one of the following:

1) DSA3288 / DSA3288R [1]
2) DSA4288A/OR/SM [2]
3) Any UPIP course [3]
4) Any NOC Internship course

The following courses are prescribed for DSAAI students to complete in order to fulfill the Common Curriculum requirements under the College of Humanities and Sciences (CHS).

- Data Literacy: DSA1101 Introduction to Data Science (*a prerequisite to DSA2111/DSA2112*)
- Digital Literacy: CS1010S Programming Methodology *(a prerequisite to CS2040/CS2040S)* or UTC2851 Problem Solving for Computing and AI
- Artificial Intelligence: CS2109HS Introduction to AI and Machine Learning (*a prerequisite to CS3263/CS3264*)

Students majoring in Data Science and Applied AI have the option to pursue **specialisations** in **(A) Operations Research** and/or **(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**:

Levels	Courses
Level 3000	• MA3227 Numerical Analysis II • MA3252 Linear and Network Optimisation • MA3270 Mathematics for Artificial Intelligence • ST3236/MA3238/MA3238S Stochastic Processes I
Level 4000	• DSA4288OR Honours Project in DSAAI (Operations Research) (8 Units) • MA4230 Matrix Computation • MA4260 Stochastic Operations Research • MA4268 Mathematics for Visual Data Processing • MA4270 Data Modelling and Computation • MA4275 Mathematics of Reinforcement Learning • ST4238/MA4251 Stochastic Processes II

(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**:

Levels	Courses
Level 3000	• ST3232 Design and Analysis of Experiments • ST3239 Survey Methodology • ST3247 Simulation • ST3248 Statistical Learning I
Level 4000	• DSA4288SM Honours Project in DSAAI (Statistical Methodology) (8 Units) • ST4231 Computer Intensive Statistical Methods • ST4234 Bayesian Statistics • ST4248 Statistical Learning II • ST4250 Multivariate Statistical Analysis • ST4253 Applied Time Series Analysis

Notes:
Students majoring in Data Science and Applied AI are precluded from pursuing a Second Major or Minor in Data Analytics, Statistics or Mathematics. For the latest information on prohibited combinations, please refer to the Faculty of Science website here.

1. Undergraduate Research Opportunities Programme in Science (UROPS) courses cannot be used to fulfil the major requirements; they are classified under Unrestricted Electives.
2. DSA4288OR/SM can be double-counted (up to a maximum of 8 Units) towards major and specialisation requirements.
3. Undergraduate Professional Internship Programme (UPIP) courses will count towards graduation requirements under Unrestricted Electives.

Sample Study Plan – Major in Data Science and Applied AI

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**	Pair 1: **Design Thinking** Pair 2: **AI Literacy** **(CS2109HS)**	Pair 1: **AI Literacy** **(CS2109HS)** Pair 2: **Design Thinking**	DSA3101 Data Science in Practice or DSA3111	DSA3111 Numerical Computation and Optimisation or DSA3101	UE 5	UE 9
Pair 1: **Data Literacy** **(DSA1101)** Pair 2: **Digital Literacy** **(CS1010S)**	Pair 1: **Digital Literacy** **(CS1010S)** Pair 2: **Data Literacy** **(DSA1101)**	DSA2101 Data Wrangling and Visualisation or Scientific Inquiry II	Scientific Inquiry II or DSA2101	ST3131 Regression Analysis or ST2133	CS3263 Foundations of Artificial Intelligence or CS3264 Foundations of Machine Learning	UE 6	UE 10
Pair 1: **CS1231** **Discrete Structures** Pair 2: **MA2001** **Linear Algebra I**	Pair 1: **MA2001** **Linear Algebra I** Pair 2: **CS1231** **Discrete Structures**	DSA2111 Cloud-Based Data Science and Programming	DSA2112 Practical AI for Data Science Pipelines	UE 1	UE 3	UE 7	UE 11
MA1531 **Calculus for Data Science**	Pair 1: ST2131 Probability Pair 2: CS2040	Pair 1: CS2040 Data Structures and Algorithms Pair 2: ST2131	ST2133 Statistical Inference or ST3131	UE 2	UE 4	UE 8	UE 12

The actual pre-allocation of CHS Common Curriculum courses may differ from the sample above. For the actual pre-allocation pairings, please refer to the Faculty of Science website here. Please note that only courses indicated in **bold** above will be pre-allocated to students. DSA1101, CS1010S, and CS2109HS are the prescribed courses for DSAAI students, fulfilling the Data Literacy, Digital Literacy, and Artificial Intelligence pillars of the CHS Common Curriculum respectively. DSAAI students enrolled in the Acacia College UTCP will read UTC2851 instead of CS1010S.

Notes on CHS Common Curriculum courses:

Students are strongly encouraged to complete all CHS Common Curriculum courses in their first two years **except** 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 students who read year-long C&E courses which extend till Special Term (during the summer break) after their 8th semester, please note that grades are awarded only at the end of Special Term 2. As a result, the degree will be conferred in late August, and students will participate in the Commencement ceremony in the following academic year, rather than in the same AY as the completion of the course. For more details, please check out the FAQ here.

- As such, students who prefer to take year-long C&E courses instead of semester-long courses (which may have limited capacity each semester) are encouraged to plan ahead by including the C&E course earlier in the study plan, 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, rather than deferring this requirement to Year 4. This is especially beneficial as students typically need to devote time for their job search in the final semester while completing their remaining graduation requirements.

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