## AY2024-2025
## CURRICULUM FOR DATA SCIENCE & ARTIFICIAL INTELLIGENCE
### With a Second Major in Sustainability

| | | | SUMMARY OF ACADEMIC UNIT REQUIREMENT | | | |
|---|---|---|---|---|---|---|
| Year of Study | Core | MPE | ICC | | BDE | Total AU |
| | | | Common-Core | Foundational-Core | | |
| 1 | 16 | 0 | 9 | 3 | 9 | 37 |
| 2 | 26 | 0 | 8 | 2 | 6 | 42 |
| 3 | 10 | 6 | 0 | 10 | 3 | 29 |
| 4 | 8 | 12 | 0 | 0 | 12 | 32 |
| Total | 60 | 18 | 17 | 15 | 30 | 140 |

### Recommended Course Schedule

| YEAR 1 SEMESTER 1 | | | | |
|---|---|---|---|---|
| Course Code | Course Title | Type | AU | Pre-requisite |
| SC1003 | Introduction to Computational Thinking & Programming | F-Core | 3 | Nil |
| MH1805 | Calculus | Core | 4 | Nil |
| MH1812 | Discrete Mathematics | Core | 3 | Nil |
| CC0001 | Inquiry & Communication in an Interdisciplinary World | U-Core | 2 | Nil |
| CC0002 | Navigating the Digital World | U-Core | 2 | Nil |
| | Sustainability - Core | BDE | 3 | Refer to syllabus |
| | | | 17 | |

| YEAR 1 SEMESTER 2 | | | | |
|---|---|---|---|---|
| Course Code | Course Title | Type | AU | Pre-requisite |
| SC1007 | Data Structures & Algorithms | Core | 3 | SC1003 |
| SC3021 | Data Science Fundamentals (Only for U24 and after) | Core | 3 | SC1003 |
| SC2002 | Object Oriented Design & Programming | Core | 3 | SC1003 OR SC1007 |
| CC0003 | Ethics & Civics in a Multicultural World | U-Core | 2 | Nil |
| CC0005 | Healthy Living & Wellbeing | U-Core | 3 | Nil |
| | Sustainability - Core | BDE | 3 | Refer to syllabus |
| | Sustainability - Core | BDE | 3 | Refer to syllabus |
| | | | 20 | |
| | Year 1 Total AU | | 37 | |

| YEAR 2 SEMESTER 1 | | | | |
|---|---|---|---|---|
| Course Code | Course Title | Type | AU | Pre-requisite |
| SC2207 | Introduction to Databases | Core | 3 | SC2001 (co-requisite) |
| SC2001 | Algorithm Design & Analysis | Core | 3 | SC1007 & MH1812 |
| MH2500 | Probability and Introduction to Statistics | Core | 4 | MH1805 |
| MH2802 | Linear Algebra for Scientists | Core | 3 | Nil |
| CC0006 | Sustainability: Society, Economy & Environment | U-Core | 3 | Nil |
| ML0004 | Career & Innovative Enterprise for the Future World | U-Core | 2 | Nil |
| | Sustainability - Core | BDE | 3 | Refer to syllabus |
| | | | 21 | |

| YEAR 2 SEMESTER 2 | | | | |
|---|---|---|---|---|
| Course Code | Course Title | Type | AU | Pre-requisite |
| SC3000 | Artificial Intelligence | Core | 3 | SC1007 & MH2500 |
| SC2006 | Software Engineering | Core | 3 | SC2002 (co-requisite) |
| MH3500 | Statistics | Core | 4 | MH2500 |
| MH3511 | Data Analysis with Computer | Core | 3 | MH2500 |
| HW0218 | Communication Across the Sciences | F-Core | 2 | CC0001 |
| CC0007 | Science & Technology for Humanity | U-Core | 3 | Nil |
| | Sustainability - Core | BDE | 3 | Refer to syllabus |
| | | | 21 | |
| | Year 2 Total AU | | 42 | |

| YEAR 3 SEMESTER 1 | | | | |
|---|---|---|---|---|
| Course Code | Course Title | Type | AU | Pre-requisite |
| SC4000 | Machine Learning | Core | 3 | SC1004 & SC1007 & SC2000 |
| SC4020 | Data Analytics and Mining | Core | 3 | SC2001 |
| MH2100 | Calculus III | Core | 4 | MH1805 |
| MH/SCxxxx | Major Prescribed Elective | MPE | 3 | Year 3 standing |
| MH/SCxxxx | Major Prescribed Elective | MPE | 3 | Year 3 standing |
| | Sustainability - Elecive | BDE | 3 | Refer to syllabus |
| | | | 19 | |

| YEAR 3 SEMESTER 2 | | | | |
|---|---|---|---|---|
| Course Code | Course Title | Type | AU | Pre-requisite |
| SD3920 | Professional Internship (Graded) | F-Core | 10 | Year 3 Standing |
| | | | 10 | |
| | Year 3 Total AU | | 29 | |

| YEAR 4 SEMESTER 1 | | | | |
|---|---|---|---|---|
| **Course Code** | **Course Title** | **Type** | **AU** | **Pre-requisite** |
| SC4079 | Final Year Project (Part 1) | Core | 4 | Year 4 Standing |
| MH/SC4xxx | Major Prescribed Elective | MPE | 3 | Year 3 standing |
| MH/SC4xxx | Major Prescribed Elective | MPE | 3 | Year 3 standing |
|  | Sustainability - Elecive | BDE | 3 | Refer to syllabus |
|  | Sustainability - Elecive | BDE | 3 | Refer to syllabus |
|  |  |  | 16 |  |

| YEAR 4 SEMESTER 2 | | | | |
|---|---|---|---|---|
| **Course Code** | **Course Title** | **Type** | **AU** | **Pre-requisite** |
| SC4079 | Final Year Project (Part 2) | Core | 4 | Year 4 Standing |
| MH/SC4xxx | Major Prescribed Elective | MPE | 3 | Year 3 standing |
| MH/SC4xxx | Major Prescribed Elective | MPE | 3 | Year 3 standing |
|  | Sustainability - Elecive | BDE | 3 | Refer to syllabus |
|  | Sustainability - Interdisciplinary Project | BDE | 3 | Refer to syllabus |
|  |  |  | 16 |  |
|  | **Year 4 Total AU** |  | **32** |  |

**Important Note for DSAI MEP:**

1. Minimum 18 AU of MPE is required.

2. Different combination between 3 & 4 AU MPE is allowed for U21 and later Cohorts.

3. It is also possible to choose all 3 AU MPE to fulfil MPE requirement.

4. Students are allowed to fulfil MPE requirement by over 1 or 2 AU.

Example: when students have 17 AU MPE currently, they are allowed to take one more 3 AU MPE.

| MPE Structure of DSAI (U24 and after) | | | |
|---|---|---|---|
| **Course Code** | **Type** | **AU** | **Remarks** |
| MH/SCxxxx | MPE-1 | 3 | Any MPE |
| MH/SCxxxx | MPE-2 | 3 | Any MPE |
| MH/SC4xxx | MPE-3 | 3 | MPE (Choose within Level 4 courses) |
| MH/SC4xxx | MPE-4 | 3 | MPE (Choose within Level 4 courses) |
| MH/SC4xxx | MPE-5 | 3 | MPE (Choose within Level 4 courses) |
| MH/SC4xxx | MPE-6 | 3 | MPE (Choose within Level 4 courses) |
|  | **Total** | **18** |  |
| Please refer the CSC MPE Courses and Specialization on CCDS website. | | | |

| Sustainability Course Lising | | | | |
|---|---|---|---|---|
| **Course Code** | **Course Title** | **Type** | **AU** | **Pre-requisite** |
|  | Sustainability - Core | BDE | 3 | Refer to syllabus |
|  | Sustainability - Elecive | BDE | 3 | Refer to syllabus |
|  | Sustainability - Elecive | BDE | 4 | Refer to syllabus |
|  | Sustainability - Interdisciplinary Project | BDE | 3 | Refer to syllabus |

econd Major in Sustainability webiste for Sustainability Course Listing:https://www.ntu.edu.sg/ase/admissions/undergraduate-programmes/second-major-in-sustainability#Co