

**CURRICULUM FOR BACHELOR OF ENGINEERING (MECHANICAL ENGINEERING - MAINSTREAM)**

CN YANG SCHOLARS PROGRAMME

SECOND MAJOR IN DATA ANALYTICS (MEDA)

(FIRST YEAR ADMISSION)

AY2025 Intake Onwards

| Year of Study  | SUMMARY OF ACADEMIC UNIT REQUIREMENT |                      |                                  |                                      |                          |                          | Total AU  |
|--|--------------------------------------|----------------------|----------------------------------|--------------------------------------|--------------------------|--------------------------|-----------|
|  | Major Requirements                   |                      |                                  | Interdisciplinary Collaborative Core |                          |                          |           |
|  | Core (C)                             | CNYSP-Core (CNYSP-C) | Major Prescribed Electives (MPE) | Common Core (CC)                     | Professional Series (PS) | Care, Serve, Learn (CSL) |           |
| 1  | 11 [3]                               | 23                   | 0                                | 2                                    | 0                        | 0                        | 0         |
| 2  | 18 [3]                               | 6                    | 0                                | 8                                    | 0                        | 3                        | 7         |
| 3  | 25                                   | 0                    | 6 [6]                            | 0                                    | 9                        | 0                        | 3         |
| 4  | 15                                   | 0                    | 0                                | 0                                    | 0                        | 0                        | 12        |
| <b>Total</b>   | <b>69 [6]</b>                        | <b>29</b>            | <b>6 [6]</b>                     | <b>10</b>                            | <b>9</b>                 | <b>3</b>                 | <b>22</b> |
| [ ] AU of courses that could be used to fulfil Core/MPE requirement and second major requirement concurrently. |                                      |                      |                                  |                                      |                          |                          |           |

**YEAR 1 SEMESTER 1**

| Course Code | Course Title             | Type    | AU        | Remarks |
|-------------|--------------------------|---------|-----------|---------|
| CY1001      | Cell                     | CNYSP-C | 3         |         |
| CY1101      | Molecule                 | CNYSP-C | 4         |         |
| CY1308      | Physics                  | CNYSP-C | 3         |         |
| CY1500      | Introduction to Research | CNYSP-C | 2         |         |
| CY1601      | Mathematics I            | CNYSP-C | 4         |         |
| EG1001      | Engineers in Society     | C       | 2         |         |
| CC0015      | Health & Wellbeing       | CC      | 2         |         |
|             |                          |         | <b>20</b> |         |

**YEAR 1 SEMESTER 2**

| Course Code | Course Title                           | Type    | AU        | Remarks |
|-------------|--|---------|-----------|---------|
| CY1007      | Climate Change                         | CNYSP-C | 3         |         |
| MA1001      | Dynamics                               | C       | 3         |         |
| MA1008^     | Introduction to Computational Thinking | C       | 3         |         |
| MA2001      | Mechanics of Materials                 | C       | 3         |         |
|             |  |         | <b>12</b> |         |

**YEAR 1 SPECIAL TERM**

| Course Code | Course Title                                 | Type    | AU       | Remarks |
|-------------|--|---------|----------|---------|
| CY2003      | Research Attachment 3 (Making and Tinkering) | CNYSP-C | 4        |         |
|             | Overseas Learning Trip                       |         |          |         |
|             |  |         | <b>4</b> |         |

**YEAR 2 SEMESTER 1**

| Course Code | Course Title                                    | Type    | AU        | Remarks   |
|-------------|---|---------|-----------|---|
| CY0001      | Writing Across The Disciplines                  | CNYSP-C | 3         |   |
| MA5915      | Undergraduate Research                          | BDE     | IP        | Course will be registered in Semester 2. Grades will be recorded at the end of Semester 2 |
| MA2002      | Theory of Mechanism                             | C       | 3         |   |
| MA2003      | Intro to Thermo-fluids                          | C       | 3         |   |
| MA2024      | Engineering Materials & Manufacturing Processes | C       | 3         |   |
| MA2006^     | Engineering Mathematics                         | C       | 3         | <b>CY1602 - waiver of pre-requisite required</b>  |
| SP0061      | Science & Technology for Humanity               | CC      | 3         |   |
|             | Tech-For-Good (T4G)                             | CSL     | <b>3</b>  |   |
|             |   |         | <b>21</b> |   |

**YEAR 2 SEMESTER 2**

| Course Code | Course Title   | Type    | AU        | Remarks  |
|-------------|--|---------|-----------|--|
| CY0002      | Ethics   | CNYSP-C | 3         |  |
| MA5915      | Undergraduate Research                                   | BDE     | 4         | 2-semester long, course registered only in Sem 2 |
| MA2005      | Engineering Graphics                                     | C       | 3         |  |
| MA2071      | Laboratory Experiments                                   | C       | 1         |  |
| MA2079      | Engineering Innovation and Design                        | C       | 2         | Semester 2 with 1 week in Special Term           |
| MH1403      | Algorithms and Computing                                 | BDE     | 3         | <b>MA1008</b>                                    |
| CC0006      | Sustainability: Society, Economy & Environment           | CC      | 3         |  |
| ML0004      | Career Design & Workplace Readiness in the V.U.C.A World | CC      | 2         | <b>AY27 cohort to read in Year 1 Semester 2</b>  |
|             |  |         | <b>21</b> |  |

**YEAR 3 SEMESTER 1**

| Course Code | Course Title                                    | Type | AU | Remarks  |
|-------------|---|------|----|--|
| MA2007      | Thermodynamics                                  | C    | 3  | <b>MA2003</b>                                    |
| MA2009      | Introduction to Electrical & Electronic Devices | C    | 3  |  |
| MA3001      | Machine Element Design                          | C    | 3  | <b>Having read MA2001, MA2002 and MA2005</b>     |
| MA3002      | Solid Mechanics and Vibration                   | C    | 3  | <b>MA2001</b>                                    |
| MA3004      | Mathematical Methods in Engineering             | C    | 3  | <b>CY1602 - waiver of pre-requisite required</b> |
| MA3071      | Engineering Experiments (ME)                    | C    | 1  |  |

|         |                        |     |    |  |
|---------|------------------------|-----|----|--|
| MA4849^ | Operations Research    | MPE | 3  |  |
| MLXXX   | Profession Preparation | PS  | 1  |  |
|         |                        |     | 20 |  |

#### YEAR 3 SEMESTER 2

| Course Code | Course Title   | Type | AU | Remarks                 |
|-------------|--|------|----|-------------------------|
| MA3003      | Heat Transfer  | C    | 3  | MA2007                  |
| MA3005      | Control Theory   | C    | 3  | Having read MA2006      |
| MA3006      | Fluid Mechanics  | C    | 3  |                         |
| MA0218      | Introduction to Data Science and Artificial Intelligence | PS   | 3  |                         |
| MA4829^     | Machine Intelligence                                     | MPE  | 3  | Second major elective 1 |
| SC2207      | Introduction to Database                                 | BDE  | 3  |                         |
|             |  |      | 18 |                         |

#### YEAR 3 SPECIAL TERM

| Course Code | Course Title            | Type | AU | Remarks |
|-------------|-------------------------|------|----|---------|
| MA3910      | Professional Attachment | PS   | 5  |         |
|             |                         |      | 5  |         |

#### YEAR 4 SEMESTER 1

| Course Code | Course Title              | Type | AU | Remarks            |
|-------------|---------------------------|------|----|--------------------|
| MA4001      | Engineering Design        | C    | 4  | Having read MA3001 |
| MA4002      | Fluid Dynamics            | C    | 3  | MA3006             |
|             | Second major elective 2   | BDE  | 3  |                    |
|             | Second major elective 3   | BDE  | 3  |                    |
| SC4020      | Data Analytics and Mining | BDE  | 3  | MH1403             |
| SC4024      | Data Visualization        | BDE  | 3  | MA1008, MA4849     |
|             |                           |      | 19 |                    |

#### YEAR 4 SEMESTER 2

| Course Code | Course Title                      | Type | AU  | Remarks         |
|-------------|-----------------------------------|------|-----|-----------------|
| MA4211      | CNYSP Overseas Final Year Project | C    | 8   | Year 4 standing |
|             |                                   |      | 8   |                 |
|             | Total AUs for Graduation:         |      | 148 |                 |

<sup>^</sup> These courses are double-counted towards both ME Mainstream as well as the Second Major in Data Analytics.

#### Compulsory Courses for Second Major in Data Analytics

| Course Type | Course Code | Course Title                           | AU | Offering Sem | Pre-req         |
|-------------|-------------|--|----|--------------|-----------------|
| MPE         | MA4849      | Operations Research                    | 3  | 1            | -               |
| Core        | MA2006      | Engineering Mathematics                | 3  | 1 & 2        | CY1602          |
| Core        | MA1008      | Introduction to Computational Thinking | 3  | 2            | -               |
| BDE         | MH1403      | Algorithms and Computing               | 3  | 2            | MA1008          |
| BDE         | SC2207      | Introduction to Database               | 3  | 1 & 2        | MH1403          |
| BDE         | SC4020      | Data Analytics and Mining              | 3  | 1            | MH1403          |
| BDE         | SC4024      | Data Visualization                     | 3  | 1            | MA1008 & MA4849 |

#### Suggested Electives for Second Major in Data Analytics

| Course Type | Course Code | Course Title                               | AU | Offering Sem | Pre-req |
|-------------|-------------|--|----|--------------|---------|
| MPE         | MA4829      | Machine Intelligence                       | 3  | 2            | -       |
| BDE         | MA4830      | Real Time Software for Mechatronics System | 3  | 1            | -       |
| BDE         | MA4832      | Microprocessor System                      | 3  | 1            | -       |