

**CURRICULUM FOR BACHELOR OF ENGINEERING (BIOENGINEERING)  
WITH CN YANG SCHOLARS PROGRAMME  
SECOND MAJOR IN SUSTAINABILITY (BESN)  
(FIRST YEAR ADMISSION)  
AY2026 Intake Onwards**

| SUMMARY OF ACADEMIC UNIT REQUIREMENT |                    |               |           |                                      |                     |                    |           |                |
|--------------------------------------|--------------------|---------------|-----------|--------------------------------------|---------------------|--------------------|-----------|----------------|
| Year of Study                        | Major Requirements |               |           | Interdisciplinary Collaborative Core |                     |                    | BDE       | Total AU       |
|                                      | School Core        | CNYS-PCore    | MPE       | CC                                   | Professional Series | Care, Serve, Learn |           |                |
| 1                                    | 6 [2]              | 27 [3]        | 0         | 7                                    | 0                   | 0                  | 3         | 43 [5]         |
| 2                                    | 27                 | 6             | 0         | 3                                    | 0                   | 3                  | 4         | 43             |
| 3                                    | 21                 | 0             | 0         | 0                                    | 6                   | 0                  | 6         | 33             |
| 4                                    | 3                  | 0             | 12        | 0                                    | 3                   | 0                  | 16        | 34             |
| <b>Total</b>                         | <b>57 [2]</b>      | <b>33 [3]</b> | <b>12</b> | <b>10</b>                            | <b>9</b>            | <b>3</b>           | <b>29</b> | <b>153 [5]</b> |

[ ] AU of courses that could be used to fulfil Core requirement and second major requirement concurrently

| YEAR 1 SEMESTER 1 |                                                     |          |           |                       |
|-------------------|-----------------------------------------------------|----------|-----------|-----------------------|
| Course Code       | Course Title                                        | Type     | AU        | Pre-Requisite/Remarks |
| CY1001            | The Systems Architecture of Life                    | CNY-Core | 3         | CNYS-PCourses         |
| CY1101            | Molecule                                            | CNY-Core | 4         |                       |
| CY1308            | Physics                                             | CNY-Core | 3         |                       |
| CY1601            | Mathematics I                                       | CNY-Core | 4         |                       |
| CB1102            | Introduction to Chemical and Biomedical Engineering | C        | 1         |                       |
| BG1141            | Cellular & Molecular Biology for Bioengineers       | C        | 3         |                       |
| CC0015            | Health & Wellbeing                                  | CC       | 2         |                       |
|                   |                                                     |          | <b>20</b> |                       |

| YEAR 1 SEMESTER 2 |                                                          |          |           |                                                                         |
|-------------------|----------------------------------------------------------|----------|-----------|-------------------------------------------------------------------------|
| Course Code       | Course Title                                             | Type     | AU        | Pre-Requisite/Remarks                                                   |
| CY1007^           | Climate Change                                           | CNY-Core | 3         | Double-counted as Planet Core                                           |
| CY1500            | Introduction to Research                                 | CNY-Core | 2         | CNYS-PCourse                                                            |
| CY1602            | Mathematics II                                           | CNY-Core | 4         |                                                                         |
| EG1001^           | Engineers in Society                                     | C        | 2         | Double-counted as Practice Core                                         |
| ML0004            | Career Design & Workplace Readiness in the V.U.C.A World | CC       | 2         |                                                                         |
| NH0007            | Critical Perspectives on Technology and Society          | CC       | 3         |                                                                         |
| XXXXXX            | SN Compulsory 3                                          | BDE      | 3         | <a href="#">Please see attached list of core courses to choose from</a> |
|                   |                                                          |          | <b>19</b> |                                                                         |

| YEAR 1 SPECIAL SEMESTER |                        |          |          |                       |
|-------------------------|------------------------|----------|----------|-----------------------|
| Course Code             | Course Title           | Type     | AU       | Pre-Requisite/Remarks |
| CY2003                  | Research Attachment 3  | CNY-Core | 4        | CNYS-PCourse          |
|                         | Overseas Learning Trip |          |          |                       |
|                         |                        |          | <b>4</b> |                       |

| YEAR 2 SEMESTER 1 |                                        |          |           |                                                                                           |
|-------------------|----------------------------------------|----------|-----------|-------------------------------------------------------------------------------------------|
| Course Code       | Course Title                           | Type     | AU        | Pre-Requisite/Remarks                                                                     |
| CY0001            | Language & Logic                       | CNY-Core | 3         | CNYS-PCourse                                                                              |
| CB5915            | Undergraduate Research                 | BDE      | IP        | Course will be registered in Semester 2. Grades will be recorded at the end of Semester 2 |
| BG2119            | Anatomy and Physiology                 | C        | 3         |                                                                                           |
| BG2131            | Biomaterials                           | C        | 3         | <b>BG1105</b>                                                                             |
| BG2142            | Biological Thermodynamics              | C        | 3         | <b>BG1103</b>                                                                             |
| BG2211            | Introduction to Computational Thinking | C        | 3         | <b>CY1601</b>                                                                             |
| BG2801            | Bioengineering Lab 2A                  | C        | 1         |                                                                                           |
| NH0001            | Tech-For-Good Service Learning         | CSL      | 3         |                                                                                           |
|                   |                                        |          | <b>19</b> |                                                                                           |

| YEAR 2 SEMESTER 2 |              |      |    |                       |
|-------------------|--------------|------|----|-----------------------|
| Course Code       | Course Title | Type | AU | Pre-Requisite/Remarks |

|        |                                                |          |           |                                                  |
|--------|------------------------------------------------|----------|-----------|--------------------------------------------------|
| CY0002 | Ethics                                         | CNY-Core | 3         | CNYSP Course                                     |
| CB5915 | Undergraduate Research                         | BDE      | 4         | 2 semester long, course registered only in Sem 2 |
| BG2103 | Signal Processing in Biosystems                | C        | 3         |                                                  |
| BG2104 | Electronics for Biomedical Engineering         | C        | 3         |                                                  |
| BG2110 | Bioelectricity                                 | C        | 3         | <b>BG1131</b>                                    |
| BG2209 | Mechanics for Bioengineers                     | C        | 3         | <b>BG1131 &amp; CB1105</b>                       |
| BG2802 | Bioengineering Lab 2B                          | C        | 1         |                                                  |
| CB2002 | Introduction to Chemical and Biological Safety | C        | 1         |                                                  |
| CC0006 | Sustainability: Society, Economy & Environment | CC       | 3         |                                                  |
|        |                                                |          | <b>24</b> |                                                  |

| YEAR 3 SEMESTER 1 |                            |      |           |                                                                         |
|-------------------|----------------------------|------|-----------|-------------------------------------------------------------------------|
| Course Code       | Course Title               | Type | AU        | Pre-Requisite/Remarks                                                   |
| BG3102            | Control in Biosystems      | C    | 3         | <b>BG1117 &amp; CY1601</b>                                              |
| BG3104            | Biomedical Imaging         | C    | 3         |                                                                         |
| BG3105            | Biomedical Instrumentation | C    | 3         |                                                                         |
| BG3112            | Cardiovascular Engineering | C    | 3         |                                                                         |
| BG3801            | Bioengineering Lab 3       | C    | 1         |                                                                         |
| MLXXXX            | Professional Preparation   | PS   | 1         |                                                                         |
| XXXXXX            | SN Compulsory 4            | BDE  | 3         | <a href="#">Please see attached list of core courses to choose from</a> |
| XXXXXX            | SN Compulsory 5            | BDE  | 3         |                                                                         |
|                   |                            |      | <b>20</b> |                                                                         |

| YEAR 3 SEMESTER 2 |                                   |      |          |                       |
|-------------------|-----------------------------------|------|----------|-----------------------|
| Course Code       | Course Title                      | Type | AU       | Pre-Requisite/Remarks |
| BG4211            | CNYSP Overseas Final Year Project | C    | 8        |                       |
|                   |                                   |      | <b>8</b> |                       |

| YEAR 3 SPECIAL SEMESTER |                         |      |          |                       |
|-------------------------|-------------------------|------|----------|-----------------------|
| Course Code             | Course Title            | Type | AU       | Pre-Requisite/Remarks |
| BG3910                  | Professional Attachment | PS   | 5        |                       |
|                         |                         |      | <b>5</b> |                       |

| YEAR 4 SEMESTER 1 |                                                  |      |           |                                                                      |
|-------------------|--------------------------------------------------|------|-----------|----------------------------------------------------------------------|
| Course Code       | Course Title                                     | Type | AU        | Pre-Requisite/Remarks                                                |
| BG4104            | Machine Learning & Optimization for Bioengineers | C    | 3         |                                                                      |
|                   | BIE PE 1                                         | MPE  | 3         |                                                                      |
|                   | BIE PE 2                                         | MPE  | 3         |                                                                      |
|                   | SN Elective 1                                    | BDE  | 3         | <a href="#">Please see attached list of electives to choose from</a> |
|                   | SN Elective 2                                    | BDE  | 3         |                                                                      |
|                   | Second Major Interdisciplinary Project           | BDE  | 3         |                                                                      |
|                   |                                                  |      | <b>18</b> |                                                                      |

| YEAR 4 SEMESTER 2        |                                                          |      |            |                                                                      |
|--------------------------|----------------------------------------------------------|------|------------|----------------------------------------------------------------------|
| Course Code              | Course Title                                             | Type | AU         | Pre-Requisite/Remarks                                                |
| CB0494                   | Introduction to Data Science and Artificial Intelligence | PS   | 3          |                                                                      |
|                          | BIE PE 3                                                 | MPE  | 3          |                                                                      |
|                          | BIE PE 4                                                 | MPE  | 3          |                                                                      |
|                          | SN Elective 3                                            | BDE  | 3          | <a href="#">Please see attached list of electives to choose from</a> |
|                          | SN Elective 4                                            | BDE  | 4          |                                                                      |
|                          |                                                          |      | <b>16</b>  |                                                                      |
| Total AU for Graduation: |                                                          |      | <b>153</b> |                                                                      |

^ These courses are double-counted towards both BIE as well as the Second Major in Sustainability.

#### Compulsory Courses and Electives for Second Major in Sustainability

[https://www.ntu.edu.sg/ase/admissions/undergraduate-programmes/second-major-in-sustainability#Content\\_C002\\_Col00](https://www.ntu.edu.sg/ase/admissions/undergraduate-programmes/second-major-in-sustainability#Content_C002_Col00)