

**Bachelor of Engineering (Industrial & Systems Engineering)  
with Second Major in Innovation & Design**

**Cohort AY2026/2027**

| Course Requirements                                                                                                                  | Units      |
|--------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Common Curriculum</b>                                                                                                             |            |
| CS1010E Programming Methodology (or other variants) <sup>1</sup>                                                                     | 4          |
| CDE2501 Sustainable Systems for Liveable Cities <sup>1</sup>                                                                         | 4          |
| ES2631 Critique and Communication of Thinking and Design <sup>1</sup>                                                                | 4          |
| GE: Cultures and Connections <sup>1</sup>                                                                                            | 4          |
| GE: Communities and Engagement <sup>1</sup>                                                                                          | 4          |
| DTK1234 Design Thinking                                                                                                              | 4          |
| EE2211 Introduction to Machine Learning<br>or EE2213 Introduction to Artificial Intelligence                                         | 4          |
| EG1311 Design and Make or EG1311BE Design and Make                                                                                   | 4          |
| PF1101A Project Management and Finance                                                                                               | 4          |
| <b>Sub-total for Common Curriculum</b>                                                                                               | <b>56</b>  |
| <b>Engineering Core</b>                                                                                                              |            |
| MA1511 Engineering Calculus                                                                                                          | 2          |
| MA1512 Differential Equations for Engineering                                                                                        | 2          |
| MA1508E Linear Algebra for Engineering                                                                                               | 4          |
| EG2401A Engineering Professionalism                                                                                                  | 2          |
| EG3611A Industrial Attachment or<br>CFG2101 NUS Vacation Internship Programme <sup>2</sup> and EG3612 Vacation Industrial Attachment | 10         |
| <b>Sub-total for Engineering Core</b>                                                                                                | <b>20</b>  |
| <b>Engineering Programme Requirements</b>                                                                                            |            |
| IE1111R Industrial & Systems Engrg Principles & Practice I <sup>3</sup>                                                              | 4          |
| IE2111 Industrial & Systems Engrg Principles & Practice II                                                                           | 4          |
| IE2100 Probability Models with Applications                                                                                          | 4          |
| IE2110 Operations Research I                                                                                                         | 4          |
| IE2141 Systems Thinking and Dynamics                                                                                                 | 4          |
| IE3101 Statistics for Engineering Applications                                                                                       | 4          |
| IE3110R Simulation                                                                                                                   | 4          |
| CS2040DE Data Structures and Algorithms                                                                                              | 4          |
| ST2334 Probability and Statistics                                                                                                    | 4          |
| Technical electives                                                                                                                  | 16         |
| CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up<br>(over 2 consecutive semesters) <sup>4</sup>                    | 8          |
| <b>Sub-total for Engineering Programme Requirements</b>                                                                              | <b>60</b>  |
| <b>Unrestricted Electives</b>                                                                                                        |            |
| CDE3301 Ideas to Proof-of-Concept (over 2 consecutive semesters)                                                                     | 12         |
| CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up<br>(over 2 consecutive semesters) <sup>4</sup>                    | 4          |
| Electives for Second Major <sup>5</sup>                                                                                              | 16         |
| Other unrestricted electives                                                                                                         | 12         |
| <b>Sub-total for Unrestricted Electives</b>                                                                                          | <b>44</b>  |
| <b>Total</b>                                                                                                                         | <b>160</b> |

**NUS Innovation & Design Programme**  
**College of Design and Engineering**

Notes:

- <sup>1</sup> Students may read equivalent courses in NUS College (NUSC), University Town College Programme (UTCP), and Ridge View Residential Programme (RVRC). CDE2501 fulfils GE: Singapore Studies while ES2631 fulfils GE: Critique and Expression.
- <sup>2</sup> May be replaced by CDE2605 Undergraduate Research Opportunities Programme or CDE2605R Undergraduate Research Experience (UREx).
- <sup>3</sup> Students who complete IE1111R do not need to take other courses to fulfil GE: Data Literacy.
- <sup>4</sup> The 12 units for CDE4301/CDE4301A are counted towards 8 units for Integrated Project while 4 units are counted as unrestricted elective.
- <sup>5</sup> Students should clear at least one elective course from List I prior to CDE3301. Students in competition teams may enrol in CDE3301C Complex Systems Design: From Mission to Prototype in Semester 3 to Semester 4 (Year 2) or Semester 5 to Semester 6 (Year 3).

**Sample study plan – JC-intake students or equivalent**  
(for students who opt for vacation internships)

| Semester 1                                                 | Units     | Semester 2                                                 | Units     |
|------------------------------------------------------------|-----------|------------------------------------------------------------|-----------|
| IE1111R Industrial & Systems Engrg Principles & Practice I | 4         | IE2111 Industrial & Systems Engrg Principles & Practice II | 4         |
| CS1010E Programming Methodology                            | 4         | ST2334 Probability and Statistics                          | 4         |
| DTK1234 Design Thinking                                    | 4         | EG1311 Design and Make<br>or EG1311BE Design and Make      | 4         |
| MA1511 Engineering Calculus                                | 2         | MA1508E Linear Algebra for Engineering                     | 4         |
| MA1512 Differential Equations for Engineering              | 2         | PF1101A Project Management and Finance                     | 4         |
| GE                                                         | 4         | Elective 1 for Second Major (from List I)                  | 4         |
| <b>Sub-total</b>                                           | <b>20</b> | <b>Sub-total</b>                                           | <b>24</b> |

| Summer vacation between Semesters 2 and 3 | Units    |
|-------------------------------------------|----------|
| CFG2101 NUS Vacation Internship Programme | 4        |
| <b>Sub-total</b>                          | <b>4</b> |

| Semester 3                                | Units     | Semester 4                                                                                   | Units     |
|-------------------------------------------|-----------|----------------------------------------------------------------------------------------------|-----------|
| IE2110 Operations Research I              | 4         | IE2100 Probability Models with Applications                                                  | 4         |
| IE2141 Systems Thinking and Dynamics      | 4         | CDE2501 Sustainable Systems for Liveable Cities                                              | 4         |
| CS2040DE Data Structures and Algorithms   | 4         | EE2211 Introduction to Machine Learning<br>or EE2213 Introduction to Artificial Intelligence | 4         |
| GE                                        | 4         | ES2631 Critique and Communication of Thinking and Design                                     | 4         |
| Elective 2 for Second Major (from List I) | 4         | CDE3301 Ideas to Proof-of-Concept                                                            | 6         |
| <b>Sub-total</b>                          | <b>20</b> | <b>Sub-total</b>                                                                             | <b>22</b> |

| Summer vacation between Semesters 4 and 5 | Units    |
|-------------------------------------------|----------|
| EG3612 Vacation Internship Attachment     | 6        |
| <b>Sub-total</b>                          | <b>6</b> |

| Semester 5                                     | Units     | Semester 6 – can be used for SEP | Units     |
|------------------------------------------------|-----------|----------------------------------|-----------|
| CDE3301 Ideas to Proof-of-Concept              | 6         | Elective 3 for Second Major      | 4         |
| IE3101 Statistics for Engineering Applications | 4         | Technical Elective 2             | 4         |
| IE3110R Simulation                             | 4         | Technical Elective 3             | 4         |
| EG2401A Engineering Professionalism            | 2         | UE                               | 4         |
| Technical Elective 1                           | 4         | UE                               | 4         |
| <b>Sub-total</b>                               | <b>20</b> | <b>Sub-total</b>                 | <b>20</b> |

| Semester 7                                                            | Units     | Semester 8                                                            | Units     |
|-----------------------------------------------------------------------|-----------|-----------------------------------------------------------------------|-----------|
| CDE4301 Innovation & Design Capstone<br>or CDE4301A Ideas to Start-up | 6         | CDE4301 Innovation & Design Capstone<br>or CDE4301A Ideas to Start-up | 6         |
| Elective 4 for Second Major                                           | 4         | UE                                                                    | 4         |
| Technical Elective 4                                                  | 4         |                                                                       |           |
| <b>Sub-total</b>                                                      | <b>14</b> | <b>Sub-total</b>                                                      | <b>10</b> |

**Sample study plan – JC-intake students or equivalent**

(for students who opt for vacation internships **plus a specialisation**)

| Semester 1                                                 | Units     | Semester 2                                                 | Units     |
|------------------------------------------------------------|-----------|------------------------------------------------------------|-----------|
| IE1111R Industrial & Systems Engrg Principles & Practice I | 4         | IE2111 Industrial & Systems Engrg Principles & Practice II | 4         |
| CS1010E Programming Methodology                            | 4         | ST2334 Probability and Statistics                          | 4         |
| DTK1234 Design Thinking                                    | 4         | EG1311 Design and Make<br>or EG1311BE Design and Make      | 4         |
| MA1511 Engineering Calculus                                | 2         | MA1508E Linear Algebra for Engineering                     | 4         |
| MA1512 Differential Equations for Engineering              | 2         | PF1101A Project Management and Finance                     | 4         |
| GE                                                         | 4         | Elective 1 for Second Major (from List I)                  | 4         |
| <b>Sub-total</b>                                           | <b>20</b> | <b>Sub-total</b>                                           | <b>24</b> |

| Summer vacation between Semesters 2 and 3 | Units    |
|-------------------------------------------|----------|
| CFG2101 NUS Vacation Internship Programme | 4        |
| <b>Sub-total</b>                          | <b>4</b> |

| Semester 3                                | Units     | Semester 4                                                                                   | Units     |
|-------------------------------------------|-----------|----------------------------------------------------------------------------------------------|-----------|
| IE2110 Operations Research I              | 4         | IE2100 Probability Models with Applications                                                  | 4         |
| IE2141 Systems Thinking and Dynamics      | 4         | CDE2501 Sustainable Systems for Liveable Cities                                              | 4         |
| CS2040DE Data Structures and Algorithms   | 4         | EE2211 Introduction to Machine Learning<br>or EE2213 Introduction to Artificial Intelligence | 4         |
| GE                                        | 4         | ES2631 Critique and Communication of Thinking and Design                                     | 4         |
| Elective 2 for Second Major (from List I) | 4         | CDE3301 Ideas to Proof-of-Concept                                                            | 6         |
| <b>Sub-total</b>                          | <b>20</b> | <b>Sub-total</b>                                                                             | <b>22</b> |

| Summer vacation between Semesters 4 and 5 | Units    |
|-------------------------------------------|----------|
| EG3612 Vacation Internship Attachment     | 6        |
| <b>Sub-total</b>                          | <b>6</b> |

| Semester 5                                     | Units     | Semester 6 – can be used for SEP | Units     |
|------------------------------------------------|-----------|----------------------------------|-----------|
| CDE3301 Ideas to Proof-of-Concept              | 6         | Elective 3 for Second Major      | 4         |
| IE3101 Statistics for Engineering Applications | 4         | Specialisation course 2          | 4         |
| IE3110R Simulation                             | 4         | Specialisation course 3          | 4         |
| EG2401A Engineering Professionalism            | 2         | UE                               | 4         |
| Specialisation course 1                        | 4         | UE                               | 4         |
| <b>Sub-total</b>                               | <b>20</b> | <b>Sub-total</b>                 | <b>20</b> |

| Semester 7                                                            | Units     | Semester 8                                                            | Units     |
|-----------------------------------------------------------------------|-----------|-----------------------------------------------------------------------|-----------|
| CDE4301 Innovation & Design Capstone<br>or CDE4301A Ideas to Start-up | 6         | CDE4301 Innovation & Design Capstone<br>or CDE4301A Ideas to Start-up | 6         |
| Elective 4 for Second Major                                           | 4         | Specialisation course 5                                               | 4         |
| Specialisation course 4                                               | 4         |                                                                       |           |
| <b>Sub-total</b>                                                      | <b>14</b> | <b>Sub-total</b>                                                      | <b>10</b> |

**Sample study plan – JC-intake students or equivalent**  
(for students who opt for industrial attachment)

| Semester 1                                                 | Units     | Semester 2                                                 | Units     |
|------------------------------------------------------------|-----------|------------------------------------------------------------|-----------|
| IE1111R Industrial & Systems Engrg Principles & Practice I | 4         | IE2111 Industrial & Systems Engrg Principles & Practice II | 4         |
| CS1010E Programming Methodology                            | 4         | ST2334 Probability and Statistics                          | 4         |
| DTK1234 Design Thinking                                    | 4         | EG1311 Design and Make<br>or EG1311BE Design and Make      | 4         |
| MA1511 Engineering Calculus                                | 2         | MA1508E Linear Algebra for Engineering                     | 4         |
| MA1512 Differential Equations for Engineering              | 2         | PF1101A Project Management and Finance                     | 4         |
| GE                                                         | 4         | Elective 1 for Second Major (from List I)                  | 4         |
| <b>Sub-total</b>                                           | <b>20</b> | <b>Sub-total</b>                                           | <b>24</b> |

| Semester 3                                | Units     | Semester 4                                                                                   | Units     |
|-------------------------------------------|-----------|----------------------------------------------------------------------------------------------|-----------|
| IE2110 Operations Research I              | 4         | IE2100 Probability Models with Applications                                                  | 4         |
| IE2141 Systems Thinking and Dynamics      | 4         | CDE2501 Sustainable Systems for Liveable Cities                                              | 4         |
| CS2040DE Data Structures and Algorithms   | 4         | EE2211 Introduction to Machine Learning<br>or EE2213 Introduction to Artificial Intelligence | 4         |
| GE                                        | 4         | ES2631 Critique and Communication of Thinking and Design                                     | 4         |
| Elective 2 for Second Major (from List I) | 4         | CDE3301 Ideas to Proof-of-Concept                                                            | 6         |
| <b>Sub-total</b>                          | <b>20</b> | <b>Sub-total</b>                                                                             | <b>22</b> |

| Semester 5                                     | Units     | Semester 6                    | Units     |
|------------------------------------------------|-----------|-------------------------------|-----------|
| CDE3301 Ideas to Proof-of-Concept              | 6         | EG3611A Industrial Attachment | 10        |
| IE3101 Statistics for Engineering Applications | 4         |                               |           |
| IE3110R Simulation                             | 4         |                               |           |
| EG2401A Engineering Professionalism            | 2         |                               |           |
| Technical Elective 1                           | 4         |                               |           |
| <b>Sub-total</b>                               | <b>20</b> | <b>Sub-total</b>              | <b>10</b> |

| Semester 7                                                            | Units     | Semester 8                                                            | Units     |
|-----------------------------------------------------------------------|-----------|-----------------------------------------------------------------------|-----------|
| CDE4301 Innovation & Design Capstone<br>or CDE4301A Ideas to Start-up | 6         | CDE4301 Innovation & Design Capstone<br>or CDE4301A Ideas to Start-up | 6         |
| Elective 3 for Second Major                                           | 4         | Elective 4 for Second Major                                           | 4         |
| Technical Elective 2                                                  | 4         | Technical Elective 4                                                  | 4         |
| Technical Elective 3                                                  | 4         | UE                                                                    | 4         |
| UE                                                                    | 4         | UE                                                                    | 4         |
| <b>Sub-total</b>                                                      | <b>22</b> | <b>Sub-total</b>                                                      | <b>22</b> |

**Sample study plan – JC-intake students or equivalent**

(for students who opt for industrial attachment **plus a specialisation**)

| Semester 1                                                 | Units     | Semester 2                                                 | Units     |
|------------------------------------------------------------|-----------|------------------------------------------------------------|-----------|
| IE1111R Industrial & Systems Engrg Principles & Practice I | 4         | IE2111 Industrial & Systems Engrg Principles & Practice II | 4         |
| CS1010E Programming Methodology                            | 4         | ST2334 Probability and Statistics                          | 4         |
| DTK1234 Design Thinking                                    | 4         | EG1311 Design and Make<br>or EG1311BE Design and Make      | 4         |
| MA1511 Engineering Calculus                                | 2         | MA1508E Linear Algebra for Engineering                     | 4         |
| MA1512 Differential Equations for Engineering              | 2         | PF1101A Project Management and Finance                     | 4         |
| GE                                                         | 4         | Elective 1 for Second Major (from List I)                  | 4         |
| <b>Sub-total</b>                                           | <b>20</b> | <b>Sub-total</b>                                           | <b>24</b> |

| Semester 3                                | Units     | Semester 4                                                                                   | Units     |
|-------------------------------------------|-----------|----------------------------------------------------------------------------------------------|-----------|
| IE2110 Operations Research I              | 4         | IE2100 Probability Models with Applications                                                  | 4         |
| IE2141 Systems Thinking and Dynamics      | 4         | CDE2501 Sustainable Systems for Liveable Cities                                              | 4         |
| CS2040DE Data Structures and Algorithms   | 4         | EE2211 Introduction to Machine Learning<br>or EE2213 Introduction to Artificial Intelligence | 4         |
| GE                                        | 4         | ES2631 Critique and Communication of Thinking and Design                                     | 4         |
| Elective 2 for Second Major (from List I) | 4         | CDE3301 Ideas to Proof-of-Concept                                                            | 6         |
| <b>Sub-total</b>                          | <b>20</b> | <b>Sub-total</b>                                                                             | <b>22</b> |

| Semester 5                                     | Units     | Semester 6                    | Units     |
|------------------------------------------------|-----------|-------------------------------|-----------|
| CDE3301 Ideas to Proof-of-Concept              | 6         | EG3611A Industrial Attachment | 10        |
| IE3101 Statistics for Engineering Applications | 4         |                               |           |
| IE3110R Simulation                             | 4         |                               |           |
| EG2401A Engineering Professionalism            | 2         |                               |           |
| Specialisation course 1                        | 4         |                               |           |
| <b>Sub-total</b>                               | <b>20</b> | <b>Sub-total</b>              | <b>10</b> |

| Semester 7                                                            | Units     | Semester 8                                                            | Units     |
|-----------------------------------------------------------------------|-----------|-----------------------------------------------------------------------|-----------|
| CDE4301 Innovation & Design Capstone<br>or CDE4301A Ideas to Start-up | 6         | CDE4301 Innovation & Design Capstone<br>or CDE4301A Ideas to Start-up | 6         |
| Elective 3 for Second Major                                           | 4         | Elective 4 for Second Major                                           | 4         |
| Specialisation course 2                                               | 4         | Specialisation course 4                                               | 4         |
| Specialisation course 3                                               | 4         | Specialisation course 5                                               | 4         |
| UE                                                                    | 4         | UE                                                                    | 4         |
| <b>Sub-total</b>                                                      | <b>22</b> | <b>Sub-total</b>                                                      | <b>22</b> |

**Sample study plan – JC-intake students or equivalent**  
(for students in year-long NOC programmes)

| Semester 1                                                 | Units     | Semester 2                                                 | Units     |
|------------------------------------------------------------|-----------|------------------------------------------------------------|-----------|
| IE1111R Industrial & Systems Engrg Principles & Practice I | 4         | IE2111 Industrial & Systems Engrg Principles & Practice II | 4         |
| CS1010E Programming Methodology                            | 4         | ST2334 Probability and Statistics                          | 4         |
| DTK1234 Design Thinking                                    | 4         | EG1311 Design and Make<br>or EG1311BE Design and Make      | 4         |
| MA1511 Engineering Calculus                                | 2         | MA1508E Linear Algebra for Engineering                     | 4         |
| MA1512 Differential Equations for Engineering              | 2         | PF1101A Project Management and Finance                     | 4         |
| GE                                                         | 4         | Elective 1 for Second Major (from List I)                  | 4         |
| <b>Sub-total</b>                                           | <b>20</b> | <b>Sub-total</b>                                           | <b>24</b> |

| Semester 3                                | Units     | Semester 4                                                                                   | Units     |
|-------------------------------------------|-----------|----------------------------------------------------------------------------------------------|-----------|
| IE2110 Operations Research I              | 4         | IE2100 Probability Models with Applications                                                  | 4         |
| IE2141 Systems Thinking and Dynamics      | 4         | CDE2501 Sustainable Systems for Liveable Cities                                              | 4         |
| CS2040DE Data Structures and Algorithms   | 4         | EE2211 Introduction to Machine Learning<br>or EE2213 Introduction to Artificial Intelligence | 4         |
| GE                                        | 4         | ES2631 Critique and Communication of Thinking and Design                                     | 4         |
| Elective 2 for Second Major (from List I) | 4         | CDE3301 Ideas to Proof-of-Concept                                                            | 6         |
| <b>Sub-total</b>                          | <b>20</b> | <b>Sub-total</b>                                                                             | <b>22</b> |

| Semester 5                                     | Units     | Semester 6 – NOC | Units     |
|------------------------------------------------|-----------|------------------|-----------|
| CDE3301 Ideas to Proof-of-Concept              | 6         | NOC              |           |
| IE3101 Statistics for Engineering Applications | 4         |                  |           |
| IE3110R Simulation                             | 4         |                  |           |
| Technical Elective 1                           | 4         |                  |           |
| <b>Sub-total</b>                               | <b>18</b> | <b>Sub-total</b> | <b>20</b> |

| Semester 7 – NOC | Units     | Semester 8           | Units     |
|------------------|-----------|----------------------|-----------|
| NOC              |           | Technical Elective 2 | 4         |
|                  |           | Technical Elective 3 | 4         |
|                  |           | Technical Elective 4 | 4         |
|                  |           | UE                   | 4         |
| <b>Sub-total</b> | <b>20</b> | <b>Sub-total</b>     | <b>16</b> |

A year-long NOC programme comprises the following courses (up to 40 units):

- ETP3206L Innovation & Enterprise Internship (16 units) – replaces EG3611A (10 units), EG2401A (2 units), and UE (4 units)
- ETP3202L Innovation & Enterprise Case Study & Analysis (8 units) – replaces CDE4301A (8 units out of 12 units)
- ETP3203L Innovation & Enterprise Internship Practicum (8 units) – replaces CDE4301A (4 units out of 12 units) and UE (4 units)
- Entrepreneurship courses (up to 8 units) – replaces Electives 3 and 4 for Second Major (students will need to complete Electives 3 and/or 4 for Second Major in NUS if they are unable to complete 8 units of entrepreneurship courses during NOC)

**Sample study plan – JC-intake students or equivalent**  
(for students in one-semester NOC programmes)

| Semester 1                                                 | Units     | Semester 2                                                 | Units     |
|------------------------------------------------------------|-----------|------------------------------------------------------------|-----------|
| IE1111R Industrial & Systems Engrg Principles & Practice I | 4         | IE2111 Industrial & Systems Engrg Principles & Practice II | 4         |
| CS1010E Programming Methodology                            | 4         | ST2334 Probability and Statistics                          | 4         |
| DTK1234 Design Thinking                                    | 4         | EG1311 Design and Make<br>or EG1311BE Design and Make      | 4         |
| MA1511 Engineering Calculus                                | 2         | MA1508E Linear Algebra for Engineering                     | 4         |
| MA1512 Differential Equations for Engineering              | 2         | PF1101A Project Management and Finance                     | 4         |
| GE                                                         | 4         | Elective 1 for Second Major (from List I)                  | 4         |
| <b>Sub-total</b>                                           | <b>20</b> | <b>Sub-total</b>                                           | <b>24</b> |

| Semester 3                                | Units     | Semester 4                                                                                   | Units     |
|-------------------------------------------|-----------|----------------------------------------------------------------------------------------------|-----------|
| IE2110 Operations Research I              | 4         | IE2100 Probability Models with Applications                                                  | 4         |
| IE2141 Systems Thinking and Dynamics      | 4         | CDE2501 Sustainable Systems for Liveable Cities                                              | 4         |
| CS2040DE Data Structures and Algorithms   | 4         | EE2211 Introduction to Machine Learning<br>or EE2213 Introduction to Artificial Intelligence | 4         |
| GE                                        | 4         | ES2631 Critique and Communication of Thinking and Design                                     | 4         |
| Elective 2 for Second Major (from List I) | 4         | CDE3301 Ideas to Proof-of-Concept                                                            | 6         |
| <b>Sub-total</b>                          | <b>20</b> | <b>Sub-total</b>                                                                             | <b>22</b> |

| Semester 5                                     | Units     | Semester 6 – NOC | Units     |
|------------------------------------------------|-----------|------------------|-----------|
| CDE3301 Ideas to Proof-of-Concept              | 6         | NOC              |           |
| IE3101 Statistics for Engineering Applications | 4         |                  |           |
| IE3110R Simulation                             | 4         |                  |           |
| Technical Elective 1                           | 4         |                  |           |
| <b>Sub-total</b>                               | <b>18</b> | <b>Sub-total</b> | <b>20</b> |

| Semester 7                                                            | Units     | Semester 8                                                            | Units     |
|-----------------------------------------------------------------------|-----------|-----------------------------------------------------------------------|-----------|
| CDE4301 Innovation & Design Capstone<br>or CDE4301A Ideas to Start-up | 6         | CDE4301 Innovation & Design Capstone<br>or CDE4301A Ideas to Start-up | 6         |
| Technical Elective 2                                                  | 4         | Technical Elective 4                                                  | 4         |
| Technical Elective 3                                                  | 4         | UE                                                                    | 4         |
| UE                                                                    | 4         | UE                                                                    | 4         |
| <b>Sub-total</b>                                                      | <b>18</b> | <b>Sub-total</b>                                                      | <b>18</b> |

A one-semester NOC programme comprises the following courses (up to 20 units):

- ETP3201S Innovation & Enterprise Internship (12 units) – replaces EG3611A (10 units) and EG2401A (2 units)
- ETP3204S Innovation & Enterprise Internship Practicum (Short) (4 units) – replaces Elective 3 for Second Major (4 units)
- Entrepreneurship course (4 units) – replaces Elective 4 for Second Major (4 units)

**Sample study plan – JC-intake students or equivalent**

(for students in Engineering Scholars Programme who plan to go for SEP)

| Semester 1                                                 | Units     | Semester 2                                                 | Units     |
|------------------------------------------------------------|-----------|------------------------------------------------------------|-----------|
| IE1111R Industrial & Systems Engrg Principles & Practice I | 4         | IE2111 Industrial & Systems Engrg Principles & Practice II | 4         |
| DTK1234 Design Thinking                                    | 4         | IE2100 Probability Models with Applications                | 4         |
| MA1512 Differential Equations for Engineering              | 2         | ST2334 Probability and Statistics                          | 4         |
| RVRC/UTCP course 1 (replaces GE)                           | 4         | PF1101A Project Management and Finance                     | 4         |
| Elective 1 for Second Major (from List I)                  | 4         | RVRC/UTCP course 2 (replaces GE)                           | 4         |
| UE                                                         | 4         | CDE3301 Ideas to Proof-of-Concept                          | 6         |
| <b>Sub-total</b>                                           | <b>22</b> | <b>Sub-total</b>                                           | <b>26</b> |

| Summer vacation between Semesters 2 and 3 | Units    |
|-------------------------------------------|----------|
| CFG2101 NUS Vacation Internship Programme | 4        |
| <b>Sub-total</b>                          | <b>4</b> |

| Semester 3                                | Units     | Semester 4 – can be used for SEP                                                          | Units     |
|-------------------------------------------|-----------|-------------------------------------------------------------------------------------------|-----------|
| IE2110 Operations Research I              | 4         | EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence | 4         |
| IE2141 Systems Thinking and Dynamics      | 4         | RVRC/UTCP course 4 (replaces ES2631)                                                      | 4         |
| CS2040DE Data Structures and Algorithms   | 4         | Elective 3 for Second Major                                                               | 4         |
| RVRC/UTCP course 3 (replaces CDE2501)     | 4         | Elective 4 for Second Major                                                               | 4         |
| Elective 2 for Second Major (from List I) | 4         | UE                                                                                        | 4         |
| CDE3301 Ideas to Proof-of-Concept         | 6         |                                                                                           |           |
| <b>Sub-total</b>                          | <b>26</b> | <b>Sub-total</b>                                                                          | <b>20</b> |

| Summer vacation between Semesters 4 and 5 | Units    |
|-------------------------------------------|----------|
| EG3612 Vacation Internship Attachment     | 6        |
| <b>Sub-total</b>                          | <b>6</b> |

| Semester 5                                                         | Units     | Semester 6                                                         | Units     |
|--------------------------------------------------------------------|-----------|--------------------------------------------------------------------|-----------|
| CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up | 6         | CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up | 6         |
| IE3101 Statistics for Engineering Applications                     | 4         | Technical Elective 2                                               | 4         |
| IE3110R Simulation                                                 | 4         | Technical Elective 3                                               | 4         |
| Technical Elective 1                                               | 4         | Technical Elective 4                                               | 4         |
| EG2401A Engineering Professionalism                                | 2         | UE                                                                 | 2         |
| <b>Sub-total</b>                                                   | <b>20</b> | <b>Sub-total</b>                                                   | <b>20</b> |

Students are highly encouraged to complete the following courses before Semester 1 through advanced placement credits:

- CS1010E Programming Methodology (4 units)
- EG1311 Design and Make (4 units)
- MA1505 Mathematics I (4 units) – replaces MA1511 Engineering Calculus (2 units) and counted as UE (2 units)
- MA2001 Linear Algebra (4 units) – replaces MA1508E Linear Algebra for Engineering (4 units)

**Sample study plan – JC-intake students or equivalent**

(for students in Engineering Scholars Programme who plan to go for one-semester NOC programmes)

| Semester 1                                                 | Units     | Semester 2                                                 | Units     |
|------------------------------------------------------------|-----------|------------------------------------------------------------|-----------|
| IE1111R Industrial & Systems Engrg Principles & Practice I | 4         | IE2111 Industrial & Systems Engrg Principles & Practice II | 4         |
| DTK1234 Design Thinking                                    | 4         | IE2100 Probability Models with Applications                | 4         |
| MA1512 Differential Equations for Engineering              | 2         | ST2334 Probability and Statistics                          | 4         |
| RVRC/UTCP course 1 (replaces GE)                           | 4         | PF1101A Project Management and Finance                     | 4         |
| Elective 1 for Second Major (from List I)                  | 4         | RVRC/UTCP course 2 (replaces GE)                           | 4         |
| UE                                                         | 4         | CDE3301 Ideas to Proof-of-Concept                          | 6         |
| <b>Sub-total</b>                                           | <b>22</b> | <b>Sub-total</b>                                           | <b>26</b> |

| Semester 3                                | Units     | Semester 4 – NOC | Units     |
|-------------------------------------------|-----------|------------------|-----------|
| IE2110 Operations Research I              | 4         | NOC              |           |
| IE2141 Systems Thinking and Dynamics      | 4         |                  |           |
| CS2040DE Data Structures and Algorithms   | 4         |                  |           |
| RVRC/UTCP course 3 (replaces CDE2501)     | 4         |                  |           |
| Elective 2 for Second Major (from List I) | 4         |                  |           |
| CDE3301 Ideas to Proof-of-Concept         | 6         |                  |           |
| <b>Sub-total</b>                          | <b>26</b> | <b>Sub-total</b> | <b>20</b> |

| Semester 5                                                                                | Units     | Semester 6                                                         | Units     |
|-------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------|-----------|
| CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up                        | 6         | CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up | 6         |
| IE3101 Statistics for Engineering Applications                                            | 4         | Technical Elective 2                                               | 4         |
| IE3110R Simulation                                                                        | 4         | Technical Elective 3                                               | 4         |
| Technical Elective 1                                                                      | 4         | Technical Elective 4                                               | 4         |
| EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence | 4         | UE                                                                 | 4         |
| RVRC/UTCP course 4 (replaces ES2631)                                                      | 4         | UE                                                                 | 2         |
| <b>Sub-total</b>                                                                          | <b>26</b> | <b>Sub-total</b>                                                   | <b>24</b> |

Students are highly encouraged to complete the following courses before Semester 1 through advanced placement credits:

- CS1010E Programming Methodology (4 units)
- EG1311 Design and Make (4 units)
- MA1505 Mathematics I (4 units) – replaces MA1511 Engineering Calculus (2 units) and counted as UE (2 units)
- MA2001 Linear Algebra (4 units) – replaces MA1508E Linear Algebra for Engineering (4 units)

A one-semester NOC programme comprises the following courses (up to 20 units):

- ETP3201S Innovation & Enterprise Internship (12 units) – replaces EG3611A (10 units) and EG2401A (2 units)
- ETP3204S Innovation & Enterprise Internship Practicum (Short) (4 units) – replaces Elective 3 for Second Major (4 units)
- Entrepreneurship course (4 units) – replaces Elective 4 for Second Major (4 units)

Sample study plan – poly-intake students

| Semester 1                                                 | Units     | Semester 2                                                 | Units     |
|------------------------------------------------------------|-----------|------------------------------------------------------------|-----------|
| IE1111R Industrial & Systems Engrg Principles & Practice I | 4         | IE2111 Industrial & Systems Engrg Principles & Practice II | 4         |
| CS1010E Programming Methodology                            | 4         | MA1511 Engineering Calculus *                              | 2         |
| MA1301 Introductory Mathematics * (UE)                     | 4         | MA1508E Linear Algebra for Engineering                     | 4         |
| PC1201 Fundamentals of Physics ^ (UE) – if required        | 4         | PF1101A Project Management and Finance                     | 4         |
| Elective 1 for Second Major (from List I)                  | 4         | Elective 2 for Second Major (from List I)                  | 4         |
|                                                            |           | CDE3301 Ideas to Proof-of-Concept                          | 6         |
| <b>Sub-total</b>                                           | <b>20</b> | <b>Sub-total</b>                                           | <b>24</b> |

| Semester 3                                      | Units     | Semester 4                                                                                | Units     |
|-------------------------------------------------|-----------|-------------------------------------------------------------------------------------------|-----------|
| IE2110 Operations Research I                    | 4         | IE2100 Probability Models with Applications                                               | 4         |
| IE2141 Systems Thinking and Dynamics            | 4         | CDE2501 Sustainable Systems for Liveable Cities                                           | 4         |
| MA1512 Differential Equations for Engineering * | 2         | EE2211 Introduction to Machine Learning or EE2213 Introduction to Artificial Intelligence | 4         |
| ST2334 Probability and Statistics               | 4         | CS2040DE Data Structures and Algorithms                                                   | 4         |
| GE                                              | 4         | ES2631 Critique and Communication of Thinking and Design                                  | 4         |
| CDE3301 Ideas to Proof-of-Concept               | 6         | GE ^                                                                                      | 4         |
| <b>Sub-total</b>                                | <b>24</b> | <b>Sub-total</b>                                                                          | <b>24</b> |

| Semester 5                                                         | Units     | Semester 6                                                         | Units     |
|--------------------------------------------------------------------|-----------|--------------------------------------------------------------------|-----------|
| CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up | 6         | CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up | 6         |
| Elective 3 for Second Major                                        | 4         | Elective 4 for Second Major                                        | 4         |
| IE3101 Statistics for Engineering Applications                     | 4         | Technical Elective 2                                               | 4         |
| IE3110R Simulation                                                 | 4         | Technical Elective 3                                               | 4         |
| EG2401A Engineering Professionalism                                | 2         | Technical Elective 4                                               | 4         |
| Technical Elective 1                                               | 4         |                                                                    |           |
| <b>Sub-total</b>                                                   | <b>24</b> | <b>Sub-total</b>                                                   | <b>22</b> |

\* Students who are exempted from MA1301 can take MA1511 and MA1512 in Semester 1.

^ Students who are exempted from PC1201 can take a GE in Semester 1.

Poly-intake students with accredited diplomas will receive the following exemptions:

- DTK1234 Design Thinking (4 units)
- EG1311 Design and Make (4 units)
- EG3611P Industrial Attachment (10 units)
- Unrestricted electives (20 units)