NUS Innovation & Design Programme
College of Design and Engineering

Bachelor of Computing (Artificial Intelligence) with Second Major in Innovation & Design

Cohort AY2025/2026

Course Requirements	Units
Common Curriculum	
CS1101S Programming Methodology [1]	4
ES2660 Communicating in the Information Age [1]	4
GE: Data Literacy	4
GE: Communities and Engagement [2]	4
GE: Cultures and Connections [2]	4
GE: Singapore Studies [2]	4
IS1108 Digital and AI Ethics	4
Interdisciplinary Courses [3]	8
Elective 1 for Second Major (from List I) [3] (double-counted as Cross-disciplinary Course)	4
Sub-total for Common Curriculum	**40**
Programme Requirements	
CS1231S Discrete Structures	4
CS2030S Programming Methodology II	4
CS2040S Data Structures and Algorithms	4
CS2100 Computer Organisation	4
CS2101 Effective Communication for Computing Professionals	4
CS2109S Introduction to AI and Machine Learning	4
CS2251 Optimization and Regression	4
CS3230 Design and Analysis of Algorithms	4
CS3263 Foundations of Artificial Intelligence	4
CS3264 Foundations of Machine Learning	4
CS3268 Responsible AI: from Algorithms to Impact	4
CS4243 Computer Vision and Pattern Recognition or CS4248 Natural Language Processing	4
MA1521 Calculus for Computing	4
MA1522 Linear Algebra for Computing	4
ST2334 Probability and Statistics	4
Artificial Intelligence Breadth and Depth courses [4]	20
Sub-total for Programme Requirements	**80**
Unrestricted Electives	
CDE3301 Ideas to Proof-of-Concept (over 2 consecutive semesters) [3]	12
CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up (over 2 consecutive semesters)	12
Other electives for Second Major [3]	12
Other unrestricted electives	4
Sub-total for Unrestricted Electives	**40**
Total	**160**

(updated 12 July 2025)

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Notes:

[1] Digital Literacy and Critique and Expression pillars are satisfied by CS1101S and ES2660, respectively.

[2] Students may read equivalent courses in NUS College (NUSC), University Town College Programme (UTCP), and Ridge View Residential Programme (RVRC).

[3] Students in this Second Major are highly recommended to read DTK1234 Design Thinking or EG1311 Design and Make as an Interdisciplinary Course if they are planning to read CDE2300 Product Design and Innovation or CDE2310 Fundamentals of Systems Design, respectively. DTK1234 should be read before CDE2300 and EG1311 before CDE2310.

Students should clear at least one elective course from List I prior to CDE3301.

[4] Students are required to satisfy at least 6 units of Industrial Experience Requirement. Those with GPA of 4.00 or higher may opt to replace Industry Experience Requirement with CP4101 B.Comp. Dissertation.

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Recommended semester schedule

(for students who opt for vacation internship)

Semester 1	Units	Semester 2	Units
MA1521 Calculus for Computing	4	MA1522 Linear Algebra for Computing	4
CS1101S Programming Methodology	4	CS2030S Programming Methodology II	4
CS1231S Discrete Structures	4	CS2040S Data Structures and Algorithms	4
IS1108 Digital and AI Ethics	4	CS2100 Computer Organisation	4
Interdisciplinary Course 1 *	4	Elective 1 for Second Major (from List I)	4
Sub-total	**20**	**Sub-total**	**20**

Semester 3	Units	Semester 4	Units
CS2101 Effective Communication for Computing Professionals	4	CS3263 Foundations of Artificial Intelligence	4
CS2109S Introduction to AI and Machine Learning	4	CS3264 Foundations of Machine Learning	4
ST2334 Probability and Statistics	4	ES2660 Communicating in the Information Age	4
GE	4	GE	4
Elective 2 for Second Major (from List I)	4	CDE3301 Ideas to Proof-of-Concept	6
Sub-total	**20**	**Sub-total**	**22**

Summer vacation between Semesters 4 and 5	Units
CP3200 Internship	6
Sub-total	**6**

Semester 5	Units	Semester 6 – can be used for SEP	Units
CDE3301 Ideas to Proof-of-Concept	6	Elective 3 for Second Major	4
CS2251 Optimization and Regression	4	Elective 4 for Second Major	4
CS3230 Design and Analysis of Algorithms	4	CS4243 Computer Vision and Pattern Recognition or CS4248 Natural Language Processing	4
GE	4	Interdisciplinary Course 2	4
GE	4	UE	4
Sub-total	**22**	**Sub-total**	**20**

Semester 7	Units	Semester 8	Units
CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6	CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6
CS3268 Responsible AI: from Algorithms to Impact	4	AI Breadth / Depth course 3	4
AI Breadth / Depth course 1	4	AI Breadth / Depth course 4	2
AI Breadth / Depth course 2	4		
Sub-total	**18**	**Sub-total**	**12**

* Students are highly recommended to read DTK1234 Design Thinking or EG1311 Design and Make as an Interdisciplinary Course if they are planning to read CDE2300 Product Design and Innovation or CDE2310 Fundamentals of Systems Design as Elective 1 for the Second Major (which can be double-counted as Cross-disciplinary Course).

(updated 12 July 2025)

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Recommended semester schedule

(for students who opt for full-semester internship)

Semester 1	Units	Semester 2	Units
MA1521 Calculus for Computing	4	MA1522 Linear Algebra for Computing	4
CS1101S Programming Methodology	4	CS2030S Programming Methodology II	4
CS1231S Discrete Structures	4	CS2040S Data Structures and Algorithms	4
IS1108 Digital and AI Ethics	4	CS2100 Computer Organisation	4
Interdisciplinary Course 1 *	4	Elective 1 for Second Major (from List I)	4
Sub-total	**20**	**Sub-total**	**20**

Semester 3	Units	Semester 4	Units
CS2101 Effective Communication for Computing Professionals	4	CS3263 Foundations of Artificial Intelligence	4
CS2109S Introduction to AI and Machine Learning	4	CS3264 Foundations of Machine Learning	4
ST2334 Probability and Statistics	4	ES2660 Communicating in the Information Age	4
GE	4	GE	4
Elective 2 for Second Major (from List I)	4	CDE3301 Ideas to Proof-of-Concept	6
Sub-total	**20**	**Sub-total**	**22**

Semester 5	Units	Semester 6	Units
CDE3301 Ideas to Proof-of-Concept	6	CP3880 Advanced Technology Attachment Programme ^	12
CS2251 Optimization and Regression	4		
CS3230 Design and Analysis of Algorithms	4		
GE	4		
GE	4		
Sub-total	**22**	**Sub-total**	**12**

Semester 7	Units	Semester 8	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
CS3268 Responsible AI: from Algorithms to Impact	4	AI Breadth / Depth course 1	4
CS4243 Computer Vision and Pattern Recognition or CS4248 Natural Language Processing	4	AI Breadth / Depth course 2	4
Interdisciplinary Course 2	4	UE	4
Sub-total	**22**	**Sub-total**	**22**

* Students are highly recommended to read DTK1234 Design Thinking or EG1311 Design and Make as an Interdisciplinary Course if they are planning to read CDE2300 Product Design and Innovation or CDE2310 Fundamentals of Systems Design as Elective 1 for the Second Major (which can be double-counted as Cross-disciplinary Course).

^ Students with GPA of 4.00 or higher after completing 112 units may opt to replace CP3880 with CP4101 in their final year.

(updated 12 July 2025)

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Recommended semester schedule

(for students in year-long NOC programmes)

Semester 1	Units	Semester 2	Units
MA1521 Calculus for Computing	4	MA1522 Linear Algebra for Computing	4
CS1101S Programming Methodology	4	CS2030S Programming Methodology II	4
CS1231S Discrete Structures	4	CS2040S Data Structures and Algorithms	4
IS1108 Digital and AI Ethics	4	CS2100 Computer Organisation	4
Interdisciplinary Course 1 *	4	Elective 1 for Second Major (from List I)	4
Sub-total	**20**	**Sub-total**	**20**

Semester 3	Units	Semester 4	Units
CS2101 Effective Communication for Computing Professionals	4	CS3263 Foundations of Artificial Intelligence	4
CS2109S Introduction to AI and Machine Learning	4	CS3264 Foundations of Machine Learning	4
ST2334 Probability and Statistics	4	ES2660 Communicating in the Information Age	4
GE	4	GE	4
Elective 2 for Second Major (from List I)	4	CDE3301 Ideas to Proof-of-Concept	6
Sub-total	**20**	**Sub-total**	**22**

Semester 5	Units	Semester 6 – NOC	Units
CDE3301 Ideas to Proof-of-Concept	6	NOC	
CS2251 Optimization and Regression	4		
CS3230 Design and Analysis of Algorithms	4		
CS3268 Responsible AI: from Algorithms to Impact	4		
GE	4		
Sub-total	**22**	**Sub-total**	**20**

Semester 7 - NOC	Units	Semester 8	Units
NOC		CS4243 Computer Vision and Pattern Recognition or CS4248 Natural Language Processing	4
		AI Breadth / Depth course 1	4
		AI Breadth / Depth course 2	4
		Interdisciplinary Course 2	4
		GE	4
Sub-total	**20**	**Sub-total**	**20**

* Students are highly recommended to read DTK1234 Design Thinking or EG1311 Design and Make as an Interdisciplinary Course if they are planning to read CDE2300 Product Design and Innovation or CDE2310 Fundamentals of Systems Design as Elective 1 for the Second Major (which can be double-counted as Cross-disciplinary Course).

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

- ETP3206L Innovation & Enterprise Internship (12 units) – fulfils Industrial Experience Requirement (12 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)

(updated 12 July 2025)

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Recommended semester schedule

(for students in one-semester NOC programmes)

Semester 1	Units	Semester 2	Units
MA1521 Calculus for Computing	4	MA1522 Linear Algebra for Computing	4
CS1101S Programming Methodology	4	CS2030S Programming Methodology II	4
CS1231S Discrete Structures	4	CS2040S Data Structures and Algorithms	4
IS1108 Digital and AI Ethics	4	CS2100 Computer Organisation	4
Interdisciplinary Course 1 *	4	Elective 1 for Second Major (from List I)	4
Sub-total	**20**	**Sub-total**	**20**

Semester 3	Units	Semester 4	Units
CS2101 Effective Communication for Computing Professionals	4	CS3263 Foundations of Artificial Intelligence	4
CS2109S Introduction to AI and Machine Learning	4	CS3264 Foundations of Machine Learning	4
ST2334 Probability and Statistics	4	ES2660 Communicating in the Information Age	4
GE	4	GE	4
Elective 2 for Second Major (from List I)	4	CDE3301 Ideas to Proof-of-Concept	6
Sub-total	**20**	**Sub-total**	**22**

Semester 5	Units	Semester 6 – NOC	Units
CDE3301 Ideas to Proof-of-Concept	6	NOC	
CS2251 Optimization and Regression	4		
CS3230 Design and Analysis of Algorithms	4		
GE	4		
GE	4		
Sub-total	**22**	**Sub-total**	**20**

Semester 7	Units	Semester 8	Units
CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6	CDE4301 Innovation & Design Capstone or CDE4301A Ideas to Start-up	6
CS3268 Responsible AI: from Algorithms to Impact	4	AI Breadth / Depth course 1	4
CS4243 Computer Vision and Pattern Recognition or CS4248 Natural Language Processing	4	AI Breadth / Depth course 2	4
Interdisciplinary Course 2	4	UE	4
Sub-total	**18**	**Sub-total**	**18**

* Students are highly recommended to read DTK1234 Design Thinking or EG1311 Design and Make as an Interdisciplinary Course if they are planning to read CDE2300 Product Design and Innovation or CDE2310 Fundamentals of Systems Design as Elective 1 for the Second Major (which can be double-counted as Cross-disciplinary Course).

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

- ETP3201S Innovation & Enterprise Internship (12 units) – fulfils Industrial Experience Requirement (12 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)

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