

AY2025-2026
CURRICULUM FOR COMPUTER ENGINEERING
With a Second Major in Data Analytics (DANA)

SUMMARY OF ACADEMIC UNIT REQUIREMENT

Year of Study	Major		ICC		Care, Serve, Learn	2M-DANA / BDE	Total AU
	Core	MPE	Common - Core	Professional Series			
Y1	20	0	6	3	0	2	31
Y2	30	0	8	0	3	3	44
Y3	7	3	0	12	0	6	28
Y4	8	15	0	1	0	9	33
Total	65	18	14	16	3	20	136

Recommended Course Schedule

YEAR 1 SEMESTER 1				
Course Code	Course Title	Type	AU	Pre-requisite/Remarks/Remarks
SC1013	Physics For Computing	Core	2	Nil
SC1004	Linear Algebra for Computing	Core/DANA-C	4	SC1003 (co-req) Double counted to DANA-C
EG1001	Engineers in Society	Core	2	Nil
CC0003	Ethics & Civics in a Multicultural World	C-Core	2	Nil
CC0015	Health & Wellbeing	C-Core	2	Nil
SC1003	Introduction to Computational Thinking & Programming	P-Series/DANA-C	3	Double counted to DANA-C
	Broadening and Deepening Elective	BDE	2	Refer to Class Schedule
HW0001	Introduction to Academic Communication	-	-	For student failed QET
HW0002	Calculus	-	-	For student not done Calculus
TOTAL			17	

YEAR 1 SEMESTER 2				
Course Code	Course Title	Type	AU	Pre-requisite/Remarks/Remarks
SC1005	Digital Logic	Core	3	Nil
SC1007	Data Structures & Algorithms	Core/DANA-C	3	SC1003 / Double counted to DANA-C
SC1008	C and C++ Programming	Core	3	SC1003
MH1812	Discrete Mathematics	Core	3	Nil
CC0001	Inquiry & Communication in an Interdisciplinary World	C-Core	2	Nil
TOTAL			14	
Year 1 Total AU			31	

YEAR 2 SEMESTER 1				
Course Code	Course Title	Type	AU	Pre-requisite/Remarks/Remarks
SC1006	Computer Organisation & Architecture	Core	3	SC1005 (co-req)
SC2000	Probability & Statistics for Computing	Core/DANA-C	3	Double counted to DANA-C
SC2001	Algorithm Design & Analysis	Core	3	SC1007 & MH1812
SC2002	Object Oriented Design & Programming	Core	3	SC1003 OR SC1007
SC2103	Digital Systems Design	Core	3	SC1005
SC2207	Introduction to Databases	DANA-C (BDE)	3	SC2001 (co-req)
ML0004	Career Design & Workplace Readiness in the V.U.C.A World	C-Core	2	Nil
CC0007	Science & Technology for Humanity	C-Core	3	Nil
TOTAL			23	

YEAR 2 SEMESTER 2				
Course Code	Course Title	Type	AU	Pre-requisite/Remarks/Remarks
SC2005	Operating Systems	Core	3	SC1006 & SC1007
SC2006	Software Engineering	Core	3	SC2002 (co-req)
SC2008	Computer Network	Core	3	SC2000 & SC1004
SC2104	Sensors, Interfacing & Digital Control	Core	3	SC1006
SC3102	Signals, Systems and Transforms	Core	3	SC1004
CC0006	Sustainability: Society, Economy & Environment	C-Core	3	Nil
CSL	CSL (service learning course) - Part 1	CSL	3	(Continue in Y3S1)
TOTAL			21	
Year 2 Total AU			44	

YEAR 3 SEMESTER 1				
Course Code	Course Title	Type	AU	Pre-requisite/Remarks/Remarks
SC2107	Microprocessor System Design and Development	Core	3	SC1006
SC2079	Multidisciplinary Design Project	Core	4	Year 3 Standing
HW0288	Engineering Communication	P-Series	2	CC0001 & Year 3 standing
SC3xxx/SC4xxx	Major Prescribe Elective (Choose within SC3xxx/SC4xxx)	MPE-1	3	Refer to MPE listing
	Data Analytics Elective 1	DANA-E (BDE)	3	Refer to the Electives List
	Data Analytics Elective 2	DANA-E (BDE)	3	Refer to the Electives List
CSL	CSL (service learning course) - Part 2	CSL	-	(Continue from Y2S2)
TOTAL			18	

YEAR 3 SEMESTER 2				
Course Code	Course Title	Type	AU	Pre-requisite/Remarks/Remarks
SC3920	Professional Internship (Graded)	P-Series	10	Year 3 Standing
TOTAL			10	
Year 3 Total AU			28	

YEAR 4 SEMESTER 1				
Course Code	Course Title	Type	AU	Pre-requisite/Remarks/Remarks
SC4079	Final Year Project (Part 1)	Core	4	Year 4 Standing
SC3xxx/SC4xxx	Major Prescribe Elective (Choose within SC3xxx/SC4xxx)	MPE-2	3	Refer to MPE listing
SC4xxx	Major Prescribe Elective (Choose within SC4xxx)	MPE-3	3	Year 3 Standing
SC4xxx	Major Prescribe Elective (Choose within SC4xxx)	MPE-4	3	Year 3 Standing
ML0015	Profession Preparation	P-Series	1	Nil
SC4020	Data Analytics and Mining	DANA-C (BDE)	3	Data Mining
TOTAL			17	

YEAR 4 SEMESTER 2				
Course Code	Course Title	Type	AU	Pre-requisite/Remarks/Remarks
SC4079	Final Year Project (Part 2)	Core	4	Year 4 Standing
SC4xxx	Major Prescribe Elective (Choose within SC3xxx/SC4xxx)	MPE-5	3	Year 3 Standing
SC4xxx	Major Prescribe Elective (Choose within SC3xxx/SC4xxx)	MPE-6	3	Year 3 Standing
**SC4024 / SC4023	Big Data Management / Data Visualisation	DANA-C (BDE)	3	Data Visualisation / Management
	Data Analytics Elective 3	DANA-E	3	Refer to the Electives List
TOTAL			16	
Year 4 Total AU			33	
Grand Total (Year 1 to 4)			136	

Important Note:

- Students are required to complete 6 Major Prescribed Electives (MPE) courses, of which at least 4 must be at the SC4xxx level.
- In order to graduate with Highest Distinction, students must achieve minimum CGPA of 4.5 and at least a 'B+' grade for the Final Year Project.

MPE Structure of Computer Engineering (U24 and after)			
Course Code	Type	AU	Remarks
SC3xxx/SC4xxx	MPE-1	3	Any MPE
SC3xxx/SC4xxx	MPE-2	3	Any MPE
SC4xxx	MPE-3	3	Choose within SC4xxx
SC4xxx	MPE-4	3	Choose within SC4xxx
SC4xxx	MPE-5	3	Choose within SC4xxx
SC4xxx	MPE-6	3	Choose within SC4xxx
	Total	18	

Please refer to the CE MPE Courses and Elective Focus Areas on CCDS website.

Data Analytics Course Listing				
Course Code	Course Title	Type	AU	Knowledge Area
SC1003	Introduction to Computational Thinking & Programming	F-Core/DANA-C	3	Data Analysis / Computing
SC1004	Linear Algebra for Computing	Core/DANA-C	*4	Linear Algebra
SC1007	Data Structures & Algorithms	Core/DANA-C	3	Algorithms
SC2000	Probability & Statistics for Computing	Core/DANA-C	3	Probability and Statistics
SC2207	Introduction to Databases	DANA-C	3	Database
SC4020	Data Analytics and Mining	DANA-C	3	Data Mining
**SC4024 / SC4023	Big Data Management / Data Visualisation	DANA-C	3	Data Visualisation / Management
	Data Analytics Elective 1	DANA-E	3	Refer to the Electives List
	Data Analytics Elective 2	DANA-E	3	Refer to the Electives List
	Data Analytics Elective 3	DANA-E	3	Refer to the Electives List
TOTAL			30	
Please Refer to the Second Major in Data Analytics website for Data Analytics Course Listing: https://www.ntu.edu.sg/engineering/admissions/ug/allprogrammes/highlights/da				

*Only 3 AU will be double counted to 2nd Major in DANA

**SC4023 is only offered in Sem 2, SC4024 is only offered in Sem 1

List of Electives for Second Major in Data Analytics Course Listing (Choose 3 from the list below)			
Course Code	Course Title	AU	Prerequisites
SC3020	Database System Principle	3	SC2207
SC4001	Neural Network and Deep Learning	3	SC1004 & SC1007 / MH2802 & SC1007
SC4002	Natural Language Processing	3	SC2001 / MH1403
SC4021	Information Retrieval	3	SC2001 / MH1403
SC4022	Network Science	3	SC2001 / MH1403
BC2407	Analytics II: Advanced Predictive Techniques	4	SC2000 & BC2406
BS3008	Computer Aided Drug Discovery	3	BS1002 OR BS1012 OR CM1001
BS4017	High-Throughput Bioinformatics	3	BS1009 / PS0001 / SC1003
CB4246	Optimisation Using Artificial Intelligence	3	Nil
CB4247	Statistics & Computational Inference to Big Data	3	CH2010
CH4244	Numerical Method & Data Analytics	3	CH2107 / BG2111 / BG2211 / BC2406 & MH2814
CM4043	Molecular Modelling: Principles and Applications	3	CM3041 / CH2108 & CH2123
CM4044	Artificial Intelligence in Chemistry	3	PS0001 & PS0002 / BS1009 & PS0002 / BS0004 & BS1009 / BS0004 & PS0001 / CB0494 & CH2107
ES2001	Computational Earth Systems Science	4	MH1800 & MH1801 / MH1100 & MH1101 / CY1201 & CY1202 / CY1601 & CY1602 / MH1802
IE4424	Machine Learning Design & Application	3	EE4483 / IE4483
IE4497	Pattern Recognition & Machine Learning	3	EE2006 / IM2006 / IE2106 / CH2010 / MH2500
MA4829	Machine Intelligence	3	MA2079
MA4830	Realtime Software for Mechatronics System	3	MA2079
MA4832	Microprocessor System	3	MA2079
MH3400	Algorithms for the Real World	4	MH1201 & MH1301 & MH1402 & MH2500 / MH1201 & MH1301 & MH1403 & MH2500 / MH1301 & MH1403 & MH2500 & MH2802
MH3500	Statistics	4	MH2500
MH3510	Regression Analysis	4	MH2500 & MH3500
MH3511	Data Analysis with Computer	3	MH2500 & BS1008
MH3701	Basic Optimization	4	MH1201 / MH2800 / MH2802
MH4302	Theory of Computing	4	MH1200 & MH2500 / MH2500 & MH2802
MH4320	Computational Economics	4	MH1200 & MH2500 / MH2500 & MH2802
MH4500	Time Series Analysis	4	MH2500 & MH3500 & MH3510
MH4511	Sampling and Survey	4	MH2500 & MH3500
MH4512	Clinical Trials	4	MH3500 & MH3510
MH4513	Survival Analysis	4	MH2500 & MH3500 & MH3510
MH4702	Probabilistic Methods in Operations Research	4	MH2500 & MH3512 / MH2500 & MH3701
MS4671	Introduction to Materials Simulation	3	SC1003 & SC1015