Bachelor of Engineering (Computer Science) Curriculum
Major Prescribed Electives for Specialisation
(For AY21/22 and later Cohort)

1. Students must take at least 5 Major Prescribed Elective (MPE) courses and a minimum of 15 AUs in each Specialisation area to qualify for the Specialisation as shown in the list below.

2. If a student has read at least 5 courses from one Specialisation and a minimum of 15 AUs regardless of whether the courses are read as MPE or Broadening & Deepening Elective (BDE), the student will be deemed to have attained that particular Specialisation. (Note: Students can only take MPE as BDE after fulfilling the MPE requirements.)

3. The same course <u>cannot</u> count towards more than one specialisation for a student.

4. Courses where Flexible Grading Option (FGO) option has been exercised <u>will not</u> be counted towards the award of a Specialisation.

5. <u>Courses taken during exchange</u>: Only TWO Pass/Fail graded MPEs (including equivalent and generic MPEs) can be counted per specialisation. Students can take at most TWO generic MPEs. Among the two generic MPEs, only ONE generic MPE can count towards at most one specialisation. No double counting of MPEs is allowed across specialisations.

6. Students can be awarded up to TWO Specialisations. No double counting of MPEs is allowed across specialisations.

7. The "Specialisation" attained will be reflected in the result transcript, e.g., Specialisation in Security.

8. Topics to be offered can vary depending on factors such as availability of faculty; availability of visiting staff with certain expertise; new technological trends, etc. Special Topics may also replace the listed specialisation courses. <u>Note that this list is subjected to changes</u>.

9. To get the most updated list of courses available in Sem 1 or Sem 2, students may check the course code via this link https://wis.ntu.edu.sg/webexe/owa/aus_schedule.main

ARTIFICAL INTELLIGENCE	Semester Offered		AU	Pre-requisite*
	S1	S2		
SC3000 Artificial Intelligence	√	√	3	SC1007 & SC1015 & SC2000
SC4000 Machine Learning	√	√	3	SC1004 & SC1007 & SC2000
SC4001 Neural Networks & Deep Learning	√	√	3	SC1004 & SC1007 or MH2802 & SC1007
SC4002 Natural Language Processing	√		3	SC2001
SC4003 Intelligent Agents		√	3	SC1007 & SC2000 or SC1007 & MH2500
SC4061 Computer Vision	√		3	Nil
SECURITY	Semester Offered		AU	Pre-requisite*
	S1	S2		
SC3010 Computer Security	√	√	3	SC2005
SC4010 Applied Cryptography	√		3	SC2000

	S1	S2	AU	Pre-requisite*
SC4011 Security Management	√		3	SC2006
SC4012 Software Security		√	3	SC2002 & SC2005
SC4013 Application Security	√(New)		3	SC2005 & SC2008
SC4014 Concepts and Techniques for Malware Analysis		√	3	SC1006 & SC2005
SC4015 Cyber Physical System Security		√	3	SC1006
SC4016 Cyber Threat Intelligence	√		3	Nil

DATA SCIENCE	Semester Offered		AU	Pre-requisite*
	S1	S2		
SC3020 Database System Principles	√	√	3	SC2207
SC4000 Machine Learning	√	√	3	SC1004 & SC1007 & SC2000
SC4002 Natural Language Processing	√		3	SC2001
SC4020 Data Analytics and Mining	√		3	SC2001
SC4021 Information Retrieval		√	3	SC2001
SC4022 Network Science		√	3	SC2001
SC4023 Big Data Management		√	3	SC2207
SC4024 Data Visualisation	√		3	SC1003 & SC2000

Other MPEs	Semester Offered		AU	Pre-requisite*
	S1	S2		
SC3030 Advanced Computer Networks	√		3	SC2008
SC3040 Advanced Software Engineering	√		3	SC2006
SC3050 Advanced Computer Architecture	√	√	3	SC1006
SC3060 Computer Graphics and Visualization	√		3	Nil
SC3061 Human-Computer Interaction	√		3	Nil
SC4030 Wireless and Mobile Networks	√		3	SC2008
SC4031 Internet of Things: Communications and Networking		√	3	SC2008
SC4040 Advanced Topics in Algorithms	√		3	SC2001
SC4050 Parallel Computing		TBA	3	SC2001 & SC3050
SC4051 Distributed Systems		√	3	SC2005 & SC2008

SC4052 Cloud Computing		√	3	SC1004
SC4053 Blockchain Technology	√		3	SC2001 & MH1812
SC4054 Simulation and Modelling		√	3	SC1007 & SC2000
SC4060 Virtual and Augmented Reality		√	3	Nil
SC4242 Compiler Techniques	√		3	SC2107

*In addition to the Pre-requisite shown here, student also needs to be of at least Study Year 3 standing.