NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE
School of Computer Science and Engineering

Bachelor of Engineering (Computer Science) Curriculum
Major Prescribed Electives and Elective Focus Areas
(For AY2020 and earlier Cohorts)

1. Students must choose to take the number of major prescribed elective courses based on their programme requirements from the list below.

2. If a student has read at least 3 courses from one area regardless of whether the courses are read as Prescribed Elective or Unrestricted Elective, he will be deemed to have attained elective focus in that particular area. Students can exercise S/U for the Unrestricted Elective and it will still be counted towards the elective focus area. (*Note: students can only take MPE as UE after fulfilling the MPE requirements*)

3. 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 elective courses. Note that this list is subjected to changes every semester.

4. The "Specialisation" attained will be reflected as "Elective Focus" in the result transcript, e.g. Elective Focus in Cyber Security.

5. Students can be awarded Elective Focus in at most two (2) areas.

Areas of Elective Focus	**Semester Offered**		**AU**	**Pre-requisite***
ARTIFICAL INTELLIGENCE	**SEM 1**	**SEM 2**		
CZ4041 Machine Learning	√	√	3	CZ1107 & CZ2100 or CZ1007 & CZ1011
CZ4042 Neural Networks & Deep Learning	√	√	3	CZ1104 & CZ1107 or CZ1007 & CZ1011 & CZ1012
CZ4045 Natural Language Processing	√		3	CZ2001
CZ4046 Intelligent Agents		√	3	CZ1107 & CZ2100 or CZ1007 & CZ1011
CZ4001 Virtual and Augmented Reality		√	3	(Year 3)
CZ4003 Computer Vision	√		3	(Year 3)
CYBER SECURITY	**SEM 1**	**SEM 2**	**AU**	**Pre-requisite***
CZ4010 Applied Cryptography	√		3	CZ2100
CZ4055 Cyber Physical System Security		√	3	CZ1106 or CZ1006
CZ4062 Computer Security	√	√	3	CZ2005
CZ4064 Security Management	√	Not offering	3	CZ2006
CZ4067 Software Security		√	3	CZ2002 & CZ2005
CZ4069 Concepts and Techniques for Malware Analysis		√	3	CZ1006 & CZ2005 (Cap at 100 max. Student should also take CZ4062)
CZ4070 Cyber Threat Intelligence	√		3	(Year 3)
Cx4024 Cryptography & Network Security#	NA	NA	3	Phased out
Cx4065	NA	NA	3	Phased out

Digital Forensics[#]				
Cx4068 Application Security[#]	NA	NA	3	Phased out
DATA SCIENCE & ANALYTICS	**SEM 1**	**SEM 2**	**AU**	**Pre-requisite***
CZ4031 Database System Principles	√	√	3	CZ2001 & CZ2007
CZ4032 Data Analytics and Mining	√		3	CZ2001
CZ4034 Information Retrieval		√	3	CZ2101 or CZ2001
CZ4041 Machine Learning	√	√	3	CZ1107 & CZ2100 or CZ1007 & CZ1011
CZ4062 Computer Security	√	√	3	CZ2005
CZ4071 Network Science		√	3	CZ2101 or CZ2001
CZ4123 Big Data Management		√	3	CZ2007
Cx4073 Data Science for Business[#]	NA	NA	3	Phased out
NETWORKING & MOBILITY	**SEM 1**	**SEM 2**	**AU**	**Pre-requisite***
CZ4013 Distributed Systems		√	3	CZ2005 & CZ3006
CZ4022 Wireless and Mobile Networks	√		3	CZ3006
CZ4023 Advanced Computer Networks	√		3	CZ3006
CZ4171 Internet of Things: Communications & Networking		√	3	CZ3006
CZ4021 Pervasive Networks[#]	NA	NA	3	Phased out
CZ4024 Cryptography & Network Security[#]	NA	NA	3	Phased out
HIGH PERFORMANCE COMPUTING	**SEM 1**	**SEM 2**	**AU**	**Pre-requisite***
CZ4013 Distributed Systems		√	3	CZ2005 & CZ3006
CZ4015 Simulation and Modelling		√	3	CZ1107 & CZ2100 or CZ1007 & CZ1011
CZ4016 Advanced Topics in Algorithms	√		3	CZ2001
CZ4052 Cloud Computing		√	3	CZ1004 or CZ1104

ELECTIVE COURSES WITH NO FOCUS AREA	**SEM 1**	**SEM 2**	**AU**	**Pre-requisite***
CZ4153 Blockchain Technology	√		3	CZ1107 & CZ2001 & MH1812 Or CZ1107 & CZ2101 & MH1812

*In addition to the Pre-requisite shown here, student also needs to be of at least Study Year 3 standing.
[#]Students who had completed these courses prior to AY22-23 Sem 1 can still count them towards fulfilling the respective Elective Focus as indicated.