

**AY2023-24 CURRICULUM FOR BACHELOR OF ENGINEERING (MATERIALS ENGINEERING)
WITH CN YANG SCHOLARS PROGRAMME
SECOND MAJOR IN DATA ANALYTICS (MTDA)
(FIRST YEAR ADMISSION)**

Last Updated : 19-Apr-23

SUMMARY OF ACADEMIC UNIT REQUIREMENT							
Year of Study	School Core	CNYS-Core	MPE	CC	FC	BDE	Total AU
1	10	23	0	5	0	0	38
2	11	10	0	8	3	7	39
3	31	0	3	0	5	9	48
4	15	0	6	0	0	6	27
Total	67	33	9	13	8	22	152

YEAR 1 SEMESTER 1				
Course Code	Course Title	Type	AU	Pre-Requisite/Remarks
CY1001	Cell	CNY-Core	3	CNYS-Core Courses
CY1101	Molecule	CNY-Core	4	
CY1308	Physics	CNY-Core	3	
CY1500	Introduction to Research	CNY-Core	2	
CY1601	Mathematics I	CNY-Core	4	
CC0005	Healthy Living & Wellbeing	CC	3	
			19	

YEAR 1 SEMESTER 2				
Course Code	Course Title	Type	AU	Pre-Requisite/Remarks
CY1007	Climate Change	CNY-Core	3	CNYS-Core Course
MS1014	Materials Chemistry II	C	2	
MS2012	Introduction to Manufacturing Processes	C	3	
EG1001	Engineers in Society	C	2	
MS1008^	Introduction to Computational Thinking	C	3	
CC0002	Navigating the Digital World	CC	2	
			15	

YEAR 1 SPECIAL SEMESTER				
Course Code	Course Title	Type	AU	Pre-Requisite/Remarks
CY2003	Research Attachment 3	CNY-Core	4	CNYS-Core Course
	Overseas Learning Trip			
			4	

YEAR 2 SEMESTER 1				
Course Code	Course Title	Type	AU	Pre-Requisite/Remarks
CY0002	Ethics	CNY-Core	3	CNYS-Core Course
MS1016	Thermodynamics of Materials	C	3	MS1017 (co-req)
MS1017	Introduction to Materials Science	C	2	
IE2107	Engineering Mathematics	BDE	3	Pre-req for EE4483
BC2406	Analytics I: Visual and Predictive Techniques	BDE	4	
SP0061	Science & Technology for Humanity	CC	3	
			18	

YEAR 2 SEMESTER 2				
Course Code	Course Title	Type	AU	Pre-Requisite/Remarks
CY0001	Writing Across the Disciplines	CNY-Core	3	CNYS-Core Course
CY2001	Research Attachment 1	CNY-Core	4	CNYS-Core Course 2-semester long, course registered only in Sem 2 (similar to URECA)
MS1018	Properties of Materials	C	2	
MS2013	Introduction to Polymer Science	C	3	MS1014 & MS1016
MS2083	Laboratory on Structure-Property Relationship in Polymers	C	1	MS2013 (co-requisite)

ML0004	Career and Entrepreneurial Development for the Future World	CC	2	
MS0003	Introduction to Data Science and Artificial Intelligence	FC	3	MS1008 Pre-req for EE4483
CC0006	Sustainability: Society, Economy & Environment	CC	3	
			21	

YEAR 3 SEMESTER 1				
Course Code	Course Title	Type	AU	Pre-Requisite/Remarks
MS2014	Materials Structure and Defects	C	3	MS1017 + MS1018 (co-req)
MS2015	Mechanical Behaviour of Materials	C	3	
MS2016	Phase Transformation and Kinetics	C	3	MS1016 (co-req)
MS2018	Electronic & Magnetic Properties of Materials	C	3	MS1017 & MS1018 (co-reqs)
MS3012	Micro/Nanoelectronic Materials Processing	C	3	
MH2811^	Mathematics II	C	3	MH1810/CY1601/CY1602
EE4483	Artificial Intelligence & Data Mining	BDE	3	IE2107 & MS0003
			21	

YEAR 3 SEMESTER 2				
Course Code	Course Title	Type	AU	Pre-Requisite/Remarks
MS3011	Metallic & Ceramic Materials	C	3	MS2016 (co-req)
MS3013	Environmental Effects on Materials	C	3	MS2013 + MS3011
MS3014	Analysis of Materials	C	3	
MS3015	Industrial Design	C	3	MS1015 + MS2013 + MS3011 (co-req)/ MS1017 + MS1018 + MS2013 + MS2083 + MS3011 (co-req) + MS3082 (co-req)
MS3082	Design Lab	C	1	
MS4671^	Introduction to Materials Simulation	MPE	3	MS0003 & MS1008
EE4791	Database Systems	BDE	3	
XXXXXX	DA Elective 1	BDE	3	
			22	

YEAR 3 SPECIAL SEMESTER				
Course Code	Course Title	Type	AU	Pre-Requisite/Remarks
MS3096	Professional Attachment	FC	5	
			5	

YEAR 4 SEMESTER 1				
Course Code	Course Title	Type	AU	Pre-Requisite/Remarks
MS4211	CNYSP Overseas Final Year Project	C	8	CNYSP Course
			8	

YEAR 4 SEMESTER 2				
Course Code	Course Title	Type	AU	Pre-Requisite/Remarks
MS4012^	Quality Control	C	3	
MS4013	Biomaterials	C	2	MS2013 & MS3011 (co-req)
MS4014	Nanomaterials: Fundamentals and Applications	C	2	MS2018 & MS3012 & MS3013
XXXXXX	DA Elective 2	BDE	3	
XXXXXX	DA Elective 3	BDE	3	
XXXXXX	Major PE 1	MPE	3	
XXXXXX	Major PE 2	MPE	3	

			19	
Total AU for Graduation:			152	

^ These courses are double-counted towards both MAT as well as the Second Major in Data Analytics.

Compulsory Courses for Second Major in Data Analytics					
Course Type	Course Code	Course Title	AU	Offering Sem	Pre-req
Core	MS4012	Quality Control	3	1,2	-
Core	MH2811	Mathematics II	3	1,2	MH1810/CY1601/CY1602
Core	MS1008	Introduction to Computational Thinking	3	1,2	-
MPE	MS4671	Introduction to Materials Simulation	3	2	MS0003 & MS1008
BDE	EE4791	Database Systems	3	2	-
BDE	EE4483	Artificial Intelligence & Data Mining	3	1	IE2107 & MS0003
BDE	BC2406	Analytics I: Visual and Predictive Techniques	4	1	Year 2 standing/AB1202

Suggested Electives for Second Major in Data Analytics					
Course Type	Course Code	Course Title	AU	Offering Sem	Pre-req
BDE	EE4414	Machine Learning Design & Application	3	2	EE4483
BDE	EE4497	Pattern Recognition & Machine Learning	3	2	EE2006/IE2106
BDE	MA4829	Machine Intelligence	3	2	-

List of Eligible Electives can be found at the following link: <https://www.ntu.edu.sg/engineering/admissions/ug/allprogrammes/highlights/da>