Curriculum for CN Yang Scholars Programme
Materials Engineering
(For AY2019-20 intake)

Course Type	AU
Core Courses	107
Major Prescribed Electives	12
GER-Core	17
GER-PE	0
Unrestricted Electives	6
Total	**142**

	Course Code	Course Title	Type	AU
Year 1 Semester 1	CY1001	Introductory Biology	Core	3
	CY1101	Principles of Modern Chemistry	Core	3
	CY1308	Physics	Core	3
	CY1500	Introductory Research Methodology	Core	3
	CY1601	Mathematics I	Core	4
	GC0001	Introduction to Sustainability: Multidisciplinary Approaches and Solutions	GER-Core	1
			Total AUs	**17**

	Course Code	Course Title	Type	AU
Year 1 Semester 2	CY1007	Climate Change	Core	3
	CY1307	Relativity and Quantum Physics	Core	3
	CY1400	CNYSP Undergraduate Research Experience	Core	3
	CY1602	Mathematics II	Core	4
	MS1014	Materials Chemistry II	Core	3
	MS1008	Introduction to Computational Thinking	Core	3
			Total AUs	**19**

	Course Code	Course Title	Type	AU
Year 1 Special Term	CY2003	Research Attachment 3 (Making & Tinkering)	Core	4
	Overseas Learning Trip			
			Total AUs	**4**

	Course Code	Course Title	Type	AU
Year 2 Semester 1	CY2001	Research Attachment 1	Core	4
	CY0002	Ethics	GER-Core	3
	MS1015	Materials Science	Core	3
	MS1016	Thermodynamics of Materials	Core	3
	MS2012	Introduction to Manufacturing Processes	Core	3
	MS2013	Polymers and Composites	Core	3
	MS2018	Electronic & Magnetic Properties of Materials	Core	3
	MS2081	Laboratory IIA	Core	1
			Total AUs	**23**

	Course Code	Course Title	Type	AU
Year 2 Semester 2	CY0001	Writing and Reasoning	GER-Core	3
	MS2014	Materials Structure and Defects	Core	3
	MS2015	Mechanical Behaviour of Materials	Core	3
	MS2016	Phase Transformation and Kinetics	Core	3
	MS2082	Laboratory IIB	Core	1
	xxxxxx	Unrestricted Elective	UE	3
		Introduction to Data Science and Artificial Intelligence	GER-Core	3
	ML0003	Career Preparatory Course	GER-Core	1
			Total AUs	**24**

	Course Code	Course Title	Type	AU
Year 3 Semester 1	MS3011	Metallic & Ceramic Materials	Core	3
	MS3012	Micro/Nanoelectronic Materials Processing	Core	3
	MS46XX	School Major PE (choose from Table B)	Major PE	3
	MS46XX	School Major PE (choose from Table B)	Major PE	3
	CY0006	Enterprise, Innovation and Leadership	GER-Core	3
			Total AUs	**15**

	Course Code	Course Title	Type	AU
Year 3 Semester 2	MS3013	Environmental Effects on Materials	Core	3
	MS3014	Analysis of Materials	Core	3
	MS3015	Materials Aspects in Design	Core	3
	MS3081	Laboratory III	Core	1
	MS4013	Biomaterials	Core	3
	MS4014	Nanomaterials: Fundamentals and Applications	Core	3
			Total AUs	**16**

	Course Code	Course Title	Type	AU
Year 3 Special Term	MS3096	Professional Attachment	Core	5
			Total AUs	**5**

	Course Code	Course Title	Type	AU
Year 4 Semester 1	MS4211	CNYSP Overseas Final Year Project	Core	8
			Total AUs	**8**

	Course Code	Course Title	Type	AU
Year 4 Semester 2	EG0001	Engineers and Society	GER-Core	3
	MS4012	Quality Control	Core	3
	MS46XX	School Major PE (choose from Table B)	Major PE	3
	MS46XX	School Major PE (choose from Table B)	Major PE	3
	xxxxxx	Unrestricted Elective	UE	3
			Total AUs	**15**
			GRAND TOTAL	**142**

Table B: School Major PE (choose courses with a total of 12 AUs)

School Major PE (12 AUs)	Type	AU
MS4601 Principles of Semiconductor Devices	Major PE	3
MS4603 Microelectronics Process Integration	Major PE	3
MS4610 Advanced Biomaterials	Major PE	3
MS4611 Biomedical Devices	Major PE	3
MS4612 Drug Delivery and Tissue Engineering	Major PE	3
MS4620 Polymer Technology	Major PE	3
MS4621 Polymer Science	Major PE	3
MS4622 Composite Materials	Major PE	3
MS4630 Photovoltaic Devices and Energy Storage	Major PE	3
MS4631 Corrosion Engineering	Major PE	3
MS4640 Advanced Analysis of Materials	Major PE	3
MS4650 Functional Nanostructured Materials	Major PE	3
MS4651 Thin Film Technology	Major PE	3

MSE Specialisation Areas

Students can choose to specialise in any of the 4 Specialisation topics below. The Core courses are offered in both semesters while the Major PE/UE courses are offered in respective semesters.

Generally, students have the opportunity to take any of the Major PE courses in an academic year in accordance to the semester the respective Major PEs are offered.

The four specialisation areas and the respective courses available for each specialisation are listed as below:

Specialisation Area 1: Medical Materials

- MS3014: Analysis of Materials# — Core
- MS4013: Biomaterials — Core
- MS4610: Advanced Biomaterials — Major PE/UE
- MS4611: Biomedical Devices — Major PE/UE
- MS4612: Drug Delivery & Tissue Engineering — Major PE/UE
- MS4621: Polymer Science — Major PE/UE

Specialisation Area 2: Industrial Materials Engineering

- MS3012: Micro/Nanoelectronic Materials Processing — Core
- MS3013: Environmental Effects on Materials — Core
- MS4603: Microelectronic Process Integration — Major PE/UE
- MS4601: Principles of Semiconductor Devices — Major PE/UE
- MS4630: Photovoltaics Devices and Energy Storage — Major PE/UE
- MS4631: Corrosion Engineering — Major PE/UE
- MS4620: Polymer Technology — Major PE/UE
- MS4622: Composite Materials# — Major PE/UE

Specialisation Area 3: Nanoscience and Nanotechnology

- MS3014: Analysis of Materials# — Core
- MS4014: Nanomaterials: Fundamentals & applications — Core
- MS4650: Functional Nanostructured Materials — Major PE/UE
- MS4640: Advanced Analysis of Materials — Major PE/UE
- MS4622: Composite Materials# — Major PE/UE
- MS4651: Thin Film Technology — Major PE/UE

Specialisation Area 4: Innovation and Intellectual Property

- MS3015: Materials Aspects in Design — Core
- ET0001: Enterprise and Innovation — GER Core
- MS4660: Fundamentals of Intellectual Property in Materials Science and Engineering — Major PE/UE
- MS4661: Application of Patents & Designs in Materials Related Industry — Major PE/UE
- MS4662: Appreciating IP in Research & Development — Major PE/UE

Note:

MS3014 and MS4622 can only be counted once in the desired respective specialisation a student chooses.

Please visit the School's website for more information on the MSE Specialisation Areas