

Department of Materials Science and Engineering

Program of Materials Science and Engineering for International Students (2021)

I. Introduction

The major of Materials Science and Engineering is a discipline, which systematically studies fundamental theories and experiment skills for materials science and engineering as well as applies these knowledge/abilities for materials' syntheses, preparation, structure characterization/evaluation, and performance controlling in various broad fields based on the principles of materials science, chemistry, and physics. Materials Science and Engineering major is an integrated discipline for application science closely related to engineering technology.

Materials are the bases for human survival and development. In 1970s, people viewed information, materials and energy as the mainstay of social civilization. In 1980s, with the rise of high technologies, materials science, information technology, and biotechnology were listed as important symbols of new technology revolution. Nowadays, materials have become important parts of the national economy, national defense and people's livelihood.

II. Objectives and Learning Outcomes

Materials Science and Engineering (MSE) will cultivate high-quality science and technology talents with firm theory knowledge of Materials Science and Engineering, abilities of mastering frontier materials' R&D and characterization technology, and capabilities of utilizing English and computer technology very well for high-tech R&D in interdisciplinary fields. These trained students possess not only the capability for researching in their disciplines and related fields, for designing and developing new materials, for teaching and managing, but also for practice innovation, cooperation, and leadership. These graduates can not only engage in conventional material industrial production, new materials creation, and development of new processes and technologies, but also continue their postgraduate studies in Materials Science and Engineering and serve in the research, development and management in top-ranked corporations, scientific research institutes, colleges, and government.

III. Study Length and Graduation Requirements

Study length: 4 years

Degree conferred: Bachelor of Materials Science and Engineering

The minimum credit requirement for graduation: 137credits (not including English courses);

Category	Module	Minimum Credit Requirement
General Education (GE) Required Courses (48 credits)	Science	28
	Physical Education	4
	Chinese Languages & Culture	16
General Education (GE) Elective Courses (10 credits)	Humanities	4
	Social Sciences	4
	Arts	2
	Science	0
Major Course (79 credits)	Major Foundational Courses	40
	Major Core Courses	17
	Major Elective Courses	8
	Internship and Undergraduate Thesis / Projects	14
Total (not including English courses)		137

IV. Discipline

Materials Science and Engineering

V. Main Courses

(I) Major Foundational Courses

Frontier Seminars in Materials Science and Engineering, CAD Engineering Drawing, Fundamentals of Circuits and Electronics, Analog Circuit Laboratory, Fundamentals of Materials Science and Engineering, Experiments for Fundamentals of Materials Science and Engineering, Crystallography, Probability and Statistics, Mechanics of Materials B, Materials Characterization Techniques, Materials Chemistry, Seminars Frontiers of Modern Materials Science and Technology, Comprehensive Experiments of Materials I, Experiments for Advanced Materials Science and Engineering I, Experiments for Advanced Materials Science and Engineering II, Comprehensive Experiments of Materials II, Physics of Materials.

(II) Major Core Course

Materials Chemistry Track: Physical Chemistry, Physical Chemistry Experiments, General Organic Chemistry, Basic Experiments for Organic Chemistry, Polymer Materials, Physical Metallurgy, Ceramic Materials, Fundamentals of Electrochemistry, Biomaterials, Experiments for Biomaterials.

Materials Physics Track: Thermodynamics and Kinetics of Materials, Introduction to Solid State Physics, Polymer Materials, Physical Metallurgy, Ceramic Materials, Biomaterials, Experiments for Biomaterials, Semiconducting Materials, Devices and Technology, Applied Quantum Mechanics.

Electronic Information Materials and Devices Track: Thermodynamics and Kinetics of Materials, Introduction to Solid State Physics, Electronic Information Materials and Devices, Introduction to VLSI Technology, Advanced Thin Film Technology, Device Reliability and Failure Analysis, Introduction to Mass and Heat Transport, Semiconducting Materials, Devices and Technology, Applied Quantum Mechanics

VI. Practice-Based Courses

Main practical teaching includes: experiments, industrial practice (Summer break of Grade 3), thesis, undergraduates' innovation experiments (starting from Year 2, undergraduates with excellent scores can work in labs to conduct research under the guidance of their supervisors; research period can include Summer break), and various academic and overseas undergraduate competitions.

VII. Pre-requisites for Major Declaration

Major Declaration Time	Course Code	Course Name	Prerequisite
Declare major at the end of First Year	MA101B	Calculus I A	None
	MA102B	Calculus II A	MA101B
	MA107B	Linear Algebra B	None
	PHY103B	General Physics I B	None
	PHY105B	General Physics II B	PHY103B
	PHY104B	Experiments of Fundamental Physics	None
	CH101B	General Chemistry B	None
Notes: At least 5 of the above courses will be completed in the first year, and the results should be qualified.			
Declare major at the end of Second Year	MA101B	Calculus I A	None
	MA102B	Calculus II A	MA101B
	MA107B	Linear Algebra B	None
	PHY103B	General Physics I B	None
	PHY105B	General Physics II B	PHY103B
	PHY104B	Experiments of Fundamental Physics	None
	CH101B	General Chemistry B	None
	CS102B	Introduction to Programming B	None
	MSE001	Fundamentals of Materials Science and Engineering	PHY105B CH101B
	MSE002	Experiments for Fundamentals of Materials Science and Engineering	PHY105B CH101B
Notes: 1. All of the above courses should be completed, and the results should be qualified. 2. At least earn 15 credits in the following courses: CAD Engineering Drawing, Fundamentals of Circuits and Electronics, Analog Circuit Laboratory, Crystallography, Mechanics of Materials B, Probability and Statistics, Materials Characterization Techniques.			

VIII. Requirements for GE Required Courses

(I) Science Module

Course Code	Course Name	Credit	Lab Credits	Hours/week	Term	Instruction Language	Prerequisite	Dept
MA101B	Calculus I A	4		4	1/Fall	E	None	MATH
MA102B	Calculus II A	4		4	1/Spr	E	MA101 B	MATH
MA107B	Linear Algebra B	4		4	1/Fall	E	None	MATH
PHY103B	General Physics I B	4		4	1/Fall	E	None	PHY
PHY105B	General Physics II B	4		4	1/Spr	E	PHY103 B	PHY
CH101B	General Chemistry B	3		3	1/Spr or Fall	E	None	CHEM
CS102B	Introduction to Programming B	3	1	4	1/Spr or Fall	E	None	CSE
PHY104B	Experiments of Fundamental Physics	2	2	4	1/Spr or Fall	E	None	PHY
Total		28	3	31				

(II) Physical Education

Course Code	Course Name	Credits	Hours/week	Terms	Instruction language	Prerequisite	Dept.
GE131	Physical Education I	1	2	Fall	C	NA	PE Center
GE132	Physical Education II	1	2	Spr	C	NA	
GE231	Physical Education III	1	2	Fall	C	NA	
GE232	Physical Education IV	1	2	Spr	C	NA	
GE331	Physical Education V	0	2	Fall	C	NA	
GE332	Physical Education VI	0	2	Spr	C	NA	
Total		4	12				

GE131, GE132, GE231, GE232, GE331, GE332 are required PE courses offered by Center For Physical Education. Students are required to select a specific sport program each semester. Student who meets the exemption conditions stated in "SUSTech Physical Education Course Exemption Regulation" can apply for exemption from GE331 and GE332.

(III) Chinese Languages & Culture

Course Code	Course Name	Credit	Hours/week	Term	Language Instruction	Prerequisite	Dept.
CLE008	Elementary Chinese I	2	4	1/Fall	B	NA	CLE
CLE009	Elementary Chinese II	2	4	1/Spr	B	CLE008	
CLE027	Intermediate Chinese I	2	4	2/Fall	B	CLE009	
CLE028	Intermediate Chinese II	2	4	2/Spr	B	CLE027	
CLE031	Advanced Chinese I	2	4	3/Fall	B	CLE028	
CLE032	Advanced Chinese II	2	4	3/Spr	B	CLE031	
CLE033	Chinese Culture	2	2	Spr/Fall	B/E	NA	CLE/ HUM/ SSC
CLE034	Chinese History	2	2	Spr/Fall	B/E	NA	

(IV) English Language

Students will undertake the English Placement Test and be placed into three levels according to the result of the test and their performance in the National College Entrance Exam. Students at different levels are required to take the courses with a different credit value in total.

Level A: 8 credits; SUSTech English III, English for Academic Purposes and 2-credit CLE elective course

Level B: 12 credits; SUSTech English II, SUSTech English III, English for Academic Purposes, and 2-credit CLE elective course

Level C: 14 credits; SUSTech English I, SUSTech English II, SUSTech English III, and English for Academic Purposes.

List of English Language Courses

Course Code	Course Name	Credit	Hours/week	Language Instruction	Prerequisite	Dept	Notes
CLE021	SUSTech English I	4	4	E	NA	CLE	Required
CLE022	SUSTech English II	4	4	E	CLE021		
CLE023	SUSTech English III	4	4	E	CLE022		
CLE030	English for Academic Purposes	2	2	E	CLE023		
/	(at least one 2-credit CLE elective course)	2	2	E	CLE030		Level A & B Required

IX Requirements for GE Elective Courses

Students are required to complete 4 credits for the Humanities Module and Social Sciences Module respectively, and 2 credits for the Music and Art Module. (Information about the available courses and the instruction language will be announced before the course selection session)

X. Major Course Arrangement

Table 1: Major Required Course (Foundational and Core Courses)

Course Category	Course Code	Course Name	Credit	Lab Credits	Hours / week	Term	Advised term to take the course	Instruction language	Prerequisite	Dept.
Major Foundational Courses	MSE102	Frontier Seminars in Materials Science and Engineering	1		1	Spr/ Fall	1/Fall	B	None	MSE
	ME102	CAD Engineering Drawing	3	1.5	4.5	Spr	1/Spr	E	None	ME
	MSE205	Fundamentals of Circuits and Electronics	3		3	Fall	2/Fall	E	MA102B MA107B PHY105B	MSE
	EE201-17 L	Analog Circuit Laboratory	1	1	2	Fall	2/Fall	E	MSE205	EE
	MSE001	Fundamentals of Materials Science and Engineering	3		3	Spr/ Fall	2/Fall	E	PHY105B CH101B	MSE
	MSE002	Experiments for Fundamentals of Materials Science and Engineering	1	1	2	Spr/ Fall	2/Fall	E	PHY105B CH101B	MSE
	MSE203	Crystallography	2		2	Fall	2/Fall	E	MA102B MA107B PHY105B	MSE
	MA212	Probability and Statistics	3		3	Spr/ Fall	2/Fall	E	MA102B	MA
	MSE213	Mechanics of Materials B	3		3	Spr	2/Spr	E	MSE001 MSE002	MSE
	MSE306	Materials Characterization Techniques	3		3	Spr	2/Spr	E	MSE001 MSE002	MSE
	MSE301	Materials Chemistry	3		3	Fall	3/Fall	E	MSE001 MSE002	MSE
	MSE347	Seminars Frontiers of Modern Materials Science and Technology	1		1	Fall	3/Fall	B	MSE001 MSE002	MSE
	MSE307	Comprehensive Experiments of Materials I	4	4	8	Fall	3/Fall	E	MSE203 MSE213	MSE
	MSE345	Experiments for Advanced Materials Science and Engineering I	1	1	2	Fall	3/Fall	E	MSE002	MSE
	MSE346	Experiments for Advanced Materials Science and Engineering II	1	1	2	Spr	3/Spr	E	MSE345	MSE
	MSE304	Comprehensive Experiments of Materials II	4	4	8	Spr	3/Spr	E	MSE307	MSE
	MSE328	Physics of Materials	3		3	Spr	3/Spr	E	MSE001 MSE002 MSE203	MSE
	Total			40	13.5	53.5				
Notes: 1. The all Major Foundational Courses are compulsory courses. 2. Please choose MSE001 and MSE002 at the same semester.										

Major Core Courses	Materials Chemistry Track									
	MSE202	Physical Chemistry	3		3	Spr	2/Spr	E	MA102B CH101B	MSE
	MSE204	Physical Chemistry Experiments	1	1	2	Spr	2/Spr	E	MA102B CH101B	MSE
	MSE210	General Organic Chemistry	3		3	Spr	2/Spr	E	CH101B	MSE
	MSE212	Basic Experiments for Organic Chemistry	1	1	2	Spr	2/Spr	E	CH101B	MSE
	MSE313	Polymer Materials	3		3	Spr	2/Spr	E	MSE001 MSE002	MSE
	MSE315	Physical Metallurgy	3		3	Fall	3/Fall	E	MSE001 MSE002	MSE
	MSE317	Ceramic Materials	3		3	Fall	3/Fall	E	MSE001 MSE002	MSE
	MSE332	Fundamentals of Electrochemistry	3		3	Fall	3/Fall	E	MSE202	MSE
	MSE338	Biomaterials	2		2	Spr	3/Spr	E	MSE001	MSE
	MSE340	Experiments for Biomaterials	2	2	4	Spr	3/Spr	E	MSE002	MSE
	Total		24	4	28					
	Materials Physics Track									
	MSE214	Thermodynamics and Kinetics of Materials	3		3	Spr	2/Spr	E	MA102B	MSE
	MSE217	Introduction to Solid State Physics	3		3	Spr	2/Spr	E	MSE215 MSE219	MSE
	MSE313	Polymer Materials	3		3	Spr	2/Spr	E	MSE001 MSE002	MSE
	MSE315	Physical Metallurgy	3		3	Fall	3/Fall	E	MSE001 MSE002	MSE
	MSE317	Ceramic Materials	3		3	Fall	3/Fall	E	MSE001 MSE002	MSE
	MSE338	Biomaterials	2		2	Spr	3/Spr	E	MSE001	MSE
	MSE340	Experiments for Biomaterials	2	2	4	Spr	3/Spr	E	MSE002	MSE
	MSE310	Semiconducting Materials, Devices and Technology	3		3	Spr	3/Spr	E	MSE001 MSE002	MSE
	MSE344	Applied Quantum Mechanics	3		3	Spr	3/Spr	E	PHY105B	MSE
	Total		25	2	27					
	Electronic Information Materials and Devices Track									
	MSE214	Thermodynamics and Kinetics of Materials	3		3	Spr	2/Spr	E	MA102B	MSE
	MSE217	Introduction to Solid State Physics	3		3	Spr	2/Spr	E	MSE215 MSE219	MSE
	MSE216	Electronic Information Materials and Devices	3		3	Spr	2/Spr	E	None	MSE
	EE305	Introduction to VLSI Technology	3	1	4	Fall	3/Fall	E	EE203	EE
	MSE407	Advanced Thin Film Technology	3		3	Fall	3/Fall	E	MSE001	MSE
	MSE348	Device Reliability and Failure Analysis	3		3	Fall	3/Fall	E	None	MSE
	MSE351	Introduction to Mass and Heat Transport	3		3	Spr	3/Spr	E	MA102B	MSE
	MSE310	Semiconducting Materials, Devices and Technology	3		3	Spr	3/Spr	E	MSE001 MSE002	MSE
	MSE344	Applied Quantum Mechanics	3		3	Spr	3/Spr	E	PHY105B	MSE

		Total	27	1	28					
Notes:										
1. The major core courses are divided into tracks: Materials Physics Track, Materials Chemistry Track, Electronic Information Materials and Devices Track. Under the guidance of the research tutor, the students should choose at least 17 credits in one track, and the courses in the other two tracks can be regarded as major elective courses' credits.										
2. Please at least choose two from MSE313, MSE317, MSE315, if you choose Materials Physics Track or Materials Chemistry Track.										
3. MSE311 is a compulsory course for the students who choose Materials Physics Track.										
4. Please choose MSE202 and MSE204 at the same semester;										
5. Please choose MSE210 and MSE212 at the same semester;										
6. Please choose MSE338 and MSE340 at the same semester.										
Practice-based Courses	MSE480	Projects of Science and Technology	2	2	16	Spr/ Fall	Spr/ Fall	B	None	MSE
	MSE470-1 7	Industrial Practice	4	4	16	Smr	3/Smr	B	None	MSE
	MSE490	Thesis (Graduation Project)	8	8	16	Spr	4/Spr	B	None	MSE
	Total		14	14	48					
Notes:										
Students who have completed Comprehensive Design I&II (COE491 & COE492) are not required to take the MSE490 Thesis (Graduation Project).										

Table 2: Major Elective Courses

Course Code	Course Name	Credits	Lab Credits	Hours / week	Term	Advised term to take the course	Instruction language	Prerequisite	Dept.
BIO102B	Introduction to Life Science	3		3	Spr/Fall	2/3/Spr or Fall	E	None	BIO
MSE103	Magic Materials	1	1	2	Spr/Fall	1/Fall	E	None	MSE
MSE460	Introduction of Materials Science and Engineering	1	0.5	1.5	Smr	1/2/Smr	E	None	MSE
MSES101	Nanomaterials and its Fabrication Methods	1		1	Smr	1/2/Smr	E	None	MSE
MSES102	Introduction to Soft Matter	1		1	Smr	1/2/Smr	E	None	MSE
MSES104	Materials Characterization	1		1	Smr	1/2/Smr	E	PHY105B	MSE
MSE321	Advanced Materials Research I	1	1	2	Fall	3/Fall	E	None	MSE
EE202-17	Digital Circuit	3		3	Spr	2/Spr	E	PHY105B	EE
EE202-17L	Digital Circuit Laboratory	1	1	2	Spr	2/Spr	E	EE202-17	EE
MSES105	Nanoprobes in Material Science, Physics and Chemistry	2		2	Smr	2/Smr	E	None	MSE
MSES103	Introduction to Nanotechnology	1		1	Smr	2/Smr	E	None	MSE
MSE325	Functional Polymers	3		3	Fall	3/Fall	B	None	MSE
MSE413	3D Printing and Laser-based Additive Manufacturing	3		3	Fall	3/Fall	E	None	MSE
MSE322	Composite Materials	3		3	Fall	3/Fall	E	MSE213	MSE
MSE5017	Crystal Chemistry	3		3	Spr	3/Spr	E	MSE001	MSE
MSE5019	Photonic Materials and Metamaterials	3		3	Spr	3/Spr	E	PHY105B	MSE
MSE334	Introduction to Energy Materials	2		2	Spr	3/Spr	E	MSE001	MSE
MSE318	Advanced Materials Research II	1	1	2	Spr	3/Spr	E	MSE321	MSE
MSE320	Introduction to Photovoltaics and Photo-thermal	3		3	Spr	3/Spr	E	MSE205(or EE201-17)	MSE
MSE330-16	Powder Metallurgy and 3D Printing of Metallic Materials	3		3	Spr	3/Spr	E	MSE315	MSE
MSE5025	Materials Science and Artificial Intelligence	3		3	Spr	3/Spr	E	PHY105B	MSE
MSE5021	Computational Materials Science	3	1	4	Spr	3/Spr	E	MSE203	MSE
MSE5028	Photon Science and Its Application to Materials Research and Interdisciplinary Frontiers	3		3	Spr	3/Spr	E	PHY105B	MSE
MSE401	Advanced Materials Research III	1	1	2	Fall	4/Fall	E	MSE318	MSE

ME103	Awareness Practical of Manufacturing Engineering	3	2	5	Fall	4/Fall	B	None	ME
EE419	Biosensors	3	1	4	Fall	4/Fall	E	None	EE
PHY5013	Advanced Electron Microscopy	3	1	4	Fall	4/Fall	B	PHY321-15	PHY
Total		59	10.5	69.5					
<p>Notes:</p> <ol style="list-style-type: none"> 1. At least 8 credits are required. 2. MSE321, MSE318, MSE401 are compulsory courses. Students should complete a project under the guidance of the research instructor to obtain courses credits. 3. MSE5017, MSE5019, MSE5021, MSE5025, MSE5028, PHY5013 are postgraduate courses, and can be recognized as Major Elective Courses credits. 									

Table 3: Overview of Practice-Based Courses

Course Code	Course Name	Credits	Lab Credits	Hours / week	Term	Advised term to take the course	Instruction language	Prerequisite	Dept.
ME102	CAD Engineering Drawing	3	1.5	4.5	Spr	1/Spr	E	None	ME
EE201-17L	Analog Circuit Laboratory	1	1	2	Fall	2/Fall	E	MSE205	EE
MSE002	Experiments for Fundamentals of Materials Science and Engineering	1	1	2	Spr/ Fall	2/Fall	E	PHY105B CH101B	MSE
MSE307	Comprehensive Experiments of Materials I	4	4	8	Fall	3/Fall	E	MSE203 MSE213	MSE
MSE345	Experiments for Advanced Materials Science and Engineering I	1	1	2	Fall	3/Fall	E	MSE002	MSE
MSE346	Experiments for Advanced Materials Science and Engineering II	1	1	2	Spr	3/Spr	E	MSE345	MSE
MSE304	Comprehensive Experiments of Materials II	4	4	8	Spr	3/Spr	E	MSE307	MSE
MSE204	Physical Chemistry Experiments	1	1	2	Spr	2/Spr	E	MA102B CH101B	MSE
MSE212	Basic Experiments for Organic Chemistry	1	1	2	Spr	2/Spr	E	CH101B	MSE
MSE340	Experiments for Biomaterials	2	2	4	Spr	3/Spr	E	MSE002	MSE
MSE480	Projects of Science and Technology	2	2	16	Spr/ Fall	Spr/ Fall	B	None	MSE
MSE470-17	Industrial Practice	4	4	16	Smr	3/Smr	B	None	MSE
MSE490	Thesis (Graduation Project)	8	8	16	Spr	4/Spr	B	None	MSE
MSE103	Magic Materials	1	1	2	Spr/ Fall	1/Fall	E	None	MSE
MSE460	Introduction of Materials Science and Engineering	1	0.5	1.5	Smr	1/2/Smr	E	None	MSE
EE305	Introduction to VLSI Technology	3	1	4	Fall	3/Fall	E	EE203	EE
MSE321	Advanced Materials Research I	1	1	2	Fall	3/Fall	E	None	MSE
EE202-17L	Digital Circuit Laboratory	1	1	2	Spr	2/Spr	E	EE202-17	EE
MSE318	Advanced Materials Research II	1	1	2	Spr	3/Spr	E	MSE321	MSE
MSE5021	Computational Materials Science	3	1	4	Spr	3/Spr	E	MSE203	MSE
MSE401	Advanced Materials Research III	1	1	2	Fall	4/Fall	E	MSE318	MSE
ME103	Awareness Practical of Manufacturing Engineering	3	2	5	Fall	4/Fall	B	None	ME
EE419	Biosensors	3	1	4	Fall	4/Fall	E	None	EE
PHY5013	Advanced Electron Microscopy	3	1	4	Fall	4/Fall	B	PHY321-15	PHY
Total		54	43	117					

Table 4: Overview of Course Hours and Credits

Materials Chemistry Track

Course Category	Total Course Hours	Total Credits	Credit Requirements	Percentage of the Total*
General Education (GE) Required Courses (not including English courses)	1072	48	48	35.04%
General Education (GE) Elective Courses	/	/	10	7.30%
Major Foundational Courses	856	40	40	29.20%
Major Core Courses	448	24	17	12.40%
Major Elective Courses	1112	59	8	5.84%
Research Projects, Internship and Undergraduate Thesis/Projects	768	14	14	10.22%
Total (not including English courses)	4256	182	137	

Materials Physics Track

Course Category	Total Course Hours	Total Credits	Credit Requirements	Percentage of the Total*
General Education (GE) Required Courses (not including English courses)	1072	48	48	35.04%
General Education (GE) Elective Courses	/	/	10	7.30%
Major Foundational Courses	856	40	40	29.20%
Major Core Courses	432	25	17	12.40%
Major Elective Courses	1112	59	8	5.84%
Research Projects, Internship and Undergraduate Thesis/Projects	768	14	14	10.22%
Total (not including English courses)	4240	185	137	

Electronic Information Materials and Devices Track

Course Category	Total Course Hours	Total Credits	Credit Requirements	Percentage of the Total*
General Education (GE) Required Courses (not including English courses)	1072	48	48	35.04%
General Education (GE) Elective Courses	/	/	10	7.30%
Major Foundational Courses	856	40	40	29.20%
Major Core Courses	448	27	17	12.40%
Major Elective Courses	1112	59	8	5.84%
Research Projects, Internship and Undergraduate Thesis/Projects	768	14	14	10.22%
Total (not including English courses)	4256	185	137	

* Percentage of the total= Credit requirements of each line / Total credit requirements

Curriculum Structure of Materials Chemistry Track

General Education Required Courses (48 credits)	Major Foundational Required Courses (40 credits)	Practice-Based Required Courses (14 credits)	Major Elective Courses (at least 8 credits)
Calculus I A	Frontier Seminars in Materials Science and Engineering	Industrial Practice	Introduction to Life Science
Calculus II A	CAD Engineering Drawing	Projects of Science and Technology	Advanced Materials Research I/II/III (Compulsory Courses)
Linear Algebra B	Fundamentals of Circuits and Electronics	Thesis (Graduation Project)*	Introduction of Materials Science and Engineering
General Physics I B	Analog Circuit Laboratory		Magic Materials
General Physics II B	Fundamentals of Materials Science and Engineering	* Students who have completed Comprehensive Design I&II are not required to take the Thesis (Graduation Project).	Nanomaterials and its Fabrication Methods
General Chemistry B	Experiments for Fundamentals of Materials Science and Engineering		Introduction to Soft Matter
Introduction to Programming B	Crystallography		Materials Characterization
Experiments of Fundamental Physics	Probability and Statistics		Nanoprobes in material science, physics and chemistry
Physical Education I~VI	Mechanics of Materials B	Major Core Courses (at least 17 credits)	Introduction to Nanotechnology
Elementary Chinese I	Materials Characterization Techniques	General Organic Chemistry	Functional Polymers
Elementary Chinese II	Materials Chemistry	Basic Experiments for Organic Chemistry	Photonic Materials and Metamaterials
Intermediate Chinese I	Seminars Frontiers of Modern Materials Science and Technology	Polymer Materials	Crystal Chemistry
Intermediate Chinese II	Comprehensive Experiments of Materials I	Physical Metallurgy	3D Printing and Lase-based Additive Manufacturing
Advanced Chinese I	Experiments for Advanced Materials Science and Engineering I	Ceramic Materials	Introduction to Energy Materials
Advanced Chinese II	Experiments for Advanced Materials Science and Engineering II	Fundamentals of Electrochemistry	Photon Science and Its Application to Materials Research and Interdisciplinary Frontiers
Chinese Culture	Comprehensive Experiments of Materials II	Biomaterials	Composite Materials
Chinese History	Physics of Materials	Experiments for Biomaterials	Introduction to Photovoltaics and Photo-thermal
		Physical Chemistry	Powder Metallurgy an 3D Printing of Metallic Materials
		Physical Chemistry Experiments	Materials Science and Artificial Intelligence
			Computational Materials Science
			Awareness Practical of Manufacturing Engineering
			Biosensors
			Advanced Electron Microscopy
			Digital Circuit
			Digital Circuit Laboratory

**The minimum credit requirement for graduation: 137 credits
(including 10 credits for GE Elective Courses, not including English courses)**

Curriculum Structure of Materials Physics Track

General Education Required Courses (48 credits)	Major Foundational Required Courses (40 credits)	Practice-Based Required Courses (14 credits)	Major Elective Courses (at least 8 credits)
Calculus I A	Frontier Seminars in Materials Science and Engineering	Industrial Practice	Introduction to Life Science
Calculus II A	CAD Engineering Drawing	Projects of Science and Technology	Advanced Materials Research I/II/III (Compulsory Courses)
Linear Algebra B	Fundamentals of Circuits and Electronics	Thesis (Graduation Project)*	Introduction of Materials Science and Engineering
General Physics I B	Analog Circuit Laboratory	* Students who have completed Comprehensive Design I&II are not required to take the Thesis (Graduation Project).	Magic Materials
General Physics II B	Fundamentals of Materials Science and Engineering		Nanomaterials and its Fabrication Methods
General Chemistry B	Experiments for Fundamentals of Materials Science and Engineering		Introduction to Soft Matter
Introduction to Programming B	Crystallography		Materials Characterization
Experiments of Fundamental Physics	Probability and Statistics		Nanoprobes in material science, physics and chemistry
Physical Education I~VI	Mechanics of Materials B		Introduction to Nanotechnology
Elementary Chinese I	Materials Characterization Techniques		Functional Polymers
Elementary Chinese II	Materials Chemistry		Photonic Materials and Metamaterials
Intermediate Chinese I	Seminars Frontiers of Modern Materials Science and Technology		Crystal Chemistry
Intermediate Chinese II	Comprehensive Experiments of Materials I		3D Printing and Laser-based Additive Manufacturing
Advanced Chinese I	Experiments for Advanced Materials Science and Engineering I		Introduction to Energy Materials
Advanced Chinese II	Experiments for Advanced Materials Science and Engineering II		Photon Science and Its Application to Materials Research and Interdisciplinary Frontiers
Chinese Culture	Comprehensive Experiments of Materials II		Composite Materials
Chinese History	Physics of Materials		Introduction to Photovoltaics and Photo-thermal
			Powder Metallurgy and 3D Printing of Metallic Materials
			Materials Science and Artificial Intelligence
			Computational Materials Science
			Awareness Practical of Manufacturing Engineering
			Biosensors
			Advanced Electron Microscopy
			Digital Circuit
			Digital Circuit Laboratory

Major Core Courses (at least 17 credits)

- Thermodynamics and Kinetics of Materials (**Compulsory Course**)
 - Semiconducting Materials, Devices and Technology
 - Polymer Materials
 - Physical Metallurgy
 - Ceramic Materials
- } **at least choose two**
- Applied Quantum Mechanics
 - Biomaterials
 - Experiments for Biomaterials
 - Introduction to Solid State Physics

The minimum credit requirement for graduation: 137 credits (including 10 credits for GE Elective Courses, not including English courses)

Curriculum Structure of Electronic Information Materials and Devices Track

General Education Required Courses (48 credits)	Major Foundational Required Courses (40 credits)	Practice-Based Required Courses (14 credits)	Major Elective Courses (at least 8 credits)
Calculus I A	Frontier Seminars in Materials Science and Engineering	Industrial Practice	Introduction to Life Science
Calculus II A	CAD Engineering Drawing	Projects of Science and Technology	Advanced Materials Research I/II/III (Compulsory Courses)
Linear Algebra B	Fundamentals of Circuits and Electronics	Thesis (Graduation Project)*	Introduction of Materials Science and Engineering
General Physics I B	Analog Circuit Laboratory	* Students who have completed Comprehensive Design I&II are not required to take the Thesis (Graduation Project).	Magic Materials
General Physics II B	Fundamentals of Materials Science and Engineering		Nanomaterials and its Fabrication Methods
General Chemistry B	Experiments for Fundamentals of Materials Science and Engineering	Major Core Courses (at least 17 credits)	Introduction to Soft Matter
Introduction to Programming B	Crystallography		Materials Characterization
Experiments of Fundamental Physics	Probability and Statistics		Nanoprobes in material science, physics and chemistry
Physical Education I~VI	Mechanics of Materials B		Introduction to Nanotechnology
Elementary Chinese I	Materials Characterization Techniques		Thermodynamics and Kinetics of Materials
Elementary Chinese II	Materials Chemistry		Introduction to Solid State Physics
Intermediate Chinese I	Seminars Frontiers of Modern Materials Science and Technology		Electronic Information Materials and Devices
Intermediate Chinese II	Comprehensive Experiments of Materials I		Introduction to VLSI Technology
Advanced Chinese I	Experiments for Advanced Materials Science and Engineering I		Semiconducting Materials, Devices and Technology
Advanced Chinese II	Experiments for Advanced Materials Science and Engineering II		Device Reliability and Failure Analysis
Chinese Culture	Comprehensive Experiments of Materials II	Introduction to Mass and Heat Transport	
Chinese History	Physics of Materials	Applied Quantum Mechanics	
		Advanced Thin Film Technology	Introduction to Photovoltaics and Photo-thermal
			Powder Metallurgy an 3D Printing of Metallic Materials
			Materials Science and Artificial Intelligence
			Computational Materials Science
			Awareness Practical of Manufacturing Engineering
			Biosensors
			Advanced Electron Microscopy
			Digital Circuit
			Digital Circuit Laboratory

The minimum credit requirement for graduation: 137 credits (including 10 credits for GE Elective Courses, not including English courses)