Curriculum

☐ **Undergraduate Program**

Classification	Subject No.	Subject Name	Lecture:Lab.: Credit (Homework)	Semester	Remark
Basic Course	MS211	Introduction to Materials Science and Engineering	3:0:3(3)	Spring, Fall	
Major (Mandatory)	MS212	Thermodynamics of Materials	3:0:3(3)	Spring	
	MS311	Phase Transformation and Microstructural Evolution	3:0:3(3)	Spring	
	MS321	Advanced Materials Lab Ⅰ	1:6:3(6)	Spring	
	MS322	Advanced Materials Lab Ⅱ	1:6:3(6)	Fall	
Major (Elective)	MS213	Crystallography and Diffraction	2:3:3(3)	Fall	
	MS214	Thermochemical Process in Materials Science and Engineering	3:0:3(3)	Fall	
	MS215	Mechanical Behavior of Materials	3:0:3(3)	Fall	
	MS216	Introduction to Electrical and Magnetic Properties of Materials	3:0:3(3)	Spring	
	MS310	Introduction to Quantum Chemistry	3:0:3(3)	Spring	
	MS331	Nanomaterials Science & Technology	3:0:3(3)	Spring	
	MS340	Polymer Materials	3:0:3(3)	Fall	
	MS354	Corrosion and Oxidation of Metals	3:0:3(3)	Fall	
	MS360	Mechanics of Materials	3:0:3(3)	Fall	
	MS371	Structure and Properties of Engineering Alloys	3:0:3(3)	Spring	
	MS381	Introduction to Solid State Physics	3:0:3(3)	Fall	
	MS412	Material Design and Manufacturing Process	2:3:3(5)	Spring	
	MS415	Introduction to Semiconductor Devices	3:0:3(2)	Spring	
	MS421	Introduction to Ceramics	3:0:3(3)	Spring	
	MS424	Understanding of Electronic Systems for Materials Engineers	3:0:3(3)	Fall	
	MS425	Introduction to Biomaterials	3:0:3(3)	Spring	
	MS431	Nano-Biomaterials	3:0:3(3)	Fall	
	MS481	Semiconductor Processing	3:0:3(2)	Fall	
	MS482	Special Topics in Materials Science and Engineering	3:0:3(3)	Spring, Fall	
	MS490	Research in Materials Science and Engineering	0:6:3(3)		
	MS495	Individual Study	0:6:1(3)		
	MS496	Seminar	1:0:1(3)		

※ Note: 400 and 500 level courses open to both undergraduate and graduate students

❑ Graduate Program

Classification	Subject No.	Subject Name	Lecture:Lab.: Credit (Homework)	Semester	Remark
Mandatory General Course	CC010	Special Lecture on Leadership	1:0:0	Fall	required
	CC020	Ethics and Safety I	1AU	Spring·Fall	
	CC500	Scientific Writing	3:0:3	Spring·Fall	
	CC510	Introduction to Computer Application	2:3:3	Spring·Fall	
	CC511	Probability and Statistics	2:3:3	Spring·Fall	
	CC512	Introduction to Materials and Engineering	3:0:3	Spring·Fall	choose 1
	CC513	Engineering Economy and Cost Analysis	3:0:3	Fall	
	CC522	Introduction to Instruments	2:3:3	Fall	
	CC530	Entrepreneurship and Business Strategies	3:0:3	Fall	
	CC531	Patent Analysis and Invention Disclosure	3:0:3	Spring·Fall	
	CC532	Collaborative System Design and Engineering	4:0:4	Spring	
Elective Course	MS511	Thermodynamics and Phase Equilibria	3:0:3(3)	Spring	
	MS513	Structure and Defects in Solids	3:0:3(3)	Spring	
	MS514	Mechanical Behavior of Solids	3:0:3(3)	Fall	
	MS521	Statistical Thermodynamics in Materials System	3:0:3(3)	Spring	
	MS523	Electron Microscopy and Experiment	2:3:3(3)	Spring	
	MS524	Phase Equilibria and Phase Diagrams	3:0:3(3)	Fall	
	MS536	Thin Film Processing	3:0:3(2)	Spring	
	MS541	Diffusion in Solid	3:0:3(3)	Fall	
	MS542	Nanoscale Surface Analysis	2:3:3(3)	Fall	
	MS543	Introduction to Dislocations	3:0:3(3)	Spring	
	MS544	Engineering of Soft Materials	3:0:3(3)	Fall	
	MS545	Applied Biomaterials	3:0:3(3)	Fall	
	MS572	Composite Materials	3:0:3(3)	Fall	
	MS575	Non-Crystalline Materials	3:0:3(3)	Fall	
	MS590	Computational Modeling and Simulation of Nano Materials and Processing	3:0:3(3)	Fall	
	MS591	Emerging nanofabrication technology	3:0:3(3)	Fall	
	MS592	Inorganic Nanomaterials	3:0:3(3)	Spring	
	MS612	Phase Transformation in Solids	3:0:3(3)	Fall	
	MS613	Solid State Physics	3:0:3(3)	Fall	
	MS615	Structure and Properties of Interfaces	3:0:3(3)	Spring·Fall	
	MS617	Electrochemistry of Solids for Materials Scientist	2:3:3(3)	Fall	
	MS619	Electronic Ceramics Materials	3:0:3(2)	Fall	
	MS620	Optical Materials	3:0:3(3)	Spring	
	MS621	Dielectric Materials	3:0:3(3)	Spring	
	MS624	Optical Waves and Periodic Media	3:0:3(3)	Fall	

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Classification	Subject No.	Subject Name	Lecture:Lab.: Credit (Homework)	Semester	Remark
Elective Course	MS631	Alloy Design and Applications	3:0:3(3)	Fall	
	MS632	Creep and Superplasticity	3:0:3(3)	Spring	
	MS633	Solid State Chemical Sensors	3:0:3(3)	Fall	
	MS634	Crystal Physics	3:0:3(3)	Spring	
	MS635	Semiconductor Integrated Process Design	3:0:3(2)	Fall	
	MS642	Electronic Packaging Technology	3:0:3(2)	Spring	
	MS643	Sintering	3:0:3(3)	Fall	
	MS644	Advanced Polymeric Materials	3:0:3(3)	Fall	
	MS653	Microstructural Analysis in Materials Science	2:3:3(3)	Spring	
	MS654	Surface Science	3:0:3(2)	Spring	
	MS656	Corrosion & Mechanochemical Reactions on Surfaces	2:3:3(3)	Fall	
	MS657	Environmental Effects on the Degradation of Materials	3:0:3(3)	Spring	
	MS660	Fracture Mechanics	3:0:3(3)	Spring	
	MS661	Fatigue Phenomena in Metals	3:0:3(3)	Fall	
	MS662	Mechanical Properties of Thin Films	3:0:3(3)	Spring	
	MS670	Sol-Gel Nano Materials and Process	3:0:3(3)	Fall	
	MS671	First-principles Modeling of Materials	3:0:3(3)	Spring·Fall	
	MS672	Special Topics on Nano Material Technology	3:0:3(3)	Spring·Fall	
	MS673	Photochemical Materials	3:0:3(3)	Spring	
	MS684	Principles of Semiconductor Devices	3:0:3(3)	Spring	
	MS685	Physics of Magnetism and Magnetic Materials	3:0:3(2)	Fall	
	MS686	Photovoltaic Materials	3:0:3(3)	Spring	
	MS696	Special Topics in Advanced Materials I	3:0:3(3)	Spring·Fall	
	MS697	Special Topics in Advanced Materials II	3:0:3(3)	Spring·Fall	
	MS698	Special Topics in Advanced Materials III	3:0:3(3)	Spring·Fall	
Research	MS960	Research in Materials Science and Engineering (Master)			
	MS966	Seminar (Master)	1:0:1(3)		
	MS980	Research in Materials Science and Engineering (Doctorate)			
	MS986	Seminar (Doctorate)	1:0:1(3)		

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