

## Table of Curriculum (Undergraduate Program)

Classification	Course No.	Computer Code	Course Name	Lecture; Lab.; Credit (Assignment)	Semester	Note
Basic Course	MS211	34.211	Introduction to Materials Science and Engineering	3:0:3(3)	Spring, Fall	
Mandatory Major courses	MS212	34.212	Thermodynamics of Materials	3:0:3(3)	Spring	
	MS213	34.213	Crystallography and Diffraction	2:3:3(3)	Fall	
	MS310	34.310	Quantum Chemistry for Materials Scientists	3:0:3(3)	Spring	
	MS311	34.311	Phase Transformation and Microstructure Evolution	3:0:3(3)	Fall	
	MS321	34.321	Advanced Materials Lab I	1:6:3(6)	Spring	
	MS322	34.322	Advanced Materials Lab II	1:6:3(6)	Fall	
Elective Major courses	MS214	34.214	Application of Thermodynamics to Materials Science and Engineering	3:0:3(3)	Fall	
	MS215	34.215	Mechanical Behavior of Materials	3:0:3(3)	Fall	
	MS216	34.216	Electrical and Magnetic Properties of Materials	3:0:3(3)	Spring	
	MS217	34.217	Organic material chemistry	3:0:3	Spring	
	MS331	34.331	Nanomaterials Science & Technology	3:0:3(3)	Spring	
	MS333	34.333	Inorganic Materials Chemistry	3:0:3	Fall	
	MS340	34.340	Polymer Materials	3:0:3(3)	Fall	
	MS354	34.354	Electrochemistry for Materials Science	3:0:3(3)	Fall	
	MS360	34.360	Mechanics of Materials	3:0:3(3)	Fall	
	MS371	34.371	Structure and Properties of Engineering Alloys	3:0:3(3)	Spring	
	MS381	34.381	Introduction to Solid State Physics	3:0:3(3)	Fall	
	MS412	34.412	Material Design and Manufacturing Process	2:3:3(5)	Spring	⊙
	MS414	34.414	Materials Characterization	3:0:3(3)	Fall	⊙
	MS415	34.415	Introduction to Semiconductor Devices	3:0:3(2)	Spring	⊙
	MS421	34.421	Introduction to Ceramics	3:0:3(3)	Spring	⊙
	MS424	34.424	Circuits and Electronics for Materials Engineering	3:0:3(3)	Fall	⊙
	MS425	34.425	Introduction to Biomaterials	3:0:3(3)	Spring	⊙
	MS431	34.431	Nano-Biomaterials	3:0:3(3)	Fall	⊙
	MS435	34.435	Applied Mathematics for Materials Science and Engineering	3:0:3	Fall	⊙
	MS436	34.436	Electrodynamics and Its Applications for MSE	3:0:3	Spring	⊙
	MS441	34.441	Introduction to Display Materials	3:0:3(3)	Fall	⊙
	MS461	34.461	Advanced Materials Quantum Mechanics and Artificial Intelligence	3:0:3	Spring	⊙
	MS462	34.462	Advanced Materials Quantum Mechanics Application	3:0:3	Spring or Fall	⊙
	MS481	34.481	Semiconductor Processing	3:0:3(2)	Fall	⊙
MS482	34.482	Special Topics in Materials Science and Engineering	3:0:3(3)	Spring, Fall	⊙	
Research	MS490	34.490	Research in Materials Science and Engineering	0:6:3(3)		
	MS495	34.495	Individual Study	0:6:1(3)		
	MS496	34.496	Seminar	1:0:1(3)		

⊙: Course mutually recognized by undergraduate and graduate programs

※ Course classification, course title, and mutual recognition of credits may differ according to the effective year of the requirements.

## Table of Curriculum (Graduate Program)

Classification	Course No.	Computer Code	Course Name	Lecture; Lab.; Credit (Assignment)	Semester	Note
Mandatory major Course	MS511	34.511	Thermodynamics and Phase Equilibria	3:0:3(3)	Spring	
Elective Course	MS513	34.513	Structure and Defects of Solids	3:0:3(3)	Spring	⊙
	MS514	34.514	Mechanical Behavior of Materials	3:0:3(3)	Fall	⊙
	MS516	34.516	Kinetic Processes in Materials	3:0:3(3)	Spring	⊙
	MS521	34.521	Statistical Thermodynamics in Materials System	3:0:3(3)	Spring	⊙
	MS523	34.523	Electron Microscopy	2:3:3(3)	Spring	⊙
	MS524	34.524	Phase Equilibria and Phase Diagrams	3:0:3(3)	Fall	⊙
	MS526	34526	Semiconductor Photoelectrochemistry: Fundamentals and Energy Applications	3:0:3	Fall	⊙
	MS527	34.527	Current Semiconductor Materials and Devices	3:0:3	Spring	⊙
	MS536	34.536	Thin Film Processes	3:0:3(2)	Spring	⊙
	MS541	34.541	Diffusion in Solid	3:0:3(3)	Fall	⊙
	MS542	34.542	Nanoscale Surface Analysis	2:3:3(3)	Fall	⊙
	MS543	34.543	Introduction to Dislocations	3:0:3(3)	Spring	⊙
	MS544	34.544	Engineering of Soft Materials	3:0:3(3)	Fall	⊙
	MS545	34.545	Healthcare Materials	3:0:3(3)	Fall	⊙
	MS551	34.551	Waves and Materials	3:0:3(3)	Spring	⊙
	MS572	34.572	Composite Materials	3:0:3(3)	Fall	⊙
	MS575	34.575	Non-Crystalline Materials	3:0:3(3)	Fall	⊙
	MS590	34.590	Design of Nanomaterials and Processing	3:0:3(3)	Fall	⊙
	MS591	34.591	Emerging nanofabrication technology	3:0:3(3)	Fall	⊙
	MS592	34.592	Inorganic Nanomaterials	3:0:3(3)	Spring	⊙
	MS595	34.595	Special Topics in Introductory Materials Science and Engineering	1:0:1	Spring. Fall	⊙
	MS612	34.612	Phase Transformation in Solids	3:0:3(3)	Fall	
	MS613	34.613	Solid State Physics	3:0:3(3)	Fall	
	MS615	34.615	Structure and Properties of Interfaces	3:0:3(3)	Fall	
	MS617	34.617	Solid-State Electrochemistry	3:0:3(3)	Fall	
	MS619	34.619	Electronic Ceramic Materials	3:0:3(2)	Fall	
	MS620	34.620	Optical Materials	3:0:3(3)	Spring	
	MS621	34.621	Dielectric Materials	3:0:3(3)	Spring	
	MS624	34.624	Optical properties of nanostructured materials	3:0:3(3)	Fall	
	MS625	34.625	Thin-film Transistors for Display Applications	3:0:3(3)	Fall	
	MS626	34.626	Physical Properties of Energy Materials	3:0:3	Spring	
	MS627	34.627	Emerging luminescent nanomaterials and devices	3:0:3	Fall	
	MS631	34.631	Alloy Design and Applications	3:0:3(3)	Fall	
MS632	34.632	Creep and Superplasticity	3:0:3(3)	Spring		
MS633	34.633	Solid State Chemical Sensors	3:0:3(3)	Fall		

Classification	Subject No.	Subject No.	Subject Name	Lecture:Lab.: Credit (Homework)	Semester	Remark
Elective Course	MS634	34.634	Crystal Physics	3:0:3(3)	Spring	
	MS635	34.635	Semiconductor Integrated Process Design	3:0:3(2)	Fall	
	MS642	34.642	Electronic Packaging Technology	3:0:3(2)	Spring	
	MS643	34.643	Sintering	3:0:3(3)	Fall	
	MS644	34.644	Advanced Polymeric Materials	3:0:3(3)	Fall	
	MS653	34.653	Microstructure Analysis in Materials Science	2:3:3(3)	Spring	
	MS654	34.654	Surface Science	3:0:3(2)	Spring	
	MS656	34.656	Corrosion & Mechanochemical Reactions on Surfaces	2:3:3(3)	Fall	
	MS657	34.657	Environmental Effects on the Degradation of Materials	3:0:3(3)	Spring	
	MS658	34.658	Materials science aspects of rechargeable batteries	3:0:3(3)	Fall	
	MS659	34.659	Materials for Sustainable Development	3:0:3(3)	Spring	
	MS660	34.660	Fracture Mechanics	3:0:3(3)	Spring	
	MS661	34.661	Fatigue Phenomena in Metals	3:0:3(3)	Fall	
	MS662	34.662	Mechanical Properties of Thin Films	3:0:3(3)	Spring	
	MS670	34.670	Sol-Gel Nano Materials and Process	3:0:3(3)	Fall	
	MS671	34.671	First-principles Modeling of Materials	3:0:3(3)	Spring.Fall	
	MS672	34.672	Special Topics on Nano Material Technology	3:0:3(3)	Spring.Fall	
	MS673	34.673	Photochemical Materials	3:0:3(3)	Spring	
	MS674	34.674	Principles and Applications of Hydrogels for Biotechnology	3:0:3	Spring	
	MS684	34.684	Principles of Semiconductor Devices	3:0:3(3)	Spring	
MS685	34.685	Physics of Magnetism and Magnetic Materials	3:0:3(2)	Fall		
MS686	34.686	Photovoltaic Materials	3:0:3(3)	Spring		
MS696	34.696	Special Topics in Advanced Materials I	3:0:3(3)	Spring.Fall		
MS697	34.697	Special Topics in Advanced Materials II	3:0:3(3)	Spring.Fall		
MS698	34.698	Special Topics in Advanced Materials III	3:0:3(3)	Spring.Fall		
Research	MS960	34.960	Research in Materials Science and Engineering (Master)			
	MS966	34.966	Seminar (Master)	1:0:1(3)		
	MS980	34.980	Research in Materials Science and Engineering (Doctorate)			
	MS986	34.986	Seminar (Doctorate)	1:0:1(3)		
	MS998	34.998	Practicum in Materials Science and Engineering I	0:3:1	Summer. Winter	
	MS999	34.999	Practicum in Materials Science and Engineering II	0:6:2	Summer. Winter	

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## Substitute Course List

Substitute courses in the department					
Category	Courses currently offered		Courses not currently offered		
	Course no.	Course title	Course no.	Course title	Remark
Undergraduate	MS216	Electrical and Magnetic Properties of Materials	MS216	Introduction to Electrical and Magnetic Properties of Materials	Change in Course Title
Undergraduate	MS310	Quantum Chemistry for Materials Scientists	MS310	Introduction to Quantum Chemistry	Change in Course Title
Undergraduate	MS354	Electrochemistry for Materials Science	MS354	Corrosion and Oxidation	Change in Course Title
Undergraduate	MS424	Circuits and Electronics for Materials Engineering	MS424	Understanding of Electronic Systems for Materials Engineers	Change in Course Title
Graduate	MS514	Mechanical Behavior of Materials	MS514	Mechanical Behaviour of Solids	Change in Course Title
Graduate	MS545	Healthcare Materials	MS545	Applied Biomaterials	Change in Course Title
Graduate	MS617	Solid-State Electrochemistry	MS617	Electrochemistry of Solids for Materials Scientist	Change in Course Title

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