

MATERIALS SCIENCE PROGRAM: FIRST AND SECOND YEARS

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	SEMESTER I	SEMESTER II	SEMESTER III	SEMESTER IV
MATHEMATICS	MATH UN1101 (3)	MATH UN1102 (3)	APMA E2000 (4) and E2001 (0) either semester	
				and APMA E2101 (3)
PHYSICS (three sequences, choose one)	UN1401 (3) UN1601 (3.5) UN2801 (4.5)	UN1402 (3) UN1602 (3.5) UN2802 (4.5)	UN1403 (3) UN2601 (3.5)	
CHEMISTRY	UN1403 (4) or UN1404 (4) or UN2045 (4) or UN1604 (4)			
REQUIRED LAB	PHYS UN1493 (3) or UN3081 (2) or CHEM UN1500 (3) or UN1507 (3) or UN3085 (4)			
UNIVERSITY WRITING	CC1010 (3) either semester			
NONTECHNICAL REQUIREMENTS¹	HUMA CC1001, COCI CC1101, or Global Core (3–4); HUMA UN1121 (3) or UN1123 (3); HUMA CC1002, COCI CC1102, or Global Core (3–4); ECON UN1105 (4) and UN1155 recitation (0)			
PHYSICAL EDUCATION	UN1001 (1)	UN1002 (1)		
THE ART OF ENGINEERING	ENGI E1102 (4) either semester			
COMPUTER SCIENCE	ENGI E1006 (3) any semester			
TECHNICAL REQUIREMENTS			MSAE E3010 (3) Foundations of materials science	

¹ Some nontech courses can be postponed to junior or senior year, so lab courses MSAE E3012 and MSAE E3013 can be taken along with MSAE E3010.

MATERIALS SCIENCE: THIRD AND FOURTH YEARS				
	SEMESTER V	SEMESTER VI	SEMESTER VII	SEMESTER VIII
REQUIRED COURSES	MSAE E3012 (3) ¹ Laboratory in mat. sci. I MSAE E3100 (3) Crystallography MSAE E4102 (3) Synthesis and processing of materials	MSAE E3013 (3) ¹ Laboratory in mat. sci. II MSAE E3201 (3) Materials thermodynamics and phase diagrams MSAE E4250 (3) Ceramics and composites	MSAE E3156 (2) Design project MSAE E4206 (3) Electronic and magnetic properties of solids MSAE Elective (3) ² 3000-, 4000-, 6000- level	MSAE E3157 (2) Design project MSAE E4202 (3) Kinetics of transformations in materials MSAE E4215 (3) Mechanical behavior of materials
TECHNICAL ELECTIVES	Students must complete 27 units of Technical Electives.			
NONTECHNICAL ELECTIVES	Students must complete the 27-point requirement. ³			

¹ Motivated students are highly encouraged to take MSAE E3012 and MSAE E3103 in the sophomore year to obtain practical understanding of material covered in the junior and senior years.

² MSAE E4999 is excluded from the courses that may be applied to MSAE major core requirement.

³ See page 9 or seas.columbia.edu for details (administered by the advising dean).

MATERIALS SCIENCE: THIRD AND FOURTH YEARS (TRANSFER STUDENTS)				
	SEMESTER V	SEMESTER VI	SEMESTER VII	SEMESTER VIII
REQUIRED COURSES	MSAE E3010 (3) Foundations of materials science and engineering MSAE E3012 (3) Laboratory in materials science, I MSAE E4102 (3) Synthesis and processing of materials	MSAE E3013 (3) Laboratory in materials science, II MSAE E3201 (3) Materials thermodynamics and phase diagrams MSAE E4250 (3) Ceramics and composites	MSAE E3156 (2) Design project MSAE E3100 (3) Crystallography MSAE E4200 (3) Theory of crystalline materials MSAE E4206 (3) Electronic and magnetic properties of solids	MSAE E3157 (2) Design project MSAE E4202 (3) Kinetics of transformations in materials MSAE E4215 (3) Mechanical behavior of materials
TECHNICAL ELECTIVES	Students must complete 27 or 24 units of Technical Electives. ¹			
NONTECHNICAL ELECTIVES	Students must complete the 27-point requirement. ²			

¹ Students transferring from another SEAS department into the Materials Science program in the junior year must complete the 27 units of technical elective requirement; Combined Plan 3/2 transfer students must complete 24 units of technical electives.

² Students transferring from another SEAS department into the Materials Science program in the junior year must complete the 27-point requirement; see page 9 or seas.columbia.edu for details (administered by the advising dean). Combined Plan 3/2 transfer students do not need nontechnical electives; see page 14 or seas.columbia.edu.