SABANCI UNIVERSITY - FACULTY OF ENGINEERING AND NATURAL SCIENCES
Materials Science and Nano Engineering - Recommended Course Program

Year -1 Freshman — Semester-1

Course Code	Course Name	Course Type	Prerequisite Courses	SU Credits	Engineering Credits (ECTS)	Basic Science Credits (ECTS)	ECTS (Total)
MATH101	Calculus I	University C.		3		6	6
NS101	Science of Nature I	University C.		4		6	6
CIP101N	Civic Involvement Projects I	University C.		0			1
HIST191	Principles of Atatürk and the History of the Turkish Revolution I	University C.		2			3
SPS101	Humanity and Society I	University C.		3			6
TLL101	Turkish Language and Literature I	University C.		2			3
IF100	Computational Approaches to Problem Solving	University C.		3	5		5
*PROJ 201	*Undergraduate Project Course			1			1
			TERM TOTAL	**18**	**5**	**12**	**31**

The students have to take *Undergraduate Project Course (PROJ 201) on freshman or sophomore year.

Year -1 Freshman — Semester-2

Course Code	Course Name	Course Type	Prerequisite Courses	SU Credits	Engineering Credits (ECTS)	Basic Science Credits (ECTS)	ECTS (Total)
MATH102	Calculus II	University C.		3		6	6
NS102	Science of Nature II	University C.		4		6	6
AL102	Academic Literacies	University C.		3			5
HIST192	Principles of Atatürk and the History of the Turkish Revolution II	University C.		2			3
SPS102	Humanity and Society II	University C.		3			6
TLL102	Turkish Language and Literature II	University C.		2			3
*PROJ 201	*Undergraduate Project Course			1			1
			TERM TOTAL	**17**	**0**	**12**	**29**

The students have to take *Undergraduate Project Course (PROJ 201) on freshman or sophomore year.

Year - 2 Sophomore — Semester-3

Course Code	Course Name	Course Type	Prerequisite Courses	SU Credits	Engineering Credits (ECTS)	Basic Science Credits (ECTS)	ECTS (Total)
*PROJ 201	*Undergraduate Project Course			1			1
ENS 205	Introduction to Materials Science	required		3	4	2	6
ENS 202	Thermodynamics	required	NS 102	3	3	3	6
CHEM 212	General Chemistry for Engineers	required		3		6	6
MATH 203	Introduction to Probability	core		3		6	6
Elective	Elective	elective		3			6
Elective	Elective	elective		3			6
			TERM TOTAL	**18**	**7**	**17**	**36**

The students have to take *Undergraduate Project Course (PROJ 201) on freshman or sophomore year.

Year - 2 Sophomore — Semester-4

Course Code	Course Name	Course Type	Prerequisite Courses	SU Credits	Engineering Credits (ECTS)	Basic Science Credits (ECTS)	ECTS (Total)
*PROJ 201	*Undergraduate Project Course			1			1
MAT 204	Electronic, Optical and Magnetic Properties of Materials	required	MATH 101 + NS 101	3	2	4	6
NS 218	Fundamentals of Nanoscience	required	ENS 202	3	2	4	6
MATH 212	Linear Algebra and Differential Equations	required		4		6	6
PHYS 113	Basic Concepts of Physics for Scientists and Engineers	required		3		6	6
MAT 206	Kinetics of Materials	core	ENS 202 + ENS 205	3	5	1	6
ENS 209	Intro to Comp. Aided Modeling	core		3	5	1	6
			TERM TOTAL	**19**	**14**	**22**	**36**

The students have to take *Undergraduate Project Course (PROJ 201) on freshman or sophomore year.

Year - 3 Junior — Semester-5

Course Code	Course Name	Course Type	Prerequisite Courses	SU Credits	Engineering Credits (ECTS)	Basic Science Credits (ECTS)	ECTS (Total)
MAT 312	Materials Characterization	required	ENS 202 & MAT 204 & ENS 205	4	7		7
MAT 314	Mechanical Prop. of Materials	required		3	4	1	5
MAT 305	Polymer Engineering I	core		3	4	1	5
Elective	Elective	elective		3	6		6
Elective	Elective	elective		3	6		6
			TERM TOTAL	**16**	**27**	**2**	**29**

MAT 395	Internship Project	required		0	5	0	5

Year - 3 Junior — Semester-6

Course Code	Course Name	Course Type	Prerequisite Courses	SU Credits	Engineering Credits (ECTS)	Basic Science Credits (ECTS)	ECTS (Total)
MAT 306	Computational Techniques for Materials at the Nanoscale	required		3	4	2	6
MAT 307	Composite Materials	core	ENS 204	3	7	0	7
MAT 308	Phase Equilibria	core		3	4	1	6
MAT 302	Polymer Chemistry	core		4	2	5	7
Elective	Elective	elective		3			6
			TERM TOTAL	**16**	**17**	**8**	**32**

Year - 4 Senior — Semester-7

Course Code	Course Name	Course Type	Prerequisite Courses	SU Credits	Engineering Credits (ECTS)	Basic Science Credits (ECTS)	ECTS (Total)
ENS 491	Graduation Project	required	MAT 314 or MAT 312	1	2	0	2
MAT 401	Surface Science	core	NS 218	3	2	4	6
MAT 408	Intro. To Ceramic Materials	core	MAT 308 MAT 204 ENS 202 ENS 205	3	4	1	5
Elective	Elective	elective		3			6
Elective	Elective	elective		3			6
			TERM TOTAL	**13**	**8**	**5**	**25**

Year - 4 Senior — Semester-8

Course Code	Course Name	Course Type	Prerequisite Courses	SU Credits	Engineering Credits (ECTS)	Basic Science Credits (ECTS)	ECTS (Total)
ENS 492	Graduation Project (Implementation)	required	ENS 491	3	5	0	5
MAT 406	Introduction to Nanoscience/Fundamentals of Nanoengineering	core	NS 218	3	5	0	5
Elective	Elective	elective		3			6
Elective	Elective	elective		3			6
Elective	Elective	elective		3			6
			TERM TOTAL	**15**	**10**	**0**	**28**

					SU CREDITS TOTAL		**132**
		Engineering	**93**	**Science**	**78**	**ECTS CREDITS TOTAL**	**251**

The minimum ECTS requirement for graduation is 240 ECTS.

*PROJ 201 is displayed in multiple semesters only to indicate possible enrollment periods. This course is taken only once, and its credit is counted only once toward the graduation requirements.

TRACK ELECTIVE COURSES

Description: These tracks are not official specializations; they are suggested course groupings for students who wish to focus on a particular area within Materials Science and Nano Engineering. The lists include selected MAT-coded and related core/elective courses. Required core courses for the program and special topics courses are not included.

1. Suggested Courses for Materials Science and Nano engineering and "Inorganic materials processing and properties" Track

Course Code	Course Name	Suggested term	Prerequisite	SU Credits	ECTS
CS 201	Introduction to Computing	Fall	none	3	6
MAT 206	Kinetics	Spring	ENS 202 + ENS 205	3	6
MAT 308	Phase Equilibira	Spring	none	3	5
MAT 309	Transport Phenomena in Materials	Fall	none	3	6
MAT 401	Surface Science	Fall	NS 218	3	6
MAT 405	Advanced Materials Charac.	Fall	none	3	7
MAT 406	Nanoengineered Systems Fabrication	Spring	NS 218	3	5
MAT 408	Intro. To Ceramic Materials	Spring	MAT 308 MAT 204 ENS 202 ENS 205	3	5
MAT 422	Glass Science and Technology	Spring	ENS 205	3	6
MAT 424	Materials Selection in Product Design	Spring	ENS 205	3	6
EE 307	Semiconductor Physics and Devices	Fall	ENS 203	3	6
	Total credits			33	64

2. Suggested Courses for Materials Science and Nano engineering and "Polymers" Track

Course Code	Course Name	Suggested term	Prerequisite	SU Credits	ECTS
CS 201	Introduction to Computing	Fall	none	3	6
NS 207	Organic Chemistry	Fall	none	4	7
CHEM202	Chemical Kinetics	Spring	none	4	7
MAT 302	Polymer Chemistry	Spring	none	4	7
MAT 305	Polymer Engineering 1	Fall	none	3	5
MAT 309	Transport Phenomena in Materials	Fall	none	3	6
MAT 402	Polymer Engineering 2	Spring	ENS 205	3	6
MAT 404	Polymer Physics	Spring	ENS 205	3	5
MAT 405	Advanced Materials Charac.	Fall	none	3	7
MAT 424	Materials Selection in Product Design	Spring	ENS 205	3	6
MAT 416	Biomaterials Science and Biocompatibility	Spring	none	3	5
BIO 304	Biological Function and Structure	Spring	none	3	6
MAT 48004	Polymer Matrix Composites	Spring/Fall	none	3	6
MAT 580	Special Topic (Suggested: Polymer Engineering and Processes)	Spring/Fall	none	3	6
	Total credits			36	73

3. Suggested Courses for Materials Science and Nano engineering and "Composites" Track

Course Code	Course Name	Suggested term	Prerequisite	SU Credits	ECTS
CS 201	Introduction to Computers	Fall	none	3	6
NS 207	Organic Chemistry	Fall	none	4	7
CHEM202	Chemical Kinetics	Spring	none	4	7
MAT 302	Polymer Chemistry	Spring	none	4	7
MAT 305	Polymer Engineering 1	Fall	none	3	5
MAT 307	Composite Materials	Fall/Spring	ENS 204	3	7
MAT 309	Transport Phenomena in Materials	Fall	none	3	6
MAT 402	Polymer Engineering 2	Spring	ENS 205	3	6
MAT 404	Polymer Physics	Spring	ENS 205	3	5
MAT 405	Advanced Materials Charac.	Fall	none	3	7
MAT 424	Materials Selection in Product Design	Spring	ENS 205	3	6
MAT 48004	Polymer Matrix Composites	Spring/Fall	NS 207	3	6
ENS 204	Mechanics	Spring	NS 101	3	6
ME 412	Introduction to FEM	Spring	none	3	6
	Total credits			38	74

MINOR PROGRAMS

DESCRIPTIONS: To earn the Minor Certificate, requireduired must be completed and course(s) must be selected from the Elective Courses group.

Suggested for Elective Courses

Course Code	Course Name	SU Credits	ECTS	Prerequisite
Chemistry Minor				
CHEM 202	Chemical Kinetics	3	7	none
CHEM 301	Inorganic Chemistry	3	6	none
CHEM 302	Analytical Chemistry	3	7	none
CHEM 405	Electrochemistry	3	6	none
NS 207	Organic Chemistry	4	7	none
Physics minor				
PHYS 302	Solid State Physics	3	6	PHYS 303
PHYS 303	Quantum Mechanics 1	3	6	NS 102
PHYS 304	Quantum Mechanics 2	3	6	PHYS 303
PHYS 401	Classical Mechanics	3	6	none
PHYS 211	Modern Physics	3	6	NS 101
Energy Minor				
CHEM 405	Electrochemistry	3	6	none
ENS 202	Thermodynamics	3	6	NS 102
ENS 207	Introduction to Energy Systems	3	6	none
ENS 315	Energy	3	6	none
ME 309	Heat and Mass Transport	3	6	ME 307