



**NATIONAL TECHNICAL UNIVERSITY OF ATHENS
SCHOOL OF MINING AND METALLURGICAL ENGINEERING**

ERASMUS+ ACADEMIC COMMITTEE

email:secretary@metal.ntua.gr

Tel: +30210-772-2067

ECTS CREDITS ALLOCATION FOR THE ERASMUS+ PROGRAMME-SCHOOL OF MINING AND METALLURGICAL ENGINEERING

ECTS ALLOCATION AS FOLLOWS:

1st Semester

	MODULES A' Compulsory	HOURS PER WEEK		ECTS UNITS		
		LECTURES	PRACTICALS		Numerical based practicals	
			Laboratory Based Practicals			
1. 1.	Mathematics I	4	-	2	4	
2. 2.	Physics I	2	2	-	3	
3. 3.	Chemistry	2	3	-	7	
4. 4.	Mineralogy	2	2	-	5	
5. 5.	Introduction to Computer Programming	2	2	-	3	
6. 6.	Geology I	2	-	-	3	

		14	9	2	
	Total hours		25		25
	B' Electives				
	(Compulsory selection of one module)				
1. 1.	Philosophy and History of Science and Technology	2	-	-	2
2. 2.	Sociology	2	-	-	2
3. 3.	Evolution of Mining and Metallurgy	2	-	-	2
	C' Electives				
	Foreign Languages		2		-
	(Compulsory selection of 1 foreign language module)				
				-	-
				-	-
				-	-
				-	-
	Final Total hours per week		29		TOTAL ECTS=27
	2nd Semester				
	MODULES	HOURS PER WEEK			
	A' Compulsory		PRACTICALS	ECTS	
		LECTURES	Laboratory Based Practicals	Numerical based Practicals	
1. 1.	Mathematics II	4	-	2	4
2. 2.	Physics II	2	2	-	3
3. 3.	Geology II	2	2	-	5
4. 4.	Petrography	2	2	-	5

5. 5.	Introduction to Computing	2	2	-	3
6. 6.	Economics	2	-	-	2
7. 7.	Engineering Drawing-Mechanical Design-CAD	2	2		5
	Total hours	16	10	2	27
	B' Electives				
	Foreign Languages		2		-
	(Compulsory Selection of 1 Foreign Language)				
			-	-	-
			-	-	-
			-	-	-
			-	-	-
	Final Total hours		30		TOTAL ECTS=27
	3rd Semester				
	Modules	Hours		ECTS	
			Practicals		
	A' Compulsory	Lectures	Laboratory Based Practicals	Numerical based practicals	
1. 1.	Mathematics III	4	-	2	4
2. 2.	Engineering Mechanics (Statics)	2	-	2	3
3. 3.	Thermodynamics	3	-	1	5
4. 4.	Electric-Circuits-Electronics Technology	2	2	-	5
5. 5.	Design and Development of Information Technology	2	1	-	2
6. 6.	Numerical Analysis	2	-	2	3
		15	3	7	
	Total hours		25		22

	B' Electives				
	Foreign Languages		2		2
			-	-	-
			-	-	-
			-	-	-
	Final Total hours		26		Total ECTS = 29
5th Semester					
	Modules	Hours			ECTS
			Practicals		
	Compulsory	Lectures	Lab based practicals	Numerical based practicals	
1. 1.	Principles of Physical Metallurgy I	3	2	-	7
2. 2.	Extractive Metallurgy I	3	-	1	5
3. 3.	Mine Exploitation I	3	2	-	7
4. 4.	Mechanical Preparation and Processing of Minerals and Industrial Minerals I	4	-	1	7
5. 5.	Transport Phenomena II	2	1	-	4
6. 6.	Engineering Mechanics (Strength of Materials)	2	-	2	3
		17	5	4	
	Total hours		26		Total ECTS=33
6th Semester					
	ΜΑΘΗΜΑΤΑ	Hours			ECTS

	Compulsory	Lectures	Practicals		
			Lab based practicals	Numerical based practicals	
1. 1.	Principles of Physical Metallurgy II	3	2	-	7
2. 2.	Operational Research	2	-	1	4
3. 3.	Extractive Metallurgy II	3	-	1	5
4. 4.	Mine Exploitation II	2	2	-	5
5. 5.	Mechanical preparation and processing of minerals and Industrial minerals II	2	2	-	5
6. 6.	Principles of Production Organisation-Business Administration	1	1	-	3
7. 7.	Environment I (Introduction to Environmental Engineering and Science)	2	2	-	5
		15	9	2	
	Total hours		26		Total ECTS=34

Total ECTS Credits Semester 1 to 6 (inclusive)=172

During the summer, following completion of Semester 6, Field Training takes place, a compulsory module of the 7th Semester.

<u>7th Semester</u>					
	Module	Hours			ECTS
		Lectures	Practicals	Numerical based practicals	
	Compulsory	Lectures	Lab based practicals	Numerical based practicals	
1. 1.	Engineering Geology I	2	2	-	5

2. 2.	Reinforced Concrete-Steel Structures	2	1	-	4
3. 3.	Environment II (Environmental Protection in Mining and Metallurgy)	2	-	2	5
4. 4.	Rock Excavation I (Εξόρυξη με Εκρηκτικές Ύλες)	3	2	-	7
5. 5.	Safety-Health-Legislation	2	-	1	4
6. 6.	Extractive Metallurgy of Iron I	2	2	-	5
7. 7.	Elements of Mechanical Engineering	2	-	2	5
8. 8.	Field Training I	-	-	-	8
		16	7	4	
	Total hours		27		Total ECTS=43

	8th Semester				
	Streams:				
	I. Mining Engineering	Hours		ECTS	
			Practicals		
		Lectures	Lab based practicals	Numerical based practicals	
1. 1.	Underground Excavation Support	2	2	-	4
2. 2.	Rock Mechanics	2	3	-	4
3. 3.	Rock Excavation II (Excavation with mechanical means)	3	1	-	4
4. 4.	Well Technology	3	1	-	4
5. 5.	Materials handling systems in heavy construction and mining	3	1	-	4
6. 6.	Marble and Insustrial Minerals	2	1	-	4
7. Γ	Geostatistics	2	1	-	4
	Total hours	17	10		
			27		Total ECTS

					=24 (6 modules)
	II. Geo-engineering	Hours		ECTS	
			Practicals		
		Lectures	Lab based practicals	Numerical based practicals	
1. 1.	Underground Excavation Support	2	2	-	4
2. 2.	Rock Mechanics	2	3	-	4
3. 3.	Rock Excavation II (Excavation with Mechanical means)	3	1	-	4
4. 4.	Well Technology	3	1	-	4
5. 5.	Engineering Geology II	3	1	-	4
6. 6	Soil Mechanics and Foundation Engineering	2	2	-	4
7. 7	Geostatistics	2	1	-	4
	Total hours	17	11		
			28		Total ECTS 24 (for 6 modules)
	III. Metallurgical Processes	Hours		ECTS	
			Practicals		
		Lectures	Lab based practicals	Numerical based practicals	
1. 1.	Extractive Metallurgy of Iron II	3	-	1	4
2. 2.	Hydrometallurgy	1	3	-	4
3. 3.	Technology of Cement and Concrete Production	2	1	-	4
4. 4.	Chemical Kinetics	3	-	1	4
5. 5.	Laboratory training in Basic Metallurgical Unit Operations	-	3	-	4
		9	7	2	

	Total hours		18		Total ECTS 20 (for 5 modules)
	IV. Materials Science and Engineering	Hours		ECTS	
			Practicals		
		Lectures	Lab based practicals	Numerical based practicals	
1. 1.	Metallurgy of Welding and Control of Weldments	2	2	-	4
2. 2.	Ceramics	3	1	-	4
3. 3.	Polymers and Composites	2	1	-	4
4. 4.	Solidification Casting and non-Destructive Testing	2	1	-	4
5. 5.	Electronic Materials	2	2	-	4
6. 6.	Solid-Solid State Phase Transformations	2	2	-	4
		13	9		
	Total hours		22		Total ECTS 24 (for 6 modules)
	V. Environmental Engineering and Geo-Engineering				
			Hours	ECTS	
			Practicals		
		Lectures	Lab based practicals	Numerical based practicals	
1. 1.	Environmental Hydrogeology	2	2	-	4
2. 2.	Environmental Geochemistry	2	1	-	4
3. 3.	Environmental Mining and Quarry Engineering (Selected Topics)	2	2	-	4
4. 4.	Soil Remediation Techniques	2	2	-	4

5. 5.	Methods of Air Waste Treatment	2	-	1	4
6.	Geostatistics	2	1	-	4
Total hours		12	8	1	
			21		Total ECTS 24 (for 6 modules)
Pool Courses					ECTS
1. 1.	Science and Technology of Geothermal Fields	2	1	-	4
2. 3.	Mineral Economics	2	1	-	4
3. 4.	Environment and Growth	3	-	-	4
4. 5.	Automatic Process Control	3	-	-	4
5. 6.	Industrial Minerals and Rocks	2	1	-	4
6. 7.	Geodesy and Mine Surveying	2	-	1	4
7. 8.	Solid State Physics	2	-	-	4
8. 9.	Environment and Growth	3	-	-	4
9. 10.	Elements of Machining	1	2	-	4
<p>During the summer time following conclusion of 8th Semester and the beginning of the 9th Semester, Field Training II takes place, a compulsory module of the 9th Semester, carried out in topics related to the specific Stream each student is following.</p>					

9th Semester						
Streams:						
I. Mining Engineering						
			Hours		ECTS	
			Lectures	Practicals		
				Lan Based Practicals	Numerical based Practicals	
1. 1.	Applied Geophysics		2	2	-	4
2. 2.	Open Pit Planning		2	1	-	4
3. 3.	Tunelling Engineering		2	2	-	4
4. 4.	Underground Mining		3	1	-	4
5. 5.	Petroleum Engineering		2	1	-	4
6. 6.	Geological Mapping and Tectonic Analysis		2	1	-	4
7. 7.	Field Training II *		-	-	-	11
Total hours			13	8		
				21		
						ECTS 20 (for 5 modules) Total ECTS 31 (for 5 modules+ Field Training II)
II. Geo-Engineering						
			Hours		ECTS	
				Practicals		
			Lectures	Lab based Practicals	Numerical based	

				Practicals	
1. 1.	Applied Geophysics	2	2	-	4
2. 2.	Underground works	1	-	1	4
3. 3.	Tunnelling Engineering	2	2	-	4
4. 4.	Applied Hydrogeology	2	1	-	4
5. 5.	Enhancement of geotechnical behaviour of geological formations	2	1	-	4
6. 6.	Geological Mapping and Tectonic Analysis	2	1	-	4
7. 7.	Field Training II *	-	-	-	11
		12	6	1	
	Total hours		19		ECTS 20 (for 5 modules) Total ECTS 31 (for 5 modules+ Field Training II)
	III. Metallurgical Engineering	Hours		ECTS	
			Practicals		
		Lectures	Lab based practicals	Numerical based practicals	
1. 1.	Metallurgical Reactor Design	2	1	-	4
2. 2.	Plant Design of Metallurgical Plants	2	2	-	4
3. 3.	Design and Construction of Mineral Processing Plants	2	2	-	4
4. 4.	Metallurgy of Non-Ferrous Metals	2	-	1	4
5. 5.	Refractories	2	1	-	4

6. 6.	Field Training II *	-	-	-	11
		10	6	1	
	Total hours		17		ECTS 20 (for 5 modules) Total ECTS 31 (for 5 modules+ Field Training II)
* Field Training is compulsory for all Streams					
	IV. Materials Science and Engineering	Hours		ECTS	
			Practicals		
		Lectures	Lab based practicals.	Numerical Based Practicals	
1. 1.	Refractories	2	1	-	4
2. 2.	Surface Technology	2	2	-	4
3. 3.	Metal Forming	3	1	-	4
4. 4.	Polymer and Composite Processing	2	1	-	4
5. 5.	Ferrous Physical Metallurgy	2	2	-	4
6. 6.	Industrial Alloys	2	1	-	4
7. 7.	Field Training II *	-	-	-	11
		13	8		
	Total hours		21		ECTS 20 (for 5 modules) Total ECTS 31

					Training II)
	Pool modules				
		Hours			ECTS
			Practicals		
		Lectures	Lab based Practicals	Numerical based practicals	
1. 1.	Project Management	2	1	-	4
2. 2.	Geographical Information Systems	2	2	-	4
3. 3.	Simulation of Mining Systems	2	1	-	4
4. 4.	Computer Applications in Geology	1	2	-	4
5. 5.	Statistical Methods in Research and Production	2	1	-	4
6. 6.	Applied Mineralogy	1	2	-	4
7. 7.	Powder Metallurgy	2	1	-	4
8. 8.	Quality Assurance-Certification	2	2	-	4
9. 9.	Economic Evaluation of Investment	2	1	-	4
10.	Entrepreneurship and Innovation	2	-	-	4
					ECTS
10th Semester					
Diploma Thesis					30