

1st SEMESTER

CODE	MODULES	HOURS PER WEEK			ECTS
		Lectures	Practicals	Laboratory	
Compulsory					
7003	Geology	2	2	-	5
7024	Mathematics I	4	2	-	5
7287	Minerology - Petrology	2	-	2	5
7054	Physics I (Mechanics, Oscillations and Waves)	2	-	2	5
7222	Chemistry	2	-	3	5
7166	Historic evolution of mining & metallurgy	2	-	-	3
TOTAL HOURS		14	4	7	28
ELECTIVES (HUMANITIES AND SOCIAL SCIENCES COURSES)					
Compulsory selection of one module					
7120	Principles of economics (Macro - and micro economics)	2	-	-	3
7224	Applied philosophy of technology	2	-	-	3
7102	Sociology of science and technology	2	-	-	3
TOTAL HOURS			27		31

2nd SEMESTER

MODULES	HOURS PER WEEK			ECTS	
	Lectures	Practicals	Laboratory		
Compulsory					
7195	Introduction to programming (Programming language Python)	2	2	-	4
7225	Thermodynamics	3	1	-	5
7072	Mathematics II	3	3	-	5
7286	Engineering economics	2	1	-	5
7253	Physics II - Electromagnetism and optics	2	2	-	5
TOTAL HOURS		12	9	-	24
ELECTIVES (ENGINEERING FUNDAMENTAL COURSES) 2nd & 4th semester					
Compulsory selection of one module					
7273	Principles of nanotechnology and electron Microscopy	2	-	2	4
7297	Principles of production organization-Project management	2	1	-	4
7196	Introduction to the electric and electronic systems	2	-	2	4
7215	Geographic information systems (GIS)	2	-	2	4
7293	Artificial intelligence and Machine Learning algorithms	2	1	-	4
7078	English Language	2	-	-	4
7079	French Language	2	-	-	4
TOTAL HOURS			23-25		28

3rd SEMESTER					
MODULES		HOURS PER WEEK			ECTS
Compulsory					
		Lectures	Practicals	Laboratory	
7230	Basic principles for materials and energy management in the production chains	2	1	-	5
7005	Ore deposit geology	2	-	2	5
7229	Mathematics III (ordinary differential equations)	4	-	2	5
7049	Technical mechanics - Statics	1	2	-	5
7294	Hydrogeology	2	2	-	5
	TOTAL HOURS	11	5	4	25
ELECTIVES (ENGINEERING FUNDAMENTAL COURSES) 3rd & 5th semester					
Compulsory selection of one module					
7232	Analytical chemistry and physical methods of analysis	2	-	3	4
7227	Numerical analysis	2	2	-	4
7063	Operations research and decision analysis	2	1	-	4
7133	Elements of mechanical design	2	2	-	4
7226	Computer aided design - Mechanical design	2	2	-	4
	TOTAL HOURS		25-27		29

4th SEMESTER					
MODULES		HOURS PER WEEK			ECTS
Compulsory					
		Lectures	Practicals	Laboratory	
7274	Transport phenomena principles	2	1	-	5
7258	Introduction to environmental science & engineering	2	-	2	5
7088	Probability theory and statistics	2	2	-	5
7104	Subsurface exploration methods - Mineral exploration	4	1	-	5
7094	Technical mechanics - Strength of materials	3	2	-	5
	TOTAL HOURS	13	6	2	25
ELECTIVES (ENGINEERING FUNDAMENTAL COURSES) 2nd & 4th semester					
Compulsory selection of one module					
7273	Principles of nanotechnology and electron Microscopy	2	-	2	4
7297	Principles of production organization-Project management	2	1	-	4
7196	Introduction to the electric and electronic systems	2	-	2	4
7215	Geographic information systems (GIS)	2	-	2	4
7293	Artificial intelligence and Machine Learning algorithms	2	1	-	4
7082	English Language	2	-	-	4
7083	French Language	2	-	-	4
	TOTAL HOURS		23-25		29

5th SEMESTER					
MODULES		HOURS PER WEEK			ECTS
Compulsory					
		Lectures	Practicals	Laboratory	
7012	High temperature processing	2	2	-	5
7228	Introduction to physical metallurgy	3	-	2	6
7210	Mechanical preparation and processing of minerals I	4	1	-	5
7233	Surface mine exploitation	2	2	-	5
	TOTAL HOURS	11	5	2	21

ELECTIVES (ENGINEERING FUNDAMENTAL COURSES) 3rd & 5th semester**Compulsory selection of one module**

7232	Analytical chemistry and physical methods of analysis	2	-	3	4
7227	Numerical analysis	2	2	-	4
7063	Operations research and decision analysis	2	1	-	4
7133	Elements of mechanical design	2	2	-	4
7226	Computer aided design - Mechanical design	2	2	-	4

ELECTIVES (ENGINEERING SPECIALIZATION COURSES) 5th & 7th semester**Compulsory selection of one module**

7272	Principles and applications of biotechnology	2	-	2	4
7231	Geodynamics and geology of Greece	2	2	-	4
7155	Applied & environmental mineralogy	2	-	2	4
7296	Computational chemical thermodynamics	2	1	-	4
7150	Solid state physicochemistry	2	-	-	4
TOTAL HOURS			23-27		29

6th SEMESTER**MODULES****HOURS PER WEEK****Compulsory**

		Lectures	Practicals	Laboratory	ECTS
7151	Physical metallurgy - The alloys	3	-	2	5
7173	Mechanical preparation and processing of minerals II	2	-	2	5
7237	Practical training I	-	-	-	6
7092	Engineering geology - Geohazards	2	-	2	6
7066	Hydrometallurgical unit operations	3	2	-	6
TOTAL HOURS		10	2	6	28
			18		

ELECTIVES (ENGINEERING SPECIALIZATION COURSES)**Compulsory selection of one module**

7277	Corrosion and Protection of Metallic Materials	2	-	2	4
7145	Elements of reinforced concrete and steel structures	1	2	-	4
TOTAL HOURS			21-22		32

7th SEMESTER**MODULES****HOURS PER WEEK**

		Lectures	Practicals	Laboratory	ECTS
7181	Health & Safety	2	1	-	5
7235	Applied environmental protection	2	2	-	6
7035	Iron and steel metallurgy	3	2	-	5
7034	Rock mechanics	2	1	2	6
7264	Underground mine exploitation	2	2	-	6
TOTAL HOURS		11	8	2	28
			21		

ELECTIVES (ENGINEERING SPECIALIZATION COURSES) 5th & 7th semester**Compulsory selection of one module**

7272	Principles and applications of biotechnology	2	-	2	4
7231	Geodynamics and geology of Greece	2	2	-	4
7155	Applied & environmental mineralogy	2	-	2	4
7296	Computational chemical thermodynamics	2	1	-	4
7150	Solid State Physicochemistry	2	-	-	4
TOTAL HOURS			23-25		32

8th SEMESTER**MINING ENGINEERING**

MODULES	HOURS PER WEEK			ECTS
	Lectures	Practicals	Laboratory	
7031 Geostatistics	2	2	-	4
7017 Rock blasting	3	-	1	4
7176 Marbles and industrial minerals	2	-	1	4
7175 Petroleum engineering	2	1	-	4
7242 Drilling engineering	3	1	-	4
7255 Practical training II / Internship	-	-	-	10
				30

GEO - ENGINEERING

MODULES	HOURS PER WEEK			ECTS
	Lectures	Practicals	Laboratory	
7009 Soil mechanics	2	2	-	4
7268 Methods of geological mapping and tectonic analysis	2	2	-	4
7265 Underground Works	2	1	-	4
7186 Groundwater and construction works	2	2	-	4
7065 Support of underground works	2	2	-	4
7255 Practical training II / Internship				10
				30

ENVIRONMENTAL ENGINEERING AND GEO-ENGINEERING

MODULES	HOURS PER WEEK			ECTS
	Lectures	Practicals	Laboratory	
7241 Remediation of contaminated soils	2	-	2	4
7238 Groundwater management and protection	2	2	-	4
7240 Special topics of environmental protection in mining and geotechnical engineering	2	2	-	4
7239 Environmental geochemistry	2	1	-	4
7219 Air pollution control	3	1	-	4
7255 Practical training II / Internship	-	-	-	10
				30

METALLURGICAL PROCESSES

MODULES	HOURS PER WEEK			ECTS
	Lectures	Practicals	Laboratory	
7282 Processing and utilisation of industrial minerals	1	-	1	4
7214 Laboratory exercises in pyrometallurgy		-	3	4
7077 Electrometallurgical Processes	2	-	2	4
7189 Metallurgy of non-ferrous metals	3	-	-	4
7192 Technology of cement and concrete production	2	1	-	4
7255 Practical training II / Internship	-	-	-	10
				30

MATERIALS SCIENCE AND ENGINEERING

MODULES	HOURS PER WEEK			ECTS
	Lectures	Practicals	Laboratory	
7059 Industrial non-ferrous alloys	2	-	2	4
7153 Ceramic Materials	3	-	1	4
7117 Metallurgy of welding, technology & control of weldments	3	-	3	4
7167 Solid to solid state phase transformations	2	-	2	4
7157 Polymers and composites	2	1	-	4
7255 Practical training II / Internship	-	-	-	10
				30

POOL COURSES

MODULES	HOURS PER WEEK			ECTS
	Lectures	Practicals	Laboratory	
7218 Principles of machining	1	2	-	4
7275 Gemology	2	-	1	4
7278 Solid industrial and hazardous waste management	2	1	-	4
7246 Special chapters in ore deposit geology	2	1	-	4
7159 Geothermal fields science and technology	2	1	-	4
7244 Magnetic materials	2	-	2	4
7177 Economics of mineral resources	1	1	-	4
7267 Environment and development	2	1	-	4
7289 Environmental policies and framework for the exploitation of mineral raw materials	2	1	-	4
7260 Environmental chemistry and metals mobility mechanisms	2	2	-	4
7290 Earth and space rocks	2	1	-	4
7190 Design and techno economic analysis of metallurgical industries	1	3	-	4

9th SEMESTER**MINING ENGINEERING**

MODULES	HOURS PER WEEK			ECTS
	Lectures	Practicals	Laboratory	
7174 Mechanical rock excavation	2	1	1	4
7061 Applied geophysics (short presentation)	2	1	1	4
7211 Conventional and robotic mining systems	2	2	-	4
7112 Open pit mine planning and design	2	2	-	4
7111 Underground Mine Planning and Design	3	1	-	4

20**GEO - ENGINEERING**

MODULES	HOURS PER WEEK			ECTS
	Lectures	Practicals	Laboratory	
7202 Geotechnical ground improvement technics	2	1	-	4
7270 Special topics in geotechnical engineering	2	2	-	4
7291 Principles of foundations and retaining structures	2	2	-	4
7200 Design and construction of tunnels	2	2	-	4
7171 Engineering geology of mining and civil construction	3	-	1	4

20**ENVIRONMENTAL ENGINEERING AND GEO-ENGINEERING**

MODULES	HOURS PER WEEK			ECTS
	Lectures	Practicals	Laboratory	
7259 Solid waste management - Material recycling	2	1	-	4
7261 Enviromental and natural resources management	2	1	-	4
7281 Energy and environment	2	1	-	4
7283 Geostatistics for environmental applications	2	1	-	4
7110 Waste water treatment technologies	2	2	-	4

20**METALLURGICAL PROCESSES**

MODULES	HOURS PER WEEK			ECTS
	Lectures	Practicals	Laboratory	
7276 Secondary metallurgy	2	-	2	4
7052 Applied hydrometallurgy	2	-	2	4
7256 Design and construction of mineral processing plants	2	2	-	4
7030 Reactor design	2	1	-	4
7143 Chemical Kinetics	3	1	-	4

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MATERIALS SCIENCE AND ENGINEERING**MODULES****HOURS PER WEEK**

		Lectures	Practicals	Laboratory	ECTS
7284	Casting & forming processes of metals	5	-	-	4
7263	Powder metallurgy & additive manufacturing (emphasis on 3D printing)	3	-	-	4
7179	Advanced physical metallurgy of iron and steel	2	-	2	4
7048	Refractory materials	2	-	1	4
7204	Surface engineering	2	-	2	4
					20

POOL COURSES**MODULES****HOURS PER WEEK**

		Lectures	Practicals	Laboratory	ECTS
7236	Total quality management principles - Quality control	2	1	-	4
7279	Natural disaster management	1	1	-	4
7280	Alternative energy systems in the industry	2	1	-	4
7285	Fatigue and fracture	2	-	2	4
7220	Polymers and composites processing	2	1	-	4
7288	Hydrocarbon production engineering	2	1	-	4
7183	Mining systems simulation	1	1	-	4
7203	Groundwater modelling	1	2	-	4
7108	Advanced investment analysis	1	1	-	4
7090	Automatic process control	3	-	-	4
7292	Stochastic simulation of geological systems	2	1	-	4
7136	Modern methods in topographic mapping	2	1	-	4
7295	Computational methods on metallurgy and materials technology	1	4	-	4

10th SEMESTER

Diploma Thesis

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