SUSTAINABLE MINING of MINERAL RESOURCES - MASTER

The mission of this study program is to provide and train specialists in the field of mining exploitation by acquiring educational skills, training and knowledge required according to the actual requirements of higher education and also to the requirements of the sustainable exploitation of underground mineral resources. The graduates of this study program of master may fall on the labor market into the following occupations: mining engineer, junior assistant mining engineer, advisor mining engineer, expert mining engineer, inspector specialized mining engineer, expert reviewer mining engineer, designer engineer in mining field, and mining researcher in mining exploitation. The disciplines in the curriculum: *Applied Geology; Mining geology and geopolitics; Geo-modelling, Resources and Reserves; Instabilities Modelling in Geomechanics; Actual (modern) mining machines and installations; Mining and sustainable development; Risk Management; Metal recovery and recycling techniques; Occupational Health and Safety; Mining economy; Projects Management*.

UNIVERSITY OF PETROSANI Academic Year 2015/2016
FACULTY OF MINING ENGINEERING
Field of Study: **MINES, OIL AND GAS**
Study Program: **SUSTAINABLE MINING of MINERAL RESOURCES**
Master Studies
Form of Study: Long-term
Official Length of the Study Program: **2 years** (4 semesters)

CURRICULUM

YEAR ONE SEMESTER ONE

Cod	Discipline	Type	Semester I				Total hours	Type examination	Credits
			C	S	L	P			
COMPULSORY DISCIPLINES									
UP-FM-EDRM-11-01	Applied Geology	DA	2	2	-	-	56	**C**	7
UP-FM-EDRM-11-02	Mining Geology and Geopolitics	DA	2	-	2	-	56	**E**	8
UP-FM-EDRM-11-03	Geo-modelling, Resources and Reserves	DCA	2	2	-	-	56	**E**	8
UP-FM-EDRM-11-04	Instabilities Modelling in Geomechanics	DS	2	-	2	-	56	**E**	7
TOTAL			**8**	**3**	**4**	**1**	**224**	**-**	**30**

YEAR ONE SEMESTER TWO

Cod	Discipline	Tip	Semester II				Total hours	Type examination	Credits
			C	S	L	P			
COMPULSORY DISCIPLINES									
UP-FM-EDRM-12-05	Actual Mining Machines and Installations	DS	2	1	-	1	56	**E**	7
UP-FM-EDRM-12-06	Mining Exploitation and Sustainable Development	DCA	2	-	2	1	70	**E**	8
UP-FM-EDRM-12-07	Risk Management	DA	2	2	-	-	56	**E**	8
UP-FM-EDRM-12-08	Metal Recovery and Recycling Techniques	DS	2	-	1	-	42	**C**	7
TOTAL			**8**	**3**	**3**	**2**	**224**	**-**	**30**

YEAR TWO SEMESTER ONE

Cod	Discipline	Tip	Semester III				Total hours	Type examination	Credits
			C	S	L	P			
COMPULSORY DISCIPLINES									
UP-FM-EDRM-21-09	Health and Safety	DCA	2	2	-	-	56	**E**	8
UP-FM-EDRM-21-10	Mining Economy	DS	2	-	2	-	56	**E**	7
UP-FM-EDRM-21-11	Projects Management	DS	2	2	-	-	56	**E**	7
UP-FM-EDRM-21-12	Internships	DA	-	-	4	-	56	**C**	8
TOTAL			**6**	**4**	**6**	**-**	**224**		**30**

YEAR TWO SEMESTER TWO

Cod	Discipline	Tip	Semester IV				Total hours	Type examination	Credits
			C	S	L	P			
COMPULSORY DISCIPLINES									
UP-FM-EDRM-22-13	Research and Documentation achievement for dissertation	DA					56 L	**C**	10
UP-FM-EDRM-22-14	Completion Achievement of dissertation	DA					168 P	**C**	20
TOTAL							**224**		**30**

Rector,
Prof.univ.dr.ing. Sorin Mihai RADU

Dean,
Prof.univ.dr.ing.ec. Andreea Cristina IONICĂ

SYLLABUS

1. Data regarding the programme

1.1 Higher Education Institution	**UNIVERSITY OF PETROSANI**
1.2 Faculty	FACULTY OF MINES
1.3 Departament	MANAGEMENT, ENVIRONMENTAL ENGINEERING AND GEOLOGY
1.4 Field of study	MINES, OIL AND GAS
1.5 Cycle of higher education[1)]	MASTER
1.6 Study programme/Qualification	

2. Information regarding the discipline

2.1 Name of the discipline	**APPLIED GEOLOGY**						
2.2 In charge with the course				**Assoc. Prof. PhD Adrian FLOREA**			
2.3 In charge with seminar / laboratory/ project				**Lecturer PhD Csaba LORINT**			
2.4 Year of study	**I**	2.5 Semester	**I**	2.6 Type of evaluation	**C**	2.7 Compulsivity[2)]	**DO**

3. Total estimated time (hours per semester)

3.1 Number of hours per week	**4**	out of which: 3.2 course	**2**	3.3 seminar/ laboratory/ project	**2**
3.4 Number of hours in the curriculum	**56**	out of which: 3.5 course	**28**	3.6 seminar/ laboratory/ project	**28**

Time distribution	**hours**
Study of textbooks, courses, bibliography and notes	**28**
Supplementary study in the library, e-learning platforms and on the field	**56**
Preparation of seminars/ laboratories/ projects, homeworks, reports, portfolios and essayes	**33**
Tutoring	**14**
Examinations	**2**
Other activities.....	-

3.7 Total hours of independent study	**133**
3.8 Total hours per semester	**189**
3.9 Number of credits[3)]	**7**

4. Preconditions (where applicable)

4.1 of curriculum	• Geology, Computer Engineering, Descriptive geometry, Survey, Prospecting and exploration
4.2 of competences	• C1. Proper application of mathematical and engineering theories.

5. Conditions (where applicable)

5.1 for the course	• The room must be equipped with video projector and projection screen; • The room must have an Internet connection (wired or wireless); • The students must shut down their cell phones during the activities; • Punctuality;
5.2 for the seminar/ laboratory/ project	• The room must be equipped with video projector and projection screen; • The room must have computers and Internet connection (wired or wireless); • The computers must have installed proper software; • Fulfilling the obligations related to the content of the laboratory activities;

6. Specific earned competences

Professional competences	• Acquire and use field methods in geology; • Collection and geologically-informed interpretation of data with a view to identifying the geological structures; • Ability to create geological data bases; • Ability to read and create geological maps and other graphical representation of geological data; • Ability to use professional software for resource estimation and analysis of uncertainty;

Transversal competences	• The existence of professional concerns for improving business results by taking roles in a multidisciplinary team work; • Involvement in research, such as documentation, development of bibliographic summaries, possibly some papers and specialty items; • Participation in scientific and demonstration projects having the ability to identify opportunities for their future training.

7. Objectives of the discipline (from the competence grid)

7.1 Overall objective	• Learning the techniques of in situ measurements, geological maps, geological sections and lithological columns execution.
7.2 Specific objective	• Learning the issues related to the achievement of virtual reality according to geo-mining conditions. • Acquiring the skills for proper handling of information between different software applications.

8. Contents

8.1 Course	Teaching methods	Observations
Field methods in geology.	Lectures and debates with students	1 course = 2 hours
Structural geology	Lectures and debates with students	2 course = 4 hours
Surpac Vision. Presentation, fundamental concepts, graphical user interface, menus and toolbars, ways of working, helpful resources. Data structure, types of files, import data from external sources. Data management tools in layers, generating surfaces and volume calculations. Data regularization, making sections, introduction to plotting.	Lectures and debates with students	3 course = 6 hours
Solid modeling. Concepts, terminology. Data preparation. Creating solid. Triangulation techniques. Bifurcation techniques.Centerline and profile. Solids intersection. Create sections. Report volume of solids	Lectures and debates with students	3 course = 6 hours
Plotting in Surpac. Plan view plotting. Three dimensional plotting. Section plotting.	Lectures and debates with students	3 course = 6 hours
Plan view map of drillhole traces. Section view map of drillhole data. Creating multi-viewport maps	Lectures and debates with students	2 course = 4 hours

Bibliography

1. Bateman, J., coord., Solids modelling in Surpac VISION, Surpac Minex GROUP Pty Ltd (a Gemcom Company), Perth, Western Australia, 2006
2. Bristol, R., coord., GEOSTATISTICS in Surpac VISION, Surpac Minex GROUP Pty Ltd (a Gemcom Company), Perth, Western Australia, 2006
3. Bristol, R., Kumar, K., Jackson, P., DTM surfaces in Surpac VISION, Surpac Minex GROUP Pty Ltd (a Gemcom Company), Perth, Western Australia, 2007
4. Florea Adrian, Proiectare şi planificare minieră asistată – *note de curs*, Petroşani, 2012
5. ***, Geology database, Surpac Minex GROUP Pty Ltd (a Gemcom Company), Perth, Western Australia, 2005

8.2 Seminar/ laboratory/ project	Teaching and learning methodes	Observations
Geological compass. Construction and use for dip and dip-direction of surfaces (foliations), and plunge and plunge-direction of lines (lineations) measurement	Solving applications with the students	1 session
Faults and fractures	Solving applications with the students	2 sessions
Familiarisation with Surpac interface and data manipulation methods. Setting the working directory. Menu structure, ways of calling a command.	Solving applications with the students	1 session
Managing data in layers. Digitizing and editing exercises of strings, segments and points.	Solving applications with the students	1 session
Coordinate import, DTM creation, making sections.	Solving applications with the students	1 session
Geological database - visualization styles of drill holes and lithological columns, plotting lithological	Solving applications with the students	1 session

columns		
Data preparation for solid modelling. Triangulation techniques. Bifurcation techniques.Centerline and profile. Solids intersection, union, outersection. Create sections. Report volume of solids	Solving applications with the students	4 sessions
Plan view plotting. Three dimensional plotting. Section plotting. Plan view map of drillhole traces. Section view map of drillhole data. Creating multi-viewport maps	Solving applications with the students	3 sessions

Bibliography

1. Bateman, J., coord., Solids modelling in Surpac VISION, Surpac Minex GROUP Pty Ltd (a Gemcom Company), Perth, Western Australia, 2006
2. Bristol, R., Jackson, P.,Kumar, K., Plotting in Surpac VISION, Surpac Minex GROUP Pty Ltd (a Gemcom Company), Perth, Western Australia, 2007
3. Buia Gr., Rebrişoreanu M., *Lucrări practice de cartografie geologică* – caiet, Litografia Universităţii din Petroşani, 1989
4. Richardson, S., Bristol, R., Jackson, P., Introduction to Surpac VISION, Surpac Minex GROUP Pty Ltd (a Gemcom Company), Perth, Western Australia, 2006
5. www.gemcomsoftware.com

9. Corroboration of the contents of the discipline with the expectations of the epistemic communities, professional associations and relevant employers in the domain related to the programme

10. Evaluation

Type of activity	10.1 Criteria of evaluation	10.2 Methods of evaluation	10.3 Weight in the final grade
10.4 Course	• Knowledge of basic notions and concepts of computer aided design • Acquiring the methodology of elaboration of geologic maps and sections • Assimilation of data manipulation procedures, specific to computer aided design	Computer exam, access to exam is conditioned by the presence during the semester. To consider the scores obtained on portfolio work, the student must obtain at least half of the announced score sample exam.	50%
10.5 Seminar/ laboratory/ project	• Understanding the issues dealt with in the course and laboratory • The correct application of the methodology of work • Understanding and correct application of data manipulation procedures	Presenting work to solve issues launched during the semester is a requirement for access to the final examination. They are taught throughout the semester until the last week of teaching activity.	50%
10.6 Minimal standard of performance			
• Knowledge of basic notions and concepts of computer aided design • Acquiring techniques of digitization of information; • Acquiring techniques of geological database interrogation			

Date	Signature of the person in charge with course	Signature of the person in charge with seminar/ laboratory/ project
30.05.2016	Assoc.Prof.Ph.D. Adrian FLOREA	Lecturer PhD Csaba LORINT

Notă:

1) Cycle of higher education – *one of the cycles:* Bachelor/ Master/ Doctoral degree;

2) Compulsivity – *choose one of the options:* **DO** (compulsory)/ **Dopt** (optional)/ **DF** (facultative);

3) One credit is equivalent of 27 hours of study (teaching activity and independent study).

SYLLABUS

1. Data regarding the programme

1.1 Higher Education Institution	**UNIVERSITY OF PETROSANI**
1.2 Faculty	FACULTY OF MINING ENGENEERING
1.3 Departament	Management, Environmental Engeneering and Geology
1.4 Field of study	MINES, OIL AND GAS
1.5 Cycle of higher education[1)]	Master
1.6 Study programme/Qualification	SUSTAINABLE EXPLOITATION OF MINERAL RESOURCES

2. Information regarding the discipline

2.1 Name of the discipline	Mining geology and geopolitics						
2.2 In charge with course				Professor, PhD.Eng. Grigore BUIA			
2.3 In charge with seminar / laboratory/ project				Lecturer, PhD.Eng. Csaba R. LORINȚ			
2.4 Year of study	**I**	2.5 Semester	**I**	2.6 Type of evaluation	**ES**	2.7 Compulsivity[2)]	**DO**

3. Total estimated time (hours per semester)

3.1 Number of hours per week	**4**	out of which: 3.2 course	**2**	3.3 seminar/ laboratory/ project	**2**
3.4 Number of hours in the curriculum	**56**	out of which: 3.5 course	**28**	3.6 seminar/ laboratory/ project	**28**

Time distribution	hours
Study of textbooks, courses, bibliography and notes	**48**
Supplementary study in the library, e-learning platforms and on the field	**56**
Preparation of seminaries/ laboratories/ projects, homeworks, reports, portfolios and essayes	**28**
Tutoring	**18**
Examinations	**10**
Other activities.....	

3.7 Total hours of independent study	**160**
3.8 Total hours per semester	**216**
3.9 Number of credits[3)]	**8**

4. Preconditions (where applicable)

4.1 of curriculum	• Mineralogy and petrology • Geology • Ore deposits geology
4.2 of competences	•

5. Conditions (where applicable)

5.1 for the course	• Room with computer and projector • The students must shut down their cell phones during the activities; • Punctuality;
5.2 for the seminar/ laboratory/ project	• Fulfilling the obligations related to the content of the laboratory activities;

6. Specific earned competences

Professional competences	• Critical quantitative and qualitative assessment and finding solutions in various applications • Knowing and understanding the basic principles of general geopolitical and geostrategic perspectives in mining resources exploitation • Capability of employing the acquired knowledge during evaluations

Transversal competences	• Preoccupations for improving the results of professional activity through assuming one's part within multidisciplinary work teams; • Participation in research activities, such as: documenting, elaboration of bibliographic syntheses or of a series of papers and specialized articles; • Participation in scientific projects and display of the capacity of identifying opportunities for one's own future professional training.

7. Objectives of the discipline (from the competence grid)

7.1 Overall objective	• Acquiring general abilities regarding the mining geology and geopolitics and identifying the main concerns and threats related to economic and social implications thereof on mineral resources exploitation in diferent region of the globe.
7.2 Specific objective	• Developing those skills useful in prognosis of supply and demand of resources evolution in terms of technological developments and need to exploitation of poor content ore deposits

8. Contents

8.1 Course	**Teaching methodes**	**Observations**
The philosophy of resource exploitation	Lecture	2 Lectures
Metallogeny subject and relations with other fields of geosciences	Lecture	2 Lectures
Metalliferous resources of the Earth	Lecture	1 Lecture
Non metalliferous resources of the Earth	Lecture	1 Lecture
Energetic resources and fossil fuels of the Earth	Lecture	1 Lecture
Geopolitical situations and conflicts. Economic and social implications thereof on mineral resources exploitation in Europe and Arctica	Lecture	1 Lecture
Geopolitical situations and conflicts. Economic and social implications thereof on mineral resources exploitation in Africa	Lecture	1 Lecture
Geopolitical situations and conflicts. Economic and social implications thereof on mineral resources exploitation in North and Central America	Lecture	1 Lecture
Geopolitical situations and conflicts. Economic and social implications thereof on mineral resources exploitation in South America	Lecture	1 Lecture
Geopolitical situations and conflicts. Economic and social implications thereof on mineral resources exploitation in Australia and Antarctica	Lecture	1 Lecture
Geopolitical and geostrategic perspectives in mining resources exploitation	Lecture	2 Lectures

Bibliography**:**

1. Grigore Buia, Csaba R. Lorinţ, *Zăcăminte de substanţe minerale utile solide*, Editura Focus, Petroşani, 2005;
2. Neacșu A., Popescu C. Gh., (2009), *Metalogenie aplicată şi prognoză geologică*, Ediţie revizuită și adăugită, Editura Universităţii Bucureşti;
3. Lorinţ R. Csaba, Buia Grigore– Geologie economică, detreminator pentru lucrări practice de laborator, Ed. Focus, 2009;
4. Grigore Buia, Ciprian Nimară, Csaba R. Lorinţ, *Geografie economică mondială*, Editura Universitas, Petroşani, 2011;
5. Grigore Buia, Csaba R. Lorinţ, *Geologie*, Editura Universitas, Petroşani, 2011;
6. Grigore Buia, Csaba R. Lorinţ - Zăcăminte de substanţe minerale utile solide: lucrări practice de laborator, Ed. Universitas, Petroşani, 2016;

8.2 Seminar/ laboratory/ project	**Teaching and learning methodes**	**Observations**
Study of global mining production statistics and their evolution in time	Thematic debate / Case studies / Individual report/essay	Topic of thematic debate / case studies / individual report/essay and relevant bibliography are announced during the previous meeting (2 seminars)
The implications of the mining industry in various sectors of the world economy	Thematic debate / Case studies / Individual report/essay	Topic of thematic debate / case studies / individual report/essay and relevant bibliography are announced

		during the previous meeting (2 seminars)
Case studies of significant metalliferous, non metalliferous and energetic resources and fossil fuels of the Earth	Thematic debate / Case studies / Individual report/essay	Topic of thematic debate / case studies / individual report/essay and relevant bibliography are announced during the previous meeting (6 seminars)
Critical zones and situations related to resources exploitation	Thematic debate / Case studies / Individual report/essay	Topic of thematic debate / case studies / individual report/essay and relevant bibliography are announced during the previous meeting (3 seminars)
Recap/Review. Evaluation. Conclusion	Individual report and essay portofolio presentation / submission	1 seminar

Bibliography

1. Reichl C., Schatz M., Zsak G., (2015), *World Mining Data*, Vol. XXX, *Minerals Production*, Federal Ministry of Sience, Research and Economy (BMWFW), Wien;
2. Voiculescu D. Lucian (1988), *Zăcăminte nemetalifere*, Curs litografiat-Universitatea Babeş Bolyai, Cluj Napoca;
3. Weber L., Zsak G. (2002-2007), *World Mining Data*, Vol. XVII-XXII, *Minerals Production*, Federal Ministry for Economy and Labour of the Republic of Austria, Wien;
4. Weber L., Zsak G., Reichl C., Schatz M., (2009-2011), *World Mining Data*, Vol. XXIV-XXVI, *Minerals Production*, Federal Ministry of Economy, Family and Youth (BMWFJ), Wien;
5. http://www.cnr-cme.ro/, Comitetul Național Român al Consiliului Mondial al Energiei
6. http://www.infomine.com/investment/stock-markets/indexes/, World Stock Market Indexes for Energy and Mining Companies
7. http://www.cmegroup.com/, New York Mercantile Exchange (NYMEX)
8. https://www.lme.com/, London Metal Exchange
9. https://www.worldenergy.org/, World Energy Council

9. Corroboration of the contents of the discipline with the expectations of the epistemic communities, professional associations and relevant employers in the domain related to the programme

In order to update the contents and teaching/learning methods, the ones in charge with the academic discipline held several discussions and meetings with representatives of National Agency for Mineral Resources, several resource exploiters and consumers from Romania or around the world.

10. Evaluation

Type of activity	10.1 Criteria of evaluation	10.2 Methods of evaluation	10.3 Weight in the final grade
10.4 Course	Understanding and acquiring theoretical concepts and basis of of resource exploitation Detailed knowledge regarding the global distribution of most important metalliferous, non metalliferous and energetic resources and fossil fuels of the Earth Basic knowledge regarding geopolitical situations and conflicts: reasons and consequences. Economic and social implications thereof on mineral resources exploitation	Written exam; as a condition for entrance in the exam, the student must present the portfolio of essays during the penultimate seminar. In order lto take the portfolio into consideration, the student must obtain at least half of the score for the written exam.	70%
10.5 Seminar/ laboratory/ project	Correctly interpreting the mining production statistics and their evolution in time Understanding and interpreting the implications of the mining industry in various sectors of the world economy	As a condition for entrance in the exam, the student must present the portfolio of essays during the penultimate seminar. The topics of the essays are stated by the one in charge with the seminar	30%

	Interpreting and understanding the reasons for conflictes in critical zones related to resources exploitation	together with the students.	

10.6 Minimal standard of performance

Understanding the indisoluble needs for resources exploitation related to world population growth and continuous society development

Knowing most important resources of the Earth and their market need

Highlighting the major implications of the mining industry in various sectors of the world economy

Date	Signature of the person in charge with course	Signature of the person in charge with seminar/ laboratory/ project
29.05.2016.		

The approval date in departament ..... 10.05.2016.....

Director of Department's signature

Note:

1) Cycle of higher education – *one of the cycles:* Bachelor/ Master/ Doctoral degree;

2) Compulsivity – *choose one of the options:* **DO** (compulsory)/ **Dopt** (optional)/ **DF** (facultative);

3) One credit is equivalent of 27 hours of study (teaching activity and independent study).

SYLLABUS

1. Data regarding the programme

1.1 Higher Education Institution	**UNIVERSITY OF PETROSANI**
1.2 Faculty	FACULTY OF MINES
1.3 Departament	MANAGEMENT, ENVIRONMENTAL ENGINEERING AND GEOLOGY
1.4 Field of study	MINES, OIL AND GAS
1.5 Cycle of higher education[1)]	MASTER
1.6 Study programme/Qualification	

2. Information regarding the discipline

2.1 Name of the discipline	**GEOMODELLING, RESOURCES, RESERVES**						
2.2 In charge with the course				**Assoc. Prof. PhD Adrian FLOREA**			
2.3 In charge with seminar / laboratory/ project				**Assoc. Prof. PhD Adrian FLOREA**			
2.4 Year of study	**I**	2.5 Semester	**II**	2.6 Type of evaluation	**C**	2.7 Compulsivity[2)]	**DO**

3. Total estimated time (hours per semester)

3.1 Number of hours per week	**4**	out of which: 3.2 course	**2**	3.3 seminar/ laboratory/ project	**2**
3.4 Number of hours in the curriculum	**56**	out of which: 3.5 course	**28**	3.6 seminar/ laboratory/ project	**28**

Time distribution	**hours**
Study of textbooks, courses, bibliography and notes	**42**
Supplementary study in the library, e-learning platforms and on the field	**56**
Preparation of seminars/ laboratories/ projects, homeworks, reports, portfolios and essayes	**46**
Tutoring	**14**
Examinations	**2**
Other activities.....	-

3.7 Total hours of independent study	**160**
3.8 Total hours per semester	**216**
3.9 Number of credits[3)]	**8**

4. Preconditions (where applicable)

4.1 of curriculum	• Geology, Computer Engineering, Descriptive geometry, Statistic, Technical drawing and infographic, Survey, Prospecting and exploration,
4.2 of competences	• C1. Proper application of mathematical and engineering theories.

5. Conditions (where applicable)

5.1 for the course	• The room must be equipped with video projector and projection screen; • The room must have an Internet connection (wired or wireless); • The students must shut down their cell phones during the activities; • Punctuality;
5.2 for the seminar/ laboratory/ project	• The room must be equipped with video projector and projection screen; • The room must have computers and Internet connection (wired or wireless); • The computers must have installed proper software; • Fulfilling the obligations related to the content of the laboratory activities;

6. Specific earned competences

Professional competences	• Acquire and use appropriate methods of mineral resources classification, • Acquiring and applying the statistical methods for processing the geological data ; • Acquire and use appropriate methods mineral resource estimation, • Ability to use professional software for resource estimation and analysis of uncertainty

Transversal competences	• The existence of professional concerns for improving business results by taking roles in a multidisciplinary team work; • Involvement in research, such as documentation, development of bibliographic summaries, possibly some papers and specialty items; • Participation in scientific and demonstration projects having the ability to identify opportunities for their future training.

7. Objectives of the discipline (from the competence grid)

7.1 Overall objective	• Understanding of resource classification • Appreciation of all aspects associated with data collection and interpretation • Learning the mineral resources estimation technique
7.2 Specific objective	• Learning the issues related to the achievement of virtual reality according to geo-mining conditions and planning the exploitation of different types of minerals. • Acquiring the skills for proper handling of information between different software applications and the principles of design and exploitation planning of various ore types.

8. Contents

8.1 Course	Teaching methods	Observations
Resources, Reserves, JORC Code	Lectures and debates with students	1 course = 2 hours
Geological database in Surpac Vision. Organizing data, creating and managing databases, import data from external sources, viewing drill holes styles of displaying information	Lectures and debates with students	2 course = 4 hours
Univariate statistical description of geological data	Lectures and debates with students	1 course = 2 hours
Bivariate statistical description of geological data	Lectures and debates with students	1 course = 2 hours
Quantitative analysis of geological structures	Lectures and debates with students	2 course = 4 hours
Estimation of spatial geological structures	Lectures and debates with students	2 course = 4 hours
Solid modeling. Concepts, data preparation, creation of solid, triangulation techniques, editing and validation solid models, intersecting solids, solids view, sectioning solids.	Lectures and debates with students	2 course = 4 hours
Geological block modeling. Stage of the execution,space model, defining the size of the blocks, attributes, constraints, methods of parameters estimation, viewing and sectioning of models, reports.	Lectures and debates with students	2 course = 4 hours
Mineral reserve evaluation	Lectures and debates with students	1 course = 2 hours

Bibliography

1. Bristol, R., coord., GEOSTATISTICS in Surpac VISION, Surpac Minex GROUP Pty Ltd (a Gemcom Company), Perth, Western Australia, 2006
2. C.J.Moon, M.K.G.Whateley,A.M.Evans, Introduction to mineral exploration,Blackwell Publishing, 2006
3. E.H. Isaaks, R.M.Srivastava, An Introduction to Applied Geostatistics, Oxford University Press, 1989
4. Florea Adrian, Proiectare şi planificare minieră asistată – *note de curs*, Petroşani, 2012
5. ***, Block modelling, Surpac Minex GROUP Pty Ltd (a Gemcom Company), Perth, Western Australia, 2005
6. ***, Geology database, Surpac Minex GROUP Pty Ltd (a Gemcom Company), Perth, Western Australia, 2005

8.2 Seminar/ laboratory/ project	Teaching and learning methodes	Observations
Mineral Resources, Mineral Reserves	Solving applications with the students	1 session
Geological database creation, visualization styles of drill holes and lithological columns, plotting lithological columns	Solving applications with the students	2 session
Analysis of total variability	Solving applications with the students	2 sessions
Analysis of spatial variability	Solving applications with the students	2 sessions
Estimation of spatial structures	Solving applications with the students	2 sessions

Estimation of distribution of geologic variables.	Solving applications with the students	2 sessions
Modeling the geological formations identified in an area.	Solving applications with the students	1 session
Block modeling for an ore mineralization. Generate reports.	Solving applications with the students	2 session

Bibliography

1. Bristol, R., coord., GEOSTATISTICS in Surpac VISION, Surpac Minex GROUP Pty Ltd (a Gemcom Company), Perth, Western Australia, 2006
2. Richardson, S., Bristol, R., Jackson, P., Introduction to Surpac VISION, Surpac Minex GROUP Pty Ltd (a Gemcom Company), Perth, Western Australia, 2006
3. ***, Block modelling, Surpac Minex GROUP Pty Ltd (a Gemcom Company), Perth, Western Australia, 2005
4. www.gemcomsoftware.com

9. Corroboration of the contents of the discipline with the expectations of the epistemic communities, professional associations and relevant employers in the domain related to the programme

10. Evaluation

Type of activity	10.1 Criteria of evaluation	10.2 Methods of evaluation	10.3 Weight in the final grade
10.4 Course	• Knowledge of basic notions and concepts of computer aided design • Acquiring the methodology of elaboration the geological databases • Assimilation of data manipulation procedures, specific to computer aided design	Computer exam, access to exam is conditioned by the presence during the semester. To consider the scores obtained on portfolio work, the student must obtain at least half of the announced score sample exam.	50%
10.5 Seminar/ laboratory/ project	• Understanding the issues dealt with in the course and laboratory • The correct application of the methodology of work • Understanding and correct application of data manipulation procedures	Presenting work to solve issues launched during the semester is a requirement for access to the final examination. They are taught throughout the semester until the last week of teaching activity.	50%
10.6 Minimal standard of performance			
• Knowledge of basic notions and concepts of computer aided design • Acquiring techniques of digitization of information; • Acquiring techniques of geological data analysis			

Date	Signature of the person in charge with course	Signature of the person in charge with seminar/ laboratory/ project
30.05.2016	Assoc.Prof.Ph.D. Adrian FLOREA	Assoc.Prof.Ph.D. Adrian FLOREA

Notă:

[1)] Cycle of higher education – *one of the cycles:* Bachelor/ Master/ Doctoral degree;

[2)] Compulsivity – *choose one of the options:* **DO** (compulsory)/ **Dopt** (optional)/ **DF** (facultative);

[3)] One credit is equivalent of 27 hours of study (teaching activity and independent study).

SYLLABUS

1. Data regarding the programme

1.1 Higher Education Institution	**UNIVERSITY OF PETROSANI**
1.2 Faculty	FACULTY OF MINES
1.3 Department	Mining Engineering, Surveying and Constructions
1.4 Field of study	Mines, Fuels and Gases
1.5 Cycle of higher education[1)]	Master
1.6 Study programme/Qualification	Sustainable mining of the mineral resources

2. Information regarding the discipline

2.1 Name of the discipline	**Instabilities modelling in the geomechanics**						
2.2 In charge with course				Prof. Arad Victor, Min.eng., PhD Prof. Onica Ilie, Min.eng., PhD			
2.3 In charge with seminar / laboratory/ project							
2.4 Year of study	**I**	2.5 Semester	**II**	2.6 Type of evaluation	**E**	2.7 Compulsivity[2)]	**DS**

3. Total estimated time (hours per semester)

3.1 Number of hours per week	**4**	out of which: 3.2 course	**2**	3.3 seminar/ laboratory/ project	**2**
3.4 Number of hours in the curriculum	**56**	out of which: 3.5 course	**28**	3.6 seminar/ laboratory/ project	**28**
Time distribution					
Study of textbooks, courses, bibliography and notes					**52**
Supplementary study in the library, e-learning platforms and on the field					**40**
Preparation of seminaries/ laboratories/ projects, homeworks, reports, portfolios and essays					**27**
Tutoring					**10**
Examinations					**4**
Other activities					**-**

3.7 Total hours of independent study	**133**
3.8 Total hours per semester	**189**
3.9 Number of credits[3)]	**7**

4. Conditions (where applicable)

4.1 for the course	• Room with computer and projector • The students must shut down their cell phones during the activities; • Punctuality.
4.2 for the seminar/ laboratory/ project	• Fulfilling the obligations related to the content of the laboratory activities.

5. Specific earned competences

Professional competences	• Using of the instabilities theories and the models of rock engineering as the solutions at the mining engineering problems; • Assessment of the rock mass instabilities behaviours in view to ensure the underground and the surface stability structures; • Identification the main factors that deal to the instability phenomena in geomechanics; • Assessment and using the rock mass properties in the solution of the rock engineering problems.
Transversal competences	• Honourable behaviour, responsibilities, ethics, the spirit of the law in a project and taking responsibilities for their own decisions and of work into a team work / laboratory

6. Objectives of the discipline (from the competence grid)

6.1 Overall objective	• Understanding of the rock instability phenomena generated by the mining activities
6.2 Specific objective	• Rock mass characterisation in view to establish the rock behaviour in the strain-stress state of mining conditions • Modelling of the ground behaviour under the influence of the mining excavations

7. Contents

7.1 Course	Teaching methods	Observations
Hard and soft rocks behaviour in situ and in the laboratory testing	Lecture	3 lectures
Formulation of the rock constitutive laws and rock strength criteria	Lecture	3 lectures
Rocks and mining structures modelling	Lecture	1 lectures
Analytical models used in the rock structure behaviour instability analyses in the mining	Lecture	2 lectures
Numerical modelling of the ground behaviour affected by the mining activity	Lecture	3 lectures
Ground surface deformation as effect of underground mining	Lecture	2 lectures

Bibliography

Arad,V., *Mining geotechniques*, Technical Publishing House, Bucharest, 1995.
Arad,V., Arad,S., *Environmental geotechnics*, Polidava Publishing House, Deva, 2000.
Arad,V., Bogdan,I., *Geotechnics and foundations*, Solness Publishing House, Timisoara, 2001.
Arad,V., *Rock mechanics*, Riosprint Publishing House, Cluj-Napoca, 2004.
Arad,v., Todorescu,A., *Rock engineering*, Riosprint Publishing House, Cluj-Napoca, 2004.
Bancila et.al., *Engineering geology*, Tom I and II, Technical Publishing House, Bucharest, 1981.
Hirian,C., *Rock mechanics,* Didactical and Pedagogical Publishing House, Bucharest, 1981.
Onica,I., *Environmental Mining Impact*, Universitas Publishing House , Petrosani, 2001.
Onica,I., *Introduction in Numerical Methods Used in Mining Excavation Stability Analysis*, Universitas Publishing House, Petrosani, 2001.
Onica,I., *Underground Mining Excavations stability driven in layered media*, Universitas Publishing House, Petrosani, 2006.
Onica,I., Marian,P.D., *Applications of the finite element method in the grounds and underground structures analysis*, Universitas Publishing House, Petrosani, 2016.
Stamatiu,M., *Rock mechanics*, Didactical and Pedagogical Publishing House, Bucharest, 1964.
Popescu,A., Todorescu,A., *Rock mechanics in mining*, Technical Publishing House, Bucharest, 1982.
Toderas,M., *Geomechanics*, Universitas Publishing House, Petrosani, 2005.
Toderaş, M., *Rocks rheology in the stability of underground mining works. Study case: Sedimentary rocks from Jiu Valley, Romania,* Scholars' Press International Publishing House, Germany, 2015.
Todorescu,A., *Rock properties*, Technical Publishing House, Bucharest, 1984.
Todorescu,A., *Rock rheology with mining applications*, Technical Publishing House, Bucharest, 1986.

7.2 Seminar/ laboratory/ project	Teaching and learning methods	Observations
Practical applications of hard and soft rocks behaviour in the laboratory testing	Practical applications with the students	3 seminaries / laboratories
Practical applications of hard and soft rocks behaviour in situ testing	Practical applications with the students	2 seminaries / laboratories
Case studies and practical applications of analytical models used in the rock structure behaviour instability analyses in the mining	Practical applications with the students and case studies	3 seminaries / laboratories
Case studies and practical applications of numerical modelling of the ground behaviour affected by the mining activity	Practical applications with the students and case studies	4 seminaries / laboratories
Case studies and practical applications of ground surface deformation as effect of underground mining	Practical applications with the students and case studies	2 seminaries / laboratories

Bibliography

Arad,V., *Mining geotechniques*, Technical Publishing House, Bucharest, 1995.
Arad,V., Arad,S., *Environmental geotechnics*, Polidava Publishing House, Deva, 2000.
Arad,V., Bogdan,I., *Geotechnics and foundations*, Solness Publishing House, Timisoara, 2001.
Arad,V., *Rock mechanics*, Riosprint Publishing House, Cluj-Napoca, 2004.
Arad,v., Todorescu,A., *Rock engineering*, Riosprint Publishing House, Cluj-Napoca, 2004.
Bancila et.al., *Engineering geology*, Tom.I and II, Technical Publishing House, Bucharest, 1981.

Hirian,C., *Rock mechanics,* Didactical and Pedagogical Publishing House, Bucharest, 1981.
Onica,I., *Environmental mining impact*, Universitas Publishing House , Petrosani, 2001.
Marian,P.D., *Deformation monitoring of the ground surface affected by the underground mining*, Universitas Publishing House, Petrosani, 2001.
Onica,I., *Introduction in numerical methods used in mining excavation stability analysis*, Universitas Publishing House, Petrosani, 2001.
Onica,I., *Underground Mining Excavations stability driven in layered media*, Universitas Publishing House, Petrosani, 2006.
Onica,I., Marian,P.D., *Applications of the finite element method in the grounds and underground structures analysis*, Universitas Publishing House, Petrosani, 2016.
Stamatiu,M., *Rock mechanics*, Didactical and Pedagogical Publishing House, Bucharest, 1964.
Popescu,A., Todorescu,A., *Rock mechanics in mining*, Technical Publishing House, Bucharest, 1982.
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Toderaş, M., *Rocks rheology in the stability of underground mining works. Study case: Sedimentary rocks from Jiu Valley, Romania,* Scholars' Press International Publishing House, Germany, 2015.
Todorescu,A., *Rock properties*, Technical Publishing House, Bucharest, 1984.
Todorescu,A., *Rock rheology with mining applications*, Technical Publishing House, Bucharest, 1986.

8. Corroboration of the contents of the discipline with the expectations of the epistemic communities, professional associations and relevant employers in the domain related to the programme

9. Evaluation

Type of activity	9.1 Criteria of evaluation	9.2 Methods of evaluation	9.3 Weight in the final grade
9.4 Course	Knowledge of notions and concepts concerning the rock mass characterisation and behaviour	Written exam	60%
	Theoretical foundation of the modelling regarding to the rock mass instabilities phenomena generated by the mining activities		
9.5 Seminar/ laboratory/ project	Laboratory works, case studies and applications	Continuous assessment Practical applications	40%
	Participation in each practical activity		
9.6 Minimal standard of performance			
Presentation of the practical applications portofolio / homeworks, access required to the final examination; Understanding the modelling of the rock mass instabilities generated by the mining activities			

Date

15.05.2016

Signature of the person in charge with course

Signature of the person in charge with seminar/ laboratory/ project

The approval date in departament ..... 10.05.2016.....

Director of Department's signature

Note:

1) Cycle of higher education – *one of the cycles:* Bachelor/ Master/ Doctoral degree;
2) Compulsivity – *choose one of the options:* **DO** (compulsory)/ **Dopt** (optional)/ **DF** (facultative);
3) One credit is equivalent of 27 hours of study (teaching activity and independent study).

SYLLABUS

1. Data regarding the programme

1.1 Higher Education Institution	**UNIVERSITY OF PETROSANI**
1.2 Faculty	FACULTY OF MINES
1.3 Departament	Mechanical, Industrial and Transportation Engineering
1.4 Field of study	Mine, Oil and Gas
1.5 Cycle of higher education[1)]	Master
1.6 Study programme/Qualification	**SUSTAINABLE EXPLOITATION OF MINERAL RESOURCES**

2. Information regarding the discipline

2.1 Name of the discipline	**Actual Mining Machines and Installations**						
2.2 In charge with course				**Prof. Eng. RADU Sorin Mihai, Ph. D.**			
2.3 In charge with seminar / laboratory/ project				**Prof. Eng. RADU Sorin Mihai, Ph. D.**			
2.4 Year of study	**I**	2.5 Semester	**2**	2.6 Type of evaluation	**E**	2.7 Compulsivity[2)]	**DO**

3. Total estimated time (hours per semester)

3.1 Number of hours per week	**4**	out of which: 3.2 course	**2**	3.3 seminar/ laboratory/ project	**2**
3.4 Number of hours in the curriculum	**56**	out of which: 3.5 course	**28**	3.6 seminar/ laboratory/ project	**28**

Time distribution	**hours**
Study of textbooks, courses, bibliography and notes	**30**
Supplementary study in the library, e-learning platforms and on the field	**30**
Preparation of seminaries/ laboratories/ projects, homeworks, reports, portfolios and essayes	**30**
Tutoring	**2**
Examinations	**1**
Other activities.....	

3.7 Total hours of independent study	**93**
3.8 Total hours per semester	**189**
3.9 Number of credits[3)]	**7**

4. Conditions (where applicable)

4.1 for the course	• Room with computer and projector • The students must shut down their cell phones during the activities; • Punctuality;
4.2 for the seminar/ laboratory/ project	• Fulfilling the obligations related to the content of the laboratory activities;

5. Specific earned competences

Professional competences	• The graduate will be able to understand basic principles of mining equipment and machinery, in terms of structure, functionality, parameters and characteristics. • The graduate will be able to connect equipment and technical endowment of the mining plant with the parameters and requirements of the mining technology.
Transversal competences	• The existence of professional concerns for improving business results by taking roles in a multidisciplinary team work; • Involvement in research, such as documentation, development of bibliographic summaries, possibly some papers and specialty items; • Participation in scientific and demonstration projects having the ability to identify opportunities for their future training.

6. Objectives of the discipline (from the competence grid)

6.1 Overall objective	• Knowing the actual state of the art and future trends of up to date mechanized mining technology used worldwide

6.2 Specific objective	• Development and design and management activity in all kind of mining industry

7. Contents

7.1 Course	Teaching methodes	Observations
I. Equipment and machinery for underground mining. Longwall equipment and machinery. Excavation, haulage, support	Lecture	2 courses
II. Equipment and machinery for underground ore mining. Drilling, loading, hauling.	Lecture	2 courses
III. Equipment for underground road development and tunneling. Underground transport systems and equipment.	Lecture	2 courses
IV. Equipment and machinery for open pit mining. Continuous systems. Excavators.	Lecture	2 courses
V. Equipment and machinery for non continuous open pit mining . Open pit transportation systems.	Lecture	2 courses
VI. Hoisting systems.	Lecture	2 courses
VII. Auxiliary equipment and machinery for underground and open pit mines	lecture	2 courses

Bibliography

Popescu Florin Dumitru, RADU Sorin Mihai**,** ***Vertical hoist systems, new trends optimizations***, LAP LAMBERT Academic Publishing, Saarbrucken, Germany,2014, ISBN: 978-3-659-49895-4, p. 207

Copaci I., **Radu S.M.**, Tănăsoiu A., Hell R., Aonofriesei I., ***Sisteme de transport ghidate pe cale*****,** Editura UNIVERSITAS, Petrosani, Romania, 2015, ISBN 978-973-741-398-7, p.270

Okwiet B.**, Radu S. M,** Tenescu A., **CHAPTER 8** with the title: ***Environmental study of communication elements in energy sector***.**IN THE BOOK** with the title: ***Current communication difficulties***, Coordinators: Florentin Smarandache (University of New Mexico, U.S.A.) & Stefan Vlăduţescu (Universitatea din Craiova), ZIP Publishing USA, 1313 Chesapeake Avenue Columbus, Ohio, 43212, USA and Editura SITECH ROMÂNIA, Aleea Teatrului, nr.2, Craiova, România, 2014, ISBN 781599739847, ISBN 978-606-11-4226-2, 15p. (pp. 151-165);

B4. Popescu Florin Dumitru, **RADU Sorin Mihai,** ***Vertical hoist systems, new trends optimizations***, LAP LAMBERT Academic Publishing, Saarbrucken, Germany,2014, ISBN: 978-3-659-49895-4, p. 207

7.2 Seminar	Teaching and learning methodes	Observations
1, Assessment of longwall face productivity .	Supervised class work	2 seminars
2.Equipment selection based on required performance and equipment features	Supervised class work	4 seminars
3 Strata pressure assessment and support design	Supervised class work	2 seminars
4. Transportation network analysis	Supervised class work	4 seminars
5. Hoist capacity verification	Supervised class work	2 seminars

Bibliography

Copaci I., **Radu S.M.**, Tănăsoiu A., Hell R., Aonofriesei I., ***Sisteme de transport ghidate pe cale*****,** Editura UNIVERSITAS, Petrosani, Romania, 2015, ISBN 978-973-741-398-7, p.270

Okwiet B.**, Radu S. M,** Tenescu A., **CHAPTER 8** with the title: ***Environmental study of communication elements in energy sector***.**IN THE BOOK** with the title: ***Current communication difficulties***, Coordinators: Florentin Smarandache (University of New Mexico, U.S.A.) & Stefan Vlăduţescu (Universitatea din Craiova), ZIP Publishing USA, 1313 Chesapeake Avenue Columbus, Ohio, 43212, USA and Editura SITECH ROMÂNIA, Aleea Teatrului, nr.2, Craiova, România, 2014, ISBN 781599739847, ISBN 978-606-11-4226-2, 15p. (pp. 151-165);

B4. Popescu Florin Dumitru, **RADU Sorin Mihai,** ***Vertical hoist systems, new trends optimizations***, LAP LAMBERT Academic Publishing, Saarbrucken, Germany,2014, ISBN: 978-3-659-49895-4, p. 207

Popescu Florin Dumitru, RADU Sorin Mihai, ***Vertical hoist systems, new trends optimizations***, LAP LAMBERT Academic Publishing, Saarbrucken, Germany,2014, ISBN: 978-3-659-49895-4, p. 207

7.3 Project	Teaching and learning methodes	Observations
Individual assignment on given case study covering many topics like ; longwall face design , open pit face design, transportation network design etc.	Individual work with periodic survey and tutoring.	
Bibliography		

8. Corroboration of the contents of the discipline with the expectations of the epistemic communities, professional associations and relevant employers in the domain related to the programme

The contents is in line with the actual state of the art and future trends of up to date mechanized mining technology used worldwide ensuring the graduate to perform high level research, development and design and management activity in all kind of mining industry.

9. Evaluation

Type of activity	9.1 Criteria of evaluation	9.2 Methods of evaluation	9.3 Weight in the final grade
9.4 Course	Appropriate mastering of the lectures content and self learning acquired knowledge	Written and oral exam	60%
9.5 Seminar/ laboratory/ project	Presentation of a written quiz of seminar work. Power Point presentation of project results.	Colloquium with all the students.	40%
9.6 Minimal standard of performance			
Attending all seminar and project classes and 80% of lectures.			

Date	Signature of the person in charge with course	Signature of the person in charge with seminar/ laboratory/ project
…….	…… ……	……

Notă:

1) Cycle of higher education – *one of the cycles:* Bachelor/ Master/ Doctoral degree;

2) Compulsivity – *choose one of the options:* **DO** (compulsory)/ **Dopt** (optional)/ **DF** (facultative);

3) One credit is equivalent of 27 hours of study (teaching activity and independent study).

SYLLABUS

1. Data regarding the programme

1.1 Higher Education Institution	**UNIVERSITY OF PETROSANI**
1.2 Faculty	FACULTY OF MINES
1.3 Departament	MANAGEMENT, ENVIRONMENTAL ENGINEERING AND GEOLOGY
1.4 Field of study	MINING
1.5 Cycle of higher education[1)]	Master
1.6 Study programme/Qualification	SUSTAINABLE EXPLOITATION OF MINERAL RESOURCES

2. Information regarding the discipline

2.1 Name of the discipline	**MINING AND SUSTAINABLE DEVELOPMENT**						
2.2 In charge with course				**Prof.Ph.D Lazar Maria**			
2.3 In charge with seminar / laboratory/ project				**Prof.Ph.D Lazar Maria**			
2.4 Year of study	**I**	2.5 Semester	**II**	2.6 Type of evaluation	**E**	2.7 Compulsivity[2)]	**DO**

3. Total estimated time (hours per semester)

3.1 Number of hours per week	**5**	out of which: 3.2 course	**2**	3.3 seminar/ laboratory/ project	**-/2/1**
3.4 Number of hours in the curriculum	**70**	out of which: 3.5 course	**28**	3.6 seminar/ laboratory/ project	**42**

Time distribution	hours
Study of textbooks, courses, bibliography and notes	**46**
Supplementary study in the library, e-learning platforms and on the field	**36**
Preparation of seminaries/ laboratories/ projects, homeworks, reports, portfolios and essayes	**32**
Tutoring	**20**
Examinations	**12**
Other activities.....	

3.7 Total hours of independent study	**146**
3.8 Total hours per semester	**216**
3.9 Number of credits[3)]	**8**

4. Conditions (where applicable)

4.1 for the course	• Room with computer and projector • The students must shut down their cell phones during the activities; • Punctuality;
4.2 for the seminar/ laboratory/ project	• Fulfilling the obligations related to the content of the laboratory activities;

5. Specific learned competences

Professional competences	• Critical quantitative and qualitative assessment and finding solutions in various applications • Knowing and understanding the basic principles of general exploitation • Capability of employing the acquired knowledge during evaluations
Transversal competences	• Preoccupations for improving the results of professional activity through assuming one's part within multidisciplinary work teams; • Participation in research activities, such as: documenting, elaboration of bibliographic syntheses or of a series of papers and specialized articles; • Participation in scientific projects and display of the capacity of identifying opportunities for one's own future professional training.

6. Objectives of the discipline (from the competence grid)

6.1 Overall objective	• Knowing the ways in which mining can become a sustainable activity
6.2 Specific objective	• Sustainable development and mining industry • Legal framework of the mining • Improving the environmental quality in the mining areas • Improving the health and safety • Profit reinvestment in sustainable development activities

7. Contents

7.1 Course	Teaching methodes	Observations
Definitions of Sustainable Development. Sustainable Development Framework for the Minerals Sector	Problem formulate Exposure Participatory lecture	1 course
Minerals and Mineral Production. Location of Exploration and Production. Processing and Fabrication. Recycling, Re-use, and Re-manufacture. Mineral-Dependent Economies.	Problem formulate Exposure Participatory lecture	1 course
The 'Need' for Minerals. Need as Demand. Basic Needs. Demand, Use, and Consumption. The Availability of Minerals. Assessing Long-term Availability.	Problem formulate Exposure Participatory lecture	1 course
Viability of the minerals industry. The Business Case for Sustainable Development. Minerals Companies and Their Employees. Job Creation. Mine Closure. Improving Worker Health and Safety. The Role of Technology.	Problem formulate Exposure Participatory lecture	1 course
The control, use, and management of land. Land and Society. Integrated Land Use Planning. Land Tenure and Mining Law. Royalties and Compensation. Land, Mining, and Indigenous Peoples. Resettlement Issues. Protected Areas	Problem formulate Exposure Participatory lecture	2 courses
Sustainable Development at the Community Level. Gains and Losses at the Local Level. Economical Perspective. Social Perspective. Cultural and Political Perspective. Environmental Perspective.	Problem formulate Exposure Participatory lecture	2 courses
Mining, minerals, and the environment. Managing the Mining Environment. Large-Volume Waste. Mine Closure Planning. Environmental Management.	Problem formulate Exposure Participatory lecture	2 courses
An integrated approach to using minerals. Connecting Production with Use. Supply Chain Management.Product Stewardship. Life-Cycle Assessment. Pricing to Reflect True Costs. Sufficiency, Efficiency, and Use. Concerns over Material Throughputs. Keys to Advances in Recycling. Re-manufacture and Re-use. Regulation and End-use.	Problem formulate Exposure Participatory lecture	2 courses
Supporting Sustainable Development in the Minerals Sector. Understanding Sustainable Development. Creating Organizational Policies and Management Systems. Achieving Cooperation Among Those With. Building Capacity for Effective Actions at All Levels.	Problem formulate Exposure Participatory lecture	2 courses
Bibliography		
7.2 Seminar/ laboratory/ project	Teaching and learning methodes	Observations
Profile of the minerals sector. Industry. The Large Multinationals. Medium-Sized and National Players. Juniors. Consultants, Contractors, and Service Companies. Traders. Fabricators. Recyclers. State-Owned Companies. Workers and Labour Unions.	Seminar. Case study.	2 seminars 2h project
Case studies on minerals. The Metals. Fuels and Industrial Minerals.	Seminar. Case study.	2 seminars 2h project
Mining Perspectives. Conservation Perspectives. The Challenges.	Seminar. Case study.	2 seminars 2h project
Mining Company-Community Engagement. Integrated Impact Assessment for Sustainable Development. Community. Sustainable Development Plans. Roles and Responsibilities.	Seminar. Case study.	2 seminars 2h project
Energy Use in the Minerals Sector. Managing Metals in the Environment. Biological Diversity: Threats and Opportunities.	Seminar. Case study.	2 seminars 2h project

Life-Cycle Assessment. Recycling. Risk Assessment and Policy.	Seminar. Case study.	4 seminars
The presentation semester project		2h project

Bibliography

1. The Report of the Mining, Minerals and Sustainable Development Project. Earthscan Publications Ltd London. 2002
2. Bastida, AE, Aguado, AY – Enhancing the Contribution of Mining to Sustainable De velopment in Romania: A Law & Policy Framework. 2008
3. Auty, R. şi Mikesell, R - Sustainable Development in Mineral Economies (Oxford:Clarendon Press, 1998).
4. Cordonnier-Segger, Khalfan, A. şi Nakjavani, S., Weaving the Rules for Our Common Future: Principles, Practices and Prospects for International Sustainable Development Law, 1 octombrie, 2002.
5. Mirovitskaya, N. and Ascher, W. (eds.), Guide to Sustainable Development and Environmental Policy (Durham: Duke University Press, 2001).

8. Corroboration of the contents of the discipline with the expectations of the epistemic communities, professional associations and relevant employers in the domain related to the programme

9. Evaluation

Type of activity	9.1 Criteria of evaluation	9.2 Methods of evaluation	9.3 Weight in the final grade
9.4 Course	Understanding the concept of sustainable development in mining General legislative framework on sustainable resource management Knowledge of tools for control, use and management of land Life-cycle assessment Environmental protection in mining	Multiple choice test	75%
9.5 Seminar/ laboratory/ project	The presentation semester project	Assessment of student activity during the semester.	25%
9.6 Minimal standard of performance			
The concept of sustainable management in mining Legal frame for the sustainable development in mining Mining and environment - mitigation solutions Mining and community - mitigation solutions			

Date
15.05.2016
…….

Signature of the person in charge with course

Signature of the person in charge with seminar/ laboratory/ project

The approval date in departament
..... 10.05.2016.....

Director of Department's signature

Note:

[1] Cycle of higher education – *one of the cycles:* Bachelor/ Master/ Doctoral degree;

[2] Compulsivity – *choose one of the options:* **DO** (compulsory)/ **Dopt** (optional)/ **DF** (facultative);

[3] One credit is equivalent of 27 hours of study (teaching activity and independent study).

SYLLABUS

1. Data regarding the programme

1.1 Higher Education Institution	**UNIVERSITATEA DIN PETROŞANI**
1.2 Faculty	**MINING ENGINEERING**
1.3 Departament	**MINING ENGINEERING, MINE-SURVEYING AND CONSTRUCTIONS**
1.4 Field of study	**MINES, OIL AND GAS**
1.5 Cycle of higher education[1)]	**MASTER**
1.6 Study programme/Qualification	**SUSTAINABLE EXPLOITATION OF MINERAL RESOURCES**

2. Information regarding the discipline

2.1 Name of the discipline	**RISK MANAGEMENT**						
2.2 In charge with the course				Professor, Ph.D. **MORARU ROLAND**			
2.3 In charge with seminar / laboratory/ project				Lecturer, Ph.D. **LORINŢ CSABA**			
2.4 Year of study	**I**	2.5 Semester	**II**	2.6 Type of evaluation	**ES**	2.7 Compulsivity[2)]	**DO**

3. Total estimated time (hours per semester)

3.1 Number of hours per week	**4**	out of which: 3.2 course	**2**	3.3 seminar/ laboratory/ project	**2**
3.4 Number of hours in the curriculum	**56**	out of which: 3.5 course	**28**	3.6 seminar/ laboratory/ project	**28**

Time distribution	hours
Study of textbooks, courses, bibliography and notes	**48**
Supplementary study in the library, e-learning platforms and on the field	**56**
Preparation of seminars/ laboratories/ projects, homeworks, reports, portfolios and essayes	**28**
Tutoring	**18**
Examinations	**10**
Other activities.....	

3.7 Total hours of independent study	**160**
3.8 Total hours per semester	**216**
3.9 Number of credits[3)]	**8**

4. Preconditions (where applicable)

4.1 of curriculum	• Basic legislation regarding the occupational health and safety • Assessement methodes and techniques for occupational risks • Occupational Health and Safety
4.2 of competences	• C5. Integration of the principles of occupational health and safety in the mining and complex industrial systems by identifying the threats, assessing and mitigation of the occupational risks.

5. Conditions (where applicable)

5.1 for the course	• Room with computer and projector; • The students must shut down their cell phones during the activities; • Punctuality;
5.2 for the seminar/ laboratory/ project	• Fulfilling the obligations related to the content of the laboratory activities; • During the seminar discussions take place regarding a topic previously established, the master students prepare the seminar by studying the relevant literture in the library, e-learning platforms and/or on the field; • The deadlines for the seminar papers are set by the person in charge with seminar together with the master students. Delays are not accepted unless for serious reasons;

6. Specific earned competences

Profesional competences	• **C1.4**. Critical quantitative and qualitative assessment and finding solutions in various applications • **C2.2** Use of the basic engineering knowledge to explain and interpret the theoretical and experimental results, some phenomena or processes specific to mining engineering as well as to analyse the emergency situations and the sources of the occupational accident and events • **C2.3** Integrated application of basic engineering principles and methods in order to solve well defined problems, specific to mining engineering, in conditions of occupational health and safety • **C4.4**. The appropriate use of the general principles regarding the prevention of risks, the choice, implementation and evaluation of the measures of prevention and correction • **C6.1** Identification of the legislation concerning the occupational health and safety in the organisation and the appropriate use of the general principles for risk prevention as well as their application for instructing the employees. • **C6.2** The implementation of the specific knowledge concerning the occupational health and safety as well as the participatory development of the programmes for prevention • **C6.3** Implementation of the general principles for risk prevention based on the assessment criteria (frequency, severity, exposure) and elaboration of the case studies • **C6.5** Coordination and involvement in risk management projects by selecting, combining and using specific concepts, principles, norms, standards and methods. • Awareness of the requirements and use of ISO 31000:2009 regarding the risk management in mining industry • Awareness and understanding of the role played by the communication, consulting, monitoring and revision within the organisational risk management process.
Traversal competences	• **CT1.** Team work at hierarchical levels; promoting the initiative, dialogue, cooperation, positive attitude and mutual respect, diversity, continuous occupational self improvement. • **CT3.** Self assessment and diagnosis of the need for continuing professional education in order to be responsive to the labour market. Aquiring apprporiate linguistic, IT and communication knowledge. (**Manager of the own continuous training).** • Responsible attitude regarding the implementation of the specific laws; • Ability for organising and planning the data interpretation; • Involvement in R&D activities, such as documentation, bibliographical synthesis, essays; • Acquirement of knowlwdge regarding the occupational risk identification, estimation, quantification and assessment • Ability to use the statistical data to the complementary application of the occupational risk assessment • Development of a proavtive behaviour regarding the occupational safety • Participating in scientific projects and proving the ability to identify opportunities for future professional training; • Effective use of the learning resources and techniques for the continuous provessional and personal development, use of the information and techniques for information management, commitment to the personal professional development.

7. Objectives of the discipline (from the competence grid)

7.1 Overall objective	• Acquiring general abilities regarding the integration of the principles of risk management in complex mining and industrial systems by indentifying the threats, assessing and treating the occupational risks
7.2 Specific objective	• Obtaining the necessary competences for understanding and acquiring the theoretical concepts and the basic methodology of the organisational risk management; • Developing the applicative competences related to the decisions regarding the risk acceptability/unacceptability; • Realisation and development of projects regardin the risk assessment; • Use of the theory for practical aplications regarding the risk treatment • Capability of organising and planning the management of risks • Management of the information obtained during the stage of risk assessment

8. Contents

8.1 Course	Teaching methodes	Observations
1. **Definition of the key concepts for the risk management**. Technical signification of the notion of risk and safety. Extensions and varieties of the notion of risk.	Lecture	1 Lecture
2. **Occupational health and safety – integrative part of the corporative social responsibility**. Corporative social responsibility. Connection between the occupational health and safety and CSR. Corporative social responsibility: stimulative element for the occupational health and safety	Lecture	1 Lecture
3. **Risk management – the importance of the standard ISO 31000: 2009**.	Lecture	1 Lecture

Purpose and finality of the risk management. Principles and general frame of the risk management. Design of the general frame. Understanding the organisation and the context. Practical importance of the standard		
4. **Simplified model of the risk management process.** Global approach of the risk management. Establishing the strategic, organisational and risk management context	Lecture	1 Lecture
5. **Identifying the risks.** Content and approach. Practical recommendations for the risk identification stage.	Lecture	1 Lecture
6. **Risk assessment: analysis, evaluation, ranking.** Estimation of the probability of risk materialising. Estimation of the risk materialisation impact on the objectives. Analysis of the risk exposure as a combination between probability and impact	Lecture	1 Lecture
7. **Risk tolerance.** Risk evaluation and ranking. Definition and setting the risk tolerance. Monitoring and revision	Lecture	1 Lecture
8. **Risk treatment.** Risk acceptance (tolerance). Continuous risk monitoring. Risk avoidance. Risk control (mitigation). Risk transfer (outsourcing). Selecting the options of risk treatment. Preparing and implementing the plans for risk treatment	Lecture	1 Lecture
9. **Principles of dynamic administration of risks for the employees' safety and health.** Basic principles. Complementarity of the available competences. Multidisciplinarity and interdisciplinarity. Risk prevention versus risk evaluation. Preventive vision versus legalistic vision. Particularities of the small and medium size enterprises. Necessity for dynamic risk administration	Lecture	1 Lecture
10. **The structure of the SOBANE strategy and the guide for the participative detection of risks.** Conditions for application. Levels of application: Detection; Observatio; Analysis; Expertise. Development of the risk detection instrument. Conception criteria. The structure of the guide for participative detection. Check-list for the complementary checking of the main risks	Lecture	1 Lecture
11. **Implementation of the strategy.** Conditions for the participative process. Introducing the enterprise strategy. Position of the representatives of the employees. The facilitator. The commitment of the management and definition of the work „situation". Adapting the guide to the work situaton. Advantages of the participative process. Costs of the participative process and variability of the results	Lecture	1 Lecture
12. Complementary recommendations regarding the coordination of the SOBANE assembly. Work procedure. General structure of the guide. Synthesis documents. Main risks synthesis. Type of the work group gathering. Progress of the corelation process	Lecture	1 Lecture
13. DUPONT methodology for assessment and management of the risks induced by the nanomaterials. Purpose and potential users. Description of the material and applications. Elaboration of the threat profile during the life cycle. Decision, documentation, action. The structure of the document for risk assessment: worksheet	Lecture	1 Lecture
14. Management of the psichosocial risks lfor the occupational safety and health. Systematisation of the professional factors for psychosocial risks. Explicative models for the emergence of the occupational stress. The structure and stages of the process of assessment of psychosocial risks. How to use the grid. Result valorisation. Actions for elimination/reduction of the psychosocial risks	Lecture	1 Lecture

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18. x x x**- Évaluation des risques professionnels. Principes et pratiques**, ED 886, INRS – CRAMIF, Franţa, http://www.cramif.fr, 12 p.
19. x x x - **De l'évaluation des risque au management de la santé et de la sécurité au travail**, ED936, INRS – CRAMIF, Franţa, http://www.cramif.fr, 2004, 8 p.

8.2. Seminar/ laboratory/ project	Teaching and learning methodes	Observations
1General frame of the risk management in undergrund and surface mining.	Thematic debate	Topic of debate and relevant bibliography are announced during the previous meeting (2h)
2.Internal, external and risk management cintext, according to the principles of the standard SR ISO 31000:2010	Thematic debate	Topic of debate and relevant bibliography are announced during the previous meeting (2h)
3. Risk administration: from objectives to strategies. Benefits of the implementation of a risk management system. Extensions and varieties of the notion of risk. Estimation of the impact on the objectives in case of materialisation of the risks	Thematic debate	Topic of debate and relevant bibliography are announced during the previous meeting (2h)
4. Psychosocial risk management for the occupational health and safety. Structure and stages of the process of assessment of psychosocial risks. Evaluation tool for the psychosocial risks in work processes. How to fill in the grid. Valorisation of the results	Thematic debate şi studii de caz	Topic of debate and relevant bibliography are announced during the previous meeting (4h)
5. Methodological marks regarding the risk assessment. Measures and tools for internal control. Plans for risk management. The concept of extended organisation and risk environment	Thematic debate	Topic of debate and relevant bibliography are announced during the previous meeting (4h)
6. Management of the risk generated by the synthesis nanoparticles. Approach, applicable techniques, methods and means	Thematic debate	Topic of debate and relevant bibliography are announced during the previous meeting (2h)
7. Case studies regarding the application of the SOBANE strategy and the DEPARIS guide for participative identification of the occupational risks in the mining and mineral processing enterprises. Extension in various industrial areas. Generalisation of the procedure in case of economic agents	Thematic debate	Topic of debate and relevant bibliography are announced during the previous meeting (6h)
8.Revision and update of the risk management process. Communication and consulting	Thematic debate	Topic of debate and relevant bibliography are announced during the previous meeting (2h)
9. Accident and occupational disease risks management. Prevention and protection plan.	Thematic debate	Topic of debate and relevant bibliography are announced during the previous meeting (2h)
10. Damage and emergency situations management	Thematic debate	Topic of debate and relevant bibliography are announced during the previous meeting (2h)

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19. x x x – **Guide for developing and implementing your risk management framework**, Victorian Managed Insurance Authority (VMIA), Melbourne, Victoria, Australia, 2008 (http://www.vmia.vic.gov.au).
20. x x x – **Management du risque – Approche globale**, AFNOR, 2006, 566 p.
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9. Corroboration of the contents of the discipline with the expectations of the epistemic communities, professional associations and relevant employers in the domain related to the programme

In order to update the contents and teaching/learning methods, the ones in charge with the academic discipline organised several meetings with representatives of the Labour Inspection, National Institute for Research-Development for Work Protection (INCDPM) „Alexandru Darabont" Bucharest, National Institute for Mining Safety and Anti-Explosive Protection S.C. INSEMEX S.A. Petroşani, National Hardcoal Company, National Lignite Company Oltenia Tg. Jiu as well as with other companies in the country (S.C. Hidroelectrica SA, SC Hidroconstrucţia SA, SC Energomontaj SA, SC Transelectrica SA etc). During the content elaboration stage there were other participants, specialists from other departments of the University of Petrosani and the Universities „Lucian Blaga" Sibiu, „Transilvania" Braşov, Polytechnics Timişoara, Polytechnics Bucharest. The meetings aimed at identifying the needs and expectations shown by the employers, public institutions and agencies and coordination with other similar programmes within other higher education units.

10. Evaluation

Type of activity	10.1 Criteria of evaluation	10.2 Methods of evaluation	10.3 Weight in the final grade
10.4 Course	• Understanding and acquiring theoretical concepts and basis of identification, analysis, evaluation and treatment of the risks in mining industry;	Written exam; as a condition for entrance in the exam, the student must present the portfolio of essays during the penultimate seminar. In order lto take the portfolio into consideration, the student must obtain at least half of the score for the written exam.	70%
	• Existence of knowledge regarding the prevention methodes and protection against risks		
	• Detailed knowledge of the requirements and the application of the standard ISO 31000:2009 regarding the risk management		
	• Accurate interpretation and application of the legislation in order to put in practice the acquired knowledge regarding the risk minimasing		
	• Basic knowledge regarding the necessity, importance and finality of the prevention of undesired events in mining		
10.5 Seminar/	• Interpreting the technical and organisational	As a condition for entrance in	

laboratory/ project	pre-conditions of the materialisation of the mining risks; • Interpreting and understanding the connection between the causes and consequences in developing accident scenarios; • Correct application of a consecrated method for occupational accident and disease risk analysis and evaluation	the exam, the student must present the portfolio of essays during the penultimate seminar. The topics of the essays are stated by the one in charge with the seminar together with the students .	30%
10.6 Minimal standard of performance			
• Knowledge of necessity, importance and methodological finality of the process of occupational risk management; • Appropriate selection of the methodes and techniques for treating the risks in the working mining units; • Appropriate ranking of the accident and occupational disease risks in a given working system in the mining industry; • Elaboration of a prevention and protection plan.			

Date	Signature of the person in charge with course	Signature of the person in charge with seminar/ laboratory/ project
03.05.2016		

The approval date in departament	Director of Department's signature
10.05.2016	

Note:

1) Cycle of higher education – one of the cycles: Bachelor/ Master/ Doctoral degree;

2) Compulsivity – choose one of the options: DO (compulsory)/ Dopt (optional)/ DF (facultative);

3) One credit is equivalent of 27 hours of study (teaching activity and independent study).

SUBJECT FILE

1. Program data

1.1 Higher education institution	**UNIVERSITY OF PETROŞANI**
1.2 Faculty	MINING
1.3 Department	MINING ENGINEERING, SURVEYING AND CONSTRUCTION
1.4 Field of study	MINING, OIL AND GAS
1.5 Study cycle[1)]	Licence
1.6 Study program / Qualification	Mining Engineering

2. Data about subject

2.1 Subject	**Recycling techniques and metals recovery**						
2.2 Holder of the course activities				Associate prof. PhD. Eng. Bold Octavian-Valerian			
2.3 Holder of the seminar activities / laboratory/ project							
2.4 Year of study		2.5 Semester		2.6 Evaluation type	E	2.7 Discipline regime[2)]	DO

3. Total estimated time (semester hours of teaching activities)

3.1 Number of hours per week		from which: 3.2 course	**2**	3.3 seminar/ laboratory/ project	**1**
3.4 Total hours of curriculum		from which: 3.5 course	28	3.6 seminar/ laboratory/ project	14
Time fund distribution					hours
Study after manual, course support, bibliography and notes					
Additional documentation in library, specialized electronic platforms and on the ground					
Time to prepare seminars / labs / projects, homework, essays, portfolios and essays					
Tutoring					
Examinations					
Other activities					

3.7 Total hours of individual study	
3.8 Total hours per semester	
3.9 The number of credits[4)]	7

4. Preconditions (where appropriate)

4.1 curriculum	•
4.2 skills	•

5. Conditions (where appropriate)

5.1 of the course	• classroom with projector
5.2 of the seminar / laboratory / project	• classroom with projector

6. Specific skills acquired

Professional skills	• Knowing the importance of minerals in the development of human civilization; • Knowledge of key issues on the main non-ferrous: name, their natural properties and main related uses, deposits and producers, processing technology and finished products.
Ttransversal skills	• The existence of professional concerns for improving business results by taking roles in a multidisciplinary team work; • Involvement in research; • Participation in projects with scientific and demonstrate the ability to identify opportunities for their future training.

7. Course objectives (based on the grid of specific skills acquired)

7.1 The overall objective of subject	• presenting the most representative technologies applied to ores; • the need to track the results in the context of all recovery operations, • achieving a product at a competitive price at the world market, ie a cost recovery deposits.
7.2 Specific objectives	• characteristics presentation of underlying processing; • underlying the development of processing technologies.

8. Contents

8.1 Course	Teaching method	Observations
General on non-metallic substances: the definition and classification of their peculiarities	lecture	lecture
Processing technologies, mineralization that contain specific types of equipment used in process streams		
Mineral clasification.	lecture	lecture
Balance reserves. Exploitable and unexploitable reserves.	lecture	lecture

References

Brana V. şi alţii – Substanţe minerale nemetalifere. Ed. Tehnică, Bucureşti, 1986.
Krausz S., Ilie P. – Teoria şi tehnologia flotaţiei, vol.II Ed. MatrixRom, Bucureşti, 2001.
Străuţ I. Prepararea substanţelor nemetalifere. Ed. Cluj Napoca
Ilie P. – Regimuri de preparare a substanţelor minerale utile. Ed. Tehnică, Bucureşti, 1978.

8.2 Seminar/ laboratory/ project	Teaching-learning method	Observations
Name of indexes technological assessment results of processing non-metallic substances	Practical applications solving with students	laboratory
Presentation of typical technologies for various non-metal processing	Practical applications solving with students	laboratory
Practical determination of parameters and indicators for uncertain non-metal.	Practical applications solving with students	laboratory

References

Brana V. şi alţii – Substanţe minerale nemetalifere. Ed. Tehnică, Bucureşti, 1986.
Krausz S., Ilie P. – Teoria şi tehnologia flotaţiei, vol.II Ed. MatrixRom, Bucureşti, 2001.
Străuţ I. Prepararea substanţelor nemetalifere. Ed. Cluj Napoca
Ilie P. – Regimuri de preparare a substanţelor minerale utile. Ed. Tehnică, Bucureşti, 1978.

9. Corroborating the contents of discipline expectations with the representatives of epistemic community, employers associations and the representative for the program

In order to translate the knowledge gained after learning course and laboratory of *Recycling techniques and metals recovery* it will be organized a themed trip 2-3 days in the county.

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3Percentage of the final grade
10.4 Course	Knowledge of concepts and basic concepts	Written examination. The exam will be held on the basis of a questionnaire with answers by choice.	**60%**
	Ability to identify and explain the processing technologies and various metal ores. Theoretical principles, types of equipment, application areas of useful substances.		
10.5 Seminar/ laboratory/ project	Understanding the issues dealt with in the course and laboratory	Test paper. Participation to laboratory activity.	**40%**
10.6 Minimum performance standard			
• Developing the economic efficiency calculations of exploiting a deposit. •			

Date	Signature of the course holder	Signature of the seminar/ laboratory/ project holder
.....	.....	.....

The approval date in departament
..... 10.05.2016.....

Director of Department's signature

Note:

[1] Ciclul de studii - *se alege una din variantele:* Licenţă/ Master/ Doctorat;

[2] Regimul disciplinei (obligativitate) - *se alege una din variantele:* **DO** (disciplină obligatorie)/ **Dopt** (disciplină opţională)/ **DF** (disciplină facultativă);

[3] Un credit este echivalent cu 27 de ore de studiu (activităţi didactice şi studiu individual).

SYLLABUS

1. Data regarding the programme

1.1 Higher Education Institution	**UNIVERSITATEA DIN PETROŞANI**
1.2 Faculty	**MINING ENGINEERING**
1.3 Departament	**MINING ENGINEERING, MINE-SURVEYING AND CONSTRUCTIONS**
1.4 Field of study	**MINES, OIL AND GAS**
1.5 Cycle of higher education[1)]	**MASTER**
1.6 Study programme/Qualification	**SUSTAINABLE EXPLOITATION OF MINERAL RESOURCES**

2. Information regarding the discipline

2.1 Name of the discipline	**OCCUPATIONAL HEALTH AND SAFETY**						
2.2 In charge with the course				Professor, Ph.D. **MORARU ROLAND**			
2.3 In charge with seminar / laboratory/ project				Professor, Ph.D. **MORARU ROLAND**			
2.4 Year of study	**II**	2.5 Semester	**III**	2.6 Type of evaluation	**ES**	2.7 Compulsivity[2)]	**DO**

3. Total estimated time (hours per semester**)**

3.1 Number of hours per week	**5**	out of which: 3.2 course	**2**	3.3 seminar/ laboratory/ project	**- /2/1**
3.4 Number of hours in the curriculum	**70**	out of which: 3.5 course	**28**	3.6 seminar/ laboratory/ project	**42**

Time distribution	hours
Study of textbooks, courses, bibliography and notes	**46**
Supplementary study in the library, e-learning platforms and on the field	**36**
Preparation of seminars/ laboratories/ projects, homeworks, reports, portfolios and essayes	**32**
Tutoring	**20**
Examinations	**12**
Other activities.....	

3.7 Total hours of independent study	**146**
3.8 Total hours per semester	**216**
3.9 Number of credits[3)]	**8**

4. Preconditions (where applicable)

4.1 of curriculum	• Mine ventilation
4.2 of competences	• C4.5. Use of technical and environmental standards for mining equipment and technologies in order to ensure the occupational health and safety during the exploitation of the mineral resources.

5. Conditions (where applicable)

5.1 for the course	• Room with computer and projector • The students must shut down their cell phones during the activities; • Punctuality;
5.2 for the seminar/ laboratory/ project	• Fulfilling the obligations related to the content of the laboratory activities;

6. Specific earned competences

Profesional competences	• Specifying the selection criteria and decribing the techniques for analysis, planning, leading and contol in mining industry, geology and environment and knowing the hazard and risk phenomena • Statement of the hypotheses and principles regarding the systemic treatment of the exploitation technologies in conditions of occupational safety in mining industry, transportation and storage of the mining products; • Application of the organisational methods in connection with the performances of the exploitation technologies, transportation and storage of the mining products, respecting the existing standards and regulations • Critical argumentation in the technical economic analysis used for the founding of the global costs, evaluation in limit and technical, economic and financial risk conditions in mining industry. • Understanding how to apply and interpret the relevant legislation; • Learning the prevention methods, the techniques for minimisation of the negative effects caused by the accidents; • Using the laboratory apparatus to determine the underground dusting degree, monitoring the explosive gases and calculus of the endogenous fire indices; • Acquiring and improving the ability to interpret and apply the occupational health and safety (O.S.H.) legislation; • Correct interpretation and application of the legislation in view of putting into practice of the acquired knowledge regarding the minimisation of the occupational risks, prevention of the occupational accidents and diseases
Transversal competences	• Existence of a responsible attitude regarding the implementation of the specific legislation; • Ability to plan and organize the activity of data interpretation; • Existence of preoccupations regarding the improvement of the results of the professional activity by taking roles in a multidisciplinary team; • Getting involved in research activities, such as documentation, bibliography based essays, possibly scientific articles; • Developing a pro-active behaviour regarding the occupational safety • Ability to solve the legal requirements regarding the occupational safety.

7. Objectives of the discipline (from the competence grid)

7.1 Overall objective	• Acquiring and understanding the basic relevant concepts, theories and methodes; using them appropriatly for the occupational communication. Utilisation of the basic knowledge to explain and interpret various types of concepts, situations, processes, projects etc that are associated to the OHS
7.2 Specific objective	• Generating and developing the ability for understanding and acquiring the theoretical concepts and methodological foundation of the OHS in the mining industry; • Interpreting and understanding the connection between the mining risks and the methods and technical, organisational and hygienic-sanitary means for prevention of the accident and disease risks in underground mining; • Use pf the laboratory apparatus to measure the microclimate parameters and quantitative analysis of the noxious gas; • Abilities regarding the practical use of the measurement apparatus and instruments to measure the specific parameters to the underground atmosphere

8. Contents

8.1 Course	**Teaching methodes**	**Observations**
1.Structure of the law system and the main normative acts regarding the occupational safety and health	Lecture	1 Lecture
2.Occupational accidents and diseases. Definition, classification, communication, research, recording. Signalling and declaring the occupational diseases	Lecture	1 Lecture
3.Basic principles and concepts regarding the industrial risks analysis. Threat, risk, acceptable risk, Farmer diagram	Lecture	2 lectures
4.Techniques and methodes for assessing the occupational accident and disease risks in mining industry.	Lecture and case studies	2 lectures
5.Gaseous explosive environments. Methane. Explosive mixtures with more components. Classification of mines from the poin of view of the gas emanations	Lecture	2 lectures
6.Underground fires and endogenous fires as major risk phemomena. The mechanism of the coal self-ignition process, detection during the incipient phase,	Lecture	1 Lecture

techniques and means for prevention and control.		
7.Powdery explosive environments. Explosive coal powder, sources, factors and parameters that influence the explosivity, the mechanism of the explosion process.	Lecture	1 Lecture
8.Prevention against industrial pneumoconiosis causing powders. Pevention against the silicosis causing powder caused by the mining operations.	Lecture	1 Lecture
9.Technical, organisational and hygienic-sanitary methods and means for prevention against the occupational accident and disease risks in underground mining	Lecture	1 lectures
10.Minimal safety and health requirements for temporary and mobile work sites	Lecture	1 Lecture
11.Occupational safety and health requirements for mining underground constructions	Lecture	1 Lecture

Bibliography

1. Băbuţ, G., Moraru, R. – **Protecţia muncii**, Editura Universitas, Petroşani, 1999.
2. Cioca, I.L., Moraru, R. **— Managementul riscurilor profesionale psihosociale**, Editura Universităţii „Lucian Blaga" din Sibiu, 2010, ISBN: 978-973-739-924-3.
3. Cioca, LI., Moraru, RI**, Explosion and/or Fire Risk Assessment Methodology: A Common Approach Structured for Underground Coalmine Environments,** ARCHIVES OF MINING SCIENCES Volume: 57 Issue: 1 Pages: 53-60 Published: 2012
4. Matei, I., Moraru, R., ş.a. – **Ingineria mediului şi ventilaţia în subteran**. Ed.
5. Moraru R.I., **Current Trends and Future Developments in Occupational Health and Safety Risk Management** în Roland Iosif Moraru (2012). Current Trends and Future Developments in Occupational Health and Safety Risk Management, Risk Management for the Future - Theory and Cases, Dr Jan Emblemsvåg (Ed.), , InTech, Pag. 3-28 din 496 pag. **InTech Europe**, Rijeka, Croatia, **Published online**: 25. April, 2012, **Published in print edition**: April, 2012.ISBN:978-953-51-0571-8, http://www.intechopen.com/books/risk-management-for-the-future-theory-and-cases/current-trends-and-future-developments-in-occupational-health-and-safety-risk-management
6. Moraru R.I., ***Occupational Healthj and Safety*** *(in Romanian),* Editura Focus, Petroşani, ISBN 978-973-677-272-6, 2013, 537 pg
7. Moraru R.I., Băbuţ, C.M., Băbuţ, G.B., *Aeraj, sănătate şi securitate în muncă*, **Focus, Petroşani, ISBN 978-973-677-253-5, 2011, 348 pg.**
8. Moraru R.I., Băbuţ, G.B.***A Romanian occupational health and safety risk assessment tool: premises, development and case study*** (2012), in ***Risk Assessment and Management***, Edited by: Prof. Zhiyong Zhang- Henan University of Science and Technology. Published by Academy Publish.org (Publishing Services LLC), 2120 Carey Avenue, Cheyenne, WY 82001, USA.**,** ISBN: 978-0-9835850-9-1, June 2012, pp. **430 – 459** din 820 pag.
9. Moraru, R.I., Băbuţ, G.B., Cioca, L.I., *Rationale and Criteria Development for Risk Assessment Tool Selection in Work Environments,* ***Environmental Engineering and Management Journal***, Vol. 13, No. 6, pp. 1371 - 1376Moraru, R.I, Băbuţ,G.B., Cioca I.L., **Adressing the Human Error Assessment and Management**,ARCHIVES OF MINING SCIENCES, Volume: 55 Issue: 4, Pages: 873-878, Published: 2010
10. Moraru, R., Băbuţ, G. – **Analiză de risc**, Editura Universitas, Petroşani, 2000.
11. Moraru, R., ş.a. – **Ghid pentru evaluarea riscurilor profesionale**, Editura FOCUS, Petroşani, 2002.
12. Moraru, R., Băbuţ, G. **— Managementul riscurilor: abordare globală - concepte, principii şi structură**, Editura Universitas Petroşani, 2009, ISBN: 978-973-741-128-0.
13. Moraru, R., Băbuţ, G. - **Evaluarea şi managementul participativ al riscurilor: ghid practic**, Editura Focus (cod CNCSIS 004), Petroşani, 2010, ISBN 978-973-677-206-1.
14. Moraru, R., Băbuţ, M.C., Băbuţ, G – **Aeraj, sănătate şi securitate în muncă**, Editura Focus (cod CNCSIS 004), Petroşani, 2011, ISBN 978-973-677-253-5.
15. Moraru, R., Cioca, I.L., - **Nanosafety**, Editura Universităţii „Lucian Blaga" din Sibiu, 2010, ISBN: 978-606-12-0189-1.
16. X X X – **Legea 319 privind securitatea şi sănătatea în muncă**.
17. X X X – **HG 1425 „ Norme metodologice de aplicare a legii 319 privind securitatea şi sănătatea în muncă"**

8.2. Seminar/ laboratory	**Teaching methodes**	**Observations**
1.Monitoring the underground methane concentration. Placing the detection heads of the tele grisou metric station in various categories of mining works.	Presentation of the apparatus and measurement instruments and practical use	1laboratory work
2.Early detection of the endogenous fires. Fire indices calculus (Indices: breathing, Graham. Trickett-Jones).	Presentation of the apparatus and measurement instruments and practical use	2 laboratory works
3.Systems and techniques for instumental measurement of the micrclimate parameters and confort degree.	Presentation of the apparatus and measurement instruments and practical use	1laboratory work
4.Determination of the characteristic parameters for the ventilation installations (flow, depression, efficiency, required power).	Presentation of the apparatus and measurement instruments and practical use	1laboratory work
5.Determining the dusting degree in the underground works. Explosive powder. Pneumoconiosis causing powder	Presentation of the apparatus and measurement instruments and practical use	1laboratory work
6.Rescuing, self-rescuing systems and individual	Presentation of the apparatus and	1laboratory work

means for protection.	measurement instruments and practical use	

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1. Băbuţ, M.C. – **Aeraj şi protecţia muncii - Lucrări practice**, Editura Focus, 2013.
2. Matei, I., Moraru, R., ş.a. – **Ingineria mediului şi ventilaţia în subteran**.
3. Matei, I.,Bălţăreţu, F. – **Ghid practic pentru proiectarea şi verificarea instalaţiilor de aeraj parţial**, MMPS, Bucureşti, 1997..
4. Moraru, R., ş.a. – **Ghid pentru evaluarea riscurilor profesionale**, Editura FOCUS, Petroşani, 2002.
5. Moraru, R., Băbuţ, M.C., Băbuţ, G – **Aeraj, sănătate şi securitate în muncă**, Editura Focus (cod CNCSIS 004), Petroşani, 2011, ISBN 978-973-677-253-5.

8.3.Project	**Teaching and learning methodes**	**Observations**
1.Functional description of the evaluated system	The student gets the digital project support and performs the calculus, analyses the alternatives through discussions with the person in charge with seminar	Each student performs the risk assessment for an underground working place (stage 1 – 2ore)
2.Risk factors identification	Design calculus coordinated by the project superviser and free discussions	Each student performs the risk assessment for an underground working place (stage 2 - 2 ore)
3.Elaboration of FELM (INCDPM method)	Design calculus coordinated by the project superviser and free discussions	Each student performs the risk assessment for an underground working place (stage 3 – 2 ore)
4.Establishing the severity and probability classes	Design calculus coordinated by the project superviser and free discussions	Each student performs the risk assessment for an underground working place (stage 4 – 2 ore)
5.Quantification of the occupational accident and disease risks	Design calculus coordinated by the project superviser and free discussions	Each student performs the risk assessment for an underground working place (stage 5 – 2 ore)
6.Risk ranking and establishing the prevention priorities	Design calculus coordinated by the project superviser and free discussions	Each student performs the risk assessment for an underground working place (stage 6 – 2 ore)
7. Elaboration of the prevetion measures and interpretation of the results	Design calculus coordinated by the project superviser and free discussions	Each student performs the risk assessment for an underground working place (stage 7 – 2 ore)

Bibliography

1. Cioca, I.L., Moraru, R. **— Managementul riscurilor profesionale psihosociale**, Editura Universităţii „Lucian Blaga" din Sibiu, 2010, ISBN: 978-973-739-924-3.
2. Moraru, R., Băbuţ, G. – **Analiză de risc**, Editura Universitas, Petroşani, 2000.
3. Moraru, R., ş.a. – **Ghid pentru evaluarea riscurilor profesionale**, Editura FOCUS, Petroşani, 2002.
4. Moraru, R., Băbuţ, G. **— Managementul riscurilor: abordare globală - concepte, principii şi structură**, Editura Universitas Petroşani, 2009, ISBN: 978-973-741-128-0.
5. Moraru, R., Băbuţ, G. - **Evaluarea şi managementul participativ al riscurilor: ghid practic**, Editura Focus (cod CNCSIS 004), Petroşani, 2010, ISBN 978-973-677-206-1.
6. X X X – **Legea 319 privind securitatea şi sănătatea în muncă**.
1. X X X – **HG 1425 „ Norme metodologice de aplicare a legii 319 privind securitatea şi sănătatea în muncă"**

9. Corroboration of the contents of the discipline with the expectations of the epistemic communities, professional associations and relevant employers in the domain related to the programme

In order to update the contents and teaching/learning methods, the persons in charge with the discipline organised a meeting with the representatives of the National Institute for Mining Safety and Anti-Explosive Protection S.C. INSEMEX S.A. Petroşani, National Hardcoal Company, National Lignite Company Oltenia Tg. Jiu as well as with other mining companies and societies in Romania. During the content elaboration stage there were other participants, specialists from other departments of the University of Petrosani and the Faculty of Mineral Resources Baia Mare. The meetings aimed at identifying the needs and expectations shown by the employers and coordination with other similar programmes within other higher education units.

10. Evaluation

Type of activity	10.1 Criteria of evaluation	10.2 Methods of evaluation	10.3 Weight in the final grade
10.4 Course	• Understanding and acquiring the theoretical and fundamental concepts regarding the occupational safety and health in mining; • Acquiring knowledge regarding the occupational accidents and diseases • Knowing the risk factors concerning the occupational accidents and diseases	Written exam, admission into exam after passing a laboratory test. In order to take into consideration the score from the lab test, the student must obtain at least half of the score for the written exam.	60%

	• Easy and rational identification of the mining risks generated by the work system elements • Approaching the decision making aspects regarding the complex interaction between the underground environment and the effects of the human errors • Basic knowledge regarding the necessity, importance and finality of the undesirable events in mining industry		
10.5 Seminar/ laboratory/ project	• Generatig and developing the ability to interpret the mining risks; • Interpreting and understanding the connection between causes and consequences in developing accident scenarios; • Use of the laboratory apparatus for measuring the dusting degree and quantitative analysis of the noxious gas	Presentation of a portfolio of laboratory works ellaborated during the semester is compulsory for admission to the final examination. The portfolio must be presented during the penultimate week of the semester. Elaboration of the partial and general ventilation project for a mining works network	40%
10.6 Minimal standard of performance			
• Knowing the necessity, importance and methodological finality of the occupational safety and health in mining industry; • Adequate selection of the methods and means for prevention and protection of the personnel; • Identification of the occupational accident and disease risk factors of the working systems in the mining induhstry; • Realisation of a project for partial and general ventilation for a mine			

Date
03.05.2016

Signature of the person in charge with course
..

Signature of the person in charge with seminar/ laboratory/ project

The approval date in departament
..... 10.05.2016.....

Director of Department's signature

Note:

1) Cycle of higher education – one of the cycles: Bachelor/ Master/ Doctoral degree;

2) Compulsivity – choose one of the options: DO (compulsory)/ Dopt (optional)/ DF (facultative);

3) One credit is equivalent of 27 hours of study (teaching activity and independent study).

SYLLABUS

1. Data regarding the programme

1.1 Higher Education Institution	**UNIVERSITY OF PETROSANI**
1.2 Faculty	FACULTY OF MINES
1.3 Departament	Management, environmental engineering and geology
1.4 Field of study	Mine, oil and gases
1.5 Cycle of higher education[1)]	Master
1.6 Study programme/Qualification	Sustainable exploitation of mineral resources

2. Information regarding the discipline

2.1 Name of the discipline	**Mining economy**						
2.2 In charge with course				**Ioan Nicolae Tiuzbaian**			
2.3 In charge with seminar / laboratory/ project				**Ioan Nicolae Tiuzbaian**			
2.4 Year of study	**II**	2.5 Semester	**3**	2.6 Type of evaluation	**E**	2.7 Compulsivity[2)]	**DO**

3. Total estimated time (hours per semester)

3.1 Number of hours per week	**4**	out of which: 3.2 course	**2**	3.3 seminar/ laboratory/ project	**2**
3.4 Number of hours in the curriculum	**56**	out of which: 3.5 course	**28**	3.6 seminar/ laboratory/ project	**28**

Time distribution	**hours**
Study of textbooks, courses, bibliography and notes	**55**
Supplementary study in the library, e-learning platforms and on the field	**18**
Preparation of seminaries/ laboratories/ projects, homeworks, reports, portfolios and essayes	**30**
Tutoring	**5**
Examinations	**5**
Other activities.....	**20**

3.7 Total hours of independent study	**133**
3.8 Total hours per semester	**189**
3.9 Number of credits[3)]	**7**

4. Conditions (where applicable)

4.1 for the course	• Room with computer and projector • The students must shut down their cell phones during the activities; • Punctuality;
4.2 for the seminar/ laboratory/ project	• Fulfilling the obligations related to the content of the laboratory activities;

5. Specific earned competences

Professional competences	• Knowing and understanding the basic principles of general and mining economy; • Knowledge of the fundamental concepts and notions in the field of integrated economy systems; • Acquiring the basic notions concerning the mining economy and their integration within the general management of companies; • Acquiring the system principles of mining economy and of integrated management systems; • Capability of employing the acquired knowledge during evaluations
Transversal competences	• Preoccupations for improving the results of professional activity through assuming one's part within multidisciplinary work teams; • Participation in research activities, such as: documenting, elaboration of bibliographic syntheses or of a series of papers and specialized articles; • Participation in scientific projects and display of the capacity of identifying opportunities for one's own future professional training.

6. Objectives of the discipline (from the competence grid)

6.1 Overall objective	• Getting the students acquainted with the theoretical approaches and practical devices in the field of mining economy, conceived as a science that targets companies improvement and competition ability in their branch of activity
6.2 Specific objective	• Conceiving work documents, using/ interpreting the data contained by the work documents with a view to elaborating an efficient organizational structure characteristics for a mining unit; • Acquiring the notions and aptitudes necessary for implementing a modern mining economy and management

7. Contents

7.1 Course	Teaching methodes	Observations
1. Integrating economics into mining. Mine planning process	Lecture	2 hours
1. Justifying exploration expenditure. Strategic assessment of mining projects	Lecture	3 hours
2. Cost-effective mining schemes. Key elements	Lecture	2 hours
3. The systematic planning process. Economic data at each phase of the planning cycle	Lecture	3 hours
4. Costs. Cost from an economic perspective	Lecture	2 hours
5. Types of costs. Marginal costs	Lecture	3 hours
6. Costs with multiproduct mines	Lecture	2 hours
2. Time value of money. Valuation at a constant point in time. Discounted cash flow analysis	Lecture	3 hours
7. Ownerships costs and capital costs.	Lecture	2 hours
8. Operation costs. Suplly costs. Job condition. Operating cost data	Lecture	2 hours
9. Mining strategy. The investment dichotonomy: Risk and Return. Criteria for decision making	Lecture	2 hours
10. Mining strategy and knowledge. Stages of strategic management	Lecture	2 hours

Bibliography

1. Sloan A. Douglas – *Mine Management,* Chapman and Hall Lt, New York, U.S.A., 1983;
2. Camus P. Juan – *Management of Mineral Resources: Creating Value in the Mining Business,* Society for Mining, Metallurgy and Exploration, Englewood, Colorado, Usa, 2002;
3. Ian C. Runge – *Mining Economics and Strategy*, Society for Mining, Metallurgy and Exploration, Inc,, Littleton, Colorado, USA, 1998;
4. Simionescu Aurelian, Dijmarescu Ion – *Organizarea si conducerea activitatilor miniere,* Editura Tehnica, Bucuresti, 1985;
5. * * * - *Manualul inginerului de mine, vol III,* Editura Tehnica, Bucuresti, 1985;
6. Simionescu, Aurelian, Mangu Sorin – *Microeconomie,* Editura Focus, Petrosani, 2004;
7. Tiuzbaian Ioan Nicolae, *Management general*, Editura Edyropres, Bucureşti, 2003.

7.2 Seminar/ laboratory/ project	Teaching and learning methodes	Observations
1. Aplication of economic evaluation.	Case study	4 hours
2. Comparison of mining equipment options. Overall project evaluation	Debate.	3 hours
3. Integrating economics into mining. Mine planning process	Multiple choice test	3 hours
4. Cost-effective mining schemes. Key elements	Multiple choice test	3 hours
5. Types of costs. Marginal costs	Aplication	4 hours
6. Inflation and constant money calculation	Aplication. Multiple choice test	4 hours
7. Operation costs. Suplly costs. Job condition. Operating cost data	Multiple choice test	3 hours
8. Mining strategy and knowledge. Stages of strategic management	Debate. Multiple choice test	4 hours

Bibliography

1. Sloan A. Douglas – *Mine Management,* Chapman and Hall Lt, New York, U.S.A., 1983;
2. Camus P. Juan – *Management of Mineral Resources: Creating Value in the Mining Business,* Society for Mining, Metalurgy and Exploration, Englewood, Colorado, Usa, 2002;

3. Ian C. Runge – *Mining Economics and Strategy*, Society for Mining, Metallurgy and Exploration, Inc,, Littleton, Colorado, USA, 1998;
4. Simionescu Aurelian, Dijmarescu Ion – *Organizarea si conducerea intreprinderilor, vol I,* Editura UP, Petrosani, 1985;
5. Simionescu Aurelian, Dijmarescu Ion – *Organizarea si conducerea intreprinderilor, vol II,* Editura UP, Petrosani, 1985;
6. Tiuzbaian Ioan Nicolae, *Management general*, Editura Edyropres, Bucureşti, 2003.
7. Simionescu, Aurelian, Mangu Sorin – *Microeconomie,* Editura Focus, Petrosani, 2004

7.3 Seminar/ laboratory/ project	Teaching and learning methodes	Observations

Bibliography

8. Corroboration of the contents of the discipline with the expectations of the epistemic communities, professional associations and relevant employers in the domain related to the programme

The targeted topics attempt at informing the students upon the themes of mining economy, providing them with basic knowledge and useful abilities for the analysis and interpretation of organizational features and of the economic and social milieu; the topics also allow them to get used with data systematization as well as with the drawing out and implementation of the documentation required with a view to applying a economic system. Meanwhile, the students are going to acquire the capacity of carrying out consultancy activities, which are valued by the representative employers in the domain related to the program

9. Evaluation

Type of activity	9.1 Criteria of evaluation	9.2 Methods of evaluation	9.3 Weight in the final grade
9.4 Course	• Acquiring the economic notions and aptitudes necessary for an efficient management • Understanding the methods and techniques used in economy and mining economy	Written examination; the entering to the examination is possible only in the case the student submits the paper on the occasion of the last seminar.	70%
9.5 Seminar/ laboratory/ project	• Acquiring and understanding the aspects displayed by the courses and seminars • Knowledge, interpretation and use of bibliographic stuff • Acquiring the methods and techniques of mining economy as well as the stages of organizational planning in the field of mining management	Submitting a paper, elaborated during the semester, is an access requirement to the final examination. The content of the paper is decided upon by each member of the teaching staff that carries out seminar activities in agreement with the students. The paper should be submitted on the occasion of the last seminar carried out during the final week of didactical activity	30%

9.6 Minimal standard of performance

- Knowledge of the fundamental notions contained by the course notes;
- Presentation of the paper enabling the display of the minimal knowledge of fundamental notions

Date	Signature of the person in charge with course	Signature of the person in charge with seminar/ laboratory/ project
25.05.2016		

The approval date in departament
..... 10.05.2016.....

Director of Department's signature

Note:

1) Cycle of higher education – *one of the cycles:* Bachelor/ Master/ Doctoral degree;
2) Compulsivity – *choose one of the options:* **DO** (compulsory)/ **Dopt** (optional)/ **DF** (facultative);
3) One credit is equivalent of 27 hours of study (teaching activity and independent study).

SYLLABUS

1. Data regarding the programme

1.1 Higher Education Institution	**UNIVERSITY OF PETROSANI**
1.2 Faculty	**FACULTY OF MINES**
1.3 Department	**DEPARTMENT OF MANAGEMENT, ENVIRONMENTAL ENGINEERING AND GEOLOGY**
1.4 Field of study	**MINE, OIL AND GAS**
1.5 Cycle of higher education[1)]	**MASTER**
1.6 Study programme/Qualification	**SUSTAINABLE EXPLOITATION OF MINERAL RESOURCES**

2. Information regarding the discipline

2.1 Name of the discipline	**Project management**						
2.2 In charge with course				**Prof.univ.dr.ing.dr.ec. EDELHAUSER EDUARD**			
2.3 In charge with seminar / laboratory/ project				**Şef lucr. dr. ing. ec. ILOIU MIRELA**			
2.4 Year of study	**II**	2.5 Semester	**I**	2.6 Type of evaluation	**ES**	2.7 Compulsivity[2)]	**DO**

3. Total estimated time (hours per semester)

3.1 Number of hours per week	**4**	out of which: 3.2 course	**2**	3.3 seminar/ laboratory/ project	**2**
3.4 Number of hours in the curriculum	**56**	out of which: 3.5 course	**28**	3.6 seminar/ laboratory/ project	**28**

Time distribution	Hours
Study of textbooks, courses, bibliography and notes	**30**
Supplementary study in the library, e-learning platforms and on the field	**30**
Preparation of seminaries/ laboratories/ projects, homeworks, reports, portfolios and essayes	**30**
Tutoring	**2**
Examinations	**1**
Other activities.....	

3.7 Total hours of independent study	**93**
3.8 Total hours per semester	**189**
3.9 Number of credits[3)]	**7**

4. Conditions (where applicable)

4.1 for the course	• The room must be equipped with video projector and projection screen; • The room must have an Internet connection (wired or wireless) • Students will present at the lecture and laboratories with ongoing support
4.2 for the seminar/ laboratory/ project	• The room must be equipped with projector and projection screen; • The room must have an Internet connection (wired or wireless)

5. Specific earned competences

Professional competences	• Identification of theories, concepts, methods and tools necessary managerial processes, according to the organization's environment • Recognition of managerial functions (forecasting, organization, coordination, training and control-assessment) • Explaining, interpreting and correlating factors that constitute the organization's internal and external environment in their dynamics • Describe the basic concepts and methods of the management system and its subsystems • Evaluate critically-constructive operation of the management system and its subsystems • Evaluation of the application of forecasting methods, organization, coordination, training and control-assessment • Applying the basic principles and methods necessary managerial decision-making process of the organization
Transversal competences	• Ability to work in team • Concern for continuing professional development and awareness of the need for accumulation of new knowledge in the field of training • Conducting studies / papers forecasting, organization, coordination, training and control-assessment in organizations

6. Objectives of the discipline (from the competence grid)

6.1 Overall objective	• Forming an overall view on the management process deployed in organizations. • Presentation of the role of management in organizations and the real problems faced by managers in fulfilling this role. • The accumulation of theoretical and practical knowledge to develop an application for funding for a project in the field of mining engineering
6.2 Specific objective	• Use effective methods of forecasting management • Create knowledge base necessary as a basis to a correct decision in a mining company • Implementation of decision making methods • Fixing the knowledge at the end of chapters with questions, problems and case studies refresher.

7. Contents

7.1 Course	Teaching method	Observations
1. Basic concepts in projects management 2. Categories of people involved in a project. Project stakeholder. Building and maintaining the team. Sponsors	Lectures and debates with students	2 courses = 4 hours
3. Determining the type of the organization for a Project. Project organizations and structure	Lectures and debates with students	2 courses = 4 hours
4. Project management within organizations. The life cycle of a project 4.1. Identifying the problem - Initiation 4.2. Planning goal, objectives, actions and resources needed to solve problems	Lectures and debates with students	5 courses = 10 hours
4. Project management within organizations. The life cycle of a project 4.3. Implementation of projects – Execution - Progress and Performance Management 4.4. Documentation, Audit, Termination and Closure - Evaluation 4.5. Control, report and communication during project execution 5. Functional areas of project management 6. Estimation of Time, costs and resources in a project	Lectures and debates with students	5 courses = 10 hours

Bibliography

1. Darnall Russell and John Preston,. Beginning Project Management, V.1.1, 2012 (http://2012books.lardbucket.org/)
2. Heerkens Gary R. PMP, Project Management, Copyright © 2002 by The McGraw-Hill Companies
3. Lock Dennis, Project Management, Published by Gower Publishing Limited, England, 2007
4. M. Hill Gerard, The Complete Project Management Office Handbook, Auerbach Publications, © 2008 by Taylor & Francis Group, LL
5. Newton Paul, The Principles of Project Management, Project Skills, www.free-management-eboks.com, 2015
6. Petrsen Christine PMP, The Practical Guide to Project Management, 1st Edition, www.bookbon.com
7. Passenheim Olaf, Project Management, 2009 Olaf Passenheim & Ventus Publishing ApS
8. Williams Meri, The Principles of Project Management, Copyright © 2008 SitePoint Pty. Ltd, http://onlinecomputerbooks.tradepub.com/free/w_sitb01/

7.2 Seminar/ laboratory/ project	Teaching and learning method	Observations
1 Basic concepts in projects management	Debates with students	1 seminar
2. Human resources in project management	Debates with students	2 seminars
3. The life cycle of the project. Identify the topic Project	Case study	2 seminars
4. The life cycle of the project. Formulating project goals and objectives	Case study	2 seminars
5. The life cycle of the project. Planning of activities and resources for the project. Sources and methods of financing of projects	Case study	2 seminars
6. Implementation. Project cost management and optimization	Case study	3 seminars
7. Evaluating projects. Methods and techniques.	Case study	2 seminars

Bibliography

1. Darnall Russell and John Preston,. Beginning Project Management, V.1.1, 2012 (http://2012books.lardbucket.org/)
2. Heerkens Gary R. PMP, Project Management, Copyright © 2002 by The McGraw-Hill Companies
3. Lock Dennis, Project Management, Published by Gower Publishing Limited, England, 2007
4. Newton Paul, The Principles of Project Management, Project Skills, www.free-management-eboks.com, 2015
5. Petrsen Christine PMP, The Practical Guide to Project Management, 1st Edition, www.bookbon.com
6. Passenheim Olaf, Project Management, 2009 Olaf Passenheim & Ventus Publishing ApS

8. Corroboration of the contents of the discipline with the expectations of the epistemic communities, professional associations and relevant employers in the domain related to the programme

To develop content and methods of teaching and learning, we have specialized continuously in Universities from Cluj Napoca and Timisoara, and we had an ongoing dialogue with developers and implementers of projects in Romania such as SC SIVECO Romania SA. Also we have implemented during 2010-2015, three European Projects as project manager. POSDRU 59756, POSDRU 141118, POSDRU156053

9. Evaluation

Type of activity	9.1 Criteria of evaluation	9.2 Methods of evaluation	9.3 Weight in the final grade
9.4 Course	Interpreting and understanding of management concepts and notions • Understand the content of a management process • Ability to analyze the applicability of methods for optimized the decision, depending on the degree of knowledge of objective conditions	The written exam consists of multiple choice and open debate subjects.	70%
9.5 Seminar/ laboratory/ project	• Understanding and learning fundamental concepts presented in the courses and exemplified during the seminars • Ability to operate with management indicators in forecasting methods • Use appropriate methods as a basis for decisions	Develop a draft of a request for funding.	30%
9.6 Minimal standard of performance			
Mastering the main concepts of Project Management • Understand the concept and process management within a project management • Knowledge of the component of the management system			

Date
17.04.2016

Signature of the person in charge with course

Signature of the person in charge with seminar/ laboratory/ project

The approval date in departament
..... 10.05.2016.....

Director of Department's signature

Note:

1) Cycle of higher education – *one of the cycles:* Bachelor/ Master/ Doctoral degree;

2) Compulsivity – *choose one of the options:* **DO** (compulsory)/ **Dopt** (optional)/ **DF** (facultative);

3) One credit is equivalent of 27 hours of study (teaching activity and independent study).