Monitoring and diagnosis of environmental quality (ENVIRONMENTAL ENGINEERING, 4th YEAR OF STUDY, 7th SEMESTER)

Credit value (ECTS) 5

Course category
Mandatory

Course holder
Lecturer Raluca-Maria HLIHOR, Ph.D.

Discipline objectives (course and practical works)

The general objective of the discipline

Knowledge of the concept of environmental monitoring considering both theory and practical skills, obtaining environmental data, processing information, selection of environmental indicators in order to analyze the quality of the environmental factors.

Specific objectives of the discipline

Awareness in environmental monitoring. Identification of terms, relationships, processes, perception of relationships and connections within the field of integrated environmental monitoring. Terminology and specialized language of the environmental monitoring field. Development of the ability to synthesize and correctly interpret information. Making connections between the sources of pressure on the environment and its quality. The ability to put into practice the knowledge acquired during the course. Development of research skills in the field of environmental monitoring.

Contents (syllabus)

Course (chapters/subchapters)
1. Environmental monitoring 1.1. Definition of environmental monitoring 1.2. Purpose of environmental monitoring 1.3. Principles of environmental monitoring 1.4. Environmental monitoring objectives & criteria 1.5. Environmental monitoring parameters 1.6. Methods for data processing in environmental monitoring systems 1.7. Shared environmental information system.
2. Water quality monitoring and assessment 2.1. Introduction 2.2. The frequency of water monitoring 2.3. Programs for water quality monitoring 2.4. Water monitoring network structure 2.5. Water Framework Directive 2.6. Integrated management of water resources 2.7. Integrated Monitoring System in Romania

3. Air quality monitoring and assessment 3.1. Introduction 3.2. Emissions and sources monitoring 3.3. Monitoring of fundamental parameters in the transfer and dispersion of pollutants 3.4. Immission monitoring 3.5. Emission inventories 3.6. Inventory methodologies 3.7. Design of air quality monitoring 3.8. Air quality monitoring system in Romania

Practical works
1. Laboratory Safety Instructions. Physico-chemical parameters of water quality
2. Water sampling for laboratory analysis. Fieldwork
3. Water temperature and conductivity analysis
4. Determining the amount of nitrates in water
5. Determining the amount of nitrites in water
6. Determining the amount of sulphates in water
7. Determination of Biochemical Oxygen Demand (BOD_5)
8. Determination of oxidizable substances in water. Potassium permanganate method (COD-Mn)
9. Determination of oxidizable substances in water. Potassium dichromate method (COD-Cr)
10. Air sampling for laboratory analysis
11. Review. Final conclusions
12. Laboratory Colloquium

Bibliography

1. Artiola J., Pepper I.L., Brusseau M.L., 2004 - *Environmental Monitoring and Characterization*, Elsevier Science & Technology Books.

2. Bîlbă D., Tofan L., Rusu G., 2007 - *Metode de Analiză în Controlul Calităţii Mediului – Lucrări practice*, Ed. Performantica, Iași.

3. Bulgariu L., 2013 - *Controlul Analitic al Calităţii Produselor*, Ed. Politehnium, Iași.

4. Ciolpan O., 2005 - *Monitoringul Integrat al Sistemelor Ecologice*, Ed. Ars Docendi, București.

5. Clesceri L.S., Greenberg A.E., Eaton A.D., 2005 - *Standard methods for the examination of water and wastewater*, 20th Edition, Franson M.A.H. (Ed.), American Public Health Association 1015 Fifteenth Street, NW, Washington DC.

6. Hlihor R.M., Simion I.M., 2016 - *Poluarea Apei și Solului: Îndrumar de Laborator*, Ed. Ecozone, Iași.

7. Mihăiescu R., 2014 - *Monitoringul integrat al mediului*, Cluj –Napoca.

8. * Ordonanța de urgență 195/2005**, privind protecția mediului, modificată la data de 15 iulie 2013 (M. Of. nr. 438/18 iul. 2013).

9. Tofan L., 2014 - *Principii și Aplicații de Chimie Analitică și Analiză Instrumentală*, Ed. Performantica, Iași.

10. Zaharia C., 2013-2014 - *Chimia Mediului: Teste de Control în Laborator și Probleme*, Ed. Performantica, Iași.

11. Zaharia C., 2014 - *Chimia Mediului - Teste de Laborator și Probleme*, Ed. Performantica, Iași.

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Course	Exam	70%
	Course attendance	10%
Practical works	Processing and interpretation of results; laboratory colloquium	20%

Contact

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Monitoring and diagnosis of environmental quality (ENVIRONMENTAL ENGINEERING, 4th YEAR OF STUDY, 8th SEMESTER)

Credit value (ECTS) 3

Course category
Mandatory

Course holder
Lecturer Raluca-Maria HLIHOR, Ph.D.

Discipline objectives (course and practical works)

The general objective of the discipline

Knowledge of the concept of environmental monitoring considering both theory and practical skills, obtaining environmental data, processing information, selection of environmental indicators in order to analyze the quality of the environmental factors.

Specific objectives of the discipline

Awareness in environmental monitoring. Identification of terms, relationships, processes, perception of relationships and connections within the field of integrated environmental monitoring. Terminology and specialized language of the environmental monitoring field. Development of the ability to synthesize and correctly interpret information. Making connections between the sources of pressure on the environment and its quality. The ability to put into practice the knowledge acquired during the course. Development of research skills in the field of environmental monitoring.

Contents (syllabus)

Course (chapters/subchapters)
1. Soil quality monitoring and assessment 1.1. Introduction 1.2. Pressures on the state of soil quality 1.3. Soil monitoring 1.4. Soil quality monitoring systems 1.5. National and international soil monitoring programs
2. Biological monitoring and biomonitoring 2.1. Introduction 2.2. Bioindicators 2.3. Vegetation monitoring
3. Statistical methods applied for environmental quality monitoring and diagnosis

Practical works
1. Physical, chemical and biological characterization of soil
2. Soil sampling for laboratory analysis. Fieldwork

3. Titrimetric determination of humus 3.1. Introduction 3.2. The principle of the method 3.3. Reagents and equipment 3.4. Methods 3.5. Results and discussion 3.6. Conclusions
4. Determination of dry matter and water content in soil by gravimetric method 4.1. Introduction 4.2. The principle of the method 4.3. Reagents and equipment 4.4. Methods 4.5. Results and discussion 4.6. Conclusions
5. Determination of iron in soil 5.1. Introduction 5.2. The principle of the method 5.3. Reagents and equipment 5.4. Methods 5.5. Results and discussion 5.6. Conclusions
6. Review. Final conclusions
7. Laboratory Colloquium

Project
Proposal of a scientific research project addressesing different aspects of environmental monitoring
1. Rules for drafting a project and establishing the work stages
2. Description of the project theme, importance, purpose, objectives, materials and method
3. Impact. Methodology
4. Time frame for project implementation. Resources and budget
5. Review and evaluation

Bibliography

1. Artiola J., Pepper I.L., Brusseau M.L., 2004 - *Environmental Monitoring and Characterization*, Elsevier Science & Technology Books.

2. Bîlbă D., Tofan L., Rusu G., 2007 - *Metode de Analiză în Controlul Calităţii Mediului – Lucrări practice*, Ed. Performantica, Iași.

3. Bulgariu L., 2013 - *Controlul Analitic al Calităţii Produselor*, Ed. Politehnium, Iași.

4. Ciolpan O., 2005 - *Monitoringul Integrat al Sistemelor Ecologice*, Ed. Ars Docendi, București.

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6. Hlihor R.M., Simion I.M., 2016 - *Poluarea Apei și Solului: Îndrumar de Laborator*, Ed. Ecozone, Iași.

7. Mihăiescu R., 2014 - *Monitoringul integrat al mediului*, Cluj –Napoca.

8. * Ordonanța de urgență 195/2005**, privind protecția mediului, modificată la data de 15 iulie 2013 (M. Of. nr. 438/18 iul. 2013).
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10. Zaharia C., 2013-2014 - *Chimia Mediului: Teste de Control în Laborator și Probleme*, Ed. Performantica, Iași.
11. Zaharia C., 2014 - *Chimia Mediului - Teste de Laborator și Probleme*, Ed. Performantica, Iași.

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Course	Exam	70%
	Course attendance	10%
Practical works	Processing and interpretation of results; laboratory colloquium	20%
Project	Project evaluation	100%

Contact

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