

Courses list for Sustainable Development and Environment Management

Second year



Code	Course name		Degree level	Year of study	Sem.	Course type	Language	Tutorial basis (yes/no; language)
NME8321	Energetic resources and the environment	5	Master	2 nd	1 st	Mandatory	English	No
Course description	The course on Energy resources and the environment offers the students a holistic view on the complex relation between identification, extraction and use of energy resources, and the environment on the other side. The conventional sources of energy are examined, in terms of geological occurrence, geographical distribution, extraction procedures, and use. At the same time, a short introduction to the unconventional energy resources is given, in terms of distribution, current and future potential, weight in the world energy balance, costs, environmental impact. This discipline focuses on the improvement of the students' capacity to operate with complex notions, to apply the knowledge and abilities to systems that include natural and anthropogenic components, costs, use, and environmental issues, and on understanding the global scale issues that affect the energy resources.							
Learning Outcomes	By the end of the course, the students will be able to understand the main issues of the energy resources management at a global scale, the geological and geographical elements of the conventional energy resources at a global scale, the correlation between energy resources exploitation and the environmental effects at a local and global scale, and the future perspectives and actions for a better energy. They will also study the global competition for resources and the links to economy and politics.							
Evaluation	exam 60% + continuous evaluation 40%							
Additional information	http://enviro.ubbcluj.ro/wp-content/uploads/2015/10/An-II_Fisa-disciplinei_Resurse-energiemediu_2019_20EN.pdf							
NME8121	Management of contaminated sites	5	Master	2 nd	1 st	Mandatory	English	No
Course description	The course Management of contaminated sites provides an overall image regarding the management issues generated by contaminated sites (the investigation methodology, the goal, the politic and regulatory framework and the remediation aspects). The course consists of a comparative analysis of them, presenting a basic remediation technology for contaminated sites. This course focuses on the current politics and legislation in this field, in Romania, EU and USA, on the main management methodologies for contaminated sites applied at national level and on the several decision support systems, which have the goal to provide proper strategies for contaminated sites rehabilitation, and evaluation of the risk assessment concept in the context of contaminated sites.							
Learning Outcomes	The participants to the course will achieve the level of knowledge necessary in order be able to understand contaminated sites management, the environmental legislation related to contaminated sites and they will acquire the ability to use the assessment methodology and remediation of contaminated sites for depollution. At the same time, students will develop: analytical abilities by assessing complex contamination situations and proposal of appropriate solutions for decontamination and analytical abilities for environmental issues management generated by the presence of contaminated sites.							
Evaluation	Oral- involvement in discussions and the quality of the questions asked. 10% + Written exam (in the regular session) 70% + Oral – presentation of projects made individual/in teams 20%							
Additional information	http://enviro.ubbcluj.ro/wp-content/uploads/2015/10/An-II_FD_Managementul-siturilor-contaminate_NME-8121_master-DSMM_2019-2020_EN.pdf							
NME8021	Waste management, treatment and recovery	5	Master	2 nd	1 st	Mandatory	English	No
Course description	The course is focused to provide the theoretical and practical knowledge in the field of waste management: waste collection, transport, treatment, recovery, recycling, composting and disposal of							

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	waste in order to reduce the environmental impact. Analysis of the urban waste management process is the main case study in the learning process, combined with the importance of efficient waste management in industry and in other economic branches.							
Learning Outcomes	Students attending this course will be able to link national legislation with EU law transposition of the Directive CE98/2008 into Law 211/2011, under which each company must appoint a person responsible for waste management under new European environmental principles.							
Evaluation	Seminar activity 25% + Project presentation 25% + written exam 50%							
Additional information	http://enviro.ubbcluj.ro/studenti-master/dezvoltarea-sustenabila-si-managementul-mediului-invatamant-cu-frecventa/							
NME8221	Eco-responsible entrepreneurship and negotiation tactics	5	Master	2 nd	1 st	Mandatory	English	No
Course description	The course aims to provide students with the basic information on ecological marketing and negotiation abilities. The course provides knowledge on collecting, processing and analysing data regarding the interaction between a company/an organisation and external environment.							
Learning Outcomes	Students attending this course will be trained in the application of professional ethics principles, norms and values within one's own rigorous, effective and responsible work strategies. Also, they will be trained to identify the roles and responsibilities in a multispecialty team and implementing various relational techniques and efficient teamwork in order to be able to run a subdivision of a company/an organisation.							
Evaluation	Seminar activity 10% + Tests/ projects during the semester 30% + Final examination 60%							
Additional information	http://enviro.ubbcluj.ro/wp-content/uploads/2015/10/AN-II_Green-marketing-and-N.pdf							
NME8022	Computer-aided design for environmental protection	7	Master	2 nd	2 nd	Mandatory	English	No
Course description	The general objective of the discipline is to provide general knowledge related to concepts and methods applied in the area of computer design, to introduce basic elements specific to computer aided design documentation necessary for the generating technical drawings. The discipline helps the students to acquire theoretical knowledge on principles, general concepts and basic rules of technical graphic design for engineers. At the same time, it focuses on the development of technical skills to achieve graphic representations at different scales, and on applying the concepts related the work techniques used in descriptive geometry and technical graphic design.							
Learning Outcomes	By the end of the semester, the students will acquire communication skills to interact effectively in a professional manner on issues related to technical design. They will know how to apply models, theories, fundamental engineering concepts related to specific issues concerning environmental protection. At the same time, they can develop teamwork abilities, think relationally and find concrete ways to approach and solve graphic problems. Students can explain and interpret properties, concepts, approaches, models and specific notions related to technical design in connection with fundamental sciences and engineering and to present drawings, sketches and engineering projects with specific to engineering areas.							
Evaluation	Evaluation of the research report (a written paper and an oral presentation) 30% + Evaluation of the project (documentation and demonstration) 60% + Participation in discussions, debates, preparation of the tasks. Students are rewarded for bringing up more challenging ideas. 10%							
Additional information	http://enviro.ubbcluj.ro/wp-content/uploads/2015/10/An-II-Fisa-disciplina-Computer-aided-design-for-environmental-protection-DSMM-2.pdf							
NME8621	Ethics, techniques of communication and academic writing	4	Master	2 nd	2 nd	Mandatory	English	No
Course	The aim of the course is to develop the students' communication abilities in terms of academic writing,							

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description	according to the academic integrity and ethics principles, with an emphasis on professional specialized content. Therefore, the students will be trained to develop their research abilities in a foreign language in order to gain the ability to operate with all the linguistic structures required in the domain of expertise.							
Learning Outcomes	Graduates will have the ability to understand the professional roles and contexts, to use the oral and written communication conventions in terms of receptive skills (reading/listening) and productive skills (writing/speaking). Also, the ability to use efficiently all the intellectual instruments, resources and communication techniques and to adopt the right learning strategies according to the professional context are objectives of the course.							
Evaluation	The elaboration of an academic article 40% + Oral exam 60%							
Additional information	http://enviro.ubbcluj.ro/studenti-master/dezvoltarea-sustenabila-si-managementul-mediului-invatamant-cu-frecventa/							
NME8322	Assessment of ecosystem services	5	Master	2 nd	2 nd	Mandatory	English	No
Course description	The content of the course takes into account the training needs of students as future pre-university teachers as well as those involved in nature conservation and the development of strategies for cultural landscapes. Based on these arguments, the course provides knowledge and understanding of social-ecological systems, their ecosystem service supply and the role of ecosystem services in sustainable development. Thus, the students are trained to develop strategic and research projects to address the ecosystem service supply and management in human modified landscapes. Discussion on conflicts around ecosystem services in human dominated landscapes is also part of the course.							
Learning Outcomes	Attending this course, the graduates will understand the role of ecosystem services in the resilience and transformability of human modified landscapes, the types of governance and their relevance for the biodiversity, ecosystem service supply and the access to ecosystem services, the importance of scenarios for the governance of human modified landscapes and archetypes and typologies of human dominated landscapes in Europe. Also, they will gain knowledge on the concept of biocultural refugia and its applicability in the understanding of cultural landscapes in Romania, Europe and other parts of the world.							
Evaluation	Attendance and feed-back provided at seminars 20% + Written exam 80%							
Additional information	http://enviro.ubbcluj.ro/studenti-master/dezvoltarea-sustenabila-si-managementul-mediului-invatamant-cu-frecventa/							
NME6412	Advanced methods in collecting of environmental samples	6	Master	1 st	2 nd	Mandatory	English	No
Course description	The general objective of the discipline is to acquire knowledge on a series of analytical techniques for sampling and processing of environmental samples, applicable for the determination of chemical compounds in the form of traces from various environmental factors.							
Learning Outcomes	Knowledge, understanding, analysis and application in inter- and trans-disciplinary perspectives, of phenomena and processes related to advanced and ultra-performing analytical separation techniques for investigating the quality of the environment. • Ability to choose relevant and contextualized methods of analytical methods / techniques / optimizations in strict accordance with the concrete situations and available resources. • Determination of concentration levels of chemical pollutants, with an emphasis on hazardous chemical compounds at the trace level. • Choosing the most appropriate techniques for taking environmental samples, depending on the pollutants and the environmental compartments concerned. • Acquisition of extremely useful practical skills related to the determination of chemical pollutants through advanced separation techniques.							
Evaluation	Course: exam 55% + Seminars: portfolio from oral verification tests 45%							
Additional	http://enviro.ubbcluj.ro/wp-content/uploads/2018/11/Metode-avansate-in-prelevarea-si-pregatirea-							

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information	probelor-de-mediu M-CMSE Beldean-Simion 2018-04.pdf							
NMX8412	Modeling and simulation of chemical accidents	4	Master	1 st	2 nd	Optional	English	No
Course description	The course is focused to bring knowledge of mathematical models used for the estimation of physical effects of chemical accidents and release of dangerous substances. Specific software in the field of environmental risk and impact assessment are used in the learning process. Also, the students will be prepared for the development of environmental risk or impact studies.							
Learning Outcomes	The knowledge acquired during the course can be used in the next domains: environment protection, process industries: chemical, pharmaceutical, petrochemical, food industry etc. and academic domains. The graduates of this course can contribute in the development of technological risk studies, safety reports or a major industrial accidents prevention policies. Also, they can work in consultancy in the field of risk assessment.							
Evaluation	Student activity 5% + Evaluation of the project (documentation and demonstration) 60% + Evaluation of the research report (a written paper of about 10 pages and an oral presentation) 30%							
Additional information	http://enviro.ubbcluj.ro/studenti-master/dezvoltarea-sustenabila-si-managementul-mediului-invataman-tu-frecventa/							
NMX8912	Assessment and analysis procedures in ecological management	4	Master	1 st	2 nd	Optional	Romanian	No
Course description	The course aims to provide students with knowledge in the fields of ecological management and ecosystem assessment. Database structures and analytical procedures are being used in the teaching process, together with the main software packages used in the field of ecological management. Field work for gathering data for ecological assessment and analyses is included in the curricula.							
Learning Outcomes	The graduates of this course can contribute in the development management plans of protected areas and to the elaboration of the scientific research programs for biodiversity conservation.							
Evaluation	Student activity 5% + Project presentation 15% + Written exam 80%							
Additional information	http://enviro.ubbcluj.ro/studenti-master/dezvoltarea-sustenabila-si-managementul-mediului-invataman-tu-frecventa/							
NMX8521	LIDAR system	4	Master	2 nd	1 st	Optional	English	No
Course description	The proposed course helps the students acquire expertise regarding concepts, methodologies and techniques used in environmental data acquisition and LIDAR remote sensing. The course focuses on theoretical background regarding data acquisition and remote sensing. It provides hands-on expertise in the use of LIDAR systems and remote sensing instrumentation, and helps the students integrate different types of environmental data in order to better characterize environmental factors.							
Learning Outcomes	At the end of the course, the students will acquire the ability to understand the concepts, methods and models used in environmental data acquisition and remote sensing, the composition of the atmosphere and its dynamics, the radiative transfer through the atmosphere and the basic meteorological aspects. Moreover, it presents the principles of active and passive remote sensing, the basic operation of LIDAR while the students will learn to derive microphysical properties of particles from optical ones and to use trajectory models for particle dynamics.							
Evaluation	Colloquium 50% + Public presentation 50%							
Additional information	http://enviro.ubbcluj.ro/wp-content/uploads/2015/10/AN-II_Optional-courses-no.-2_LIDAR_systems_DSMM_Ajtai_en_2019-2020-1.pdf							
NME6321	Population protection against supertoxic chemical	5	Master	2 nd	1 st	Optional	English	No

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agents								
Course description	The course is based on understanding, analysing and working with advanced analytical techniques for assessment of environmental quality, focusing on HAZMAT and CBRN compounds. During the course, the students will be taught to determine the concentration of chemical pollutants, especially dangerous supertoxic chemical compounds. Planning, preparation and response of population exposure to supertoxic chemical agents and biological ones are part of the course.							
Learning Outcomes	The goal of the course is to gain knowledge in population protection against supertoxic chemical and biological agents: recognising the main threats, planning and organizing response to CBRN (chemical, bacteriological, radiologic and nuclear) or HAZMAT (dangerous materials, toxic industrial compounds – TIC) incidents. Using advanced analytical techniques, photoionization detections (PID) and ion mobility spectrometry (IMS), is planned for students to develop primary field assessment of incidents. At the end of the course, knowledge of decontamination methods and techniques will be gained.							
Evaluation	Student activity and project presentation 40% + Colloquium 60%							
Additional information	http://enviro.ubbcluj.ro/studenti-master/dezvoltarea-sustenabila-si-managementul-mediului-invatamant-cu-frecventa/							
NME8821	Specialised communication strategies	5	Master	2 nd	1 st	Optional	English	No
Course description	The aim of the course is to develop the students' communication abilities in terms of specialized language, according to the academic integrity and ethics principles, with an emphasis on professional communication requirements. The students will be trained to develop professional responsibilities in order gain the ability to operate with all the linguistic structures required in the domain of expertise.							
Learning Outcomes	Graduates will be able to develop specialised communication abilities, will enhance their research abilities in a foreign language and will be able to deliver research in accordance with the academic integrity principles. Thus, they will master all the necessary communication techniques at an academic level.							
Evaluation	The elaboration of an application file 40% + Oral exam 60%							
Additional information	http://enviro.ubbcluj.ro/wp-content/uploads/2015/07/Strategii-comunicationale.pdf							
NME8521	Dosimetric techniques in environmental studies and radioprotection training.	4	Master	2 nd	1 st	Optional	English	No
Course description	This course will provide students with knowledge on: environmental radioactivity of natural and artificial origin, the potential applications of background radioactivity in environmental studies, the peaceful use of radioactive sources, nuclear regulations and legislation, the effects of ionizing radiations on living beings and the risk associated with exposure to sources of radioactivity in the environment.							
Learning Outcomes	The outcomes are: <ul style="list-style-type: none"> • Knowing the sources of nuclear radiation in the environment. Understanding the basis of nuclear decay and types of radiation • Identifying the sources of human and other biota exposure to nuclear radiation in the environment and the pathways of radionuclide's migration in the environment and ecosystems • Training in basic dosimetry • Developing a well-documented opinion on the advantages as well as the risks associated with nuclear energy production • Obtaining knowledge on the radioactive contaminated sites and the potential remediation of these areas • Gaining knowledge on various other applications of environmental radioactivity to environmental 							

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	studies such as radioactive dating methods.
Evaluation	Course paper – 3p, course exam – 3p, seminar activities – 3p
Additional information	http://enviro.ubbcluj.ro/wp-content/uploads/2015/07/Tehnici-dozimetrice-in-studiul-mediului-si-notiuni-de-radioprotectie.pdf