

**RTU Course "Environment and Climate Roadmap"**

27301 null

General data

Code	VAS038
Course title	Environment and Climate Roadmap
Course status in the programme	Compulsory/Courses of Limited Choice
Responsible instructor	Andra Blumberga
Academic staff	Dagnija Blumberga Francesco Romagnoli Marika Rošā Jūlija Gušča Anna Kubule Kārlis Valters Gatis Žogla Claudio Rochas Gatis Bažbauers Ivars Veidenbergs Jeļena Pubule Vladimirs Kirsanovs Dace Lauka Silvija-Nora Kalniņš Aiga Barisa Indra Muižniece Ruta Vanaga Edgars Vīgants Girts Vīgants Āgris Kamenders Uldis Bariss Miķelis Dzikēvičs Dzintars Jaunzems Valdis Vītoliņš Ieva Pakere
Volume of the course: parts and credits points	1 part, 1.0 Credit Points, 1.5 ECTS credits
Language of instruction	LV, EN
Annotation	During the study course, students are introduced with the European Environment and Climate Roadmap for Economic Sustainability in order to promote resource efficiency through the transition to a clean, circular economy and to reduce climate change, loss of biodiversity and pollution. The study course analyses the role of environmental engineering among other sciences, the focus of the topic in today's society, environmental problems, their impact on future generations and other environmental issues. Within the framework of the study course, opportunities to improve technical production systems from an environmental and sustainability perspective are analysed and evaluated. The study course is implemented as a module. The course content includes lectures. Lectures are supplemented with practical work.
Goals and objectives of the course in terms of competences and skills	Goal: Acquire knowledge of the fundamental principles of environmental and climate policy and the objectives set by Europe for sustainable economy, in particular transport, energy, agriculture, buildings and industry. Tasks: Acquire knowledge of the challenges of environmental protection and climate change and focus on the causes of pollution and analyse the possibilities for reducing these causes. Understanding the most pressing environmental challenges and their solutions, as well as how the student's chosen specialty and future professional activity will affect environmental pollution and climate change. After the course the student can: - understand the most pressing environmental problems and their solutions, as well as how the student's chosen specialty and future professional activity will influence environmental pollution and climate change; - to name the main European environmental and climate goals, have a knowledge of individual methods of environmental research and management; - describe and apply the concept of sustainable development based on different models, perspectives and definitions; - be able to define and explain the key concepts of environmental technologies from an industry perspective; - describe, compare and analyse technical solutions for production systems based on environmental impact and sustainability.
Structure and tasks of independent studies	Practical work included in the course consists of independent work, where the student performs a simplified environmental assessment of the selected product and formulates the main environmental aspects. The results are presented during the seminar as part of the course.

Recommended literature	<p>Compulsory literature:</p> <ol style="list-style-type: none"> Blumberga A., Bažbauers G., Davidsen P., Blumberga D., Grāvelsiņš A., Prodaņuks T. Sistēmdinamika biotehonomikas modelēšanai. Rīga: RTU Izdevniecība, 2016, 332 lpp. ISBN 978-9934-10-801-3. Blumberga, D., Barisa, A., Kubule, A., Kļaviņa, K., Lauka, D., Muižniece, I., Blumberga, A., Timma, L. Biotehonomika. Rīga: RTU Izdevniecība, 2016, 338 lpp. ISBN 978-9934-10-789-4. Blumberga, D., Veidenbergs, I., Romagnoli, F., Rochas, C., Žandeckis, A. Bioenerģijas tehnoloģijas. Rīga: RTU Vides aizsardzības un siltuma sistēmu institūts, 2011. 272 lpp. ISBN 9789934819636. Blumberga A. Sistēmiskas domāšanas integrēšana vides politikā. Rīga: RTU Vides aizsardzības un siltuma sistēmu institūts, 2010. Blumberga, A., Blumberga, D., Kļaviņš, M., Rošā, M., Valtere, S. Vides tehnoloģijas. Rīga: Latvijas Universitāte, 2010. 212 lpp. ISBN 978-9984-45-274-6. Frederiksen S., Werner S. District Heating and Cooling, Studentlitteratur AB, 2013, 586 lpp. D. Blumberga, I. Dzene, T. Al Sedi, D. Rucs, H. Prasls, M. Ketners, T. Finstervalders, S. Folka, R. Jansens. Biogāze. Rokasgrāmata, 2010. gads, 155 lpp. <p>Recommended literature:</p> <ol style="list-style-type: none"> Hauschild, Michael, Rosenbaum, Ralph K., Olsen, Stig (Eds.) Life Cycle Assessment. Theory and Practice. Springer International Publishing, 2018, 1216 lpp. Meadows D.H., Meadows D.L., Randers J., Behrens W. Limits to Growth, Potomac Associates – Universe Books, 1972, 205.lpp Wimmer W., Zust R., Lee K. Eco-design Implementation, Springer, 2004. D.H. Cole and E. Ostrom. Property in Land and Other Resources, Lincoln Institute of Land Policy, 2011. Gary C. Young. Municipal Solid Waste to Energy Conversion Processes: Economic, Technical, and Renewable Comparisons, 2010. M. Kļaviņš, D. Blumberga, I. Bruņiniece, A. Briede, G. Grišule, A. Andrušaitis, K. Āboliņa. Klimata mainība un globālā sasilšana. Latvijas Universitātes Akadēmiskais apgāds, 2008 M.Kļaviņa un Jāņa Zaļokšņa redakcijā. Klimats un ilgtspējīga attīstība Latvijas Universitāte 2016.- 379
Course prerequisites	not necessary

Course contents

Content	Full- and part-time intramural studies		Part time extramural studies	
	Contact Hours	Indep. work	Contact Hours	Indep. work
Course acquisition conditions. Introduction to Environmental Engineering	1	1	2	2
European Green Deal	1	1	0	2
Sustainability of energy policy	1	1	0	2
Systems-thinking. Impact of buildings on climate change	1	1	0	2
The concept of cleaner production	1	1	0	2
Climate technology	1	1	0	2
Alternative energy resources	1	1	0	2
Environmental technologies and sustainable production	1	1	0	2
District heating today and in the future	1	1	0	2
Eco-efficient engineering	1	1	0	2
Ecodesign	1	1	0	3
Bioeconomic	1	1	0	3
Presentation of practical work	4	4	0	4
Exam	4	4	4	4
Total:	20	20	6	34

Learning outcomes and assessment

Learning outcomes	Assessment methods
The student can name the main environmental problems and their causes, has knowledge about certain methods of environmental research and management.	Types of examination: practical work, test. Criteria: The student identifies the most pressing problems, describes the ways of their research and solution.
The student can define the main European environmental and climate goals.	Types of examination: practical work, test. Criteria: The student identifies the main European environmental and climate goals and describes the mechanisms for achieving them.
The student can carry out a simplified environmental impact assessment of the selected product, to formulate the main environmental aspects.	Types of examination: practical work, test. Criteria: Develops a simplified environmental assessment of a selected product.
Oriented in environmental technologies and strategies to solve environmental problems.	Types of examination: practical work, test. Criteria: Student demonstrates ability to define and explain basic concepts of environmental technologies.
When dealing with complex problems, aware of the connection with the environment and is able to consider the concept of sustainable development when solving problems.	Types of examination: practical work, test. Assessment criteria: The student demonstrates the ability to consider the concept of sustainable economic development in decision making.

Evaluation criteria of study results

Criterion	%
Course work	35
Course work presentation	25
Test	40
Total:	100

Study subject structure

Part	CP	Hours per Week			Tests		
		Lectures	Practical	Lab.	Test	Exam	Work
1.	1.0	0.5	0.5	0.0	*		