

INDUSTRIAL ECOLOGY

Graduate study programme

Area of Studies: Technological Sciences

Faculty: Faculty of Natural Sciences

Mode of Studies: Full-time studies

Duration of Programme: 2 academic years (120 ECTS)

Name of Qualification: Master of Technology

Access Requirements

The minimal admission requirement is to hold a Bachelor or equivalent degree in physical, technological, biomedicine, life sciences and other sciences or closely related field from a Lithuanian academic institution or an equivalent foreign institution qualification.

How to Apply

English language requirement:

Proof of English proficiency (TOEFL87 iBT / 448 PBT, IELTS 4.5, level B1).

Students with English language level A2 can be admitted to the studies. After arrival applicant will be asked to take English language test and take English language classes.

Applicants, who finished their previous studies in English, are not required to take any English language test.

If applicants had English language classes in their previous studies, certificate from applicant's previous school / university can be accepted as a document showing English language proficiency.

Selection criteria:

The selection criteria are based on the weighted average of relevant grades recorded in the transcript of the student's academic record.

Selection criteria consist of:

English grade – 30 %

Motivation letter – 30 %

Average grade of bachelor transcript – 40 %

For transferring students:

The Faculty of Natural Sciences accepts transfer students to Industrial Ecology study programme. If interested, please send a copy of a transcript of academic records from your current university to the coordinator of international studies at the Vytautas Magnus University, email: studies@vdu.lt.

Coordinator in Faculty of Natural Science:

Vykintas Baublys

Faculty of Natural Sciences

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Lithuania

E-mail: vykintas.baublys@vdu.lt

Programme Objectives and Competencies Acquired

The aim of this Programme is to prepare highly educated and qualified professionals in the interdisciplinary area of environment and technology sciences, able to analyze, design and manage natural and industrial systems in a sustainable manner, to solve environmental problems at different levels by integrating appropriate technological, environmental and social approaches contributing to greening of the economy. More specifically this programme aims:

- Understand, describe and analyze environmental, energy and industrial systems, their structure, functioning, complexity, dynamics and interrelations.
- Analyze complex environmental problems by determining their causal factors, interactions and integrating interdisciplinary knowledge related to energy and industrial sectors.
- Apply principles of industrial ecology for the solution of the problems related to the use of different energy technologies and industrial systems
- Operate with the core principles and methodologies underlying the current research in the interdisciplinary area combining environment, energy technologies and industrial systems.
- Apply methods and techniques used for system sustainability assessment, system input-output management and system dynamics analysis from the inter- and transdisciplinary approaches
- Plan and conduct theoretical analysis, experimental investigation and process based simulation of a particular industrial ecology problem, critically analyze and evaluate research data and results
- Perform the analysis of relations between industrial system, energy transformation technologies, industrial management features and international environmental legislation and regulation for the economically reasonable and environmentally friendly solutions of the sustainable industry growth and the efficient use of energy resources
- Use ecological and technological understanding of processes in industrial and energy systems for critical analysis of the development trends of technologies in the near- and distant-future and selection of an innovative technical, methodical or organizational approach in solving industry related ecology problems
- Analyze the connections between industrial activity and processes in the environment and incorporate them into the solution of problems from a multidisciplinary perspective
- Apply academic skills, research methods and tools from statistics, data collection, modelling techniques or experiments for the industrial material cycle optimization, development of innovations and implementation of new findings
- Demonstrate ability to prepare and communicate on complex issues related to industrial ecology in inter- and transdisciplinary teams in both oral and written forms for academic and non-academic target groups in national and international context
- Demonstrate ability to work collaboratively on industrial ecology projects involving typical business timelines

- Demonstrate ability to work in an autonomous manner and as a member of a team, initiate, plan and take responsibility for activities related to practical and other field-specific problem-solving assignments
- Make innovative decisions assessing possible public and ethical outcomes and perceiving moral responsibility for the impact of activity on economic development and the environment

Career Opportunities

Having completed the study programme, the students acquire a professional qualification of a Master of Science in Industrial Ecology, and thus are able to hold positions in all public and private sector institutions and organizations. Graduates of the Programme can continue their studies and seek a doctoral degree in the areas of technology and physical sciences. The focus on social topics of the Programme also prepares the students for careers not directly related to scientific research. They can find jobs in the private and public sector (EU, national, regional and local government- and administration level) as well in consulting companies or non-governmental organizations. Typical areas of employment are: i) Industrial companies, ii) Scientific Research, iii) Environmental and management consultancy, iv) International organizations, v) Teaching as well as vocational training and continuing education, vi) Quality assurance, vii) Administration and Management.

Exchange Studies

All VMU students can choose the possibility to become an Exchange Student at the foreign universities during Erasmus mobility in Eurozone and Schengen Area. Participants of the Erasmus programme have twelve months opportunity per cycle to study at a university abroad and do internship in a foreign company and gain scholarship for exchange time. Erasmus mobility gives opportunities for studying or training in 27 EU member countries (like Germany, Sweden, Czech Republic and others) as well as Iceland, Lichtenstein, Norway, Turkey, Switzerland, Croatia and Macedonia.

In addition to Erasmus exchange, students can use Bilateral Agreements. Bilateral Agreement is an inter-institutional agreement between Vytautas Magnus University and partner institution to develop mutual activities, student exchange among them. It offers excellent opportunity for Vytautas Magnus University students to spend a semester or two in United States, Japan, South Korea, Taiwan, Brazil, Indonesia, and other non – EU countries. At the moment Vytautas Magnus University has 156 bilateral collaboration agreements with universities from 40 countries of the world.

Curriculum

Subject Title	Subject Code	EC TS	Subject Title	Subject Code	EC TS
First year (1st -2nd semesters)			Second year (3rd - 4th semesters)		
I semester			III semester		
Principles of industrial ecology and sustainable development	PRE 5001	6	Hybrid energy systems	PRE 6001	6
Ecosystems processes and services	PRE 5002	6	GIS applications in industrial ecology	PRE 6002	6
Sustainable energy futures	PRE 5003	6	Research project	PRE 6003	6
System analysis and modelling	PRE 5004	6	Electives: - Restoration of contaminated sites - Water and waste treatment and reuse technologies - Climate change science and solutions	PRE 6004 PRE 6005 PRE 6006	6
Electives: - Green economy and policy - Special course	APL 5013 PRE 5005	6	Electives: - Hydrogen energy and energy saving technologies - Biofuels - Industrial energy systems	PRE 6007 PRE 6008 PRE 6009	6
Total per semester:		30	Total per semester:		30
II semester			IV semester		
Tools for industrial ecology	PRE 5006	6	Master Thesis	PRE 6010	30
Cleaner production and corporate social responsibility	PRE 5007	6			
Risk assessment and reduction	PRE 5008	6			
Chemical pollution management	PRE 5009	6			
Electives: - Physical pollution management - Radioecology	PRE 5010 FIE 5012	6			
Total per semester:		30	Total per semester:		30
Total per year:		60	Total per year:		60
			Total in the Programme:		120

Note: there might be some changes in the programme.