INFORMATION ON THE STUDY PROGRAMME
ENVIRONMENTAL PROTECTION

Version (valid from): 2024-9 (21.10.2024)

Basic information

Programme name	**Environmental protection**
Programme features	Interdisciplinary
Type	PhD
Rate	third level
CLASS-SRV	Doctoral education (third Bologna cycle)/Doctorate of Science (third Bologna cycle) (18202)
ISCED	• Environmental protection (85)
CLASS-P	• Environmental protection (unspecified) (8500)
CLASS-P-16	• Interdisciplinary educational activities/outputs, mainly arts and humanities (0288) • Interdisciplinary educational activities/outputs, mainly social sciences, journalism and information science (0388) • Interdisciplinary educational activities/outputs, mainly business and administrative sciences, law (0488) • Environment (excluding environmental technology), unspecified (0520) • Interdisciplinary educational activities/outcomes, mainly natural sciences, mathematics and statistics (0588) • Environmental Technology (0712) • Interdisciplinary educational activities/outputs, mainly engineering, production technologies and construction (0788) • Interdisciplinary training activities/outputs, mainly agriculture, forestry, fisheries and veterinary medicine (0888) • Interdisciplinary educational activities/resources, mainly health and social security (0988) • Sanitation and public utilities (1021) • Interdisciplinary educational activities/outcomes, mainly transport, security, hospitality and tourism, personal services (1088)
Frascati	• Natural and Mathematical Sciences (1) • Technical sciences (2) • Medical Sciences (3) • Biotechnical Sciences (4) • Social sciences (5) • Humanities (6)
Raven SOK	Raven SOK 10
Raven EOC	Raven EOK 8
Raven EOVK	Third level
Areas/modules/targets	• No articulation (study programme)
Members of the University of Ljubljana	• Faculty of Biotechnology, Jamnikarjeva ulica 101, 1000 Ljubljana, Slovenia • Faculty of Economics, Kardeljeva ploščad 17, 1000 Ljubljana, Slovenia • Faculty of Social Sciences, Kardeljeva ploščad 5, 1000 Ljubljana, Slovenia • Faculty of Civil Engineering and Geodesy, Jamova 2, 1000 Ljubljana, Slovenia • Faculty of Chemistry and Chemical Technology, Večna pot 113, 1000 Ljubljana, Slovenia • Faculty of Mathematics and Physics, Jadranska ulica 19, 1000 Ljubljana, Slovenia • Faculty of Maritime Studies and Transport, Pot pomorščakov 4, 6320 Portorož, Slovenia

	• Faculty of Mechanical Engineering, Aškerčeva 6, 1000 Ljubljana, Slovenia • Faculty of Arts, Aškerčeva 2, 1000 Ljubljana, Slovenia • Faculty of Medicine, Vrazov trg 2, 1000 Ljubljana, Slovenia • Faculty of Natural Sciences and Engineering, Aškerčeva cesta 12, 1000 Ljubljana, Slovenia • Faculty of Law, Poljanski nasip 2, 1000 Ljubljana, Slovenia • Faculty of Veterinary Medicine, Gerbičeva ulica 60, 1000 Ljubljana, Slovenia
Duration (years)	4
Number of KT per year	60
Study delivery methods	Associate

The main objectives of the programme

The main objective of the interdisciplinary PhD programme in Environmental Protection is to train highly qualified professionals who will be able to solve complex environmental problems with an interdisciplinary approach and the ability to integrate knowledge from different fields into a comprehensive solution. In the first case, they will look for preventive solutions to prevent environmental damage: through public social action, through a more appropriate spatial distribution of activities, through correct technical measures, etc. In the second case, they will look for solutions to eliminate the consequences, reduce pollution and remediate the situation - mainly from technical, renovation, medical-hygienic, spatial-planning and other perspectives.In the second case, they will look for solutions to remedy the consequences, reduce pollution and remediate the situation - mainly from technical, renovation, medical-hygienic, spatial-planning and other perspectives.In the third case, they will look for solutions to remedy the situation. The programme is interdisciplinary and aims to develop skills in the fields of biotechnics, engineering, natural sciences, medicine and the social sciences and humanities.

General competences (learning outcomes)

Upon completion of the PhD, the student will be able to carry out creative and independent scientific research and solve scientific problems using an interdisciplinary approach. They will be able to critically evaluate research results, develop new research methods and transfer new technologies and knowledge into practice.

Subject-specific competences (learning outcomes)

The PhD student will deepen his/her interdisciplinary knowledge in specific fields, acquire the ability to address challenging and complex scientific research questions in different areas of environmental protection and develop new research methods. He/she will be able to carry out independent research work, solve specific work problems using modern scientific methods and procedures, find new solutions and manage the most complex scientific research and other projects.

The objectives and competences are also set out in the curricula for each subject.

Conditions for enrolment

The interdisciplinary PhD programme in Environmental Protection is open to graduates:

1. second-level study programmes

2. study programmes which train for professions regulated by European Union directives, provided that they are worth 300 credits (e.g. medicine, dentistry, veterinary medicine, pharmacy), or other single master's degree programmes worth 300 credits.

3. specialisation programmes who have previously completed a higher professional programme. The Programme Board for Environmental Protection shall set additional requirements for these candidates, ranging from 30 to 60 credits, prior to enrolment in the third cycle study programme.

4. study programmes leading to a master's degree or a specialisation following a bachelor's degree. These candidates shall be awarded study requirements of at least 60 credits in a third cycle doctoral programme.

5. bachelor's degree programmes adopted before 11.6.2004.

Graduates of foreign universities can also enrol in the PhD programme in Environmental Protection. The equivalence of previously acquired education abroad is determined in the process of recognition of foreign education for further education, in accordance with the UL Statutes.

Selection criteria in the event of an enrolment limitation

In the event that more applicants apply for the programme than the number of places available, the selection of candidates for admission to the Interdisciplinary Doctoral Programme in Environmental Protection will be based on:

- performance in previous university studies or second cycle studies (50%)

(40% for an average grade of 8 or above in the previous university or postgraduate studies and 10% for a grade of 9 or 10 in the bachelor's or master's thesis)

-success in an optional exam (50%)

(of which the presentation of the PhD thesis 30%, evidence of previous scientific research work and prizes 20%).

In the event of an enrolment cap, the candidates with the highest cumulative percentage will be selected.

When selecting candidates for admission, consideration is also given to the available research capacity of potential mentors.

Criteria for the recognition of knowledge and skills acquired before entry to the programme

Knowledge and skills acquired through formal, non-formal or experiential learning prior to enrolment in the programme will be recognised in the selection process when limiting enrolment, in accordance with the Rules of the University of Ljubljana on the Procedure and Criteria for the Recognition of Informally Acquired Knowledge and Skills. The Programme Board, with the consent of the candidate's mentor and co-mentor, will decide on the recognition of the knowledge and skills acquired by the candidate prior to enrolment in the programme on the basis of a written application from the candidate and the attached evidence (certificates and other documents) proving the successful acquisition of the knowledge and the content of these skills.

Assessment methods

The methods, formats and structure of examination and assessment enable UL students to adequately verify their learning outcomes and competences. Students' knowledge is tested and assessed on a subject-by-subject basis, and the forms of assessment are specified in the curricula of the subjects. The examination of knowledge, including the way in which examinations are assessed, is defined in detail in the UL Statutes, Articles 128 to 150, and some Members have adopted Regulations on the examination and assessment of knowledge. The results of examinations are published on the notice boards of the Members or on websites which allow students to compare their results with those of other participants in the examination through registration numbers or other passwords. Feedback on student progress is also given by some Members through praise and awards to the best students.

In accordance with Article 138 of the UL Statutes, performance in examinations is assessed by marks:
10 - (excellent: outstanding results with negligible errors),
9 - (good: above average performance but with some errors),
8 - (very good: solid results),
7 - (good: good knowledge but with major errors),
6 - (sufficient: knowledge meets the minimum criteria),
5 - 1 - (insufficient: knowledge does not meet the minimum criteria).
A candidate passes the examination if he/she obtains a pass mark between satisfactory (6) and excellent (10).

Success in examinations in doctoral programmes may also be assessed by grades:
fail
Pass
pass with distinction.

The specific way in which success in examinations in doctoral programmes is assessed shall be defined in the

doctoral programme.

Within the framework of the doctoral programme in Environmental Protection, the method of examination and assessment shall be laid down in the curricula of the courses.

Conditions for progression through the programme

The conditions for advancement from the 1st to the 2nd year of doctoral studies are the completion of study requirements of at least 45 KT. Of these, the doctoral candidate must complete at least 30 KT in the compulsory methodology and foundation courses.

Students who have completed all the study requirements of the organised forms of instruction from the 1st and 2nd year, the doctoral seminar with a successful presentation of the topic of the doctoral dissertation and a positive evaluation of the Doctoral Student Monitoring Committee on the appropriateness of the topic of the doctoral dissertation at the UL Member Senate, confirmed by , may be enrolled in the 3rd year of the doctoral study programme.

Students who have completed all the study requirements of the first three years and had the topic of their doctoral dissertation approved by the UL Senate may enrol in the fourth year.

Conditions for switching between programmes

Transfer from other doctoral programmes to the interdisciplinary doctoral programme in Environmental Protection is possible if the student fulfils the eligibility conditions for enrolment in this programme. When transferring from another study programme, the candidate must submit a certificate of completion of the study requirements of the study programme in which he/she was enrolled and the valid syllabuses for the courses and other subjects in which he/she has completed the study requirements. Applications for transfer to the PhD programme in Environmental Protection will be considered individually by the Programme Board in accordance with the Criteria for Transfers between Study Programmes and the Statutes of the University of Ljubljana.

Conditions for completing your studies

The completion of studies and the award of the title of Doctor of Science is conditional on the candidate successfully completing all the study requirements set out in the programme and successfully defending a doctoral dissertation totalling 240 KT. The doctoral candidate is also obliged to publish at least one first-authored scientific article. The scientific article must be published or accepted for publication at the latest at the time of submission of the doctoral dissertation for assessment.

Conditions for completion of the individual parts of the programme, if contained in the programme

There is no possibility to complete individual parts of the programme.

Professional, scientific or artistic title (English title and abbreviation)

- Doctor of Philosophy (Ph.D.)

STUDY PROGRAMME CURRICULUM
ENVIRONMENTAL PROTECTION

2024/2025

Name of study programme	**Environmental Protection**
Programme characteristics	interdisciplinary
Type	doctoral
Cycle	doctoral
University of Ljubljana members	• Biotechnical Faculty, Jamnikarjeva ulica 101, 1000 Ljubljana, Slovenija • School of Economics and Business, Kardeljeva ploščad 17, 1000 Ljubljana, Slovenija • Faculty of Social Sciences, Kardeljeva ploščad 5, 1000 Ljubljana, Slovenija • Faculty of Civil and Geodetic Engineering, Jamova 2, 1000 Ljubljana, Slovenija • Faculty of Chemistry and Chemical Technology, Večna pot 113, 1000 Ljubljana, Slovenija • Faculty of Mathematics and Physics, Jadranska ulica 19, 1000 Ljubljana, Slovenija • Faculty of Maritime Studies and Transport, Pot pomorščakov 4, 6320 Portorož, Slovenija • Faculty of Mechanical Engineering, Aškerčeva 6, 1000 Ljubljana, Slovenija • Faculty of Arts, Aškerčeva 2, 1000 Ljubljana, Slovenija • Faculty of Medicine, Vrazov trg 2, 1000 Ljubljana, Slovenija • Faculty of Natural Sciences and Engineering, Aškerčeva cesta 12, 1000 Ljubljana, Slovenija • Faculty of Law, Poljanski nasip 2, 1000 Ljubljana, Slovenija • Veterinary Faculty, Gerbičeva ulica 60, 1000 Ljubljana, Slovenija

Year 1

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0020660	Interdisciplinary Scientific Research Work	Katja Vintar Mally	45	15			190		250	10		no
2.	0020661	Core course 1						250		250	10		yes
3.	0020662	Core course 2						250		250	10		yes
4.	0020663	Elective course 1						250		250	10		yes
5.	0020665	Individual research work							500	500	20		no
		Total		45	15	0	0	940	500	1500	60		

Year 2

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0020666	Elective course 2						250		250	10		yes
2.	0020667	Doctoral						125		125	5		no
3.	0020668	Individual research work 2						1125		1125	45		no
		Total		0	0	0	0	1500	0	1500	60		

Year 3

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0138203	Individual research work 3						1500		1500	60		no
		Total		0	0	0	0	1500	0	1500	60		

Year 4

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0138275	Individual Research Work 4						1375		1375	55		no
2.	0138204	Doctoral seminar with presentation of the results of the research work and public defence						125		125	5		no
		Total		0	0	0	0	1500	0	1500	60		

Temeljni predmeti

	Contact hours	

	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0020619	ECOLOGY WITH NATURE CONSERVATION	Gorazd Urbanič	30	30				190	250	10		yes
2.	0020620	Economic and Law of Environmental Management	ALEKSANDAR KEŠELJEVIĆ, Senko Pličanič	7	3				240	250	10		yes
3.	0020621	ENVIRONMENTAL CHEMISTRY AND TECHNOLOGY	Andreja Žgajnar Gotvajn	50	10				190	250	10		yes
4.	0020622	Crisis management	Vlado Dimovski	10	30			15	195	250	10		yes
5.	0020623	Disaster medicine	Radko Komadina	20	30			20	180	250	10		yes
6.	0020624	ENVIRONMENT, HEALTH, AND WELLBEING	Ivan Eržen	30	30	15			175	250	10		yes
7.	0020625	ENVIRONMENTAL AND SOCIOLOGICAL ASPECTS OF SUSTAINABLE DEVELOPMENT	Katja Vintar Mally, Marjan Hočevar	45	15				190	250	10		yes
8.	0020626	SEISMOLOGY AND EARTHQUAKE ENGINEERING	Andrej Gosar	10	40	30			170	250	10		yes
9.	0020627	Soils and Environmental Geology	Marjetka Suhadolc	40	20				190	250	10		yes
10.	0020628	Risk Management	Sabina Huč	60	30	30			130	250	10		yes
11.	0020629	Energy and Natural Resource Management	Sašo Medved	40	10	10			190	250	10		yes
12.	0020630	AIR, WATER AND CLIMATE	Matjaž Mikoš	40	20				190	250	10		yes
		Total		382	268	85	0	35	2230	3000	120		

Kandidat skupaj z mentorjem in somentorjem izbere dva temeljna predmeta v skupnem obsegu 20 KT. Glavni cilj temeljnih predmetov, ki so zasnovani interdisciplinarno, je pridobitev in osvojitev tistih znanj, ki jih kandidat potrebuje za izdelavo doktorske disertacije in jih še ni osvojil na 2. stopnji oz. dodiplomskem študiju.

Izbirni predmeti

				Contact hours									
	University Course Code	Course title	Lecturers	Lectures	Seminar	Tutorials	Clinical tutorials	Other forms of study	Individual student work	Total hours	ECTS	Semesters	Elective
1.	0020631	ENVIRONMENTAL ANALYTICAL CHEMISTRY	Helena Prosen	20	20	20			190	250	10		yes
2.	0020632	Biogeochemical cycles	Jadran Faganeli	60	60				130	250	10		yes
3.	0020633	BIOINDICATION AND CONSERVATION OF TERRESTRIAL ECOSYSTEMS	Klemen Eler	30	15			15	190	250	10		yes
4.	0020634	BIOMONITORING	Romana Marinšek Logar	30	30			30	160	250	10		yes
5.	0020635	PLANT ECOPHYSIOLOGY	Dominik Vodnik	30		10		20	190	250	10		yes
6.	0020636	EKOHYDROLOGY	Simon Rusjan	20	10	10			210	250	10		yes
7.	0020637	ECOLOGY OF SUBTERRANEAN HABITATS	Cene Fišer	20	40			30	160	250	10		yes
8.	0020638	Marine ecological processes	Lovrenc Lipej	60	60				130	250	10		yes
9.	0180747	ECOTOXICITY AND ENVIRONMENTAL RISK ASSESSMENT OF CHEMICALS	Anita Jemec Kokalj	15	40	10		60	125	250	10		yes
10.	0020640	The Ethics of Nature	Borut Ošlaj	30	30				190	250	10		yes
11.	0020641	Plant Protection Products and Their Alternatives	Stanislav Trdan	20		60			170	250	10		yes

12.	0020642	Physiology under special conditions	Uroš Kovačič	10	20			60	160	250	10		yes
13.	0020643	Environmental Geochemistry	Nina Zupančič	25	35				190	250	10		yes
14.	0020644	Environmental Geology	Nina Zupančič	25	35				190	250	10		yes
15.	0020645	Geology of living environment	Nina Zupančič	25	30				195	250	10		yes
16.	0020646	Fuels, Combustion and Environment	Andrej Senegačnik	30	30				190	250	10		yes
17.	0020647	WASTE MANAGEMENT	Andreja Žgajnar Gotvajn	25	30	5			190	250	10		yes
18.	0020648	FOREST AND ENVIRONMENT	Andrej Bončina	20	30	10			190	250	10		yes
19.	0020649	HYBRID MODELLING OF ENVIRONMENTAL SYSTEMS	Nataša Atanasova	30	30				190	250	10		yes
20.	0020650	Information Approaches in Science and Technology	Danica Dolničar	30	30				190	250	10		yes
21.	0020651	INDUSTRIAL ECOLOGY	Andreja Žgajnar Gotvajn	50	10				190	250	10		yes
22.	0020652	The Interdisciplinary Aspects of Rural Areas Protection	Majda Černič Istenič	15	15	15			205	250	10		yes
23.	0020653	Engineering Modelling of Ecological Processes in Surface Waters	Matjaž Četina	20	40				190	250	10		yes
24.	0020654	CHEMICAL PROCESSES IN THE ENVIRONMENT	Helena Prosen	20	40				190	250	10		yes
25.	0020655	METALS IN THE ENVIRONMENT	Marija Zupančič	40	20				190	250	10		yes
26.	0020664	Karst and Environment	Mihael Brenčič	30	30				190	250	10		yes
27.	0020657	International Environmental Law	Vasilka Sancin	30	30			30	160	250	10		yes

28.	0020658	Microbial ecology	David Stopar	10	50				190	250	10		yes
29.	0020659	Mineral materials in cultural heritage	Mirijam Vrabec	25	25	10			190	250	10		yes
30.	0020671	DESIGNING ENVIRONMENTALLY-FRIENDLY PRODUCTS AND TECHNOLOGIES	Borut Kosec	20	30	30			170	250	10		yes
31.	0020673	NATURAL HAZARDS IN MOUNTAINOUS ENVIRONMENT	Matjaž Mikoš	20	40				190	250	10		yes
32.	0020686	HAZARDOUS SUBSTANCES IN TEXTILES	Petra Eva Forte Tavčer	30	30				190	250	10		yes
33.	0020687	Renewable energy sources	Sašo Medved	30	30	60			130	250	10		yes
34.	0020688	Conservation Forestry	Jurij Diaci	20	35			5	190	250	10		yes
35.	0020689	Environment, Biosecurity and Animal Production	Štefan Pintarič	20	40				190	250	10		yes
36.	0020690	ENVIRONMETAL EPIDEMIOLOGY	Ivan Eržen	30	30	15			175	250	10		yes
37.	0020691	ENVIRONMENTAL POLICIES BETWEEN MORAL JUSTIFICATION, ECONOMIC ANALYSIS AND POLITICAL FEASABILITY	Simon Hajdini	30	30				190	250	10		yes
38.	0020692	Ground Water	Mihael Brenčič	30	30				190	250	10		yes
39.	0020693	Political Ecology	Andrej A. Lukšič	25	35				190	250	10		yes
40.	0020694	Fires and Their Environmental Impacts	Stojan Petelin	20	60	60			110	250	10		yes
41.	0020695	ASSESSING ENVIRONMENTAL IMPACTS AND LANDSCAPE VULNERABILITY	Matej Ogrin	30	15				205	250	10		yes

42.	0020696	Spatial planning and environment	Alma Zavodnik Lamovšek, Gregor Čok	30	60			20	140	250	10		yes
43.	0020697	RECYCLING OF METAL MATERIALS	Boštjan Markoli	30	30	20			170	250	10		yes
44.	0020698	Soil Remediation	Domen Leštan	25	35				190	250	10		yes
45.	0020699	Environmental Changes and Plants	Mateja Germ	20	20	10		10	190	250	10		yes
46.	0020700	Toxicokinetics of Medicinal Products for Use in Veterinary Medicine in an Animal's Organism and the Environment	Tomaž Snoj	40		20			190	250	10		yes
47.	0020701	SUSTAINABLE DEVELOPMENT ORIENTED TECHNOLOGIES OF UNDERGROUND SPACE USED	Željko Vukelić	30	45	20	10		145	250	10		yes
48.	0020702	Course title: PLACEMENT RISKY BUILDINGS IN SOCIAL ENVIRONMENT	Marjan Hočevar	30	30				190	250	10		yes
49.	0020703	Application of Remote Sensing	Krištof Oštir	25	35	10			180	250	10		yes
50.	0020704	SAFETY AND RELIABILITY IN PROCESS ENGINEERING	Ivo Kljenak	30	30				190	250	10		yes
51.	0020705	Landscape conservation	Mojca Golobič	20	40				190	250	10		yes
52.	0020706	Protection of Wooden Objects of Cultural Heritage	Davor Kržišnik	40	5	15			190	250	10		yes

53.	0020707	Land Evaluation and Management	Helena Grčman	30	20	10			190	250	10		yes
54.	0020708	Protection of Hydrosphere	Nataša Atanasova	30	10				210	250	10		yes
55.	0020709	Health ecology	Marjan Bilban	20	40				190	250	10		yes
56.	0020710	COMBUSTION AND HEAT TRANSFER IN METALLURGICAL REACTORS	Borut Kosec	25	30	35			160	250	10		yes
57.	0020711	Science in the social and in the environmental context	Olga Markič	30	30				190	250	10		yes
58.	0020712	INFECTIOUS ANIMAL DISEASES AND THE ENVIRONMENT	Peter Hostnik	50					200	250	10		yes
		Total		1605	1700	455	10	280	10450	14500	580		

Doktorandi lahko izbirajo med 58 izbirnimi predmeti, ki so ovrednoteni z 10 KT. Izbirne predmete si izbirajo glede na raziskovalno področje doktorske disertacije. Izbrati morajo najmanj dva predmeta s po 10 KT, enega v prvem in enega v drugem letniku. Izbirni predmeti se izvajajo v raziskovalnih enotah v laboratorijih, oddelkih, katedrah in drugih raziskovalnih enotah članic Univerze v Ljubljani. Doktorandi si lahko v dogovoru z mentorjem in somentorjem izberejo 10 KT izbirnih vsebin iz drugih programov UL, primerljivih programov tujih univerz in iz predmetov, ki jih razpisuje Univerza v Ljubljani in omogočajo osvajanje posebnih znanj in spretnosti (»generic skills«).