

Doctoral School of Environmental Sciences

Discipline: Environmental Science

Form of education: Doctor of Philosophy (Ph.D.) training

Program objectives: to acquire the academic degree training

Training time: 4 + 4 semesters

Training type: regular school

Financing: state-sponsored or tuition fee based

Entrance requirements: Master's degree and a successful entrance exam

Language requirements: the condition of admission is fluent English, to be proven at the entrance exam; the condition of the PhD degree is at least level B2 complex state-recognised language certificate in English or equivalent certified language proficiency in English ~~is~~ required

The training ends with: closing certificate (absolutorium)

The number of credits required: 240

Ways of getting credits / modules: training credits (48), research credits (180) + other credits (see Regulations of The Doctoral School)

Responsible for the training: Prof. Tamás Turányi, head of the Doctoral school

Name of faculty responsible for training: Faculty of Science

Doctoral education programs: Environmental Biology, Environmental Physics, Environmental Chemistry, Environmental Earth Sciences

Heads of the Doctoral Programmes

Environmental Biology:	Dr. Erika Tóth
Environmental Physics:	Dr. Ákos Horváth
Environmental Chemistry:	Dr. Viktor Mihucz
Environmental Earth Sciences:	Dr. Zoltán Szalai

Training / Learning Module:

KÖR-2/02 Meteorological modeling of the land-surface-atmosphere interactions: a historical review Ács Ferenc

6 credits, theory, optional, no repetition

KÖR-2/03 Application of isotopes in environmental science Czuppon György

6 credits, theory, optional, no repetition

KÖR-2/04 Environmental climatology Bartholy Judit

6 credits, theory, optional, no repetition

KÖR-2/05 Microbial ecology of waters and aquatic habitats Kériné Borsodi Andrea and Tóth Erika

6 credits, theory, optional, no repetition

KÖR-2/06 Environmental aspects of subsurface carbon dioxide storage Falus György

6 credits, theory, optional, no repetition

KÖR-2/07 The application of infrared spectrometry to Earth Sciences Kovács István János

6 credits, theory, optional, no repetition

KÖR-2/08 Writing scientific papers in English Böddi Béla

6 credits, theory, optional, no repetition

KÖR-2/09 Ecology of soil seed banks Csontos Péter
6 credits, theory, optional, no repetition

KÖR-2/10 Spatial and temporal analysis of environmental geochemical data Jordán Győző
6 credits, theory, optional, no repetition

KÖR-2/11 Volcanic heritage and geotourism Harangi Szabolcs
6 credits, theory, optional, no repetition

KÖR-2/12 Transboundary environmental impacts and international environmental cooperation
Farágó Tibor
6 credits, theory, optional, no repetition

KÖR-2/13 Environmental biophysics Horváth Gábor
6 credits, theory, optional, no repetition

KÖR-2/15 General and special aspects of plant mineral nutrition and the nutrient stress Fodor
Ferenc
6 credits, theory, optional, no repetition

KÖR-2/16 Micrometeorology Weidinger Tamás
6 credits, theory, optional, no repetition

KÖR-2/17 Sensory biophysics I.: Polarization sensitivity and its environmental optical aspects
Horváth Gábor
6 credits, theory, optional, no repetition

KÖR-2/18 Community ecology of tropics Hufnagel Levente
6 credits, theory, optional, no repetition

KÖR-2/19 Weather and climate models Breuer Hajnalka
6 credits, theory, optional, no repetition

KÖR-2/20 Nuclear environmental protection Homonnay Zoltán
6 credits, theory, optional, no repetition

KÖR-2/21 Radon in natural and artificial environments Horváth Ákos
6 credits, theory, optional, no repetition

KÖR-2/22 Bio-geochemical models Grosz Balázs Péter
6 credits, theory, optional, no repetition

KÖR-2/23 Soil organic matter research Szalai Zoltán
6 credits, theory, optional, no repetition

KÖR-2/25 Environmental sociology Izsák Éva
6 credits, theory, optional, no repetition

KÖR-2/26 Physics of environmental flows Jánosi Imre
6 credits, theory, optional, no repetition

KÖR-2/28 Grasslands ecology Kalapos Tibor
6 credits, theory, optional, no repetition

KÖR-2/34 Hydrobiology Török Júlia
6 credits, theory, optional, no repetition

KÖR-2/36 Geostatistical analysis in environmental science Kovács József and Hatvani István
Gábor
6 credits, theory, optional, no repetition

KÖR-2/39 Hydrogeology of karst systems Mádlné Szőnyi Judit
6 credits, theory, optional, no repetition

KÖR-2/42 Modelling of deposition of trace gases Mészáros Róbert
6 credits, theory, optional, no repetition

KÖR-2/45 Atmospheric aerosols and environmental impacts Salma Imre
6 credits, theory, optional, no repetition

KÖR-2/47 Sustainable energy management Munkácsy Béla
6 credits, theory, optional, no repetition

KÖR-2/52 Cycling of elements Szabó Csaba

6 credits, theory, optional, no repetition
 KÖR-2/55 How to measure size and shape of nano- and micro size particles? Szalai Zoltán
 6 credits, theory, optional, no repetition
 KÖR-2/56 Pedogenesis Szalai Zoltán
 6 credits, theory, optional, no repetition
 KÖR-2/57 Introduction to digital surface modelling Székely Balázs
 6 credits, theory, optional, no repetition
 KÖR-2/61 Scale dependent atmospheric dispersion models Weidinger Tamás
 6 credits, theory, optional, no repetition
 KÖR-2/63 Environmental analysis Záray Gyula
 6 credits, theory, optional, no repetition
 KÖR-2/65 Thermal waters and geothermal energy Mádlné Szőnyi Judit
 6 credits, theory, optional, no repetition
 KÖR-2/66 Introduction to Prokaryotic taxonomy Tóth Erika and Vajna Balázs
 6 credits, theory, optional, no repetition
 KÖR-2/72 Groundwater flow systems in sedimentary basins Mádlné Szőnyi Judit
 6 credits, theory, optional, no repetition
 KÖR-2/73 Generation of air pollution in combustion systems Turányi Tamás
 6 credits, theory, optional, no repetition
 KÖR-2/75 Hyphenated techniques for element speciation Mihucz Viktor
 6 credits, theory, optional, no repetition
 KÖR-2/76 Advanced Separation Science Eke Zsuzsanna
 6 credits, theory, optional, no repetition
 KÖR-2/77 Methods of multivariate data analysis 1. Héberger Károly
 6 credits, theory, optional, no repetition
 KÖR-2/78 The global carbon cycle Barcza Zoltán
 6 credits, theory, optional, no repetition
 KÖR-2/82 Radiobiology and environmental radiohygiene Turai István
 6 credits, theory, optional, no repetition
 KÖR-2/83 Soil microbiology Borsodi Andrea and Szili Kovács Tibor
 6 credits, theory, optional, no repetition
 KÖR-2/84 Environmental health Vargha Márta
 6 credits, theory, optional, no repetition
 KÖR-2/89 International conventions on environmental protection and nature conservation
 Faragó Tibor
 6 credits, theory, optional, no repetition
 KÖR-2/90 Soil protection measurements on the field Jakab Gergely / Barta Károly (SZTE) /
 Centeri Csaba (SZIE)
 6 credits, theory, optional, no repetition
 KÖR-2/91 Environmental science and policy related international cooperation: its
 development, organisations, fora, programmes and agreements Faragó Tibor
 6 credits, theory, optional, no repetition
 KÖR-2/93 Atmospheric icing of structures Kollár László
 6 credits, theory, optional, no repetition
 KÖR-2/94 Human biology and environmental science Tóth Gábor Antal
 6 credits, theory, optional, no repetition
 KÖR-2/95 Introduction to light pollution studies Kolláth Zoltán
 6 credits, theory, optional, no repetition
 KÖR-2/96 Radiation transfer in Earth's atmosphere Kolláth Zoltán
 6 credits, theory, optional, no repetition
 KÖR-2/100 Survival kit for scientific life Torma Csaba Zsolt
 6 credits, theory, optional, no repetition

KÖR-2/101 New approaches to urban studies Berki Márton
6 credits, theory, optional, no repetition

KÖR-2/102 Methods of applied statistics Keszei Ernő
6 credits, theory, optional, no repetition

KÖR-2/103 Modern reaction kinetics Keszei Ernő
6 credits, theory, optional, no repetition

KÖR-2/104 Introduction to Separation Sciences Zsigrainé Vasanits Anikó
6 credits, theory, optional, no repetition

KÖR-2/105 Basics of reaction kinetics Túri László
6 credits, theory, optional, no repetition

KÖR-2/106 Chemometrics Tóth Gergely
6 credits, theory, optional, no repetition

KÖR-2/109 Methods of multivariate data analysis 2. Héberger Károly
6 credits, theory, optional, no repetition

KÖR-2/110 Karst hydrogeology Kovács Attila
6 credits, theory, optional, no repetition

KÖR-2/113 European regional climate modelling practices: EURO-CORDEX and Med-CORDEX Torma Csaba Zsolt
6 credits, theory, optional, no repetition

KÖR-2/115 Exploration and utilization of geothermal energy László Lenkey
6 credits, theory, optional, no repetition

KÖR-2/116 New approaches to cultural geography Berki Márton
6 credits, theory, optional, no repetition

KÖR-2/120 Theoretical and practical solutions of environmental technologies Kardos Levente
6 credits, theory, optional, no repetition

KÖR-2/121 Global and regional climate scenarios Pongrácz Rita
6 credits, theory, optional, no repetition

KÖR-2/122 Trends in modern ecology Herczeg Gábor, Szentesi Árpád, Török János
6 credits, theory, optional, no repetition

KÖR-2/123 Raman spectroscopy and its applications to environmental science Vácz Tamás
6 credits, theory, optional, no repetition

KÖR-2/124 Genetic dissection of beneficial interactions between legumes and arbuscular mycorrhiza fungi and nitrogen-fixing rhizobia Kaló Péter
6 credits, theory, optional, no repetition

KÖR-2/125 Plant-fungi interactions Barna Balázs
6 credits, theory, optional, no repetition

KÖR-2/128 Environmental isotopes Szabó-Krausz Zsuzsanna, Szabó Csaba
6 credits, theory, optional, no repetition

KÖR-2/131 Sensory biophysics II.: visual, biomechanical, thermoreceptional and bioacoustical case studies Horváth Gábor
6 credits, theory, optional, no repetition

KÖR-2/132 Microbial Ecology Tóth Erika
6 credits, theory, optional, no repetition

KÖR-2/133 Spatial Ecology: from Islands to Metacommunities Horváth Zsófia
6 credits, theory, optional, no repetition

KÖR-2/134 Instrumental element analysis for biological samples Fodor Ferenc
6 credits, theory, optional, no repetition

KÖR-2/136 Advanced data analysis and visualization by R programming Szabó-Krausz Zsuzsanna, Virág Attila
6 credits, theory, optional, no repetition

KÖR-2/137 Water, society, economy Gyuris Ferenc

- 6 credits, theory, optional, no repetition
 KÖR-2/138 Sustainable food systems Mihucz Viktor
 6 credits, theory, optional, no repetition
 KÖR-2/139 Geospatial information in R Bede-Fazekas Ákos
 6 credits, theory, optional, no repetition
 KÖR-2/140 Introduction to tree-ring science Kern Zoltán, Árvai Máttyás
 6 credits, theory, optional, no repetition
 KÖR-2/141 Natural tracers of Earth system processes Eröss Anita
 6 credits, theory, optional, no repetition
 KÖR-2/142 Historical landscape ecology and traditional ecological knowledge
 Biró Marianna
 6 credits, theory, optional, no repetition
 KÖR-2/143 Geographies and geopolitics of knowledge Ferenc Gyuris
 6 credits, theory, optional, no repetition
 KÖR-2/144 Transportation of water and solutes through the unsaturated zone Horel Ágota
 6 credits, theory, optional, no repetition
 KÖR-2/145 Salt affected soils Novák Tibor József
 6 credits, theory, optional, no repetition
 KÖR-2/146 Environment and Society Ferenc Jankó
 6 credits, theory, optional, no repetition
 KÖR-2/148 Raman spectroscopy in Earth science Berkesi Márta
 6 credits, theory, optional, no repetition
 KÖR-2/149 The impact of urbanization on surface water Weiperth András
 6 credits, theory, optional, repetition
 KÖR-2/150 Economic systems and environmental sustainability Antal Miklós
 6 credits, theory, optional, no repetition
 6 kredit, elmélet, nem kötelező, nem ismételhető
 KÖR-2/151 Plankton ecology: from patterns to processes Vad Csaba, Pálffy Károly
 6 credits, theory, optional, no repetition
- KÖR-2/-201 Special topics in environmental science I.
 6 credits, theory, optional, no repetition
 KÖR-2/202 Special topics in environmental science II.
 6 credits, theory, optional, no repetition
 KÖR-2/203 Special topics in environmental science III.
 6 credits, theory, optional, no repetition
 KÖR-2/-204 Special topics in environmental science IV.
 6 credits, theory, optional, no repetition
 KÖR-2/205 Special topics in environmental science V.
 6 credits, theory, optional, no repetition
 KÖR-2/206 Special topics in environmental science VI.
 6 credits, theory, optional, no repetition
 KÖR-2/-207 Special topics in environmental science VII.
 6 credits, theory, optional, no repetition
 KÖR-2/208 Special topics in environmental science VIII.
 6 credits, theory, optional, no repetition
 KÖR-2/209 Special topics in environmental science IX.
 6 credits, theory, optional, no repetition
 KÖR-2/-210 Special topics in environmental science X.
 6 credits, theory, optional, no repetition
 KÖR-2/211 Special topics in environmental science XI.
 6 credits, theory, optional, no repetition
 KÖR-2/212 Special topics in environmental science XII.

6 credits, theory, optional, no repetition

KÖR/RK-KV Part-time Training / Credit Transfer

Credits can be obtained by part-time doctoral training in other domestic or foreign institutions. The training program of part-time work, based on a proposal by the supervisor and program director, must be approved by the Council of the Doctoral School.

KÖR/ET Accounting Previous Performance

The Council of the Doctoral School, based on a proposal by the supervisor and program director, can recognize by credits previous studies and/or research fitting into the training program.

The total number of credits obtained during the training period by credit transfer, part-time training, or by previous performance cannot be more than 50 % of the required academic credits.

Teaching activity: KÖR-2/OKT

8 credits maximum in each semester

practice, optional, repeatable

The teaching credits are entered into Neptun by the Doctoral Group, based on the student's written request to the Head of the Doctoral School. The request must include details of the subject taught by the PhD student and must be supported by the lecturer responsible for the subject.

Publication: KÖR-2/PUB

Q1 publication:	8 credits
Q2 publication:	6 credits
Q3 publication and book chapter:	3 credits
Conference lecture or poster with published abstract	2 credits
Conference lecture or poster without published abstract	1 credit

Publication credits are entered into Neptun by the Doctoral Group, based on the student's written request to the Head of the Doctoral School. The request must include details of the publications, conference lectures and posters to be recognised and their conversion into credits as described above. It is sufficient to write one such request before the complex exam and one at the end of the training period, before awarding the closing certificate (absolutorium). The Q1-Q4 classification scheme of the MTMT publication database has to be used.

Transitional provision: for publications and conference presentations accepted before 1 September 2022, the PhD students may opt for the publication credit award scheme valid until 31 August 2022.

Research Module:

KÖR-2/KUT Supervised research

In the first two years, 15 credits per semester (60 in total) and in the second two years, 30 credits per semester (120 in total) may be accumulated.

30 hours of student activities (learning, research, teaching and others) = 1 credit point
optional, repeatable

Acquisition of skills for scientific research, active participation in research
24 hours/week.

Evaluation and control

Fulfilments of requirements of a given course is evaluated and recorded in the transcript by the lecturer on a five-point scale (1-2-3-4-5, 1: failed 5: excellent).

Research activities are evaluated and recorded in the transcript by the supervisor on a three-point scale (excellent – acceptable - failed).

Credits are approved by the program directors.

Subject list of the Complex Exam

After finishing the 2nd year (4 semesters), the students must pass a complex exam, a mandatory prerequisite for continuing the training. Subjects for the exam can be chosen from the following list:

Environmental Biology:

- Environmental microbiology
- Environmental and conservation biology
- Ecology
- Environmental health
- Environmental science of water

Environmental Physics:

- Radiation in the environment
- Environmental material science and technology
- Renewable energy sources
- Physics of environmental flows
- Environmental biophysics

Environmental Chemistry:

- Chemistry of environmental systems
- Environmental technologies
- Instrumental methods of analytical chemistry
- Bio-inorganic chemistry
- Atmospheric chemistry
- Reaction kinetics and its applications

Environmental Earth Sciences:

- Applied meteorology and climatology
- Environmental geology
- Environmental geochemistry
- Environmental geography
- Hydrogeology
- Sustainability and social science research

At the registration for the complex exam, the student, in accordance with her/his supervisor, may suggest subjects from different programs, provided that it is justified by the interdisciplinary character of the research topic.