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: 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 (KÖR-2/1):	Dr. Erika Tóth
Environmental Physics (KÖR-2/2):	Dr. Ákos Horváth
Environmental Chemistry (KÖR-2/3):	Dr. Tamás Turányi
Environmental Earth Sciences (KÖR-2/4):	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 Faragó 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-2/28 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 / Farsang Andrea (SZTE) / 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 Váczi 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-2/129 Oceanology Báldi Katalin
6 credits, theory, optional, no repetition
KÖR-2/130 Future of the oceans Báldi Katalin
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 Víz, társadalom, gazdaság Gyuris Ferenc
6 kredit, elmélet, választható, nem ismételhető
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 Térinformatika R-ben Bede-Fazekas Ákos
6 kredit, elmélet, választható, nem ismételhető
KÖR-2/140 Bevezetés az évgyűrűvizsgálatba Kern Zoltán, Árvai Mátyás
6 kredit, elmélet, választható, nem ismételhető
KÖR-2/140 Introduction to tree-ring science Kern Zoltán, Árvai Mátyás
6 credits, theory, optional, no repetition
KÖR-2/141 Természetes nyomjelzők alkalmazása földi folyamatokban Erőss Anita
6 kredit, elmélet, választható, nem ismételhető
KÖR-2/141 Natural tracers of Earth system processes Erőss Anita
6 credits, theory, optional, no repetition
KÖR-2/142 Történeti tájökológia és hagyományos ökológiai tudás Biró Marianna
6 kredit, elmélet, választható, nem ismételhető
KÖR-2/142 Historical landscape ecology and traditional ecological knowledge Biró Marianna
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 (KÖR-2/1):

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

Environmental Physics (KÖR-2/2):

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

Environmental Chemistry (KÖR-2/3):

Chemistry of environmental systems
Environmental technologies

Instrumental methods of analytical chemistry
Bio-inorganic chemistry
Atmospheric chemistry
Reaction kinetics and its applications

Environmental Earth Sciences (KÖR-2/4):

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.