

ENSITE Summer School

**Socio-scientific Issues in Mathematics and Science
Initial Teachers Education
June 15th – 24th 2022, Prague, Czechia**

For prospective science teachers:

Join a unique intercultural experience preparing you for the future classroom!

For implementation of socio-scientific issues, first-hand experiences are indispensable and in particularly relevant for the future classroom. Yet, prospective science teachers need to be aware of the social realities of many science tasks as well as of culturally different algorithms. They should be able to perceive social different perspectives and develop socio-scientific sensitivity.

Participating students of the ENSITE summer school will have numerous opportunities for intercultural exchange, both within the international student group and outside when meeting local students, teachers, and pupils. This will enable them to gain rich experience connected to their own future profession.

Lectures will be held by an international team of renowned lecturers from 4 countries!

Venue: Faculty of Education, Charles University, Prague, Czech Republic (M. D. Rettigové street 4, closest Metro station – Národní třída or Můstek)

Main target group: Mathematics and natural sciences students in teacher education programmes – also interested teachers welcome!

Application deadline: 31 May, 2022

Award: 3 ECTS credits from Faculty of Education, Charles University, certificate of participation

Language: English

Costs for students of ENSITE partner universities: free of charge

Fee for students of other universities: Attendance fee 100,- EUR. Travel, accommodation and subsistence costs on own expenses.

Organizer: ENSITE Project – Charles University Faculty of Education

Contact for information and application: martin.bilek@pedf.cuni.cz

Web: <https://icse.eu/ensite/>

Programme

Students profit from the summer school as an excellent opportunity for gaining international and intercultural experiences which enable them to better appreciate and understand socio-scientific issues. During the summer schools, students will live and work in an intercultural setting together with students from many different European countries, having numerous opportunities for intercultural communication.

The programme provides lectures and workshops on socio-scientific issues in learning as well offers activities to make own experiences in activities that are offered after the lectures and workshops (museums, expositions, sights of the city etc.). Also, a school and non-governmental institution excursions will be organised to give prospective teachers an insight into school life in another country.

Modules

During the summer school lectures and workshops with a particular emphasis on those topics will be held (selected modules developed in project ENSITE):

- Module IO1: Nature of Socio-Scientific Issues in Education
- Module IO2: Reasoning, Argumentation & Critical Thinking
- Module IO4: Analysing Data
- Module IO5: Decision-making based on Confronting Scientific Positions on the example of Food Provision for the World
- Module IO6: Negotiating Social, Political and Ethical Dimensions in SSI
- Module IO8: Beliefs on teaching SSI
- Module IO10: Designing SSI Lesson, focus to Methods
- Module IO11: Scaffolding
- Module IOX: Additional Culture related Study Events

Participation in the modules IO is mandatory to apply for 3 ETCS credits. Participation in module IOX is voluntary.

Module descriptions

Module IO1: Nature of Socio-Scientific Issues in Education

Lecturers from the University of Education in Freiburg (PHFR), Germany

The module developed by University of Education in Freiburg (Germany) will be developed as a basis for the other modules in this project and it promotes a comprehensive understanding of environmental socio-scientific issues (SSI) guided by research and the educational discussion on SSI. It will provide meta-knowledge on characteristics of SSI and on how to deal with them. The aim of this module is to present a conceptual foundation for the other modules. In relation to the overall aim of motivating and enabling future teachers to include SSI into their teaching it will also initiate first reflections on future teachers' beliefs on including SSI into teaching and give future teachers reasons for doing so. As an introductory module 'The nature of environmental SSI' will focus on the different topics of the SSI teaching and SSI learning.

This module raises the aspect of environmental SSI in initial education for future science and maths teachers and gives first insights in the potential of SSIs with regard to science and maths teaching and what roles (future) teachers and their beliefs play.

Module IO2: Reasoning, Argumentation & Critical Thinking

Lecturers Gultekin Cakmakci and Semra Akgonullu from the Hacettepe University (HU), Turkey

In this module, developed by Hacettepe University, Ankara (Turkey), we will focus on ways to enhance pre-service teachers' competences in reasoning, argumentation and critical thinking through the use of media reports on environmental socio-scientific issues (SSIs). This session provides resources and strategies to help pre-service teachers to grasp underlying ideas and to create effective learning environments for reasoning, argumentation, and critical thinking. At the end of this session, participants will get an overview on how to use media reports in their classroom practices.

Module IO4: Analysing Data

Lecturer Soňa Čeretková from the Constantine Philosopher University in Nitra (UKF), Slovakia

The aim of modul developed by Utrecht University (Nederlands) is to address the mathematics behind the construction of (true and wrong) stories based upon data. Module will show the connection between environmental socio-scientific issues (SSI) and mathematics (statistics) by providing illustrative examples and visualizations of big data sets of environmental issues. The focus of this module is on handling very big amounts of data, where it is very easy to lose overview and forming an opinion based on it. In our current data driven society it has become important to be able to understand, communicate about and critically reflect on quantitative information.

Module IO5: Decision-making based on confronting scientific positions on the example of food provision for the world

Lecturer Martin Bílek from the Charles University (CUNI), Czechia

In the module developed by Charles University, Prague (Czechia) future science teachers will develop competences in decision-making concerning environmental socio-scientific issues (SSI) using the example of confronting scientific positions on global food provision. The aim of this module is to present conditions and influencing factors for decision-making related to global food provision and to provide orientation on the global food market, e.g. on aspects like food sources, food production, food distribution and food consumption. Whilst the focus in this module is on learning, there will be also insights into including these aspects into science teaching at school. The module 5 will address future teachers' values and attitudes and confront them with their role as active responsible citizens since topics such as "world hunger and malnutrition" have a very strong emotional and emphatic component. It will also contain concrete ideas on how to include issues with such an emotional aspect in science and maths teaching and learning.

Module IO6: Negotiating Social, Political and Ethical Dimensions in SSI

Lecturers Andrea Frantz-Pittner and Christina Pichler-Koban from the University of Klagenfurt (KLU), Austria

In this module, developed by the University of Klagenfurt, we will use the topic of mobility to consider the different perspectives that need to interact in the sustainable management of Socio-Scientific Issues. We will reflect on our own attitudes and values towards the topic and develop approaches to use the traffic situation in the school environment as a starting point for SSI Teaching.

Module IO8: Beliefs on teaching SSI

Lecturer Soňa Čeretková from the Constantine Philosopher University in Nitra (UKF), Slovakia

A problem that is still unexplored in environmental socio-scientific issues (SSI) is how different people (e.g. from different cultural backgrounds, with different experiences) identify with the SSI they are exploring. The aim of module developed by University of Nicosia (Cyprus) is to help participants (teachers) recognize how their own beliefs, narratives, cultural backgrounds and personal identities might influence their choice to teach or not teach specific SSI, and how they teach it. With the development of a tool (questionnaire), the module helps teachers to reflect on their own beliefs, narratives and biases teaching SSI. This tool will also help participants understand their limitations when it comes to teaching SSI, and critical reflect on them.

Module IO10: Designing SSI Lesson, Focus to Methods

Lecturer Soňa Čeretková from the Constantine Philosopher University in Nitra (UKF), Slovakia

The focus of the module developed by The Constantine Philosopher University in Nitra (Slovakia) is on enabling participants, future teachers, to support their students in developing creativity, critical thinking and reasoning. They will learn to design their own related lesson. Transversal skills like critical thinking, reasoning and creativity can be enhanced in students by selecting controversial topics which promote these transversal skills and by choosing appropriate pedagogical methods, which allow for reasoning, critical thinking and creativity. Examples of methods are: plenary discussions, debates, group work, world cafes and using digital technologies. Participants will learn to choose these methods in relation to the specific aims of the lesson and in order to support transversal skills, also considering the need to consider social, cultural, political or ethical aspects of SSI.

Module IO11: Scaffolding

Lecturers and Christina Pichler-Koban and Andrea Frantz-Pittner from the University of Klagenfurt (KLU), Austria

In this module, developed by University of Klagenfurt, Austria we will get introduced in the pedagogical concept of scaffolding, explore different perspectives on forests and discuss their potential as SSI and test examples of forest-related issues in classroom teaching.

Module IOX: Additional culture related study events

Team of the Faculty of Education Charles University (CUNI), Czech Republic

Schedule

Participation in the modules IO1 is mandatory. Participation in module IOX is voluntary.

Wednesday 15 June

Time	Session	Contact Person
13:00 - 14:00	Arrival and Registration Department of Chemistry and Chemistry Education Faculty of Education Charles University, M. D. Rettigové street 4, 2 nd floor, room R201	
14:00 - 14:10	Welcome	Room R231 Martin Bilek from Charles University (CUNI), Faculty of Education (PedF)
14:10 - 15:30	General Introduction University Study and Students in Czech Republic Introduction of participants country groups Group discussion	Room R231 CUNI Participants groups
15:30 - 16:00	Break	
16:00 - 17:30	Module IO1 Nature of Socio-Scientific Issues in Education	Room R231 PHFR and CUNI teams
18.00	Module IOX Welcome in Prague	Room R231 CUNI students

Thursday 16 June

Time	Session	Contact Person
10:00 - 11:00	Module IO5 Decision-making based on confronting scientific positions (1)	Room 206 CUNI
11.00 – 11.30	Break	
11:30 - 12:30	Module IO5 Decision-making based on confronting scientific positions (2)	Room 206 CUNI
12:30 - 14:00	Lunch Break	
14:00 - 15:00	Module IO5 Decision-making based on confronting scientific positions (3)	Room 206 CUNI
15.00 – 15.30	Break	
15.30 – 16.30	Module IO5 Decision-making based on confronting scientific positions (4)	Room 206 CUNI

Friday 17 June

Time	Session	Contact Person
10:00 - 11:00	Module IO6 Negotiating Social, Political and Ethical Dimensions in SSI (1)	Room 206 KLU
11.00 – 11.30	Break	
11:30 - 12:30	Module IO6 Negotiating Social, Political and Ethical Dimensions in SSI (2)	Room 206 KLU
12:30 - 14:00	Lunch Break	
14:00 - 15:00	Module IO11 Scaffolding (1)	Room 206 KLU
15:00 – 15:30	Break	
15:30 – 16:30	Module IO11 Scaffolding (2)	Room 206 KLU

Saturday 18 June

Time	Session	Contact Person
	Module IOX Socio-scientific issues in Prague	CUNI
	Module IOX Welcome in Prague –excursion in city centre from the perspective of the intercultural life in the city	CUNI

Sunday 19 June

Time	Session	Contact Person
	Module IOX Whole day trip	CUNI
	Module IOX Socio-scientific issues outside of Prague	CUNI

Monday 20 June

Time	Session	Contact Person
10:00 - 11:00	Module IO2 Reasoning, Argumentation & Critical Thinking (1)	Room R206 HU
11.00 – 11.30	Break	
11:30 - 12:30	Module IO2 Reasoning, Argumentation & Critical Thinking (2)	Room R206 HU
12:30 - 14:00	Lunch Break	
14:00 - 15:00	Module IO2 Reasoning, Argumentation & Critical Thinking (3)	Room R206 HU
15:00 - 15:30	Break	
15:30 - 16:30	Module IO2 Reasoning, Argumentation & Critical Thinking (4)	Room R206 HU

Tuesday 21 June

Time	Session	Contact Person
10:00 - 12:00	Module E School visit (be specified)	CUNI
12:00 – 14:00	Lunch Break	
14:00 - 16:00	Environmental issues of Science & Society (be specified)	CUNI

Wednesday 22 June

Time	Session	Contact Person
10:00 - 11:00	Module IO4 Analysing Data (1)	Room R206 UKF
11:00 – 11:30	Break	
11:30 - 12:30	Module IO4 Analysing Data (2)	Room R206 UKF
12:30 - 14:00	Lunch Break	
14:00 - 15:00	Module IO10 Designing SSI Lesson, Focus to Methods (1)	Room R206 UKF
15:00 - 15:30	Break	
15:30 - 16:30	Module IO10 Designing SSI Lesson, Focus to Methods (2)	Room R206 UKF

Thursday 23 June

Time	Session	Contact Person
10:00 - 11:00	Module IO8 Beliefs on teaching SSI (1)	Room R206 UKF
11:00 - 11:30	Break	
11:30 - 12:30	Module IO8 Beliefs on teaching SSI (2)	Room R206 UKF
12:30 - 14:00	Lunch Break	
14:00 - 15:00	Module IO10 Designing SSI Lesson, Focus to Methods (3)	Room R206 UKF
15:00 - 15:30	Break	
15:30 - 16:30	Module IO10 Designing SSI Lesson, Focus to Methods (4)	Room R206 UKF

Friday 24 June

Time	Session	Contact Person
10:00 - 12:00	Final Colloquium	Martin and Soňa (CUNI)
12:00 - 14:00	Farewell & Departure	

Prague – one of the most beautiful cities in Europe

For ENSITE Summer School we elected Prague as beautiful city in hearth of the Europe with great opportunities to meet and recognize multicultural society and intercultural relations. Venue in Prague offers to discover “genius loci” connected with intercultural feeling and rich historical memory.



Photo: Martin Bilek

The ENSITE project

ENSITE (2019-2022) is an Erasmus+ project supporting the development of future science and maths teachers' environmental citizenship and related teaching competences.

The project faces severe global environmental challenges such as climate change, plastic waste, and loss of biodiversity. To develop sustainable solutions for these challenges, people need skills to deal with them. It needs not only profound scientific know-how, but also transversal skills such as critical thinking, creativity, responsible citizenship competences and a forward-perspective.

ENSITE supports this endeavour. Researchers from 11 European countries work closely together to develop an innovative approach which aims at improving higher education by including environmental socio-scientific issues in science initial teacher education.

By offering **international summer schools** and **multiplier events**, ENSITE will strengthen transnational cooperation between universities in establishing mobility programmes for maths and science students in initial teacher education.

The project brings together 11 teams of higher education institutions for initial teacher education from across Europe comprising experts in maths and science education:

- University of Education Freiburg, Germany (coordinating institution)
- University of Nicosia, Cyprus
- Charles University, Czech Republic
- University of Klagenfurt, Austria
- National and Kapodistrian University of Athens, Greece
- Bulgarian Academy of Sciences in Sofia, Bulgaria
- University of Malta, Malta
- Utrecht University, Netherlands
- Norwegian University of Science and Technology, Norway
- Jönköping University, Sweden
- Constantine the Philosopher University, Slovakia

**We are looking forward to welcome you
at our ENSITE Summer School in Prague!**

The ENSITE project, 2019-2022, has received funding by the Erasmus+ programme of the European Union (*grant no. 2019-1-DE01-KA203-005046*) and is coordinated at the International Centre for STEM Education (ICSE) of the University of Education Freiburg, Germany.