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EUGreen BIP



EUROPEAN UNIVERSITIES ALLIANCE FOR SUSTAINABILITY:
RESPONSIBLE GROWTH, INCLUSIVE EDUCATION AND ENVIRONMENT



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UNIVERSITY
OF GÄVLE

Blended Intensive Programme (BIP)

INTRODUCTION TO MATHEMATICAL AND COMPUTATIONAL MODELLING FOR SUSTAINABILITY



Seize research possibilities with our BIP – turning passion into discovery. Apply now!

Blended Intensive Program

Introduction to Mathematical and Computational Modelling for Sustainability

Module 1 Overview of Modelling	Module 2 Differential equation based models
Module 3 Numerical Methods for partial differential equations	Module 4 Cellular automata/Agent-based models
Module 5 Finite Dynamical systems - Markov Chains	Module 6 Stochastic modelling, Monte Carlo methods
Module 7 Introduction to Machine Learning Classification and Regression problems	
Module 8 Constraint Modeling and Constraint solving	Module 9 Local Search and Metaheuristics

Participants:

MSc students, PhD students, postdoc researchers

Program details: Virtual attendance period: From 6th of May to 21st of June In-presence attendance period: From 24th of June to 28th of June Language: English	Organized by: Universitatea din Oradea Co-Organized by: Atlantic Technological University Universidade de Evora Högskolan i Gävle Université d'Angers
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Contact your international office form more information



Link to BIP



Register to BIP



Erasmus+

UNIVERSITY OF ORADEA, within the EU GREEN University Alliance (<https://eugreenalliance.eu/eu-green-blended-intensive-programmes-bips/>), organizes Blended Intensive Programme open for all the students from EU GREEN partner universities.

Coordinating and organizing University

UNIVERSITY OF ORADEA (Romania)

Prof. Radu ȚARCĂ

Co-organizing Universities

Atlantic Technological University (Ireland)

Universidade de Evora (Portugal)

Högskolan i Gävle (Sweden)

Université d'Angers (France)

Programme details

- IN-PRESENCE attendance period: 24th – 28th of June 2024;
- VIRTUAL attendance period: 6th of May – 21st of June 2024;
- Language of instruction: English;
- ECTS for participation in the programme: 6.

Programme description

This 6ECTS BIP will give an introduction to mathematical and computational modelling techniques for application in developing understanding and supporting sustainable decision making in health, environmental, societal, and industrial systems. The programme is designed for students at the Masters or Doctoral level who wish to develop these skills for application in research projects

Aims:

- Develop familiarity with fundamental approaches to mathematical and computational modelling methods, techniques and tools, including Differential Equations, Machine Learning/AI, Finite difference/element/volume method,
- Cellular Automata and Optimisation Algorithms;
- Develop awareness of which methods may be suitable for different types of research problems along with the potential benefits, challenges and limitations of each approach;
- Develop skills in application of these methods to real-world multidisciplinary research problems aligned to the EU Green themes;
- Develop student transferable skills in group working and communication;
- Help to create a culture of international and cross-discipline collaboration in postgraduate research at the EU Green institutions.

The programme will consist of 9 x 2hr online weekly sessions and a week-long in-person summer school at the University of Oradea. The teaching will be delivered by different academic staff from ATU, HiG, Oradea, Evora and Angers. The summer school will comprise hands-on workshops, student presentations, and participation in a group project as well as social/networking opportunities. Students will select an individual project related to their own research domain with support from the academic staff.

As learning outcomes, it is intended to promote:

- Approach the formulation of health/societal/industrial/environmental problems into a mathematical/computational framework;
- Develop familiarity with a range of modelling and analytic approaches (mathematical & stochastic modelling, machine learning and optimisation);
- Build and analyse models of processes and physical systems. These models may be predictive or descriptive and may increase understanding of the processes/physical systems;
- Identify the limitations and weaknesses of a range of modelling/analytical approaches – in terms of accuracy, robustness, sensitivity, reliability, range of validity and resolution;
- Appraise a range of modelling/analytical approaches to solving a problem – in terms of the potential accuracy/resolution etc. of the model predictions but also taking account of the required investment in time and cost in order to develop and test the models;
- Program mathematical models/analytical tools;
- Communicate model findings and limitations to technical and nontechnical audiences (e.g. policy makers) including effective visualisation.

Assessment:

- Individual poster presentation (20%) – To introduce the student's own Masters/PhD research at the beginning of the summer school;
- Group Project (20%) – To be completed and presented at the summer school;
- Individual Project (60%) – Written report. The project should typically comprise either (i) a high-level review of modelling relevant to the student's research topic or (ii) some preliminary modelling work relevant to the student's research topic.

Total number of participants by institution

The BIP is open to a maximum of 15 participants from the EU GREEN universities.

Admission profile

Students can be MSc, PhD or postdoctoral researcher, but should normally have completed at least 5 ECTS relevant to Mathematics/Statistics at undergraduate or master level.

Conditions for Admission

- participation to the program is open to MSc, PhD or postdoctoral researcher;
- to apply for this program, students must be regularly enrolled at one of the participating universities and completed a course in Programming, Mathematics/Statistics, or similar content;
- at the time of the application submission, applicants must demonstrate proof of English language competence at the B2 level. This can be certified by the applicant's home University.

How to apply

- Students should complete the APPLICATION FORM (<https://forms.office.com/Pages/ResponsePage.aspx?id=zZHXBQWjo0Cq6O7O180Xpcq0UOBFfYVAKS4mPhEmeTpUMIU5QIA3MkdNWWVhNREFGR0IzSE9KNER>)
- Students should send the following documents to dan.noje@uoradea.ro (mailto:dan.noje@uoradea.ro) till 15th April 2024:
 - copy of ID or passport;
 - transcript of records and certificate of enrolment;
 - proof of English language competence.

Deadline for application – April 15th, 2024

Selection procedure

An appointed Committee of the organizer and co-organizer institution will carry out the selection procedure.

Students and researchers should expect to hear back about the result of their application by 25th of April 2024. Selected students must communicate their acceptance or withdrawal within 5 days from the publication of the selection results by contacting their university program coordinator. Selected students will be contacted with further instructions upon completion of the selection procedures.

Financial support

The attendance of the Blended Intensive Programme may be covered by an ERASMUS+ SMS Short Mobility Grant for all mobile students (excluding students from the hosting University). This financial support may only be guaranteed by the selected student's home University. The University of origin of each selected student is fully responsible for the management of the financial aspects of the mobilities in accordance with the provisions of the competent ERASMUS+ National Agency.

No financial support is foreseen for host institution students as they will not be traveling for the purposes of participation in this program (non-mobile participants).

Please refer to your local coordinator or Erasmus/International Relations Office for any further information related to the financial support made available.

[Other Events \(/en/events-art/other-events-art\)](/en/events-art/other-events-art)

[Scientific Communications \(/en/events-art/scientific-communications-art\)](/en/events-art/scientific-communications-art)

[Conferences \(/en/events-art/conferences-art\)](/en/events-art/conferences-art)

[Domenii de doctorat \(/en/evenimente-2/eugreen-bip-menu/2-uncategorised/385-domenii-de-doctorat\)](/en/evenimente-2/eugreen-bip-menu/2-uncategorised/385-domenii-de-doctorat)

Contact UO

Pentru a fi student, masterand sau doctorand, primul pas este să ne contactați. Cu cât mai electronic, cu atât mai bine.



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Title of the BIP

Introduction to Mathematical and Computational Modelling for Sustainability

Virtual Period start:6th May 2024**Virtual Period end:**21st June 2024**In-presence Period start:**24th June 2024**In-presence Period end:**28th June 2024**Language of teaching:**

English B1

Hosting UniversityUniversity of Oradea (ROMANIA)**ECTS credits:**

6

Number of participants:

TBA

Study level required:

Masters or Doctoral level applicants.

Selection criteria:

TBA

Contacts:Prof. Radu Cătălin Țarcă (University of Oradea)**Programme description**

This 6-ECTS BIP will introduce mathematical and computational modelling techniques for application in developing understanding and supporting sustainable decision making in health, environmental, societal, and industrial systems. The programme is designed for students at the Masters or Doctoral level who wish to develop these skills for application in research projects aligned to the EU Green research themes.

This programme prioritizes high-level strategic thinking in the design and analysis of modelling paradigms and how they can be applied for effective decision making. Interpersonal skills together with technical skills are central to the learning outcomes.

Aims:

- Develop familiarity with fundamental approaches to mathematical and computational modelling methods, techniques, and tools, including Differential Equations, Machine Learning/AI, Finite difference/element/volume method, Cellular Automata and Optimization Algorithms.
- Develop awareness of which methods may be suitable for different types of research problems along with the potential benefits, challenges, and limitations of each approach.
- Develop skills in application of these methods to real-world multidisciplinary research problems aligned to the EU Green themes – Develop student transferable skills in group working and communication.
- Help to create a culture of international and cross-disciplined collaboration in postgraduate research at the EU Green institutions.

Postgraduate students will develop skills in translating broad-ranging real-world problems in a mathematical/computational framework and be familiar with fundamental tools in analyzing models for problem solving, particularly in the context of sustainability. Students can be from any discipline but should normally have completed at least 5 ECTS relevant to Mathematics/Statistics at undergraduate level.

The programme will focus on familiarity with different methods, their potential applications and their limitations and will enable students to select specific topics for further in-depth study. The programme will consist of 9 x 2hr online weekly sessions and a week-long in-person summer school at the University of Oradea. The teaching will be delivered by different academic staff from ATU, HiG, Oradea, Evora and Angers. The summer school will comprise hands-on workshops, student presentations, and participation in a group project as well as social/networking opportunities. Students will select an individual project related to their own research domain with support from the academic staff.

The project should typically comprise either:

- a high-level review of modelling relevant to the student's research topic or
- some preliminary modelling work relevant to the student's research topic.

FOR MORE INFO CLICK [HERE](#)
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