

## Endogenic geohazards

### Educational subject description sheet

#### Basic information

<b>Study programme</b> Geohazards and Climate Change <b>Speciality</b> - <b>Organizational unit</b> Faculty of Geographical and Geological Sciences <b>Study level</b> Second-cycle programme <b>Study form</b> Full-time <b>Education profile</b> General academic		<b>Didactic cycle</b> 2024/25 <b>Subject code</b> 07GCCS.21P.02850.24 <b>Lecture languages</b> English <b>Course type</b> Obligatory <b>Block</b> Basic subjects
<b>Subject coordinator</b>	Wojciech Stawikowski	
<b>Lecturer</b>	Wojciech Stawikowski	
<b>Period</b> Semester 1	<b>Activities and hours</b> <ul style="list-style-type: none"> <li>• Lecture: 15, Exam</li> <li>• Laboratories: 15, Graded credit</li> </ul>	<b>Number of ECTS points</b> 4

#### Goals

Code	Goal
C1	Transferring the knowledge about endogenic geohazards with the reference to geodynamic processes occurring in the Earth. Description and explanation of the endogenic geohazards and their impact on humans and their activity.
C2	Developing the knowledge and skills related to the analysis of specific types of endogenic geohazards.
C3	Presenting the recent state of knowledge about the mitigation, monitoring and avoidance of endogenic geohazards.

## Entry requirements

Basic knowledge in the Earth sciences.

## Subject learning outcomes

Code	Outcomes in terms of	Learning outcomes	Examination methods
<b>Knowledge - Student:</b>			
W1	understands the geodynamic background of the processes related to generation of endogenic geohazards;	GCC_K2_W01	Written exam
W2	knows the reasons, mechanisms and characteristics of endogenic geohazards and describes classical examples of the related events from historic and modern times;	GCC_K2_W03	Written exam, Multimedia presentation, Assessment of tasks
W3	knows the modern methods of studying, monitoring and analysing endogenic geohazards, as well as the ways of preventing the risks and minimising the disastrous effects connected with them;	GCC_K2_W11	Written exam, Multimedia presentation
W4	understands the interplay between the endogenic geologic hazards and surface geohazards, as well as scale of human impact on occurrence of specific endogenic geohazards.	GCC_K2_W01	Written exam
<b>Skills - Student:</b>			
U1	analyzes the endogenic processes standing behind the development of geohazards;	GCC_K2_U03, GCC_K2_U14	Assessment of tasks
U2	describes the methods connected with mitigation of different types of endogenic geohazards, and to analyse the effects of application of these methods;	GCC_K2_U16	Written exam, Multimedia presentation
U3	analyzes the cases of events related to specific types of endogenic geohazards based on scientific literature and data analysis;	GCC_K2_U03, GCC_K2_U07	Multimedia presentation, Assessment of tasks
U4	draws conclusions and competently presents knowledge related to occurrence of phenomena connected with endogenic geohazards and their impact on humans.	GCC_K2_U03, GCC_K2_U16	Multimedia presentation, Assessment of tasks
<b>Social competences - Student:</b>			
K1	is conscious of significance of detailed and continuous research and technological efforts related to understanding of endogenic geohazards and their mitigation, with reference to the specificity of given regions on the globe;	GCC_K2_K02	Multimedia presentation, Assessment of tasks
K2	appreciates the importance of the appropriate, thorough selection of topical and reliable sources knowledge and information in studying the role of geohazards and their mitigation in modern society.	GCC_K2_K04	Written exam, Multimedia presentation

## Study content

No.	Course content	Subject learning outcomes	Activities
1.	Geodynamic processes in the solid Earth incl. plate tectonics as a framework for understanding endogenic geological hazards.	W1	Lecture
2.	Overview of the endogenic geohazards (their types) with reference to tectonic and magmatic processes.	W1, W2	Lecture
3.	Earthquake hazards – their reasons, mechanisms, diversity, related processes. Global and regional distribution of earthquakes. Examples of catastrophic earthquakes and their effects in historic and modern times.	W2, U1, U3	Lecture, Laboratories
4.	Consequences of earthquakes for humans, their infrastructure and activity. Mitigation of the earthquake hazards: their monitoring and forecasting. Prevention/minimizing of earthquake-based damages for human society and its material wealth (constructions, infrastructure).	W3, U2, K1	Lecture, Laboratories
5.	Volcanic hazards – their reasons, mechanisms, diversity, related processes. Global and regional distribution of volcanic eruptions. Examples of catastrophic volcanic eruptions and their effects in historic and modern times.	W2, U1, U3	Lecture, Laboratories
6.	Consequences of volcanic events for humans, their infrastructure and activity. Mitigation of the volcanic hazards: their monitoring and prediction. Prevention/minimizing of volcanism-based damages for human society and its material wealth (constructions, infrastructure).	W3, U2, K1	Lecture, Laboratories
7.	Isostatic movements – their reasons, mechanisms, related processes. Examples of isostatic processes and their impact on human environment and activity.	W1, W2	Lecture
8.	Interactions between the endogenic geohazards and surface geohazards. Role of the underground geological hazards on generation of exogenic hazardous processes (like landslides, mud flows, tsunamis, air and water pollution, temporal weather anomalies etc.).	W4, U3	Lecture, Laboratories
9.	Impact of human activity (anthropogenic phenomena) on the potential occurrence and characteristics of endogenic geohazards.	W4, U3, K1	Lecture, Laboratories
10.	Significance of development in the multidisciplinary studies of endogenic geological processes and related geohazards for the modern and future society. Overview of modern methods and techniques involved in monitoring of endogenic geohazards and their mitigation.	W4, U4, K1, K2	Lecture, Laboratories

### Additional information

Activities	Teaching and learning methods and activities
Lecture	Lecture with a multimedia presentation of selected issues
Laboratories	Discussion, Work with text, Solving tasks (e.g. computational, artistic, practical)

Activities	Credit conditions
Lecture	<p>Passing the exam with positive grade in the first or the second attempt.</p> <p>Grading scale:</p> <ol style="list-style-type: none"> <li>1. very good (5.0) - from 90% of points,</li> <li>2. good plus (4.5) - from 80% of points,</li> <li>3. good (4.0) - from 70% of points,</li> <li>4. sufficient plus (3.5) - from 60% of points,</li> <li>5. satisfactory (3.0) - from 50% of points,</li> <li>6. unsatisfactory (2.0) - below 50% of points</li> </ol>
Laboratories	<p>Participation in the classes: presence at least 80% of the laboratories is required, (the documented medical leave will be respected as justification for bigger absence).</p> <p>The summary grades includes proportionally:</p> <ul style="list-style-type: none"> <li>- assessment of tasks made by a student - 65% of the grade from laboratories</li> <li>- multimedia presentation prepared by a student - 35% of the grade from laboratories</li> </ul> <p>Grading scale:</p> <ol style="list-style-type: none"> <li>1. very good (5.0) - from 90% of points,</li> <li>2. good plus (4.5) - from 80% of points,</li> <li>3. good (4.0) - from 70% of points,</li> <li>4. sufficient plus (3.5) - from 60% of points,</li> <li>5. satisfactory (3.0) - from 50% of points,</li> <li>6. unsatisfactory (2.0) - below 50% of points</li> </ol>

## Literature

### Obligatory

1. McCall G.J.H., Laming D.J.C., Scott S.C. (ed.) (1992) – Geohazards: natural and man-made. 227 p., Springer.
2. Bolt B.A. ; Horn W.L.; MacDonald G.A; Scott R.F. (ed.) (1982) – Geological Hazards: Earthquakes - Tsunamis - Volcanoes - Avalanches - Landslides - Floods. 332 p. Springer.

### Optional

1. Ramkumar M., (ed.) (2009) – Geological Hazards: Causes, Consequences and Methods of Containment. 328 p., New India Publishing Agency.
2. Graniczny M, Włodzimierz Mizerski W. (2017) – Geohazards. (in Polish), 338 p., Polish Scientific Publishers PWN
3. Moores E.M., Twiss, R.J., (2014) Tectonics. 415 p., Waveland Press
4. Anon. (2017) Volcanic Eruptions and Their Repose, Unrest, Precursors, and Timing. 134 p. National Academies Press
5. Selected papers from scientific journals indicated by a teacher.

## Calculation of ECTS points

Activities	Activity hours*
Lecture	15
Laboratories	15
Preparation for classes	15
Preparation of a multimedia presentation	10
Reading the indicated literature	15
Preparation for the exam	15

Other	15
<b>Student workload</b>	<b>Hours</b> 100
<b>Number of ECTS points</b>	<b>ECTS</b> 4

\* academic hour = 45 minutes

## Efekty uczenia się dla kierunku

Kod	Treść
GCC_K2_K02	The graduate is ready to identify the influence of environmental processes onto the socio-economic processes, and also influence of anthropogenic activities onto the various components of the natural environment in various timescales
GCC_K2_K04	The graduate is ready to use reliable sources of information associated with environmental hazards and climate and critical assessments of these sources
GCC_K2_U03	The graduate can conclude based on the data and information from various sources and geographical and environmental information
GCC_K2_U07	The graduate can look for and select the necessary information from the scientific literature and other written sources and based on that learn and continuously update the knowledge throughout the life
GCC_K2_U14	The graduate can describe in extended degree environmental components and their relationships
GCC_K2_U16	The graduate can transparently and accessibly present the Earth and environmental sciences topics
GCC_K2_W01	The graduate knows and understands thoroughly, the processes operating in the natural environment, their causes, mechanisms, consequences and associated geohazards
GCC_K2_W03	The graduate knows and understands thoroughly, endogenic processes, anthropogenic influence on endogenic processes and following from them geohazards
GCC_K2_W11	The graduate knows and understands advanced laboratory methods and techniques used in the research on the elements of the environment and the environmental processes