Wrocław University of Science and Technology
Doctoral School

# COURSE CARD

## 1. Basic information

| | | |
|---|---|---|
| Course name in English: | Geodynamics - Selected Issues | |
| Course name in Polish: | Geodynamika - wybrane zagadnienia | |
| Number of hours: | 15 | |
| Type of course: | Elective course | |
| Form of course: | lecture | |
| Code of course: | | |
| Course leader: | Jurand Wojewoda, DSc, PhD, Prof@WUST | |
| Faculty of the course leader: | W6 Faculty of Geoengineering, Mining and Geology | |
| Email address of the course leader: | jurand.wojewoda@pwr.edu.pl | |
| Scientific discipline(s) assigned to the course (doctoral students representing the marked disciplines can participate in the course): | Architecture and urban planning | ☐ |
| | Automation, electronic, electrical engineering and space technologies | ☐ |
| | Information and communication technology | ☐ |
| | Biomedical engineering | ☐ |
| | Chemical engineering | ☐ |
| | Civil engineering, geodesy and transport | ☒ |
| | Materials engineering | ☐ |
| | Mechanical engineering | ☐ |
| | Environmental engineering, mining, and energy | ☒ |
| | Mathematics | ☐ |
| | Chemical sciences | ☐ |
| | Physical sciences | ☒ |
| | Management and quality studies | ☐ |

## 2. Objectives

The lectures are aimed at familiarizing students with selected methods for assessing geokinematics and geodynamic activity of the lithosphere, in particular the area of Lower Silesia.

## 3. Content

*Detailed information about the course content, including topics and form of classes.*

| No. | Topic | Number of hours | Form of classes |
|---|---|---|---|
| 1 | **Introduction** - - what are **geostatics**, **geokinematics** and **geodynamics** (research subjects, research goals, conclusions and applications; methodological categorization - the physical, stochastic, phenomenological) | 3 | lecture |

| | | | |
|---|---|---|---|
| 2 | **Indicators of geokinematics and geodynamics** (geodetic, geological, archaeological and geomorphological) | 4 | lecture |
| 3 | **The global monitoring system of geodynamics** | 4 | lecture |
| 4 | **World geodynamic laboratories** - overview and research specialization. Tasks of the Geodynamic Laboratory of the Space Research Center of the Polish Academy of Sciences in the Książ Castle - instruments, measurement results and regional, as well as supra-regional applications | 4 | lecture |

## 4. Prerequisites

*List of prerequisites relating to knowledge, skills and other competences for course participants.*

Basic knowledge in the field of geology, geography and physics/geophysics

## 5. Learning outcomes

*List of learning outcomes at level 8 of the Polish Qualifications Framework assigned to the course (mark the learning outcomes in the last column).*

| Symbol | Learning outcome | |
|---|---|---|
| | *KNOWLEDGE. Doctoral student knows and understands:* | |
| SzD_W3 | the main trends in the development of the scientific or artistic disciplines covered in the curricula; | ☒ |
| SzD_W4 | research methodology; | ☒ |
| SzD_W5 | the rules for the dissemination of scientific results, including in open access mode; | ☒ |
| SzD_W6 | the fundamental dilemmas of modern civilization; | ☒ |
| SzD_W7 | the legal and ethical conditions of scientific activity; | ☒ |
| SzD_W8 | the economic and other relevant conditions of scientific activity; | ☒ |
| SzD_W9 | basic principles of knowledge transfer to the economic and social spheres and commercialisation of results of scientific activity and know-how related to these results. | ☒ |
| | *SKILLS. Doctoral student is able to:* | |
| SzD_U2 | use knowledge from different fields of science or art to creatively identify, formulate and innovatively solve complex problems or perform research tasks, in particular:<br>- define the purpose and subject of scientific research, formulate a research hypothesis,<br>- develop research methods, techniques and tools, and use them creatively,<br>- draw conclusions on the basis of scientific research;<br>critically analyse and evaluate the results of scientific research, expertise and other creative work and their contribution to knowledge development;<br>transfer the results of scientific activities to the economic and social spheres; | ☒ |

| | | |
|---|---|---|
| SzD_U3 | communicate on specialised topics to the extent that they enable an active participation in the international scientific community; | ☒ |
| SzD_U4 | disseminate research results, including in popular forms; | ☒ |
| SzD_U5 | initiate debates and participate in a scientific discourse; | ☐ |
| SzD_U6 | be able to speak a foreign language at B2 level of the Common European Framework of Reference for Languages to a level that enables them to participate in the international scientific and professional environment; | ☒ |
| SzD_U7 | plan and implement an individual or collective research or creative activity, including in an international environment; | ☐ |
| SzD_U8 | independently plan and act for one's own development and inspire and organize the development of others; | ☐ |
| SzD_U9 | plan classes or groups of classes and implement them using modern methods and tools. | ☒ |
| | *SOCIAL COMPETENCES. Doctoral student is ready to:* | |
| SzD_K3 | fulfilling the social obligations of researchers and creators, initiate public interest activities, thinking and acting in an entrepreneurial way; | ☒ |
| SzD_K4 | maintaining and developing the ethos of research and creative environments, including:<br>- carrying out scientific activities in an independent manner,<br>- respecting the principle of public ownership of research results, taking into account the principles of intellectual property protection. | ☐ |

## 6. Evaluation

*Short description of the method(s) used to evaluate the learning outcomes assigned to the course, e.g., exam, test, report, presentation, etc.*

Active participation in lectures and preparation of a short, summarizing report on classes

## 7. Teaching methods

*Short description of the teaching methods used during the course, e.g., multimedia presentation, discussion, literature studies, developing written documents, own work, etc.*

The lecturer presents richly illustrated topics and animations. Possible visit (personal or virtual) in the PAN Geodynamic Laboratory in Książ Castle

## 8. Literature

*List of primary and secondary literature used to prepare the course and including additional knowledge for participants, e.g., books, textbooks, research papers, standards, web pages, etc.*

Artiuszkow, E.W., 1979. Geodynamika. Wydawnictwo Nauka, Moskwa, 327 pp.

Dadlez, R., Jaroszewski, W., 1994. Tektonika. PWN, 743 pp.

Kaczorowski, M., Wojewoda, J., 2011. Neotectonic activity interpreted from a long water-tube tiltmeter record at the SRC geodynamic laboratory in Książ, Central Sudetes, SW Poland. Acta Geodynamica et Geomaterialia, 8, 3: 1- 13.

Pilqer, R., 2003. Geokinematics. Springer Verlag, 280 pp.

Schumm, S.A., Dumont, J.F. & Holbrook, J.M., 2006. Active Tectonics and Alluvial Rivers. Cambridge University Press, 290 pp. ISBN: 0521890586

Turcotte, D.L., Schubert, G., 1982. Geodynamics – Applicatons of Continuum Physics to Geological Problems. John Willey & Sons, New York, 450 pp.

## 9. Other remarks

*Additional remarks, comments, (e.g., language of the course)*

English