



Module name: Processing of Seismic Data

Academic year: 2015/2016 Code: BGF-2-105-AG-s ECTS credits: 4

Faculty of: Geology, Geophysics and Environmental Protection

Field of study: Geophysics Specialty: Applied Geophysics

Study level: Second-cycle studies Form and type of study: Full-time studies

Lecture language: English Profile of education: Academic (A) Semester: 1

Course homepage: —

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### Module summary

Student zna i potrafi zastosować zaawansowane procedury przetwarzania danych sejsmicznych oraz dobrać ich parametry.

### Description of learning outcomes for module

MLO code	Student after module completion has the knowledge/ knows how to/is able to	Connections with FLO	Method of learning outcomes verification (form of completion)
Social competence			
M_K001	Is ready to work wherever basic skills and knowledge of seismic processing are required, particularly in geophysical companies		Activity during classes, Execution of a project, Report, Oral answer, Participation in a discussion, Examination
Skills			
M_U001	Efficiently uses modern seismic processing programs		Execution of a project
M_U002	Can individually design and construct the basic seismic processing sequence.		Activity during classes, Execution of a project, Report
Knowledge			
M_W001	Has knowledge of modern geophysical techniques and specialized software		Activity during classes, Execution of a project, Oral answer, Examination

M_W002	Knows the methodology and specialized tools for processing of acquired data by using specialized computing tools		Activity during classes, Execution of a project, Oral answer, Report, Examination
M_W003	Understands the principles and methodology of the analysis of seismic data using specialized software		Activity during classes, Execution of a project, Oral answer, Report, Examination

## FLO matrix in relation to forms of classes

MLO code	Student after module completion has the knowledge/ knows how to/is able to	Form of classes										
		Lectures	Auditorium classes	Laboratory classes	Project classes	Conversation seminar	Seminar classes	Practical classes	Fieldwork classes	Workshops	Others	E-learning
Social competence												
M_K001	Is ready to work wherever basic skills and knowledge of seismic processing are required, particularly in geophysical companies	-	-	+	-	-	-	-	-	-	-	-
Skills												
M_U001	Efficiently uses modern seismic processing programs	-	-	+	-	-	-	-	-	-	-	-
M_U002	Can individually design and construct the basic seismic processing sequence.	-	-	+	-	-	-	-	-	-	-	-
Knowledge												
M_W001	Has knowledge of modern geophysical techniques and specialized software	-	-	+	-	-	-	-	-	-	-	-
M_W002	Knows the methodology and specialized tools for processing of acquired data by using specialized computing tools	-	-	+	-	-	-	-	-	-	-	-
M_W003	Understands the principles and methodology of the analysis of seismic data using specialized software	-	-	+	-	-	-	-	-	-	-	-

## Module content

### Laboratory classes

Processing of seismic data

Creation of the project and database in specialized program. Principles of seismic data processing system (processing sequence design, selection of parameters of individual procedures). Gain control procedures (AGC TAR) and data visualization. Interactive edition of seismic traces. Interactive spectral analysis. First breaks picking with use of crosscorrelation or neural networks. Field and residual statics. Interactive velocity analysis. Horizontal stacking (seismic section). Noise suppression methods (eg. ground roll, multiples). Wavelet processing. Prestack or poststack migration.

Advanced seismic data processing procedures

Seismic migration – mathematical basis, types of migration.

Time-depth conversion.

Vertical Seismic Profiling – methodology, processing specificity.

AVO analysis – mathematical basis, processing specificity.

### **Method of calculating the final grade**

Arithmetic mean of the laboratory assessment and examination. Activity during classes and participation in discussions influence the final grade.

### **Prerequisites and additional requirements**

Completed course of Seismic Methods II.

### **Recommended literature and teaching resources**

1. Kasina Z., 1998 – Metodyka badań sejsmicznych. Wydawnictwo Centrum PPGSMiE PAN, Kraków.
2. Kasina Z., 1998 – Przetwarzanie sejsmiczne. Wydawnictwo Centrum PPGSMiE PAN, Kraków.
3. Kasina Z., 2005 – Interaktywne przetwarzanie danych sejsmicznych w systemie ProMAX. Wydawnictwa AGH, Kraków.
4. Kasina Z., 2009 – Teoria sygnału sejsmicznego. Wydawnictwa AGH, Kraków.
5. Raś G., 2013. Sejsmika morska. Akwizycja i nawigacja sejsmiczna. Wydawnictwo LIBRON, Kraków
6. Yilmaz O., 1987 – Seismic Data Processing. Seg, Tulsa.

### **Scientific publications of module course instructors related to the topic of the module**

Additional scientific publications not specified

### **Additional information**

None

**Student workload (ECTS credits balance)**

Student activity form	Student workload
Participation in laboratory classes	56 h
Preparation of a report, presentation, written work, etc.	10 h
Completion of a project	15 h
Examination or Final test	15 h
Contact hours	10 h
Summary student workload	106 h
Module ECTS credits	4 ECTS