

**AGH**AGH UNIVERSITY OF SCIENCE
AND TECHNOLOGY

Module name: Statistical modeling and data analysis in scientific research

Academic year: 2019/2020 Code: ZSDA-3-0150-s ECTS credits: 4

Faculty of: Szkoła Doktorska AGH

Field of study: Szkoła Doktorska AGH Specjalty: —

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

Lecture language: English Profile of education: Academic (A) Semester: 0

Course homepage: —

Responsible teacher: prof. nadzw. dr hab. inż. Saramak Daniel (dsaramak@agh.edu.pl)

Module summary

Student nabędzie wiedzę i umiejętności w zakresie wykorzystanie technik i programów komputerowych do analizy danych przemysłowych oraz modelowanie operacji technologicznych w górnictwie i przeróbce surowców mineralnych. Student nabędzie umiejętności tworzenia raportów produkcyjnych związanych z oceną efektywnością przebiegu procesu przemysłowego oraz eksploracji danych.

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: is able to			
M_K001	PhD Student is aware of the need of statistical description and modeling of mining and mineral processing, aiming at better understanding of analysed problems	SDA3A_K01, SDA3A_K03	Activity during classes
Skills: he can			
M_U001	PhD Student is able to run statistical analysis of the problem on the basis of empirical process data	SDA3A_U03, SDA3A_U01	Execution of laboratory classes, Execution of a project, Activity during classes
Knowledge: he knows and understands			
M_W001	PhD Students gain knowledge related to process data analysis	SDA3A_W03, SDA3A_W01	Activity during classes
M_W002	PhD Students know techniques of mining and mineral processing modeling	SDA3A_W03	Activity during classes

Number of hours for each form of classes

Suma	Form of classes										
	Lectures	Auditorium classes	Laboratory classes	Project classes	Conversation seminar	Seminar classes	Practical classes	Fieldwork classes	Workshops	Prace kontrolne i przejściowe	Lektorat
60	30	0	15	15	0	0	0	0	0	0	0

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	Prace kontrolne i przejściowe	Lektorat
Social competence: is able to												
M_K001	PhD Student is aware of the need of statistical description and modeling of mining and mineral processing, aiming at better understanding of analysed problems	+	-	+	-	-	-	-	-	-	-	-
Skills: he can												
M_U001	PhD Student is able to run statistical analysis of the problem on the basis of empirical process data	-	-	+	+	-	-	-	-	-	-	-
Knowledge: he knows and understands												
M_W001	PhD Students gain knowledge related to process data analysis	+	-	-	-	-	-	-	-	-	-	-
M_W002	PhD Students know techniques of mining and mineral processing modeling	+	-	+	+	-	-	-	-	-	-	-

Student workload (ECTS credits balance)

Student activity form	Student workload
Udział w zajęciach dydaktycznych/praktyka	60 h
Preparation for classes	20 h
przygotowanie projektu, prezentacji, pracy pisemnej, sprawozdania	10 h
Realization of independently performed tasks	10 h
Examination or Final test	2 h
Contact hours	1 h
Summary student workload	103 h
Module ECTS credits	4 ECTS

Additional information

Module content

Lectures

- Descriptive statistics used in analysis of process data.
- Data mining
- Statistical models of process run
- Contemporary models and trends in mineral processing and mining modelling
- economic and technological assessment of models

Laboratory classes

During laboratory classes PhD Students undergo practical analyse, application and development of issues and topics given on lectures.

Project classes

Practical projects based on individual research area of PhD Students and issues presented during lectures

Teaching methods and techniques:

Lectures: Nie określono

Laboratory classes: Nie określono

Project classes: Nie określono

Warunki i sposób zaliczenia poszczególnych form zajęć, w tym zasady zaliczeń poprawkowych, a także warunki dopuszczenia do egzaminu:

Final mark from project: on the basis of prepared statistical analysis of given problem. In case of unsuccessful score it is possible to provide another analysis or to improve the one assessed as negative.
Final mark from lectures: on the basis of PhD Student activity. In case of problems with obtaining a positive score, PhD student is obliged to pass a short test related to issues presented during lectures.

Zasady udziału w poszczególnych zajęciach, ze wskazaniem, czy obecność studenta na zajęciach jest obowiązkowa:

Lectures:

- Attendance is mandatory: Yes
- Participation rules in classes: Nie określono

Laboratory classes:

- Attendance is mandatory: Yes
- Participation rules in classes: Nie określono

Project classes:

- Attendance is mandatory: Yes
- Participation rules in classes: Nie określono

Method of calculating the final grade

Final mark: arithmetic value of mark from project, laboratory classes and lectures.

Sposób i tryb wyrównywania zaległości powstałych wskutek nieobecności studenta na zajęciach:

Self-study of missed topic(s)

Prerequisites and additional requirements

Basic knowledge of statistics

Recommended literature and teaching resources

1. Sobczyk: Statystyka, PWN Warszawa, 2005
2. Krysicki i in.: Rachunek prawdopodobieństwa i statystyka matematyczna w zadaniach, cz.2
3. Greń: Statystyka matematyczna, modele i zadania. PWN, 1974

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

1. Tumiadajski T., Saramak D.: Metody i modele statystyki matematycznej w przeróbce mineralnych, Wydawnictwo AGH, 2009.
2. Foszcz D., Saramak D., Tumiadajski T., Niedoba T., Gawenda T.: Możliwości poprawy dokładności aproksymacji krzywych składu materiałów uziarnionych, Possibilities of adjusting the adequacy of grained materials particle size distribution approximation, Górnictwo i Geoinżynieria Akademia Górniczo-Hutnicza im. Stanisława Staszica, Kraków; ISSN 1732-6702. Tyt. poprz.: Górnictwo (Kraków). 2010 R. 34 z. 4/1 s. 37-47
3. Tumiadajski T., Foszcz D., Jamróz D., Niedoba T., Saramak D.: Niestandardowe metody statystyczne i obliczeniowe w opisie procesów przeróbki surowców mineralnych, (Non classical statistical and calculation methods in mineral processing description). Instytut Gospodarki Surowcami Mineralnymi i Energią Polskiej Akademii Nauk., Kraków: Wydawnictwo IGSMiE PAN, 2009. 125 s.. ISBN 978-83-60195-62-

Additional information

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