Program studiów

Kierunek: Remote Sensing and Geo Informatics

Spis treści

Charakterystyka kierunku

Informacje podstawowe

Nazwa wydziału:	Wydział Geodezji Górniczej i Inżynierii Środowiska
Nazwa kierunku:	Remote Sensing and Geo Informatics
Poziom:	Studia magisterskie II stopnia
Profil:	Ogólnoakademicki
Forma:	Stacjonarne
Klasyfikacja ISCED:	0788
Liczba punktów ECTS konieczna do ukończenia studiów na danym poziomie:	120
Tytuł zawodowy nadawany absolwentom:	magister
Termin rozpoczęcia cyklu:	2024/2025, semestr zimowy
Czas trwania studiów (liczba semestrów):	4

Dziedzina/-y nauki, do której/-ych przyporządkowany jest kierunek studiów:

Dziedzina nauk inżynieryjno-technicznych

Dyscyplina/-y naukowa/-e, do której/-ych przyporządkowany jest kierunek studiów:

Dyscyplina	Udział procentowy	ECTS
Inżynieria lądowa, geodezja i transport	100%	120

Wskazanie związku kierunku studiów ze strategią rozwoju AGH oraz misją AGH

The new faculty is in line with the strategic goals and mission of AGH, in particular in terms of education point: 3. broadening the educational offer, in particular:

- increasing the flexibility of the forms of studying, especially for the best students - a modular and block approach along the lines of short courses has been proposed,
- launching new majors and specializations with curricula adapted to the changing expectations of the labour market, also thanks to the cooperation with employers
- a new major in English has been proposed meeting the expectations of the market in the field of all-round remote sensing, which is in line with state initiatives e.g. the creation of the Polish Space Agency and various centres in this field,
- introduction of new subjects taught by eminent scientists from Poland and abroad, as well as specialists from industry, business and administration, improvement of the educational offer in foreign languages
- the specialisation is in English
- development of education through the use of new technologies, including teaching via the Internet (e-learning), a large part of classes is on-line, which made it possible to concentrate classes to 5 weeks in a semester.

Informacja na temat uwzględnienia w programie studiów potrzeb społeczno-gospodarczych oraz zgodności zakładanych efektów uczenia się z tymi potrzebami

Socio-economic demand for graduates in this specialisation is high. This is evidenced by the high activity of various centres around the world and in Poland in developing web-based solutions using ESA satellite imagery, mainly Sentinel (Sentinel-hub Playground, esa-sen4cap, Copernicus DIAS (CREODIAS, mundi, sobloo, Wekeo, ONDA), Landsat App, CENAGIS and others).

Ścieżki kształcenia - zakres w języku polskim oraz w języku angielskim

Not applicable.

Ścieżki dyplomowania - zakres w języku polskim oraz w języku angielskim

Not applicable.

Nazwy specjalności w języku polskim oraz w języku angielskim

Nazwa [pl]	Nazwa [en]

Ogólne informacje o programie studiów

Kierunek: Remote Sensing and Geo Informatics

Ogólne informacje związane z programem studiów (ogólne cele kształcenia oraz możliwości zatrudnienia, typowe miejsca pracy i możliwości kontynuacji kształcenia przez absolwentów)

The course is available in English at Master's degree II and lasts 4 semesters. Recruitment is possible after the first engineering degree or after the bachelor's degree. Classes are scheduled in blocks, i.e. they are clustered thematically and time-wise. There are 5 blocks of classes scheduled each semester lasting 5 days each. There are two modules in the first semester. The first module, the initial 2.5 blocks, covers issues related to remote sensing Earth observation (Earth observation and Geoinformation Science). Within the module, students will gain an in-depth knowledge of remote sensing in the optical, thermal and radar domains. Topics covered in the module include: methods of acquiring and processing remote sensing data from satellite, airborne, unmanned aerial vehicles (BSPs) and via ground-based measurements. The second module, the next 2.5 blocks, covers programming issues (Python for remote sensing). Within the module, students will systematise, deepen their knowledge and skills in the use of the Python language in the broad field of GeoScience.

In semester two there are 4 modules also clustered into two blocks. First block, 2 modules: time series analysis (Time series analysis) and machine learning, applications of mathematics (Machine Learning, applications of mathematics). The second block, comprises 2 modules: data science for smart environment, fundamentals of negotiation (Data Science for Smart Environment,) and geo-information tools (Geo-information Tools).

Semester three consists of two modules delivered in two blocks. Students will acquire knowledge and skills in: natural hazards and disaster risk reduction (Natural hazards and disaster risk reduction) and urban planning and environmental management, basics of negotiations (Urban planning and environmental management, basics of negotiations).

The final semester is devoted to the preparation of the master's thesis.

Semesters 1, 2 and 3 have a separate unit: the project, in which the student carries out a larger individual task thematically related to the modules in the semester.

The project is given credit by examination.

In semesters 1 and 3 there is an optional course (from UBO or selected from the range of optional courses available at WGGiIŚ). The course is designed according to the idea of short courses that can be taken separately or assembled into a larger whole (e.g. master's degree, postgraduate studies). This allows for a modular nature, block classes and a large proportion of hours provided for remote consultations. The specialisation is open to both undergraduates and engineers and is taught in English, which broadens the group of interested students.

Informacja na temat uwzględnienia w programie studiów wniosków z analizy wyników monitoringu karier zawodowych studentów i absolwentów

During the development of the study programme, the conclusions from the analysis of the results of the monitoring of careers of the "Geodesy and cartography" faculty contained in the report entitled "Career fate of AGH graduates 2013 three years after graduation" were used.

"Professional fate of AGH 2013 graduates three years after graduation AGH University of Science and Technology St. Staszic in Kraków Full-time second-cycle studies - November 2016", made by the AGH Career Centre, as well as individual knowledge of the faculty staff on the basis of maintained contacts with graduates.

Informacja na temat uwzględnienia w programie studiów wymagań i zaleceń komisji akredytacyjnych, w szczególności Polskiej Komisji Akredytacyjnej i środowiskowych komisji akredytacyjnych

The faculty has not yet been accredited. Accreditation at the Faculty of GCC was conducted in 2014 (accreditation of the GCC faculty) and 2016 (institutional accreditation). In both cases, the faculty received a positive assessment. The positive assessment is valid until the academic year 2022/2023.

Informacja na temat uwzględnienia w programie studiów przykładów dobrych praktyk

The design of the curriculum for the course "Remote Sensing and Geo Informatics" took into account good practices of universities educating in a similar field in the world (e.g. University of Twente or Wageningen Univeristy

https://www.utwente.nl/.uc/fca6a749701030fc63500febec4049b4bd62e1def838b00/master-of-science-geo-information-scien c e - a n d - e a r t h - o b s e r v a t i o n . p d f   ; https://www.wur.nl/en/education-programmes/master/msc-programmes/msc-geo-information-science/programme-of-geo-info rmation-science.htm).

The concept of short courses was used, which consists of clustering contact classes at AGH in the form of remote classes. http://www.explore.agh.edu.pl/availablecourses.html This should make the course significantly more attractive.

Informacja na temat współdziałania w zakresie przygotowania programu studiów z interesariuszami zewnętrznymi, w szczególności stowarzyszeniami i organizacjami zawodowymi, społecznymi

A number of graduates and employees of the Faculty are members of Management Boards or Supervisory Boards, co-owners of firms or enterprises, start-ups, which allows them to follow the development trends of the industry and know its problems.

Employees of companies are often invited to the Faculty to give lectures or specialised talks for students, in order to show them not only modern technologies, but also the problems of everyday operation of companies in this industry.

Wymiar, zasady i forma odbywania praktyk zawodowych

Not applicable.

Warunki rekrutacji na studia

Kierunek: Remote Sensing and Geo Informatics

Opis kompetencji oczekiwanych od kandydata ubiegającego się o przyjęcie na studia

The prospective student should have competence in mathematics, finance or computer science at a good level.

Warunki rekrutacji, z uwzględnieniem laureatów oraz finalistów olimpiad stopnia centralnego, a także laureatów konkursów międzynarodowych oraz ogólnopolskich

The rules and conditions of recruitment are set out in Resolution No. 62/2022 of the AGH Senate of May 25, 2022 on the conditions, procedure and date of commencement and completion of recruitment for the first year of first- and second-cycle studies starting the academic year 2023/2024. The entrance exam is mandatory.

Przewidywany limit przyjęć na studia wraz ze wskazaniem minimalnej liczby osób przyjętych, warunkującej uruchomienie edycji studiów

Minimum number of students: 15

Maximum number of students: 30

Efekty uczenia się

Kierunek : Remote Sensing and Geo Informatics

Wiedza

Symbol KEU	Kierunkowe efekty uczenia się	Symbol CEU
RSGI2A_W01	has a deep knowledge of mathematics in remote sensing data analysis	P7S_WG_A
RSGI2A_W02	has an enhanced knowledge of physics necessary to understand the interaction of electromagnetic radiation in the atmosphere and with the Earth's surface	P7S_WG_A
RSGI2A_W03	has a deep understanding of remote environmental data acquisition methods	P7S_WG_A
RSGI2A_W04	has a deep understanding of methods, algorithms and automation of spatial data processing	P7S_WG_A
RSGI2A_W05	has an enhanced knowledge of the use of computer science in geoscience	P7S_WG_A
RSGI2A_W06	knows selected social, economic and legal aspects of the geo-information society	P7S_WK_A
RSGI2A_W07	knows the basic concepts and principles of intellectual property protection, copyright and patent information resources	P7S_WK_A

Umiejętności

Symbol KEU	Kierunkowe efekty uczenia się	Symbol CEU
RSGI2A_U01	can apply knowledge of mathematics and physics to analyze geospatial data	P7S_UW_A
RSGI2A_U02	can acquire remote environmental data	P7S_UW_A
RSGI2A_U03	is able to process geospatial data and automate data processing in an advanced manner	P7S_UW_A
RSGI2A_U04	is able to use IT tools for spatial data processing	P7S_UW_A
RSGI2A_U05	can work both individually and in teams; can prepare a proposal for a research project	P7S_UU_A, P7S_UO_A, P7S_UK_A
RSGI2A_U06	is able to communicate on specialist topics in the field of remote sensing and geoscience with a diverse audience; Student can use a foreign language at the B2 + level of the European System for the Description of Languages and specialist and proper Terminology	P7S_UK_A

Kompetencje społeczne

Symbol KEU	Kierunkowe efekty uczenia się	Symbol CEU
RSGI2A_K01	is ready to resolve conflicts, negotiate, work in a team	P7S_KO_A, P7S_KK_A, P7S_KR_A
RSGI2A_K02	is ready for creative time management, working under time pressure	P7S_KO_A, P7S_KK_A, P7S_KR_A

Symbol KEU	Kierunkowe efekty uczenia się	Symbol CEU
RSGI2A_K03	maintain an ethical attitude while performing and presenting the results of assigned tasks	P7S_KO_A, P7S_KK_A, P7S_KR_A

Symbol KEU	Kierunkowe efekty uczenia się	Symbol CEU
		P7S_KO_A, P7S_KK_A, P7S_KR_A

Matryca pokrycia efektów kierunkowych

Kierunek: Remote Sensing and Geo Informatics

2024/2025/S/II/GGiIS/RSGI/all

Przedmiot	Kod	Semestr	RSGI2A_W01	RSGI2A_W02	RSGI2A_W03	RSGI2A_W04	RSGI2A_W05	RSGI2A_W06	RSGI2A_W07	RSGI2A_U01	RSGI2A_U02	RSGI2A_U03	RSGI2A_U04	RSGI2A_U05	RSGI2A_U06	RSGI2A_K01	RSGI2A_K02	RSGI2A_K03
Earth Observation and Geoinformation Science	DRSGIS.II1P.638491401bfbd.24	1s		x	x	x				x	x	x	x		x	x	x	x
Python for Remote Sensing	DRSGIS.II1K.638491410ada8.24	1s				x	x					x	x			x		x
Transitional work on geo-informatics in remote sensing – individually selected issue solved under the supervision of a tutor	DRSGIS.II1K.63849141ede89.24	1s	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Time Series Analysis	DRSGIS.II2K.61d8360e0cfef.24	2s		x	x	x	x			x	x	x	x				x	
Machine Learning, Application of Mathematics	DRSGIS.II2P.63849144b7161.24	2s	x			x	x			x	x	x				x	x	
Data Science for Smart Environment	DRSGIS.II2K.6384914579b98.24	2s			x	x	x	x	x			x	x			x		x
Geo-information Tools	DRSGIS.II2K.63849146398d9.24	2s	x		x	x	x			x	x	x	x	x		x	x	x
Transitional work on machine learning in smart environment – individually selected issue solved under the supervision of a tutor	DRSGIS.II2K.63849146ecd47.24	2s	x		x	x	x	x	x	x	x	x					x	
Natural Hazards and Disaster Risk Reduction	DRSGIS.II4K.63849149651f2.24	3s	x			x	x			x	x	x				x	x	
Urban Planning and Environmental Management	DRSGIS.II4K.6384914a27632.24	3s	x		x	x						x	x			x	x	
Transitional work on geoscience in environmental management – individually selected issue solved under the supervision of a tutor	DRSGIS.II4K.6384914ae3c24.24	3s	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x
Diploma Thesis	DRSGIS.II8K.e53bc1ffec52171870fc55d1cec2fa6a.24	4s	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Przedmiot	Kod	Semestr	RSGI2A_W01	RSGI2A_W02	RSGI2A_W03	RSGI2A_W04	RSGI2A_W05	RSGI2A_W06	RSGI2A_W07	RSGI2A_U01	RSGI2A_U02	RSGI2A_U03	RSGI2A_U04	RSGI2A_U05	RSGI2A_U06	RSGI2A_K01	RSGI2A_K02	RSGI2A_K03
Suma (obowiązkowy):			8	5	9	12	10	5	5	5	9	12	12	5	3	10	10	7
Suma (fakultatywny):			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Suma:			8	5	9	12	10	5	5	5	9	12	12	5	3	10	10	7

Matryca charakterystyk efektów uczenia się w odniesieniu do modułów zajęć

Kierunek: Remote Sensing and Geo Informatics

2024/2025/S/II/GGiIS/RSGI/all

Przedmiot	Kod	Semestr	P7S_WG_A	P7S_WK_A	P7S_UW_A	P7S_UU_A	P7S_UO_A	P7S_UK_A	P7S_KO_A	P7S_KK_A	P7S_KR_A
Earth Observation and Geoinformation Science	DRSGIS.II1P.638491401bfbd.24	1s	x		x			x	x	x	x
Python for Remote Sensing	DRSGIS.II1K.638491410ada8.24	1s	x		x				x	x	x
Transitional work on geo-informatics in remote sensing – individually selected issue solved under the supervision of a tutor	DRSGIS.II1K.63849141ede89.24	1s	x	x	x	x	x	x	x	x	x
Time Series Analysis	DRSGIS.II2K.61d8360e0cfef.24	2s	x		x	x	x	x	x	x	x
Machine Learning, Application of Mathematics	DRSGIS.II2P.63849144b7161.24	2s	x		x				x	x	x
Data Science for Smart Environment	DRSGIS.II2K.6384914579b98.24	2s	x	x	x				x	x	x
Geo-information Tools	DRSGIS.II2K.63849146398d9.24	2s	x		x	x	x	x	x	x	x
Transitional work on machine learning in smart environment – individually selected issue solved under the supervision of a tutor	DRSGIS.II2K.63849146ecd47.24	2s	x	x	x				x	x	x
Natural Hazards and Disaster Risk Reduction	DRSGIS.II4K.63849149651f2.24	3s	x		x				x	x	x
Urban Planning and Environmental Management	DRSGIS.II4K.6384914a27632.24	3s	x		x				x	x	x
Transitional work on geoscience in environmental management – individually selected issue solved under the supervision of a tutor	DRSGIS.II4K.6384914ae3c24.24	3s	x	x	x	x	x	x	x	x	x
Diploma Thesis	DRSGIS.II8K.e53bc1ffec52171870fc55d1cec2fa6a.24	4s	x	x	x	x	x	x	x	x	x
Suma (obowiązkowy):			12	5	12	5	5	6	12	12	12
Suma (fakultatywny):			0	0	0	0	0	0	0	0	0

Przedmiot	Kod	Semestr	P7S_WG_A	P7S_WK_A	P7S_UW_A	P7S_UU_A	P7S_UO_A	P7S_UK_A	P7S_KO_A	P7S_KK_A	P7S_KR_A
Suma:			12	5	12	5	5	6	12	12	12

Matryca kierunkowych efektów uczenia się w odniesieniu do form zajęć i sposobu zaliczenia, które pozwalają na ich uzyskanie

Kierunek: Remote Sensing and Geo Informatics

2024/2025/S/II/GGiIS/RSGI/all

Nazwa modułu zajęć	Forma zajęć dydaktycznych	Sposób weryfikacji i oceny efektów uczenia się osiągniętych przez studenta w ramach poszczególnych form zajęć i dla całego modułu zajęć	Odniesienia do KEU
Earth Observation and Geoinformation Science	Wykład, Zajęcia warsztatowe	Egzamin, Aktywność na zajęciach, Udział w dyskusji, Sprawozdanie, Studium przypadków , Prezentacja	RSGI2A_W02, RSGI2A_W03, RSGI2A_W04, RSGI2A_U01, RSGI2A_U02, RSGI2A_U03, RSGI2A_U04, RSGI2A_U06, RSGI2A_K01, RSGI2A_K02, RSGI2A_K03
Python for Remote Sensing	Wykład, Zajęcia warsztatowe	Udział w dyskusji, Egzamin, Zaangażowanie w pracę zespołu	RSGI2A_W04, RSGI2A_W05, RSGI2A_U03, RSGI2A_U04, RSGI2A_K01, RSGI2A_K03
Transitional work on geo-informatics in remote sensing – individually selected issue solved under the supervision of a tutor	Prace kontrolne i przejściowe	Udział w dyskusji, Egzamin, Sprawozdanie, Studium przypadków , Zaangażowanie w pracę zespołu, Przygotowanie i przeprowadzenie badań	RSGI2A_W01, RSGI2A_W02, RSGI2A_W03, RSGI2A_W04, RSGI2A_W05, RSGI2A_W06, RSGI2A_W07, RSGI2A_U01, RSGI2A_U02, RSGI2A_U05, RSGI2A_U06, RSGI2A_U03, RSGI2A_U04, RSGI2A_K01, RSGI2A_K02, RSGI2A_K03
Time Series Analysis	Wykład, Zajęcia warsztatowe	Udział w dyskusji, Studium przypadków , Sprawozdanie, Zaangażowanie w pracę zespołu	RSGI2A_W02, RSGI2A_W03, RSGI2A_W04, RSGI2A_W05, RSGI2A_U02, RSGI2A_U03, RSGI2A_U04, RSGI2A_U05, RSGI2A_K02
Machine Learning, Application of Mathematics	Wykład, Zajęcia warsztatowe	Kolokwium, Aktywność na zajęciach, Udział w dyskusji, Projekt, Sprawozdanie	RSGI2A_W01, RSGI2A_W05, RSGI2A_W04, RSGI2A_U02, RSGI2A_U03, RSGI2A_U04, RSGI2A_K01, RSGI2A_K02
Data Science for Smart Environment	Wykład, Zajęcia warsztatowe	Udział w dyskusji, Studium przypadków , Sprawozdanie, Zaangażowanie w pracę zespołu	RSGI2A_W03, RSGI2A_W04, RSGI2A_W05, RSGI2A_W06, RSGI2A_W07, RSGI2A_U03, RSGI2A_U04, RSGI2A_K01, RSGI2A_K03
Geo-information Tools	Wykład, Zajęcia warsztatowe	Aktywność na zajęciach, Udział w dyskusji, Kolokwium, Studium przypadków	RSGI2A_W01, RSGI2A_W03, RSGI2A_W04, RSGI2A_W05, RSGI2A_U01, RSGI2A_U02, RSGI2A_U03, RSGI2A_U04, RSGI2A_U05, RSGI2A_K01, RSGI2A_K02, RSGI2A_K03

Matryca kierunkowych efektów uczenia się w odniesieniu do form zajęć i sposobu zaliczenia, które pozwalają na ich uzyskanie

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Nazwa modułu zajęć	Forma zajęć dydaktycznych	Sposób weryfikacji i oceny efektów uczenia się osiągniętych przez studenta w ramach poszczególnych form zajęć i dla całego modułu zajęć	Odniesienia do KEU
Transitional work on machine learning in smart environment – individually selected issue solved under the supervision of a tutor	Prace kontrolne i przejściowe	Udział w dyskusji, Egzamin, Sprawozdanie, Studium przypadków , Przygotowanie i przeprowadzenie badań	RSGI2A_W01, RSGI2A_W03, RSGI2A_W04, RSGI2A_W05, RSGI2A_W06, RSGI2A_W07, RSGI2A_U02, RSGI2A_U03, RSGI2A_U04, RSGI2A_K02
Natural Hazards and Disaster Risk Reduction	Wykład, Zajęcia warsztatowe	Kolokwium, Udział w dyskusji, Wykonanie projektu, Sprawozdanie	RSGI2A_W01, RSGI2A_W04, RSGI2A_W05, RSGI2A_U02, RSGI2A_U03, RSGI2A_U04, RSGI2A_K01, RSGI2A_K02
Urban Planning and Environmental Management	Wykład, Zajęcia warsztatowe	Kolokwium, Egzamin, Projekt, Przygotowanie i przeprowadzenie badań	RSGI2A_W01, RSGI2A_W04, RSGI2A_W03, RSGI2A_U04, RSGI2A_U03, RSGI2A_K02, RSGI2A_K01
Transitional work on geoscience in environmental management – individually selected issue solved under the supervision of a tutor	Prace kontrolne i przejściowe	Udział w dyskusji, Egzamin, Sprawozdanie, Studium przypadków , Zaangażowanie w pracę zespołu, Przygotowanie i przeprowadzenie badań	RSGI2A_W01, RSGI2A_W02, RSGI2A_W03, RSGI2A_W04, RSGI2A_W05, RSGI2A_W06, RSGI2A_W07, RSGI2A_U01, RSGI2A_U02, RSGI2A_U03, RSGI2A_U04, RSGI2A_U05, RSGI2A_K01, RSGI2A_K02, RSGI2A_K03
Diploma Thesis	Praca dyplomowa	Sprawozdanie z odbycia praktyki , Przygotowanie i przeprowadzenie badań	RSGI2A_W01, RSGI2A_W02, RSGI2A_W03, RSGI2A_W04, RSGI2A_W05, RSGI2A_W06, RSGI2A_W07, RSGI2A_U01, RSGI2A_U02, RSGI2A_U03, RSGI2A_U04, RSGI2A_U05, RSGI2A_U06, RSGI2A_K01, RSGI2A_K02, RSGI2A_K03

Matryca kierunkowych efektów uczenia się w odniesieniu do form zajęć i sposobu zaliczenia, które pozwalają na ich uzyskanie

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Szczegółowe zasady realizacji programu studiów ustalone przez dziekana wydziału (tzw. zasady studiowania)

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Zasady wpisu na kolejny semestr

The rules for entry into the next semester are governed by the Academic Regulations in force for the academic year. In order to obtain registration it is necessary to:

1. obtaining credit for all courses (learning modules) compulsory for the chosen field of study, educational profile included in the plan of that semester (year) of study.
2. obtain at least 30 ECTS credits, depending on the number of ECTS credits provided for in the study schedule for a given semester (year) of study.

Zasady wpisu na kolejny semestr studiów w ramach tzw. dopuszczalnego deficytu punktów ECTS

The rules for entry into the next semester with a deficit are regulated in the Academic Regulations. If the standard conditions for entry into the next semester are not met, it is possible to apply for entry into the next semester of study with a so-called acceptable total credit deficit.

The acceptable cumulative deficit of credits is 10 ECTS.

Dopuszczalny deficyt punktów ECTS

10

Organizacja zajęć w ramach tzw. bloków zajęć (tj. taka organizacja przedmiotów lub poszczególnych form zajęć, która zakłada odstępstwa od cykliczności prowadzenia zajęć w poszczególnych tygodniach w danym semestrze studiów)

The degree programme lasts four semesters. Programme content per semester contained in large modules. Classes are planned in blocks, i.e. they are clustered thematically and time-wise. Modules are completed one after the other. Study requires attendance at AGH for 25 days per semester (5 blocks of 5 days each).

Semestry kontrolne

2

Zasady odbywania studiów według indywidualnej organizacji studiów

There is no provision for an individual mode of study due to the English language of study.

Warunki realizacji praktyk zawodowych, w tym w szczególności system kontroli praktyk i ich zaliczania

Not applicable.

Zasady obieralności modułów zajęć

Students choose elective courses from the UBPO or from the course offerings in English. Students may also choose elective courses in Polish.

Zasady obieralności ścieżek kształcenia, ścieżek dyplomowania lub specjalności albo kwalifikacji na nie

Not applicable.

Warunki i wymagania związane z przygotowaniem projektów dyplomowych i prac dyplomowych oraz realizacją procesu dyplomowania

The graduation process involves the preparation of a diploma thesis (individual or team) and taking the diploma examination. The diploma examination includes:

1. presentation of the diploma thesis,
2. discussion of the thesis,
3. verification of the level of mastery of knowledge and skills in the field of study studied, the so-called master's exam.

Diploma thesis topics together with their supervisors and additional conditions for thesis realisation are approved by the Dean upon the proposal of the head of the department submitting a given topic. A list of thesis topics and their supervisors is made available to students one year before the diploma semester. Enrolment in a given topic takes place on an individual basis. The selection of a topic is a condition for the student's entry into the final year of study. Changing the topic of the thesis, changing the supervisor or submitting an additional topic is possible at the request of the supervisor with the written consent of the Dean. Resignation from the thesis supervisor shall be made in writing, stating the reasons for the resignation.

The scope and form of the thesis shall be agreed with the thesis supervisor. The thesis supervisor shall also determine the mode and timetable for the thesis to enable its timely completion. In the case of a team thesis, a detailed definition of each performer's contribution to the thesis is required. After completing the diploma thesis, receiving a positive mark for it from the thesis supervisor and passing all the subjects provided for in the study programme (obtaining a pass mark), students submit and register their thesis at the Dean's Office, after which the thesis is made available to a reviewer for review and a date is set for the thesis defence.

The thesis reviewer is appointed by the Dean of the Faculty. The reviewer may be a professor, postdoctoral researcher or doctor. It is recommended that if the supervisor of a thesis is a doctor, the reviewer of that thesis should be a professor or a postdoctoral doctor. Once the thesis has been registered, the supervisor and the reviewer prepare written evaluations of the thesis.

After obtaining a positive review of the thesis, the student takes the diploma exam at a designated date before a Commission appointed by the Dean of the Faculty.

Normally, the diploma examination commission consists of:

1. the Dean of the Faculty as chairperson or a person authorised by him/her, who may be an academic teacher with the title of professor or the degree of doctor habilitated,
2. the thesis supervisor,
3. the thesis reviewer.

The master's examination consists of answering at least two cross-cutting questions in the field of study, one of which is asked by the thesis supervisor and the other by the thesis reviewer. The general scope of the master's exam is made available to students at the latest in the semester preceding the graduation semester. When preparing it, the directional learning outcomes for the second-cycle studies in a given field of study and the modular learning outcomes resulting from the programme of a given specialisation shall be taken into account. The scope of this examination may also include basic knowledge for a given field of study resulting from the directional learning outcomes for first-cycle studies conducted at the Faculty. The partial grades obtained for the thesis presentation and the answers to the set questions are included in the diploma examination report , as is the final grade for the thesis, resulting from the grades obtained from the thesis supervisor and the reviewer. In the case of a discrepancy between the thesis supervisor's and reviewer's grades, the final grade for the thesis is determined at the Examination Board meeting. The diploma examination grade is determined by the Examination Board as the arithmetic mean of the partial grades obtained for the thesis presentation and the answers to both questions posed (assessed by those asking the questions).

For preparation of the thesis and submission of the diploma thesis confirmed by obtaining a positive final grade for the thesis and a positive grade for the diploma examination, the student is awarded 20 ECTS points in the last semester of studies (allocated by the Dean in accordance with the Study Regulations).

Zasady ustalania ogólnego wyniku ukończenia studiów

The degree completion result is determined as a weighted average of the following grades:

1. the average grade of the degree programme - with a weighting of 0.6;
2. the final grade of the diploma thesis - with a weighting of 0.2, with the final grade of the thesis being determined by a committee appointed by the Dean in the event of a discrepancy between the grades of the supervisor and the reviewer;
3. the grade of the diploma examination - with a weighting of 0.2, with the grade being calculated as the arithmetic mean of the grade of the master's examination and the grade of the presentation and discussion of the thesis (defence grade). In the event that a student passes the diploma examination on a resit date, the average of the

grades from the primary and resit dates, but not less than 3.0, shall be taken into account in the calculation. The rules resulting from the Study Regulations shall be taken into account when determining individual grades, including the average grade. The Examination Board may award a distinction to a graduate who fulfils all of the following criteria (listed in the AGH Study Regulations):

a. has submitted his/her diploma thesis and taken the diploma examination on the scheduled date,

b. has obtained an average mark from his/her studies (first or second degree) above 4.71,

c. has obtained a very good grade from the diploma thesis,

d. has obtained a very good grade from the diploma examination.

The award of a distinction should be recorded in the examination report. Confirmation of the distinction will be an appropriate document attached to the diploma of graduation.

Inne wymagania związane z realizacją programu studiów wynikające z Regulaminu studiów albo innych przepisów obowiązujących w Uczelni

Not applicable.

The Remote Sensing and Geo-Informatics (RSG-I) belongs to engineering and technical sciences (disciplines: civil engineering, surveying and transportation at 51% and environmental engineering, mining and energy at 30%) and natural sciences (discipline: earth and environmental sciences at 19%). The RSC-I is available in English as a second-cycle master's degree program and lasts 4 semesters. Recruitment is possible after the first engineering degree or after the bachelor's degree. The modular nature of the study program is unique, allowing thematic clustering of courses in large blocks: Earth observation and Geoinformation Science, Python for Remote Sensing, Time Series Analysis, Machine learning, Geo-information Tools, Natural Hazards and Disaster Risk Reduction, Urban Planning and Environmental Management. A significant amount of classes are provided in the online mode, which also allows for clustering over time, i.e. live classes are held over 5 weeks per semester.

The field RSG-I is a response to the demand for remote sensing specialists, which increased significantly after 2015, when the European Space Agency (ESA) launched the second satellite in the Sentinel series. Since then, radar and optical images with high spatial and temporal resolution as never before are available free of charge. In addition, a huge amount of other geospatial information (images, rasters, vectors, database etc.) is acquired and collected by various government and private entities.

A number of units, research, administrative, commercial, have been established to deal with this topic. There are many online solutions using satellite imagery, e.g. ESA (Sentinel-hub Playground, esa-sen4cap, Copernicus DIAS (CREODIAS, mundi, sobloo, Wekeo, ONDA), Landsat App, CENAGIS and others).

Due to the wide range of remote sensing applications, first degree graduates (engineering/bachelor degree) are needed in various fields: mathematics, physics, geology, geography, geodesy, engineering/environmental protection, geoinformation, computer science, economics, management and even law, who are at the same time familiar with modern technologies in remote sensing and "geo" oriented programming. Acquisition of knowledge in this field, at level II, is what the RSG-I course makes possible. Graduates can find employment in state and local administration, consulting and service companies, and industry.

Mentor of the field of study: prof. dr hab. inż. Beata Hejmanowska

[View full description of the field of study](#)

Study programme determined by Resolution No. 10/2023 of the AGH UST Senate of 1 February 2023