

Satelite navigation systems and digital maps - opis przedmiotu

Informacje ogólne	
Nazwa przedmiotu	Satelite navigation systems and digital maps
Kod przedmiotu	06.0-WE-INF-D-SNSaDM-Er
Wydział	Wydział Nauk Inżynieryjno-Technicznych
Kierunek	Informatyka
Profil	ogólnoakademicki
Rodzaj studiów	Program Erasmus drugiego stopnia
Semestr rozpoczęcia	semestr zimowy 2022/2023

Informacje o przedmiocie	
Semestr	2
Liczba punktów ECTS do zdobycia	5
Typ przedmiotu	obieralny
Język nauczania	angielski
Sylabus opracował	• dr inż. Michał Doligalski

Formy zajęć					
Forma zajęć	Liczba godzin w semestrze (stacjonarne)	Liczba godzin w tygodniu (stacjonarne)	Liczba godzin w semestrze (niestacjonarne)	Liczba godzin w tygodniu (niestacjonarne)	Forma zaliczenia
Wykład	30	2	-	-	Egzamin
Laboratorium	30	2	-	-	Zaliczenie na ocenę

Cel przedmiotu

- Obtaining competences in the field of satellite navigation systems (GNSS) and digital maps and use them in IT projects
- To familiarize students with the use of GNSS systems, data acquisition, determination the level of confidence and accuracy of the data
- Developing skills in the use of GNSS system interfaces
- Shaping skills in the field of design and programming of applications with integrated digital maps.

Wymagania wstępne

Zakres tematyczny

The genesis of GNSS systems, in particular, the GPS and Galileo systems. Overview of operational satellite navigation systems. Components of satellite navigation systems (user segment, cosmic and control). The ability to obtain data and to integrate user segment devices with other IT systems. The concept and principle of operation of satellite navigation systems. methods distance measurement, position determination, azimuth, and speed. Distribution of time and frequency pattern. Reliability of information from GNSS systems and factors affecting performance and correctness determination of position and time (clock errors, ionosphere impact, tracking errors, multipath). Accidental and deliberate jamming and spoofing of satellite navigation systems. Registration, formats storing and analyzing data from GNSS systems. Application of GNSS systems in civil and military solutions. Geographic information services and systems (GIS) using GNSS systems. Limitations of GNSS systems, possibilities and directions of further development. Systems of satellite navigation augmentation. Digital map formats. Integration of digital maps in applications, including mobile, GIS systems. Creating applications enabling, tracking and registration position and its location on the map.

Metody kształcenia

Lecture: conventional and multimedia lecture.
Laboratory: laboratory exercises

Efekty uczenia się i metody weryfikacji osiągania efektów uczenia się

Opis efektu	Symbole efektów	Metody weryfikacji	Forma zajęć
A student who has completed the course: He understands the role of navigation systems satellite in contemporary computer science and electronics and is able to practically use them in the reality that surrounds him		<ul style="list-style-type: none">• bieżąca kontrola na zajęciach• sprawdzian	<ul style="list-style-type: none">• Laboratorium
He can indicate the design stages systems and applications for navigation satellite and discuss architecture such a system		<ul style="list-style-type: none">• egzamin - ustny, opisowy, testowy i inne	<ul style="list-style-type: none">• Wykład

Opis efektu	Symbole efektów	Metody weryfikacji	Forma zajęć
He can use specialist tools, design simple satellite navigation system and write an application to a location by using programming languages		<ul style="list-style-type: none"> bieżąca kontrola na zajęciach sprawdzian 	<ul style="list-style-type: none"> Laboratorium
He knows formal models and their features used in system design and applications for satellite navigation		<ul style="list-style-type: none"> egzamin - ustny, opisowy, testowy i inne 	<ul style="list-style-type: none"> Wykład

Warunki zaliczenia

- Lecture - A pass condition is to get a positive exam grade implemented in writing. The condition to take the exam is a positive assessment from the laboratory.
- Laboratory - the condition for passing is to get positive grades from everyone laboratory exercises planned for implementation as part of the laboratory program (80%) and active participation in classes (20%).
- Components of the final grade = lecture: 50% + laboratory: 50%

Literatura podstawowa

- An Introduction to GNSS - free e-book** <https://novatel.com/an-introduction-to-gnss>
- Springer Handbook of Global Navigation Satellite Systems, Editors: **Teunissen**, Peter J.G., **Montenbruck**, Oliver (Eds.), Springer 2017
- Global Positioning System, Theory and Applications, Volume I, J. Spilker & B. Parkinson, AIAA, 1996
- GNSS: Global Navigation Satellite Systems, Bernhard Hofmann-Welnhof, Herbert Lichtenegger and Elmar Wasle, Springer-Verlag, 2007
- An Introduction to GNSS: GPS, GLONASS, Galileo and Other Global Navigation Satellite Systems, Novatell (only PDF)

Literatura uzupełniająca

- Atmospheric Effects in Space Geodesy, **Böhm**, Johannes, **Schuh**, Harald (Eds.), Springer, 2013

Uwagi

Zmodyfikowane przez dr inż. Michał Doligalski (ostatnia modyfikacja: 23-04-2022 07:52)

Wygenerowano automatycznie z systemu SyllabUZ