UCLouvain

lphys2260

2024

Geodesy and GNSS (Global Navigation Satellite System)

5.00 credits 30.0 h Q2

(!)

This biannual learning unit is not being organized in 2024-2025!

Language :	English > French-friendly Louvain-la-Neuve Basic training in physics and mathematics (level of bachelor in sciences or applied sciences). Having followed LPHYS2161 is an asset.				
Place of the course					
Prerequisites					
Main themes	The topics/themes covered in the teaching unit are space geodesy for the Earth and planets with a particular focus on the Global Navigation Satellite System (GNSS) and their applications in geophysics.				
Learning outcomes	At the end of this learning unit, the student is able to :				
	a. Contribution of the teaching unit to the learning outcomes of the programme (PHYS2M and PHYS2M1) AA1: A1.1, A1.2, A1.3, A1.4, A1.5, A1.6 AA2: A2.1, A2.2 AA3: A3.1, A3.2, A3.4 AA6: A6.1 AA7: A7.3 AA8: A8.1, A8.2 b. Specific learning outcomes of the teaching unit At the end of this teaching unit, the student will be able to: 1 explain space geodesy techniques used on Earth; 2 properly apply spatial geodesy methods to retrieve terrestrial geophysical information; 3 define terrestrial and celestial reference systems and passages from one to the other; 4 explain the geophysical phenomena that disturb the rotation and orientation of the Earth; 5 explain spatial geodesic techniques used around planets and moons of the solar system; 6 properly apply spatial geodesy methods to retrieve the geophysical information that can be obtained for the planets and moons of the solar system on their current, past and future states				
Evaluation methods	and their evolutions; 7. access the databases of space geodesy; 8. use multidisciplinary approaches to solve a spatial geodesy problem or a fundamental question such as the habitability of the planets and moons of the solar system or exoplanets. Individual oral exam with two presentations of questions to choose from the course.				
	Individual work on GNSS data.				
Teaching methods	Lectures and exercises, with a visit of a geodesic site and of the Royal Observatory of Belgium				
Content	 Classical and spatial geodesy GPS system European Galileo System and other satellite navigation systems GPS / GNSS applications in Earth sciences Celestial reference systems and frames Terrestrial reference systems and frames Rotation of the Earth Space geodesy techniques other than GNSS Space geodesy around other planets of the solar system Motion of an artificial satellite around a planet and geophysical information 				
Bibliography					
Other infos					

Université catholique de Louvain - Geodesy and GNSS (Global Navigation Satellite System) - en-cours-2024-lphys2260

Faculty or entity in charge	PHYS
1	

Programmes containing this learning unit (UE)						
Program title	Acronym	Credits	Prerequisite	Learning outcomes		
Master [120] in Geography : Climatology	CLIM2M	5		•		
Master [60] in Physics	PHYS2M1	5		Q		
Master [120] in Physics	PHYS2M	5		٩		