



Subject card

Subject name and code	Astronomy with Elements of Astrophysics, PG_00050008						
Field of study	Space and Satellite Technologies, Space and Satellite Technologies						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2022/2023		
Education level	second-cycle studies	Subject group			Obligatory subject group in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Geoinformatics -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Zbigniew Łubniewski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		10.0		35.0	75
Subject objectives	Students obtain knowledge and practical skills in the field of astronomy and astrophysics for space and satellite technologies.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_W02] has ordered and theoretically grounded knowledge of selected aspects of astronomy and astrophysics constituting the basis for solutions in the field of space and satellite technologies.	Student has ordered and theoretically grounded knowledge of selected aspects of astronomy and astrophysics constituting the basis for solutions in the field of space and satellite technologies.			[SW1] Assessment of factual knowledge		
	[K7_K02] Understands the non-technical aspects of activities in the field of space and satellite technologies, including their social consequences and impact on the state of the environment. Expresses opinions on the development of technology and related risks.	Student understands the non-technical aspects of activities in the field of astronomy and astrophysics, including their social consequences and impact on the state of the environment.			[SK2] Assessment of progress of work [SK4] Assessment of communication skills, including language correctness		
	K7_U09	Student is able to evaluate the suitability and then to apply the learned methods and tools related to astronomy and astrophysics for solving complex tasks, including practical issues, in the area of space and satellite technologies.			[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		
Subject contents	The celestial sphere, spherical coordinates, horizontal coordinate system, astronomical meridian, gnomon, hourly coordinate system, sun clock, sphere movement at different latitudes, apparent celestial motion, determination of altitude in upper and lower culmination of celestial body. Stars, their origin, naming, division of the celestial sphere, equatorial and ecliptic coordinate systems, atlases and star catalogs, precession, apparent annual motion of the Sun, concept of ecliptic, Kepler laws, days, 'nights, seasons, moon, its phases, Eclipses of the Sun and Moon, planets and their apparent motion, geocentric system, heliocentric system, calendar concept. Selected physical processes in the Universe related to objects such as galactic stars, interstellar matter and their interactions, Star formation and planetary systems, Gas and star dust: formation of molecules and grains, flares. The apparent and absolute brightness of stars, own movements, spectral classes, Russell's Hertzsprung diagram. Evolution of the stars.						
Prerequisites and co-requisites	Mathematics, physics						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exercises	100.0%	20.0%
	Colloquium	56.0%	80.0%
Recommended reading	Basic literature	E. Rybka, <i>Astronomia ogólna</i> , PWN, Warszawa, 1983 B. Kołaczek, <i>Astronomia sferyczna</i> , Warszawa, 1976 P. G. Kulikowski, <i>Poradnik miłośnika astronomii</i> , PWN, Warszawa 1976 M. Kubiak, <i>Gwiazdy i materia międzygwiazdowa</i> , PWN, Warszawa, 1994.	
	Supplementary literature	Not specified.	
	eResources addresses	Adresy na platformie eNauczenie:	
Example issues/ example questions/ tasks being completed	Not specified.		
Work placement	Not applicable		