



Subject card

Subject name and code	Navigation Systems, PG_00049081						
Field of study	Automatic Control, Cybernetics and Robotics						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2029/2030		
Education level	first-cycle studies	Subject group			Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	4	Language of instruction			Polish		
Semester of study	7	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Signals and Systems -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jacek Marszał					
	Teachers	dr hab. inż. Jacek Marszał					
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	0.0	0.0	45
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	45		3.0		27.0	75
Subject objectives	The aim of the course is to acquaint students with the basics of the theory of navigation, as well as the use of navigation systems.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	

Subject contents	Course content – lecture 1. Organizing issue: rules of passing, consultations, literatures 2. Fundamentals of navigation 3. Navigation and geodesy 4. Shape of the Earth 5. Geographical position 6. Reference systems - review 7. WGS-84 i GRS'80 8. Projection types 9. Mercator Projection 10. Gauss-Krüger Projection and Universal Transversal Mercator 11. Projection „65” 12. Navigational maps 13. ECDIS digital maps 14. Directions, corrections – course, bearing, track angle 15. Magnetic declination and compass deviation 16. Drift, wind correction 17. Terrestrial navigation 18. Inertial navigation 19. Magnetic compasses - classical 20. Magnetic compasses - electronic 21. Gyro-compasses 22. Ring Laser Gyro 23. Screw log 24. Pitometer log 25. Electromagnetic log 26. Ultrasonic Doppler log 27. Ship berthing control systems 28. Accelerometers, inertial platforms 29. Structure and GPS principles 30. GPS space segment 31. GPS control segment 32. Position determination in GPS system 33. Signal transmitted by satellite GPS 34. Depesza nawigacyjna 35. DGPS, WAAS, EGNOS differential systems 36. GPS receivers 37. GPS in geodesy 38. Global navigational system GALILEO 39. Errors and precision of position in GPS system 40. Underwater navigation systems 41. Hydroacoustic buoys- pingers, transponders, responders 42. Hydroacoustic local navigation system with long base 43. Hydroacoustic local navigation system with short and super short base 44. Navigational echo sounder 45. Principles of radar 46. Radar in navigation 47. Instrument landing system ILS											
Prerequisites and co-requisites												
Assessment methods and criteria	<table border="1" data-bbox="448 1290 1489 1395"> <thead> <tr> <th data-bbox="448 1290 794 1323">Subject passing criteria</th> <th data-bbox="794 1290 1141 1323">Passing threshold</th> <th data-bbox="1141 1290 1489 1323">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 1323 794 1357">Midterm colloquium</td> <td data-bbox="794 1323 1141 1357">60.0%</td> <td data-bbox="1141 1323 1489 1357">67.0%</td> </tr> <tr> <td data-bbox="448 1357 794 1395">Practical exercise</td> <td data-bbox="794 1357 1141 1395">60.0%</td> <td data-bbox="1141 1357 1489 1395">33.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Midterm colloquium	60.0%	67.0%	Practical exercise	60.0%	33.0%
Subject passing criteria	Passing threshold	Percentage of the final grade										
Midterm colloquium	60.0%	67.0%										
Practical exercise	60.0%	33.0%										
Recommended reading	<table border="1" data-bbox="448 1402 1489 1733"> <tbody> <tr> <td data-bbox="448 1402 794 1599">Basic literature</td> <td colspan="2" data-bbox="794 1402 1489 1599"> 1. Czarnecki K. Geodezja współczesna w zarysie. Wyd. Wiedza i Życie Warszawa 1997. 2. Narkiewicz J. Podstawy układów nawigacyjnych. WKŁ Warszawa 1999. 3. Narkiewicz J. GPS i inne satelitarne systemy nawigacyjne. WKŁ Warszawa 2007. 4. Hogmann B., Lichtenegger H., Collind J. Global Positioning System Theory and Practice. Springer, Wien 1997 </td> </tr> <tr> <td data-bbox="448 1599 794 1704">Supplementary literature</td> <td colspan="2" data-bbox="794 1599 1489 1704"> 1. Stateczny A. Nawigacja porównawcza, Wydawnictwo Gdańskie, 2001. 2. Narkiewicz J. GPS globalny system pozycyjny GPS, budowa, działanie, zastosowania. WKŁ Warszawa 2006. </td> </tr> <tr> <td data-bbox="448 1704 794 1733">eResources addresses</td> <td colspan="2" data-bbox="794 1704 1489 1733"></td> </tr> </tbody> </table>			Basic literature	1. Czarnecki K. Geodezja współczesna w zarysie. Wyd. Wiedza i Życie Warszawa 1997. 2. Narkiewicz J. Podstawy układów nawigacyjnych. WKŁ Warszawa 1999. 3. Narkiewicz J. GPS i inne satelitarne systemy nawigacyjne. WKŁ Warszawa 2007. 4. Hogmann B., Lichtenegger H., Collind J. Global Positioning System Theory and Practice. Springer, Wien 1997		Supplementary literature	1. Stateczny A. Nawigacja porównawcza, Wydawnictwo Gdańskie, 2001. 2. Narkiewicz J. GPS globalny system pozycyjny GPS, budowa, działanie, zastosowania. WKŁ Warszawa 2006.		eResources addresses		
Basic literature	1. Czarnecki K. Geodezja współczesna w zarysie. Wyd. Wiedza i Życie Warszawa 1997. 2. Narkiewicz J. Podstawy układów nawigacyjnych. WKŁ Warszawa 1999. 3. Narkiewicz J. GPS i inne satelitarne systemy nawigacyjne. WKŁ Warszawa 2007. 4. Hogmann B., Lichtenegger H., Collind J. Global Positioning System Theory and Practice. Springer, Wien 1997											
Supplementary literature	1. Stateczny A. Nawigacja porównawcza, Wydawnictwo Gdańskie, 2001. 2. Narkiewicz J. GPS globalny system pozycyjny GPS, budowa, działanie, zastosowania. WKŁ Warszawa 2006.											
eResources addresses												
Example issues/ example questions/ tasks being completed												
Practical activities within the subject	Not applicable											

Document generated electronically. Does not require a seal or signature.