# GDAŃSK UNIVERSITY OF TECHNOLOGY

## Subject card

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| Subject name and code | Geographical Information Systems, PG_00047876 |
| Field of study | Informatics |

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| Date of commencement of studies | October 2025 | Academic year of realisation of subject | 2027/2028 |
| Education level | first-cycle studies | Subject group | Optional subject group<br>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 | 3 | Language of instruction | Polish |
| Semester of study | 5 | ECTS credits | 2.0 |
| Learning profile | general academic profile | Assessment form | assessment |

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| Conducting unit | Department Of Geoinformatics -> Faculty Of Electronics Telecommunications And Informatics -> Wydziały Politechniki Gdańskiej |
| Name and surname of lecturer (lecturers) | Subject supervisor: dr hab. inż. Zbigniew Łubniewski<br>Teachers: dr hab. inż. Zbigniew Łubniewski |

| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|---|
| | Number of study hours | 15.0 | 0.0 | 15.0 | 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 plan | Participation in consultation hours | Self-study | SUM |
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| | Number of study hours | 30 | 2.0 | 18.0 | 50 |

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| Subject objectives | Learning by students on basic knowledge and practical skills on Geographical Information Systems (GIS), what includes both using GIS and elements of programming for basic GIS functions implementation. |

| Learning outcomes | Course outcome | Subject outcome | Method of verification |
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| | [K6_W04] knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices | Student knows basics of GIS applications software development. | [SW1] Assessment of factual knowledge |

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| Subject contents | 1. GIS - definition, concepts, structure and basic terms 2. Examples of GIS applications 3. Data models in GIS 4. Vector data model. Basic vector data types: point, line, polygon. Thematic maps 5. Composed vector data types 6. Raster data model in GIS 7. Vector and raster data formats in GIS 8. Database as a GIS foundation. GIS database types: relational, object-oriented. Specific features of databases used for spatial attributes storage 9. Database queries using spatial attributes of data 10. Standardisation of vector data models. OGC, SQL 11. Topological model of vector data in GIS. Topology rules 12. Three-dimensional data models and representations in GIS 13. GIS data sources and acquiring methods. Import and processing of existing data, geocoding 14. Examples of GIS data measurement techniques 15. Vector data processing algorithms. Geometrical transformations and analysis 16. Layers composition and basic geoprocessing operations: buffering, union, intersection |
| Prerequisites and co-requisites | |

| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
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| | Midterm colloquium | 50.0% | 50.0% |
| | Practical exercise | 50.0% | 50.0% |

| Recommended reading | Basic literature | 1. Longley P., Goodchild M., Maguire D., Rhind D. "Geographic Information Systems and Science", John Wiley & Sons Ltd., West Sussex 2005 |
| | | 2. Litwin L., Myrda G. "Systemy Informacji Geograficznej. Zarządzanie danymi przestrzennymi w GIS, SIP, SIT, LIS", Wydawnictwo HELION, Gliwice 2005 |
| | Supplementary literature | No requirements. |
| | eResources addresses | Adresy na platformie eNauczanie: |
| Example issues/ example questions/ tasks being completed | | |
| Work placement | Not applicable | |

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