



### MODULE SPECIFICATION

|                                       |                                     |
|---------------------------------------|-------------------------------------|
| Module code                           |                                     |
| Module title in Polish                | <b>Systemy informacji o terenie</b> |
| Module title in English               | <b>Land Information Systems</b>     |
| Module running from the academic year | <b>2016/2017</b>                    |

### A. MODULE IN THE CONTEXT OF THE PROGRAMME OF STUDY

|   |   |
|---|---|
| Field of study                                      | Surveying and Cartography   |
| Level of qualification                              | first cycle<br>(first cycle, second cycle)  |
| Programme type                                      | academic<br>(academic/practical)  |
| Mode of study                                       | full-time<br>(full-time/part-time)  |
| Specialism  | <b>All</b>  |
| Organisational unit responsible for module delivery | <b>The Department of Geotechnical Engineering, Geomatics and Waste Management</b> |
| Module co-ordinator                                 | <b>Ryszard Florek-Paszkowski, PhD, Eng.</b>                                       |
| Approved by:  | <b>Ryszard Florek-Paszkowski, PhD, Eng.</b>                                       |

### B. MODULE OVERVIEW

|  |  |
|--|--|
| Module type  | core module<br>(core/programme-specific/elective HES*)           |
| Module status  | compulsory module<br>(compulsory/optional)                       |
| Language of module delivery                                      | English  |
| Semester in the programme of study in which the module is taught | semester 6   |
| Semester in the academic year in which the module is taught      | summer semester<br>(winter semester/summer semester)             |
| Pre-requisites   | No requirements<br>(module code/module title, where appropriate) |
| Examination required   | no<br>(Yes/No)   |
| ECTS credits   | 5  |

\* elective HES – elective modules in the Humanities and Economic and Social Sciences



# Politechnika Świętokrzyska

## WYDZIAŁ INŻYNIERII ŚRODOWISKA, GEOMATYKI I ENERGETYKI

| Mode of instruction      | lectures | classes | laboratories | project | others |
|--------------------------|----------|---------|--------------|---------|--------|
| Total hours per semester | 30       |         | 30           |         |        |



### C. LEARNING OUTCOMES AND ASSESSMENT METHODS

|                    |  |
|--------------------|--|
| <b>Module aims</b> | The aim of the module is to acquaint students with the knowledge on Land Information Systems (LIS). Student also become familiarised with the methodology of creating LIS and spatial data analysis. Moreover, a student obtains the ability of recording data and analysing it in LIS (and using geoportals). |
|--------------------|--|

| Module outcome code | Module learning outcomes  | Mode of instruction<br>(l/c/lab/p/<br>others) | Corresponding programme outcome code | Corresponding discipline-specific outcome code |
|---------------------|---|---|--------------------------------------|--|
| W_01                | A student knows the applied spatial reference systems, other reference systems, cartographic projections as well as appropriate coordinate systems.   | I   | GiK_W10                              | T1 A_W03                                       |
| W_02                | A student obtains basic knowledge as regards the methodology of creating LIS as well as spatial data analysis systems; furthermore, a student is familiar with functional models, the principles of designing, creating, updating, and harmonising office and referential spatial databases (public registers).   | I   | GiK_W11                              | T1 A_W03                                       |
| W_03                | A student acquires basic knowledge as regards the European infrastructure of spatial information as well as the types of spatial analyses; furthermore a student is familiar with basic implementation guidelines of the EU directives concerning the infrastructure of spatial information; finally, a student knows the principles of creating and functioning geoportals as part of this infrastructure. | I   | GiK_W14                              | T1 A_W03<br>T1 A_W04<br>T1 A_W05               |
| U_01                | A student can register real-life objects in LIS; a student can create and realise the procedures in the formal language with the use of program tools.  | I   | GiK_U12                              | T1A_U07<br>T1A_U10                             |
| U_02                | A student can integrate spatial data from various sources; furthermore, a student can make simple spatial analyses in LIS; furthermore, a student can utilise a geoportal which meets the requirements of the European infrastructure of spatial information; a student can make 3D models; a student can also obtain and update data for the needs of databases as regards topographic objects.            | I   | GiK_U19                              | T1A_U09<br>T1A_U10                             |
| U_03                | A student can utilise analytical, simulation, and experimental methods for solving engineering tasks; a student can also prepare and realise algorithms which serve the purpose of solving a determined geodetic problem.   | I   | GiK_U16<br>GiK_U18                   | T1A_U08<br>T1A_U13<br>T1A_U14<br>T1A_U16       |
| K_01                | A student can appropriately determine priorities which serve the purpose of realising a determined task (by himself or herself); moreover, a student understands non-technical aspects and effects of surveying activity (including its impact on the economy).   | I/I   | GiK_K05<br>GiK_K06                   | T1A_K02<br>T1A_K04                             |
| K_02                | A student is aware of the responsibility for the realisation of team tasks; a student can also co-  | I/I   | GiK_K06<br>GiK_K07                   | T1A_K03  |



|  |  |  |  |  |
|--|--|--|--|--|
|  | operate and work in a team during the realisation of engineering projects. |  |  |  |
|--|--|--|--|--|

### Module content:

#### 1. Topics to be covered in the lectures

|          |  |                      |
|----------|--|----------------------|
| 1 – 3.   | Legal fundamentals and the organisation of LIS and the National Land Information System in Poland. Implementation guidelines concerning the EU directives on the infrastructure of spatial information.  | W_01<br>W_03<br>K_01 |
| 4 – 6.   | Obligatory and facultative data from the National Land Information System. Attributes and their characteristics.   | W_02<br>K_01         |
| 7 – 9.   | The types of Spatial Information Systems together with the criteria of their division in terms of information and accuracy types. Comparing GIS and LIS.   | W_02<br>W_03<br>K_01 |
| 10 – 12. | WFM and WFS functions for data presentation and visualisation.   | W_02<br>W_03<br>K_02 |
| 13 – 15. | Numerical base map as a LIS database. Functional models, the principle of designing, creating, updating, and harmonising office and referential spatial databases (public registers). Obligatory update. | W_02<br>W_03<br>K_02 |

#### 2. Topics to be covered in the laboratories

| No.      | Topics  | Module outcome code          |
|----------|---|------------------------------|
| 1 – 5.   | Spatial analysis for finding the best possible location for the investment. Operations on rasters and vectors. Land analysis.                               | U_01<br>U_02<br>K_02         |
| 6 – 10.  | Introduction to GRASS as the analysis and visualisation environment. Preparing a 3D model, data update for the needs of databases of topographical objects. | U_02<br>U_03<br>K_01<br>K_02 |
| 11 – 15. | Spatial analysis on the basis of students' own criteria.  | U_02<br>U_03<br>K_01         |

### Assessment methods

| Module outcome code | Assessment methods<br><i>(Method of assessment; for module skills – reference to specific project, laboratory and similar tasks)</i> |
|---------------------|--|
| W_01                | A test and reports on laboratory classes   |
| W_02                | A test and reports on laboratory classes   |
| W_03                | A test and reports on laboratory classes   |
| U_01                | A test and reports on laboratory classes   |
| U_02                | A test and reports on laboratory classes   |
| U_03                | A test and reports on laboratory classes   |
| K_01                | A test, a discussion during tutorials and obtaining a credit.  |
| K_02                | Reports on laboratory classes, a discussion during tutorials and obtaining a credit  |



### D. STUDENT LEARNING ACTIVITIES

| ECTS summary |  |                        |
|--------------|--|------------------------|
|              | Type of learning activity  | Study time/<br>credits |
| 1            | Contact hours: participation in lectures   | 30                     |
| 2            | Contact hours: participation in classes  |                        |
| 3            | Contact hours: participation in laboratories   | 30                     |
| 4            | Contact hours: attendance at office hours (2-3 appointments per semester)                                    | 5                      |
| 5            | Contact hours: participation in project-based classes  |                        |
| 6            | Contact hours: meetings with a project module leader   |                        |
| 7            | Contact hours: attendance at an examination  | 10                     |
| 8            |  |                        |
| 9            | <b>Number of contact hours</b>   | 75<br><i>(total)</i>   |
| 10           | <b>Number of ECTS credits for contact hours</b><br><i>(1 ECTS credit = 25-30 hours of study time)</i>        | 3                      |
| 11           | Private study hours: background reading for lectures   | 10                     |
| 12           | Private study hours: preparation for classes   | 10                     |
| 13           | Private study hours: preparation for tests   |                        |
| 14           | Private study hours: preparation for laboratories  |                        |
| 15           | Private study hours: writing reports   | 5                      |
| 16           | Private study hours: preparation for a final test in laboratories  |                        |
| 17           | Private study hours: preparation of a project/a design specification   |                        |
| 18           | Private study hours: preparation for an examination  |                        |
| 19           |  |                        |
| 20           | <b>Number of private study hours</b>   | 25<br><i>(total)</i>   |
| 21           | <b>Number of ECTS credits for private study hours</b><br><i>(1 ECTS credit = 25-30 hours of study time)</i>  | 2                      |
| 22           | <b>Total study time</b>  | 125                    |
| 23           | <b>Total ECTS credits for the module</b><br><i>(1 ECTS credit = 25-30 hours of study time)</i>               | 5                      |
| 24           | <b>Number of practice-based hours</b><br><i>Total practice-based hours</i>                                   | 45                     |
| 25           | <b>Number of ECTS credits for practice-based hours</b><br><i>(1 ECTS credit = 25-30 hours of study time)</i> | 1.8                    |

### E. READING LIST

|                |  |
|----------------|--|
| References     |  |
| Module website |  |