



## Subject card

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| Subject name and code                       | Shaping resilient cities and regions, PG_00064978                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                          |                                         |                                     |                                                                                                                         |            |     |
| Field of study                              | Spatial Development                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          |                                         |                                     |                                                                                                                         |            |     |
| Date of commencement of studies             | February 2026                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                          | Academic year of realisation of subject |                                     | 2026/2027                                                                                                               |            |     |
| Education level                             | second-cycle studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                          | Subject group                           |                                     | Optional subject group<br>Specialty 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                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                          | Language of instruction                 |                                     | English                                                                                                                 |            |     |
| Semester of study                           | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                          | ECTS credits                            |                                     | 5.0                                                                                                                     |            |     |
| Learning profile                            | general academic profile                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                          | Assessment form                         |                                     | assessment                                                                                                              |            |     |
| Conducting unit                             | Department of Spatial Planning -> Faculty of Architecture -> Faculties of Gdańsk University of Technology                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          |                                         |                                     |                                                                                                                         |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                          |                                         |                                     |                                                                                                                         |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                          |                                         |                                     |                                                                                                                         |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lecture                                                  | Tutorial                                | Laboratory                          | Project                                                                                                                 | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.0                                                      | 0.0                                     | 0.0                                 | 60.0                                                                                                                    | 0.0        | 60  |
|                                             | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 60                                                       |                                         | 10.0                                |                                                                                                                         | 55.0       | 125 |
| Subject objectives                          | <p>The aim of the course is to introduce students to a range of analytical methods and design solutions used in pro-ecological spatial tranformations of cities and their regions through problem-solving approaches that integrate systems thinking, anticipatory strategic competences, real life scenarios and insights, and interpersonal skills.</p> <p>These methods include assessments of climate sensitivity of the analyzed structures and strategies to enhance their resilience through appropriate spatial planning solutions.</p> |                                                          |                                         |                                     |                                                                                                                         |            |     |

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| Learning outcomes               | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Subject outcome                                                                                                                                                                                                                                             | Method of verification                                                                                                                                                   |
|                                 | [K7_U05] according to a given specification, taking into account also non-technical aspects, is able to design a complex spatial system of different scales (district, city, region), using appropriate methods, techniques and tools, including the ability to draw up an urban planning concept for the transformation of midtown development with the development of public spaces                                                                                                                                                                                                                                                                                           | Student is able to interpret the system of connections on a regional and local scale - primarily natural and functional relations                                                                                                                           | [SU5] Assessment of ability to present the results of task<br>[SU4] Assessment of ability to use methods and tools<br>[SU2] Assessment of ability to analyse information |
|                                 | [K7_W01] has in-depth and expanded knowledge of spatial development, urban planning and spatial planning, including activities used in the process of revitalization of degraded areas and ecological design                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Student knows the essence and complexity of the processes related to the ecological design of cities and regions of the coastal zone, with particular emphasis on the effects of climate change                                                             | [SW3] Assessment of knowledge contained in written work and projects<br>[SW2] Assessment of knowledge contained in presentation<br>[SW1] Assessment of factual knowledge |
|                                 | [K7_U08] knows how to cooperate in a group, take on different roles in it, including leading the work of a team; has experience in work implemented in different formulas, and in his actions is characterized by creativity and enterprise                                                                                                                                                                                                                                                                                                                                                                                                                                     | Student is able to agree with the group the correct division of tasks, support each other substantively and inspire in finding the best pro-ecological solutions at various scales. By conducting a seminar, he can involve the group in a discussion       | [SU1] Assessment of task fulfilment<br>[SU5] Assessment of ability to present the results of task                                                                        |
|                                 | [K7_W06] knows and understands the concepts and principles of copyright protection and the need to manage intellectual property resources                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Student knows and understands the concepts and principles of copyright protection and the need to manage intellectual property resources - in particular in the field of photographic resources, expert studies, databases and spatial information systems. | [SW3] Assessment of knowledge contained in written work and projects<br>[SW2] Assessment of knowledge contained in presentation                                          |
| Subject contents                | Course content – project<br>Identification and assessment of regional ecological issues affecting cities and other settlement structures. Assessment of the sensitivity and adaptive potential of various spatial structures. General principles of sustainable urban and settlement design while overtaking the holistic landscape approach. Linkages between regional-scale pro-ecological actions and design in a local scale. Determination and using the social, economic and environmental measures and indexes to transform urban structures. Building sustainable development strategies for the urban areas. Ecological design as a tool for environmental protection. |                                                                                                                                                                                                                                                             |                                                                                                                                                                          |
| Prerequisites and co-requisites |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                             |                                                                                                                                                                          |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Passing threshold                                                                                                                                                                                                                                           | Percentage of the final grade                                                                                                                                            |
|                                 | Delivering a thematic presentation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 100.0%                                                                                                                                                                                                                                                      | 100.0%                                                                                                                                                                   |

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| Recommended reading | Basic literature         | <p>1) Beatley T., Planning for sustainability in European cities: A review of practices in leading cities, [in:] The Sustainable Urban Development Reader, red. T. Beatley, S.M. Wheeler, Topical Urban Readers, The Routledge Urban Reader Series, series editor: LeGates R. T., Stout F., Routledge, Taylor &amp; Francis Group, London-New York 2004.</p> <p>2) Riddell R., Sustainable urban planning. Blackwell Publishing, 2007.</p> <p>3) Jenks M., The acceptability of urban intensification, [in:] Achieving Sustainable Urban Form, red. E. Burton, M. Jenks, K. Williams, E &amp; FN Spon, Tailor &amp; Francis Group, London-No York 2001. Kenworthy J., Newman P., Sustainable urban form: The big picture, [in:] Achieving Sustainable Urban Form, red. E. Burton, M. Jenks, K. Williams, E&amp;FN Spon, Tailor &amp; Francis Group, London-New York 2001.</p> <p>4) A. Sahavacharin, P. Sompongchaiyakul, D.Thaitakoo The effects of land-based change on coastal ecosystems Original Paper Published: 02 April 2022 Volume 18, pages 351366, (2022)</p> <p>5) Carmona M., Sustainable urban design - a possible agenda, [w:] Planning for a Sustainable Future, red. A. Layard, S. Davoudi, S. Batty, Spon Press, Taylor &amp; Francis Group, London 2001.</p> <p>6) The effect of climate change and urbanization on outdoor microclimate: A case study in Berlin <a href="https://www.sciencedirect.com/science/article/pii/S0378778824001403#f0035">https://www.sciencedirect.com/science/article/pii/S0378778824001403#f0035</a></p> <p>7) How to measure and quantify biogenic carbon removals <a href="https://www.umweltbundesamt.de/sites/default/files/medien/11850/publikationen/42_2024_cc_biogenic_carbon_removals.pdf">https://www.umweltbundesamt.de/sites/default/files/medien/11850/publikationen/42_2024_cc_biogenic_carbon_removals.pdf</a></p> <p>8) Persson U, Wiechers E, Möller B, Werner S. <a href="#">Heat Roadmap Europe: Heat distribution costs</a>. Energy, 2019, 176: 604-622.</p> |
|                     | Supplementary literature | <p>1) Williams K., Does intensifying cities make them more sustainable? [in:] Achieving Sustainable Urban Form, red. E. Burton, M. Jenks, K. Williams, E&amp;FN Spon, Tailor &amp; Francis Group, London-New York 2001.</p> <p>2) Selman P., Environmental Planning: The conservation and development of biophysical resources, 2nd edition, SAGE, London, Thousand Oaks, New Delhi 2000.</p> <p>3) Möller B, Wiechers E, Persson U, Grundahl L, Lund RS, Mathiesen BV. <a href="#">Heat Roadmap Europe: Towards EU-Wide, Local Heat Supply Strategies</a>. Energy, 2019, 177: 554-564.</p> <p>4) Möller B, Wiechers E, Persson U, Grundahl L, Connolly D. <a href="#">Heat Roadmap Europe: Identifying local heat demand and supply areas with a European thermal atlas</a>. Energy, 2018; 158: 281-292.</p> <p>5) Persson U, Möller B, Werner S. <a href="#">Heat Roadmap Europe: Identifying strategic heat synergy regions</a>. Energy Policy 2014; 74: 663-681.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                     | eResources addresses     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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| Example issues/<br>example questions/<br>tasks being completed | 1) Environmental conditions influencing climate change and urban environment interactions.<br>2) Conditions contributing to the urban heat island phenomenon and associated risks.<br>3) Urban adaptation strategies in response to climate change.<br>4) Ecological considerations in the design of various settlement structures: key issues.<br>5) Contemporary challenges of water retention in cities: problems and solutions.<br>6) Air quality in urban areas: problems and solutions.<br>7) Forms and functions of urban greenery: structure and spatial characteristics of primary types.<br>8) Designing tall greenery along urban transport routes and its spatial implications.<br>9) Ecological linkages of regional importance: examples of planning policies and implemented projects.<br>10) Ecological linkages of metropolitan importance: examples of planning policies and implemented projects.<br>11) Methods for assessing the recreational capacity of ecologically valuable areas.<br>12) Sustainable approaches to developing and utilizing ecologically valuable areas for recreation.<br>13) Modern mobility in cities and regions that minimizes ecological impact. |
| Practical activities within<br>the subject                     | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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