

**HOURS PER SEMESTER/WEEK:** LECTURES: 15/1; CLASSES: 30/2

**FIELD OF THE STUDY:** Environmental protection

**Level of study:** First-cycle (Engineer's degree) program

**Course status:** optional \*

**Year of the study:** IV

#### COURSE CONTENTS

**LECTURES:** The variety of types of surface waters, their specificity, and their role in the environment and economy. Factors causing natural and anthropogenic degradation of water and wetland ecosystems. Various methods of valorization and assessment of the ecological status of surface waters and wetlands. The bioindicative role of aquatic and aquatic vegetation in the assessment of the ecological status of water reservoirs, watercourses, and wetlands. Evaluation of the status and problems of protection of wetlands in protected areas. Legal and administrative tools in the protection and renaturation of waters in Poland and European Union countries, the role of spatial planning in these activities. The use of GIS spatial information systems in the assessment of the status and protection of surface waters.

**CLASSES:** Valorization of the landscape in post-lake areas and within river valleys - methodology and practical application of various methods of landscape value assessment. Assumptions and rules for the use of various methods of valorization of water reservoirs, watercourses and wetlands. Possibilities of shaping wetlands and their surroundings in terms of improving their ecological status. Developing the principles of passive and active protection of water and wetland ecosystems with varying degrees of anthropopressure.

**EDUCATIONAL PURPOSE:** Presentation of the diversity and role of surface waters and wetlands in the landscape, acquiring the ability to assess their ecological status, threats and natural effects of water degradation, getting to know the possibilities and principles of conducting protective measures for various types of surface waters and wetlands.

#### LEARNING OUTCOMES

**Knowledge.** Knows and understands the basic processes determining the functioning of water objects in the landscape. He has knowledge of research techniques that allow the assessment of the ecological status and the degree of degradation of surface waters and wetlands.

**Skills.** Can assess the landscape values of post-lake areas using typical methods. Has the ability to search and obtain information about the environment on the basis of source, archival and cartographic materials. He is able to interpret water monitoring data, draw conclusions and justify the need to protect objects.

**Social competences.** Understands and appreciate the environmental role of surface waters and wetlands. He is aware of the effects of improper practices in economic activity, leading to the deterioration of water facilities. Understands and is able to justify the need for protection and proper use of waters and wetlands.

#### TEACHING FORMS AND METHODS

**Lectures.** Lecture with a multimedia presentation.

**Classes.** Subject-project exercises - carrying out a research project supplemented with subject-related exercises and field activities - presentation of research methods and examples of water protection and reclamation.

#### FORM AND CONDITIONS FOR VERIFICATION OF LEARNING OUTCOMES

**Lectures.** Written final test on the lecture material, test-descriptive form.

**Classes.** Written test on the exercise material - in a mixed form, including test and descriptive questions as well as practical and interpretative tasks. Report - Final study of the exercises (report, research project).

#### BASIC LITERATURE

1) Keddy P.A., Wetland ecology. Principles and conservation, Wyd. Cambridge University Press, 2010, pp. 497. 2) Dodds W.K., Whiles M.R., Freshwater ecology. Concepts and environmental applications of limnology. Elsevier Academic Press, 2010, pp. 811. 3) Scheffer M., Ecology of shallow lakes. Kluwer Academic Publishers, 2004, pp. 357. 4) Lee C.C., Lin S.D., Handbook of environmental engineering calculations. McGraw Hill Handbooks, 2007, pp. 1712.

#### ADDITIONAL LITERATURE

1) Chin D.A., Water-quality engineering in natural systems. Wiley-John Wiley and Sons Inc., 2006, pp 610. 2) Smol J.P., Pollution of lakes and rivers. Blackwell Publishing, 2008, pp. 383.

#### THE TEACHER/TEACHERS CONDUCTING THE CLASSES:

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