



## Civil Engineering

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|--------------------------------------------------------|------------|
| Version                                                | 2020       |
| Effective from (date of when the course was developed) | 02.07.2020 |

|                                               |                               |
|-----------------------------------------------|-------------------------------|
| ECTS Credits                                  | 4                             |
| Level/Year                                    | Bachelor (after 2nd semester) |
| Teaching (contact) hours                      | 52                            |
| Total learner managed hours (incl. self-work) | 92                            |
| Total hours of student learning               | 144                           |

|                                |                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pre-requisites                 | Knowledge corresponding to the first two years of a Bachelor's degree program in construction or architecture. Good command of English. All classes and extracurricular activities are conducted in English. Knowledge of the Russian language is not required.                                                                              |
| Co-requisites                  | None                                                                                                                                                                                                                                                                                                                                         |
| Alignment to graduate profiles | This course contributes to achievement of the graduate outcomes of the following qualifications:<br>- Bachelor in Architecture/Industrial and civil engineering/Construction<br>- Master of Science in Architecture/Industrial and civil engineering/Construction                                                                            |
| Course aim                     | The main goal of the program is to give the students competence in design by means of BIM technology, introduction to energy saving concepts in the world, energy efficiency formation in Russia, examples of its application in civil engineering, types and classes of energy efficiency in buildings, main energy consumption indicators. |
| Indicative Course content      | Building information modelling. Principles of BIM. Modeling of buildings in BIM-environment. Mobile data access. Energy Efficiency of the Buildings. Introduction to Energy Efficiency of the Buildings. Energy efficiency. Green Building Certification Systems.                                                                            |

### LEARNING OUTCOMES

| On successful completion of this course students will be able to: |                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                                                                 | Create building models using BIM                                                                                                                                                                                                                                                                          |
| 2                                                                 | Use Autodesk Revit software and manage data                                                                                                                                                                                                                                                               |
| 3                                                                 | Visualize the construction project by using a virtual three-dimensional model.                                                                                                                                                                                                                            |
| 4                                                                 | Have an understanding of the software available today in the field of information modeling; energy consumption in the residential sector; heat loss of buildings; concepts of heat and moisture transfer in building envelopes; types and classifications of environmentally friendly building materials. |
| 5                                                                 | Know the principles of working in a BIM environment; BIM terminology; the advantages of BIM; case studies in information modelling; how to determine the energy efficiency classes of buildings, the main indicators of energy consumption; the main green building rating systems LEED and BREAM         |

### ASSESSMENTS

| Basis of assessment                |                   |                         |              |
|------------------------------------|-------------------|-------------------------|--------------|
| Methods of assessment              | Learning Outcomes | Pass criteria (Minimum) | % Weightings |
| Summative review                   |                   |                         |              |
| Portfolio – summative of practices |                   |                         |              |

### REQUIREMENTS FOR SUCCESSFUL COURSE COMPLETION

|              |                                                   |
|--------------|---------------------------------------------------|
| Requirements | Mark of 50% or more in every summative assessment |
|--------------|---------------------------------------------------|



## RESULTS

|                           |                                                                                                                                                                                                                                                  |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Assessment results</b> | Results for assessments are given in percentage marks                                                                                                                                                                                            |
| <b>Course results</b>     | <ul style="list-style-type: none"><li>• Each summative assessment is assigned a percentage weighting.</li><li>• The overall percentage mark for the course is calculated by adding the weighted results for all summative assessments.</li></ul> |

## LEARNING AND TEACHING

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Learning and teaching approaches</b> | Lectures, seminars, discussions, debate, learner activities.<br>Group work is encouraged.                                                                                                                                                                                                                                                                                                                           |
| <b>Learning and teaching resources</b>  | Textbooks, journals and library resources; use of Internet; computer software.                                                                                                                                                                                                                                                                                                                                      |
| <b>Learner managed activities</b>       | <ul style="list-style-type: none"><li>• Completion of course work, set assignments</li><li>• Reading of course materials</li><li>• Project work in mini-group work</li><li>• Preparation for classes</li><li>• Practicing relevant skills/methods/techniques</li><li>• Self-evaluation of course work</li><li>• Gathering relevant contextual information/ issues/ideas to build knowledge of the subject</li></ul> |