



**RIGA TECHNICAL
UNIVERSITY**

FACULTY OF CIVIL ENGINEERING

Please note! This is a preliminary list of courses. Changes may occur!

**AUTUMN 2017
MASTER COURSES**

BBK580 Investigation and Testing of Structural Elements of Buildings (*graduate*)

2.0 CP (3.0 ECTS)

Goals, tasks and methods of experimental testing. Research of constructions and buildings. Methods and means of conducting engineering experiments. Construction modeling.

BKA516 The Finite Element Method (General Course) (*graduate*)

4.0 CP (6.0 ECTS)

Today the finite element method (FEM) is considered as one of the well established and convenient technique for the computer solution of complex problems in different fields of engineering: civil engineering, mechanical engineering, nuclear engineering, biomedical engineering, hydrodynamics, heat conduction, geo-mechanics, etc. From other side, FEM can be examined as a powerful tool for the approximate solution of differential equations describing different physical processes.

The success of FEM is based largely on the basic finite element procedures used: the formulation of the problem in variational form, the finite element discretization of this formulation and the effective solution of the resulting finite element equations. These basic steps are the same whichever problem is considered and together with the use of the digital computer present a quite natural approach to engineering analysis.

The objective of the course for Master study is to present briefly each of the above aspects of the finite element analysis and thus to provide a basis for the understanding of the complete solution process. According to three basic areas in which knowledge is required, the course is divided into three parts. The first part of the course comprises the formulation of FEM and the numerical procedures used to evaluate the element matrices and to estimate the numerical errors. In the second part, methods for the efficient solution of the finite element equilibrium equations in nonlinear static, dynamic, buckling and thermal analyses will be discussed. In the third part of the course, some modelling aspects and modern applications of the finite element method will be briefly examined.

BMT403 Reinforcement of Structures (*graduate*)

2.0 CP (3.0 ECTS)

Subject "Structural Reinforcement" gives a real insight into the existing structure renovation, improvement or capacity building. Is addressed in a broad range of structural materials (wood, metal, concrete, composite materials). Describes the various approaches to gain implementation. Defined in practical action, from the design and operation of up to provide. Analysis of the technological issues, gain controls as possible.

BBK559 Optimization in Engineering Design (*graduate*)

2.0 CP (3.0 ECTS)

Optimum design of load-bearing structures — formulation of the question. Mathematical methods of optimization. Optimization of beams, frames and thin wall structures. Optimization of spatial structures.

BBR443 Technology of Building Repair Works (*graduate*)

2.0 CP (3.0 ECTS)

Building inspection before reconstruction. Technological project of repair works. The volume of repair works. Repair works technology of foundations, columns, walls, ceilings, windows, doors, roof-bearing structure and surface repair. Labor intensity calculation. Environmental and labor protection.