



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Vilniaus Gedimino technikos universiteto

**PROGRAMOS INOVATYVIOS STATYBOS  
MEDŽIAGOS IR TECHNOLOGIJOS (61202T112,  
612J82001)**

**VERTINIMO IŠVADOS**

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**EVALUATION REPORT  
OF STUDY PROGRAMME INNOVATIVE BUILDING  
MATERIALS AND TECHNOLOGIES  
(61202T112, 612J82001)**

at Vilnius Gediminas Technical University

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## DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Inovatyvios statybos medžiagos ir technologijos</i>
Valstybinis kodas	61202T112 (naujas kodas – 612J82001)
Studijų sritis	Technologijos mokslai
Studijų kryptis	Statybų technologijos
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	Pirmoji
Studijų forma (trukmė metais)	Nuolatinė (4)
Studijų programos apimtis kreditais	240
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Statybų technologijų bakalauras
Studijų programos įregistravimo data	1997 05 19

## INFORMATION ON ASSESSED STUDY PROGRAMME

Name of the study programme	<i>Innovative Building Materials and Technologies</i>
State code	61202T112 (new code – 612J82001)
Study area	Technological Sciences
Study field	Building Technology
Kind of the study programme	University studies
Level of studies	First
Study mode (length in years)	Full-time (4)
Scope of the study programme in credits	240
Degree and (or) professional qualifications awarded	Bachelor of Building Technology
Date of registration of the study programme	1997 05 19

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## I. INTRODUCTION

This report presents the findings of an evaluation of the programme *Inovatyvios statybos medžiagos ir technologijos* 61202T112 (new code – 612J82001), referred to in English as the programme *Innovative Building Materials and Technologies* or *Construction Materials and Products*. This programme was evaluated against the criteria supplied to the Review Group in the document “Extracts from the Description of the Evaluation Process for Study Programmes and Methodological Guidelines”, with particular reference to Paragraphs 170 to 225.

This report is based on an analysis of the document “Summary of Self-Assessment, Study Field of Civil Engineering, Study Programme Construction Materials and Products (state code – 61202T112), Vilnius, June 2010”, 41 pages (excluding annexes) and information gathered by the Review Team during a site visit to Vilnius Gediminas Technical University on 23 September 2011.

The site visit included:

- discussions with senior faculty administration staff,
- discussions with staff responsible for preparation of Self-Assessment Reports (SAR),
- discussions with teaching staff,
- discussions with students,
- discussions with alumni,
- discussions with employers of recent graduates of the programme,
- inspection of student coursework including final year projects,
- inspection of teaching premises and equipment including auditoria, library, computing facilities and laboratories.

The Review Team found it necessary to get clarification of some issues reported in the SAR. This was in part due to misunderstandings arising through the poor use of written English. The Review Team was satisfied with the clarifications provided during the site visit.

The international Review Team attempted to conduct its meetings entirely in English. However this was simply impractical as many contributors to the discussions did not understand nor speak English. The extent of the need for translation of both questions and answers was inefficient in the use of the time afforded to the discussions. It also greatly reduced the effectiveness of open dialogue, a significant element of any quality evaluation exercise. Nevertheless the Review Group is satisfied that it gathered sufficient data from written and verbal evidence to form its assessment under each of the six evaluation areas and thereby conclude its evaluation.

The study programme *Inovatyvios statybos medžiagos ir technologijos* (“Innovative Building Materials and Technologies” or “Construction Materials and Products”), with state code 61202T112 and new code 612J82001, was given a positive evaluation, with eleven recommendations.

## II. PROGRAMME ANALYSIS

### ***1. Programme aims and learning outcomes***

#### **1.1. Programme demand, purpose and aims**

##### *1.1.1. Uniqueness and rationale of the need for the programme*

The programme specifically prepares undergraduates for a career in the construction sector, as civil engineers working either for construction firms or for firms engaged in the production and development of construction materials. (This is because the study plan, with a common part identical to all civil engineering specializations, and the laboratories, show that the graduates are civil engineers and not materials engineers). There appeared to be a lack of unanimity as to whether or not the programme aim was to produce civil engineers or construction/material technologists. The new title of the programme, “Innovative Building Materials and Technologies”, suggests a bias in favour of the core value being one of materials engineering but the Review Group found that the core value was construction technology. There is a need for graduates in this sector, driven by the need for research and development engineers employed by SME’s. These SME’s are exploiting the availability of significant local resources of raw materials but they need the support of engineers with an innovation culture to grow the business and keep the products competitive. This view is endorsed by external stakeholders, who see a need for the programme. The programme is wide and is unique.

##### *1.1.2. Conformity of the programme purpose with institutional, state and international directives*

The programme conforms with the strategic plans of the Vilnius Gediminas Technical University for 2009-2011 and the draft plan for 2010-2012. The programme has been prepared with regard to institutional directive Order of Rector No. 81, 19 February 2007 and state directive ISAK-734, 29 April 2005. Notwithstanding current good standards, international directives and best practice could be analysed and implemented in the programme.

##### *1.1.3. Relevance of the programme aims*

The programme aims are relevant and are integrated with the goals of the University. The context of the programme aims in the European and global construction market was clear. The relevance of the aims to the holistic formation of a graduate engineer was also noted by the Review Group.

#### **1.2. Learning outcomes of the programme**

##### *1.2.1. Comprehensibility and attainability of the learning outcomes*

The basis of the learning outcomes is clearly articulated in the SAR, Paragraph 24, Table 2. These are appropriate. The actual workload and learning outcome expectations in subjects in the last semester are demanding.

##### *1.2.2. Consistency of the learning outcomes*

The SAR, Table 3 clearly presents the relationship between study outcomes at programme level and the individual subjects. The results expected from the study programme are consistent with the programme structure.

### *1.2.3. Transformation of the learning outcomes*

Evidence was presented of significant updating of the programme structure in 2010, with nine changes to the subjects, including the removal of subjects, addition of subjects and transfer of some subjects to later or earlier semesters.

## **1.3. Main strengths and weaknesses of programme aims and learning outcomes**

The programme is wide and is unique, preparing undergraduates for a career in the construction sector, as civil engineers working either for construction firms or for firms engaged in the production and development of construction materials.

The context of the programme aims in the European and global construction market form a clear basis for the learning outcomes. The results expected from the study programme are consistent with the programme structure.

Notwithstanding current good standards, international directives and best practice could be analysed and implemented in the programme.

## **2. Curriculum design**

### **2.1. Programme structure**

#### *2.1.1. Sufficiency of the study volume*

The Review Group noted that the programme is in transition. Table 5 of the SAR demonstrates contact hours amounting to 2562 hours spread across relevant subjects.

#### *2.1.2. Consistency of the study subjects*

The links and sequence of the study subjects is generally logical. The philosophy of interlinking general and specialist study was noted. However see Section 2.2.2.

### **2.2. Programme content**

#### *2.2.1. Compliance of the contents of the studies with legal acts*

The study volume contact hours exceed the required minimum of 2,600 hours. The overall programme credits, 160 credits, match the requirement to fall in the range of 140 to 180. The volume of General Studies is 7.5%, exceeding the minimum required of 7%. Mathematics, physics and chemistry subjects comprise 24 credits, matching the minimum requirement. Core Subjects of Engineering include 27 credits exceeding the minimum required of 20 credits. Specialized education (Special Subjects of the Study Field, professional practices and the final degree project) is 33.8% exceeding the minimum required of 30%. Practice includes the required 10 credits. Students have Free Selections amounting to 5%, matching the minimum requirement. Core Subjects of the Study Field include 27 credits, exceeding the minimum required of 24 credits. The subjects of Social Sciences comprise 8 credits matching the minimum requirement. The preparation and defending of the Final Project comprises 12 credits, exceeding the required value bracket.

#### *2.2.2. Comprehensiveness and rationality of programme content*

Generally the programme is rational. However the courses “Applied Mathematics 1” is in Semester III “Applied Mathematics 2” is in Semester VI. There is a gap of two semesters between these courses which is unhelpful to student learning. These courses should follow each other. Although students have Free Selections amounting to 5%, in practice the elective places on offer do not regularly match the preference of students for admission to these subjects

### **2.3. Main strengths and weaknesses of Curriculum design**

The links and sequence of the study subjects is generally logical but the courses “Applied Mathematics 1” is in Semester III and “Applied Mathematics 2” is in Semester VI. There is a gap of two semesters between these courses. These courses should follow each other.

Students should always have the possibility of attending free selection courses that they want. However the elective places on offer do not regularly match the preference of students for admission to these subjects.

## **3. Staff**

### **3.1. Staff composition and turnover**

#### *3.1.1. Rationality of the staff composition*

There are 10 professors and 19 associate professors teaching on the programme and 11.3% of the subjects are taught by professors. The number of teachers is given as 41 in the SAR Paragraph 73 but totals 58 in the SAR Paragraph 76, Table 6. Workload distribution is variable across this large group. The number of final theses supervised per staff member averaged four. It is identified in the SAR that lecturers lack class-work time to discuss in details with each student they architectural solutions. Nevertheless the programme has a very large number of contributors, of whom 85% are full-time.

#### *3.1.2. Turnover of teachers*

No information was presented on how the number of teachers (professor, associate professor, lecturers, assistants) changed during the analyzed period. Approximately 60% of the staff is aged 50 years or less.

### **3.2. Staff competence**

#### *3.2.1. Compliance of staff experience with the study programme*

The staff members have significant experience of scientific, practical and pedagogical work. The staff members are research-active.

#### *3.2.2. Consistency of teachers' professional development*

Professional development is facilitated by mobility using the ERASMUS/Lifelong learning programme, internships and international conferences.

### **3.3 Main strengths and weaknesses of staff**

The staff members have significant experience of scientific, practical and pedagogical work. Staff increase their qualification by participating in training in industry companies or other universities.

The Head of Department or staff from the Dean's Office check the quality of teachers' work. No collegial evaluation of teachers' work is present.

## **4. Facilities and learning resources**

### **4.1. Facilities**

#### *4.1.1. Sufficiency and suitability of premises for studies*

There are sufficient auditoria and laboratory space for the programme. The lectures are organised in one building complex, except for physical training. The lecture theatres are generally in good condition and a rolling refurbishment programme ensures that the proportion of lower quality space is decreasing. Wireless internet access is installed and becoming more widely available in the buildings. Provision for students working on individual tasks is afforded through a number of facilities, including the reading rooms of the Department of Construction and Management, the library and the SRL-1 520 computer classroom (20 workstations). The library hours are good and reading room access hours are generous, especially the Internet Reading Room.

#### *4.1.2. Suitability and sufficiency of equipment for studies*

The laboratory facilities available to students of the course are excellent, especially those of the research institute.

#### *4.1.3. Suitability and accessibility of the resources for practical training*

Internships (4 weeks and 3 weeks) are well established with companies involved in the construction sector. A tripartite agreement between the student, company and VGTU is prepared and registered in the Department for each work placement.

### **4.2. Learning resources**

#### *4.2.1. Suitability and accessibility of books, textbooks and periodical publications*

The resources in place in respect of books, textbooks and periodical publications are good. There is regular investment in books and database subscriptions. The students have access to specific publications in the library, the methodological rooms or the reading-rooms of the Construction and Business Management Faculty.

#### *4.2.2. Suitability and accessibility of learning materials*

Some old literature is presented in the course description cards. For example "Steel and Plastic Structures" has a recommended book from 1977; "Binding Materials" has a recommended book from 1980; "Technologies of Concrete" has a recommended book from 1982. For all of these and other subjects new literature is available and should be advised for students.



### **4.3. Main strengths and weaknesses of learning resources**

The library resources of new books and periodical publications are good. The 24-hour open internet room is useful for students. The laboratories have up-to-date equipment available for students' research and practise work.

Some old literature is presented in the course description cards. New literature is available and should be recommended to the students.

## **5. Study process and student assessment**

### **5.1. Student admission**

#### *5.1.1. Rationality of requirements for admission to the studies*

The use of weighted average competitive points with high values for mathematics (0.4) and the inclusion of physics, with a weighting of 0.2, is appropriate. These weightings generally ensure that the students admitted to the programme have the potential to succeed. The competitive scores of students is cyclical, as would be expected for a programme related to the construction industry. The average peaked at 21.40 in 2006 but has fallen back in line with the cyclical decline of the global construction industry.

#### *5.1.2. Efficiency of enhancing the motivation of applicants and new students*

Proactive measures are in place to attract students and support those in the early stages of first year in university. Staff resources dedicated to the task of attracting students include use of the Admissions Commission and staff members of the Faculty appointed by the Rector. The latter point indicates the importance attached to the role. The measures include Open Day events at the University and regional centres, visits to secondary schools, media articles, a summer camp for prospective future first year students, nominal grants for student achievement and the joint project with Kaunas University of Technology, which showcases the best graduates of technical universities.

### **5.2. Study process**

#### *5.2.1. Rationality of the programme schedule*

The programme schedule in respect of both student learning and examinations is rational. The programme schedule includes very high auditoria hours, typically 25 hours per week, except for the final semester. This requires scheduling of lectures in the evenings or at weekends.

#### *5.2.2. Student academic performance*

Drop-out rates reached 40% in recent years with some students taking up employment if possible and failing to keep up with coursework deadlines. The trend has recently reversed, possibly due to a downturn in the industry.

#### *5.2.3. Mobility of teachers and students*

The staff experiences a proactive and supportive environment for mobility. A total of 69 co-operation agreements were signed in the analysed period.

Paragraph 171 of the SAR provides information on the number of students leaving. The SAR claims that the interest from students is high but that funding opportunities are limited. The actual number of students going to other universities is very low (one or two per year). The low number of available places means that it is very competitive and some students indicated that they do not apply because they have little confidence in their chances of success. The number of incoming exchange students (SAR, Paragraph 175, Table 15) is given for basic sub-division but not for analyzed programme.

### **5.3. Student support**

#### *5.3.1. Usefulness of academic support*

Academic support to the programme is good. Students are appointed a mentor from first year and have one through the entire programme.

#### *5.3.2. Efficiency of social support*

First year obligatory subjects that promote a healthy way of living (physical culture theory and practical exercises) are noteworthy and commendable. Sport and cultural activities are well catered for. Onetime grants are given for active cultural, sports and other public activities for the benefit of the university. It seems that no specific resource for psychological support is provided. There was general agreement among current students and recent graduates that student accommodation facilities could be improved to enhance study conditions.

### **5.4. Student achievement assessment**

#### *5.4.1. Suitability of assessment criteria and their publicity*

The relationship between evaluation outcome (score) and the acquired knowledge / skills (Table 17 of the SAR) is clear. The formulae used for calculating scores in the case of accumulative evaluations ensure that the students spread their workload evenly and are aware of the mark's distribution. A bonus system (10%) for early submission of coursework is noteworthy. All of this information is made known to the students in advance, through announcements at lectures and through the University's website.

#### *5.4.2. Feedback efficiency*

Students receive their results in a timely manner and may get oral feedback from the lecturer if the lecturer agrees. Exam results are available within 5 days for full-time students. Students provide feedback through anonymous student surveys.

#### *5.4.3. Efficiency of final thesis assessment*

Final thesis assessment is described in an annexe to the SAR report. Supervisor's and reviewer's evaluation are not taken into account while giving a mark for final project.

#### *5.4.4. Functionality of the system for assessment and recognition of achievements acquired in non-formal and self-education*

Not applicable in this case. This innovation has not been introduced to the programme yet.

## **5.5. Graduates placement**

### *5.5.1. Expediency of graduate placement*

The expediency of graduate placement is cyclical in response to the cyclical nature of the construction sector. For example, it was reported as 75% in 2008 and 54.2% in 2009. Figures for other years in the analyzed period were not presented.

## **5.6. Main strengths and weaknesses of study process and student assessment**

Students are appointed a mentor from first year and have one through the entire programme. Students receive their examination results in a timely manner.

Students' international mobility is very low. Supervisor's and reviewer's evaluation are not taken into account while giving mark for Final project. The Review Group did not find any particular University resource specifically devoted to student welfare, such as a Faculty Student Advisor or Student Counsellor. Student accommodation facilities could be improved to enhance study conditions.

## **6. Programme management**

### **6.1. Programme administration**

#### *6.1.1. Efficiency of the programme management activities*

VG TU structures for overview of programmes are well established. The system includes a Study Committee. The Committee considers and approves changes to programmes but there are no people from industry in Study Committee.

There have been recent changes to the programme. The impact on students already in the programme needs to be carefully managed. Students need to be officially informed about the changes and the impact on their part in study program (old v new course).

### **6.2. Internal quality assurance**

#### *6.2.1. Suitability of the programme quality evaluation*

The well-documented QA procedures were noted. Significant stakeholder access to information is laudable.

#### *6.2.2. Efficiency of the programme quality improvement*

Paragraphs 272 to 278 of the SAR are very poorly translated into English. Nevertheless the Review Group is satisfied that programme quality improvement is on-going.

#### *6.2.3. Efficiency of stakeholders participation.*

Paragraphs 279 to 291 of the SAR are very poorly translated into English. Nevertheless the Review Group noted that the position appears to be satisfactory and the role of students, alumni and employers is noted.

### **6.3. Main strengths and weaknesses of programme administration**

The VGTU structures for overview of programmes include a Study Committee. The Committee considers and approves changes to programmes but there are no people from industry in Study Committee.

Students need to be better informed about the impact of changes in the programme structure on their individual study programme.

### III. RECOMMENDATIONS

#### 3.1.

Verify that actual workload and learning outcome expectations in subjects in the last semesters are realistic compared to stated hours.

#### 3.2.

It is recommended, that courses “Applied Mathematics 1” and “Applied Mathematics 2” would follow each other, either in Semester III and IV or consecutive semesters in the period Semester VI to VIII.

#### 3.3.

The elective places on offer in the free selection subject context should be managed to better match the preferences of students for admission to these subjects.

#### 3.4.

Notwithstanding current good standards of teaching, international best practice indicates that more formal collegial evaluation of teaching, instead of informal evaluation of teacher’s work by department staff, is recommended. This could be implemented by using certain evaluation criteria.

#### 3.5.

Literature presented in the course description cards should be revised. It is recommended to change reference to some older books with appropriate new ones.

#### 3.6.

Students’ mobility abroad should be encouraged through greater opportunities on the ERASMUS programmes or other exchange programmes.

#### 3.7.

Evaluation of the final project should change, by taking into account the evaluation of the supervisor and reviewer.

#### 3.8.

The University should consider providing a professional resource specifically devoted to student welfare, such as a Faculty Student Advisor or Student Counsellor.

#### 3.9.

Student accommodation facilities should be improved to enhance study conditions.

#### 3.10.

One-time grants fund for the active sports, cultural and other public activities and voluntary work should be increased where possible.

#### 3.11.

A Study Committee considers and approves changes to programmes but people from practice should be invited to take an official part in the work of Study Committee.

#### IV. GENERAL ASSESSMENT

The study programme Innovative Building Materials and Technologies (state code – 61202T112, new code – 612J82001) is given **positive** evaluation.

*Study programme assessment in points by fields of assessment.*

No.	Evaluation Area	Evaluation Area in Points*
1.	Programme aims and learning outcomes	3
2.	Curriculum design	3
3.	Staff	4
4.	Material resources	4
5.	Study process and assessment (student admission, study process student support, achievement assessment)	3
6.	Programme management (programme administration, internal quality assurance)	3
	<b>Total:</b>	<b>20</b>

\*1 (unsatisfactory) - there are essential shortcomings that must be eliminated;

2 (satisfactory) - meets the established minimum requirements, needs improvement;

3 (good) - the field develops systematically, has distinctive features;

4 (very good) - the field is exceptionally good.

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