



საქართველოს ტექნიკური უნივერსიტეტი  
GEORGIAN TECHNICAL UNIVERSITY

Approved by  
GTU Academic Council  
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## Doctorate Educational Program

### Program name

ინოვაციებისა და ოპერაციათა მენეჯმენტი

Innovation and Operations Management

### Faculty

ენერგეტიკისა და ტელეკომუნიკაციის

Power Engineering and Telecommunications

### Head of the Program

Professor Konstantine Khmaladze

### Qualification to be awarded

Doctor of Management

(მენეჯმენტის დოქტორი)

*Shall be awarded in case of performing no less than 180 credits of the educational program*

### Language of Instruction

Georgian

### Prerequisite for admission to the program

Diploma certifying Master's or equivalent academic degree. The following shall be considered: existence of scientific publications; Participation in scientific conferences; Other documents and materials related to teaching/research activities (certificates, diplomas, patents, etc.).

The results of the exam in one of the foreign languages (English, German, French, Russian), which will be held at the Testing Center of the University and interview with the Faculty Temporary Commission. Compliance of a doctoral candidate with the doctoral program is established by the Faculty Temporary Commission.

### **Description of the program**

The program is elaborated with ECTS system, 1 credit equals 25 hours, which means the contact and independent work hours. The credit distribution is presented in the program curriculum. The program lasts for 3 years (6 semesters) and covers 180 credits. Teaching component - 60 credits that cover basic subjects with research components - 120 credits.

The academic semester covers 20 weeks, from which a classroom classes are conducted for 15 weeks and one week is allocated to the midterm exams. The XVII week is a period of preparation for final exams, which are held on the XVIII-XIX week. XX week, if necessary, is allocated to the additional exams.

The first year academic process – Doctoral student prepares two thematic seminars. Credit capacity of each thematic seminar is 15 credits.

The second year academic process is dedicated to theoretical / experimental research 1 (15 credits) and theoretical / experimental research 2 (15 credits).

In the same year, PhD student prepares Colloquium - 1 (15 credits) and Colloquium - 2 (15 credits).

The third year academic process is dedicated to theoretical/experimental study - 3 (15 credits) and Colloquium - 3 (15 credits).

Completion of the thesis and defense (30 credits). The dissertation thesis and its public defense is evaluated by a 7-9-person Dissertation Board with a 100-point system by the following criteria: Actuality - 25; Novelty - 25; Reveal the problem -20; Answers to the questions -15; Presentation of visual material - 5 and thesis design - 10 points.

Regulations of Georgian Technical University Dissertation Board and Doctoral Studies  
[http://gtu.ge/Study-Dep/Files/Pdf/doqtorantura\\_debuleb\\_2014.10.14\\_SD.pdf](http://gtu.ge/Study-Dep/Files/Pdf/doqtorantura_debuleb_2014.10.14_SD.pdf)

### **The purpose of the program**

The ongoing transformation of the country's economy, the expansion of international cooperation, puts principally new demands on entrepreneurial entities.

The issue of commercialization of products (services), first of all, entrepreneurial activity based on innovations and the latest technologies, takes important place in the business of the enterprise.

As a result, the demand is increased for specialists, who have the ability to analyze the essence of the engineering business (scientific products and technologies), analyze the local and international markets with a systemic view, solve manufacturing and organization management issues.

The intensification of the economy and the need to increase its efficiency requires the continuous improvement of various economic processes, first of all of the forms and methods of management innovative processes, , as the high level of innovation is the guarantee of economic development and national security of the country.

At present, the non-existence of innovations management mechanism is one of the weakest parts of the organizational-economic system of national economy management. In the market economy, innovations should contribute to the intensive development of the economy, ensure implementation of the advancement of science and technology in the production, satisfy customers' need for high quality products and services.

The acquisition of innovations and operations management is a necessary condition for the development of modern managers and professionals. The main aim of the program is to equip student with systematic theoretical and practical knowledge in order to: manage innovative processes in the Georgian economy, extend experience, to create a normative-legal base, to establish mechanism for

creation and management system of innovative organizations.

**Learning outcomes / competences (general and sectoral)**

**Knowledge and understanding**

- Knowledge based on modern paradigms and innovative achievements of engineering - innovative spheres that make opportunities to apply innovative methods in practical activities, Prepare refereed publications relevant to the existing standards.
- Apprehend the importance of receiving the necessary knowledge. Rethink the accumulated knowledge and empirical experiences and if needed, reassess and update it.

**Ability to apply knowledge in practice**

- Correct and creative understanding of modern technological achievements and innovations. Readiness to introduce them in practice; Prepare scientific-practical work on the latest forms and methods of innovations and operations management.
- Develop and implement methods and forms of research innovation system for the need for scientific-practical activities, accumulate and disseminate new knowledge primarily through international scientific refereed publications.

**Making judgments:**

- Critical analysis, synthesis and assessment of new, complex and contradictory ideas and approaches as a result of the necessary assessments and information processing for the elaboration and development of proper methodology in innovation and operations management.
- Draw grounded conclusions and make decisions independently on innovative processes.

**Communication skill**

- Ability to present new information reasonably relative to the knowledge in the field of innovative technologies.
- Ability to get involved in the thematic polemic with the international scientific community and exchange scientific achievements.
- Ability to deliver information to the audience on his/her conclusions, arguments and research methods clearly and to convince listeners. Use modern technologies when dealing with people.

**Learning skills:**

- Ability to acquire new ideas, initiatives and undertakings based on the latest achievements of knowledge; Study independently, generate new ideas or processes in the process of study, activity and research, based on the knowledge of the latest achievements. Promotion of learning organization.

**Values**

- Has the ability to continuously pursue to the establishment of general and national values. Explores and develops innovative methods for introducing the values. In his scientific-theoretical, practical and pedagogic activities, he/she applies such values as professional objectivity, collegiality and honesty.

**Forms and methods of learning outcomes**

- Lecture     Seminar (team working)     Practice work     Laboratory
- Scientific-thematic seminar     Independent work     Consultation
- Research component     Dissertation design     Dissertation defense

Based on the specificity of the particular course, the appropriate activities of teaching-learning methods are used

that are depicted in the course programs (syllabus):

1. **Discussion / debate** - one of the most common methods of interactive teaching. Discussion process increases the quality and activity of student engagement. Discussions can be overcome in the debate and this process is not limited to the questions asked by the teacher. It develops a student's ability to reason and to justify his opinion.
2. **Collaborative Work** - This method involves dividing students into groups and giving them instruction. The group members work on the issue individually and in parallel share their opinions with other members of the group. Depending on the set objective, it is possible to divide the functions among the members of the Group during work process. This strategy ensures maximum involvement of all students in the learning process.
3. **Brain storming** - This activity promotes formation and expression of the radically different opinion, idea within the premises of the topic. The mentioned activity contributes to the development of a creative approach to the problem. Use of the method is effective in the existence of 2 large number groups of students and consists of several main stages:
  - Determining problem / issue in creative perspective; Making note without criticizing the ideas expressed by the listeners in a certain period of time (mainly on the board);
  - Determining assessment criteria to state the relevance of the idea with the aim of the research;
  - Assessing selected ideas according to the predetermined criteria;
  - Selecting the ideas that are most relevant to the issue, by the method of exclusion;
  - Identifying the idea having the highest assessment, as the best means revealing the solution of the problem.
4. **Demonstration Method** - This method involves visual representation of information. In terms of achieving the result it is quite effective. In many cases, it is best to provide the materials simultaneously with audio and visual means. The study material can be demonstrated by both - the teacher and the student. This method helps to visualize the different levels of learning material, to specify what students will have to do independently; at the same time, this strategy will visually represent the essence of the issue/problem. Demonstration may be simple.
5. **Analysis Method** - Helps dissolve the learning material as part of one whole component. This will simplify detailed coverage of individual issues within a difficult problem.
6. **Verbal or oral method** - Narration, speaking, etc. belong to this activity. In this process, the teacher represents the teaching material verbally, explains the teaching material, and the students perceive and acquire the material by listening, remembering and apprehending.
7. **Explanatory method** - is based on the discussion around the given issue, a teacher gives particular example being discussed in details within framework of the topic.
8. **Action-oriented teaching** - requires the involvement of the teacher and the student in the teaching process, where the practical interpretation of the theoretical material is taken into consideration.

### Student knowledge grading system

Assessment system is based on a 100-point scale.

Assessment of Teaching Component:

Positive grades:

- (A) - Excellent - the rating of 91-100 points;
- (B) - Very good - the rating of 81-90 points
- (C) - Good - the rating of 71-80 points
- (D) - Satisfactory - the rating of 61-70 points
- (E) - Enough - the rating of 51-60 points

Negative grades:

- (FX) - Did not pass - 41-50 points of rating, which means that the student needs more work to pass the

- subject and is given the right to take the additional exam once with independent work;
- **(F)** – Failed - 40 points and less, which means that the work carried out by the student is not enough and he/she has to learn the subject from the beginning.

**Assessment of Scientific-Research Component/Components:**

- a) Excellent (summa cum laude) - excellent work
- b) Very good (magna cum laude) - the result is above all requirements;
- c) Good (cum laude) - the result exceeds the requirements;
- d) Average (bene) - the result meets all the requirements;
- e) Satisfactory (rite) - the result meets the requirements despite the shortcomings,
- f) Inadequate (insufficenter) - the result does not meet the set-out requirements due to significant shortcomings;
- g) Completely unsatisfactory (sub omni canone) - the result does not meet requirements.

**Field of employment**

Doctoral program graduates will be able to work and achieve success in professional and higher educational institutions, state and regional governing and self-governance bodies, public organizations, consulting firms and agencies, international organizations.

**Human and material resources necessary for the implementation of the program**

The program is provided with material-technical resources (the document confirming the material resource is attached to the program): Academic auditors of the Faculty of Power Engineering and Telecommunication; Computer classes, laboratories; GTU library.

**Software Systems:**

1. Production and Operational Management – Quantitative Methods (POM-QM for Windows), Which is accompanied by methodical material: POM – QM for Windows. Software for Decision Sciences: Production and Operations Management, Quantitative Methods. Version 3. H. J. Weiss. Pearson Education, Inc. 2005. 235 p.
2. Excel Examples for Quantitative Methods, Which is accompanied by methodical material: Excel QM. H. J. Weiss. Pearson Education, Inc. 2012. 174 p.
3. SAP ERP 6.0 Enhancement Package 4 GBI system, Which is accompanied by methodical material:SAP ERP Using Global Bike Inc. 2.0, Stefan Weidner, Nov 2009
4. MRP Plus. Which is accompanied by methodical material: MRP Plus Concepts and Interactive Demo Manual, 2006, Horizon Software, Inc.
5. Computer Management of Programs Management Microsoft Project

**The program will be implemented by the following academic personnel (CVs are attached to the program):**

Konstantine Khmaladze, Professor, Candidate of Economic Sciences - Theory and Practice of Innovative Entrepreneurship, Management, Technological Basis for Economic Development;  
Archil Samadashvili, Professor, Candidate of Technical Sciences - Management of Business Processes, Operations Management, Innovation Management;  
Irine Khomeriki, Professor, Doctor of Technical Sciences - Project Management Systems, Computer Technologies in Management, Business Planning.

Number of attached syllabuses: 6

**Program subjects**

Nº	Learning component	Precondition to admit	ECTS credits						
			I Year		II Year		III Year		
			Semester						
			I	II	III	IV	V	VI	
1	Scientific communication techniques and modern methods of teaching	N/A	5						
2	Modern trends in enterprise management	N/A	5						
3	Intellectual potential and intellectual property	N/A	5						
4	Research Methods	N/A		5					
5	Business Process Organizing	N/A		5					
6	EU innovative space	N/A		5					
7	First thematic seminar	N/A	15						
8	Second thematic seminar	First thematic seminar		15					
Research component									
1	Theoretical / experimental research 1	N/A			15				
2	colloquium -1	N/A			15				
3	Theoretical / Experimental research 2	Theoretical / experimental study 1				15			
4	Colloquium -2	colloquium -1				15			
5	Theoretical / Experimental research y 3	Theoretical / experimental study 2					15		
6	Colloquium -3	Colloquium -2					15		
7	Dissertation thesis design, defense	All study and research components							30
<b>Total in year:</b>			<b>60</b>		<b>60</b>		<b>60</b>		
<b>Total:</b>			<b>180</b>						

### Map of learning outcomes

Nº	Study and Research Components	Knowledge and understanding	Ability to use knowledge in practice	Judgment skill	Communication skill	Learning skill	Values
1	Scientific communication techniques and modern methods of teaching	+	+	-	-	+	-
2	Modern trends in enterprise management	+	+	-	-	+	-
3	Intellectual potential and intellectual property	+	+	+	+	-	-
4	Research Methods	+	+	+	+	-	-
5	Business Process Organizing	+	+	-	-	+	-
6	EU innovative space	+	+	+	+	-	-
Research component							
7	First thematic seminar	+	+	+	+	+	+
8	The second thematic seminar	+	+	+	+	+	+

### Program curriculum

Nº	Subject code	Learning component	ECTS credit/hour	Lecture	Seminar (work in the group)	Practical work	Laboratory	Mid-semester exam	Final exam	Independent work
1	EDU1012G 1-LS	Scientific communication techniques and modern methods of teaching	5/125	15	30	-	-	1	2	77
2	BUA35402 G2-S	Modern trends in enterprise management	5/125	-	45	-	-	2	1	77
3	BUA35202 G2-LS	Intellectual potential and intellectual property	5/125	15	30	-	-	2	2	76
4	BUA35302 G2-LP	Research Methods	5/125	15	-	30	-	2	1	77
5	BUA35502 G2-LB	Business Process Organizing	5/125	15	-	-	30	2	1	77
6	SOS63102	EU innovative space	5/125	15	30	-	-	2	2	76

№	Subject code	Learning component	ECTS credit/hour	Lecture	Seminar (work in the group)	Practical work	Laboratory	Mid-semester exam	Final exam	Independent work
	G1-LS									

Head of the program

Jemal Beridze

Head of Quality Assurance Service of  
Faculty of Power Engineering and Telecommunication

Nikoloz Abzianidze

Dean of the faculty

Gia Arabidze

**Approved by**

Faculty of Power Engineering and telecommunication  
At the Faculty Board Meeting  
09.12.2015.

**Agreed with**

Quality Assurance Service of GTU

Irma Inashvili

**Modified by**

Faculty of Power Engineering and telecommunication  
At the Faculty Board Meeting  
27.03.2018 (Protocol №2)

Head of the Faculty Board

Gia Arabidze