საქართველოს ტექნიკური უნივერსიტეტი
GEORGIAN TECHNICAL UNIVERSITY

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PhD Educational Program

Program Title

ინოვაციებისა და ოპერაციათა მენეჯმენტი
Innovative and Operational Management

Faculty

ენერგეტიკისა და ტელეკომუნიკაციის
Power Engineering and Telecommunications

Program Head/Heads

Professor Konstantine KHMALADZE

Qualification to be Awarded and the Extent of the Program in terms of Credits

Doctor of Management Will be awarded in case of completion of the educational component (60 credits) and the research component provided by the educational program. The duration of the program is at least 3 years.

Language of Teaching

Georgian

Prerequisite for Admission to the Program

Master's degree or equivalent academic degree. The following are taken into account: the existence of scientific publications; participation in scientific conferences; other documents and materials related to educational/research activities (certificates, deeds, patents, etc.).
The results of the exam in one of the foreign languages (English, German, French, Russian), which will be held at the university testing center and an interview with the faculty temporary committee. The suitability of the doctoral candidate to the doctoral program is determined by the faculty temporary committee.
Regulations of the Dissertation Board and Doctorate of the Georgian Technical University http://gtu.ge/Study-Dep/Files/Pdf/doqtorantura_debuleb_2014.10.14_SD.pdf

Program Description

The educational program is compiled by the European Credit Transfer and Accumulation System (ECTS). At the Georgian Technical University, 1 credit corresponds to 25 academic hours and includes both contact and independent work hours. The distribution of the credits of the training component provided by the program is presented in the curriculum of the program.

The duration of the program is at least 3 years (6 semesters).

The objectives of the educational component are the sectoral and methodological preparation of the doctoral candidate for the implementation of the goals of the doctoral educational program. The educational component helps the doctoral candidate in the successful preparation of the thesis, in the future pedagogical and scientific activities. The educational component of the doctoral program is 60 credits.

Before the beginning of the semester, the rector of the university issues an order on the progress of the educational process, which will be posted on the website.

The education component is carried out in the I-II semesters, and its components, by dividing them into semesters, are given in the curriculum of the program.

The stages of the research component provided by the program are: research project/prospectus, colloquium - 1, colloquium - 2, colloquium - 3, preliminary defense and thesis completion-defense. Observance of the order of completion of the stages of the research component is mandatory, and the completion of each stage is a prerequisite for the next one.

The research component is assessed once, at the thesis defense stage, with a final assessment.
Detailed information is provided on the website of GTU.

Program Objective

The ongoing transformations in the country's economy, the expansion of international cooperation fundamentally impose new requirements on business entities. The issues of commercialization of products (services) occupy the most important place in the activities of enterprises, first of all, entrepreneurial activities based on innovations and the latest technologies.

As a result, there was a demand for those specialists who are able to understand the essence of engineering business (in scientific products and technologies), to analyze local and international markets with a systemic view, to solve complex issues of production and organization management.

The intensification of the economy and the need to increase its effectiveness require continuous improvement of the forms and methods of managing various economic processes, primarily innovative processes, as, at the modern stage, only a high level of innovation is a guarantee of the country's economic development and national security.

Currently, one of the weak links of the organizational-economic system of national economy management is the absence of innovation management mechanism. In the conditions of the market economy, innovations should contribute to the intensive development of the economy, ensure the introduction of scientific and technical achievements in production, and the full satisfaction of consumer demand for high-quality products and services.

Mastering innovation and operations management is a necessary condition for the formation of a modern manager-professional. Its purpose and tasks are to provide students with systematic theoretical and practical knowledge in order to: manage innovative processes in the field of Georgian economy, generalize experience, create a normative-legal base, establish a mechanism for the creation and management of innovative organizations.

Learning Outcomes/Competences (general and professional)

Knowledge and Understanding

- Knowledge based on modern paradigms and latest achievements of the engineering-innovative field, which creates opportunities to use innovative methods in practical activities, to prepare referable publications corresponding to existing standards.
- The importance of acquiring the necessary knowledge should be realized for the student. He/she should be able to re-understand the accumulated knowledge and empirical experience and, if necessary, re-evaluate/update it.

Ability to apply knowledge in practice

- Correct and creative understanding of modern technological advances and innovations, readiness for their implementation in practice; preparation of a scientific-practical work on the latest forms and methods of innovation and operations management.
- Development and implementation of methods and forms of innovative research system for the needs of scientific-practical activities, accumulation and distribution of new knowledge mainly through international scientific refereed publications.

Ability to make conclusions

- Critical analysis, synthesis and evaluation of new, complex and contradictory ideas and approaches from necessary evaluations and information processing in order to design and develop the right methodology in the field of innovation and operations management.
- Making independent conclusions and decisions based on innovative processes.

Communication skills

- The ability to present news in an argumentative manner compared to existing knowledge in the field of innovative technologies.
- Involvement in thematic polemics with the international scientific community, mutual exchange of scientific achievements.
- The ability to convey one's conclusions, arguments and research methods in a language understandable to the audience and to convince the listeners. Using modern technologies in dealing with people.

Ability to learn

- Constant willingness to learn, ability to absorb new ideas, initiatives and ventures based on the latest advances in knowledge. Conducting learning independently, on the basis of knowledge based on the latest achievements, the development of new ideas or processes through learning, activity and research. Support for the organization of learning.

Values

Has the ability to constantly strive for the establishment of public and national values. Researches and develops innovative methods for their implementation. In his/her scientific-theoretical, practical and pedagogical activities, he/she is guided by such values as professional objectivity, collegiality and honesty.

Methods of Achieving Learning Outcomes (teaching-learning)

☒ Lecture ☒ Practical ☒ Laboratory ☒ Seminar ☒ Consultation ☒
Independent work ☒ Research component ☒ Seminar paper ☒
Doctoral thesis

Teaching methods:

1. **Discussion/debate** – this is the most widely spread method of interactive teaching. A discussion process greatly increases the quality of students' involvement and their activity. A discussion may turn into an argument and this process is not merely confined to the questions posed by the teacher. It develops students' skills in reasoning and substantiating their own ideas.
2. **Cooperative learning** - this is a teaching strategy in which each group member is required not only to learn independently, but also to help his teammate learn the subject better. Each group member works on a problem until everyone has mastered it.
3. **Collaborative work** - using this method implies dividing students into separate groups and giving each group its own task. The group members work at their issues individually and at the same time share their opinions with the rest of the group. According to the problem raised, it is possible to shift the functions among the group members in this process. This strategy ensures the students' maximum involvement in the learning process.
4. **The heuristic method -** is based on the step-by-step solution of the given task. This process is carried out by independently fixing the facts and seeing the connections between them.
5. **Case study** – the teacher discusses specific cases with students and they study the issue comprehensively and thoroughly. For example, in engineering safety it might be a discussion of a specific accident or disaster

6. Brain storming - this method involves facilitating the formation and expression of as many, preferably radically different, opinions and ideas on a particular issue/problem within the theme as possible. The mentioned method stipulates the development of a creative approach to the problem. The use of the method is effective when there are large groups of students and consists of several basic stages:
- definition of the problem/issue from a creative point of view;
- during a certain period of time, uncritical recording of thoughts expressed by listeners on a problem (mostly on the board);
- definition of the evaluation criteria to determine whether the idea corresponds to the purpose of the research;
- evaluation of the chosen ideas according to predetermined criteria;
- through exclusion, to highlight those ideas that are most relevant to the issue
- identification of the idea with the highest score as the best way to solve the problem.

7. Demonstration method - this method implies a visual presentation of information. It is quite effective in terms of achieving results. In many cases, it is better to present the material to students in both audio and visual form simultaneously. The material being studied can be demonstrated by both the teacher and the student. This method helps to make visible the different stages of understanding the learning material, to clarify what students will have to do independently; At the same time, this strategy visualizes the essence of the issue/problem. The demonstration can take a simple form.

8. Deductive method - determines the form of transferring any knowledge, which is a logical process of discovering new knowledge based on general knowledge, i.e., the process goes from the general to the specific.

9. Method of analysis - helps to break down the learning material as a whole into its component parts. This facilitates detailed coverage of individual issues within a complex problem

10. Verbal or oral method. This method includes lecture, narration, conversation, etc. In the above process, the teacher conveys and explains the learning material through words, and students actively perceive and internalize it by listening, memorizing, and understanding.

11. Practical method - combines all the forms of teaching that provide students with practical skills. In this case, the student independently performs action based on the acquired knowledge, for example, production and pedagogical practice, field work, etc.

12. Laboratory method - involves the following actions: showing video material, dynamic material, etc.

13. Explanatory method - is based on discussing a given issue. In the process of explaining the material, the teacher brings concrete examples, the detailed analysis of which is made in the framework of the given topic.

14. Activity-based learning - requires the active involvement of the teacher and the student in the learning process, where the practical interpretation of theoretical material is especially important.

Student's Knowledge Assessment System

Assessment of the learning component:

Positive grades are:

- (A)-Excellent - 91-100 points;
- (B)-Very Good – 81-90 points;
- (C)-Good – 71-80 points;
- (D)-Satisfactory – 61-70 points;
- (E)-Sufficient – 51-60 points.

Negative grades are:

- (FX) - Failed to pass – 41-50 points, which means that the student needs more work to pass and is allowed to take an additional exam once with independent work;
- (F) - Failed - 40 points or less, which means that the work done by the student is insufficient and he/she will have to study the subject again.

Evaluation forms, methods, criteria and scales can be found in the relevant education course programs (syllabi).

Assessment of the scientific research component(s):

a) with the highest praise (summa cum laude) - excellent performance;

b) with great praise (magna cum laude) - result exceeding the requirements in all parameters;

c) with honor (cum laude) - a result that exceeds the requirements;

d) satisfactory (bene) - an average level work that meets the basic requirements;

e) sufficient (rite) - a result that, despite its shortcomings, still meets the requirements;

f) insufficient - an unsatisfactory level work that cannot meet the requirements due to significant deficiencies in the work;

g) completely unsatisfactory (sub omni canone) - a result that completely fails to meet the requirements

Fields of employment

Graduates of the doctoral program will be able to work and achieve success in professional and higher educational institutions, state and regional government and self-government bodies, public organizations, consulting firms and agencies, and international organizations.

Human and material resources needed to implement the program

The program is provided with human resources; The authors of study courses, syllabi and supervisors of doctoral students are professors of the Georgian Technical University.

The program is provided with material and technical resources (a document confirming the material resources is attached to the program): education auditoriums, computer classes, laboratories of the Department of Production Innovations and Operations Management (9th building of GTU); GTU library.

Software systems:

1. Production and Operational Management – Quantitative Methods (POM-QM for Windows), to which methodological material is attached: 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, to which methodological material is attached: Excel QM. H. J. Weiss. Pearson Education, Inc. 2012. 174 p.
3. SAP ERP 6.0 Enhancement Package 4 GBI system, to which methodological material is attached: SAP ERP Using Global Bike Inc. 2.0, Stefan Weidner, Nov 2009
4. MRP Plus, to which methodological material is attached: MRP Plus Concepts and Interactive Demo Manual, 2006, Horizon Software, Inc.
5. Program management computer packageMicrosoft Project

Additional information about the program's human and material resources is provided in the attached documents.

Number of attached syllabi: 6