



საქართველოს ტექნიკური უნივერსიტეტი
GEORGIAN TECHNICAL UNIVERSITY

Approved by
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PhD Educational Program

Program Title

მექანიკის ინჟინერია და ტექნოლოგია

Mechanical Engineering and Technology

Faculty

სატრანსპორტო სისტემებისა და მექანიკის ინჟინერიის ფაკულტეტი

Faculty of Transportation and Mechanical Engineering

Program Head/Heads

Associate Professor Khatuni AMKOLADZE

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

Doctor in of Mechanical Engineering and Technologys

will be awarded if the educational component of 60 credits of the educational program is mastered and the research component is completed. The period of study is at least 3 years.

Language of Teaching

Georgian

Prerequisite for Admission to the Program

A person with a education, relevant to a Classifier of Fields of Study 07: Engineering, Manufacturing and Construction, holding Master's degree or an academic degree equivalent to it, who meets the requirements for enrollment in the PhD program in accordance with the current rules in GTU, will be admitted to the mechanical engineering and technology PhD educational program. 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.). Applicants for enrollment in the program must submit a research project, where the purpose and direction of the applicant's research is outlined.

An applicant must present a relevant international certificate proving knowledge of English language at least B2 level or must pass an exam at the GTU exam center. An applicant who has completed a first- and second-level English-language program of higher education is not required to present a certificate or pass an exam.

In case of receiving a positive assessment in the English language, the applicant goes through an interview with the faculty temporary committee.

The procedure for admission to PhD studies and enrollment conditions are given on the university's website.

It is possible to enroll in the program on a mobility basis within the time limits established by the Ministry of Education, Science, Culture and Sports of Georgia, following the compulsory procedures and the rules established by the university. Enrollment in the program or transfer enrollment from a recognized higher educational institution of a foreign country is carried out in accordance with the rules defined by the legislation of Georgia.

Program Description

The program is based on the European Credit Transfer System (ECTS), at the Georgian Technical University -1 credit is equal to 25 hours, which includes both contact and independent work hours. The duration of the educational program is at least 3 years (6 semesters) and its educational component includes 60 credits.

The educational component of the program consists of a compulsory and elective component, which the PhD student must take in the first and second semesters. For the educational component of the program, 55 compulsory credits are defined, elective - 5 credits. The second and subsequent semesters involve the completion of research components, including: research project/prospectus, colloquium - 1, colloquium - 2, colloquium - 3, preliminary defense, thesis completion and defense.

See the Georgian Technical University's Doctoral Regulations and "Teaching and Research Components of Doctoral Education Programs and Their Evaluation Rules" in detail on the website of GTU.

The academic year consists of two semesters - fall and spring. Mid-semester and final/supplementary exam dates are set at the beginning of each semester by the rector's order on the basis of the "Instructions for managing the educational process at the Georgian Technical University", which is posted on the website.

Program Objective

The objective of the program is to prepare researchers who are competitive for the local and international labor market, who are focused on solving problematic issues of international importance, with knowledge based on the latest achievements, who will contribute:

- To the solution of tasks of kinematic and dynamic research, calculation, schematic and structural perfection of the main structural elements of machines and machine systems of any functional purpose (mechanisms, drive systems and mechatronic modules) and the machines and devices built on them as a whole;

- To solving the problematic issues of designing, developing, manufacturing, maintaining and monitoring modern production processes and equipment, technological devices and technological systems in the field;
- They will be able to independently develop innovative methods and do pedagogical and scientific work.

Learning outcomes/competencies (general and professional)

- **Possesses** the latest achievements in mechanical engineering and technology, which allows for the expansion of existing knowledge and the use of innovative methods, including for solving current problems of research, design and production of machines and machine systems;
- **Critically considers** the latest knowledge in the field of mechanical engineering and technology in order to identify the need for its partial reassessment and renewal in accordance with the development of technologies;
- **Analyzes** the results of the latest advances in the field of mechanical engineering and technology, which he uses in the implementation of research projects in academic and professional contexts;
- **Justifies** the need to develop innovative research and analytical methods and methodologies in the field of mechanical engineering and technology, which are focused on the creation of new knowledge and are reflected in international publications;
- **Plans** theoretical and experimental studies in mechanical engineering and technology using modern methods and adhering to the principles of integrity;
- **Independently solves** the problematic issues of the basic functional elements of machine mechanics (mechanisms, drive systems, mechatronic modules) and the research of machines built on them as a whole;
- **Performs** the work of perfecting and introducing new field technologies in mechanical engineering and production processes, joint analysis and synthesis of technical and economic efficiency, formation of new ideas and criteria and their implementation;
- **Argumentatively justifies** opinions about ways and methods of researching and solving complex problems in mechanical engineering and technology in thematic discussions held at seminars and conferences;
- **Implements** teaching by combining the latest teaching-learning methods and their strategies, imparting knowledge based on the latest achievements and preparing assignments focused on its reinforcement, ensuring the inclusion/participation of students in the process of analyzing issues and using relevant methods and criteria for their assessment;
- **Adheres** to the principles of ethical and professional responsibility and integrity in the learning and research process.

Methods of achieving learning outcomes (teaching-learning)

Lecture Seminar (group work) Practical Laboratory Scientific and thematic seminar Independent work Consultation Research component Thesis design Thesis defense

In the learning process, depending on the specifics of a particular study course program, the following activities of the teaching-learning methods are used, which are outlined in the relevant study course programs (syllabi):

Discussion/debate; group (collaborative) work; demonstration; induction; deduction; analysis; synthesis; verbal word or oral; written work; explanation; Case studies; action-oriented learning; problem-based learning (PBL); brain storming; project development and presentation;

Student's Knowledge Assessment System

The student's knowledge is assessed on a 100-point scale.

Assessment of the educational component:

Positive grades are:

- (A) – Excellent – 90-100 points of assessment;
- (B) – very good – 81 – 90 points of assessment
- (C) – Good – 71 – 80 points of the assessment
- (D) – satisfactory – 61 – 70 points of the assessment
- (E) – sufficient – 51 – 60 points of the assessment

Negative grades are:

- (FX) - Failed to pass – 41-50 % of the assessment, 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.

In case of FX, an additional exam is held, not less than 5 days after the announcement of the results. The grade obtained in the additional exam is not added to the grade obtained in the final assessment. The grade obtained on the additional exam is the final grade and is reflected in the final grade of the educational program component. In case of receiving 0-50 points in the final evaluation of the educational component, taking into account the evaluation received at the additional exam, the student is assigned an F-0 score.

Assessment of the scientific-research component/components:

- a) Excellent (summa cum laude) - excellent performance;
- b) Very good (magna cum laude) - result exceeding the requirements in all parameters;
- c) Good (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 (insufficenter) - 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.

The assessment of the research component of the PhD educational program is done once, with a final assessment. The educational and research components of the educational program of doctoral studies and the procedure for their evaluation are posted on the University website: "Instructions for managing the educational process at the Georgian Technical University" ..

Fields of Employment

Related to the design, manufacture, technical and production operation of various types of machines and machinery systems, including mechanical engineering and technology, sectoral research and design institutions, universities, educational and scientific institutes, state and private firms and organizations.

Human and material resources needed to implement the program

The PhD educational program is provided with appropriate human and material resources. Information is provided in the attached documentation.

Number of attached syllabi: 10