

Georgian Technical University

The Faculty of Engineering Economics, Media Technologies and Social Sciences

The Department of Engineering Economics

The Laboratory of Economic Process Modelling

Regulations

1. The novelty, objective and tasks of the survey

1.1 The topicality and novelty of the problem

An urgent need for economic disciplines training level improvement in modern educational sphere has become very critical, which, above all, was conditioned by the deficiency of the relative scientific-pedagogical brainpower. Unfortunately, the problem has not been overcome even today.

It is complimentary, that at present stage the Ministry of Education and Science of Georgia gives priority to subjects teaching enhancement in exact and natural sciences and the process should start directly at public schools. With a view to technical branches developing and facilitating, 80 per cent of grants are allotted for the faculties of engineering, natural sciences and IT technologies. Definitely, all this will contribute to the popularity of engineering professions, though it is important to realize plenty of innovative projects in mentioned direction.

The greatest progress in the development of computer technologies ensures accentuation on formalized methods and algorithms as reliable and precision tools in the course of complicated economic process survey.

For the determination of wide range tasks of economic analyses and forecasting and managerial skills ability development, the economic-mathematical methods and models (EMMM) may be successfully used. Consequently, it is beyond question how actual it has become to train highly - skilled experts, especially in the spheres of economic and business administration, as well as in the engineering ones. Without performing this kind of activity, the steady economic development of the country is impossible.

Despite the fact that in the country (and especially in GTU) the scientific potential in economic-mathematical modelling sphere is still very high, owing to some subjective or objective reasons, the amount of relative publications is rather small. In this relation it should be mentioned, that today's problems are not captured in them with clear topicality and acuity.

Taking into consideration the mentioned above, the main objectives of the laboratory survey could have been formulated as follows:

- retrieval, acquisition and analysis of EMMM available programmed packages. Their adjustment, taking into consideration all the GTU faculties realities;
- new economic-mathematical models creation;

- working out of new modern methodologies with the view of EMMM introducing into the educational process. To amend relatively the syllabi and educational programs;
- holding trainings for the teachers and professors, who consider it reasonable to utilize relevant EMMM programmed packages in the educational process;
- efficiency rating increase of EMMM tools utilization in Masters' and Doctoral survey components;
- the scientific survey intensifying in the direction of economic-mathematical modeling, with the view of survey results into practice applying.

1.2 The matter and the objectives of the survey

The matter of the laboratory survey is the complicated economic process, connected both, with separate branches (construction, power engineering, transport, industry, agriculture and others), and effective functioning of economic in general. The goal of the laboratory is the survey of the problems in educational and scientific line, which are connected with the EMMM utilization in the mentioned process. Raising the standards of economic disciplines teaching and their extremely close drawing to modern ones based on syllabi and educational programs improvement.

At the starting point the EMMM applied programmed packages, retrieved and acquired via various informational sources will be analyzed. Their adjustment possibilities to various GTU faculties will be investigated.

Further on, the survey should be continued with the view of new program output creating. At the same time, alongside with the professors and teachers, the bachelors, masters and Doctors of Science should become involved into the process. Without doubt, it will raise their educational and survey motivation and in its turn, it will have an influence both, on their scientific publications and masters' and doctoral thesis.

2. The methods of the survey and anticipated results

2.1 Survey methods conformity with the project tasks

The scientific survey will be conducted in compliance with the following directions of the disciplines, involved in EMMM:

- **Economical cybernetics:** systems analysis of the economics, economic informatics and control systems theory;
- **Mathematical statistics:** selective method, dispersing, correlative, regressive, multidimensional statistic analysis, the theory of indices and others.
- **Mathematical economics:** the theory of economic growth, the theory of production function, inter-sectoral balancing, national accounts, demand and consumption analysis, regional and spatial analysis, global modeling and others.
- **Optimal decision making methods** and among them operational research in economics. It comprises the following disciplines and methods: mathematical

programming (rectilinear, non-rectilinear, dynamic, integer, fraction-linear, parametric, separable, stochastic, geometrical), planning and controlling network methods, storekeeping methods, queuing system theory, game theory, decision taking theory and methods;

- **Economic optimal functioning models:** optimal planning, optimal pricing (price formation) theory, logistics support models, competitive models, indicator planning models, company's theory models and others.
- **Experimental models of economic events studying:** simulation model, business games. Methods of expert assessment could be reckoned in.

Within the limits of the foregoing engineering-economic scientific disciplines:

- the relevant educational programs and syllabi will be processed;
- the methodology of economic disciplines teaching will be worked out.

Close cooperation with teachers and professors using EMMM programmed packages (among them active teaching methods. Simultaneously relative training courses would be held for them;

- the scientific conferences, theoretical seminars, discussions will be held with active participation of masters and doctoral students and other participants interested in;
- publications, masters' and doctoral theses will be prepared;
- at the final stage the proposals and recommendations of conducted scientific survey will be worked out the results of which will be aimed at practical application;

The ways of problem solution, facing the laboratory of economic process modelling could be represented in the following way:

1. in relation to EMMM utilization, acquisition of programmed packages and business games conforming to modern standards. Their adaptation to relative scientific and educational goals;
2. models processing (specification, parameterization, verification) based on empirical data, connected with real economic processes. Their introduction into the educational process and utilization with a view to forecasting.
3. using the methods of simulative (imitative) modelling, processing of economic facility normative models and corresponding business – games.

2.2 Anticipated results of the survey and their significance for various scientific lines

The programmed material worked up in the laboratory of economic process modelling may be used for the non-commercial educational classes and laboratories of University.

The efficient functioning of the laboratory will qualitatively raise to a new stage an educational process at the Faculty of Engineering Economics, Media Technologies and Social Sciences in Georgian Technical University.

Using the theoretical knowledge on optimized models (both static, and dynamic) of complicated economic and manufacturing processes, the students will acquire practical skills of optimal decision working out and controlling parameters seeking ways in the course of numerical algorithms realization.

The results of scientific research conducted in the laboratory will also be very important, as it will have effect on the amount and quality of publications, doctoral theses, manuals (textbooks) and monographies.