Ministry of Education and Science of Georgia

Kutaisi University

Faculty of Economics and Business
Economics Department

Approved at the meeting of the Academic Council
Minutes # 3 June 9, 2011

Rector: L. Kelbakiani

Minor Program

in

Applied Mathematics

Kutaisi 2011
Name of the Academic Program:
Applied Mathematics

Stage of Higher Education:
Bachelor's Degree Course

Language of Instruction:
Georgian

Program Prerequisites:
Certificate of General Education, passing Unified National Examinations in Georgian, general skills, English language and an optional fourth subject, obtaining the status of a student of Kutaisi University and minimum “C” grade in the following modules:
- Mathematics for Economists 1;
- Mathematics for Economists 2.

Program Volume:
Overall volume of the program is 60 credits or 1500 hours.

General overview of the program:
The program curriculum includes general theoretical courses such as Econometrics, Economic and Mathematical Modeling, etc. as well as applied courses connected with the use of mathematical modeling in solving economic problems (operational research, case analysis, intracompany situation modeling, inflation modeling, methods of analysis of financial indicators, modeling financial markets, etc.).

Students get acquainted with mathematical models and their use in decision-making. They become familiar with mathematical instruments used for making and implementing economic and management decisions in the modern world.

The main aim of the Minor in “Applied Mathematics”:
The program aims to prepare highly qualified specialists capable of applying up-to-date mathematical methods and techniques in various areas of economic and business activities.

Learning Outcomes:
The job of a company analyst is creative and has high potential. Analysts are interested not only in what was or is, but also what could have been. They must be able to create a full picture from disembodied numbers, indicators and pieces of information. They are responsible for defining the company’s future prospects and finding the best ways to achieving the goals.

The students successfully completing the minor program in “Applied Mathematics” will be able to
• construct a mathematical model of formation and/or change of the main indicators of a company’s activities;
• take part in developing strategies in various branches of economy;
• use up-to-date programs in the process of decision-making;
• manage projects and risks using mathematical methods;
• optimize business processes in logistics;
• evaluate company’s assets and manage them.

On completion of the program the students will have developed the following competencies:

**Knowledge and understanding:**

have knowledge of the main concepts and methods of modern mathematical disciplines, namely the main methods of mathematical analysis, differential equations, linear algebra, financial mathematics, relativity theory and mathematical statistics that are used to solve problems in economics; understand the use of mathematical modelling of specific economic problems, have knowledge required to specify or disprove hypotheses suggested by economic theory, interpret and use econometric models.

**Applying knowledge and understanding**

be able to use mathematical methods in analyzing and solving practical tasks, use logical mathematical reasoning clearly identifying given values, suppositions and conclusions; be able to calculate financial outcomes of an operation for all parties concerned, compare effectiveness of various operations and options; coordinate the main parameters of an operation and determine the results of contracts; work out plans for conducting financial operations; in cases of probability relationships describe their distribution principles and make adequate conclusions on the basis of relevant knowledge.

Graduates will have skills in mathematical modeling and be able to apply econometric methods in solving analytic tasks and economic forecasting, to determine adequacy-inadequacy of a model.

**Making judgments:**

Students will be able to collect data when researching economic phenomena, define and formulate values, provide adequate economic interpretation or analysis of obtained mathematical results, make well-argumented conclusions.

**Learning skills**

Students will get acquainted with up-to-date academic literature and receive additional knowledge. They will be able to evaluate their own learning processes, determine future learning needs; the received knowledge will serve as a foundation for studying disciplines that rely on the results of the disciplines covered in the program.
Communication Skills
Students will be able to perceive, generalize, critically analyze and synthesize information, set goals and select the ways to achieve these goals; to structure their thoughts logically, fluently in a reasoned and clear way in written or spoken form; to use modern equipment and information technologies for solving tasks and searching for information; be aware of the value of information and have skills required for obtaining, storing and processing it; be able to communicate (in Georgian and English languages) with specialist and non-specialist audiences on the issues concerning mathematics; to work in a group; to create and edit professional texts and present the results of their work.

Values
Students will have critical thinking skills and ability for self-criticism; demonstrate initiative and creative approach to work, have professional responsibility and be aware of the main principles of ethics; is capable of making decisions and taking responsibility in nonstandard situations.

Employment Opportunities
Minor in “Applied Mathematics” is offered within the major program in “Business Administration”. Consequently, the modules taught as part of this program aim to refine the competencies developed within the Major program thus increasing the graduate’s competitive potential on the labor market and forming a foundation for a successful career.

Teaching Methodology
Teaching within the program will be conducted using modern methodology of teaching and learning as described in the didactic concept of KU. Applying independent, competitive and cooperative approaches in teaching, facilitating student interaction and planning a variety of academic activities ensures high level of student motivation, effectiveness of knowledge acquisition and development of social skills. This approach makes the academic process more enjoyable, varied and interesting (quality of knowledge acquisition, critical thinking) and comprehensive (skill building, information coverage). Alongside with traditional lectures practical trainings, group work, projects, case studies and other active methods of teaching are used.

Assessment
Assessment implies measuring an object, event or a process against pre-defined criteria. The main purpose of assessment is to determine the quality and results of student learning with regard to the aims and parameters of the academic program. For measuring students’ success the program uses the criteria of assessment that determine whether the students have developed skills necessary to solve problems in the business context, whether they are capable of formulating prerequisites and conditions, research questions, conclusions and recommendations, if they can organize their own work, report on their findings and conclusions and provide arguments in their defense. Summative as well as formative (providing feedback) assessment is used.
The system of assessment aims to provide a qualitative descriptor of students’ results as measured against the aims and parameters of the academic program.

The structure of assessment in each module/discipline comprises two elements – intermediate and final assessment – with certain percentage attached to each of them. Intermediate assessment may also contain several components each carrying certain percentage. A grade is calculated from the sum of both elements of assessment considering their percentage. Minimum pass grade is 51.

An examination is an instrument of assessing students’ knowledge and it aims to reveal the degree to which students have familiarized themselves with the given module or course.

All tests are administered in written form.

**Prerequisites for allowing students to take a final examination:**
- Students are allowed to take examinations if sum total of mid-semester exams and maximum grade of the final exam is 51 points minimum.
- Preparing papers, presentations, etc. This implies that students who have not handed in their papers or any coursework are not allowed to take the final examination until they complete all these assignments even if in other components they have reached the pass grade.
- Complying with the requirements of the KU Statute and conditions of contracts.

**The System of Assessment**

Student performance is assessed on a scale of points, maximum final grade in each module being 100 points. A student’s overall grade is not based only on the results of the final exam. It is derived from the results throughout the course.

This system of assessment recognizes 5 types of passing grade.

- 91% of maximum grade and over – A (excellent)
- 81% of maximum grade and over – B (very good)
- 71% of maximum grade and over – C (good)
- 61% of maximum grade and over – D (average)
- 51% of maximum grade and over – E (satisfactory)

There are 2 fail grades:

- 41-50% of maximum grade – FX (unsatisfactory), means that some more work is required to pass and the student has the right to retake the exam once after independent study. In this case the student must retake the examination in the same semester within 1 month but not earlier than in 10 days after the end-of-semester examination.
- 41% and lower of the maximum grade – F (fail) means that considerable further work is required and the student has to study the module again.

The program at KU is considered completed if the student accumulates the number of credits required by the program and successfully defends Bachelor’s dissertation.
GPA Calculation at Kutaisi University

<table>
<thead>
<tr>
<th>GPA</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0</td>
<td>higher than 91%</td>
</tr>
<tr>
<td>3.7</td>
<td>85 - 91%</td>
</tr>
<tr>
<td>3.3</td>
<td>81 - 84.9%</td>
</tr>
<tr>
<td>3.0</td>
<td>75 - 80.9%</td>
</tr>
<tr>
<td>2.7</td>
<td>71 - 74.9%</td>
</tr>
<tr>
<td>2.3</td>
<td>61 - 70.9%</td>
</tr>
<tr>
<td>2.0</td>
<td>51 - 60.9%</td>
</tr>
<tr>
<td>1.7</td>
<td>41 - 50.9%</td>
</tr>
<tr>
<td>1.3</td>
<td>30 - 39.9%</td>
</tr>
<tr>
<td>1.0</td>
<td>20 - 29.9%</td>
</tr>
<tr>
<td>0.0</td>
<td>0.0 - 19.9%</td>
</tr>
</tbody>
</table>

GPA for individual modules:
GPA for individual modules is calculated according to the table above. For instance, if a student has accumulated 88 points, their GPA is 3.7

Calculating Cumulative GPA
At the end of the term or an academic year a student’s cumulative GPA is calculated according in the following way
Cumulative GPA= total number of grade points/ accumulated number of credits
Total number of grade points = individual GPA * course credit
For example, if you did 2 3-credit courses earning 88 points (GPA 3.7) and 78 points (GPA 3.0) for them, cumulative GPA for these two courses will be:
Total number of grade points= (3.7*3credits) + (3.0*3) =11.1+9.0=20.1
Cumulative GPA = 20.1 / 6 =3.33

Material and Technical Resources
The university has adequate material and technical resources for implementation of the academic program: lecture rooms, a library, offices of the academic personnel, information and communication technologies, all the facilities and equipment needed for the program.

Human Resources
1. Kordzadze Tea – PhD in Technology, Associate Professor (Program Supervisor)
2. Beradze Maia - PhD in Mathematics, Associate Professor
3. Kelbakiani Lali - PhD in Mathematics, Associate Professor
4. Modebadze Temuri - PhD in Mathematics, Invited staff
5. Mnatsakaniani Miranda - PhD in Mathematics, Invited staff
6. Gogoladze Nino - PhD in Technology, Invited staff