MINISTRY OF EDUCATION

Identified competency focus areas and core courses for National Exit Examination

Program: Bachelor of Science Degree in Surveying Engineering

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1. Introduction

The Ethiopian Ministry of Education has disclosed a plan to introduce exit exams in all undergraduate university programs from the next academic year, starting June 2015 E.C. The ministry's decision can be regarded as a manifestation of decreasing trust in degrees acquired from universities and student grades, both of which are no longer regarded as a true measurement of actual academic capabilities.

The proposed scheme appears to resemble a high-stakes exam. Students who do not pass can be given additional opportunities to sit for another round of the exit exam but will not be entitled to any form of employment unless they pass. The ministry believes that the scheme will bring about attitudinal changes by discouraging students from rampant exam cheating and helping them do their own work.

The main idea behind an exit exam is the need to check whether students have attained the intended learning outcomes of the programs they have attended. In fact, exit exams can offer several potential benefits if designed as a reliable measure of student learning. There are those who argue that the competition and transparency encouraged through exit exams can help raise the declining quality of education and provide the chance for restoring confidence in a given higher education system.

Exit exams are also regarded as helpful in instituting a system of accountability and transparency through which students, instructors, higher education institutions and academic leaders can be measured for their success or failure, based on student outcomes. This is due to the capacity of the exams to offer detailed up-to-date feedback about student performance and the system.

The academic program reviews and benchmarking that could ensue following exit exam results can also be vital to the improvement of the quality and effectiveness of academic programs and institutional performance. In addition to helping pinpoint areas for development or improvement at institutional level, achievements on exit exams can offer options for individual students, who achieve higher scores, to attend higher education institutions.

Exit exams can also provide useful information to universities on the overall quality of their system with the ensuing incentive of prioritizing high-quality instruction without which they may risk losing their competitiveness. Employers can use exit exams as a means of gauging the performance and potential of recent college graduates whom they wish to employ. However, there are also those who consider exit exams as an unnecessary intrusion in the system.

Regardless of their benefits, not all higher education institutions will necessarily see the need for such a scheme, and for a variety of reasons.

Surveying Engineering concerns with acquiring, storing, managing, processing, integrating, and visualizing geographic and spatially referenced information as well as integrating the data for different kind of analyses. Surveying Engineers conduct one, or more, of the following activities; determine measure and represent land, three dimensional objects, point fields and trajectories; assemble and interpret land and geographically related information, use that information for the planning and efficient administration of the land, the sea and any structures thereon; and, conduct research into the above practices and to develop them.

The harmonized curriculum developed for this program basically had two categorize, which is before and after 2012 E.C. An exit exam is conducted to evaluate the practical skills, knowledge and attitude of a student who learnt courses or competencies of a given curriculum. The exit exams are given at the end of the tenure of higher education to get a degree or diploma for a particular program.

1.1. Objective of exit examination

The national public administration exit exam shall have the following objectives

- To produce skilled and competent manpower to national and international market
- Assessing students' educational achievement in major areas of Surveying Engineering.
- Ensuring whether the graduation profile of Surveying Engineering curriculum have achieved at least common standards of knowledge and practical skills
- Improving public trust and confidence in Surveying Engineering activities of professionals
- Facilitating the efforts of students to revise the core learning outcomes of the courses covered by the exit examination
- Ensuring all graduates from HEIs satisfy the requirements of the labor market and employability through the national wide implementation of competency-based exit exam
- Creating competitive spirit among Surveying Engineering department in Ethiopia with the vies to encouraging them to give due attention to the national standards

1.2. Significance of the document

It is important to set competency areas of the subject matter (program) in order to measure the how much graduates are acquired with skills, knowledge and attitudes. The following shows us the significance or setting competencies and identifying core courses of the program;

- To set competencies that helps to assess the basic skills, knowledge and attitude of graduating students;
- To systematically identify the core courses which will be included the exit exam;

2. Expected profile of graduates

The graduates of the Surveying Engineering program should demonstrate competency in one or more of the following Surveying Engineering competency areas: boundary/land surveying, photogrammetry, geodesy, GIS, cartography, cadaster and other related area of applications.

- The graduates of the Surveying Engineering program should apply basic mathematical, scientific, legal and measurement principles that form the theoretical framework of professional surveying practice.
- The graduates of the Surveying Engineering program should undertakes reconnaissance, preliminary and construction activities in civil engineering, irrigation and construction projects.
- The graduates of Surveying Engineering program should plan, manage, monitor and evaluate Geospatial engineering projects.
- The graduates of Surveying Engineering program should select and properly use appropriate techniques and tools to collect, analyze and interpret data to obtain optimum surveying solutions for different situations in the country.
- The graduates of the Surveying Engineering program should demonstrate professional and Ethical responsibilities of surveying engineers in relation to public and private institutions.

3. Competencies and learning outcomes

3.1. Competencies

The graduate of Surveying Engineering degree program should have the following competencies

3.1.1. Knowledge

Knowledge if the fact or condition of knowing something with familiarity gained through experience or association. Surveying engineering students are expected to know both theoretical and practical skills. So, the areas of knowledge embodied by the graduate of Surveying Engineering degree program can be stated as the following:

- Identifying, formulating, and resolving Surveying Engineering problems, and creating possible approaches that reflect economic, environmental, and social sensitivities.
- Understanding the utilization of surveying and carrying out of site survey and preparation of contour maps and section.
- Understanding the concept of Land policy and administration fundamentals.
- Understanding how to prepare map in traditional methods and in modern software.
- Acquiring the use remote sensing data for development, analysis and interpretation of spatial information.
- Realizing surveying knowledge for linear engineering and construction.

3.1.2. Skill

Skill is the learned ability to carry out pre-determined results often with the minimum outlay of time, energy, or both. So, the graduate of Surveying Engineering degree program should have the following skills.

- Performing numerous Topographic and Route Surveys for Civil Engineering purposes for local municipalities.
- Applying Geospatial skill for practical projects develop and execute a GIS or other related spatial database.
- Interpreting and analyzing aerial photography to measure length, area, & angle from aerial photograph.
- Preparing maps in traditional methods also use hardware and software programs.
- Being able to function in multidisciplinary teams and to communicate effectively.

3.1.3. Attitude

Attitudes encompass the communication, emotional skills, ethics, and behaviors, to carry out tasks to know when and how to engage in those tasks with others. he attitudes gained by the graduates are listed as follows:

- Exhibiting a commitment to lifelong learning and professional development, involvement in professional activity and public service, and achievement of professional licensure;
- Reflecting a broad intellectual training for success in multidisciplinary professional practice, in Surveying Engineering or diverse related careers, and toward achieving leadership roles in industry, government, and academia
- Keeping up to date with current developments in the discipline to continue one's professional development.
- Displaying a systems viewpoint, critical thinking, effective communication and interpersonal skills, a spirit of curiosity, and conduct by reflecting a professional and ethical manner;

3.2. Learning outcomes

The graduate of Surveying Engineering degree program should have the following learning outcomes:

- Ability to apply knowledge of mathematics, science and Engineering.
- Ability to design, conduct, and supervise different Surveying Engineering works, as well as to analyze and interpret data.
- Ability to function on multi-disciplinary teams and to communicate effectively.
- Ability to identify, formulates, analyze and solve Geospatial Engineering problems.
- Understand professional and ethical responsibility.
- Ability to use the techniques, skills, and modern Engineering tools necessary for engineering practice.
- Keep abreast of new technologies in Surveying Engineering and provide orientation and/or training to subordinates as required.

4. Course to be included in the exam

The core courses listed on the harmonized curriculum (old curriculum /before 2012 E.C.) are the main focus area for the preparation of the exit exam. Those courses are listed as the following:

- Fundamentals of Surveying
- Route Surveying
- Topographic Surveying
- Construction Surveying
- Cadastral Surveying
- Cartography
- GIS
- Spatial Database Management System
- Remote Sensing
- Digital Image Analysis
- Photogrammetry
- Geodesy (Introduction and Control Surveying)
- Global Positioning System (GPS)
- Adjustment of Surveying Measurements

4.1. Categorizing courses into themes

The above listed course included in the exit exam are categorized based the relationship subject matter of the courses and learning outcomes.

S.N	Course theme		Course name	Course ECTS	Weight in %
1	Basic of Surveying	1	Fundamentals of Surveying	**5**	**5.88**
		2	Route Surveying	**5**	**5.88**
		3	Topographic Surveying	**5**	**5.88**
		4	Construction Surveying	**5**	**5.88**
		5	Cadastral Surveying	**5**	**5.88**
2	GIS and Cartography	6	Cartography	**10**	**11.76**
		7	GIS	**10**	**11.76**
		8	Spatial Database Management System	**5**	**5.88**
3	Remote Sensing and Photogrammetry	9	Remote Sensing	**5**	**5.88**
		10	Digital Image Analysis	**5**	**5.88**
		11	Photogrammetry	**10**	**11.76**
4	Geodesy	12	Geodesy (Introduction and Control Surveying)	**5**	**5.88**
		13	Global Positioning System (GPS)	**5**	**5.88**
		14	Adjustment of Surveying Measurements	**5**	**5.88**
				85	**100.00**

5. Conclusion

The proposed exit exam for 2015 academic year graduates of first degree consists of 14 courses. This exit exam is considered as the main input for educational quality assurance, to meet graduate profile, to assess students' educational achievements, improves learning outcomes set on the curriculum and used as source of information for decision makers.

The undergraduate program of Surveying Engineering students generally took around sixty courses. The main focus of the students should be on the core courses listed above to be competent for the exit exam. Moreover, at the end of each course and also the program each student must fulfill the outcomes of the graduate profile listed on the curriculum.

The course domain included for exit exam is mainly focus on selected core courses from the curriculum and categorized in four course themes. These course themes are Basics of Surveying, GIS & cartography, remote sensing & photogrammetry and geodesy.

Generally this document is used as a reference for exit exam question preparation, benchmark for the coming document preparation and guideline for the universities who gives the program.