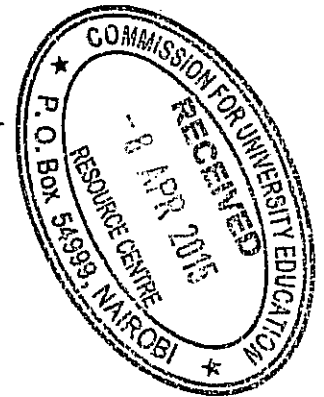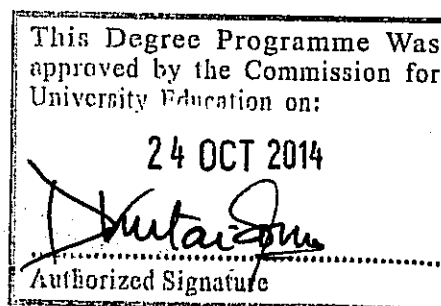# DAYSTAR UNIVERSITY

Proposed Curriculum for:

BACHELOR OF SCIENCE IN ACTUARIAL SCIENCE

SUBMITTED TO THE COMMISSION FOR UNIVERSITY EDUCATION

SEPTEMBER 2014

D.U App prog 2015

CHAPTER 2   ACTUARIAL SCIENCE PROGRAMME

2.1   *Introduction*

The Department of Science and Engineering, in line with the vision and mission of Daystar University proposes to offer a Bachelor of Science Degree with a major in Actuarial Science, which will help meet the very high demand for actuaries in the fields of insurance, employee benefits, pension and management consulting as well as banking and finance. Actuaries are also needed in brokerage firms, software development and elsewhere.

Actuarial science is primarily concerned with construction of models and solutions for financial, business, and societal problems involving uncertain future events. Actuaries forecast the cost of future risks and improve financial decision making. This is achieved by developing models to evaluate the current financial implications of uncertain future events. There is also an increasing interest within organizations in risk assessment and risk management. The increasing uncertainties of today's rapidly changing economies are opening up more opportunities for actuarial problem solving, making actuarial science one of the most sought after professions.

Actuaries are experts in evaluating the likelihood of future events, designing creative ways to reduce the likelihood of undesirable events, and decreasing the impact of undesirable events that do occur. The impact of undesirable events can have both emotional and financial implications. Reducing the likelihood of these events helps relieve emotional pain. But some events, such as death, cannot be totally avoided. So, reducing their financial impact is very important. Actuaries are the leading professionals in finding ways to manage risk. It takes a combination of strong analytical skills, business knowledge and understanding of human behavior to design and manage programmes that control risk.

By its very nature, actuarial science is interdisciplinary and actuaries need to have ethics that are desirable and well rounded. Daystar University is a liberal arts university, where the major courses are supplemented with general education courses in a wide variety of subject areas. Thus, the actuary will be developed with a broad range of knowledge that includes human behavior, history, culture, religion, communication, etc. The Actuarial Science Programme seeks to develop the skills of an actuary, integrated with Christian values that are necessary to produce a "whole" person with ethics that are admirable in the Christian context and by the population in general.

Daystar University, being founded on Christian principles strives to train servant leaders who are dedicated and honest in their work. Honesty is required in all professional fields, but more so in the actuarial science profession.

2.2   *Rationale*

In the current rapidly changing economies of the world, there is a great need for professionals with skills of an actuary, integrated with Christian values, who are able to help cushion financial institutions and financial service providers by providing timely advice on the possible risks of current financial undertakings.

Daystar University has adequate facilities and is strategically placed near headquarters of many financial and other institutions where data that may be used for learning purposes is available. In addition, there are numerous financial institutions not far from the University where actuaries are required. Furthermore, there is an acute need in sub-Saharan Africa to forecast the cost of future risks and improve financial decisions due to the weak economies that need sound risk assessment procedures. Daystar is thus in a position to help these economies by producing professionals who are able to develop models to predict, and minimize these risks.

Computers are available in both campuses of the university and effort is being made to acquire the relevant software to be used for this programme. The software includes Matlab, SPSS, R, S, S+ (R, S, and S+ are open-source statistics software packages) among others. Daystar's libraries are well equipped with relevant books for the required foundational courses in mathematics and specific books in actuarial science have been acquired. No other major equipment or apparatus is required to launch the programme since some of the mathematics courses are already in place at Daystar.

2.3 Admission Requirements for the Programme

Applicants must meet the general admission requirements that apply to all Daystar University students as stated in the University Catalogue. They must have at least a C+ (C Plus) or better overall average grade in KCSE or equivalent examination for students who have gone through other systems.

In addition, a candidate must fulfill at least one of the following requirements

2.3.1   Have passed the KCSE (or equivalent) with a grade C+ or better in mathematics and English.

2.3.2   Students having an A-level certificate must have at least two (2) principal passes of which one must be in mathematics.

2.3.3   Students having an O-level certificate must have five (5) credits and must have a credit 4 or better in both Mathematics and English.

2.3.4   A credit pass in a relevant ordinary diploma from a recognized tertiary institution.

2.3.5   Hold a relevant Higher National Diploma.

2.3.6   Students may also enter the programme from the Daystar University's Pre-university programme if their average grade is B- or better in mathematics.

2.4 Programme Objectives

The objectives of the programme are to prepare graduates:
2.4.1   for the following careers:
   2.4.1.1   Insurance Companies: Valuing financial contracts and investing funds;
   2.4.1.2   Consultancy: Offering advice to occupational pension funds and employee benefit plans;
   2.4.1.3   Government Service: Supervising insurance companies and advising on the national insurance;
   2.4.1.4   General: Stock exchange, industry, commerce and universities.

2.4.2 to continue their studies at the postgraduate level

2.4.3 to qualify in exams for professional bodies, for example International Society of Actuaries' examinations, and

2.4.4 to conduct relevant research in the field.

2.5 Learning Outcomes

A graduate of the Actuarial Science programme is expected to:

2.5.1 apply knowledge of calculus, probability, and statistics to actuarial analysis;

2.5.2 relate economics and finance knowledge to basic business sense;

2.5.3 demonstrate advanced knowledge of interest theory, actuarial mathematics, and contingency theory;

2.5.4 apply fundamental actuarial and statistical methods for quantitatively assessing risk;

2.5.5 evaluate a problem and model a solution using advanced actuarial and statistical methods;

2.5.6 apply the theoretical basis of actuarial models to insurance and other financial risks;

2.5.7 solve business problems following the steps involved in the modeling process;

2.5.8 use basic computer skills including knowledge of software packages for statistical analysis; and

2.5.9 develop solid written and oral communication skills.

2.6 Assessment

Unless specified in the individual course syllabus of a specific course, the continuous assessment items will form 40%, while the final exam will contribute 60% to the score to be used to determine a student's grade. Conversion to letter grades will follow the University standards outlined in Chapter 1.

2.7 Duration and Graduation Requirements

The Bachelor of Science in Actuarial Science shall typically extend over a period of four academic years, unless Senate on recommendation of the School Board approves exemption.
The University's common regulations for undergraduate examinations shall apply for all the examinations leading to the award of the degree.
To graduate with a Bachelor of Science in Actuarial Science degree, a candidate will be expected to register for, complete, and pass a minimum of 149 credit-hours, divided as follows: 118 credits required in Actuarial Science, Mathematics, Statistics and computer Science and 31 credits from General Education courses.
Students must achieve a minimum GPA of 2.00 in order to graduate. Other requirements, as outlined on page 11 of this document, apply.