ADVENTIST UNIVERSITY OF AFRICA

CURRICULUM FOR THE

MASTER OF SCIENCE IN APPLIED COMPUTER SCIENCE

Submitted to the

Commission for University Education

Nairobi, Kenya

April 2017

This Degree Programme Was approved by the Commission for University Education on:

07 APR 2017

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Authorized Signature

2.0 THE CURRICULUM

2.1 Title of the Programme

The title of the programme is: **Master of Science in Applied Computer Science.**
Three specializations are proposed in the following areas:

a. Cyber Security
b. E-Services
c. Networks and Systems Administration

2.2 Philosophy of the Programme

The philosophy of the Master of Science in Applied Computer Science is derived from the basic beliefs of the Seventh-day Adventist church and the mission of the University concerning the need for stewardship and development of the person in order to maintain the physical, mental and spiritual health necessary for the in-dwelling of the Spirit of God and provision of service to individuals, the local community as well as the broader society.

The specific philosophy of this programme is that 21st century scientists and technicians are required not only to be competent in their respective areas of specialization but also thrust worthy, reliable, committed, and accountable to God, to their employer, and their direct supervisor.

2.3 Rationale of the Programme

Rapid industrialization, global competition, and advances in technology have enabled man to generate information faster than it can be disseminated. As a result, conventional management tools have become ineffective in responding to information requirements of modern organizations. The speed and memory of the modern computer and communications technology have replaced conventional tools for storing, processing and disseminating information in most organizations. Such information systems have become so vital to the survival of organizations that it is nowadays widely accepted that the major management challenge of the 21st century is how to use information technology to design and operate organizations that are competitive and efficient.

Hence, the government, the non-governmental organizations, the Institutions of learning, the private sector and the parastatals will have interest in such a person and hence need for the programme.There exists a lot of interest from the Industry, Agencies and Institutions as confirmed by many request from individuals and various adverts for qualified computer and information Systems specialist needed by various organizations, both public and private.

2.3.1 Needs Assessment/Market Survey/Situation Analysis

The need and demand for offering a master programme in information technology, and computer science have been studied internally at the University since year 2012. The University has done great effort to put in place the conditions to offer the programme.

Market Survey

Church organizations in both West/Central Africa, East Africa, South and Indian Ocean Africa territories have express the need to train their IT and computing personnel. They have been expecting this programme since couple of years.

Situation Analysis

Considering the current challenges in information security, the development of Cloud Computing and Internet of Things, this programme will strongly contribute in training and preparing Africans that in tune with the new trends.

2.3.2 Stakeholder Involvement

All major AUA stakeholders express support for this programme. The stakeholder groups will be involved in the ongoing programme development in the capacity of faculty, staff, sponsors and donors. AUA operates under the auspices of the General Conference of Seventh-day Adventists (GC). The GC has mandated AUA to offer post-graduate education at the highest level.The University Charter also authorizes AUA to offer quality education up to the highest level attainable, with the directive to offereducation in a manner that will help learners to lead in research and moral formation in African society.

2.3.3 Justification of Need for the Programme

A strong justification for this programme is the need for effective competencies in information technology and security to meet the need of Africa and the world. This programme will help to address these needs by educating men and women who can lead both in the private and public sectors. Graduates will exhibit professionalism and be prepared to deliver dedicated service with a servant leader mindset.

Administration has been thoughtful and strategic in the offering of this programme. At this point there are several factors that make this an

1. Faculty experts are in place to deliver the curriculum effectively;
2. A cadre of international adjunct lecturers is available for recruitment, which will add to the diverse, global perspectives of teaching;
3. Because of its endorsement by the Seventh-day Adventist church, AUA has the potential to recruit and admit students from throughout West, East-Central and South Africa;
4. The programme is consonant with the AUA vision, mission, objectives and core values.

Another consideration that is part of the justification for this programme is the demographic composition of Kenya—specifically the age range population estimates. In 2016, approximately 42% of the population is under the age of 15 years. The male to female population is approximately equal (49.9% and 50.1% respectively). These data tell us that there is currently a great need for education and the need will grow exponentially in the future. The Seventh-day Adventist Church in Africa is primarily young also—more than 75% are 30 years of age and below. Again, this sends a message to all leaders and strategists about current and future educational needs.

2.4 Goal of the Programme

The primary goal of the master in Applied Computer Science programme is to produce graduates who will have the knowledge, skills and attitudes to effectively manage IT and Computing Environments. These graduates will have the theory in computer and information science and the ability to translate the theory into everyday life in their current employment position as they plan, design and manage computer information systems within an African context, and the world at large.

2.5 Expected Learning Outcomes

2.5.1 Programme Learning Outcomes

By the end of the Master degree programme, students will be able to:

a. Keep abreast of the ongoing trends in research and the technological advancement in computer science,

Measured by

i. On the final exam of ACSP 695 Research Methods & Pub. In Computer Science the student will be asked questions on how they have kept up with trends in computing (Programme success is an average of a B grade of all students on these questions)

ii. During the Thesis Process the student will fill out a questionnaire on how they have integrated new trends in their research. (Programme success is a mean of 5.5 on a 7 point linear Likert scale, 1 = Severely Disagree, and

7 = Strongly Agree.)

iii. On a questionnaire five after graduation the student will be asked if they have kept up with trends and integrated them into their work. (Programme success is a mean of 5.5 on a 7 point linear Likert scale, 1 = Severely Disagree, and 7 = Strongly Agree.)

b. Have the practical skills to integrate new advancements into their current setting.

Measured by

i. On a questionnaire five after graduation the student will be asked If their studies at AUA prepared them to use new cutting edge technology in their work. (success is a mean of 5.5 on a 7 point linear Likert scale, 1 = Severely Disagree, and 7 = Strongly Agree.)

ii. On the final exam of ACSP 695 Research Methods & Pub. In Computer Science the student will be asked questions on how they integrated new advancements into projects they have been assigned during the programme (Programme success is an average of a B grade of all students on these questions)

c. Effectively compare, evaluate, and specify appropriate hardware and software.

Measure by

i. Group members in final year group projects evaluating each other in this area. (Programme success is an average of a B grade of all students on these questions)

ii. Faculty evaluating each student as to their effectiveness in this area in their final year and on their Thesis. (Programme success is an average of a B grade of all students on these questions)

iii. On a questionnaire five after graduation the student will be asked if they have used the skills to effectively compare, evaluate, and specify appropriate hardware and software. (Programme success is a mean of 5.5 on a 7 point linear Likert scale, 1 = Severely Disagree, and 7 = Strongly Agree.)

d. Have an understanding of business environments to smoothly work with business personal in a team setting providing leadership in integrating information and computer technology.

Measured by

i. Questions on final exam of any business related courses of how they will work with people who do not understand Computer Science. (Programme success is an average of a B grade of all students on these questions)

ii. During the Thesis Process the student will fill out a questionnaire asking if they feel comfortable dealing

(Programme success is a mean of 5.5 on a 7 point linear Likert scale, 1 = Severely Disagree, and 7 = Strongly Agree.)

iii. On a questionnaire five after graduation the student will be asked if the AUA programme helped them feel comfortable dealing with business people. (Programme success is a mean of 5.5 on a 7 point linear Likert scale, 1 = Severely Disagree, and 7 = Strongly Agree.)

e. Be a self-starter.

Measured by

i. In final year courses the professor will rate the the students on their self-starter ability.

ii. On a questionnaire five after graduation the student will be asked:

1. Currently, I am a self-starter.
2. AUA's programme improved my self-starter ability.
3. My self-starter ability was improved on the job.

(Programme success is a mean of 5.5 on a 7 point linear Likert scale, 1 = Severely Disagree, and 7 = Strongly Agree.)

f. Understand and have defined the concept of a worldview and servant leadership.

Measured by

i. During the Thesis Process the student will fill out a questionnaire asking:

1. Have I carefully defined my worldview?
2. Do I feel comfortable defending my worldview?
3. Do I understand the concepts of servant leadership?

ii. On a questionnaire five after graduation the student will be asked:

1. Do I still have a clearly defined worldview?
2. Can I still defend my worldview?

(Programme success is a mean of 5.5 on a 7 point linear Likert scale, 1 = Severely Disagree, and 7 = Strongly Agree.)

1.0 GENERAL INFORMATION

1.1 Vision and Mission of the Institution

Vision

The vision of Adventist University of Africa is:
To be one of the best universities, fostering the highest standards of postgraduate education in Africa, advancing knowledge and professional skills in a holistic context.

Mission

The mission of the University is:
To deliver balanced and dynamic postgraduate education in a Christian context to prepare graduates to provide competent leadership and service based on integrity, respect and love to church and society.
The University emphasizes academic scholarship, quality research by both faculty and students, and professional preparation that leads to professional service to God and humanity.

Central to the mission of the Institution is the preparation of leaders who, in turn, will be able and eager to prepare others for service.

1.2 Philosophyof the Institution

As a Seventh-day Adventist educational institution, in harmony with the distinctive characteristics of Adventist education, the University sees true education as redemptive, restoring the image of God in human beings.

Thus the Universityendeavours to foster a balanced development of the whole person—spiritually, intellectually, physically, and socially. The time dimensions of Adventist education span eternity. It seeks to develop a life of faith in God and respect for the dignity of all human beings; to build character akin to that of the Creator, to nurture thinkers rather than mere reflectors of others' thoughts; to promote loving service rather than selfish ambition; to ensure maximum development for each individual's potential; and to embrace all that is true, good, and beautiful.

1.3 Admission Requirements

1.3.1 Minimum university entrance requirements

Applicants to the master's programmes must have a first degree from a recognized university with a minimum of 3.0 grade point average on a 4.0-point scale or its equivalent. Applicants with a CGPA between 2.50 and 2.99 may be admitted on probationary status if they meet the conditions (see Admission Status Classifications) and are recommended for admission to the programme.

1.3.2 Other admission requirements

- Applicants are also expected to submit recommendation letters from previous university and employing organizations where applicable.
- As AUA uses the English language as the medium of instruction, students must have the ability to study (read, write and speak) in English. In order to qualify for admission to AUA, students are required to demonstrate English ability in one of the following ways:

    1. Have a bachelor's degree from a college/university in an Englishspeaking country where English was the medium of instruction.

    2. Achieve a passing score on a recognised English language test (TOEFL, IELTS, Michigan). Test scores are valid for 3 years.

    3. Achieve a Minimum Entry score on a recognised English language test, and attend the 3-week intensive English course every year (usually just before the regular courses) until a Full Pass score has been achieved.

    4. If a student has achieved the Minimum Entry score, a Full Pass may also be achieved by passing the English intensive course with a grade of B or better, AND achieving a B average on the courses for the entire term. If either of these two scores is insufficient, the student must repeat the English course the following year.

- ***Requirements specific to Master of Science in Applied Computer Science***. In addition to all other requirements, applicants to this programme must meet the following prerequisites as having been taken at undergraduate level:
    - Algorithms and Data Structures,
    - Operating Systems,
    - Object Oriented Programming,
    - Databases,