



THE UNIVERSITY OF ZAMBIA

SCHOOL OF NATURAL SCIENCES

DEPARTMENT OF COMPUTER STUDIES

**MASTER OF SCIENCE
IN
COMPUTER SCIENCE**

November 2014

1) BACKGROUND

From the inception of Computer Science programmes at the University of Zambia about a decade ago, the Department of Computer Studies has been offering undergraduate programmes only. Following a situational analysis of Information and Communication Technology (ICT) demands in both government and industry as well as the improved staffing levels, the Department is now ready to offer a Masters Program in Computer Science (MSc) which is intended to provide leading edge, adaptable and relevant computer science education that produces professionals capable of thriving in the challenging environments demanded in today's highly evolving technological world. The proposed Masters programme will strive to offer a challenging and rewarding graduate program that covers the essentials of applied computer science in areas such as security, mobile and cloud computing, networking, databases, web technologies and data mining.

2) RATIONALE

With rapid advancements in the Information and Communication Technology (ICT) sector over the years, considerable number of graduates serving in both government and industry have continued to face challenges in effectively and efficiently performing their functions on account of inadequate knowledge and skills to address the ever-changing ICT demands. These graduates have not been able to further their education because there are no postgraduate courses in the country that cater for their needs. Very few manage to pursue postgraduate studies in other countries because of lack of scholarships. This lack of advanced training opportunities has a negative impact on the institutions in the ICT sector which, as a consequence, have failed to meet the immediate national ICT interests as well as the country's regional and continental commitments. The need for specialized ICT solutions in the light of new technological developments, cyber security threats and increased international obligations and commitments requires higher level specialised ICT know-how beyond first degree. It is the case, therefore, that in view of the growing need in both the public and private sectors for professional computer science experts, it has become necessary for the Department of Computer Studies to introduce the Master of Science in Computer Science programme as Zambia and the region move into the knowledge economy.

3) AIM

The aim of the Master of Science in Computer Science is to enhance the expertise of personnel in the computing field by provide graduates with leading edge, adaptable and relevant computer science education which covers the essentials of applied computer science in areas such as security, mobile computing, cloud computing, networking, databases, web technologies and data mining.

4) OBJECTIVES

By the end of the programme students should be able to:

- (i) Apply the knowledge and skills in the wider context of computer science in society, industry, and academia;
- (ii) Describe the basic principles that underpin computer science;
- (iii) Demonstrate a range of transferable skills including communication, self-organisation, and basic mathematical and logical reasoning;
- (iv) Demonstrate a range of practical software development, networking and other computing skills in accord with best modern engineering practice; and
- (v) Demonstrate analytical and problem-solving skills in a wide variety of situations.

5) TARGET GROUP

This programme is designed for graduates in computer science and related field in ICTs and also employees of various institutions whose operations call for specialized knowledge in ICTs. It offers participants advanced preparation for further career development in applied computer science in areas such as information security, mobile computing, virtualisation, networking, databases, web technologies, signal processing (audio and video encoding) and data mining. The course is therefore, appropriate for experts working in the ICT security sector, members of the armed forces and police service, telecommunication sector, financial sector and employees of the government ministries with active ICT departments, ZICTA as well as other professionals interested in issues of ICTs.

6) EXPECTED OUTPUT

Graduates of the Master of computer Science will be equipped with analytical skills that will enable them to work more effectively in the ICT sector in both public and the private sector.

7) ADMISSION REQUIREMENTS

- (i) A candidate must have a Bachelor's degree from the University of Zambia (credit or better) in computer science field or a recognized institution of higher learning (with equivalent of credit from UNZA or better);
- (ii) In cases where the applicant obtained a Bachelor's degree without credit, the publication of a research article in a peer reviewed journal and relevant work experience will be a strong recommendation; and
- (iii) A prospective student may be interviewed and assessed by the relevant unit or department before being recommended to the Board of Graduate Studies for admission

8) APPLICATION PROCEDURE

- (i) All applicants must submit the completed application forms, together with sealed letters of recommendation and the required copies of transcripts and certificates.
- (ii) Application forms are obtainable from the Director, Directorate of Research and Graduate Studies.
- (iii) Completed application forms should be submitted to the Director, Directorate of Research and Graduate Studies who will forward them to the Dean, School of Natural Sciences for processing.
- (iv) The Board of Graduate Studies will consider the applications taking into account the recommendations of the School of Natural Sciences Graduate Studies Committee.
- (v) The Director, Directorate of Research and Graduate Studies will communicate the decision of the Board of Graduate Studies to the applicant.

9) DURATION

(i) Full Time

Two academic years, divided as follows; course work in the first year, and an independent research project in the second year.

(ii) Part Time

Three years, divided as follows; course work in the one and half years and an independent research in the last one and a half years.

10) MODE OF DELIVERY

The Master of Science in Computer Science programme is divided in two parts. The first years is taught coursework while the second year will be a research component that will be through a student's independent research project under supervision (Mode B).

11) METHOD OF TEACHING

The method of teaching will include lectures, discussions, seminars, case studies, student presentations, group projects, simulations exercises, and guest speakers from the ICT sectors, the academia and government.

12) ASSESSMENT AND PROGRESSION OF STUDENTS

- (i) For each course taught, there will be two modes of assessment comprising continuous assessment and a written examination in the ratio of 60:40;
- (ii) A candidate shall be required to have obtained at least 50% in the Continuous Assessment component to be admitted to the examination in a course;
- (iii) A candidate must pass all the courses (including the research project course) with at least 50% to qualify for the award of the MSc in Computer Science degree;

- (iv) A student who has failed more than three trimester courses will be discontinued from the programme;
- (v) A student who has failed three trimester courses or less will be allowed to sit a supplementary examination in each of the courses at the end of the third trimester;
- (vi) A student who has failed a supplementary examination in a given course will be required to repeat the course in the subsequent academic year;
- (vii) A candidate will be conferred the MSc in Computer Science degree upon successful completion of all the requirements outlined above; and
- (viii) The University of Zambia's Postgraduate Studies rules and regulations shall apply in all cases where rules are not explicitly stipulated in this programme.

13) LANGUAGES OF INSTRUCTION

The language of instruction shall be English.

14) STRUCTURE OF THE PROGRAMME

The MSc in Computer Science will consist of eight half year courses and one full year course. The first year will consist of eight half year courses. These are six (6) compulsory half year courses and two electives as half year courses. The second year will consist of one full year research course (Dissertation) from which the student is expected to publish the results that meet directorate of research and graduates studies (DRGS) requirements.

15) COURSE CODING

The course codes used in the MSc programme are in line with the seven alphanumeric course code system adopted by the department as desired by the School of Natural Sciences. The descriptions for the letters and digits used are presented below

Course unit numbers are of the form CSC ypnT where:

CSC	=>	Computer Science Programmes
Y	=>	Year the course is offered
P	=>	Course Category
N	=>	is used to give each course a different number
T	=>	duration and time of the year when the course is offered

16) NOMENCLATURE

The department is following the nomenclature as specified by Association for Computing Machinery ACM / Institute of Electrical and Electronics Engineers (IEEE) Course Coding System. The second digit classification in our programmes is according to the following classifications as specified by ACM and IEEE

Table 1 - Course category and classification for the second digital according to ACM/IEEE and DRGS

CODE	CATEGORY	CODE	CATEGORY
0	Research	5	Graphics and Visual Computing
1	Computer organization and Architecture	6	Software Engineering
2	Operating Systems	7	Information Management
3	Programming Languages design and Implementation, , Data Structures and	8	Net-Centric Computing
4	Intelligent Systems	9	Mathematics

17) EXEMPTIONS

There are no exemptions for this programme

18) COURSE COMBINATIONS

The programme has the following course combinations;

a) YEAR 1

i) *Core Courses*

CSC 5039	Research Methodology
CSC 5331	Advanced Web Technologies
CSC 5771	Advanced Distributed Systems
CSC 5222	Information and System Security
CSC 5802	Mobile Computing and Networking
CSC 5202	Advanced Operating Systems

ii) *Elective Courses*

CSC 5741	Data Mining and Warehousing
CSC 5491	Soft Computing
CSC 5132	Information Coding Techniques
CSC 5232	Biometrics

b) YEAR 2

CSC 6000	Dissertation
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