COLLEGE OF BIOLOGICAL AND PHYSICAL SCIENCES

Principal: Prof. B.O.C. Aduda, BEd, MSc, (Nairobi), PhD, DIC (London)

College Registrar: CS. Daniel Gitonga, BA (KU), MSc HRM (JKUAT), CPS(K), MICPSK, MIHRM

College Bursar: Mr. Thomas R. Ng'ang'a, BSc, (USIU), MBA, (Nairobi), CPA(K)

A BRIEF OF THE COLLEGE

The College which is located at Chiromo Campus consists of:

i) School of Biological Sciences
ii) School of Computing and Informatics
iii) School of Mathematics
iv) School of Physical Sciences
v) Centre for Biotechnology and Bioinformatics
vi) Pre-Clinical departments of Human Anatomy, Biochemistry, Medical Physiology and Veterinary Anatomy and Physiology
vii) Institute of Climate Change and Adaption.

SCHOOL OF BIOLOGICAL SCIENCES

Director of School: Prof. P aul N. Ndegwa, BSc, MSc, PhD, (Nairobi)

The School of Biological Sciences was born out of the merger of the former Department of Botany and Zoology in March 2006. The School is structured into thematic areas and offers undergraduate, postgraduate training, and research programmes. It has an abundant capacity for laboratory and field research.

UNDERGRADUATE PROGRAMMES

The School offers five year courses in Biological Sciences under for the following degree programmes:

i) BSc. degree in Applied Aquatic Science and Resources Management
ii) BSc. degree in Biology
iii) BSc. degree (General) Botany and Zoology Major or Botany/Zoology
iv) BSc. degree in Environmental Conservation & Natural Resource Management
v) BSc. degree in Microbiology and Biotechnology

REGULATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN APPLIED AQUATIC SCIENCE AND RESOURCES MANAGEMENT

1. INTRODUCTION

This program has been developed in line with the University of Nairobi's Quality Policy requirement of producing holistic graduate prepared for the dynamic needs of the society. This syllabus for undergraduate studies in Applied Aquatic Science and Resource Management takes into account the need to train students to be agents of conservation and sustainable use of Aquatic resources while promoting national development to alleviate poverty in line with Vision 2030. The development of the program has been motivated by the university's core value of respect for and conservation of the environment. The program will cover four subject areas; aquatic science, biological, physical sciences and fisheries biology.

This is a University of Nairobi program offered in the School of Biological Sciences in collaboration with Kenya Marine & Fisheries Research Institute (KMFRI).

The Bachelor of Science Degree in Applied Aquatic Science and Resources Management is designed to produce aquatic resources managers with a broad interdisciplinary background coupled with specific focus in identifying, protecting and managing the aquatic resources and helping the society harness the resources for poverty alleviation. The program is coordinated by the School of Biological Sciences and offered in collaboration with KMFRI. The students will learn about the functioning of the aquatic ecosystems, ecosystem sustainability, economic and social use of the natural resources in the aquatic ecosystems.

2. COURSE OBJECTIVES

The objective of the B.Sc. degree programme in Applied Aquatic Science and Resources Management is to produce well-trained aquatic resource managers, researchers in aquatic science, fisheries extension educationist and aquaculture entrepreneurs. Graduates from the program will be able to pursue further studies in aquatic related sciences in our school or other universities worldwide and/or seek employment in government ministries and parastatals, research institutes, NGOs, private industries etc.

3. ENTRY REQUIREMENTS

Applicants must have obtained the minimum University of Nairobi and the School of Biological Sciences general admission requirements. They must have obtained at least one of the following qualifications:

A minimum average of a C+ in KCSE with a minimum of a C+ in Biology or Biological Sciences and a minimum of a C (plain) in other science subjects (Mathematics, Chemistry, Physics or Physical Sciences) in KCSE or equivalent. Students with a C+ in Geography will have an added advantage.

Two principal passes at Advanced Level, one of which must be in Biology and the other in any other science subject from the following: Chemistry, Geography, Physics and Mathematics.

Holders of a degree, ordinary or higher national diploma, or equivalent in biological sciences or related subjects from a University or institution recognized by Senate.

A degree or its equivalent in biological sciences from a university recognised by senate.

REGULATIONS AND SYLLABUS FOR THE BACHELOR OF SCIENCE DEGREE IN BIOLOGY

1.0 INTRODUCTION

BSc. (Biology) is a new programme in which the School of Biological Sciences participates in teaching and research (Research Project). In this programme, students have to take Botany and Zoology units (unlike BSc. where they may take either Botany or Zoology with other non-biology subjects of their choice). Appropriate non-biology units (1st and 2nd year) have also been selected for them for better understanding of modern biology. It is expected that these students shall have a broad-based foundation in biology including molecular biology. The syllabus for the BSc. (Biology) course places emphasis on disciplines that relate to natural resource management, such as parasitology, entomology, microbiology and molecular biology, to provide graduates who will directly contribute to food production and poverty eradication. Furthermore, the course is designed to produce capability for food processing industries and development, environmental protection and parks development which require specialists in biology who are trained in statistics and computer-mathematical modeling in addition to taxonomists.

Specialization will be offered on application to a few selected students whose academic performance in their 1st, 2nd and 3rd years of study have been outstanding.

Fourth year students undertaking the specialized programmes will be required to conduct a supervised individual research project and submit a dissertation thesis duly typed and bound for examination.

2.0 ENTRY REQUIREMENTS

2.1. Candidates must have obtained the minimum University and Faculty of Science admission requirements.

2.2. Must have passed in Biology/Biological Sciences with a minimum grade C+ in the Kenya Certificate of Secondary Education (KCSE) or its equivalent.

MAJORING IN BOTANY

Candidates who intend to major in Botany must have obtained the minimum University and School of Biological Sciences admission requirements.

They must have obtained a minimum grade of C+ in Biology in KCSE.

They must have passed with a minimum grade of C+ in Chemistry or Physical Science in the KSCE.

MAJORING IN ZOOLOGY

The School offers 4:3:2:2, and 4:3:2:1, programmes for students who take Zoology in combination with two subjects in 1st, and 2nd years, or with another subject in 3rd and 4th years, or take Zoology alone in the 4th year depending on the degree structure. Thus, majoring in Zoology will be restricted to 4th year only. Students majoring in Zoology will be allowed to undertake a project only if they have attained a minimum of B+ grade in the third year units in Zoology.

ENTRY REQUIREMENTS:

i) Candidates who intend to take Zoology must have obtained the minimum University of Nairobi and School of Biological Sciences admission requirements.

ii) Must have passed in Biology or Zoology with a B- minimum grade in the K.S.C.E. or its equivalent or in Biological Sciences with a minimum of B plain.

iii) Must have passed Chemistry with a minimum of C plain in K.S.C.E or its equivalent.

iv) A level with 2 principal passes or equivalent recognized by Senate.

v) Transfer of credit maximum 1/3

BACHELOR OF SCIENCE DEGREE IN ENVIRONMENTAL CONSERVATION AND NATURAL RESOURCES MANAGEMENT

1.0 INTRODUCTION

This is a science degree programme that will specialize in subjects dealing with the environment, and natural resources conservation and management. Environmental issues and natural resources conservation and management are of major concern. Graduates of this degree programme will find themselves well placed to meet the challenges of this expanding field. The field of natural resources conservation and environmental management is a complex and interdisciplinary in nature and, therefore, it is difficult to provide a thorough coverage of all areas of natural resources

management and environmental sciences in one undergraduate curriculum. The course will be composed of four core subject areas, namely biological sciences, physical sciences, environmental science and policy. The Bachelor of Science Degree in Environmental Conservation and Natural Resources Management is designed to produce natural resources and environmental professionals with a broad interdisciplinary background coupled with specific focus in identifying, understanding, protecting, enhancing and managing natural resources and their environment. It is a campus-wide programme coordinated by the School of Biological Sciences. The students will learn: how natural ecosystems function, how to maintain the functions that are important both for ecosystem sustainability and for man's use of those ecosystems. They will also deal with economic, social and political issues of natural resource use and environmental management decision-making processes.

2.0 COURSE OBJECTIVES

The objectives of the BSc. degree programme in Environmental Conservation and Natural Resources Management are to:

i) Encourage the integration of environmental issues and themes into courses and student projects in the basic and natural sciences,

ii) Encourage sustainable and wise use of our natural resources using the ecosystem approach.

iii) Foster an understanding of fundamental environmental issues, including biological diversity and the preservation of natural ecosystem integrity, both in the University community and the public at large, and

iv) Foster an understanding of the interaction between people, natural resources and environmental systems, with special emphasis on the political, social and economic factors that influence biological resources use.

3.0 ENTRY REQUIREMENTS

A candidate eligible for admission to the above degree programme must meet the following requirements:

i) Applicants must have obtained the minimum University of Nairobi and School of Biological Sciences general admission requirements.

ii) Applicants must have passed with a minimum average of a C+ in KCSE with a minimum of a C+ in Biology or Biological Sciences and a minimum of a C (plain) in other science subjects (Mathematics, Chemistry, Physics or Physical Sciences) in KCSE or equivalent. Students with a C+ in Geography will have an added advantage.

iii) Two principal passes at KACE, one of which must be in Biology and the other in any other science subject from the following: Chemistry, Geography, Physics and Mathematics.

iv) Holders of a degree, diploma or equivalent in a biological science or related subjects from a University or institution recognized by Senate.

BACHELOR OF SCIENCE DEGREE IN MICROBIOLOGY AND BIOTECHNOLOGY

1.0 INTRODUCTION

Microbiology is the scientific study of the biology of microorganisms and their activities as well as their effects on other living organisms. It comprises such sub-disciplines as bacteriology, mycology, protozoology, phycology, parasitology, virology, nematology, cellular microbiology, evolutionary microbiology, systems microbiology and molecular microbiology, with wide applications in the medical, pharmaceutical and food and brewing industry. Soil microbiology, water microbiology, air microbiology, and microbial biotechnology are significant aspects of microbiological applications.

In their unicellular state, microorganisms are too small to be seen with the unaided human eye. The subject of microbiology is concerned with identification, structure and function, and natural distribution of microorganisms. It is also concerned with how the organisms relate to each other and other living things and their impact on the environment. To be a good microbiologist it is important that one should have a wide knowledge of biology, basic chemistry and mathematics. Microorganisms are rarely found in isolation but always living in association with other microorganisms, plants or animals. For this reason, a wide range of biology units is taught in the first two years of study.

Microorganisms have a wide range of physiological and metabolic flexibility, e.g. some use atmospheric nitrogen to synthesize proteins and other nitrogenous compounds while others have the ability to synthesize all or some of the vitamins that they require. Microorganisms too have the capacity to break down a wide range of chemical substances such as organic matter and to use them as energy sources. The Microbiology and Biotechnology program endeavors to expose the students to the immense biotechnological potential that microorganisms have and how it is exploited for economic benefit in modern age. Students who have successfully gone through the program get employment opportunities in food, feed

and pharmaceutical industries, medical, agricultural and other research institutions; quality control and diagnostic laboratories among others. They also qualify to enroll for various degrees in medicine at the University of Nairobi.

ENTRY REQUIREMENTS

Applicants must have obtained the minimum University of Nairobi and School of Biological Sciences general admission requirements. They must have at least one of the following qualifications:

a) A minimum of KCSE mean grade C+, with C+ in Biology/Biological Sciences and C plain in both Chemistry and Mathematics in or its equivalent.
b) A minimum of KCSE mean grade C or KCE Division III plus Ordinary/Higher National Diploma in Biology/Biological Sciences or its equivalent with a minimum of a credit pass
c) KACE or IGSCE/GCE- A level or equivalent with 2 principal passes in Biology and Chemistry and at least a credit pass in Mathematics at Ordinary level of Education.
d) International Baccalaureate (IB) Diploma, with a pass of not less than five in biology, Chemistry and Mathematics.
e) A degree or its equivalent in biological sciences from a recognized University.

COURSE OUTLINE

FIRST YEAR COURSE UNITS

Code	Title
SBT 101	Survey of the Plant Kingdom, Fungi and Algae
SBT 102	Introductory Biochemistry and Genetics
SBT 105	Introductory Microbiology
SZL 101	Invertebrate Zoology
SZL 102	Vertebrate Zoology
SZL 103	Fundamentals of Ecology
SBL 101	Mathematics for Biologists
SCH 101	General and Inorganic Chemistry
SCH 102	Introduction to Organic Chemistry, Chemistry of Alkanes and Cycloalkanes

COMMON UNDERGRADUATE UNITS

CCS 001	Communication and Learning Skills
CCS 009	Elements of Economics
CCS 010	HIV AIDS

SECOND YEAR COURSE UNITS

SBT 201	Gymnosperm and Angiosperm Taxonomy
SBT 202	Principles of Bacteriology
SBT 205	Introduction to Mycology
SBT 204	Plant Structure and Function
SBL 201	Biomolecules
SBL 202	Laboratory Techniques
SBL 204	Proteins and Enzymes
SBL 205	Basic Metabolism
SZL 201	Cell Biology
SZL 202	Histology
SZL 203	Animal Physiology
SZL 204	Basic Immunology

THIRD YEAR COURSE UNITS

SBT 301	General Mycology
SBT 304	General Genetics
SBT 317	Food Microbiology
SBT 318	Methods in Microbiology
SBT 319	Mechanisms of Microbial pathogenicity
SZL 303	Biostatistics
SZL 304	Applied Immunology
SZL 310	Introduction to Parasitology
SZL 311	Molecular Biology I
SZL 315	Virology
SZL 308	Phycology
SZE 302	Environmental Health and Ecotoxicology

FOURTH YEAR COURSE UNITS

SBT 402	Microbial Ecology
SBT 405	Applied Mycology
SBT 413	Applied Microbiology & Biotechnology
SBT 414	Research Project
SBT 415	Molecular Biology II
SBL 416	Microorganisms as Biological Control Agents
SBT 417	Environmental Microbiology
SBT 418	Marine Microbiology
SZL 406	Medical protozoology
SZL 407	Medical Helminthology
SZL 416	Vector Biology
SZE 403	Conservation in International Trade & Development

REGULATIONS AND SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN APPLIED PARASITOLOGY

1.0 INTRODUCTION

This is an applications oriented programme targeting fresh graduates, employees of government and parastatal bodies, research institutes and the private sector including those that are self employed. It aims to train students in various aspects of Parasitology and lays emphasis on current trends in the diagnosis, transmission dynamics, surveillance and management of parasitic infections and diseases of man and domestic animals. In addition, students are exposed to current trends in Parasitology research which prepares them for PhD studies and/or research work.

This programme is in line with the Millennium Development Goals and Kenya's Vision 2030 for socio-economic development, which emphasize, among others, lowering major disease incidence and providing globally competitive quality education, training and research.

Graduates of the programme will be able to self employ or seek employment in academia, international research institutions, relevant government ministries and parastatals, diagnostic laboratories, and hospitals working in areas such as immunology, disease surveillance, vector control, epidemiology and public health.

2.0 COURSE OBJECTIVES:

i) To provide students with up to date theoretical and practical knowledge in Applied Parasitology.
ii) To produce skilled personnel in the surveillance, control and management of parasitic infections and diseases.
iii) To expose students to current trends in Parasitology research.

3.0 ENTRY REQUIREMENTS

2.1 The common regulations for the Masters' degrees in the University of Nairobi and the School of Biological Sciences shall apply.
2.2 The following shall be eligible for admission into the Master of Science degree in Applied Parasitology
- **i)** Holders of a Bachelor's degree of the University of Nairobi of at least Upper Second Class Honours in Biological Sciences or an equivalent qualification from a university recognized by the University of Nairobi Senate with at least a unit passed in Parasitology.
- **ii)** Holders of a Bachelor's degree of the University of Nairobi of Lower Second Class Honours in Biological Sciences or an equivalent qualification from a university recognized by the University of Nairobi Senate with at least a unit passed in Parasitology. In addition, the candidate must have at least two years of documented relevant work/research experience.
- **iii)** Holders of a Bachelor's Pass degree of the University of Nairobi in Biological Sciences or an equivalent qualification from a university recognized by the University of Nairobi Senate with at least a unit passed in Parasitology plus a relevant postgraduate diploma from an institution recognized by the University of Nairobi Senate or at least five years of documented relevant work/research experience.

REGULATIONS AND SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN AQUACULTURE

1. INTRODUCTION

The syllabus for the postgraduate studies in Aquaculture takes account of the need to train graduates who can engage in Aquaculture as a business or work within the Aquaculture industry as consultants, while promoting food security, poverty alleviation and development. The syllabus has been designed to include new concepts, fundamental theories, ideas, issues, and techniques in Aquaculture. It provides a thorough understanding of aquatic ecosystems, fish biology and Aquaculture as an enterprise. The programme will draw on inter-disciplinary expertise and prepare the students to exploit information technology and biotechnology to enhance Aquaculture development and production.

The programme targets employees of government and parastatal bodies, research institutes, and the private sector.

2. COURSE OBJECTIVES

1.1 To provide training for students who intend to pursue a career in research and/or teaching in Aquaculture or Hydrobiology.
1.2 To produce scientists with specialised skills to provide appropriate technologies for the Aquaculture industry.

3. ENTRY REQUIREMENTS

3.1 The common regulations for Masters' degrees in the University of Nairobi and the School of Biological Science shall be applicable.

3.2 The following shall be eligible for admission into the Master of Science degree in Aquaculture.

3.2.1 A holder of Bachelor of Science degree in Biological Sciences or equivalent, with at least an Upper Second Class Honours and must have taken any aquatic science units at undergraduate level from a University recognized by Senate.

3.2.2 A candidate holding a Bachelor of Science degree with a Lower Second Class Honours or equivalent and with at least three years research experience and who must have taken any aquatic science units at undergraduate level from a university recognized by Senate, may be considered for admission.

3.2.3 A candidate holding a Bachelor of Science degree with a pass from a university recognized by senate and who must have taken aquatic sciences may be considered for admission if (a) he/she has at least five years research experience and (b) has a postgraduate diploma in a relevant field from an institution recognized by senate.

REGULATIONS AND SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN ENTOMOLOGY

1.0 INTRODUCTION

The Master of Science in Entomology degree course covers agricultural, medical and veterinary components of insect science. It provides advanced training in detection, identification, classification, biology as well as diverse practical aspects of management and control of household insect pests as well as insect pests of agricultural crops, trees and forests and, vectors of human, livestock and wildlife diseases. The graduates of this programme will be competent to pursue doctoral studies anywhere in the world. They are also employable in academic institutions, inter-governmental organizations, government ministries, parastatals, research institutes, non-governmental organizations and the industry, whereas others are capable of initiating their businesses as manufacturers and processors of insect-based products or providing consulting services in various aspects of entomology. The course targets fresh graduates, employees of government and parastatal bodies, research institutes and the private sector.

2.0 COURSE OBJECTIVES:

a) Provide high quality training in Entomology at a national, regional and international level

b) Produce personnel with specific skills who are capable of providing specialised services such as identification, surveillance, control and management of arthropod vectors of diseases, insect pests and other practical aspects of Entomology.

c) Train students in current trends in Entomological research and prepare them for doctoral studies.

3.0 ENTRY REQUIREMENTS

2.1 The common regulations for the Masters' degrees in the University of Nairobi and the School of Biological Sciences shall apply.

2.2 The following shall be eligible for admission into the Master of Science degree in Entomology:

a) Holders of a Bachelor's degree from the University of Nairobi of at least Upper Second Class Honours in Biological Sciences or Zoology or Agriculture with at least one unit passed in Entomology or an equivalent qualification from a university recognized by University of Nairobi Senate.

b) Holders of a Bachelor's degree from the University of Nairobi of Lower Second Class Honours in Biological Sciences, Zoology or Agriculture with at least one unit passed in Entomology or an equivalent qualification from an institution recognized by the Senate. In addition, the candidate must have at least two years of documented relevant work and/or research experience.

c) Holders of a Bachelor's Pass degree of the University of Nairobi in biological sciences or an equivalent qualification from a university recognized by University of Nairobi Senate plus a relevant postgraduate diploma an institution recognized by University of Nairobi Senate or at least five years of documented relevant work/research experience

REGULATIONS AND REVISED SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN HYDROBIOLOGY

1.0 INTRODUCTION

The syllabus for the postgraduate studies in Hydrobiology takes account of the need to train graduates to be agents of conservation and sustainable use of aquatic resources while promoting development to alleviate poverty.

Accordingly the subject matter has a focus to produce three additional specialized cum application-biased degree options in an enriched Master of Science Hydrobiology course suitable for even generalist students.

2.0 COURSE OBJECTIVES:

i) Produce well trained freshwater biologists, marine biologists, fisheries biologists, aquaculturists and hydrobiologists.

ii) Draw on interdisciplinary expertise and prepare the students to exploit information technology and biotechnology to enhance productivity.

Graduates of the programme will be able to pursue further studies for PhD. and/or seek employment in inter-governmental organizations, government, parastatals, research institutes, NGOs and industry. The programme is targeted to employees of government and parastatals bodies, research institutes and the private sector.

3.0 ENTRY REQUIREMENTS

The common regulations for the Masters' degrees in the University of Nairobi and the Faculty of Science shall be applicable.

i) Draw on interdisciplinary expertise and prepare the students to exploit information technology and biotechnology to enhance productivity.

ii) The following shall be eligible for admission into the Master of Science degree in Hydrobiology.

- **a)** A holder of a Bachelor of Science degree in Biological Science with at least an Upper Second Class Honours with Grade B in Fish and Fisheries, Biology and Limnology or Marine Biology from a University recognized by Senate.
- **b)** A candidate holding Bachelor of Science degree in Biological Sciences with a Lower Second Class Honours degree or equivalent and with at least three years research experience, with supporting relevant publications, and who must have attained a Grade B in Fish and Fisheries Biology and Limnology or Marine Biology may also be considered for registration.

REGULATIONS FOR THE DEGREE OF MASTER OF SCIENCE IN MARINE BIODIVERSITY CONSERVATION AND FISHERIES MANAGEMENT

1. INTRODUCTION

The program for the postgraduate studies in Marine Biodiversity Conservation & Fisheries Management takes into account the need to train scientists and managers to be agents of conservation and sustainable use of marine biodiversity and fisheries resources. The course also aims to train students to play a key role in active research in Marine Biodiversity Conservation & Fisheries Management and to become critical, problem-solving, open-minded scientist. Further, by incorporating newly emerging frontiers in these fields of studies, the programme seeks to widen the scope and imagination of the graduates.

Accordingly the program has a focus to produce specialized cum application-biased degree in Master of Science in Marine Biodiversity Conservation and Fisheries Management Course. The program is targeted for students from both local and regional institutions interested in marine biodiversity conservation and fisheries management. While most theoretical aspects of this Masters program will be taught at the University of Nairobi, prospecting students will be oriented to practical applications of the course at Kenya Marine and Fisheries Research Institute.

Graduates of the program will be able to pursue further studies for Ph.D. and/or seek employment in inter-governmental organizations, government, parastatals, research institutes, NGOs and industry. The programme is targeted for employees of government and parastatal bodies, research institutes and the private sector including self employment.

Master of Science in Biodiversity Conservation and Fisheries Management program will be conducted under the University of Nairobi and GS MSc option of Course work and dissertation. This means that students take taught causes for three semesters and one semester research and dissertation preparation.

Course Objectives

i) Produce highly-trained scientists and managers of marine resources.

ii) Draw on interdisciplinary expertise and prepare the students to exploit information technology and biological diversity to enhance productivity.

iii) Expose students to new and emerging knowledge and technologies for sustainable management of coastal and marine environment and resources

2. ENTRY REQUIREMENTS

2.1 The common regulations for the Masters' degrees in the University of Nairobi and the School of Biological Sciences shall be applicable.

2.2 The following shall be eligible for admission into the Master of Science degree in Marine Biodiversity Conservation and Fisheries Management.

i) A holder of a Bachelor of Science degree in Biological Sciences or equivalent with at least an Upper Second Class Honours from a University recognized by the Senate.

ii) A candidate holding Bachelor of Science degree in Biological Sciences as in (i) or equivalent with a Lower Second Class Honours degree and with at least three years research experience, with supporting relevant publications is also eligible for registration.

iii) A candidate holding a Bachelor of Science degree as above with a Pass may be considered for admission if he/she has at least five years research experience and a postgraduate diploma in a relevant field from an institution recognized by the Senate.

POSTGRADUATE PROGRAMMES

1.0 INTRODUCTION

The School offers Master of Science degrees by coursework, examination and thesis. This transcends a number of disciplines including Genetics, Microbiology, Mycology, Plant Biochemistry and Physiology, Plant Ecology, Plant Taxonomy and Economic Botany, Biology of Conservation, Agricultural Entomology, Medical and Veterinary Entomology, Hydrobiology, Parasitology, and Applied Physiology and Cellular Biology.

2.0 ENTRY REQUIREMENTS

i) A candidate must satisfy the common regulations governing the Master's degrees of the University of Nairobi and School of Biological Sciences.

ii) Holders of a degree of the University of Nairobi of at least Upper Second Class Honours in Biological Sciences or an equivalent qualification from a university recognized by University of Nairobi Senate.

iii) Holders of a Lower Second Class Honours degree in Biological Sciences or equivalent plus at least two years relevant work/research experience evidenced by publications may be considered for admission.

iv) A pass degree in Biological Sciences or equivalent, plus a relevant postgraduate diploma may be considered for admission.

STAFF LIST

Professor

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Mibey, R.K., BA, (Warren Wilson College), MSc, (Boone) MSc, DEd, (Oklahoma), PhD, (Nairobi)
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Wachira, P.M., BSc, MSc, PhD, (Nairobi)
Kiboi, S.K., BSc. (Moi), MSc, PhD, (Lund)
Kimata, D.M., BSc, MSc, PhD, (Nairobi)
Chira, R.M., BSc, MSc, PhD, (Nairobi)

Lecture

Otieno, A.C.A., BSc, (Nairobi), PhD, (Louisiana)
Sigana, D.A.O. , BEd, MSc, (Nairobi), PhD, (Nairobi)
Ong'amo, G.O., BSc, MSc, PhD, (KU)
Wang'ondu, V.W., BSc, MSc, PhD, (Nairobi)

Mutahi, W.T., BSc, MSc, PhD, (Nairobi)
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Kitonde, C., BSc, MSc, (Nairobi)
Omari, J.K., BEd, (CUEA), MSc, (Nairobi)

Details on specific admission requirements of the school, credit transfer and exemptions, course structure and duration, examination regulations, course outline and award of degree may be obtained from the School

Please contact
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SCHOOL OF COMPUTING AND INFORMATICS

Director: Prof. Robert O. Oboko, BEd, (KU), PGDip C.S., (Nairobi), MSc, (VUB Belgium), PhD, (Nairobi)

A BRIEF HISTORY

The School of Computing and Informatics is part of the College of Biological and Physical Sciences. The School was formally established by statute in 1977 as the Institute of Computer Science. Prior to that, the Institute had started out in 1969 as the Computing Centre of the University, a department based in the Faculty of Engineering. In 1976, the Computing Centre moved to the Chiromo Campus where it occupied the purpose built premises used by the School today.

ICS mandate included academic as well as provision of university-wide ICT services. In 2002, in the interest of realizing more focused management and efficiency of the two functions, ICS was split into two entities, namely, Information Communication Technology Centre (ICTC) and the School of Computing Informatics (SCI).

The School of Computing and Informatics takes its name from the core competencies that it seeks to nurture: Computing, to cover the theory and science of computation and Informatics to exemplify the practical outworking of this theory in technology and application.

SCI is a regional leader in research, research and development (R&D) and advanced education in computing. It was the first to offer degree, postgraduate diploma and postgraduate degrees in computer science in the region.

The core mission areas are: Research, Teaching and Learning, Consultancy, Research and Development and Extension Services activities relating to Computer Science, Technology and Innovation.

REGULATIONS AND SYLLABUS FOR BACHELOR OF SCIENCE IN COMPUTER SCIENCE

1.0 BACKGROUND

1.1 SCI Programmes

The School of Computing & Informatics (*formerly Institute of Computer Science*) launched the Bachelor of Science (Computer Science) programme in 1992. The programme was aimed at meeting perceived development needs in Kenya, which it has done very well. Indeed, most of the computer science professionals in industry today have been developed through this programme. The programme was comprehensively reviewed in the year 2000 and again in the year 2004. With experience in offering this programme and given changes in national development needs as well as developments in the fast changing area of computing and information technology, it was determined that the programme is due for another comprehensive review.

1.2 Inputs into the Review Process

The review has benefited from, and the resulting programme is determined by:

a) IEEE/ACM guidelines for curriculum development,

b) the output of a self-assessment of the current curriculum that was undertaken using IUCEA-DAAD Quality Assurance model during 2009,

c) the Commission for Higher Education guidelines for curriculum development, and d) stakeholder feedback that was solicited and received by the School during the review process.

2.0 COURSE OBJECTIVES

The overall goal of this program is to Develop human capacity to transition Kenya to focus on higher levels of the ITeS value chain and grow the sector. At the end of the program therefore, the student should be able to:

2.1 Demonstrate a practical understanding of the potential business opportunities and growth potential in the ITeS sector

2.2 Formulate, synthesize, analyse, develop and interpret trends within the sector

2.3 Explain theoretical and practical skills necessary to provide leadership in the development, provision and management of ITeS in their organizations

2.4 Express requisite knowledge and skills to establish their own ITeS enterprises

3.0 ENTRY REQUIREMENTS

3.1 The common regulations for the Masters degree in the University of Nairobi shall apply.

3.2 The following applicants shall be eligible for admission into the Master of Science degree in Information Technology Enabled Services Management.

- **i)** Holders of a bachelor's degree with at least an upper second class honours in any discipline of the University of Nairobi or an equivalent qualification recognized by the University of Nairobi Senate.
- **ii)** Holders of a bachelor's degree with at least a lower Second Class honours or an equivalent qualification recognized by Senate plus two years relevant work experience.
- **iii)** Holders of a bachelor's degree with at least a pass degree of the University of Nairobi or an equivalent qualification recognized by Senate plus five years relevant work experience.
- **iv)** Holders of a Postgraduate degree or diploma of the University of Nairobi or an equivalent qualification recognized by Senate.

3.3 In addition to 3.2 above, the applicant shall be required to pass an entrance examination test on competency in basic ICT skills and spoken and written English language skills respectively.

BACHELOR OF EDUCATION (ICT)

1.0 COURSE OBJECTIVES

The development of this programme is motivated by:

- **a)** The need for Kenya to harness ICT for increased productivity and effectiveness in all sectors of the economy for national prosperity.
- **b)** The need for widespread socio-economic awareness in Kenya of the purpose and capabilities of information systems.
- **c)** The need for Kenya to participate effectively in and reap maximum benefits from the global information economy.
- **d)** The need to address the increasing demand for ICT and Computer Studies educators.

An essential step in achieving these aims is the training of teachers for secondary schools and other post-secondary institutions. The trained teachers will be best placed to teach ICT at Secondary and Diploma levels, and commercial colleges. Therefore, the University of Nairobi has introduced a Bachelor of Education degree in BEd. (ICT).

The Programme Provides

- **a)** BEd. (ICT) with a double major in ICT. The trained personnel produced will be able to teach related courses, serve as system administrators in their schools, and also work in the ICT industry at technical levels.
- **b)** BEd. (ICT) with major in ICT and a minor in Mathematics or Physics. The trained personnel produced will be able to teach related courses and also serve as system administrators in their schools.

3.0 ENTRY REQUIREMENTS

Candidates must satisfy the University's general admission criteria.

The following shall be eligible for admission into the Bachelor of Education (ICT) programme or an equivalent qualification recognized by Senate:

1. A holder of Kenya Certificate of Secondary Education (KCSE) with a minimum aggregate performance of C+. In addition candidates must have obtained minimum grade of C+ in Mathematics and Physics.
2. A holder of Kenya Advanced Certificate of Education (KACE) with two principal passes, one of which must be in Mathematics or Physics.
3. A holder of a credit grade Diploma in Education majoring in Computer Studies, Mathematics, or Physics, or a holder of a credit grade Diploma in Computer Studies.
4. Holder of a Bachelor's degree from a recognized university.

REGULATIONS AND SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN APPLIED COMPUTING

1.0 INTRODUCTION

The School of Computing & Informatics started offering postgraduate programmes in 1980. The Postgraduate Diploma in Computer Science was started in 1980 and has since been phased out after graduating 378 students over the years. The MSc in Information Systems, designed as a conversion course, was started in 1998 and has graduated 263 students. The MSc in Applied Computer Science, an R&D project based programme, was started in 2003 and has graduated 9 students. The MSc in Computer Science was launched in 2005 and has since graduated 82 students. These programmes were aimed at meeting perceived development needs in Kenya for high caliber computing and IT professionals and have achieved their objectives.

The need for developing new MSc Programmes was necessitated by many factors that include experiences learnt, time lapsed since the last review, development of the School's research strategy, fast changing computing and information technology developments, national and industry needs and trends, requirements of performance contracting and quality management system.

In developing this programme, the following was taken into consideration:

a) experiences learnt
b) alignment to the School's research strategy
c) analysis of current programmes and completion rates
d) analysis of stakeholder's feedback
e) benchmarking with other international masters programmes.

All these have guided in the development of the core courses, domain areas, specializations, new knowledge areas, type of research projects that will be undertaken by students, provision of courses with more practical orientation, alignment with changing industry needs, emphasis on product development and entrepreneurial opportunities, and project management.

The Master of Science in Applied Computing is designed for graduates with a computing/IT background interested in working to solve specific societal problem in various domains of application using technology. Graduates of this programme would work within their domain of choice understand the functions, structure, processes and terminologies of the sector, understanding the problems and opportunities that may be amenable to ICT-based solutions, understand and develop appropriate models to solve sector specific problems and demonstrate knowledge and competence in applying ICT-based methodologies and techniques to solve sector problems.

2.0 COURSE OBJECTIVES:

i) Enable students with computing background to innovatively apply technologies to solve societal problems at a higher level of specialization
ii) Demonstrate the value of state-of-the-art development in one area of specialization
iii) Enable learners to effectively link research, innovation, entrepreneurship and practical application.

3.0 ENTRY REQUIREMENTS

3.1 The common regulations for Masters degree in the University of Nairobi shall apply.
3.2 The following shall be eligible for admission into the Master of Science in Applied Computing:
- **a)** Holders of a Bachelor's degree in Computer Science or Information Technology or any related discipline, with at least Upper Division Second Class Honours, of the University of Nairobi, or an equivalent qualification from another institution recognized by Senate.
- **b)** Holders of a Bachelor's degree in Computer Science or Information Technology or any related discipline, of Lower Division Second Class Honours, of the University of Nairobi, or an equivalent qualification from another institution recognized by Senate. In addition, they must have demonstrable relevant experience of at least two years.
- **c)** Holders of a Bachelor's degree in Computer Science or Information Technology or any related discipline, with at least a pass degree of the University of Nairobi, or an equivalent qualification recognized by Senate. In addition, they must have demonstrable relevant experience of at least five years.
- **d)** Holders of a Postgraduate Diploma in Computer Science or Postgraduate Diploma in Information Systems of the University of Nairobi, of at least Credit or an equivalent qualification from another institution recognized by Senate.

3.3 Applicants shall be required to pass a School-based entrance examination.

REGULATIONS AND SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN COMPUTATIONAL INTELLIGENCE

1. INTRODUCTION

The School of Computing and Informatics has offered postgraduate programmes since 1980 when the Postgraduate Diploma in Computer Science was started. This has since been phased out after graduating 378 students. The MSc in Information Systems was started in 1998 and has graduated 263 students; the MSc in Applied Computer Science was started in 2003 and has graduated 9 students; while the MSc in Computer Science was launched in 2005 and has since graduated 82 students. These programmes were aimed at meeting perceived development needs in Kenya for high calibre computing and IT professionals and they have achieved their objectives and contributed a good percentage of IT professionals in Kenya today.

The need for developing new MSc Programmes at the School was necessitated by many factors that include experiences learned, time lapsed since the last review, development of the School's research strategy, fast changing computing and information technology developments, national and industry needs and trends, requirements of performance contracting, and quality management system.

The process of developing this MSc programme has benefitted from the following:

a) experiences learnt,
b) alignment to the School's research strategy,
c) analysis of current programmes and completion rates,
d) analysis of stakeholders' feedback, and
e) benchmarking with other international masters programmes.

All these have guided the development of the various knowledge areas, provision of courses with more practical orientation, alignment with changing industry needs, emphasis on product development and entrepreneurial opportunities, and project management.

Remarkable progress has been made in applying computing technologies to real-world problems. However there exists a class of problems, specifically knowledge discovery problems, for which traditional computational methods are not applicable or sufficient. Given the explosion of digital information and knowledge that permeates all sectors of the society today, there is a great need for expertise in processing existing information and knowledge banks for the betterment of society. This category of problems requires solutions that mimic human intelligence. This programme seeks to expose the learner to the tools, techniques, algorithms and problem-solving methods that are applicable to real-world problems whose solution requires approaches that mimic human intelligence. This programme will endeavor to work closely with industry to address real-world needs by linking computational intelligence techniques to real-world applications and projects in areas such as business, finance, natural language engineering and control systems.

2 COURSE OBJECTIVES:

i) Create new opportunities for postgraduate research in computational intelligence
ii) Contribute to the production of computer science professionals with knowledge and skills in the theory and application of systems that perceive, reason, learn and act intelligently in solving real-world problems
iii) Cultivate an active and relevant computational intelligence research and development community
iv) Collaborate with industry to develop intelligent products and services that address needs in key economic sectors
v) Produce high quality research and products that can compete effectively at the global level.

3.0 ENTRY REQUIREMENTS

3.1 The common regulations for the Masters degrees in the University of Nairobi shall apply.
3.2 The following shall be eligible for admission into the Master of Science in Computational Intelligence:
- **a)** Holders of a Bachelor's degree of the University of Nairobi in Computer Science, of at least Upper Second Class Honours or an equivalent qualification from an institution recognised by Senate.
- **b)** Holders of a Bachelor's degree of the University of Nairobi in a related Engineering, Mathematics or Statistics discipline, of at least Upper Second Class Honours or an equivalent qualification from an institution recognised by Senate.
- **c)** Holders of a Bachelor's degree of the University of Nairobi in Computer Science, of Lower Second Class Honours or an equivalent qualification from an institution recognised by Senate. In addition, they must have demonstrable relevant experience of at least two years.
- **d)** Holders of a Bachelor's degree of the University of Nairobi in a related Engineering, Mathematics or Statistics discipline, of Lower Division Second Class Honours. In addition, they must have demonstrable relevant experience of at least two years.

3.3 Applicants shall be required to pass a School-based entrance examination.

REGULATIONS AND SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN DISTRIBUTED COMPUTING TECHNOLOGY

1.0 INTRODUCTION

The School of Computing & Informatics has offered postgraduate programmes since 1980, having started with the Postgraduate Diploma in Computer Science which has since been phased out having graduated 378 students over the years. The MSc in Information Systems, designed started in 1998 and has graduated 263 students. The MSc in Applied Computer Science was started in 2003 and graduated 9 students.

The MSc in Computer Science started in 2005 and has since graduated 82 students. These programmes were aimed at meeting perceived development needs in Kenya for high caliber computing and IT professionals and have achieved their objectives.

The need for developing new MSc Programmes at the School was necessitated by many factors including experiences learnt, time lapsed since the last review, development of the School's research strategy, fast changing computing and information technology developments, national and industry needs and trends, requirements of performance contracting and quality management system. One of the outcomes of the comprehensive review is this Master of Science in Distributed Computing Technology.

In compliance with the University Quality Management System, the development of this programme has taken into consideration the following:

a) experiences learnt,
b) alignment to the School's research strategy,
c) analysis of current programmes and completion rates,
d) analysis of stakeholder's feedback,
e) Benchmarking with other international masters programmes.

All these have guided the development of the various knowledge areas, with emphasis on courses with more practical orientation and aligned with changing industry needs, product development and entrepreneurial opportunities, and project management.

This programme aims to produce graduates who would fit in Telecommunication and Internet service providers industry, cloud and grid solution providers, organizations requiring management of network infrastructure as well as distributed applications. These would be people who can plan, design, build and manage corporate computing systems; as well as people involved with the design, implementation and maintenance of telecommunication networks.

2.0 COURSE OBJECTIVES:

i) Produce distributed systems engineers and technologist to plan, design, build, manage corporate computing systems, ISP and TSP networks and services
ii) Produce researchers in the area of distributed computing technology who can explore and innovate new techniques for solving real world problems.

3.0 ENTRY REQUIREMENTS

3.1 The common regulations for Masters degrees in the University of Nairobi shall apply.
3.2 The following shall be eligible for admission into the Master of Science in Distributed Computing Technology:
- **a)** Holders of a Bachelor's degree in Computer Science or a related discipline (e.g. Engineering, Mathematics and Physics), with at least Upper Second Class Honors, of the University of Nairobi, or an equivalent qualification from an institution recognized by Senate.
- **b)** Holders of a Bachelor's degree in Computer Science or a related discipline (e.g. Engineering, Mathematics and Physics), of Lower Second Class Honors, of the University of Nairobi, or an equivalent qualification from an institution recognized by Senate. In addition, they must have relevant works experience of two years.
- **c)** Holders of the above mentioned degree programmes with at least Pass degree. In addition, they must have relevant works experience of five years.

3.3 Applicants shall be required to pass a School-based entrance examination.

REGULATIONS AND SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN INFORMATION TECHNOLOGY MANAGEMENT

1.0 INTRODUCTION

The School of Computing & Informatics has offered postgraduate programmes since 1980 when Postgraduate Diploma in Computer Science was started in 1980. This has since been phased out after graduating a total of 378 students. The MSc in Information Systems, designed as a conversion course, was started in 1998 and has graduated 263 students. The MSc in Applied Computer Science, an R&D programme, was started in 2003 and graduated 9 students. The MSc in Computer Science which was launched in 2005 has graduated 82 students to date. The above programmes were aimed at meeting perceived development needs in Kenya for high caliber computing and IT professionals and they have achieved their objectives, with a good percentage of IT professionals in the Kenyan industry, public sector and academic institutions today have been developed through these programmes.

The need for the development of new SCI MSc programmes was necessitated by many factors that include experiences learnt, time lapsed since the last review, the School's research strategy, fast changing computing and information technology

developments, national and industry needs and trends, Vision 2030, requirements of performance contracting and quality management system.

The development of the MSc in Information Technology Management has taken into consideration the following:

a) experiences learnt,
b) alignment to the School's research strategy,
c) analysis of current programmes and completion rates,
d) analysis of stakeholder's feedback,
e) benchmarking with other international masters programmes.

This has guided in the development of knowledge areas, provision of courses with more practical orientation, alignment with changing industry needs, emphasis on product development and entrepreneurial opportunities, and project management.

Most ICT Managers are deficient in the key areas of managerial and organizational issues. The graduates with ICT technical skills get promoted to higher positions of management but are not well prepared to carry out their management duties. This programme is designed to fill this gap by providing practicing and aspiring ICT managers with the relevant skills that will enhance their service delivery in both technical and management perspectives.

2.0 COURSE OBJECTIVES:

i) Provide an opportunity to graduates with a strong IT background to enhance their IT knowledge and management skills
ii) Provide learners with skills necessary to implement ICT based solutions in organizations
iii) Equip learners with skills necessary to manage the ICT function in organizations
iv) Inculcate interdisciplinary approach, work team orientation and professionalism among the learners
v) Serve national and regional development needs with respect to staff development.

3.0 ENTRY REQUIREMENTS

3.1 The common regulations for Masters degrees in the University of Nairobi shall apply.
3.2 The following shall be eligible for admission into the Master of Science in Information Technology Management:

a) Holders of a Bachelor's degree in Computer Science or Information Technology or a related discipline, with at least Upper Second Class Honours, of the University of Nairobi, or an equivalent qualification from another institution recognized by Senate.
b) Holders of a Bachelor's degree in Computer Science or Information Technology or a related discipline, of Lower Second Class Honours, of the University of Nairobi, or an equivalent qualification from another institution recognized by Senate. In addition, they must have demonstrable relevant Information Technology expertise and experience of at least two years.
c) Holders of a Postgraduate Diploma in Computer Science or Postgraduate Diploma in Information Systems of the University of Nairobi, of at least Credit or an equivalent qualification from another institution recognized by Senate.

3.3 Applicants shall be required to pass a School-based entrance examination.

REGULATIONS AND SYLLABUS FOR MASTER OF SCIENCE DEGREE IN INFORMATION TECHNOLOGY ENABLED SERVICES [MSc. ITES]

1. INTRODUCTION

Business process outsourcing (BPO) was identified as a key economic sector under the economic pillar of the first medium term plan (MTP) of Vision 2030. Recent studies indicate that although the country has been moderately successful in attracting foreign BPO firms to Kenya, the focus on international BPO work has not succeeded as originally envisioned and Kenya has not been able to build a positive and successful brand around the BPO sub-sector. In BPO, which is the low-end segment of IT enabled services (ITeS), Kenya cannot effectively compete with the economies of scale that India or the Philippines offer.

At the same time, there have been changes to the global BPO and Outsourcing industry which has rendered the traditional BPO market that Kenya had been focusing on less attractive. For instance, global outsourcing contracts are increasingly larger in scale and bundled i.e. they include various services e.g. IT support, help desk and contact centres. Also due to the competitiveness of the global outsourcing market, the deals also have smaller margins. This is why Kenya must focus on the high-end segment of IT enabled services, which includes IT and knowledge outsourcing where the margins are bigger. This will contribute to both value capture and skills development.

According to Kenya Vision 2030 Development Blueprint, Kenya seeks to become an industrialized middle income country, with information and communication technology (ICT) as one of the foundations for this transformation. The Government is cognizant of the tremendous opportunities presented by the high-end segment of the ITeS industry. In order to gain a competitive edge in this industry, the Government is committed to developing a skilled manpower base as a requirement to become a major player in the global ITeS industry.

It is with this background that the University of Nairobi, with support from the Ministry of ICT, is setting up a Centre of Excellence for ITeS training (*herein after referred to a the* ***Centre***). The mandate of the Centre is to train, assess and certify successful candidates for the ITeS industry in accordance with the Government objectives, as contained in the Kenya Vision 2030 Development Blueprint. Already a purpose-built facility has been constructed for the program.

2. PROGRAM PHILOSOPHY

This course is responding to the University of Nairobi's core business of participating in the discovery, transmission and preservation of knowledge and the stimulation of the intellectual life and cultural development of Kenya in the 21st Century. The Internet and Globalisation have redefined modalities of carrying out business in ways never imagined before. In the wake of the African Union's "Agenda 2063" which is an approach to how the continent should effectively learn from the lessons of the past, build on the progress now underway and strategically exploit all possible opportunities available in the short, medium and long term, so as to ensure positive socioeconomic transformation within the next 50 years, we are developing this course to enable Kenya and the region extend its business opportunities beyond the borders. The philosophy of this course is therefore guided by the need to lay a firm human resource foundation for both local and international business opportunities made possible by new and emerging ICT technologies.

3. RATIONALE

A needs-assessment carried out by Ministry of ICT determined that there exists a skills gap with respect to trained human resource for the ITeS sector in Kenya. In order to mitigate this gap, the University of Nairobi, funded by the Ministry of ICT, set up the Centre to train and certify manpower for the ITeS sector in Kenya and the region. The Centre has determined that it is at the middle management level where the biggest gap in human capacity exists in this sector.

It is in this context that the Masters degree in ITeS curriculum is being developed. This course, therefore, seeks to produce trained mid-level manpower for ITeS sector. In particular, it will train supervisors and managers of call agents, front office and back office staff in existing and potential ITeS firms; corporate organizations, Government departments and agencies that want to outsource; new micro, small and medium enterprises that want to attract ITeS outsourcing work; and off-shore companies involved ITeS outsourcing. The target group for this course will be graduates who are already involved in the ITeS sector or who would like to develop a career in this sector.

4. COURSE OBJECTIVES

The overall goal of this program is to develop human capacity to transition Kenya to focus on higher levels of the ITeS value chain and grow the sector. At the end of the program therefore, the student should be able to:

4.1 Demonstrate a practical understanding of the potential business opportunities and growth potential in the ITeS sector
4.2 Formulate, synthesize, analyse, develop and interpret trends within the sector
4.3 Explain theoretical and practical skills necessary to provide leadership in the development, provision and management of ITeS in their organizations
4.4 Express requisite knowledge and skills to establish their own ITeS enterprises

5. PROGRAM LEARNER OUTCOMES

By the end of the program, the graduate will have ability to:

5.1 Describe potential business opportunities and growth areas in the ITES sector
5.2 Interpret ITES trends within the sector and take necessary interventions
5.3 Provide leadership and management knowledge in ITES services in respective organisations
5.4 Establish own ITES enterprise

6. ENTRY REQUIREMENTS

6.1 The common regulations for the Masters degree in the University of Nairobi shall apply.
6.2 The following applicants shall be eligible for admission into the Master of Science degree in Information Technology Enabled Services Management.
i) Holders of a bachelor's degree with at least an upper second class honours in any discipline of the University of Nairobi or an equivalent qualification recognized by the University of Nairobi Senate.

ii) Holders of a bachelor's degree with at least a lower Second Class honours or an equivalent qualification recognized by Senate plus two years relevant work experience.

iii) Holders of a bachelor's degree with at least a pass degree of the University of Nairobi or an equivalent qualification recognized by Senate plus five years relevant work experience.

iv) Holders of a Postgraduate degree or diploma of the University of Nairobi or an equivalent qualification recognized by Senate.

6.3 In addition to 6.2 above, the applicant shall be required to pass an entrance examination test on competency in basic ICT skills and spoken and written English language skills respectively.

REGULATIONS AND SYLLABUS FOR DOCTOR OF PHILOSOPHY IN COMPUTER SCIENCE AND DOCTOR OF PHILOSOPHY IN INFORMATION SYSTEMS PROGRAMMES

1.0 INTRODUCTION

The School of Computing and Informatics (*formerly, the Institute of Computer Science*) started offering a twelve-month Postgraduate Diploma in Computer Science programme in 1980. This programme has served the objectives of training Information Systems professionals for the industry very well. In 1992, the Institute started offering a very competitive four-year Bachelor of Science (Computer Science) programme. The first graduands of this programme will graduate in 1997. The staff who have been teaching these two programmes have all been trained outside the country. With diminishing scholarship programmes and the growing need for the training of Computer Science and Information Systems professionals, there has been need to start local training programmes at the postgraduate level. It is partly in order to address this challenge that we propose these Ph.D. programmes, among other postgraduate programmes. There is a pool of potential candidates for these programmes; those trained locally as well as abroad.

A further reason for developing this programme is to train high calibre manpower locally, regionally and internationally. Locally, this manpower would help to steer the country towards industrialization as per the current Government's industrialization vision. This is owing to the critical role of science and technology, and particularly information technology, to national development.

A graduate of the PhD. programmes will, among others, be able to join research groups in Information Systems or Computer Science at universities or in industry, and teach information systems and/or computer science programmes at both undergraduate and postgraduate levels.

2..0 COURSE OBJECTIVES

a) To provide a progression path for graduates of our MSc. (Computer Science) and MSc. (Information Systems) programmes;

b) To facilitate research at the Institute;

c) To serve national and regional development needs with respect to staff development;

d) To provide high quality training in computer science and information systems locally and internationally.

3.0 ENTRY REQUIREMENTS

To be eligible for registration for the Doctor of Philosophy programme, a candidate must be a holder of a Master of Science in Computer Science or a Master of Science in Information Systems of the University of Nairobi or a holder of an equivalent qualification, recognized by Senate, from another institution.

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Details on specific admission requirements of the school, credit transfer and exemptions, course structure and duration, examination regulations, course outline and award of degree may be obtained from the School.

Please contact
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SCHOOL OF MATHEMATICS

Director of School: Prof. Patrick G.O. Weke, BSc, MSc, (Nairobi), MSc, (City, UK), PhD, (HIT, China)

BACHELOR OF SCIENCE IN MATHEMATICS

1.0 INTRODUCTION

Mathematics plays a fundamental role in scientific discovery and development. This course is designed to develop a mathematical education, both as an entity in itself and as a subject that is applicable to social and scientific fields. The program is flexible with different options for the students. The options cover pure theory, which prepares the student for more advanced mathematical studies, and applied mathematics with a focus on mathematical modeling which provides a basis for solution of real world problems.

Mathematics is critical ingredient for the development of social and scientific disciplines. It is therefore absolutely necessary to continuously produce a stream of graduates with strong mathematical foundation and problem solving skills for the challenges in the research domain as well as in industry in Kenya and globally. With the advances in technology, the nature of research and business is becoming increasingly complex and quantitative. A good background in mathematics is essential for taking full advantage of these developments in technology.

This program will equip the students with the necessary skills and capacity for advanced mathematical research as well as provide the necessary problem solving skills to deal with real life situations and emerging issues.

The aim of this programme is to provide the student with the opportunity to develop confidence and skills in pure and applied mathematics so as to use mathematical modeling and mathematical techniques to solve real world problems.

2.0 COURSE OBJECTIVES

By the end of this programme, the student will be able to:

i) Express and present mathematical arguments in a logical and precise manner.
ii) Construct mathematical models for the abstraction of real life phenomena
iii) Apply physical insight and mathematical techniques in solving problems in mathematical sciences.
iv) Demonstrate mathematical relationships and theories based on fundamental principles of Mathematics.

3.0 ENTRY REQUIREMENTS

3.1 Candidates must satisfy the University's general admission criteria for undergraduate programmes.

3.2 Eligibility for consideration for admission into the degree of Bachelor of Science in Mathematics at the school of mathematics shall be governed by the following minimum admission requirements or an equivalent qualification recognized by the senate.

3.2.1 **KCSE:** A holder of the Kenya Certificate of Secondary Education (KCSE) with a minimum aggregate performance of C+. In addition candidates must have obtained a minimum of grade B+ in mathematics.

3.2.2 **A-Level:** A holder of the Kenya Advanced Certificate of Education (KACE) with 2 principal passes in mathematics/physics, mathematics/chemistry, mathematics/geography, or Mathematics/Economics

3.2.3 **Diploma in Computer Studies/Statistics/Education:** A holder of an ordinary diploma in computer studies, statistics, or education with mathematics as a major subject, with a minimum pass at credit level, from an institution recognized by the senate.

3.2.4 **A Bachelors Degree:** A holder of a Bachelors' Degree from an institution recognized by the senate preferably with a good mathematics background.

BACHELOR OF SCIENCE IN STATISTICS

1.0 INTRODUCTION

Statistics is an informative science in fact the science and art of extracting meaning from seemingly incomprehensible data. Most sectors of human endeavour produce raw data. Thus there is a lot of raw data that is usually stored in computer discs. Such undigested data is of no use until we can start to make sense of it. Proper utilization of available resources in all sectors of an economy can accelerate the attainment of the aspirations of Vision 2030.

Statistics is a practical discipline which helps us to solve real problems in the real world. The field of Statistics provides the Scientist with some of the most useful techniques for evaluating ideas, testing theory and discovering the truth. The Scientist thus can make informed decisions by using Statistical methods.

Statistics has applications in Bioinformatics, Biostatistics, Computing (Statistical computing is a highly sought skill), and Economics, Finance, Psychology, Physics and Health industry.

In all these fields evidence based decision making impacts positively in proper utilization of available resources and spur Economic growth. The delivery of the programme is based on inter-faculty collaboration and use of information technology (IT).

The aim of this programme is to provide students with the opportunity to develop confidence and skills to apply statistical principles to solve practical problems in industry and public service.

2.0 COURSE OBJECTIVES

The objectives of the programme shall be to:

a) Equip the students with good knowledge of fundamental principles of the Theory and Methods of Statistics.

b) Impart the necessary knowledge in Statistical Computing to enable students analyze large data sets.

c) Equip the students with skills in Statistical Methods necessary in making evidence based decisions.

1.2 Learning Outcomes

At the end of this programme, the student will able to:

a) Explain fundamental principles of the Theory and Methods of Statistics.

b) Apply Statistical Methods and Survey Techniques to a wide range of practical problems.

c) Analyse large data sets using Statistical Computing Techniques.

d) Employ Statistical Methods necessary in making evidence based decisions.

3. 0 ENTRY REQUIREMENTS

3.1 Candidates must satisfy the University's general admission criteria for undergraduate programmes.

3.2 Eligibility for consideration for admission into the Degree of Bachelor of Science in Statistics at the School of Mathematics shall be governed by the following minimum admission requirements or an equivalent qualification recognized by Senate:

3.2.1 **KCSE:** A holder of Kenya Certificate of Secondary Education (KCSE) with minimum mean aggregate of C+. In addition candidates must have obtained a minimum grade of B in Mathematics.

3.2.2 **A-level:** A holder of Kenya Advanced Certificate of Education (KACE) with two Principal passes in Mathematics/Physics, Mathematics/Chemistry, Mathematics/Geography or Mathematics/Economics.

3.2.3 **Diploma in Computer Studies/Statistics:** A holder of ordinary diploma in Computer Studies or Statistics with a minimum pass at credit level from an institution recognized by Senate and had obtained a mean grade C at KCSE

3.2.4 **Diploma in Education:** A holder of ordinary diploma in Education with Mathematics as a major subject from an institution recognized by Senate.

BACHELOR OF SCIENCE IN ACTUARIAL SCIENCE

1.0 INTRODUCTION

Actuarial Science is the profession concerned with the application of mathematical, statistical, probabilistic, and financial theories to solve real business problems. These problems involve analyzing future financial events, especially where future payments involved have certain or uncertain timing. The traditional areas in which actuaries operate are: life and general insurance, pensions, and investment. Actuaries are also increasing moving into other fields like health insurance, solvency measurements and asset-liability management, financial risk management, mortality and morbidity investigation and so on, where their analytical skills can be employed. Currently, there is high demand for Actuarial Science expertise locally, regionally and internationally.

The BSc. in Actuarial Science course (*which was started in 1999*) is designed to equip the students with training in theoretical and practical aspects of Actuarial Science in order for them to work in life and non-life insurance companies (designing insurance

products and valuing financial contracts and investing funds); consultancy (*offering advice to occupational pension funds and employee benefit plans*); government service (*supervising insurance companies and advising on the* national insurance); and also in the stock exchange, industry, commerce and academia.

The aim of this programme is to provide students with the opportunity to develop confidence and skills to apply Actuarial Science techniques to solve practical problems in financial sector and society in general. This course is ideal for those who excel in and enjoy mathematics, in particular modelling and probability, especially those who like asking "What if?" It will equip the student with the skills to become an actuary and also offers a good starting point for those who want to use their skills in risk management, investment management or financial analysis.

2.0 COURSE OBJECTIVES

a) Equip the students with good knowledge of fundamental principles of the Theory and Methods of Actuarial Science.
b) Impart the necessary knowledge in Actuarial Science to enable students in the designing of insurance products, valuation of financial contracts and modelling of mortality and morbidity.
c) Equip the students with skills in Actuarial and Financial Methods necessary in making prudent decisions that inform national development.

2.1 LEARNING OUTCOMES

At the end of this programme, the student will able to:
a) Explain fundamental principles of Actuarial Science as applied in investments, life and non-life insurance, pension funds and financial risk management.
b) Employ Actuarial Science techniques in the design of insurance products, valuation of financial contracts and modelling of mortality and morbidity.
c) Interpret demographic and financial data to inform prudent decisions in national development.
d) Demonstrate ability to apply the principles, methods and techniques of Actuarial Science that meet standards of practice required by the relevant professional bodies.

3. ENTRY REQUIREMENTS

3.1 Candidates must satisfy the University's general admission criteria for undergraduate programmes.
3.2 Eligibility for consideration for admission into the degree of Bachelor of Science in Actuarial Science at the School of Mathematics shall be governed by the following minimum admission requirements or an equivalent qualification recognized by Senate:
3.2.1 **KCSE:** A holder of Kenya Certificate of Secondary Education (KCSE) with a minimum aggregate performance of B+. In addition candidates must have obtained a minimum grade of B+ in Mathematics.
3.2.2 **A-Level:** A holder of Kenya Advanced Certificate of Education (KACE) with 2 principal passes in Mathematics/Physics, Mathematics/Chemistry, Mathematics/Geography, or Mathematics/Economics.
3.2.3 **Diploma in Computer Studies/Statistics/Education:** A holder of an ordinary diploma in computer studies, Statistics, or Education with Mathematics as a major subject, or equivalent with, a minimum pass at credit level, from an institution recognized by Senate and had obtained a mean grade C at KCSE.
3.2.4 **Bachelor's Degree:** A holder of a Bachelor's degree from an institution recognized by Senate, preferably with a good Mathematics background.

BACHELOR OF SCIENCE IN MATHEMATICS AND COMPUTING

1.0 INTRODUCTION

Mathematics is a critical ingredient for the development of social and scientific disciplines to solve real life problems. With advances in technology, the nature of research and business is becoming increasingly more complex and quantitative.

The pace of industrialisation of any country depends on how fast it is able to put into technological use the available scientific knowledge. The scientific solution of many real life problems requires mathematical modelling, and the evaluation of a model with the help of computers is accomplished by scientific computing. So mathematics and computing is becoming increasingly important in economic and technological development of our time.

A good background in mathematics and computing is essential for taking full advantage of these developments in technology. This is done without compromising the mathematical skill necessary for a degree in mathematics. The computing skills are important for efficiently solving mathematical methods and ultimately provide scientific and business solutions. The combined mathematical and computing skills will leverage a learner to innovation and enhance the scope for future employment and entrepreneurship.

In this degree course mathematical content is combined with principles of computer science, computation, systems design and software engineering to give a computer-aided approach to mathematics. This approach is necessary in the current society where information technology is permeating every facet of the society for efficient and effective delivery of superior business and scientific solutions.

The aim of this programme is to provide the student with the opportunity to develop confidence and skills in mathematical modelling and computing for delivery of innovative business and scientific solutions

2.0 COURSE OBJECTIVES

By the end of this programme, the student will be able to:

i) Express and present mathematical and computing knowledge, techniques and tools in a logical and precise manner.

ii) Apply mathematical modelling, systems design and software engineering techniques to construct computer-aided business solutions

iii) Demonstrate and apply machine learning methods including neural networks and fuzzy systems.

iv) Apply mathematical and computing skills in innovation and discovery to meet challenges and needs of business and industry.

3.0 ENTRY REQUIREMENTS

3.1 Candidates must satisfy the University's general admission criteria for undergraduate programmes.
Eligibility for consideration for admission into the degree of Bachelor of Science in Mathematics and Computing at the School of Mathematics shall be governed by the following minimum admission requirements or an equivalent qualification recognized by Senate:

3.2.1 KCSE: A holder of Kenya Certificate of Secondary Education (KCSE) with a minimum aggregate performance of C+. In addition, candidates must have obtained a minimum grade of B in Mathematics.

3.2.2 A-Level: A holder of Kenya Advanced Certificate of Education (KACE) with 2 principal passes in Mathematics/Physics, Mathematics/Chemistry, Mathematics/Geography, or Mathematics/Economics.

3.2.3 Diploma in Computer Studies/Industrial Mathematics and Informatics/ Education: A holder of an ordinary diploma in computer studies Industrial Mathematics and Informatics, or Education with Mathematics as a major subject, or equivalent with, a minimum pass at credit level, from an institution recognized by Senate.

3.2.4 Bachelor's Degree: A holder of a Bachelor's degree from an institution recognized by Senate, preferably with a good Mathematics background.

BACHELOR OF ARTS PROGRAMME IN MATHEMATICS

1.0 ENTRY REQUIREMENTS

Candidates must meet the minimum University and Faculty of Arts general admission criteria.

In addition to above requirement to register for Mathematics a candidate must have passed Mathematics with a minimum grade of C+ at KCSE. or an equivalent qualification.

BACHELOR OF EDUCATION (SCIENCE) PROGRAMME IN MATHEMATICS

1.0 COURSE STRUCTURE

The course structure provides for three distinct categories of students; Double mathematics, mathematics major and mathematics minor. In each case the student must take all the prescribed core units. In the fourth year of study a double mathematics student may specialize in any of the five areas: Pure Mathematics, Applied Mathematics, Statistics, Operations Research or Actuarial Mathematics by judiciously selecting the elective courses.

POSTGRADUATE PROGRAMMES

1.0 ENTRY REQUIREMENTS

To be eligible for registration for the Master of Science degree in Mathematics, candidates must have taken Mathematics or Statistics as a major subject in their first degree and obtained at least an upper second class honours or its equivalent.

1.1.1 Common regulations for the Masters' degree in the University shall be applicable and the general regulations for the Masters' degree in the School of Mathematics shall also be applicable. In the First Year of study, all candidates shall take a minimum of 8 units by course work and in the second year of study, candidates may either take course work and project or undertake thesis research.

1.1.2 Candidates taking course work in the second year of study will take either six course units or four course units and a project whose findings shall be presented in the form of a brief write up. The project shall be regarded as equivalent to two units.

1.1.3 Candidates undertaking a thesis research in the second year of study, shall do so on an approved subject. The thesis shall be regarded as equivalent to six course units. Examinations shall be governed by the general regulations for the Degree of Master of Science in the School of Mathematics.

1.1.4 The course work examinations shall be held at the end of the semester in which they are offered. A one-unit course will be examined by a two-hour paper while a two-unit course will be examined by a three-hour paper.

The project write-up shall be submitted for evaluation by an external examiner.

MASTER OF SCIENCE IN BIOMETRY

1.0 ENTRY REQUIREMENTS

Common regulations for the Master of Science degree in the University of Nairobi and the School of Mathematics shall apply.

a) Holders of a degree of the University of Nairobi of at least Upper Second Class in Mathematics or Statistics or an equivalent qualification from a university recognised by Senate.

b) Holders of degrees in Medicine, Agriculture, Biology, Agricultural Engineering, and Agricultural Economics, with a good mathematical background.

c) Holders of a Lower Second Class degree in the areas specified above and at least two years relevant research experience or academic work may be considered for admission.

d) Holders of a pass degree in the areas specified above plus a postgraduate diploma in the relevant areas may be considered for admission.

A candidate who meets the minimum admission requirements and has been admitted into the course, but needs knowledge in any of the following areas: use of modern statistical software, basic mathematical tools for statistics and principles of plant and animal biology will be required to take an introductory course in the relevant areas. This will be a preliminary course which must be successfully completed before embarking on the MSc. Programme.

MASTER OF SCIENCE IN INDUSTRIAL MATHEMATICS

1.0 ENTRY REQUIREMENTS

1.1. Common regulations for the Master of Science degree in the University of Nairobi and the School of Mathematics shall be applicable

1.2. Holders of a degree of the University of Nairobi of at least Upper Second Class in Mathematics, Physics, Computer Science, Biology or Economics, or an equivalent qualification from a university recognised by Senate.

1.3. Holders of a Lower Second Class degree plus at least two years relevant research experience or academic work may be considered for admission.

1.4. Non-holders of a first degree who can show evidence of relevant research experience or academic work may be considered for admission provided that they pass relevant qualifying examinations.

MASTER OF SCIENCE IN SOCIAL STATISTICS

1.0 ENTRY REQUIREMENTS

1.1 Common regulations for the Master of Science degree in the University of Nairobi and the School of Mathematics shall be applicable.

1.2 Holders of a degree of the University of Nairobi of at least upper second class in mathematics or statistics or an equivalent qualification from a university recognised by senate.

1.3 Graduates in Economics, Sociology, Psychology, Geography and Commerce, with a good mathematical background.

1.4 Holders of a lower second class degree plus at least two years relevant research experience or academic work may be considered for admission.

1.5 Non-holders of a first degree who can show evidence of relevant research experience or academic work may be considered for admission provided that they pass relevant qualifying examinations.

POSTGRADUATE DIPLOMA IN ACTUARIAL SCIENCE

1.0 ENTRY REQUIREMENTS

1.1 Common regulations governing Postgraduate Diploma programmes in the University of Nairobi shall apply.

1. 2 Holders of a degree of the University of Nairobi or an equivalent qualification, preferably with a good mathematics background.

MASTER OF SCIENCE IN ACTUARIAL SCIENCE

1.0 INTRODUCTION

Actuarial Science is the profession concerned with the application of mathematical, statistical, probabilistic, and financial theories to solve real business problems. These problems involve analyzing future financial events, especially where future payments involved have certain or uncertain timing. The traditional areas in which actuaries operate are: life and general insurance, pensions, and investment. Actuaries are also increasing moving into other fields like health insurance, solvency measurements and asset-liability management, financial risk management, mortality and morbidity investigation and so on, where their analytical skills can be employed. Currently, there is high demand for Actuarial Science expertise locally, regionally and internationally.

The Master of Science in Actuarial Science course is designed to equip the students with advance training in theoretical and practical aspects of Actuarial Science in order for them to work in life and non-life insurance companies (designing insurance products and valuing financial contracts and investing funds); consultancy (*offering advice to occupational pension funds and employee benefit plans*); government service (supervising insurance companies and advising on the national insurance); and also in the stock exchange, industry, commerce and universities.

The overall objective of this course is to equip students with theoretical and practical knowledge, develop and apply techniques of mathematics, statistics, probability and finance to solving real business problems.

2.0 COURSE OBJECTIVES:

i) To offer high quality training in Actuarial Science locally and internationally.

ii) To provide an opportunity for research in Actuarial Science and development of Actuarial products.

iii) To provide an opportunity to students from other disciplines to pursue training in Actuarial Science.

3.0 ENTRY REQUIREMENTS

3.1 Common regulations for the Masters degree in the University of Nairobi shall apply. In addition, candidates must be

3.2 Holders of a Bachelor's degree from the University of Nairobi in Actuarial Science, of at least Upper Second Class Honours, or equivalent qualification from an institution recognized by the Senate.

3.3 Holders of a Bachelor's degree in Actuarial Science, of Lower Second Class Honours, from the University of Nairobi, or an equivalent qualification from another institution recognized by Senate. In addition, a candidate must have at least two years relevant work experience.

3.4 Holders of a pass Bachelor's degree in Actuarial Science from the University of Nairobi, or an equivalent qualification from another institution recognized by Senate. In addition, a candidate must have at least three years relevant work experience.

3.5 Holders of a Bachelor's degree from the University of Nairobi or any other institution recognized by the Senate and a Postgraduate Diploma in Actuarial Science from the University of Nairobi, of a minimum credit grade.

3.6 Holders of a Bachelor's degree from the University of Nairobi or any other institution recognized by the Senate and a Postgraduate Diploma in Actuarial Science from the University of Nairobi, of a pass grade. In addition, the candidate must have at least two years relevant work experience.

STAFF LIST

Director of School:

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Professor:

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Odweso, G.M., BSc, MSc, PhD, (Nairobi

Lecturer:

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Kiratu, B., BSc, MSc
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Mwangi, F.M., BSc, MSc, (Nairobi)
Chagpar, F.Z.M., BSc, MSc, (Nairobi)
Sarguta, R.J., BSc, MSc, (Nairobi)

Details on specific admission requirements of the school, credit transfer and exemptions, course structure and duration, examination regulations, course outline and award of degree may be obtained from the School.

Please contact
Director, School of Mathematics
Email: director-maths@uonbi.ac.ke

SCHOOL OF PHYSICAL SCIENCES

Dean of School (Ag.): Prof. Leonida K. Omosa, BSc, (Bharkhatullah), MSc, (Devi Ahilya, M.P. India), PhD, (Nairobi) (*w.e.f. 29.11.2019*)

A BRIEF HISTORY OF THE SCHOOL

The School of Physical Sciences was culmination of the internal restructuring of departments of the University of Nairobi in 2005. The School consists of 5 departments; namely Chemistry, Geography and Environmental Studies, Geology, Meteorology and Physics. All the departments are located at the Chiromo Campus except for Geography which is located at the Main Campus.

The Departments of Geology, Meteorology and Physics are all housed on separate floors in a two-storey building complex (former Faculty of Science Building Complex). The Department of Chemistry is located in a single separate one-storey building which comprises a basement. All the departments in the School of Physical Sciences have fully equipped laboratories and enjoy adequate shared facilities for teaching and research. The Department of Geography and Environmental Studies falls both under the School of Physical Sciences and Faculty of Arts for Administrative purposes.

The School of Physical Sciences is served by the Chiromo Campus Library which has a good stock of relevant books in the Biological and Physical Sciences and subscribes to most major journals in these fields. It also shares facilities which include a glass-blowing, metal and wood fabrication workshop and a computer laboratory for students.

Both undergraduates and postgraduate courses based on a flexible course unit system are offered within the School. Applicants seeking admission into specific programmes within the School are encouraged to obtain further information from the office of the Dean or from relevant Departments.

REGULATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE

1.0 ENTRY REQUIREMENTS

No person shall be registered as a candidate for the degree of Bachelor of Science unless he/she satisfies the prescribed University and School's minimum entry requirements.

In addition to meeting the minimum University general admission requirements, candidates for the School of Physical Sciences must have passed:-

a) Kenya Certificate of Secondary Education (KCSE), or equivalent qualifications, with passes in at least three subjects from either of the following two alternatives (A or B), with the minimum grades shown

Alternative A			**Alternative B**		
Chemistry	-	C+	Physical Sciences	-	C+
Biology	-	C+	Biological Sciences	-	C+
Physics	-	C+	Geography	-	C+
Geography	-	C+	Mathematics	-	C+
Mathematics	-	C+			

b) Kenya Advanced Certificate of Education (KACE), or equivalent qualifications, with at least two Principal level passes in: Applied Mathematics, Biology, Botany, Chemistry, Geography, Geology, Mathematics, Physics, Pure Mathematics, Statistics and Zoology

c) Ordinary/Higher National Diploma, or equivalent qualifications, in the sciences or computer science with at least a pass.

d) Science/Technical Diploma from Teachers Training Colleges, or equivalent qualifications, in the sciences or in computer science with at least pass.

e) A degree from a recognized University, or equivalent qualifications.

f) A candidate for the Bachelor of Science degree in the School of Physical Sciences shall be required to take a combination of courses approved by the Dean of the School. An approved combination of courses may be modified only with the consent of the Dean normally within the first two weeks of the Semester.

GENERAL REGULATIONS FOR THE DEGREE OF MASTER OF SCIENCE

The common regulations for the Master`s Degree in the University of Nairobi shall apply.

i) Candidates for the Master of Science Degree in the School of Physical Sciences shall follow courses of study as laid down in approved programmes, for a period of not less than two academic years and not more than three years (*unless with approval from Senate*).

ii) In any year of study by taught courses, the programmes shall consist of a minimum of 8 units or the equivalent, each unit comprising the equivalent of 45 lecture hours. Each unit shall be examined at the end of the semester as appropriate and within the year of study.

iii) Normally the first year of study shall be by taught courses and second year of study shall be by taught courses/project or thesis (*as applicable in the departmental regulations*).

iv) Examination of each unit shall be by continuous assessments and written paper. Unless otherwise specified in approved Departmental regulations, continuous assessment shall comprise 30% of the marks and the written paper shall comprise 70% of the marks in the end of semester examination.

v) For each unit the written paper shall be of a maximum of two hours duration.

vi) To proceed to second year of study, a candidate shall be required to pass all the prescribed course units in the first year.

vii) The pass mark of an examination [Continuous Assessment Tests and Main Examination (written paper)] shall be 50%. A candidate who fails to obtain a pass in any course unit may be allowed to do a Supplementary examination in the failed unit. A candidate who fails in at least 50% of the total units registered for in that academic year shall be discontinued.

viii) Candidates failing in the examinations for not more than two units or one three-hour paper where units are combined but with a mark of not less than 40% may be allowed to sit and pass a supplementary examination in those two units or the one failed paper.

ix) A candidate who fails to obtain the pass mark in the second re-submission of a project/or thesis where applicable or fails to complete a course within the prescribed period shall be discontinued.

x) Candidates failing in two units (*or one paper*) at below 40% or in more than two units or one paper, or at supplementary examination will be discontinued.

xi) To qualify for the award of the MSc degree, a candidate MUST pass all the taught course units and projects or thesis

COMMON UNDERGRADUATE COURSES

1.0 INTRODUCTION

The common courses shall be administered by the Board of Common Undergraduate Courses in collaboration with relevant Departments.

2.0 OBJECTIVE

The programme is aimed at fostering in the graduates a broad sense of self reliance, general awareness in the dynamic environment and appreciation of the need for concerted effort and common endeavour in developing their own ability to compete in the changing world.

3.0 ENTRY REQUIREMENTS

In order to be admitted to the compulsory common Courses Programme, a Candidate must have fulfilled the General Minimum University entry requirements.

DEPARTMENT OF CHEMISTRY

UNDERGRADUATE PROGRAMMES

REGULATIONS AND SYLLABUS FOR BACHELOR OF SCIENCE IN ANALYTICAL CHEMISTRY

Analytical chemistry is the science of measurement and identification of the chemical compounds that underlies most aspects of modern life and plays a central part within the chemical industry. It also involves the processing and communication of information about the composition and structure of matter.

The students will be expected to complete a total of 12 courses in each of the first two academic years. The first two years comprise chemistry courses covering the traditional areas of inorganic, organic and physical chemistry, as well as a basic grounding in mathematics and computer skills (including use of the World Wide Web). In the final two years, in addition to the traditional core chemistry courses designed for chemistry majors, students will choose from specialist options in the field of analytical chemistry. They will also undertake BA analytical chemistry-type research project and/or dissertation in fourth year.

2.0 COURSE OBJECTIVES

At the end of the course the graduate will:

i) Have gained the specialist analytical skills, techniques and methodologies
ii) Have gained hands-on experience of the major analytical techniques on analyzing samples from a wide range of sources
iii) Carry out projects that will avail the opportunity to carry out in-depth studies developing new methods and assays.
iv) Have gained a broad solid foundation in Chemistry.

3.0 ENTRY REQUIREMENTS

i) A candidate who wishes to register must have the minimum University general admissions requirements.
ii) In addition to meeting (i) above, candidates wishing to register for Bachelor of Science in Analytical Chemistry must have any of the following:
   a) Kenya Certificate of Secondary Education (KCSE) or equivalent qualifications, with passes in at least three subjects in either of the following two alternatives (A or B), one of which must be Chemistry or Physical Science

Alternative A			**Alternative B**		
Chemistry	-	C+	Physical Sciences	-	C+
Biology	-	C+	Biological Sciences	-	C+
Physics	-	C+	Geography	-	C+
Geography	-	C+	Mathematics	-	C+
Mathematics	-	C+			

b) Kenya Advanced Certificate of Education (KACE), or equivalent qualification with at least two principal passes (*of which one must be in chemistry*)
c) Ordinary Diploma/Higher National Diploma or equivalent qualifications in the sciences with at least a pass
d) Science/Technical Diploma from Teachers Training Colleges or equivalent qualifications in the sciences
e) A science/technology based degree or a non science based degree with a minimum of C+ in chemistry or its equivalent from an institution recognized by the University

REGULATIONS AND SYLLABUS FOR BACHELOR OF SCIENCE IN INDUSTRIAL CHEMISTRY

1.0 INTRODUCTION

Industrial Chemistry is the branch of chemistry which applies physical and chemical processes towards the transformation of raw materials into products that are of benefit to humanity. The goal of the Bachelor of Science in Industrial Chemistry degree programme is to produce graduates who will be highly skilled in this activity. We do this by first giving the students a strong foundation in chemistry, mathematics and physics. The Industrial Chemistry graduate is a chemist with knowledge linkages in engineering, chemical processing, economics and industrial management.

2.0 COURSE OBJECTIVES

At the end of the course, the graduates will:

i) Have skills to enable them understand, develop and modify industrial technologies and hence promote industrial development.
ii) Be able to operate and manage industrial equipment, processes and plants.
iii) Have the potential to pursue careers in academia, research and consultancy.
iv) Have a broad understanding of chemistry.

3.0 ENTRY REQUIREMENTS

i) A candidate who wishes to register must have the minimum University general admissions requirements.
ii) In addition to meeting (i) above, candidates wishing to register for Bachelor of Science in Industrial Chemistry must have any of the following:
   a) Kenya Certificate of Secondary Education (KCSE) or equivalent qualifications, with passes in at least three subjects in either of the following two alternatives (A or B), one of which must be Chemistry or Physical Science.

Alternative A			**Alternative B**		
Chemistry	-	C+	Physical Sciences	-	C+
Biology	-	C+	Biological Sciences	-	C+
Physics	-	C+	Geography	-	C+
Geography	-	C+	Mathematics	-	C+
Mathematics	-	C+			

   b) Kenya Advanced Certificate of Education (KACE), or equivalent qualification with at least two principal passes (*of which one must be in chemistry*)

c) Ordinary Diploma/Higher National Diploma or equivalent qualifications in the sciences with at least a pass
d) Science/Technical Diploma from Teachers Training Colleges or equivalent qualifications in the sciences
e) A science/technology based degree or a non science based degree with a minimum of C+ in chemistry or its equivalent from an institution recognized by the University

REGULATIONS AND SYLLABUS FOR BACHELOR OF SCIENCE IN ENVIRONMENTAL CHEMISTRY

1.0 INTRODUCTION

Environmental chemistry is the study of the interaction between chemical substances, man and the environment. The aim of the degree program is to produce graduates who are well grounded in chemistry and physical environmental management.

2.0 COURSE OBJECTIVES

At the end of the course, the graduate will be able to:

i) Apply sustainability management tools on physical environment.
ii) Sample, analyze, quantify baseline conditions and predict impacts of substance interaction between man and the environment, propose solutions and communicate the same to decision makers.
iii) Conceptualize and design projects to identify and quantify environmental and human health risks and propose interventions
iv) Be conversant with local and international efforts aimed at mitigating key environmental challenges.
v) Qualify for certification/registration by the regulatory authorities as environmental assessment experts without further training.

3.0 ENTRY REQUIREMENTS

i) A candidate who wishes to register must have the minimum University general admissions requirements.
ii) In addition to meeting (i) above, candidates wishing to register for Bachelor of Science in Environmental Chemistry must have any of the following:
   a) Kenya Certificate of Secondary Education (KCSE) or equivalent qualifications, with passes in at least three subjects in either of the following two alternatives (A or B), one of which must be Chemistry or Physical Science

Alternative A			**Alternative B**		
Chemistry	-	C+	Physical Sciences	-	C+
Biology	-	C+	Biological Sciences	-	C+
Physics	-	C+	Geography	-	C+
Geography	-	C+	Mathematics	-	C+
Mathematics	-	C+			

   b) Kenya Advanced Certificate of Education (KACE), or equivalent qualification with at least two principal passes (*of which one must be in chemistry*)
   c) Ordinary Diploma/Higher National Diploma or equivalent qualifications in the sciences with at least a pass
   d) Science/Technical Diploma from Teachers Training Colleges or equivalent qualifications in the sciences
   e) A science/technology based degree or a non science based degree with a minimum of C+ in chemistry or its equivalent from an institution recognized by the University

REGULATIONS AND SYLLABUS FOR BACHELOR OF SCIENCE IN CHEMISTRY

1.0 INTRODUCTION

Bachelor of Science in Chemistry is a foundational course in chemistry that has material covering the traditional branches of chemistry namely organic, inorganic and physical. It also has courses from other branches of chemistry such as analytical chemistry, environmental chemistry and industrial chemistry as well as other disciplines such as physics. It seeks to explain factors that cause reactions to occur, how they occur and their adverse and non-adverse effects on our well being. It prepares one to pursue postgraduate studies in any of these fundamental branches.

The students in the final two years, in addition to the traditional core chemistry courses designed for chemistry majors, will choose from specialist options in the field of analytical chemistry. They will also undertake a research project and/or dissertation in their final fourth year

Students who intend to specialize in chemistry will be expected to complete a total of 12 courses in each of the first two academic years. The first two years comprise chemistry courses covering the traditional areas of inorganic, organic and physical chemistry, as well as a basic grounding in mathematics and computer skills (*including use of the World Wide Web*). In the final two years, they will take a minimum of ten

courses in each year made up of core courses and requisite number of approved electives. Students, who wish to study chemistry but do not intend to specialize in it, will be advised as to which units to take.

2.0 COURSE OBJECTIVES

At the end of the course the graduate will:

i) Have acquired a broad based knowledge of chemistry.
ii) Be able to address chemistry related problems that confront us in various fields and also to pursue further studies in chemistry related fields

3.0 ENTRY REQUIREMENTS

i) A candidate who wishes to register must have the minimum University general admissions requirements.
ii) In addition to meeting (i) above, candidates wishing to register for Bachelor of Science in Environmental Chemistry must have any of the following:
   a) Kenya Certificate of Secondary Education (KCSE) or equivalent qualifications, with passes in at least three subjects in either of the following two alternatives (A or B), one of which must be Chemistry or Physical Science

Alternative A			**Alternative B**		
Chemistry	-	C+	Physical Sciences	-	C+
Biology	-	C+	Biological Sciences	-	C+
Physics	-	C+	Geography	-	C+
Geography	-	C+	Mathematics	-	C+
Mathematics	-	C+			

   b) Kenya Advanced Certificate of Education (KACE), or equivalent qualification with at least two principal passes (of which one must be in chemistry)
   c) Ordinary Diploma/Higher National Diploma or equivalent qualifications in the sciences with at least a pass Science/Technical Diploma from Teachers Training Colleges or equivalent qualifications in the sciences
   d) A science/technology based degree or a non science based degree with a minimum of C+ in chemistry or its equivalent from an institution recognized by the University

POSTGRADUATE PROGRAMMES

REGULATIONS AND SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN CHEMISTRY

1.0 INTRODUCTION

Master of Science in Chemistry has materials covering the traditional branches of chemistry namely organic, inorganic and physical chemistry. It also has courses from other branches of chemistry such as analytical chemistry, environmental chemistry and industrial chemistry. It seeks to explain factors that cause reactions to occur, how they occur and their adverse and non-adverse effects on our well being.

2.0 COURSE OBJECTIVES

The programme shall be to train and equip the students with

a) Knowledge in analytical, environmental, industrial, material science, drug development among others.
b) Competence in developing creative research and also synthesise novel inorganic organic compounds.
c) skills to synthesize and characterize organic compounds.
d) knowledge in extraction, separation, purification and characterization of compounds from plants.
e) An in-depth knowledge of molecular structure, thermodynamics and chemical kinetics of transformations of the various chemical processes, materials and surfaces.
f) Skills to apply current research and technology to detect chemical and biological analytes in a variety of contexts, including environmental testing, biological probing and medical diagnostics
g) Skills to derive useful information and expressions for practical application of equilibria of processes and kinetics of various chemical interactions.

3.0 ENTRY REQUIREMENTS

a) The common regulations for the Masters degrees in the School of Physical Sciences shall apply.
b) In addition to meeting (a) above, candidates wishing to register for Master of Science in Chemistry must have any of the following:
   i) A degree of the University of Nairobi of at least an Upper Second Class Honours in Chemistry or equivalent from any other institution recognized by the Senate.

ii) A lower Second Class honours degree of the University of Nairobi in Chemistry or equivalent from any other institution recognized by the Senate plus at least two years relevant research/work experience
iii) A pass degree of the University of Nairobi in Chemistry or equivalent from any other institution recognized by the Senate plus at least five years relevant research/work experience

REGULATIONS AND SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN ANALYTICAL CHEMISTRY

1.0 INTRODUCTION:

Analytical chemistry is the science of measurement and identification of the chemical compounds that underlie most aspects of modern life and plays a central part within the chemical industry. It also involves the processing and communication of information about the composition and structure of matter.

This is a new program that the Department is introducing for the first time. Its introduction has been occasioned by the large number of graduates in other related disciplines of chemistry who intend to proceed to post-graduate level in analytical chemistry. In addition to the traditional chemistry areas, the course covers research methods, chemical separation and instrumentation and statistics and chemometrics.

Postgraduate students in analytical chemistry will acquire skills that will enable them develop new methods for use of instruments in the analysis of chemical compounds.

2.0 COURSE OBJECTIVES

a) To equip the students with knowledge in the operation of a wide range of modern analytical instruments.
b) To be competent to analyze compounds in diverse matrices.
c) In new analytical methods and also improve on existing ones.

3.0 ENTRY REQUIREMENTS

a) The common regulations for the Masters degrees in the School of Physical Sciences shall apply.
b) In addition to meeting (a) above, candidates wishing to register for Master of Science in Analytical Chemistry must have any of the following:
i) A degree of the University of Nairobi of at least an Upper Second Class Honours in Chemistry or equivalent from any other institution recognized by the Senate.
ii) A lower Second Class honours degree of the University of Nairobi in Chemistry or equivalent from any other institution recognized by the Senate plus at least two years relevant research/work experience
iii) A pass degree of the University of Nairobi in Chemistry or equivalent from any other institution recognized by the Senate plus at least five years relevant research/work experience

REGULATIONS AND SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN ENVIRONMENTAL CHEMISTRY

1.0 INTRODUCTION

This is a revised version of the Master of Science in Environmental Chemistry that the Department has been offering over the years. Its revision was occasioned by the technological advances that have taken place over the years. In addition to revision of existing units, new ones have also been included to fill the gaps in environmental chemistry. New areas introduced include air chemistry, environmental geology, industrial ecology, biotechnology, fuel science, risk assessment management and project management. The aim of this postgraduate program is to produce graduates who are well grounded in environmental science, project management and research skills.

Graduates find employment in various government departments, parastatals, non-governmental organizations (NGOs) and intergovernmental bodies involved in environmental management, research and development. In industry, opportunities exist in product marketing, process control, quality assurance and product design. Opportunities also exist in the education sector.

2.0 COURSE OBJECTIVES

Shall be to train and equip the students with:
i) Skills in sustainability management tools.
ii) Skills to sample, analyze, quantify baseline conditions and predict impacts of substance interaction between man and the environment and propose solutions to decision makers.
iii) Competence in both local and international efforts aimed at mitigating key environmental challenges.
iv) Knowledge to design and implement cutting-edge environmental projects that are relevant to industry and policy.

3.0 ENTRY REQUIREMENTS

a) The common regulations for the Masters degrees in the School of Physical Sciences shall apply.

b) In addition to meeting (a) above, candidates wishing to register for Master of Science in Environmental Chemistry must have any of the following:

i) A degree of the University of Nairobi of at least an Upper Second Class Honours in Chemistry or equivalent from any other institution recognized by the Senate.

ii) A lower Second Class honours degree of the University of Nairobi in Chemistry or equivalent from any other institution recognized by the Senate plus at least two years relevant research/work experience

iii) A pass degree of the University of Nairobi in Chemistry or equivalent from any other institution recognized by the Senate plus at least five years relevant research/work experience

REGULATIONS AND SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN INDUSTRIAL CHEMISTRY

1.0 INTRODUCTION:

Industrial Chemistry is the branch of chemistry, which applies physical and chemical processes towards the transformation of natural materials and their derivatives to products that are of benefit to humanity. Science and technology drives industrialization and hence economic growth. It is therefore important to develop graduates capable of translating chemical knowledge and skills into industrial development.

This is a new program that the Department is introducing for the first time. Its introduction has been occasioned by the large number of our former Bachelor of Science in Industrial Chemistry students together with others who intend to proceed to post-graduate level. In addition to the traditional chemistry areas, the course covers research methods, material science, waste management, project management and total quality management.

2.0 COURSE OBJECTIVES

Shall be to train and equip the students:

i) With skills to understand develop and modify industrial technologies and therefore promote industrial development.

ii) With knowledge in transforming the chemical and allied industry through their involvement in research and development, policy and business decision-making.

iiii) To be competent in academia, research and consultancy.

3.0 ENTRY REQUIREMENTS

a) The common regulations for the Masters degrees in the School of Physical Sciences shall apply.

b) In addition to meeting (a) above, candidates wishing to register for Master of Science in Industrial Chemistry must have any of the following:

i) A degree of the University of Nairobi of at least Upper Second Class Honours in Industrial Chemistry or equivalent from any other institution recognized by the Senate.

ii) A lower Second Class honours degree of the University of Nairobi in Industrial Chemistry or equivalent from any other institution recognized by the Senate plus at least two years relevant research/work experience

iii) A pass degree of the University of Nairobi in Industrial Chemistry or equivalent from any other institution recognized by the Senate plus at least five years relevant research/work experience

REGULATIONS AND SYLLABUS FOR MASTER OF SCIENCE IN ORGANIC CHEMISTRY

1.0 INTRODUCTION

Organic chemistry is an important interface between theory and application in chemical sciences. Synthetic and natural products chemistry are the two key areas in organic chemistry.

This is a new program that the Department is introducing for the first time. Its introduction has been occasioned by the ever increasing demand for trained personnel in synthetic and natural products chemistry.

Graduate students will in addition to the traditional areas of chemistry take courses in organometallic chemistry, secondary metabolites, medicinal chemistry, research methods and advanced electroanalytical chemistry.

2.0 COURSE OBJECTIVES

Shall be to train and equip the students with

a) Skills to synthesize and characterize organic compounds.
b) Knowledge in extraction, separation, purification and characterization of compounds from plants.
c) Competence in medicinal chemistry.

3.0 ENTRY REQUIREMENTS

a) The common regulations for the Masters degrees in the School of Physical Sciences shall apply.
b) In addition to meeting (a) above, candidates wishing to register for Master of Science in Organic Chemistry must have any of the following:
   i) A degree of the University of Nairobi of at least an Upper Second Class Honours in Chemistry or equivalent from any other institution recognized by the Senate.
   ii) A lower Second Class honours degree of the University of Nairobi in Chemistry or equivalent from any other institution recognized by the Senate plus at least two years relevant research/work experience
   iii) A pass degree of the University of Nairobi in Chemistry or equivalent from any other institution recognized by the Senate plus at least five years relevant research/work experience

REGULATIONS AND SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN INORGANIC CHEMISTRY

1.0 INTRODUCTION

Inorganic Chemistry is concerned with the study of the synthesis, structure and behaviour of chemical compounds. It is the only chemistry discipline that examines specifically the differences among all the different kinds of atoms.

This is a new program that the Department is introducing for the first time. Its introduction has been occasioned by the shortage of graduates and trained personnel in this discipline.

Graduate students will in addition to the traditional areas of chemistry take courses in descriptive inorganic and physical inorganic chemistry. They will also be introduced to bioinorganic chemistry, inorganic polymers, research methods, reaction kinetics and synthetic chemistry.

2.0 COURSE OBJECTIVES

Shall be to train and equip the students with

i) Knowledge in analytical, environmental, industrial, material science, drug development among others.
ii) Competence in developing creative research and also synthesise novel inorganic compounds.
iii) Inorganic chemistry knowledge that is relevant in business.

3.0 ENTRY REQUIREMENTS

a) The common regulations for the Masters degrees in the School of Physical Sciences shall apply.
b) In addition to meeting (a) above, candidates wishing to register for Master of Science in Inorganic Chemistry must have any of the following:
   i) A degree of the University of Nairobi of at least an Upper Second Class Honours in Chemistry or equivalent from any other institution recognized by the Senate.
   ii) A lower Second Class honours degree of the University of Nairobi in Chemistry or equivalent from any other institution recognized by the Senate plus at least two years relevant research/work experience
   iii) A pass degree of the University of Nairobi in Chemistry or equivalent from any other institution recognized by the Senate plus at least five years relevant research/work experience

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DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES

GENERAL INFORMATION

The Department of Geography and Environmental Studies offers a wide range of academic courses and programmes leading to Diploma, BA, BSc, BEd (Arts), BEd (Science), MA, MSc, and PhD degrees. Our vision is to be a Department of international repute committed to scholarly excellence in geography and environmental studies. Our mission is to provide dynamic leadership in training and research in geography and environmental studies for sustainable development.

BACHELOR OF ARTS DEGREE PROGRAMME

All the University and Faculty of Arts regulations governing the award of Bachelor of Arts degree shall apply. The number of course units taken in each semester and academic year will depend on the degree option the student chooses.

BACHELOR OF SCIENCE DEGREE PROGRAMME

All the University and School of Physical Sciences regulations governing the award of Bachelor of Science degree shall apply. The number of course units taken in each semester and academic year will depend on the degree option the student chooses.

MASTER OF ARTS DEGREE PROGRAMMES

All the University and Faculty of Arts regulations governing the award of Master of Arts degree shall apply. The Masters of Arts degree programme shall consist of coursework, examination, project or thesis. The programme shall cover a minimum of 4 semesters and a maximum of 10 semesters of 15 weeks each.

The M.A. degree programme shall have two options offered and the student shall select one of these options, that is, either Option One (Thesis) or Option 2 (Research Project)

A candidate in the Thesis Option shall be required to successfully take 8 taught course units - 3 core units and 5 specialization units in the first two semesters. The thesis which is equivalent to 8 course units shall be undertaken in the last two semesters.

A candidate in the Project Option shall be required to successfully take 12 taught course units - three core units, five specialization units and four elective units – in the first three semesters. The project, to be undertaken in the last semester, shall be equivalent to 4 course units.

MASTER OF SCIENCE DEGREE PROGRAMMES

All the University and School of Physical Sciences regulations governing the award of Master of Science degree shall apply. The Department offers Master of Science degree programmes in the following areas of Geography and Environmental Studies:

1. Master of Science in Hydrology
2. Master of Science in Sustainable Urban Development

PHD PROGRAMMES

PhD programmes are available in all the MA programmes listed above. A PhD programme is offered by research and thesis and requires a minimum of three academic years.

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Chief Technologist
Ayuyo, I.O., BA, (Moi), MA, (Nairobi)

DEPARTMENT OF GEOLOGY

UNDERGRADUATE PROGRAMMES

1.0 INTRODUCTION

The Department Geology offers undergraduate degree programmes based on the course unit system. It offers (BSc. Geology), BSc. and BEd. (Science) degree programmes. BSc. Geology allows students to specialise in Geology. The students do Geology courses only in the third and fourth years of the degree programme. In the second programme (BSc. and BEd. - Science) students can opt to take geology courses in each year of their selected programme. In the BSc. (Geology), students must take all Geology units in the first and second years.

The Department also has BSc. and BEd. (Science) by Open and Distance Learning (ODL) Programmes.

2.0 ENTRY REQUIREMENTS

Candidates must meet the minimum University and School of Physical Sciences admission requirements.

Candidates seeking admission into the four-year degree programme in geology must meet one of the following entry requirements:

1. Minimum grades of C+ in Mathematics, Physics and Chemistry or
2. Minimum grades of C+ in Mathematics and Physical Sciences.

POSTGRADUATE PROGRAMME

1.0 INTRODUCTION

The Department of Geology offers MSc. degree and postgraduate Diploma programmes. The MSc. degree programme is a restructured programme which groups the course units into suitable areas of specialization. It aims at providing specialised training to make students adequately competent in their fields of specialization.

At the end of each of the first three semesters of the MSc. degree programme, students are expected to sit and pass written examinations of two-hour papers. In the fourth semester (second semester of the second year) of the programme, students are expected to undertake research projects leading to the submissions of written dissertations.

2.0 ENTRY REQUIREMENTS

To be eligible for MSc. postgraduate studies in the Department of Geology, candidates must fulfil the requirements below:

i) They must be in a possession of a BSc. degree in Geology with at least a Second Class Honours (Upper Division) or equivalent. For candidates wishing to specialize in applied Geophysics or Seismology, they must also have studied physics and/ or mathematics to atleast second year of the University of Nairobi BSc. Degree programme or equivalent.

ii) They must fulfill the general University and School of Physical Sciences regulations for the Master of Science Degree.

REGULATIONS AND SYLLABUS FOR THE DEGREE OF BACHELOR OF SCIENCE IN PETROLEUM GEOSCIENCE

1.0 INTRODUCTION

Following the recent discovery of oil and gas in Kenya and beyond, and in cognizant of the strategic direction the country has taken as outlined in the Vision 2030, the Bachelor of Petroleum Geoscience course is part of a set of academic programs at the School of Physical Sciences that has been motivated by the following needs at the National level:

i) The need to provide qualified manpower to spearhead petroleum exploration, drilling, reserve estimation and development.

ii) The need to provide technically well informed managers at the decision making level for the oil industry

iii) The need to promote sustainable exploitation of national energy resources to spur economic activities in line with the goals of the Vision 2030

The Department of Geology will offer the new undergraduate program for the B.Sc. degree in Petroleum Geoscience based on the course unit system. The program in Petroleum Geoscience will focus on modern natural resource industries, which will not only involve the exploration phase, but also their development and management practices. This program aims to offer a coherent understanding of the areas of science that relate to the earth's petroleum resources including their nature, origin, distribution, discovery and exploitation. The course is designed to impart practical knowledge and the ability to understand the geological and technological complexity of the petroleum systems. The practical training and hands-on experience will be achieved through partnerships and collaborations between the Department and the players in the petroleum industry. Students who specialize in Petroleum Geoscience

will be required to enroll for appropriate pre-selected courses in Chemistry, Mathematics and Physics in their 1st and 2nd year of their study in this program.

2.0 COURSE OBJECTIVES

The programme is aimed to produce competent graduates equipped with knowledge and skills in the exploration and exploitation of petroleum resources in order to be able to:

i) Evaluate the mechanisms of petroleum formation, migration and concentration
ii) Apply the techniques used in the location of various petroleum reserves and the challenges associated with petroleum production and management
iii) Perform petroleum prospect evaluation taking into account petroleum economics, legal and environmental impacts of petroleum exploitation
iv) Contribute to society through teaching, research, consultancy and outreach in the area of petroleum geology

3.0 ENTRY REQUIREMENTS

1. Candidates must have attained the minimum University of Nairobi and School of Physical Sciences entry requirements.
2. In addition to meeting (1) above, candidates wishing to register for Bachelor of Science in Petroleum Geoscience must have any of the following:
   a) Kenya Certificate of Secondary Education (KCSE) with mean grade of C+ or equivalent, with passes in at least three subjects from either of the following;
      i) Minimum grades of C+ in Mathematics, Chemistry, Physics, Biology and Geography or
      ii) Minimum grades of C+ in Mathematics, Biology, Geography and B- in Physical Sciences,
   b) Kenya Advanced Certificate of Education (KACE), or equivalent qualifications, with at least two Principal level passes in: Applied Mathematics, Chemistry, Biology, Geography, Geology, Mathematics, Physics, Pure Mathematics and Statistics
   c) Holders of KCSE mean grade of C plain or equivalent plus a Certificate and Diploma in a relevant field from an institution recognized by the senate.
   d) Ordinary/Higher National Diploma, or equivalent qualifications in the sciences with at least a pass.
   e) Science/Technical Diploma from Teacher Training Colleges, or equivalent in sciences with at least a pass.
   f) A science/technology degree from an institution recognized by the senate, or equivalent qualifications

Candidates who may have not fulfilled conditions in 2(ii) above may be considered for admission provided they present evidence of having undertaken and passed relevant bridging courses from an institution recognized by the Senate and MUST have scored at least grade C in the subject(s) for which bridging has been undertaken.

REGULATIONS AND SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN PETROLEUM GEOSCIENCE

1.0 INTRODUCTION

The oil discovery in Kenya has currently generated so much excitement in the oil industry and the general public, in particular, that the Department of Geology feels a strong need to launch a postgraduate course in petroleum geosciences to train young Kenyans for manpower development in the oil industry. Being the only department in the country that still continues to train postgraduate geologists for manpower requirements of this nation, the Department of Geology has the necessary experienced expertise to launch such a course.

In response and pursuant to public and private sectors needs for trained personnel with specialization in the field of petroleum, the Department, in consultation with the stake holders in the industry, has structured an M.Sc. Degree Programme in Petroleum Geoscience. The course will enjoy close links with the oil and gas (O&G) industry. Field industrial research data will be used to supplement the course material. This close research collaboration with the industry will ensure that the course is tailored to the needs of the industry, and that the students will gain valuable working experience at the same time.

2.0 COURSE OBJECTIVES

The objectives of this program shall be to produce competent petroleum geoscientists equipped with knowledge and skills to:

1.1 Exploit petroleum geology for hydrocarbon exploration.
1.2 Execute geophysical survey, its analysis and presentation of results.
1.3 Analyze oil reservoir, its characterization and modeling.
1.4 Provide dynamic leadership and management for efficient and ethical performance services in the petroleum geoscience industry.
1.5 Contribute to society through teaching, research, consultancy and outreach in the area of petroleum geoscience.

3.0 ENTRY REQUIREMENTS

3.1 Candidates must fulfill the common regulations governing Master of Science programmes and those of the School of Physical Science.

3.2 Holders of the following qualifications will be eligible;

a) A BSc. degree in Geology, Petroleum Geoscience or its equivalent with at least a Second Class Honours (Upper Division) from a recognized University or equivalent from any other institution recognized by the Senate. In addition, candidates for Petroleum Geoscience degree programme should have taken undergraduate courses in Mathematics and Physics/Chemistry.

b) A BSc. degree in Geology or Petroleum Geology with a Second Class Honours (Lower Division) from a recognized University or equivalent from any other institution recognized by the Senate. In addition, candidates for Petroleum Geoscience degree programme should have taken undergraduate courses in Mathematics and Physics/Chemistry. Further, the applicant must have at least two years' work experience in a geology related field.

c) A pass degree of the University of Nairobi in Geology or equivalent from any other institution recognized by the senate plus at least five years relevant research/work experience.

d) A holder of a degree in categories specified above with a credit pass in a relevant postgraduate diploma or other equivalent qualifications from the University of Nairobi or any other institution recognized by senate as being of comparable academic status or with at least 4 years of relevant work experience.

POSTGRADUATE DIPLOMA IN ENVIRONMENTAL AND NATURAL DISASTER MANAGEMENT

The Department of Geology offers Postgraduate Diploma in Environmental and Natural Disaster Management as Module II Programme.

The programme of study is for one academic year, leading to the award of the postgraduate diploma. The programme consists of lectures, coursework, seminars, examinations and a project dissertation.

There will be a third term, during which students will undertake a project assignment culminating in a written dissertation.

ENTRY REQUIREMENTS

Applicants must be graduates from recognized universities in any of the following discipline areas: geology, meteorology, engineering, hydrology, land development, geography, architecture, environmental science, and urban and regional planning or have other qualifications approved by the University of Nairobi Senate.

STAFF LIST: DEPARTMENT OF GEOLOGY

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DEPARTMENT OF METEOROLOGY

UNDERGRADUATE PROGRAMMES

1.0 INTRODUCTION

The Department of Meteorology offers two undergraduate programmes. The first programme is a professional course which leads to a BSc. degree in Meteorology. The Department also offers Atmospheric Science programme for students not specialising in Meteorology.

2.0 ENTRY REQUIREMENTS:

All students who wish to join the Department of Meteorology must fulfil the minimum entry requirements for the University and for the School of Physical Sciences. Registration for the BSc. Meteorology programme requires that students be qualified to satisfactorily register for courses in both the School of Mathematics and Departments of Physics and Chemistry. The Atmospheric Science courses are open to science-based students wishing to register for courses in any other TWO Departments in the School of Physical Sciences.

BACHELOR OF SCIENCE IN ATMOSPHERIC SCIENCE PROGRAMME

1.0 INTRODUCTION

The Department of Meteorology offers two undergraduate programmes. The first programme is a professional course, which leads to a BSc. degree in Meteorology. The Department also offers the Atmospheric Science programme for students not specialising in Meteorology.

2.0 ENTRY REQUIREMENTS

The Atmospheric Science course is open to all science-based students. The candidates must meet the minimum University and School Physical Sciences admission requirements.

1.2 REGULATIONS

The course structure for this programme is a 4:3:2:2. The student must take all the prescribed core units in the Department of meteorology. In addition, students will take courses as per the School of Physical Sciences requirements from any of the following Departments: Botany, Chemistry, Geography, Geology, Mathematics, Physics, and Zoology.

POSTGRADUATE DIPLOMA IN METEOROLOGY

1.0 INTRODUCTION

The Department of Meteorology offers both undergraduate and postgraduate programmes in Meteorology. The Postgraduate Diploma programme is designed to equip students with knowledge and skills in practical application of Meteorology. It targets first degree holders interested in pursuing Meteorology as a profession.

2.0 COURSE OBJECTIVES

i) To provide students, having a background of undergraduate Mathematics and Physics, with the theoretical and practical knowledge in Meteorology.
ii) Equip the students with tools necessary for them to work in an operational meteorological set-up.
iii) Expose the students to areas of current operational and applied meteorological interests.

3.0 ENTRY REQUIREMENTS

The following shall be eligible for admission:

A holder of first degree of at least pass level, of the University of Nairobi or an equivalent qualification from any other institution recognised by the Senate. In addition, the candidate must have any of the following background qualifications:

a) Mathematics and Physics,
b) Mathematics and Physics done in the First Year,
c) Mathematics, Chemistry and Physics done in the First Year,
d) Physics and Chemistry,
e) Applied Mathematics with any other science subject
f) Agricultural Engineering, Civil Engineering, Electrical Engineering, or Mechanical Engineering.
g) Computer Science

POSTGRADUATE DIPLOMA IN AVIATION METEOROLOGY

1.0 INTRODUCTION

The Postgraduate Diploma programme in Aviation Meteorology is designed to equip students with knowledge and skills in practical application of aviation Meteorology. It targets first degree holders interested in pursuing Aviation Meteorology as a profession.

2.0 COURSE OBJECTIVES

i) Provide students, having a background of undergraduate Meteorology, Mathematics, Chemistry, Physics, and any other applied sciences with theoretical and practical knowledge in Aviation Meteorology.
ii) Equip the students with the necessary tools for them to work in Aviation and related industries.
iii) Expose the students to areas of current operational and research aspects in Aviation Meteorology.

3.0 ENTRY REQUIREMENTS

3.1 The common regulations governing Postgraduate Diploma programmes in all institutes and schools shall apply.
3.2 A holder of first degree of the University of Nairobi or an equivalent qualification from any other institution recognised by the Senate, in Meteorology, Mathematics and Physics, Physics and Chemistry, Applied Mathematics, Geography and Mathematics, Engineering, or Computer Science.

POSTGRADUATE DIPLOMA IN OPERATIONAL HYDROLOGY

1.0 INTRODUCTION

Increasing population, industrial development, agricultural extension services are gradually stressing the quality and quantity of natural resources like water. Consequently there is an increasing need for skilled personnel in rational management of water resources based on a thorough understanding of water availability and movement.

The course is therefore designed to improve the understanding of hydrologic processes and the influence of human activities in the exploitation of water resources. The objective of the course is to train, and equip students with skills and knowledge, in operational Hydrology.

2.0 ENTRY REQUIREMENTS

2.1 The common regulations governing Postgraduate programmes in the University and schools shall apply.
2.2 A holder of first degree of the University of Nairobi or an equivalent qualification from any other institution recognized by the Senate, in Meteorology, Mathematics and Physics, Physics and Chemistry, Applied Mathematics, Geography, Geology and Mathematics, Agricultural engineering, Civil Engineering, Mechanical Engineering, Computer Science, Mining, Geophysics or equivalent are also eligible for registration.

MASTER OF SCIENCE IN AVIATION METEOROLOGY

1.0 INTRODUCTION

Meteorological information plays an essential role for air navigation and is required to ensure the safety and efficiency of civil aviation operations. The weather hazards to aviation cause serious problems for the aviation industry in terms of delays, diversions and accidents. The hazardous phenomena include aircraft in-flight icing, turbulence near the ground and the related wind shears, reduced surface visibility due to different fog types among other phenomena.

People working with the aviation industry or meteorology are expected to reflect technological developments including interpretation of radar information towards making of short-term forecasts for specific aerodromes.

The Kenya vision 2030 envisions Nairobi as a hub for the region. The proposed hub will heavily rely on air transportation efficiency and safety. This requires training of highly skilled personnel in Aviation Meteorology. Aviation Meteorology has been offered at postgraduate diploma level in the Department of Meteorology and in order for the postgraduate Diploma graduates to advance academically an MSc in Aviation Meteorology programme, offering advanced skills and knowledge in the aviation industry, has been developed.

This programme is in response to a request from our stakeholders in Kenya and in the East Africa Community region.

2.0 COURSE OBJECTIVES:

i) Provide students, having a background in Meteorology, with advanced theoretical and applied knowledge in Aviation Meteorology for increased safety on the ground and in the air.
ii) Equip the students with knowledge in accident site management techniques including accident investigation and reporting.
iii) Expose the students to current research in the aviation industry.
Expose the students to legal and moral concepts that influence developments in national and international law in the aviation industry.

3.0 ENTRY REQUIREMENTS

A holder of a first degree of the University of Nairobi or an equivalent qualification from any other institution recognised by the Senate shall be eligible for admission if he/she has one of the following qualifications;

a) At least upper second-class honors degree in Meteorology or equivalent.
b) Postgraduate Diploma in Aviation Meteorology or equivalent.
c) Lower second-class honors degree in Meteorology with a working experience of at least two years in a relevant research/operational institution.
d) Pass level degree in Meteorology with a working experience of at least five years in a relevant research/operational institution.

MASTER OF SCIENCE IN AGRO-METEOROLOGY

1.0 INTRODUCTION

Agrometeorology is a multi-disciplinary science. It encompasses the science of meteorology on the one hand and agricultural and animal sciences on the other hand. The Master of Science Course in Agrometerology is meant to address socio-economic development, food security and disaster management, and water related problems of the countries, including Kenya. This realization is important for marshalling together the limited resources to produce a solid agrometeorologist with the capacity to be versatile and to address myriads of problems associated with food insecurity and natural and man-made disasters, in addition to other operational problems facing African countries.

2.0 COURSE OBJECTIVES

i) Equip students with advanced knowledge and skills in practical application of Agro-meteorology.
ii) Provide students, having a scientific background, with advanced theoretical and applied knowledge in agrometeorology.
iii) Train students in skills and knowledge in applied aspects of agrometeorology
iv) Equip the students with tools necessary for them to work in operational, research and training institutions.
v) Expose the students to areas of current research in agrometeorology.

3.0 ENTRY REQUIREMENTS

3.1 The common regulations for the Master's Degree in the University shall apply.
3.2 The following shall be eligible for admission:

3.2.1 Holders of a Bachelor of Science (BSc.) Degree, of at least upper second class honours, in any of the following science based disciplines: Meteorology, Agriculture, Agricultural engineering, Horticulture.
3.2.2 Bachelor of Science (BSc.) Degree, of lower second class honours, in the disciplines mentioned in 3.2.1 with a working experience of at least two years in a relevant research/operational institution.
3.2.3 Bachelor of Science (BSc.) Degree, of pass level, in the disciplines mentioned in 3.2.1 with a working experience of at least five years in a relevant research/operational institution.
3.2.4 Holders of equivalent degrees from other Universities recognized by the University of Nairobi Senate.

MASTER OF SCIENCE IN METEOROLOGY

1.0 INTRODUCTION

The Department of Meteorology offers both undergraduate and postgraduate programmes in Meteorology. The Master of Science programme is designed to equip students with advanced knowledge and skills in practical application of Meteorology.

2.0 COURSE OBJECTIVES

i) Provide students, having a background in Meteorology, with advanced theoretical and applied knowledge in Meteorology.
ii) Equip the students with tools necessary for them to work in operational, research and training institutions.
iii) Expose the students to areas of current research and applied meteorological interests.

3.0 ENTRY REQUIREMENTS

3.1 The common regulations governing the Masters Degree programmes in institutes and schools shall apply.
3.2 Holders of any of the following:

3.2.1 A degree of the University of Nairobi of at least upper second in Meteorology or an equivalent qualification from any other institution recognised by the Senate.
3.2.2 A lower second class honours degree of the University of Nairobi in Meteorology or an equivalent qualification from any other institution recognised by the Senate plus at least two years relevant research/work experience.

3.2.3 A pass degree of the University of Nairobi in Meteorology or an equivalent qualification from any other institution recognised by the Senate, with a working experience of at least five years in a relevant research/operational institution.

3.2.4 A degree of the University of Nairobi in any science based discipline or an equivalent qualification from any other institution recognised by the Senate, plus a Postgraduate Diploma in Meteorology.

REGULATIONS AND SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN CLIMATE CHANGE

1.0 INTRODUCTION

Kenya Vision 2030, the country's new development blueprint covering the period 2008 to 2030, aims to transform Kenya into a newly industrialising, "middle-income country providing a high quality life to all its citizens by the year 2030". Several **"flagship"** projects have been identified and are being implemented. They are expected to take the lead in generating rapid and widely-shared growth. Climate change has been recognised as a developmental issue which may impede the gains expected from some of the proposed flagship projects in the Vision 2030. For instance, the flagship environment project, namely the Water Catchment Management Initiative, calls for rehabilitating of the five water towers (i.e. Mau Escarpment, Mt. Kenya, Aberdares Range, Cherangani Hills and Mt. Elgon). Sustainable rehabilitation of these towers requires skills in climate change science.

The Kenya National Climate Change Response Strategy (2009) identified the need to train skilled personnel in Climate Change Science for sustainable national development. The Master of Science programme in Climate Change is uniquely broad in its coverage. It is designed to tackle the range of knowledge and skills required to address the challenges of climate change and sustainable development. It also provides depth in key areas, drawing upon the internationally recognized teaching, research and consultancy expertise of the multi-disciplinary team of lecturers drawn from many disciplines from within the university, plus visiting lecturers from industry.

Climate Change Science is growing rapidly due to the rapid technological developments. The course structure and content will be constantly revised to align it with emerging knowledge, technologies and demands.

The Master of Science programme in Climate Change is designed to provide students, having a first degree, with advanced theoretical and practical knowledge in Climate Change Science. The programme meets the needs of graduates seeking a career in the climate change and Climate risk management and also enables professionals to extend their knowledge or to change career.

2.0 COURSE OBJECTIVES

The course intends to:

i) Equip the students with research skills in Climate Change Science

ii) Equip students with knowledge and skills in practical applications in Climate Change Science

3.0 ENTRY REQUIREMENTS

The common regulations of the University of Nairobi (UoN) governing Masters programmes in all faculties, institutes and schools shall apply.

The following shall be eligible for admission:

A holder of a first degree of the UoN or an equivalent qualification from any other institution recognised by the Senate of University of Nairobi. Specifically, the candidate must have any of the following qualifications:

i) At least Upper second class Honours degree.

ii) Second class lower division degree with a working experience of at least two years in a relevant research/operational institution,.

iii) Pass degree with a relevant post graduate professional qualification.

iv) Pass degree with a working experience of at least five years in a relevant research/operational institution.

DOCTOR OF PHILOSOPHY IN CLIMATE CHANGE SCIENCE

1.0 INTRODUCTION

The PhD programme in Climate Change is designed to provide students with advanced theoretical and practical knowledge in Climate Change Science. The programme is designed to meet the needs of those graduates seeking careers in the fields such as Climate Change Science; Modeling; Climate Risk Management and research in Climate Change science.

OBJECTIVES

The objectives of the programme shall be to impart students with:

i) Advanced knowledge in climate change science and develop competence in the applications of climate change science

ii) Skills to conduct advanced research in climate change issues and disseminate research findings.

2.0 ENTRY REQUIREMENTS

2.1 The Common Regulations for the Degree of Doctor of Philosophy (PhD) in the University of Nairobi and in the School of Physical Sciences shall apply.

2.2 The following shall be eligible for admission:

2.2.1 A holder of a Master's Degree in Climate Change, or its equivalent from the University of Nairobi or any other institution recognized by Senate.

STAFF LIST

Chairman of Department:
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DEPARTMENT OF PHYSICS

UNDERGRADUATE PROGRAMMES

1.0 INTRODUCTION

The course units below are offered to BSc. Degree programme. The unit combinations chosen by the students must be approved by the Dean, School of Physical Sciences. There is opportunity to major in Physics during the third and fourth years of studies.

2.0 ENTRY REQUIREMENTS

Candidates must have attained the minimum University and the School of Physical Sciences entry requirements. In addition the prospective candidates must have a minimum of C+ in Physics and C+ in Physical Sciences.

BACHELOR OF SCIENCE IN ASTRONOMY AND ASTROPHYSICS

1.0 INTRODUCTION

This degree course is designed to train graduates who will have the relevant skills to work in areas of Basic and Applied Space Sciences, such as Satellite Space Stations (e.g., San Marco in Malindi), Astronomical observatories and Aeronautical Engineering Departments and Remote Sensing. The mounting of this course is meant to be the basis for serious capacity building to attain the critical mass of expertise needed for the development of space science in Kenya, which ultimately will be critical to the establishment of a Kenya Space Agency, whose establishment is long overdue. Currently Kenya is engaged in some joint Space Science activities, with the Italian Government through the San Marco Project in Malindi.

The units offered under this program are meant for BSc. Astronomy and Astrophysics degree programme covered in eight regular University of Nairobi semesters.

The capacity of this course is envisaged to be 30 candidates per class per year.

2.0 ENTRY REQUIREMENTS

Candidates must have attained the minimum University of Nairobi and School of Physical Sciences entry requirements. In addition, the prospective candidates must have attained a minimum grade of C+ in Physics or Physical Science and C+ in Mathematics at KCSE level OR principal passes in Mathematics and Physics at KACE/ EAACE level.

BACHELOR OF SCIENCE IN MICROPROCESSOR TECHNOLOGY AND INSTRUMENTATION

1.0. INTRODUCTION

The Department, in conjunction with the Industrial Electronics Unit, runs a Bachelor of Science in Microprocessor Technology and Instrumentation. The course is intended to provide an avenue for the professional development of qualified secondary school leavers as well as those who have passed Diploma in Computer Studies program or equivalent. The course is also open to secondary school graduates who meet the normal University of Nairobi entrance requirements. The course covers extensively the subjects of computer technology and applications in business as well as in industrial and scientific microprocessor-based instrumentation and provides an avenue for graduate studies in the areas of Computer Technology, Scientific and Industrial Instrumentation, Solid State and Semiconductor Device Physics, and advanced technologies for electronic devices and new materials.

The course units below are offered for the degree program covered over eight regular University of Nairobi semesters with a period for Industrial Attachment. Some of the course units below have been revised (R) from the original to bring them up to date in line with the fast changing computer hardware and software technologies. A number of new (N) courses have been introduced to allow for specialization in the following areas:

i) Applied Physics
ii) Computing
iii) Industrial Electronics
iv) Biomedical and Radiometric Instrumentation
v) Telecommunications

2.0 ENTRY REQUIREMENTS

i) Candidates must have attained the minimum University of Nairobi and School of Physical Sciences entry requirements. In addition, the prospective candidates must have attained a minimum grade of C+ in Physics or Physical Science and C+ in Mathematics at KCSE level OR principal passes in Mathematics and Physics at KACE/EAACE level.
ii) Candidates with Ordinary Diploma in Computer Studies, Science or Engineering related fields from a recognized institution will be considered.

REGULATIONS AND SYLLABUS FOR THE DEGREE OF MASTER OF SCIENCE IN PHYSICS

1.0 INTRODUCTION

This is a revised MSc. Program that aims at providing sufficient basis for specialization in the various distinct areas of Physics as a subject. It captures the strengths of the Department in terms of expertise and infrastructure. The Department has in the past offered courses, which largely produced MSc. graduates with limited specialization scope. Whereas four of the Specialization Groups below have largely existed in a homogenous form, two entirely new Groups of Nuclear and Radiation Physics, and Laser Physics and Spectroscopy respectively have been introduced. Some of the units in the old program have been re-structured or re-packaged while a number of new units have been introduced to cater for stronger specialization. These will help the students to focus early on their areas of specialization in order to reduce the time taken for thesis research. Areas of specialization have been grouped as below for award of specific Masters degree:

i) Theoretical Physics
ii) Experimental Condensed Matter Physics
iii) Geo and Space Physics
iv) Electronics and Instrumentation
v) Nuclear and Radiation Physics
vi) Laser Physics and Spectroscopy

2.0 COURSE OBJECTIVES

The program aims to train high-level personnel competent in various disciples of Physics and who are well prepared to meet the various challenges of industrial and human resource development. This is premised on

2.1 good knowledge and skills in the basic courses of physics;
2.2 in-depth knowledge of some special areas of physics;
2.3 provision of basis for further training and education in physics.

3.0 ENTRY REQUIREMENTS

3.1 Common regulations for the Master of Science degree in the University of Nairobi and the School of Physical Sciences shall apply.

3.2 Holders of a Bachelor's degree with at least Second Class Honours (Upper Division) in Physics or a related subject from the University of Nairobi or any other Institution recognized by the Senate.

3.3. Holders of a Bachelors degree with a Second Class Honours (Lower Division) in Physics or a related subject from the University of Nairobi or any other Institution recognized by the Senate, plus at least two years relevant research/ work experience may be considered for admission.

3.4. Holders of a Bachelors Pass degree in Physics or a related subject from the University of Nairobi or any other Institution recognized by the Senate, plus at least five years relevant research/work experience may be considered for admission.

REGULATIONS AND SYLLABUS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN PHYSICS

1.0 INTRODUCTION

The Ph.D Program aims at providing sufficient basis for specialization in the various distinct areas of Physics as a subject. It captures the strengths of the Department in terms of expertise and infrastructure. Areas of specialization have been grouped as below for award of Doctorate degree:

i) Theoretical Physics
ii) Experimental Condensed Matter Physics
iii) Geo and Space Physics
iv) Electronics and Instrumentation
v) Nuclear and Radiation Physics
vi) Laser Physics and Spectroscopy

2.0 COURSE OBJECTIVES

The goal of the programme is to train high-level and competent research scholars and, in many cases, future university faculty members personnel with the relevant knowledge and refined skills in thematic areas of physics such as condensed Matter Physics, Geo- and Space Physics, Electronics and Instrumentation, Nuclear and Radiation Physics and Laser Physics and Spectroscopy. This is necessary for scientific innovations capable of making transformative contribution to the world of knowledge and further addressing societal challenges of industrial and human resource development for the betterment of humanity.

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Nyaamba, D.M., BEd, (KU), MSc, (Nairobi)
Githaiga, J.I., BSc, MSc, (Nairobi)
Okech, P.O., BSc, (Moi), MSc, (Nairobi)

Graduate assistant
Okonda, J.J., BEd, (Nairobi), MSc, (Nairobi)

Chief Technologist:
Omollo, F.J., Part I, II & III (Electronics), PGD Computer Sci.
Omucheni, D.L., BSc, (Moi), MSc, (Nairobi)

Details on specific admission requirements of the school, credit transfer and exemptions, course structure and duration, examination regulations, course outline and award of degree may be obtained from the School.

Please contact
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CENTRE FOR BIOTECHNOLOGY AND BIOINFORMATICS

Director: Dr. George O. Obiero, BSc, (Nairobi), MSc, (Botswana), PhD, (Free State)

1.0 INTRODUCTION

The establishment of Centre for Biotechnology and Bioinformatics (CEBIB) at the College of Biological and Physical Sciences, Chiromo Campus was approved by the University of Nairobi Senate on August 17, 2005. CEBIB is established as a Centre of excellence, a shared research facility, to facilitate capacity building and generate marketable products, through exploitation of biotechnology and Bioinformatics.

1.2 THE POSTGRADUATE TRAINING PROGRAMME

The CEBIB shall form the nucleus for training in Biotechnology and Bioinformatics for the entire country and the region. The training Programme will be conducted in collaboration with relevant University departments and partner institutions leading to award of degrees of the University of Nairobi. CEBIB shall offer a MSc. Programme in Biotechnology and Bioinformatics, as well as research opportunities for students pursuing PhD. studies. In addition, relevant short courses shall be conducted to strengthen the Programme .

REGULATIONS AND SYLLABUS FOR MASTER OF SCIENCE DEGREE IN BIOINFORMATICS

This Programme is designed to provide sound knowledge of various aspects of the Bioinformatics as relevant to teaching, research development and entrepreneurship in Bioinformatics. This would assist in formulating adequate strategy to facilitate the application of biotechnology in research and encourage its use for the development of marketable products as well as to protect the environment and improve the quality of life.

2.0 ENTRY REQUIREMENTS

Common regulations for the Master's degree in the University of Nairobi shall apply.

2.2.1. Holders of a degree of the University of Nairobi of at least Upper Second Class in Science, Engineering, Agriculture or an equivalent qualification from a University recognized by Senate.

2.2.2. Holders of degree of the University of Nairobi in Bachelor of Medicine, Bachelor of Veterinary Medicine, Bachelor of Pharmacy, Bachelor of Dentistry or an equivalent qualification from a University recognized by Senate.

2.2.3. Holders of a Lower Second Class degree in areas specified in 2.2.1 plus at least two years relevant research/work experience may be considered for admission.

2.2.4. Holders of Lower Second Class degree in the areas specified in 2.2.1 plus a Postgraduate Diploma in the relevant disciplines.

2.2.5. Holders of a Pass degree in the areas specified in 2.2.1 plus Postgraduate Diploma in the relevant disciplines or at least 3 years relevant research/work may be considered for admission.

REGULATIONS AND SYLLABUS FOR MASTER OF SCIENCE DEGREE IN BIOTECHNOLOGY

1.0 BACKGROUND

The establishment of Centre for Biotechnology and Bioinformatics (CEBIB) at the College of Biological and Physical Sciences, Chiromo Campus was approved by University of Nairobi, Senate on August 17, 2005. CEBIB is established as a centre of excellence, a shared research facility, to facilitate capacity building and generate marketable products, through exploitation of biotechnology and Bioinformatics.

1.1 The Postgraduate Training Programme

The CEBIB shall form the nucleus for training in Biotechnology and Bioinformatics for the entire country and the region. The training Programme will be conducted in collaboration with relevant University departments and partner institutions leading to award of degrees of the University of Nairobi. CEBIB shall offer a MSc. Programme in Biotechnology and Bioinformatics, as well as research opportunities for students pursuing PhD. studies. In addition, relevant short courses shall be conducted to strengthen the Programme.

1.2 Expected Output of the Training Programme

CEBIB training Programme shall generate human resource (with expertise in all aspects of biotechnology) with the capacity to provide services in all sectors of research and training pertaining to biotechnology. It will also provide infrastructure through its state-of-the-art facilities and computer software as well as popularize biotechnology through outreach. The trained manpower will furthermore promote science industries through technology transfer as well as collaborations with

industry. The graduates will also implement biosafety guidelines for genetically modified organisms and recombinant DNA products and biotechnology based Programmes for societal benefits.

REGULATIONS AND SYLLABUS FOR MASTERS IN BIOTECHNOLOGY

1.1 INTRODUCTION

This Programme is designed to provide sound knowledge of various aspects of the Biotechnology as relevant to teaching, research development and entrepreneurship in biotechnology. This would assist in formulating adequate strategy to facilitate the application of biotechnology in research and encourage its use for the development of marketable products as well as protect the environment and improve the quality of life.

2.2 ENTRY REQUIREMENTS

Common regulations for the Master's degree in the University of Nairobi shall apply.

2.2.1. Holders of a degree of the University of Nairobi of at least Upper Second Class in Science, Engineering, Agriculture or an equivalent qualification from a University recognized by Senate.

2.2.2. Holders of degree of the University of Nairobi in Bachelor of Medicine, Bachelor of Veterinary Medicine, Bachelor of Pharmacy, Bachelor of Dentistry or an equivalent qualification from a University recognized by Senate.

2.2.3. Holders of a Lower Second Class degree in areas specified in 2.2.1 plus at least two years relevant research/work experience may be considered for admission.

2.2.4. Holders of Lower Second Class degree in the areas specified in 2.2.1 plus a Postgraduate Diploma in the relevant disciplines.

2.2.5. Holders of a Pass degree in the areas specified in 2.2.1 plus Postgraduate Diploma in the relevant disciplines or at least 3 years relevant research/work may be considered for admission.

DOCTOR OF PHILOSOPHY PROGRAMME

1.0 ENTRY REQUIREMENTS AND REGULATIONS

Common regulations for the PhD degree in the University of Nairobi shall apply.

ii) Holders of a Master of Science degree in Biological and Physical Sciences, Bioinformatics, Medicine, Veterinary Medicine, Pharmacy, Dentistry of the University of Nairobi.

iii) Holders of Master of Science degree in Biological and Physical Sciences, Bioinformatics, Medicine, Veterinary Medicine, Pharmacy, Dentistry or an equivalent qualification from a University recognized by Senate.

iv) Candidates will be required to draw and submit a detailed Doctoral research proposal in the prescribed manner at the time of applying for admission.

STAFF LIST

Director
Obiero, G. O., BSc, (Nairobi), MSc, (Botswana), PhD, (Free State)

Lecturer
Kulohoma, B., BSc, (Nairobi), MSc, PhD, (Manchester), (*Leave of absence*).

Visiting Lecturers
Oyier, I. L. O., BSc, (Nottingham), PhD, (Liverpool)
Ochola, H. M., BSc, (Nairobi), PhD, (Liverpool)

Part-time Lecturers
Macharia, R., BSc, MSc, (Nairobi), PhD, (Western Cape).
Ikawa, R. A. O., BSc, (Moi), MSc, (Nottingham), PhD, (Nairobi)
Ojwang, M. E. A., BSc, (JKUAT); MSc, (Nairobi)

Graduate Assistant
Visendi, P., BSc, MSc, (Nairobi), PhD, (Queens)

Senior Administrator
Obulinji, S.S., CPS, (KASNEB), BEd, (Egerton), MA, (Nairobi)

Administrative Assistant
Parwos, A.P., BSc, (KU)

Senior Technologists
Rono, E., BSc, (Egerton)
Owiti, A., BSc, (TUK)

Technologist
Markinga, E. O., BSc, (Nairobi)

Details on specific admission requirements of the school, credit transfer and exemptions, course structure and duration, examination regulations, course outline and award of degree may be obtained from the Centre.

Please contact
The Director, CEBIB, Chiromo Campus
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INSTITUTE FOR CLIMATE CHANGE AND ADAPTATION

Director of the Institute: Prof. Shem O. Wandiga, BSc, (Howard), MSc, (Maryland), PhD, (Case W. Reserve)

REGULATIONS AND SYLLABUS FOR THE DEGREE OF MASTER OF CLIMATE CHANGE ADAPTATION (MCCA)

1.0 INTRODUCTION

The Master of Climate Change Adaptation (MCCA) programme of the University of Nairobi seeks to improve the science and practice of climate change and adaptation. It explores the fundamental changes caused by anthropogenic and natural activities that influence the alteration of the living earth's environment. As a result of the anthropogenic climate change drivers, the global mean surface temperature is projected to increase between 1.5°C and 5.8°C by 2100. The Intergovernmental Panel on Climate Change (IPCC) in its 4th Assessment Report, 2007 has stated that warming in Africa, throughout the continent and in all seasons, is very likely to be larger than the global annual mean warming, with drier subtropical regions warming more than the moister tropics. The future warming rate is likely to range from 0.2°C per decade (for the low scenario) to more than 0.5°C per decade (for the high scenario). This warming will be greatest over the interior of semiarid margins of the Sahara and central southern Africa. The observed annual rainfall anomalies of the climate change models indicate that there are possible increases in precipitation in East Africa, contrasted with reduced precipitation for southern Africa in the next 100 years. While for East Africa an increase in rainfall as projected would be welcome, it will be accompanied by an increase of extremely wet events, from the current 5% to about 20%, which could seriously disrupt food production systems and infrastructure.

For these reasons targeted research and advocacy on the systemic challenges and solutions to the **'implementation gap'** facing countries in sub-Saharan Africa – innovative thinking about civil service motivation and reform and work to unlock the existing capabilities within and financing for existing institutions who will play a key role in reducing vulnerability and ensuring the security of and equitable access to natural resource assets is needed. Similarly, support is required to ensure that the climate change response in Africa moves beyond merely gender inclusion, towards gender empowerment through (and for) effective climate change adaptation, through for example by targeting work with women's groups, farming cooperatives, rural development, or economic empowerment initiatives. This is because most polices do have statements on dealing with gender and vulnerable communities on climate change adaptations but the way forward is too general for the ordinary citizens to understand.

Graduates of this programme will find employment in national government ministries, private sector enterprises, non-governmental organizations and the United Nations organizations. They will also be green business and technology entrepreneurs.

2.0 COURSE OBJECTIVES

The specific objectives are to:

i) Impart Tran-disciplinary knowledge amongst the candidates on the issues related to climate change and adaptation.

ii) Equip the student with relevant knowledge required to address climate change and adaptation science that meet the unique needs of African societies;

iii) Impart the ability of candidates to engage in action-oriented, trans-disciplinary research activities that will help improve the climate adaptation capacity in Africa;

iv) Equip the candidate in the skills for the management of risks posed by climate change at global, regional, national and community levels;

v) Equip candidates with decision support tools for sound advice to policy and decision makers;

vi) Produce effective and proficient communicators of climate change and adaptation science and practice for the transformation of lives and habits.

3.0 ENTRY REQUIREMENTS

3.1 The common regulations for the Masters' degree in the University of Nairobi shall apply.

3.2 The following shall be eligible for the registration for the Masters degree:

i) Holder of at least an upper second class honours degree or equivalent in non-classified degrees from a recognized university;

ii) A holder of lower second class with at least two years of relevant work experience after graduation;

iii) Holder of a pass degree with at least three years of relevant work experience after graduation.

REGULATIONS AND SYLLABUS FOR THE DOCTORAL PROGRAMME IN CLIMATE CHANGE AND ADAPTATION

1.0 INTRODUCTION

The Doctor of Philosophy in Climate Change and Adaptation programme of the University of Nairobi seeks to impart the science and practice of climate change and adaptation. It explores the fundamental changes caused by anthropogenic and natural activities that influence the alteration of the living earth's environment. As a result of the anthropogenic climate change drivers, the global mean surface temperature is projected to increase between 1.5°C and 5.8°C by 2100. The Intergovernmental Panel on Climate Change (IPCC) in its 4th Assessment Report, 2007 has stated that warming in Africa, throughout the continent and in all seasons, is very likely to be larger than the global annual mean warming, with drier subtropical regions warming more than the moister tropics. The future warming rate is likely to range from 0.2°C per decade (*for the low scenario*) to more than 0.5°C per decade (*for the high scenario*). This warming will be greatest over the interior of semiarid margins of the Sahara and central southern Africa. The observed annual rainfall anomalies of the climate change models indicate that there are possible increases in precipitation in East Africa, contrasted with reduced precipitation for southern Africa in the next 100 years. While for East Africa an increase in rainfall as projected would be welcome, it will be accompanied by an increase of extremely wet events, from the current 5% to about 20%, which could seriously disrupt food production systems, health and infrastructure.

For these reasons targeted research and advocacy on the systemic challenges and solutions to the **'implementation gap'** facing countries in sub-Saharan Africa – innovative thinking about civil service motivation and reform and work to unlock the existing capabilities within and financing for existing institutions who will play a key role in reducing vulnerability and ensuring the security of and equitable access to natural resource assets is needed. Graduates of this programme will find employment in national government ministries, academia, private sector enterprises, non-governmental organizations and the United Nations organizations. They will also be green business and technology entrepreneurs.

2.0 COURSE OBJECTIVES

The specific objectives of the programme are to:

a) Impart trans-disciplinary knowledge required to address climate change and adaptation issues that meet the unique needs of African societies.

b) Enhance the ability of candidates to engage in action-oriented and trans-disciplinary research activities that will help improve climate change and adaptation capacity in Africa.

c) Equip the candidates with skills for managing risks posed by climate change at global, regional, national and community levels.

d) Provide candidates with decision support tools for sound advice to policy and decision makers;

3.0 ENTRY REQUIREMENTS

3.1 The common regulations governing admission into PhD programmes in all Institutes, Faculties, Schools and Centres of the University of Nairobi shall apply.

3.2 The following shall be eligible for admission in the PhD programme in Climate Change and Adaptation:

a) A holder of a Masters' degree in climate change and adaptation or equivalent from the University of Nairobi or any other institution recognised by the Senate.

b) A holder of a doctoral degree from the University of Nairobi or any other institution recognised by the Senate.

c) Applicants with a Master's degree other than in climate change and adaptation will be considered for admission on the basis of their transcript and climate change and adaptation-related professional experience.

STAFF LIST:

Director of the Institute:

Prof. Wandiga, S.O., BSc, (Howard), MSc, (Maryland), PhD, (Case W. Reserve)

Lecturers

Olago, BSc, (Nairobi), MSc, PhD

Opondo, M., BEd, (KU), MSc, (Nairobi), PhD, (Germany)

Ouma, G.

For more information, please contact

The Director, Institute for Climate Change and Adaptation

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