THE TECHNICAL UNIVERSITY OF KENYA

PROGRAMME DESCRIPTIONS FOR BACHELOR OF TECHNOLOGY PROGRAMMES

APRIL 2015

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1. PREAMBLE

The Technical University of Kenya has established the Bachelor of Technology (B.Tech.) programmes in each of its three faculties - Faculty of Applied Sciences and Technology, Faculty of Engineering Sciences and Technology, and Faculty of Social Sciences and Technology - in response to the needs of today's innovation-based and technology-oriented organizations. Industry (local, regional, and global) has identified a growing need for a workforce that possesses practical abilities as well as a wide range of competencies including critical thinking, problem solving, communication, and interpersonal skills. Equipped with this blend of skills and abilities, the TUK B.Tech. graduates are able to market themselves to industry as well-rounded, industry-ready employees. Our B.Tech. programmmes combine technological and management studies so that our graduates are able to function in various levels in the work place, from shop floor technologists to liaising with senior-level management. The combination of technology and management course-work, along with our mandatory industry-based learning experiences, give our students the skills to make technology and management decisions in the business context.

A student who completes the B.Tech. programme successfully, either by direct entry or through an approved Diploma in Technology programme, receives a B.Tech. degree from the University within any one of the three faculties. A Diploma in Technology holder will join the B.Tech programme in the third year of study.

The four-year B.Tech. programmes offer an innovator approach to education in the current dynamic world of technology by taking our students beyond textbook learning to "hands on" experience through laboratory/workshop and work experience. The programmes are designed for students who learn best by doing and provides a good balance between university-level course-work and practical experience by applying theoretical knowledge gained in the classroom to the real-life environment.

2. FACULTY OF APPLIED SCIENCES AND TECHNOLOGY

2.1 Introduction

The Bachelor of Technology in Applied Sciences prepares students to respond to the needs of today's innovation-based and technology-oriented organizations. Industry has identified a growing need for a workforce that possesses a wide range of competencies including critical thinking, problem solving, communication, and interpersonal skills. Equipped with this blend of skills and abilities, the TUK B.Tech. graduates are able to market themselves to industry as well-rounded, industry-ready employees. While students may specialize in a particular technology area such as healthcare or information technology or communications, the primary purpose of the degree is to give students the confidence to work in different sectors of technology. The combination of technology and management course-work, along with our mandatory industry-based learning experiences, give our students the skills to make technology and management decisions in the business context.

Technology has become a major part of lives, its usage, functions, and results can be seen in our day to day lives. Many professions require the skill and expertise of technology majors. Students can enroll in technology degrees with specialization in either of the following:

- Bachelor of Technology in Computer Technology
- Bachelor of Technology in Communication and Computer Networks
- Bachelor of Technology in Information Technology
- Bachelor of Technology in Medical Laboratory Technology
- Bachelor of Technology in Community and Public Health
- Bachelor of Technology in Nutrition and Dietetics
- Bachelor of Technology in Applied Biology
- Bachelor of Technology in Science Laboratory Technology
- Bachelor of Technology in Biotechnology
- Bachelor of Technology in Food Science and Technology
- Bachelor of Technology in Technical and Applied Physics
- Bachelor of Technology in Applied Chemistry (Industrial Chemistry Option)
- Bachelor of Technology in Applied Statistics

2.2 SCHOOLS

2.2.1 School of Communication and Information Technologies

2.2.2 School of Health Sciences and Technology

2.2.3 School of Biological and Life Sciences

2.2.4 School of Physical Sciences and Technology

2.2.5 School of Mathematics and Actuarial Science

2.3 BACHELOR OF TECHNOLOGY IN COMPUTER TECHNOLOGY

2.3.1 Introduction

Computer technology is a discipline that embodies the science and technology of design, construction, implementation, and maintenance of software and hardware components of modern computing systems and computer-controlled equipment. Computer technology can be viewed as a combination of both computer science and computer engineering that produces a technologist.

This curriculum provides training for technologists in the area of computer hardware and software technology. In the broad field of Computer technology the technologist is normally a professional with the practical skills to develop and maintain software systems and maintain equipment, structures, and

systems and to participate as a 'hands-on' person in the production of such equipment, structures, and systems. In this, the computer technologist works very closely with the computer scientist and engineer. The programme is thus designed to produce a person with strong 'hands-on' skills and to give the trainee opportunity for further studies to pursue the Masters of Technology degree in computer technology and other related field of study.

2.3.2 Rationale

The computer technology curriculum will address the following:-

- The need to provide route for further studies for the Diploma graduates who wish to acquire university degree qualification in their field of study.
- The increasing demand for computer technology professional with practical skills and training, awareness for the use of computer systems, information systems and industrial computer-controlled equipment to increase productivity in Kenya and neighboring countries.
- To be in line with The Technical University of Kenya mandate "to meet the need for middle level personnel for both public and private sector with practical skills required in the industry".
- To bridge the gap in the job market for individuals with qualifications and professional training with practical orientation to meet the practical demand.
- The need for the use of Computer technology to drive the economy and the realization of industrialization by the year 2030 vision requires computer technologist to design, construction, implementation, and maintenance of software and hardware components of modern computing systems and industrial computer-controlled equipment.
- Global use of computer technology in business and communication requires computer technologist to design, construction, implementation, and maintenance

of software and hardware components of modern computing systems and computer-controlled equipment.

- The need for a curriculum that is adaptable and flexible with the changing needs and technical advancement in the industry.

2.3.3 Objectives

i. To offer education and training to most competitive computer technologists in Computer Technology with technical skills and industrial orientation
ii. To produce a technologist skilled in the art of production technology of design, construction, implementation, and maintenance of software and hardware components of modern computing systems and computer-controlled equipment
iii. To equip the trainee with hand on technical skills in computer technology required in the industry
iv. To give opportunity to the students for further studies in their field of study
v. To prepare the students as computer technologist
vi. To equip the graduates with the skills to understand and interpret both science and engineering design.

2.3.4 Career Prospects

Graduates are prepared for employment in any trade, industry or profession that is heavily reliant on computing systems, including media, communications, finance, energy and medicine.

2.3.5 Entry Requirements

The basic admission requirement shall be at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, applicants are expected to have obtained at least a grade C+ in each of the cluster subjects in following cluster of subjects in KCSE examinations:

(i) Mathematics
(ii) Physics
(iv) Second Group II or any Group III
(v) Biology/any Group III/any Group IV/any Group V.

2.4 BACHELOR OF TECHNOLOGY IN COMMUNICATION AND COMPUTER NETWORKS

2.4.1 Introduction

The continuing developments in computer technology enables computers that were once stand-alone systems to be linked together to form networks, internetworks and distributed systems. Today computer networks span the whole globe. In the light of these developments, our students need to be aware of these technologies to keep up with the present times. The development of this program is motivated by the explosive growth of mobile and wireless technologies and services, the increased internet and web presence in the mobile area, and the possibility of using mobile subscriber terminals as a tool for delivering public information and services.

There is an increasing dependence of modern businesses on diverse network technologies and this demands efficient design and management skills. The programme includes substantial coverage of network technologies as well as social sciences. It has enhanced features which reflect the current user changing needs and advancing technology.

The entire programme is covered in 3983 hours and 83 units of study. The units of study are all compulsory.

2.4.2 Rationale

- Computer communication systems and networks is an important aspect of today's communication systems. It requires the knowledge of all current networking technologies and aims to incorporate them adequately into every aspect of business and social life. It guarantees that all communication systems are efficiently designed and implemented based on the user requirements, ready to support every daily activity.
- This program intends to provide an understanding of the principles underlying computer communication together with implementing data communication systems. The programme has integrated communication systems and computer networks because candidates with such skills are highly sought after in this era of telecoms, broadcasting and information technology convergence. The programme was therefore created to respond to the demand in the market because there is a big gap for people with this kind of qualification.

2.4.3 Objectives

i. To provide adequate education and training required by this profession.

ii. To develop practical skills and acquire knowledge in the management of computer communication networks

iii. To plan and design networked systems with adequate security features which conform with the organizations security policy

iv. To develop innovative solutions to an integrated information systems infrastructure which reflect the current user changing needs

2.4.4 Career Prospects

Graduates are prepared for employment in any trade, industry or profession requiring management of information technologies, administration and management of networks or database systems and development of new software solutions to meet specific market or organisational needs.

2.4.5 Entry Requirements

The basic admission requirement shall be at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade C+ in each of the cluster subjects in following cluster of subjects in KCSE examinations:

(i) Mathematics

(ii) Physics

(iv) Second Group II or any Group III

(v) Biology/any Group III/any Group IV/any Group V.

2.5 BACHELOR OF TECHNOLOGY IN INFORMATION TECHNOLOGY

2.5.1 Introduction

Information Technology (IT) in its broadest sense encompasses all aspects of computing technology. IT, as an academic discipline, is concerned with issues related to advocating for users and meeting their needs within an organizational and societal context through the selection, creation, application, integration and administration of computing technologies. Information technology focuses on integrating computer technology solutions and business processes to meet the information needs of businesses and other enterprises, enabling them to achieve their objectives in an effective and efficient way. This discipline's perspective on information technology emphasizes information, and views technology as an instrument for generating, processing, and distributing information. Professionals in the discipline are primarily concerned with the information that computer systems can provide to aid an enterprise in defining and achieving her goals, and the processes that an enterprise can implement or improve using technology. They must understand both technical and organizational factors, and they must be able to help an organization determine how information and technology-enabled business processes can provide a competitive advantage.

2.5.2 Rationale

Information Technology is one of the most significant ingredients that can lead Kenya to the globalization era. Many organizations both private and public sectors have perceived and realized the great significance of computer and information technologies that shall facilitate their business operation and management with the most efficiency and effectiveness. As a result, a great number of computer and information technology professionals are in high demand. In particular, there is great demand for programmers, network administrators and managers, system and web designers. Currently, there is also pressure on information technology managers to have internationally recognized qualifications in their fields of specialization. The ready job market for these graduates justifies the need to mount diploma and degree courses in information technology to facilitate participation in the global information society. The B.TECH. (IT) programme provides students with a combination of knowledge, hands-on experience, and application of theory to information issues.

2.5.3 Objectives

B.TECH. (IT) graduates will be able to:

i. Carry out installation, networking, configuration and maintenance of computer systems.
ii. Offer technical user support in ICT.
iii. Carry out software development tasks.
iv. Explain and apply appropriate information technologies and methodologies to help an individual or organization achieve its goals and objectives.
v. Manage the information technology resources.

2.5.4 Career Prospects

Graduates are prepared for employment in any trade, industry or profession requiring management of information technologies, administration and management of networks or database systems and development of new software solutions to meet specific market or organisational needs.

2.5.5 Entry Requirements

The basic admission requirement shall be at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade C+ in each of the cluster subjects in following cluster of subjects in KCSE examinations:

(i) Mathematics
(ii) Physics
(iv) Second Group II or any Group III
(v) Biology/any Group III/any Group IV/any Group V.

2.6 BACHELOR OF TECHNOLOGY IN MEDICAL LABORATORY TECHNOLOGY

2.6.1 Introduction

The Technical University of Kenya is one of only a handful of universities in Kenya, and the region that offer an undergraduate training in Biomedical Science and Technology. The program is a popular and fascinating field of study concerned with a detailed study and comprehension of the human body in health and disease, central to which are techniques and methodologies for disease diagnosis, monitoring and identification of treatment procedures. The program is multidisciplinary, encompassing areas such as Morphology, Cell Biology, Anatomy, Physiology, Immunology, Pharmacology, Toxicology, Biochemistry, Molecular Biology and Microbiology. A partnership between the university and medical and research institutions allow us to offer this unique program which permits the students access to medical research facilities and training to undergraduate students across the country. The programme is covered in 4308 hours and 89.8 course units. Distribution of the hours by subject areas is as indicated in the table below.

2.6.2 Rationale

Many countries in Africa are currently facing a difficult time in the development and application/implementation of biomedical technologies. This has stemmed primarily from a lack of clear focus and technical proficiency in the identification of deficiencies in biomedical applications in diagnostic and treatment strategic programmes to meet present and future challenges. As the economies of most countries become liberalized, modern or conventional medicine is becoming more and more technology - oriented. Thus there is a strong need to train people who will have the competence to identify emerging biomedical technologies, be able to apply their expertise in the public and private sectors as well harness their innovativeness to start and manage their own biomedical science and technology ventures; micro and macro-enterprises.

2.6.3 Objectives

i. To equip the students with modern techniques in disease diagnosis.

ii. To produce technologists with a firm scientific and hands-on with scientific research skills relevant to tropical diseases.
iii. To impart skills and creativity, resourcefulness, critical thinking and professional ethics for the enhancement of effective service delivery.
iv. To train students in community leadership, proper Health management and stringent utilization of available resources.
v. To provide opportunities for further development of health technologies.
vi. To assist in development and management of comprehensive biomedical programmes, at local and national levels, building on various community and public institutional initiatives.
vii. To conduct research and participate in the development of new medical laboratory techniques.
viii. To impart knowledge and understanding in the student of the scientific discipline of biomedical science and sufficient knowledge in related fields, as appropriate for relevant biomedical boards to meet local, national and International needs.
ix. To develop in the student transferable skills relevant to a wider range of graduate employment opportunities.
x. To impart in the student an awareness of the wider social, economic and ethical aspects of biomedical science;

2.6.4 Career Prospects

Graduates are prepared for employment Hospitals and medical centres, Nursing facilities, Schools, Biomedical Research Institutions.

2.6.5 Entry Requirements

The basic admission requirement shall be the minimum entry requirements set for admission into public universities, which is at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, applicants are expected to have obtained at least a grade C+ in each of the following cluster subjects:

(i) Biology
(ii) Chemistry
(iii) Mathematics Alt. A, Mathematics Alt. B OR Physics
(iv) ANY Group III/any Group IV/any Group V.

2.7 BACHELOR OF TECHNOLOGY IN COMMUNITY AND PUBLIC HEALTH

2.7.1 Introduction

The Bachelor of Technology in Community and Public Health curriculum is designed to provide training in the area of community and public health technology. In the broad field of community and public health, the technologist is normally a professional with the practical skills to develop and maintain structures and systems, and to participate as a 'hands-on' person in the area of community and public health. The programme is designed to produce a person with strong technical and supervisory' skills as well as managerial skills. Graduates of the programme have a wide range of employment opportunities which include disease surveillance, resource mobilization and management, health programme or project management, community intervention programmes, among others.

2.7.2 Rationale

Primary health care is a high priority nationally. The core disciplines in primary health care need to develop capacity. Only a few bachelor programs exist and career tracks for primary healthcare workers are just beginning to receive increased importance. Most community and public health training is conducted at high levels in academic institutions. Significant population groups receive healthcare from community or social health workers in both publicly and privately funded community-based services. Furthermore, hospital-based care often cannot be applied to a primary care setting. As a result primary care is worth investing in, because of the demonstrated association between the benefits of primary care and a country's health status.

Primary health care is of high national and international priority. The Bachelor of Technology in Community and Public Health programme shall provide an interdisciplinary approach for training community and public health professionals with work competencies in the healthcare sector of the economy. The training will also bridge the gap in the job market for individuals with qualifications and professional training with a practical orientation to meet the practical demand. Availability of the combined programme is lacking, thus, the need to train qualified professionals to meet the demands of the market. Training will be in line with The Technical University of Kenya mandate, 'To train high and middle level personnel for both public and private sectors.'

2.7.3 Objectives

At the end of this course the student will be able to:

i. To develop practical skills and acquire the knowledge and attitude required for the profession.

ii. To identify the role of community and Public Health in the prevention and management of diseases.

iii. To plan, organise and Implement community and public health procedures to prevent diseases.
iv. To carry out basic health assessment and plan sound primary health care strategies.
v. To develop innovative ways of community health management
vi. To examine aspects of modern health care systems in the country and in the world.

2.7.4 Career Prospects

Graduates are prepared for employment in both public and private sectors. They can work in: local health departments, as Health inspectors and Health educators; universities as researchers; non-profit organizations in health advocacy, policy and research in specific health issues.

2.7.5 Entry Requirements

The basic admission requirement shall be the minimum entry requirements set for entry into the public universities, which is at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, applicants are expected to have obtained at least a grade C+ in each of the subjects in following cluster of subjects in KCSE examinations:

(i) Biology
(ii) Chemistry
(iii) Mathematics A /Physics
(iv) English/Kiswahili or third Group II/ III / IV/ V.

2.8 BACHELOR OF TECHNOLOGY IN NUTRITION AND DIETETICS

2.8.1 Introduction

The degree in Nutrition and Dietetics prepares the students to function as nutrition and dietetic technologists, due to the emphasis placed on giving the students considerable practical knowledge in Nutrition and Dietetic practice. This study involves the promotion of health, as well as the prevention and treatment of diet-related disease/s.

The units of study in the first, second and third years of study are all compulsory while in the fourth year of study, a student takes thirteen compulsory units with

options. The compulsory courses constitute two units of project. The options are grouped into four subject areas, namely, Clinical Nutrition, Community Nutrition and Sports and Wellness Nutrition. A student is required to select a particular subject area of specialization and then take all the respective OPTIONS within the cluster.

Candidates shall be expected to cover four compulsory University Common courses within the first year.

The entire programme is covered in 4572 hours and 83.25 units of study. Taking into consideration that two hours of practical attachment are counted as one contact hour, the total contact hours for the course are 3996 hours. In this, theory sessions constitute 1532 hours while practical sessions account for 3040 hours, which translates to 34% and 66% 0f the programme respectively.

2.8.2 Rationale

The Bachelor of Technology programme is strongly grounded in a study of scientific principles of Nutrition, Dietetics and research, which are then applied to influence the wider environment affecting food supply, policy and eating behaviours. The course gives graduates an understanding of Nutrition, Dietetics, Health principles

2.8.3 Objectives

At the end of this course, the candidate should be able to:

i. Plan, organize and implement the dietary management procedures.
ii. Develop new and innovative ways of dietary management and wellness.
iii. Explain methods of basic nutritional assessment and Relate to planning sound nutrition care.
iv. Develop practical skills, knowledge and attitude required in the profession.
v. Identify the role of Nutrition and Dietetics in the economy and its impact on human life.

2.8.4 Career Prospects

Graduates are prepared for employment in skilled Community based programs, Nursing facilities, Schools, Hospitals and medical centres, food industry Public health agencies, Research Institutions, Faith based organizations and Chemists.

2.8.5 Entry Requirements

The basic admission requirement shall be the minimum entry requirements set for entry into the public universities, which is at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, applicants are expected to have obtained at least a grade C+ in each of the cluster subjects:

(i) Biology
(ii) Chemistry
(iii) Mathematics A /Physics
(iv) English/Kiswahili or third Group II/ III / IV/ V.

2.9 BACHELOR OF TECHNOLOGY IN APPLIED BIOLOGY

2.9.1 Background

The objective of this programme is to offer education and training in Applied Biology. The programme prepares the candidates to function as Technologists in research and learning institutions and industries. The programme aims at equipping the trainees with knowledge and skills relevant applied aspects of biological sciences. Considerable emphasis is placed on giving the candidates practical knowledge and skills through elaborate laboratory work and Industrial based learning covered through internal and external attachment. Graduates can effectively manage the day to day operations in Science Laboratories in Learning and Research institutions as well as in Industries involved in production of bioproducts and in environmental conservation and waste management.

The programme has 64 units covered in 3072 hours and Industrial based learning covered in 768 hours. Thus in the programme, 50% of the contact hours shall be allocated to lectures while 50% shall be taken up by practical and field work. For internal, external and research project time, 48hours are taken to be 0.5 units, this is so because the nominal hour for a practical semester is counted as only half a contact hour.

The various courses of study on the programme shall be assessed on the basis of coursework and written examination. For the entire programme coursework shall account for 30% while written examinations shall be responsible for 70% of the total marks a student may earn.

2.9.2 Rationale

There is increased need of Technologists in learning and research institutes as well as in industries. The Bachelor of Technology in Applied Biology is therefore designed to produce general laboratory managers skilled in sequential planning, coordination of laboratory operations, while providing requisite consultancies in contemporary technological approaches and practical training in pursuit of solving technical problems related to biological research.

2.9.3 Objectives

The objective of this programme is to:

i. Equip learners with knowledge and skills to manage modern biological science laboratories.
ii. Apply biological science knowledge and skills in solving problems related to health, food security and environment.
iii. Prepare learners for postgraduate studies

2.9.4 Career Prospects

Graduates are prepared for pharmaceutical, biotechnology, or applied and medical research. They find employment as research officers, teachers, lecturers, and laboratory managers in both governmental and non-governmental organizations.

2.9.5 Entry Requirements

The basic admission requirement shall be at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade C+ in each of the cluster subjects in following cluster of subjects in KCSE examinations:

(i) Biology
(ii) Chemistry
(iii) Mathematics A /Physics
(iv) English/Kiswahili or third Group II/ III / IV/ V.

2.10 BACHELOR OF TECHNOLOGY IN SCIENCE LABORATORY TECHNOLOGY

2.10.1 Background

The objective of this programme is to offer education and training in Applied Biology. The programme prepares the candidates to function as Technologists in research and learning institutions and industries. The programme aims at equipping the trainees with knowledge and skills relevant applied aspects of biological sciences. Considerable emphasis is placed on giving the candidates practical knowledge and skills through elaborate laboratory work and Industrial based learning covered through internal and external attachment. Graduates can effectively manage the day to day operations in Science Laboratories in Learning and Research

institutions as well as in Industries involved in production of bioproducts and in environmental conservation and waste management.

The programme has 64 units covered in 3072 hours and Industrial based learning covered in 768 hours. Thus in the programme, 50% of the contact hours shall be allocated to lectures while 50% shall be taken up by practical and field work. For internal, external and research project time, 48hours are taken to be 0.5 unit, this is so because the nominal hour for a practical semester is counted as only half a contact hour. The various courses of study on the programme shall be assessed on the basis of coursework and written examination. For the entire programme coursework shall account for 30% while written examinations shall be responsible for 70% of the total marks a student may earn.

2.10.2 Rationale

There is increased need of Technologists in learning and research institutes as well as in industries. The Bachelor of Technology in Laboratory Science Technology is therefore designed to produce general laboratory managers skilled in sequential planning, coordination of laboratory operations, while providing requisite consultancies in contemporary technological approaches and practical training in pursuit of solving technical problems related to biological research.

2.10.3 Objectives

The objective of this programme is to:

i. Equip learners with knowledge and skills to manage modern biological science laboratories.
ii. Apply biological science knowledge and skills in solving problems related to health, food security and environment.
iii. Prepare learners for postgraduate studies

2.10.4 Career Prospects

Graduates are prepared for employment in: industries where knowledge and practical skills on biological, physical sciences and engineering are required; research institutions and secondary schools laboratories.

2.10.5 Entry Requirements

KCSE Candidates

The basic admission requirement shall be the minimum entry requirements set for entry into the public universities, which is at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade C+ in each of the cluster subjects in following cluster of subjects in KCSE examinations:

(i) Biology
(ii) Chemistry
(iii) Mathematics A /Physics
(iv) English/Kiswahili or third Group II/ III / IV/ V.

2.11 BACHELOR OF TECHNOLOGY IN BIOTECHNOLOGY

2.11.1 Introduction

The objective of this programme is to offer education and training in Biotechnology to Candidates fresh from KCSE and those who have obtained a minimum of Diploma in Biotechnology or in relevant Biological Sciences. This programme envisages a two-level entry approach where fresh KCSE graduates will start at the first year while diploma in Technology graduates will start at the third year of study. The program is deliberately designed to produce Innovators and Techno-Scientists equipped with fundamental principles of science so as to enable them understand and accurately interpret existing scientific principles and knowledge into applications in hands-on approach. In addition they will be expected to carry out research to convert existing Knowledge in the Science of biotechnology into new technologies which is expected to promote manufacturing enterprises leading to creation of employment and wealth. Graduates of this programme will also be able to advance in their training to Masters and PhD level.

The programme shall be covered in 4584 nominal teaching hours or 3936 contact hours and 64 course units. Out of 3936 contact hours 2708 hours will be for lectures. The lecture hours will be 50% while the other 50% will be designated for practical and experiments. In addition there will be 480 hours dedicated to teaching techniques only in various subjects. Also 432 hours half of which will be dedicated to internal and the other half will be dedicated to external attachments. Therefore contact hours allocated for hands on training will be 60% and 40% shall be allocated to lectures. For internal, external and research project time 48hours are taken to be 0.5unit.

2.11.2 Rationale

Innovations in Biotechnology and need to change from petrochemical and synthetic products to bio-products experienced in the recent years has lead to rise in demand for Biotechnology services. In response to this a number of Bio-manufacturing/Biotechnology industries have emerged hence the need for skilled manpower to work in this sector. Bio-manufacturing being an interplay of a number of disciplines including Biotechnology, Biochemistry, Molecular Biology, Basic Biological sciences, Engineering, Physical sciences, Computational Biology and Management a. training curriculum to produce competent graduates requires optimum balancing in various disciplines. Over the years training for such manpower has been offered out of the country making capacity building expensive and this has reduced the country's capability to meet its human resource demand. The Technical University of Kenya (TUK) has responded by developing programs to train manpower in this area locally.

Career opportunities: Graduates from this program will work in Biomanufacturing / Bio-processing industries and Biotechnology-service providing sectors including; Medical, Industrial, Agricultural, Environmental, Food, Bioinformatics, Forensic Science among others . Specific areas include, diagnostics, Biopharmaceutics, waste management, Animal / Crop breeding, Biofuels production, Molecular farming, food processing, teaching/training among others. In addition graduates will advance their training to Masters and PhD levels.

2.11.3 Objectives

i. To enable students acquire knowledge and skills which will improve their proficiency and efficiency in their work places.
ii. To produce technologists who can be able to do research and produce new innovative technologies.
iii. To train students to develop entrepreneurship skills in the fields of biotechnology.
iv. To train students to be able to Manage, preserve and propagate biotechnological resources.
v. To impart in the student skills for the Manufacture bio-products for local and foreign markets.

2.11.4 Career Prospects

Graduates are prepared for employment in: research as research officers, technologists or technicians in research institutions; bio-manufacturing / bio-processing industries and biotechnology-service providing sectors including; medical, industrial, agricultural, environmental, food, bioinformatics and forensic Science.

2.11.5 Entry Requirements

The basic admission requirement shall be the minimum entry requirements set for entry into the public universities, which is at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade C+ in each of the cluster subjects in following cluster of subjects in KCSE examinations:

(i) Biology
(ii) Chemistry
(iii) Mathematics A /Physics
(iv) English/Kiswahili or third Group II/ III / IV/ V.

2.12 BACHELOR OF TECHNOLOGY IN FOOD SCIENCE AND TECHNOLOGY

2.12.1 Introduction

The Bachelor of Technology (Food Science and Technology) is aimed at producing a food technologist skilled in the application of science and technologies in the production of various food products. The qualification obtained upon successful completion of the course will be a degree in Bachelor of Technology (Food Science Technology) of The Technical University of Kenya.

The programme has 73 course units covered in 3,936 hours. Considering that a nominal hour for practical semester is counted as half a contact hour, the total contact hours on the programme comes to 3,506 of which 1,268 hours will be lectures while 2,572 hours will be taken up by practical and tutorial work. Thus in the programme, 33% of the contact time shall be allocated to lectures while 67% shall be taken up by practical and tutorial work. Considerable time has also been allocated to practical work where the candidate takes 24 weeks of practical attachment of which 12 are taken on campus while the other 12 in the industry.

In addition, the student is required to cover four non-credit units on Health Education, Critical and Creative Thinking, Society and Culture and Communication Skills of which is covered in 48 hours each.

Industrial based learning takes an equivalent 9units which translate to 864 hours. It is divided into two parts, internal attachment done after the second year of study and external attachment after third year.

2.12.2 Rationale

The programme is designed to generate food technologist skilled in sequential planning, coordination of operations in large and small scale food manufacturing, research and learning institutions, extension services, consultancies and other allied areas. This programme has been developed to meet the ever growing need for well skilled food scientist/technologist with a broad perspective to advance the production, manufacture and development of wholesome foods through an ethically sound supply chain.

2.12.3 Objectives

The objectives of this programme are to:

i. Enable students acquire knowledge and skills which will improve their proficiency and efficiency in the work places.
ii. Produce technologists who can be able to do research and produce new innovative technologies.
iii. Train students to develop entrepreneur skills in the field of food science and technology.
iv. Impart in the student skills for the manufacture of food product for local and foreign markets.

2.12.4 Career Prospects

Graduates are prepared for employment in: food and allied industries as technicians, technologists, supervisors, lecturers and researchers in educational and research institutions; in sales and executive positions in food and food-related industries. They can also be agribusiness entrepreneurs. Food Science and Technology graduates can advance careers in health-related careers.

2.12.5 Entry Requirement

The basic admission requirement shall be at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, applicants are expected to have obtained at least a grade C+ in each of the cluster subjects in following cluster of subjects in KCSE examinations:

(i) Mathematics
(ii) Physics
(iii) Second Group II or any Group III
(iv) Biology/any Group III/ IV/ V.

2.13 BACHELOR OF TECHNOLOGY IN TECHNICAL AND APPLIED PHYSICS

2.13.1 Introduction

Advances in physics which is one the most fundamental of all physical sciences have been essential for many developments in modern technology. Physicist continues to lead in discoveries, inventions and innovations such as internet and mobile technology. Typical features of this programme include practically-oriented technical subjects and modern methods of analysis and computer simulation. The programme gives priority to mastering experimental techniques as well as theoretical principles. It also provides opportunity for further studies in various physics-oriented masters' programmes; such as environmental physics, nuclear energy, material science, polymers science among others.

The programme's graduates will have adequate knowledge and an understanding of the key areas in scientific subjects:

(i) Mechanics, optics and electrodynamics
(ii) Atomic and molecular physics
(v) Materials and solid-state physics
(iii) Quantum mechanics, thermodynamics and statistical physics
(iv) Materials and solid-state physics
(vi) Mathematical methods and computer simulations.

All the units in first, second and third years are compulsory while in the fourth year, students will choose between the following areas of specialization: Instrumentation, Material Science or Energy

The program also covers Chemical and Biological techniques, information technology, and mathematics and laboratory professional studies. This programme will ensure that our graduates will be familiar with laboratory operations and systems in all relevant fields of technology. Each student will do two projects one in the trade area (physics) and the other in the field of entrepreneurship. Each semester has total of 15 weeks where 12 weeks are for normal lectures/study while 3 weeks are used for assessment.

2.13.2 Rationale

The current scarcity of technologist in the broad field of technical physics negatively affect efficient research development. Graduates of this programme will have opportunity for careers in research and development work in industrial set-up such as those in the fields of energy, material, polymers, ceramics, glass and general industrial instrumentation. Locally opportunities exist in government ministries such Trade and Industry, Public Works and Energy as well as department such as Kenya Bureau of standards and, department of Weight and Measures. In private sector: research bodies and Educational Institutions such as Universities and colleges needs qualified technologist.

2.13.3 Objectives

This curriculum will enable the trainee to:

i. Develop problem solving skills, analyze physical systems and understand the theoretical framework which applies to them.
ii. Analyze complex processes using the current methods of computer simulation,
iii. Acquire a basic mastery of experimental science including data reduction and error analysis.
iv. Develop effective communication skills orally and in writing as well as computing.
v. Develop efficient laboratory management skills
vi. Identify physics problems and organize their implementation in the form of projects.

2.13.4 Career Prospects

Graduates are prepared for employment infields of energy, polymer, ceramics and glass. In government sector opportunities are available in ministry of Trade and Industries, Kenya Bureau of standards among others while in private sector; research bodies, Educational Institutions such as Universities laboratories, as well as colleges and secondary schools are in need of qualified physics technologist/technicians

2.13.5 Entry Requirements

The basic admission requirement shall be at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade C+ in each of the cluster subjects in the following cluster of subjects in KCSE examinations:

(i) Mathematics
(ii) Physics
(iii) Chemistry
(iv) Biology/any Group III/ IV/ V.

2.14 BACHELOR OF TECHNOLOGY IN APPLIED CHEMISTRY (INDUSTRIAL CHEMISTRY OPTION)

2.14.1 Introduction

Bachelor of technology (applied chemistry- Industrial chemistry option) is aimed at producing an industrial chemist skilled in the application of science and technology in Industrial processes and product development based on analytical methods and assessments with view to improving the lives of the public in the real world. The qualification obtained on successful completion of the course will be a degree in Bachelor of Technology in Applied chemistry (industrial Chemistry option of the The Technical University of Kenya.

The programme has 73 course units covered in 3936 hours. Considering that a nominal hour for practical semester is counted as a half a conduct hour, the total contact hours on the programme is therefore 3506 of which 1268 hours will be lectures, 2572 hours is covered by practical and tutorial work. Thus in the programme, 33% of the contact time shall be allocated to lectures while 67% is taken up by practical and tutorial work. Considerable time has been allocated to practical work where the candidate takes 24 weeks of practical attachments,12 of which are taken on campus and the other 12 in industry.

The students are also required to cover 4 non-credit units which include; communication skills, health education, critical and creative thinking and society and culture, each takes 48 hours. Industry based learning is also emphasised and it takes an equivalent of 9 units translating to 864 hours. IBL is done in two parts; internal IBL and external IBL at the end of second and third year respectively.

The course takes four academic years, split into 3 semesters per calendar year. Emphasis is placed on practical skills acquired during Industry Based Learning (IBL) which is both internal and external. IBL will take a total of 330 hrs in every third semester of each academic year. During this period the students are exposed to hands-on practical experience to make them ready for work in various industries or individual entrepreneurship.

The programme has 64 units covered in 3072 hours, of lectures and practicals, and 1320 hours industrial attachment adding up to a total of 4392 nominal hours, distributed as shown in Table 1 below. A nominal hour for a practical session is counted as half of a contact hour.

Note: The total contact hours on the programme is 3522 of which 1872 hrs shall be dedicated to lectures while 1200 shall be taken up by practical and tutorial work. Thus in the programme, 60.94% of the contact time shall be dedicated to lectures and 39.06% shall be taken up by practicals and tutorial work.

The various courses of study in the programme shall be assessed on the basis of coursework and written examination. For the entire programme, coursework shall account for 30% while written examinations shall account for 70% of the total marks a student can score.

2.14.2 Rationale

The programme is designed to generate industrial chemists skilled in planning, coordination of operations in large and small scale chemical industries, research, manufacturing and learning institutions, extension services, consultancies and other allied areas. This programme has been developed to meet the ever growing need for well skilled industrial chemists with broad perspective to advance the production, manufacture and development processes.

2.14.3 Objectives

Chemical principles form the basis for many industrial processes and products. Consequently, the Bachelor of Technology in Applied Chemistry (Industrial Chemistry Option) degree course aims to:

i. Produce a applicants that meet industrial needs with the ability to carry out industry-oriented projects
ii. Provide quick solutions at their places of work.
iii. Equip applicants with knowledge in the areas of chemical unit operations and processes; fundamental chemistry; mathematics and statistics; policies and practices in areas of environment, health, and safety; process systems and control; as well as
iv. Prepare applicants in areas of laboratory instrumentation as quality help, to understand the operation of modern chemical industries.

2.14.4 Career Prospects

Graduates are prepared for employment in research and development, management positions, and technical roles within multinationals such as Unilever, Government Chemist and Glaxo-SmithKline. Others venture into small and medium enterprises, or apply their technical and analytical skills in fields such as patent law or innovation.

2.14.5 Entry Requirements

The basic admission requirement shall be the minimum entry requirements set for entry into the public universities, which is at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade C+ in each of the cluster subjects in following cluster of subjects in KCSE examinations:

(i) Mathematics
(ii) Physics
(iii) Chemistry
(iv) Biology/any group III/ IV/ V.

2.15 BACHELOR OF TECHNOLOGY IN APPLIED STATISTICS

2.15.1 Introduction

The programme leading to a Bachelor of Technology degree in Applied Statistics is structured to provide fundamental knowledge as well as practical skills in application of statistics in various fields.

2.15.2 Rationale

Applied statistics is a professional discipline which can be viewed both as a science as well as an art. Its science aspect lies in providing theoretical background, theoretical techniques and algorithms for solving real life problems. Many of the business decision making processes are mainly dependent on the results obtained by algorithms. Well defined algorithms for the different statistical methods where necessary and the workings of different statistical techniques with fitting statistical software, are utilized. Some of the environmental decisions are probabilistic in nature. Simulation which helps researchers deal with such situations is now being extensively used and relied upon in solving real life problems. As art, as its success in all the phases; preceding and succeeding the solution of the mathematical model depends to a large extent on the creativity and personal abilities of the experts.

The course is intended to produce a practical and hands-on statistician with cutting edge computing skills. The graduates are expected carry to our research and apply statistical data analysis to problems to various sectors of the economy. These include; research institutions, education, business, industry, financial services, medicine, information technology in the public, corporate, non-governmental organizations, multinationals, and multilateral United Nation bodies. In line with the country's Vision 2030 national goals, the graduates who are not absorbed in the formal job market should be able to start small-scale consultancy businesses in statistical data analysis.

2.15.3 Objectives

The objectives of this programme are to:

i. Provide a sound foundation in the principles and practice of Statistics with emphasis on Practical data collection, organization, presentation, analysis and Interpretation
ii. Equip the student with broad based knowledge and skills in statistics
iii. Equip the graduates for employment in public or private sectors or self- employment

iv. Prepare the candidate for postgraduate studies in Statistics

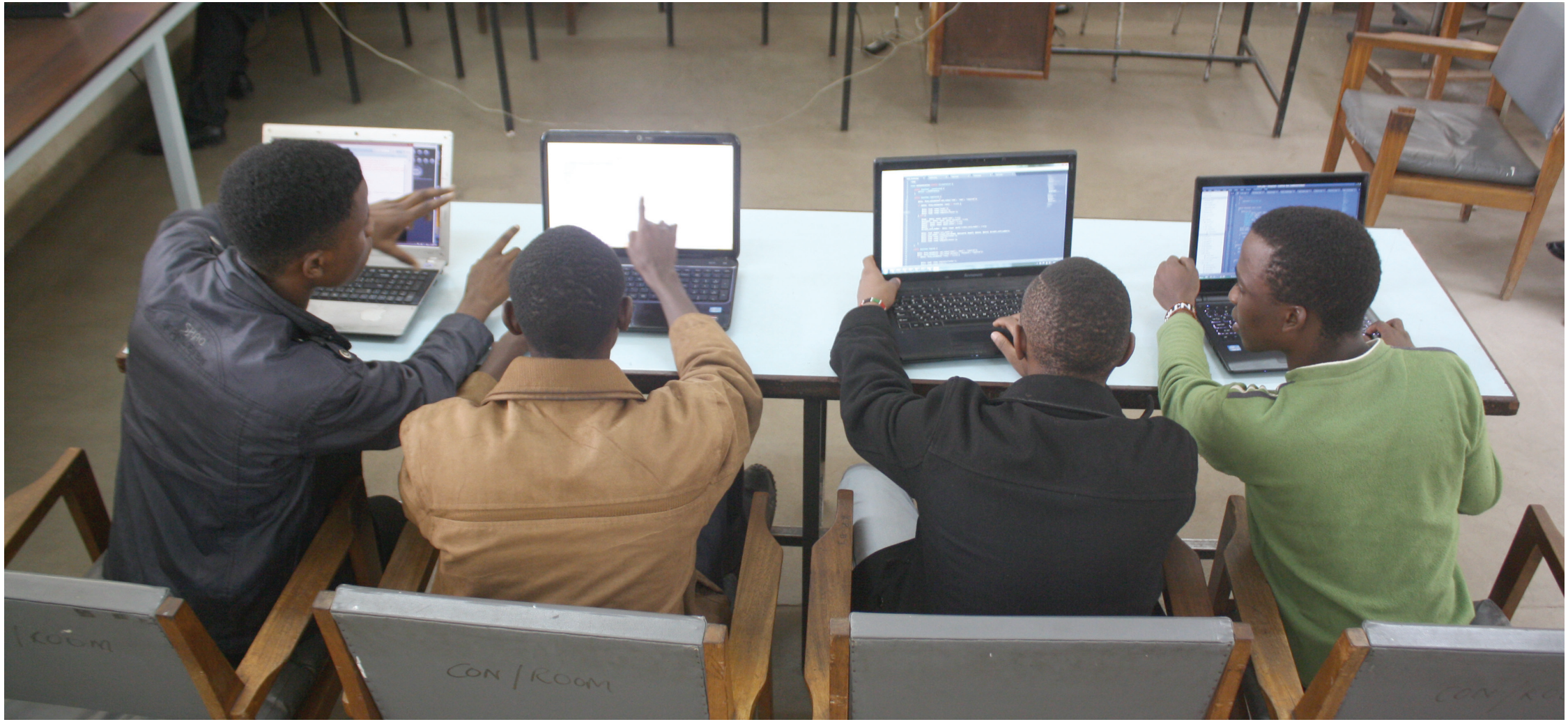
2.15.4 Career Prospects

Graduates are prepared for employment in research institutions, education, business, industry, financial services, medicine, information technology in the public, corporate, non-governmental organizations, multinationals, and multilateral United Nation bodies.

2.15.5 Entry Requirements

A student wishing to pursue Bachelor of Technology in Applied Statistics must obtain at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade C+ in each of the cluster subjects in following cluster of subjects in KCSE examinations except in Mathematics in which a candidate must have obtained a grade B Plain:

(i) Mathematics
(ii) Physics
(iii) Chemistry
(iv) Biology/any group III/ IV/ V.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3. FACULTY OF ENGINEERING SCIENCES AND TECHNOLOGY

3.1 Bachelor of Technology in Faculty of Engineering Science and Technology

The Bachelor of Technology in the Faculty of Engineering Science and Technology prepares students to respond to the needs of today's innovation-based and technology-oriented organizations. Kenyan universities have been producing engineers and scientists with Bachelor of Science or Bachelor of Engineering degrees. Traditionally these degrees focus on conceptualization and design of products, systems and processes. But another cadre of professionals known as technologists is required to turn the concepts and designs into products and services. Indeed for developing economies, the ratio required of engineers to technologists is one to three (1:3). In Kenya, the few available technologists were trained through the higher national diploma qualification. Their population is too small to impact expected technological transformation. Hence Technical University of Kenya plans to train a large number of engineering technologists through the innovative Bachelor of Technology curricula that puts emphasis on practical technical and managerial skills. These professionals will be registered with the **Engineering Technologists and Technicians Registration Board** that will be established through the enactment of the **Engineering Technologists and Technicians Bill, 2012** that is now in its final stages in Parliament.

Students can enroll in Bachelor of Technology degrees in any of the following specializations:

- Bachelor of Technology in Building Construction
- Bachelor of Technology in Chemical Engineering Technology
- Bachelor of Technology in Mechanical Engineering Technology
- Bachelor of Technology in Civil Engineering Technology
- Bachelor of Technology in Geoinformation Technology
- Bachelor of Technology in Surveying Technology
- Bachelor of Technology in Electrical and Electronic Engineering Technology

3.2 SCHOOLS

3.2.1 **School of Architecture and the Built Environment**

3.2.2 **School of Infrastructure and Resources Engineering**

3.2.3 **School of Mechanical and Process Engineering**

3.2.4 **School of Surveying and Geospatial Science**

3.2.5 **School of Electrical and Electronic Engineering**

3.3 Bachelor of Technology in Building Construction

3.3.1 Introduction

The UN Charter of 1948 declares adequate housing as a basic human right. With increase in human population and changing socio-economic conditions, there has been a continuous evolution of shelter designs aimed at creating an improved habitable and working environment.

Over the years, institutions of higher learning have trained numerous graduates in the traditional disciplines of Architecture, Civil Engineering, Quantity Surveying, Mechanical Engineering and Electrical Engineering all of which are essential for provision of buildings. While great achievements have been made with regard to organizing space, design services and structure, very little progress has been made in training personnel with adequate competencies in the assembly of building components.

The proposed Bachelor of Technology (in Building Construction) program to be offered in the Department of Building Science and Technology, has been developed keeping in mind the importance of improving quality when actualizing designs formulated by the professionals earlier mentioned. This program has been specifically designed to advance and improve the practice of building construction. Hence, it is organized to deliver to the construction industry a professional who is well equipped with construction techniques at the level of a technologist.

3.3.2 Rationale

The Rationale underlying the B. Tech. (Building Construction) is to develop and advance the practice of building construction. The graduates of this program are expected to devote a substantial part of their professional career to solving rational problems of how to make Kenya technologically advanced as well as break new grounds in all aspects of Building Construction Technologies and processes.

The entire programme is covered in 4272 hours making up 75.5 units of study. The units are distributed thus: 56.5 units (74.83%) cover courses offering practical/ technical skills, while 19 units (25.17%) cover theory foundation courses.

3.3.3 Objectives

The objective of the programme is to:

i. Introduce Building Construction Technology course at degree level without jeopardizing the science and technology component of their training.

ii. Produce competent graduates in building construction who are able to uphold best practices; as well as respond to new and current ideas, developing and emerging trends in building and the building industry.

iii. Provide sufficient general knowledge and specialized skills/techniques, which enable the professional builder to coordinate and control the technological and material resources involved in the building process.

iv. Enable the building construction technology graduate to interact with other allied professionals in the construction industry.

3.3.4 Career Prospects

The programme is packaged to equip graduates with the necessary skills for employment in construction industry, banking sector, Oil sector, teaching and research, as well as self-employment. Upon graduation, the students can pursue Post Graduate programs in master of technology in construction management, masters of construction economics and Master of Science in building construction amongst others

3.3.5 Entry Requirements

The basic admission requirement shall be at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade C+ (plus) in each of the following subject clusters:

(i) Mathematics
(ii) Physics
(iii) Any Group III
(iv) 2nd Group II/ 2nd Group III/ any Group IV/V

3.4 BACHELOR OF TECHNOLOGY IN CIVIL ENGINEERING TECHNOLOGY

3.4.1 Introduction

The graduates of this program shall thus in the first instance be equipped with the skills to understand and accurately interpret engineering designs. Because the special strength of the graduate from this program is to be a 'hands-on' person, considerable emphasis is placed on giving the candidate considerable practical knowledge in engineering technology. Besides, considerable time that has been allocated to laboratory work, the candidate also takes 36 weeks of practical attachment, of which 24 are taken on campus while 12 are taken in industry. In total 52.2% of the contact time is dedicated to practical work leaving 47.8% for theoretical study.

The program is covered in 4920 hours and 89 course units. Considering then that a nominal hour for a practical semester is counted as only half a contact hour, the total contact hours on the program comes to 4272 of which 2040 are dedicated to lectures while 2232 shall be taken up by practical and tutorial work. Thus on the programme, 47.8 % of the contact time shall be allocated to lectures while 52.2 % shall be taken up by practical and tutorial work

The units of study in the first, second, and third years of study are all compulsory while in the fourth year of study, a student takes ten compulsory units with six electives. The electives are grouped into four subject areas, namely, Water and Environmental Engineering, Highway and Transportation Engineering, Construction Engineering management and Transportation and Highway Engineering. Each of these subject areas has six core units, with two electives to be taken be taken at once in semester one and in the second semester a similar arrangement exist. A student is required to select a particular subject area of specialization and then take the entire respective core within the cluster.

3.4.2 Rationale

Technological changes, rapid development, and sustained population growth have been a catalyst to the fast expansion and improvement of civil engineering infrastructure nationwide. This course is designed to be a route for upgrading Diploma graduates who wish to acquire university degree qualifications in their field of study. This is in response to the demands of qualified civil engineering technologists for the industry, and would provide the much needed trained technical staff with skills and competency to cope with and handle the challenges and tasks posed by the new emerging trends and technologies in the civil engineering industry such as new design techniques.

3.4.3 Objectives

i. To offer education and training to technologists in Civil engineering
ii. To prepare the candidates to function as engineering technologists.
iii. To produce a technologist skilled in the art of production of structures, and systems on the basis of designs.
iv. To equip the graduates with the skills to understand and accurately interpret both scientific and engineering design.
v. To provide the much needed Technologists in the Civil Engineering Industry who will work alongside Civil Engineers to implement and monitor civil engineering works.

3.4.4 Career Prospects

Civil engineering technologists are professionals who work in various industries involved in infrastructural development. In these various industries, the civil engineering technologist does the work of interpreting designs and actual construction work of projects. Some of the specific industries in Kenya where civil engineering technologist serve include: road construction and maintenance, Rail construction and maintenance, building industry and the water sector.

3.4.5 Entry Requirements

The basic admission requirement shall be at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade C+ in each of the cluster subjects in following cluster of subjects in KCSE examinations:

(i) Mathematics
(ii) Physics
(iii) Chemistry
(iv) Biology/any Group III/IV/V.

3.5 BACHELOR OF TECHNOLOGY IN CHEMICAL ENGINEERING TECHNOLOGY

3.5.1 Introduction

Chemical engineering exists for the purpose of improving the quality of life of humanity by providing solutions and improvements to the myriad of human challenges while taking into consideration social, economic and environmental concerns. The objective of this curriculum is to provide training for technologists in the area of chemical engineering technology. The engineering technologist is normally a professional with the practical skills to maintain equipment, systems and processes and to be a 'hands-on' leader in the production and development of such equipment, systems and processes. In these tasks, the technologist works very closely with the engineer and technician and acts as a link between the two. The programme is also designed to allow diploma graduates to continue their training onwards to degree level.

3.5.2 Rationale

The citizen of any modern society is dependent on products of the chemical processing industry. These products include household chemicals (e.g. toiletries,

detergents, paints and margarine), agrochemicals (e.g. fertilizer and pesticides), pharmaceuticals (e.g. aspirin and antibiotics) and industrial chemicals (e.g. sulphuric acid, ammonia and petrol fuels) amongst many others. For the Kenyan case, some of these products are already manufactured locally while others are imported. There is therefore a need to develop the manpower necessary to participate in the design, development and operation of the chemical processing plants that produce the above mentioned products. This curriculum is therefore designed to produce the chemical engineering technologists necessary to fit into those roles.

3.5.3 Objectives

i. To offer education and training in chemical engineering technology and to equip the student with the knowledge and skills that will allow for eventual practice as a technologist.
ii. To provide the student with knowledge and skills as applied in contemporary chemical engineering industry.
iii. To equip the student with social science and management skills to enable him/her function in today's multi-faceted society.
iv. To understand and maintain professional ethics and the need to safeguard the public, environment and natural resources of this country.

3.5.4 Career Prospects

Chemical engineering technologists are professionals who work in various industries involved in the conversion of one chemical form to the other. In these various industries, the chemical engineering technologist does the work of constructing, operating and maintaining the plants (hardware/equipment) and processes (techniques/methodologies) that convert one chemical form to another that is of more utility to humanity or that is less harmful to the environment.

Some of the specific industries in Kenya where chemical engineering technologist serve include: petrochemicals and care products manufacturing. Internationally, they serve an even wider role and can be found working in industries as diverse as semi-conductor manufacturing, environmental technology and biotechnology.

3.5.5 Entry Requirements

The basic admission requirement shall be at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade of C+ in each of the cluster subjects of the KCSE examinations:

(i) Mathematics
(ii) Physics
(iii) Chemistry
(iv) Biology/any Group III/ IV/ V.

3.6 BACHELOR OF TECHNOLOGY IN CHEMICAL ENGINEERING TECHNOLOGY

3.6.1 Introduction

Chemical engineering exists for the purpose of improving the quality of life of humanity by providing solutions and improvements to the myriad of human challenges while taking into consideration social, economic and environmental concerns. The objective of this curriculum is to provide training for technologists in the area of chemical engineering technology. The engineering technologist is normally a professional with the practical skills to maintain equipment, systems and processes and to be a 'hands-on' leader in the production and development of such equipment, systems and processes. In these tasks, the technologist works very closely with the engineer and technician and acts as a link between the two. The programme is also designed to allow diploma graduates to continue their training onwards to degree level.

3.6.2 Rationale

The citizen of any modern society is dependent on products of the chemical processing industry. These products include household chemicals (e.g. toiletries, detergents, paints and margarine), agrochemicals (e.g. fertilizer and pesticides), pharmaceuticals (e.g. aspirin and antibiotics) and industrial chemicals (e.g. sulphuric acid, ammonia and petrol fuels) amongst many others. For the Kenyan case, some of these products are already manufactured locally while others are imported. There is therefore a need to develop the manpower necessary to participate in the design, development and operation of the chemical processing plants that produce the above mentioned products. This curriculum is therefore designed to produce the chemical engineering technologists necessary to fit into those roles.

3.6.3 Objectives

v. To offer education and training in chemical engineering technology and to equip the student with the knowledge and skills that will allow for eventual practice as a technologist.

vi. To provide the student with knowledge and skills as applied in contemporary chemical engineering industry.

vii. To equip the student with social science and management skills to enable him/her function in today's multi-faceted society.

viii. To understand and maintain professional ethics and the need to safeguard the public, environment and natural resources of this country.

3.6.4 Career Prospects

Chemical engineering technologists are professionals who work in various industries involved in the conversion of one chemical form to the other. In these various industries, the chemical engineering technologist does the work of constructing, operating and maintaining the plants (hardware/equipment) and processes (techniques/methodologies) that convert one chemical form to another that is of more utility to humanity or that is less harmful to the environment.

Some of the specific industries in Kenya where chemical engineering technologist serve include: petrochemicals and care products manufacturing. Internationally, they serve an even wider role and can be found working in industries as diverse as semi-conductor manufacturing, environmental technology and biotechnology.

3.6.5 Entry Requirements

The basic admission requirement shall be at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade of C+ in each of the cluster subjects of the KCSE examinations:

(i) Mathematics
(ii) Physics
(iii) Chemistry
(iv) Biology/any Group III/ IV/ V.

3.7 BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING TECHNOLOGY

3.7.1 Introduction

The modern mechanical engineering technologist is expected to be skilled in communication, production, and have good understanding of the social environment. The mechanical engineering technologists use the arts of designing, drawing, developing, operating, maintaining and modifying various types of products, machines, mechanical systems and manufacturing processes to avail and sustain solutions that are based on defined and applied engineering procedures, processes, systems or methodologies. This cadre of engineering personnel is very critical to the establishment and operation of industry, as they are the ones directly responsible for production. Training of mechanical engineering technologists must therefore focus on the development of strong analytical capabilities and hands on proficiency. The mechanical engineering technologist student is expected to acquire industry relevant skills to produce components and to install, operate, and analyse the performance of machinery and plants. They are also expected to acquire knowledge to enable them understand and undertake the design of basic mechanical systems. Theoretical and hands-on practical training is therefore given to mechanical engineering technologist in order to grow in them, knowledge in product

and machine development, operation and maintenance. Mechanical engineering technologists are expected to work independently or with mechanical engineers in designing, drawing, developing and modifying various types of product, machines, mechanical systems and manufacturing systems. This curriculum is designed to prepare mechanical engineering technologist students for productive careers in industry, government, education, private consultancy and postgraduate studies. It contains electives that provide opportunity for each student to acquire a good understanding of specific areas of interest that may lead to diverse careers. The program incorporates some social science and management units to make it more wholesome.

3.7.2 Rationale

As society continues to grow, its needs continue to change, and with this, emerging concerns on conservation and a reduction of pollution. This raises demand for products with ever changing specifications, through processes that are energy efficient and clean. The existence of practical hands-on personnel with the capacity to produce, operate and maintain machinery and plants capable of supplying such products is therefore critical; a need that is best met through the training of competent mechanical engineering technologists.

3.7.3 Objectives

The program is aimed at imparting competencies (skills, knowledge and attitude) that:

i. Produce mechanical engineering technologists skilled in the art of production, operation and maintenance of plants and mechanical systems.

ii. Are sought in industry in areas of new technology and/or product development.

iii. Augment the knowledge of holders of Diplomas in Mechanical Engineering by imparting more training in mathematics, basic and engineering sciences, for use in developing solutions to engineering problems.

iv. Enhance understanding and accurate interpretation of engineering designs.

v. Build life-long learning habits, a good command of advanced technology, and basic research abilities.

vi. Support entry of graduates into exciting careers that entail solving a wide range of technical problems in diverse industrial settings.

vii. Promote sustenance of professional ethics and safeguard the public, environmental and natural resources.

3.7.4 Career Prospects

The graduates from this programme can expect to find employment in the engineering industry, manufacturing industry and in business in general. Considering that Kenya's vision 2030 is basically anchored on the country's industrialisation, mechanical engineering technologists will definitely be in high demand in order to help realise the Vision.

3.7.5 Entry Requirements

The basic admission requirement shall at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade of C+ in each of the cluster subjects of the KCSE examinations:

(i) Mathematics
(ii) Physics
(iii) Chemistry
(iv) Biology/any Group III/IV/V.

3.8 BACHELOR OF TECHNOLOGY IN GEOINFORMATION TECHNOLOGY

3.8.1 Introduction

The programme is designed for trainees at technological level in geo-information production organisations whose prime concern is to executive daily operational tasks, including acquisition, analysis, processing and dissemination of geographical data. These technologists coordinate digital production process, implement work procedures, and supervise groups of operators.

3.8.2 Rationale

The course provides an avenue for up-grading diploma students. Owing to the rapid changes and development in geo-information acquisition, analysis and dissemination, organisations require staff that can keep pace with and validate the relevance of such development, design new systems and infrastructure, and explore new-edge technology for efficient and effective implementation of projects.

3.8.3 Objectives

The objectives of this programme are to:

- Impart modern knowledge and skills in the art, science and technology of production of maps
- Equip students with knowledge and skills to understand and accurately interpret geospatial engineering designs.

3.8.4 Career Prospects

The graduates in geoinformation technology are engaged in acquisition, analysis, processing and dissemination of geographical data. These professionals will primarily be engaged in the manipulation and production of maps. Some of the specific sectors in Kenya where geoinformation technologist serve include: land surveying, urban planning, and all areas of infrastructural development.

3.8.5 Entry Requirements

The basic admission requirement shall be the minimum entry requirements set for entry into the public universities, which is at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, applicants are expected to have obtained at least a grade C+ in each of the cluster subjects in the following cluster of subjects in KCSE examinations:

(i) Mathematics A
(ii) Physics
(iii) Geography
(iv) 2nd Group II / 2nd Group III / any Group IV /V.

3.9 BACHELOR OF TECHNOLOGY IN SURVEYING TECHNOLOGY

3.9.1 Introduction

The programme is designed for trainees at technological level in geospatial production organisations whose prime concern is to executive daily operational tasks, including acquisition, analysis, processing and dissemination of geospatial data. These technologists coordinate digital production process, implement work procedures, and supervise groups of operators.

3.9.2 Rationale

The course provides an avenue for up-grading diploma students. Owing to the rapid changes and development in geospatial data acquisition, analysis and dissemination, organisations require staff that can keep pace with and validate the relevance of such development, design new systems and infrastructure, and explore new-edge technology for efficient and effective implementation of geospatial projects.

3.9.3 Objectives

The objectives of this programme are to:

i. Impart modern knowledge and skills in the art, science and technology of production of geospatial data
ii. Equip students with knowledge and skills to understand and accurately interpret and implement geospatial engineering designs

3.9.4 Career Prospects

The surveying graduates are engaged in professions dealing with measurement technologies principally for the production of maps or setting out of any system. They also can be engaged in surveying technology with specializations in engineering surveying, topographic surveying, hydrographic surveying, and cadastral surveying.

3.9.5 Entry Requirements

The basic admission requirement shall be at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, applicants are expected to have obtained at least a grade C+ in each of the cluster subjects in following cluster of subjects in KCSE examinations:

(i) Mathematics A
(ii) Physics
(iii) Geography
(iv) 2nd Group II / 2nd Group III /IV /V.

3.10 BACHELOR OF TECHNOLOGY IN ELECTRICAL AND ELECTRONIC ENGINEERING TECHNOLOGY

3.10.1 Introduction

The objective of this programme is to offer education and training in electrical and electronic engineering technology. The programme prepares the candidates to function as engineering technologists. The engineering technologist is normally skilled in the art of production of artefacts, structures, and systems on the basis of designs prepared by the engineer. The graduates of this programme shall thus in the first instance be equipped with the skills to understand and accurately interpret engineering designs. Because the special strength of the graduate from this programme is to be a 'hands-on' person, considerable emphasis is placed on giving the candidate considerable practical knowledge in engineering technology. Besides, considerable time that has been allocated to laboratory work, the candidate also takes 36 weeks of practical attachment, of which 24 are taken on campus while 12 are taken in industry. In total 66.2% of the contact time is dedicated to practical work leaving 33.8% for theoretical study.

The programme is covered in 4,488 hours and 80 course units. Considering then that a nominal hour for a practical semester is counted as only half a contact hour, the total contact hours on the programme comes to 3, 840 of which 1, 268 are dedicated to lectures while 2, 572 shall be taken up by practical and tutorial work. Thus on the programme, 33.0% of the contact time shall be allocated to lectures while 67.0% shall be taken up by practical and tutorial work.

The units of study in the first, second, and third years of study are all compulsory while in the fourth year of study, a student takes ten compulsory units with six electives. The electives are grouped into four subject areas, namely, power systems engineering, telecommunication systems engineering, instrumentation and control engineering, and computer systems engineering. Each of these subject areas has six electives, with three electives to be taken in the second semester while the other three are to be taken in the third semester. A student is required to select a particular subject area of specialisation and then take all the respective electives within the cluster.

In addition, the student is required to cover two non-credit units on 'Health and Emerging Diseases' and 'Drug and Substance Abuse' each of which is to be covered in 24 hours. These non-credit courses shall have to be taken and passed in Part I of the course of study. The two courses shall be assessed on the basis of 'pass' and 'fail' and a student shall not be allowed to proceed to the second part of the course without having obtained a 'pass' in each of the courses. The marks obtained in each of the courses shall however not be used in determining the final grade of the student in any of the examinations.

3.10.2 Rationale

Technological changes, rapid development, and sustained population growth have been a catalyst to the fast expansion and improvement of electrical and electronics engineering products and services worldwide. This course is designed to be a route for KSECE holders and upgrading Diploma graduates who wish to acquire university degree qualifications in the field of electrical and electronics engineering. This is in response to the demands of qualified electrical and electronics engineering technologists for the industry, and would provide the much needed trained technical staff with skills and competency to cope with and handle the challenges and tasks posed by the new emerging trends and technologies in the electrical and electronics engineering industry.

3.10.3 Objectives

i. To offer education and training to technologists in electrical and electronics engineering
ii. To prepare the candidates to function as engineering technologists.
iii. To produce a technologist skilled in the art of production of products, and systems on the basis of designs.
iv. To equip the graduates with the skills to understand and accurately interpret both scientific and engineering design.
v. To provide the much needed Technologists in the electrical and electronics Engineering Industry who will work alongside electrical and electronics Engineers to implement and monitor electrical and electronics engineering works.

3.10.4 Career Prospects

The graduates from this programme can expect to find employment in the engineering industry, informatics industry and in business in general. Considering that Kenya's vision 2030 is basically anchored on the country's industrialisation, electrical engineering technologists will definitely be in high demand in order to help realise the Vision.

3.10.5 Entry Requirements

The basic admission requirement shall at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade C+ in each of the cluster subjects in following cluster of subjects in KCSE examinations:

(i) Mathematics
(ii) Physics
(iii) Chemistry
(iv) Biology/any Group III/IV/ V.

4. FACULTY OF SOCIAL SCIENCES AND TECHNOLOGY

4.1 SCHOOLS

4.2 BACHELOR OF TECHNOLOGY IN OFFICE ADMINISTRATIONAND TECHNOLOGY

4.2.1 Introduction

The Bachelor of Technology in Office Administration and technology degree programme prepares the student for a career in Office Administration in both the public and private sectors of the economy. The programme is designed to produce graduates with the appropriate skills to become efficient and effective office administrators.

The programme is covered in 3648 hours and 67 units of study. Taking into Consideration the fact that two hours of practical attachment are counted as one hour, the total contact hours in the course come to 3216 hours. In this, theory sessions constitute 1388 hours while practical sessions account for 1828 hours, which translates to 43.2% and 56.8% of the programme respectively.

4.2.2 Rationale

The modern office requires professionals with skills to conceptualize solutions to office administration problems and with ability to critically evaluate office issues from academic and practical perspectives. The programme is designed to provide the student with office management and information and communication technology skills. These skills enhance self-confidence and enable them function effectively and efficiently in today's dynamic office.

4.2.3 Objectives

i. To develop self-confident professionals with skills to conceptualize solutions to office and business s solutions.

ii. To produce professional office managers with up-to-date knowledge and skills in the area of office a administration.

iii. To produce professionals who are creative, innovative and able to communicate effectively and to adapt to the dynamic business environment.

iv. To instill problem-solving attitudes, business ethics

4.2.4 Career Prospects

Our graduates have a wide range of opportunities to become business managers in various sectors of economies including, government ministries and departments, NGOs in community development projects as project managers or directors, management consultants, mentors, business service providers, investment consultants, business and management trainees.

4.2.5 Entry Requirements

The basic admissions requirement shall be at least a mean grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have performed well in the following cluster subjects in KCSE examinations, but at any rate shall have obtained at least a grade C plain in each of the cluster subjects:

(i) English/Kiswahili
(ii) Mathematics A /B /Any Group II
(iii) Any group III
(iv) Group II / 2nd Group III / Any Group IV /V

4.3 BACHELOR OF TECHNOLOGY IN BUSINESS INFORMATION TECHNOLOGY (B.TECH. (BIT))

4.3.1 Introduction

The Bachelor of Technology in Business Information Technology degree prepares candidates to meet the increasing demand for IT professionals in the modern business environment with a wide knowledge of business management, technical skills and the capacity to harness and implement IT strategies, taking advantage of emerging technologies. The program prepares students for the job market through thorough knowledge of Information Technology with an understanding and appreciation of how business is organized and managed.

4.3.2 Rationale

The Bachelor of Technology (Business Information Technology) programme shall provide an interdisciplinary approach for training business information technology professionals who need working competency in all sectors of the economy. The programme will therefore provide business information graduates with a real world technological experience that will prepare them into the fields of business and information technology for the economic growth and prosperity of Kenya, thereby facilitating the realization of Vision 2030. This is also in line with Nairobi Technical University motto and mandate, 'Education and training for the real world', and 'To train high and middle level personnel for both public and private sectors' respectively.

4.3.3 Objectives

The Bachelor of Business Information Technology degree programme aims to:

i. Develop a coherent and broad-based coverage of business information systems and the underlying technology to implement these systems.

ii. Enhance confidence and the ability to critically evaluate business information requirements and develop solutions from both moral, professional and academic perspectives.

iii. Prepare the candidates to apply the principles learnt in the performance of their duties.

iv. Prepare the candidates for progression to higher levels of study in their fields of specialization.

4.3.4 Career Prospects

The graduates have opportunities to become ICT business managers in various sectors of economies including: banking, microfinance, marketing, government ministries and departments, NGOs in community development projects as project managers or directors, ICT business management consultants, entrepreneurs, mentors, business service providers, investment consultants, business and management trainees.

4.3.5 Entry Requirements

The basic admission requirement shall be at least a mean grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, applicants are expected to have obtained at least a grade C in each of the cluster subjects in the following cluster of subjects in KCSE examinations:

(i) Mathematics A
(ii) Physics
(iii) 2nd Group II / Any Group III
(iv) Any Group II /III /IV /V

4.4 BACHELOR OF TECHNOLOGY IN DESIGN

4.4.1 Introduction

Manufacturers of products and providers of services, both private and public, are increasingly recognising design as an integral part of their offering and a means of differentiation. More than ever before, designed products and services are shaping a worldwide material and non-material culture and influencing the quality of our lives and environments. This is because design has come to encompass an extraordinary range of artefacts, applications, techniques, philosophies and values all of which influence our experience and perception of the world around us. Hence, the choices we make today in design education and practice will have a significant and enduring effect on the quality of our future lives and environments.

4.4.2 Rationale

The design of this curriculum has been informed by the imperative that the knowledge and skills which Kenya's creative industries require most are those which meet global demand for creative products and services on the one hand and are relevant and applicable to the priority areas identified in Kenya's long-term development plans on the other; the content also takes into account the diversity of creative possibilities – from cultural to demand-driven service-oriented contexts and aesthetic to functional applications, This Bachelor of Technology in Design programme addresses these needs with regard to products and environments.

4.4.3 Objectives

i. To engender agility and adaptability among students so that they can respond creatively, intellectually and practically to a broad range of design needs
ii. To stimulate inquisitiveness by encouraging the use of enquiry and a social consciousness to gain insight into individual, community and business needs
iii. To respond to the design needs of people living in developmental and economic peripheries
iv. To prepare learners for more advanced studies in the discipline

4.4.4 Career Prospects

Those who have studied and graduated in Design and Creative Media at TU-K, will find exciting opportunities in publishing houses, advertising agencies, public relations companies, broadcasting houses and multi-media production agencies. Further, with the growing business opportunities, in manufacturing, education, healthcare and agricultural sectors, there has been dire need for creative services in advertising, publishing, packaging, and broadcasting. This has in turn driven organizations to recruit creative designers to their workforce. Rather than rely exclusively on consultants.

4.4.5 Entry Requirements

The basic admission requirement shall be at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade C+ in each of the cluster subjects in the following cluster of subjects in KCSE examinations:

(i) Mathematics A
(ii) Any Group II
(iii) Any Group III
(iv) 2nd Group II /III / any Group IV /V.

4.5 BACHELOR OF TECHNOLOGY IN JOURNALISM AND MASS COMMUNICATION

4.5.1 Introduction

The information age has opened awareness for creating and accessing information. News is no longer confined to our living rooms but it can be read anywhere and at any time. In this, media houses and corporations seek for personnel who can articulate news and general information in a creative and coherent manner for quickly consumed by a niche audience as opposed to the diminishing mass audience.

The Bachelor of Journalism and Mass Communication curriculum has been developed to provide personnel equipped with knowledge, and technological capacity. It is not just news but the angle, style and creativity that make the difference.

4.5.2 Rationale

The programme comes at a time when the media industry requires personnel who are well endowed with practical skills through knowledge of the use of tools and equipment. This programme will provide the necessary skills to learners in response to media industry needs.

4.5.3 Objectives

The Bachelor of Technology in Journalism and Mass communication will:

i. Equip learners with a firm theoretical knowledge and practical skills in journalism and mass communication.
ii. Provide learners with knowledge, skills and attitude for communication, management, media technology and production.
iii. Expose learners to political, economic, historical and cultural factors that shape the nature and content of mass media messages.
iv. Empower learners with practical working skills in journalism and mass communication.
v. Prepare learners to undertake basic research in the field of journalism.

4.5.4 Career Prospects

Our graduates work as writers, reporters or editors in newsrooms – print or electronic – and owing to practical skills required, they will be able to handle journalistic

equipment and processes with a lot of aptitude. They also have the choice to work as communications and public relations experts, and will work as the link between the organization they work for and other stakeholders.

4.5.5 Entry Requirements

The basic requirement for the KCSE Candidates shall be at least an average grade of C+ (plus) in the Kenya Certificate of Secondary Education (KCSE). In addition candidates are expected to have obtained at least grade C+ (minus) in each of the following cluster subjects in KCSE examinations.

(i) English /Kiswahili
(ii) Mathematics A/ Mathematics B
(iii) Any Group II
(iv) A Group II/III / IV/ V

4.6 BACHELOR OF TECHNOLOGY IN INFORMATION STUDIES

4.6.1 Introduction

The Bachelor of Technology in Information Studies degree programme is designed to produce competent and intelligent information professionals with necessary skills, expertise and knowledge to work and manage any of the areas of information studies. The objective of this programme is to offer education and training in Information Sciences. The programme prepares the candidates who can provide information and knowledge services in an information technology intensive environment. The information technologist is normally skilled in the art of information collection, analysing, processing, storage, retrieval and dissemination.

The curriculum addresses the requirement of the Kenyan Vision 2030. It also addresses job and industrial needs and the vision and mission of Nairobi Technical University and TVET programme. The graduates of this programme shall thus in the first instance be equipped with the skills to understand and accurately interpret information systems and services. Because the special strength of the graduate from this programme is to be a 'hands-on' person, considerable emphasis is placed on giving the candidate practical knowledge in information studies. Besides, considerable time that has been allocated to practical work, the candidate also takes 24 weeks of practical attachment, of which 12 are taken on campus while 12 are taken in industry. In total 66.2% of the contact time is dedicated to practical work leaving 33.8% for theoretical study.

The programme is covered in 3792 hours and 71 course units. Considering then that a nominal hour for a practical semester is counted as only half a contact hour, the total contact hours on the programme comes to 3384of which 1640 are dedicated to lectures while 2152 shall be taken up by practical and tutorial work. Thus

on the programme, 40% of the contact time shall be allocated to lectures while 60% shall be taken up by practical and tutorial work.

The units of study in the first, second, and third years of study are all compulsory while in the fourth year of study, a student takes ten compulsory units with six electives. The electives are grouped into (4) four subject areas, namely, Library and information studies, Records Management, Publishing and Book Trade and Knowledge Management. Each of these subject areas have six electives, with three electives to be taken in the second semester while the other three are to be taken in the third semester. A student is required to select a particular subject area of specialization and then take all the respective electives within the cluster.

In addition, the student is required to cover common non-credit units on 'Health Education' and 'Critical and Creative thinking and Communication studies', society and culture each of which is to be covered in 36 hours. These non-credit courses shall have to be taken and passed in Part I of the course of study. The two courses shall be assessed on the basis of 'pass' and 'fail' and a student shall not be allowed to proceed to the second part of the course without having obtained a 'pass' in each of the courses. The marks obtained in each of the courses shall however not be used in determining the final grade of the student in any of the examinations.

The various courses of study on the programme shall be assessed on the basis of coursework and written examination. For the entire programme coursework shall account for 54.5% while written examinations shall be responsible for 45.5% of the total marks a student may earn.

4.6.2 Rationale

There exist various types of information centres. These information centre's have come about as a result of the crucial role played by information as a resource in the success of any field of human endeavour, Indeed the information is a national resource upon which all aspects of development are hinged. Effective organization of this national resource requires high level human resources with the requisite academic and professional skills. The Library and information Studies Department in this university mandate is to develop and implements the necessary high level programmes to cater for the production of such manpower. There is a large pool of professionals and Para- professionals who are in dire need of upgrading themselves by acquiring the necessary skills through appropriate programmes such as the one proposed here. Many institutions in this country, including universities, polytechnics, technical institutes, and professional schools, continue to produce diploma and certificate holders without any provision for their professional upward training. This programme proposed here is designed to meet such a need.

4.6.3 Objectives

To build human resource capacity in information studies discipline in both the public and private sectors, especially in universities to:

i. Generate a pool of highly qualified candidates for post graduate Degree Programme;
ii. Develop professionals with theoretical and practical skills in the Information sector;

iii. Have acquired the necessary knowledge, attitudes, and skills, to work in the Information environment; and
iv. Develop necessary skills and exposure to enable grandaunts create self- employment in the information field.

4.6.4 Career Prospects

Graduates have opportunities to work as information officers, knowledge managers, librarians, documentalists, archivists, information systems analysts, webmasters, information systems managers, information consultants, information project managers, information researchers, and ICT programme managers.

4.6.5 Entry Requirements

The basic admission requirement shall be at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade C+ in each of the cluster subjects in following cluster of subjects in KCSE examinations:

(i) English and Kiswahili
(ii) Mathematics A/B
(iii) Any group II and III
(iv) Any 2nd Group II/III/ Any Group IV/V.

4.7 BACHELOR OF TECHNOLOGY IN INFORMATION STUDIES

4.7.1 Introduction

The Bachelor of Technology in Information Studies degree programme is designed to produce competent and intelligent information professionals with necessary skills, expertise and knowledge to work and manage any of the areas of information studies. The objective of this programme is to offer education and training in Information Sciences. The programme prepares the candidates who can provide information and knowledge services in an information technology intensive environment. The information technologist is normally skilled in the art of information collection, analysing, processing, storage, retrieval and dissemination.

The curriculum addresses the requirement of the Kenyan Vision 2030.It also addresses job and industrial needs and the vision and mission of Nairobi Technical University and TVET programme. The graduates of this programme shall thus in the first instance be equipped with the skills to understand and accurately interpret information systems and services. Because the special strength of the graduate from this programme is to be a 'hands-on' person, considerable emphasis is placed on giving the candidate practical knowledge in information studies. Besides, considerable time that has been allocated to practical work, the candidate also takes 24

weeks of practical attachment, of which 12 are taken on campus while 12 are taken in industry. In total 66.2% of the contact time is dedicated to practical work leaving 33.8% for theoretical study.

The programme is covered in 3792 hours and 71 course units. Considering then that a nominal hour for a practical semester is counted as only half a contact hour, the total contact hours on the programme comes to 3384of which 1640 are dedicated to lectures while 2152 shall be taken up by practical and tutorial work. Thus on the programme, 40% of the contact time shall be allocated to lectures while 60% shall be taken up by practical and tutorial work.

The units of study in the first, second, and third years of study are all compulsory while in the fourth year of study, a student takes ten compulsory units with six electives. The electives are grouped into (4) four subject areas, namely, Library and information studies, Records Management, Publishing and Book Trade and Knowledge Management. Each of these subject areas have six electives, with three electives to be taken in the second semester while the other three are to be taken in the third semester. A student is required to select a particular subject area of specialization and then take all the respective electives within the cluster.

In addition, the student is required to cover common non-credit units on 'Health Education' and 'Critical and Creative thinking and Communication studies', society and culture each of which is to be covered in 36 hours. These non-credit courses shall have to be taken and passed in Part I of the course of study. The two courses shall be assessed on the basis of 'pass' and 'fail' and a student shall not be allowed to proceed to the second part of the course without having obtained a 'pass' in each of the courses. The marks obtained in each of the courses shall however not be used in determining the final grade of the student in any of the examinations.

The various courses of study on the programme shall be assessed on the basis of coursework and written examination. For the entire programme coursework shall account for 54.5% while written examinations shall be responsible for 45.5% of the total marks a student may earn.

4.7.2 Rationale

There exist various types of information centres. These information centre's have come about as a result of the crucial role played by information as a resource in the success of any field of human endeavour, Indeed the information is a national resource upon which all aspects of development are hinged. Effective organization of this national resource requires high level human resources with the requisite academic and professional skills. The Library and information Studies Department in this university mandate is to develop and implements the necessary high level programmes to cater for the production of such manpower. There is a large pool of professionals and Para- professionals who are in dire need of upgrading themselves by acquiring the necessary skills through appropriate programmes such as the one proposed here. Many institutions in this country, including universities, polytechnics, technical institutes, and professional schools, continue to produce diploma and certificate holders without any provision for their professional upward training. This programme proposed here is designed to meet such a need.

4.7.3 Objectives

To build human resource capacity in information studies discipline in both the public and private sectors, especially in universities to:

i. Generate a pool of highly qualified candidates for post graduate Degree Programme;
ii. Develop professionals with theoretical and practical skills in the Information sector;
iii. Have acquired the necessary knowledge, attitudes, and skills, to work in the Information environment; and
iv. Develop necessary skills and exposure to enable grandaunts create self- employment in the information field.

4.7.4 Career Prospects

Graduates have opportunities to work as information officers, knowledge managers, librarians, documentalists, archivists, information systems analysts, webmasters, information systems managers, information consultants, information project managers, information researchers, and ICT programme managers.

4.7.5 Entry Requirements

The basic admission requirement shall be at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade C+ in each of the cluster subjects in following cluster of subjects in KCSE examinations:

(i) English and Kiswahili
(ii) Mathematics A/B
(iii) Any group II and III
(iv) Any 2nd Group II/III/ Any Group IV/V.

4.8 BACHELOR OF TECHNOLOGY IN INSTITUTIONAL CATERING AND ACCOMMODATION MANAGEMENT

4.8.1 Introduction

The Bachelor of Technology in Institutional Catering and Management prepares students to assume a managerial role and provide leadership skills in settings such as hotels, the food and beverage industry, travel and tourism, entertainment and sport venues, resort and spa services, and casinos to name just a few. With the growing business travel, improved domestic and foreign tourism, the need for qualified individuals trained in Hospitality Management are in high demand. With the

degree programme, students will obtain the skills required to over-'see the everyday operations of any type of full- service in Hotels and Restaurants Outlets. It is strongly grounded in the study of principles and research which are then applied to influence the wider environment affecting Hospitality Industry. The programme gives graduates an understanding of the accommodation industry, food and beverage management in all hospitality outlets, marketing, strategic management, customer relationship management as well as develops their creative and entrepreneurial skills.

The modern hospitality manager and professional is expected to be skilled in communication skills as well as greater understanding of the social, political and economic environment that affect the industry locally and globally. They are also expected to provide the leadership necessary to deliver quality products, services as well as memorable experiences to visitors.

To this extent, the programme is designed to provide the candidate with social science and management skills to enable them function in today's multifaceted world. The programme equips the students with knowledge and skills that will normally allow for eventual as Managers in the Hospitality Industry.

4.8.2 Rationale

The aim of this programme is to offer education and training in catering and institutional management and to equip the candidates with the skills and knowledge that will allow for eventual practice as a Manager in the welfare type of catering Industry. In the recent years, this sector has been revitalised by the building of brand new universities and polytechnics with modern purpose- built catering and accommodation facilities. Development in hospital service and the development of large comprehensive schools have also led to development and innovation in the provision of school meals and accommodation. With the degree programme, students will obtain the skills that are required to oversee the everyday operations and management of these types of establishments.

4.8.3 Objectives

The programme aims to:

i. Provide learners with requisite knowledge skills, tools and technologies to operate effectively in the hospitality and related industries.
ii. Equip learners with operational skills knowledge and tools necessary to be successful middle and senior managers and leaders in the hospitality sector and society.
iii. Enhance awareness and commitment by learners to the principles of environmental conservation resource stewardship and code of ethics.
iv. Prepare learners for more advanced studies and careers

4.8.4 Career Prospects

Because of their practical, hands-on, and application training, graduates find ready employment in management of hotels, hospitals, hostels, uniformed service mess, residential institutions, cleaning companies, laundry and dry cleaning firms; management of: resorts, lodges, entertainment clubs, county clubs, cruise ships, airline services, education and research institutions.

4.8.5 Entry Requirements

The basic admission requirement shall be at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, candidates are expected to have obtained at least a grade C+ in each of the cluster subjects in following cluster of subjects in KCSE examinations:

(i) English/ Kiswahili
(ii) Mathematics A/B
(iii) Any group II or any group III
(iv) Any group II /III/IV /V

4.9 BACHELOR OF TECHNOLOGY IN TOURISM AND TRAVEL MANAGEMENT

4.9.1 Introduction

The Bachelor of Technology degree in Tourism and Travel Management prepares the students to function as Tourism and Travel Managers with emphasis placed on giving the students considerable practical knowledge and skills in tourism products planning, tour and travel operations, as well as destination management and marketing. This programme involves the promotion of tourism as well as mitigation of unintended adverse outcomes including negative social, cultural, and economic impacts as well as environmental degradation. It is strongly grounded in the study of principles and research which are then applied to influence the wider environment affecting tourism and travel. The programme gives graduates an understanding of the tourism and hospitality industry, travel and tours management, world geography, history and heritage, flora and fauna, survival techniques, marketing, strategic management, airfares and ticketing as well as develop their creative and entrepreneurial skills. The modern tourism manager is expected to be skilled in communication skills and should have an acute understanding of the social, political and economic environment in which they operate. Moreover, a manager is always expected to take into consideration the economic factors that affect the projects they work on as well manage such projects with utmost professionalism. To this extent, the programme is designed to provide the candidate with social science and management skills to enable them function in today's multifaceted world. The programme equips the students with skills that will normally allow for eventual practice as tourism business owners, tour operators, travel agents, tourism marketing managers and planners, tourism product developers among others.

4.9.2 Rationale

According to the authoritative World Tourism and Travel Council (WTTC, 2012), Travel & Tourism comprise one of the world's largest industries, or economic sectors, contributing trillions of dollars annually to the global economy, creating jobs and wealth, generating exports, boosting taxes and stimulating capital investment. Because of its great potential for socioeconomic and other benefits, advocates of tourism development frequently pay little attention to its potentially adverse negative consequences to local communities. Tourism is one of the six priority sectors in the economic pillar of Kenya's vision 2030. Kenya aims to be among the top ten long-haul tourist destinations globally. To be ranked among the top ten, Kenya must expand her global and African market share by offering new products, expanding tourist expenditure per capita and by improving her international marketing strategies as well as mitigate unintended adverse outcomes such as child prostitution, drug abuse and environmental degradation. Unfortunately, because there is great demand for skilled employees, many institutions of higher education tend to over-emphasize the need to equip graduates with operational skills while downplaying critical knowledge and skills required to successfully plan, develop and market sustainable tourism products and destinations. The Bachelor of Technology degree in Tourism and Travel Management is intended to develop high quality, technological, innovative, and application oriented graduates with the operational as well as critical skills and knowledge required to be effective professionals and managers in the dynamic local and global tourism and travel industries. .

4.9.3 Objectives

The programme aims to:

i. Impart adequate academic skills required by the graduate to have competitive advantage over their peers.
ii. Equip the graduate with the technological skills and knowledge required to take on a position of responsibility in the tourism and travel sector as an entrepreneur or in salaried employment.
iii. Develop skills which will be responsive and relevant to the country's human resource required at the functional and strategic levels.
iv. Equip the graduate with both critical and analytical skills as well as the tools required to conceptualise solutions to tourism problems at their level of responsibility.

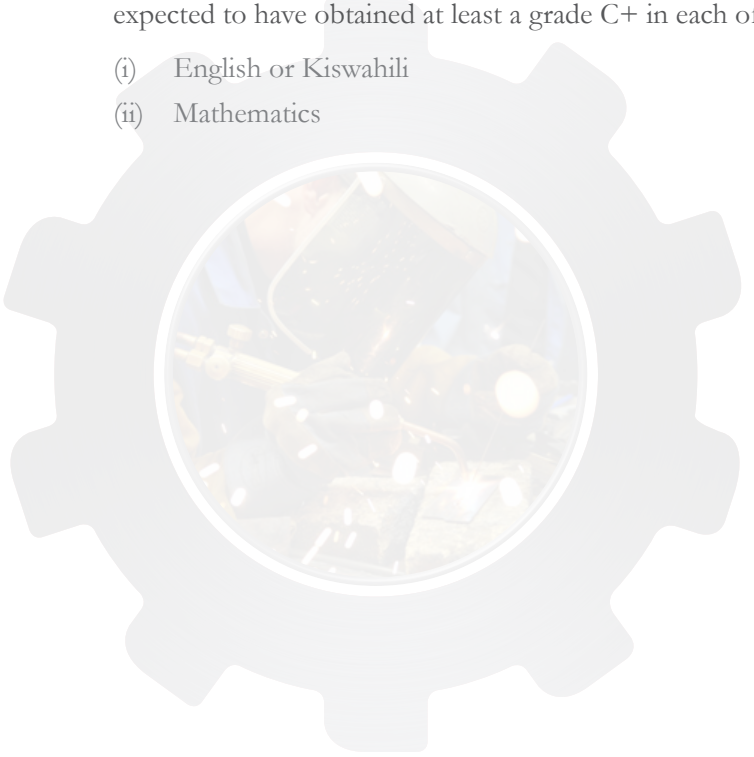
4.9.4 Career Prospects

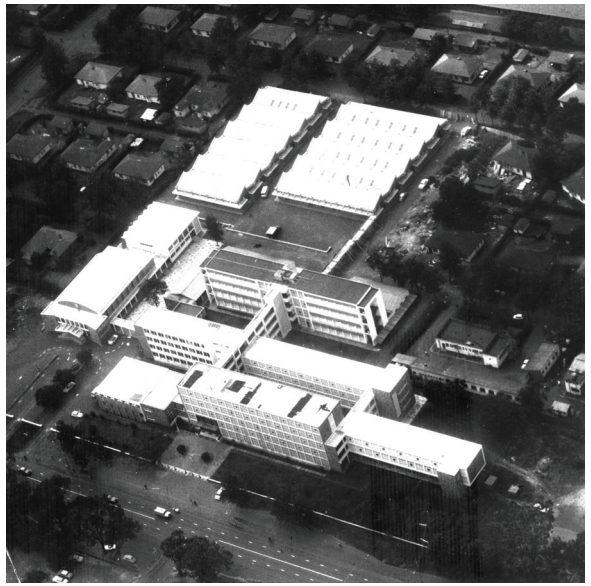
Our graduates work in the area of: management level in tourism industry, tour companies, air, sea, destination marketing organizations, tour Offices, rail and road travel sectors.

4.9.5 Entry Requirements

The basic requirements for admission shall be at least an average grade of C+ in the Kenya Certificate of Secondary Education (KCSE). In addition, applicants are expected to have obtained at least a grade C+ in each of the cluster subjects in following cluster of subjects in KCSE examinations:

(i) English or Kiswahili
(ii) Mathematics
(iii) Any group II or any group III
(iv) A group II/III/IV/ V





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