COURSES OFFERED UNDER COLLEGE OF PURE & APPLIED SCIENCES

.

SCHOOL OF MATHEMATICS AND PHYSICAL SCIENCES

B.SC. IN ANALYTICAL CHEMISTRY

The programme is geared at producing analytical chemists for the industries, state co-operations, research institutes, university sector and other organizations. The study will include practical and applied chemistry that will prepare students adequately for the challenges of the new technological era.

Requirements: Mean grade C+, Chemistry C+, Physics C+ and Mathematics C+

B.SC. IN INDUSTRIAL CHEMISTRY

The programme is geared at producing industrial chemists for the industries, state co-operations, research institutes, university sector and other organizations. The study will include practical and applied chemistry that will prepare students adequately for the challenges of the new technological era.

Requirements: Mean grade C+, Chemistry C+, pass in any two of the following; Biology/Physics/Mathematics C+

B.SC. IN CONTROL AND INSTRUMENTATION

The programme will produce graduates with skills required in electronics, energy, environmental and information technology. This programme is designed to meet the national needs for technical and trained manpower that can work in research laboratories, hospitals and industry where instrumentation is inevitable. The programme is an intensive study that prepares students to have necessary skills to operate and maintain modern equipment.

Requirements: Mean grade C+, Physics C+, pass in any two of the following Mathematics/Chemistry/Biology C+

B.SC IN GEOPHYSICS

The program seeks to produce graduates in the field of applied geophysics who will work in oil industry, mineral exploration and in geo research institutes the students will acquire analytical and field experience in the discipline required in coming up with geo solutions.

Requirements: KCSE mean grade C+, Physics C+, Chemistry/Biology/geography C+, English/Kiswahili C+.

B.SC IN RENEWABLE ENERGY & ENVIRONMENTAL PHYSICS

The programme prepares graduates and equips them with knowledge, technological skills and values in the field of renewable energy and environmental physics. Graduates will make a solid contribution not only to solving global environmental and energy challenges but also in the wider field of science and technology.

Requirements: KCSE mean grade C+, Physics C+, Mathematics C+, English/Kiswahili Chemistry/Biology /Geography C+.

B.SC. IN ACTUARIAL SCIENCE

Actuarial Science is a branch of Science that uses Mathematics, Statistics, Economics, and Financial knowledge to model and manage future uncertainty in financial and insurance industries. Insurance firms, pension and benefits and other similar organizations require services of actuaries in pricing products and minimize future risks. The graduates will mostly find employment in the Insurance, employee benefits, and pension and management consulting industry. Actuaries will also be employed in banks, brokerage houses, and software development companies e.g. writing software for pension managers and risk analysts.

Requirements: Mean grade C+, Mathematics C+ and English C+

B.SC. IN FINANCIAL ENGINEERING

The program prepares students for a career as a financial engineer. Students study areas like risk identification, risk modelling and mitigation to help companies respond to increased regulation and public pressure to manage financial risk. They will also study topics in areas of economics, marketing, mathematics of investment and finance, risk management, insurance and accounting. The graduate will be able to construct models in the formulation of solutions to financial risk problems, apply statistics, financial theory and instruments in structuring financial solutions, developing financial products and exploring new opportunities in Banks and Insurance. The graduates shall find employment in investment firms, commercial banks, insurance, and employee benefits pension etc.

Requirements: Mean grade C+, Mathematics C+ and English C+

B.SC. IN BIOSTATISTICS

Biostatistics is a discipline that is fundamental to Biomedical and Agricultural research problems. The course offers statistical techniques and methodology for design of experiments, analysis of data and many other areas of statistics within life sciences. Students also learn how to use the most up-to-date software programs in Biostatistics, making them relevant after graduation in areas like academia, applied life science research and the private sector.

Requirements: Mean grade C+, Mathematics C+, English C+ and Biology C+

B.SC. IN STATISTICS

Statistics is a discipline that is fundamental to decision making and policy formulation. The program focuses on statistical science and its application to real problems. Statistical techniques and methodologies including collecting, compilation and designing of experiments and analysis of data are handled. Graduates may apply the knowledge gained in production industry, financial, medical and agriculture.

Requirements: Mean grade C+, Mathematics C+ and English C+

B.SC. IN INDUSTRIAL MATHEMATICS

Requirements: 2.0.1 must have passed Mathematics in the KCSE at a minimum grade of C+. In addition, a student must have passed in both subjects from one of the following alternatives:

Alternative A , Alternative B Chemistry Physical Science Physics Biological

Employment opportunities include systems engineering, research associate, technical consultant, scientific programme. Employment areas include state government, insurance companies, financial industry, banks, automotive, aeronautics and industrial companies.

B.SC. IN MATHEMATICS AND COMPUTER SCIENCES

Various Programmes will be offered. One programme will target the computer technology that is in high demand. The graduates will find employment in public universities, banks, government institutions, manufacturing, and research institutions. The graduates can also venture into entrepreneurship and further studies.

Requirements: Mean grade C+, Biology C+, Mathematics/ Physics C+ and Chemistry C+

B.SC IN OPERATIONS RESEARCH

Operations research is a branch of science that makes use of analytical techniques in the fields of mathematical modelling, statistics and optimization helping students arrive at optimal solutions to complex decision making problems.

Course objective:

A graduate in operations research is expected to be able to formulate mathematical, experimental and simulation model, they are expected to be able to define and evaluate operational problems and alternatively recommend computational and manipulative methods that will help solve these problems.

Employment venues:

The students are expected to find employment in:-Government and Non-Governmental Institutions,Banking sector,Consultancy firms,Health sector.

Requirements: K.C.S.E mean grade of C+, C+ Mathematics & English**.**

BACHELOR OF SCIENCE

The course offers options in Chemistry, Physics, Pure and Applied Mathematics, Statistics, Mathematics & Computer Science, Biotechnology, Microbiology, Zoology and PLEES.

SCHOOL OF BIOLOGICAL SCIENCES

B.SC. IN BIOTECHNOLOGY

The programme will be applicable in areas of agro biodiversity where the graduates will be able to solve problems of food security, processing and in areas of pharmacognosy to solve problems in medicine. The graduates will be equipped with the necessary biotechnological skills to solve present and future problems. Graduates work in research institutions, pharmaceutical industries, water and sewerage companies, flower firms, food and beverage industry etc.

Requirements: Mean grade C+, Biology C+, Mathematics/ Physics C- and Chemistry C+

B.SC. IN GENOMIC SCIENCES

Genomic science essentially comprises of genetics and molecular biology and application of these to studying genomes of organisms. It involves the mapping of genes of human, animals, plants and microorganisms by large-scale DNAsequence analysis. The large-scale research of the function of genes and how heredity compounds are stored in these genes are being translated to the functioning of a cell and the whole organism. Also "high-throughput" technologies and the information assimilation and analysis of the very large amounts of complex data are included. Graduates will be able to work in areas such as health and medicine, food and agriculture, nanotechnology, manufacturing and forensics.

Requirements: Mean grade C+, Biology C+, Chemistry C+ and Mathematics C+

B.SC. IN APPLIED BIOLOGY

The study of Applied Biology encompasses any manifestation of life, from the DNA molecule to the interactions of organisms within the various ecosystems of the earth. This broad discipline includes the subject areas of Botany, Zoology, Microbiology, Ecology,. Graduates of this programme may work in various biological laboratories, research institutions, pharmaceutical sector, food industry, agricultural sector or may go into gainful self-employment. The programme also provides a foundation for further training in biological technology, microbiology, biochemistry and molecular biology.

Requirements: Mean grade C+, Biology C+, Chemistry C+ and Mathematics C+

B.SC. IN ENVIRONMENTAL SCIENCES

Environmental Sciences entails the application of a wide knowledge especially in physical and life. It also applies novel techniques of acquiring and analyzing data, such as Geographical Information Systems and Remote Sensing in exploitation, management and conservation of natural resources. The graduates of the programme can work as a: environmental officers, research scientist/officer, academician (lecturer, teacher, and tutor), environmental safety officers, or they can further their education in more advanced field of environmental sciences.

Requirements: Mean grade C+, Biology C+, Chemistry C+ and Mathematics C+

B.SC. IN FISHERIES AND AQUACULTURE

The Bachelor of Science degree in Fisheries and Aquaculture Sciences is an applied technology four-year degree program that provides a mix of a broad based science background and applied hands-on, technical skills.

The graduates of the programme can work as a: Fish Farm managers, research scientists/officers, academicians (lecturer, teacher, tutor), product sales specialists, sales executive for biotech products, environmental safety officers, or they can further their education in more advanced field of Fisheries and Aquaculture Technologies.

Requirements: Mean grade C+, Biology C+, Chemistry C+ and Mathematics C+

B.SC IN MICROBIOLOGY

Microbiology is the branch of life sciences, which deals with the biology of prokaryotic and eukaryotic microorganisms including bacteria, fungi protozoa, algae and viruses.in terms of basic molecular and cell biology, microbiology has many elements in common with biochemistry and genetics..

A student who graduates with a degree in Microbiology may work in research institutions, the pharmaceutical sector, food industry, medical research, public health, biotechnology, agricultural sector or may go into gainful self-employment.

Requirements: Mean grade C+, Biology C+, Chemistry C+ and Mathematics C+

SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY

B.SC. IN BUSINESS COMPUTING

The course opens up a wide range of career opportunities in software development, or more general IT roles, which can lead to Project Management, IT and general management as well as a wide range of specialist technical roles. Prepare graduates for progression to higher levels of study in their fields of specialization.

Requirements: Mean Grade: KCSE C+ and grades C in English and Mathematics • 2 Principal passes at A level/Kenya Advanced Certificate of Education • A pass in JKUAT-Diploma in Computer Technology or Diploma in Management and I.T.

B.SC. IN INFORMATION TECHNOLOGY (YEAR II) FULL TIME

The course provides adequate training, knowledge and skills in order to develop solution providers in the ICT dynamic world and prepare graduates for progression to higher levels of study in their fields of specialization.

Requirements: A Credit pass in • JKUAT Diploma in IT • JKUAT Diploma in Management and IT • JKUAT Bridging course in IT • KSPS Advanced Diploma in IT or any other equivalent qualification approved by the University Senate

B.SC. IN INFORMATION TECHNOLOGY (YEAR 1)

The course provides adequate training, knowledge and skills in order to develop solution providers in the ICT dynamic world and prepare graduates for progression to higher levels of study in their fields of specialization.

Requirements: Mean Grade: C+ (Plus) in KCSE with at least grade C (Plain) in Mathematics and English KACE: TWO Principal passes an overall PASS in: • JKUAT-Diploma Information Technology, • JKUAT- Diploma in Management and Information Technology • K.S.P.S: both Ordinary and Advanced Diplomas in Information Technology Or an equivalent qualification recognized by Senate.

BSC COMPUTER SCIENCE

Computer Science involves the study and design of Computer Systems and associated system software. It covers the knowledge and techniques concerned with the design and exploitation of Computer Technology in the development of information processing systems. The course emphasizes the architecture of both the hard and software surrounding the Computer, converting it from a box of electronics into a sophisticated Information Processing tool. It focuses on the ways in which the hardware and software are constructed, and provide an insight into the purpose of each of the major computing system.

Course Objectives

To provide the opportunity for students to acquire a thorough grounding in the fundamentals of computer Science.

To enable students to develop knowledge, practical skills and understanding in relation to Computer systems for both hardware and systems software perspectives.

Requirements: The minimum University requirements apply.

In addition a candidate must satisfy the minimum requirement for admission to the institute, which is an average grade of A-(A minus) in one the following combinations of three subjects taken in K.C.S.E (or equivalent examination): Mathematics, Physics, Chemistry Mathematics, Physical Science, Biological Science

B.SC. COMPUTER TECHNOLOGY

Computer Technology is essential to the effective operations of industry and commerce from large multinational organizations through to small companies. Programmed and programmable systems are now common place in both industry and commerce with substantial growth forecast worldwide. Programmable systems require a broad knowledge of software techniques. This degree is designed to equip students with knowledge of software, data communications and the foundations of electronic systems along with microprocessor design and programming languages. The course is designed to equip graduates for entry into the computing industry as computer systems designers, engineers and integrators. Emphasis is placed on both the hardware and software aspects of computing, giving an integrated view of computers as systems in a way found in few other courses. Graduates will have a flexible approach to problem solving through an appreciation of the interface between hardware and software in computer or other digital system.

Requirements: K.C.S.E; Aggregate C+ and average grade C+ in one of the following subject combinations: a).Mathematics, Physics, Chemistry b).Mathematics, Physical Science, Biological Science

Diploma in Computer Technology, Computer Science, Information Technology, or in any other relevant diploma with a credit pass from an Institution recognized by the Senate.

Any other qualifications deemed by the Senate to be equivalent to the above.

DIPLOMA IN INFORMATION TECHNOLOGY YEAR I SEM II FULL-TIME

The course is intended to provide students with a wide range of software, technical and technological ICT skills required by industry at the diploma level. A graduate will be expected to develop an IT solution to a practical business problem using an engineering approach.

Requirements: A Distinction/credit passes in JKUAT Information Technology Certificate.

DIPLOMA IN INFORMATION TECHNOLOGY YEAR I FULL-TIME

The course is intended to provide students with a wide range of software, technical and technological ICT skills required by industry at the diploma level. A graduate will be expected to develop an IT solution to a practical business problem using an engineering approach.

Requirements: Mean Grade: KCSE C (Plain) and grades C- in English and Mathematics. • Division II in KCE with credit in English and Mathematics • KACE certificate with a subsidiary pass in Maths. Or an equivalent qualification recognized by Senate.

CERTIFICATE IN INFORMATION TECHNOLOGY

The course is intended to provide students with technical and technological ICT skills required by industry at the certificate level. Provides the graduate with avenue to progression upon attainment of Credit and above.

Requirements: Mean Grade: KCSE grade C- (minus) Or Division III in KCE

MASTERS PROGRAMMES (2 YEARS)

1. MSc in Botany
2. MSc in Chemistry
3. MSc in Zoology
4. MSc in Physics
5. MSc in Pure Mathematics
6. MSc in Applied Mathematics
7. MSc in Statistics
8. MSc in Applied Statistics
9. MSc in Geophysics
10. MSc in Analytical and Environmental Chemistry.
11. Msc.in Software Engineering
12. MSc in human Centred computing
13. MSc in Artificial Intelligence
14. MSc in Advanced material Science and Nano Technology

Requirement: Holders of a Bachelor's degree with at least 2nd class Honours (Upper Division) from JKUAT in relevant fields or from any other institution recognized by the Senate Tuition Fees

PhD D Programmes in all above areas (3 Years)

Requirements: Master's Degree in relevant field