



SCHOOL OF PHYSICAL SCIENCES

GUIDE TO FIRST YEAR COURSE REGISTRATION

Signed: _____

Date: _____

Dean, School of Physical Sciences

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1. INTRODUCTION

School of Physical Sciences comprises of five Departments namely; Chemistry, Geology, Meteorology, Physics and Geography & Environmental studies.

To qualify for the award of a degree, a candidate shall normally have completed a minimum of 44 units for the four years of study. **In the first year of study all students are required to register a minimum of twelve (12) units.**

All courses shall be examined during the academic year in which they are taken. Such examinations shall consist of continuous assessments, course tests and end of semester examinations.

Each unit shall be graded out of a maximum of 100 marks, and the pass mark from each unit shall be 40%. End of semester examinations will comprise of 70% of the total course marks whereas continuous assessment accounts for 30%.

In order to proceed to second year of study, a candidate must complete successfully at least ten units out of a minimum of twelve (12) units taken in the first year of study, whether by ordinary, special or supplementary examinations.

ALL STUDENTS ARE ADVISED TO CONSULT THE VARIOUS DEPARTMENTS/SCHOOLS FOR GUIDANCE ON UNITS TO BE TAKEN IN THE FIRST SEMESTER.

2. UNDERGRADUATE DEGREE PROGRAMMES

2.1 BSc. IN INDUSTRIAL CHEMISTRY (108)

Industrial Chemistry is a branch of Chemistry which applies physical and chemical processes towards the transformation of raw materials into products that are of benefit to humanity. The Industrial Chemistry graduate is a chemist with knowledge linkages in engineering, chemical processing, economics and Industrial management.

In First year Students of Industrial Chemistry are required to register for the following courses units in their first year:

Course units	Course title	Hours
SCH101	General and Inorganic Chemistry	45
SCH102	Introduction to Organic Chemistry, Chemistry of Alkanes and Cycloalkanes	45
SCH103	General and Physical Chemistry	45
SCI101	Elements of Physics I	45
SCI104	Foundations of Computer Science	45
SCA101	Safety methods in the Laboratory	45
SMA101	Basic Mathematics	45
SMA103	Calculus I	45
SMA104	Calculus II	45
CCS001	Communication Skills	45
CCS009	Elements of Economics	45
CCS010	HIV and AIDS	45

2.2 BSc. IN METEOROLOGY (I10)

Bachelor of Science in Meteorology programme has been developed to embrace new developments in the Science of Meteorology and the expanding areas of meteorological application. The objectives of the course are therefore to equip students with the knowledge and skills in weather and climate system analysis, weather forecasting, early warning, environmental pollution and Environmental Impacts Assessment, Biometeorology, Agrometeorology, Hydrometeorology, Renewable Energy Resources, Marine Meteorology, Aviation Meteorology and Environmental Meteorology.

In First year Students of Meteorology are required to register for the following courses units in their first year:

Course units	Course title	Hours
SMR101	Introduction to Meteorology I	45
SMR102	Introduction to Meteorology II	45
SMR103	Quantitative Methods and Computer Applications in Meteorology I	45
SMA101	Basic Mathematics	45
SMA103	Calculus I	45
SMA104	Calculus II	45
SPH101	Mechanics I	45
SPH102	Electricity and Magnetism 1	45
SPH103	Waves and Optics	45
CCS001	Communication Skills	45
CCS009	Elements of Economics	45
CCS010	HIV and AIDS	45

2.3 BSc. IN GEOLOGY (I13)

The Department of Geology offers an undergraduate programme for the BSc. degree based on the course unit system. The programme allows students to specialize in Geology by registering for Geology courses only in the third and fourth years of the BSc. programme. Students wishing to specialize in Geology are advised to select apart from Geology courses, appropriate courses in Chemistry, Mathematics or Physics.

In First year Students of Geology are required to register for the following courses units in their first year:

Course units	Course title	Hours
SGL101	Materials of the Earth	45
SGL102	Earth Processes	45
SGL103	Introduction to Paleontology	45
CCS001	Communication skills	45
CCS009	Elements of Economics	45
CCS010	HIV/AIDS	45
Students intending to specialize in Geology can select courses from the following School/Departments		
Option 1: Mathematics units		
SMA101	Basic Mathematics	45
SMA103	Calculus I	45
SMA104	Calculus II	45
Option 2: Physics units		
SPH101	Mechanics I	45
SPH102	Electricity & Magnetism I	45
SPH103	Waves and Optics	45
Option 3: Chemistry units		
SCH 101	General and Inorganic Chemistry	45
SCH 102	Introduction to Organic Chemistry, Chemistry of Alkanes and cycloalkanes	45
SCH 103	General and Physical Chemistry	45

2.4 BSc. IN ANALYTICAL CHEMISTRY (I14)

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

In First year Students of Analytical Chemistry are required to register for the following courses units in their first year:

Course units	Course title	Hours
SCH101	General and Inorganic Chemistry	45
SCH102	Introduction to Organic Chemistry, Chemistry of Alkanes and Cycloalkanes	45
SCH103	General and Physical Chemistry	45
SCI101	Elements of Physics I	45
SCI104	Foundations of Computer Science	45
SCA101	Safety methods in the Laboratory	45
SMA101	Basic Mathematics	45
SMA103	Calculus I	45
SMA104	Calculus II	45
CCS001	Communication Skills	45
CCS009	Elements of Economics	45
CCS010	HIV and AIDS	45

2.5 BSc. IN PETROLEUM GEOSCIENCE (I15)

The program in Petroleum Geoscience, that is offered in the Department of Geology, focuses on modern natural resource industries which will not only involve the exploration phase, but also their development and management practices. This program aims to offer a coherent understanding of the areas of science that relate to the earth's petroleum resources including their nature, origin, distribution, discovery and exploitation.

The practical training and hands-on experience will be achieved through partnerships and collaborations between the Department and the players in the petroleum industry. Students who specialize in Petroleum Geoscience will be required to enroll for appropriate pre-selected courses in Chemistry, Mathematics and Physics in their 1st and 2nd year of their study in this program.

First year Students of Petroleum Geoscience are required to register for the following courses units in their first year:

Course units	Course title	Hours
SGL 101	Materials of the Earth	45
SGL 102	Earth Processes	45
SMA 101	Basic Mathematics	45
SMA103	Calculus I	45
SMA 104	Calculus II	45
SCH 101	General Inorganic Chemistry	45
SCH 102	Introduction to Organic Chemistry of Alkanes and Cycloalkenes	45
SCH 103	General Physical Chemistry	45
SPH 103	Waves and Optics	45
CCS 001	Communication Skills	45
CCS 009	Elements Of Economics	45
CCS 010	HIV/Aids	45

2.6 BACHELOR OF SCIENCE (I20)

- 1) Bachelor of Science (I20) students can select units from the following Schools/Departments depending on what you want to specialize in:
 - a. School of Biological Sciences
 - b. School of Mathematics
 - c. Department of Chemistry
 - d. Department of Geography and Environmental studies
 - e. Department of Geology
 - f. Department of Meteorology
 - g. Department of Physics

- 2) Bachelor of Science (I20) students **must take a minimum of 12 units, which are a combination of three course units from three Schools/Departments, in addition to the three common course units.** This is with exception for students intending to register for double mathematics, where they shall register for six (6) mathematics units and another three (3) units from one other School/Departments.

- 3) Bachelor of Science (I20) students specialize during the third and fourth years of study in either one or two subject areas in which they registered.

- 4) Bachelor of Science (I20) students, who intend to be admitted into **Biochemistry** after their first year of study, will be required to select units from Chemistry Department and other units from the School of Biological Sciences that is, Botany/Zoology units and School of Mathematics. This is a competitive programme which admits only the best thirty (30) first year students who have fulfilled the requirements. Students admitted to this programme will in addition to the one year taken at the School of Physical Sciences, take an additional four (4) years. Thus, in total the students take a total of five (5) years.

2.6.1 Chemistry option

Bachelor of Science (I20) students who wish to Major (specialize) in Chemistry are required to register for the following course units:

Course units	Course title	Hours
SCH101	General and Inorganic Chemistry	45
SCH102	Introduction to Organic Chemistry, Chemistry of Alkanes and Cycloalkanes	45
SCH103	General and Physical Chemistry	45
CCS001	Communication skills	45
CCS009	Elements of Economics	45
CCS010	HIV/AIDS	45

Other courses can be taken from the following Schools/Departments:

- **School of Mathematics**
- **School of Biological Sciences**
- **Department of Geography**
- **Department of Physics**
- **Department of Geology**
- **Department of Meteorology**

Students are required to take a minimum of 12 units. Kindly consult the Schools/Departments on the course units to be registered.

2.6.2 Geography option

Bachelor of Science (I20) students who wish to Major (specialize) in Geography are required to register for the following course units:

Course units	Course title	Hours
SGP 105	Physical Geography I	45
SGP 107	Human Geography I	45
SGP 106	The East African Environment	45
SGP 108	Map and Aerial Photo Interpretation	45
CCS001	Communication skills	45
CCS009	Elements of Economics	45
CCS010	HIV/AIDS	45

Other courses can be taken from the following Schools/Departments:

- **School of Mathematics**
- **School of Biological Sciences**
- **Department of Geography**
- **Department of Physics**
- **Department of Meteorology**
- **Department of Chemistry**

Students are required to take a minimum of 12 units. Kindly consult the Schools/Departments on the course units to be registered.

2.6.3 Geology option

Bachelor of Science (I20) students who wish to Major (specialize) in Geology are required to register for the following course units:

Course units	Course title	Hours
SGL101	Materials of the Earth	45
SGL102	Earth Processes	45
SGL103	Introduction to Paleontology	45
CCS001	Communication skills	45
CCS009	Elements of Economics	45
CCS010	HIV/AIDS	45

Other courses can be taken from the following Schools/Departments:

- **School of Mathematics**
- **School of Biological Sciences**
- **Department of Geography**
- **Department of Physics**
- **Department of Meteorology**
- **Department of Chemistry**

Students are required to take a minimum of 12 units. Kindly consult the Schools/Departments on the course units to be registered.

2.6.4 Meteorology option

Bachelor of Science (I20) students who wish to Major (specialize) in Meteorology are required to register for the following course units:

Course units	Course title	Hours
SMR101	Introduction to Meteorology I	45
SMR102	Introduction to Meteorology II	45
SMR103	Quantitative Methods and Computer Applications in Meteorology I	45
CCS001	Communication Skills	45
CCS009	Elements of Economics	45
CCS010	HIV and AIDS	45

Other courses can be taken from the following Schools/Departments:

- **School of Mathematics**
- **Department of Physics**

Students are required to take a minimum of 12 units. Kindly consult the Schools/Departments on the course units to be registered.

2.6.5 Physics option

Bachelor of Science (I20) students who wish to Major (specialize) in Physics are required to register for the following course units:

Course units	Course title	Hours
SPH101	Mechanics I	45
SPH102	Electricity & Magnetism I	45
SPH103	Waves and Optics	45
CCS001	Communication skills	45
CCS009	Elements of Economics	45
CCS010	HIV/AIDS	45
Elective		
SPH104	Man and the Physical World	45
First year students who wish to combine Physics with mathematics, must register for the following units:		
SMA101	Basic Mathematics	45
SMA103	Calculus I	45
SMA140	Introduction to Probability and Statistics	45
Other courses can be taken from the following Schools/Departments: <ul style="list-style-type: none">- Department of Meteorology- Department of Geology- Department of Chemistry Students are required to take a minimum of 12 units. Kindly consult the Schools/Departments on the course units to be registered.		

2.6.6 Mathematics option

Bachelor of Science (I20) students who wish to Major (specialize) in Mathematics are required to register for the following course units in addition to courses from one other department.

Course units	Course title	Hours
SMA101	Basic Mathematics	45
SMA103	Calculus I	45
SMA104	Calculus II	45
SMA105	Geometry I	45
SMA108	Discrete Mathematics I	45
SMA140	Introduction to Probability & Statistics	45
CCS001	Communication skills	45
CCS009	Elements of Economics	45
CCS010	HIV/AIDS	45

Other courses can be taken from the following Schools/Departments:

- **School of Biological Sciences**
- **Department of Meteorology**
- **Department of Geology**
- **Department of Chemistry**
- **Department of Physics**
- **Department of Geography**

Students are required to take a minimum of 12 units. Kindly consult the Schools/Departments on the course units to be registered.

- **Double Mathematics requirements**

A candidate wishing to take Double Mathematics is required to take the following six units: SMA101, SMA 103, SMA105, SMA104, SMA108 and SMA140.

- **Single Mathematics requirements**

A candidate wishing to take Single Mathematics is required to take the following three units: SMA 101, SMA103 and SMA104. The candidate is free to take a fourth course, SMA140 if they so wish.

2.6.7 Botany option

Bachelor of Science (I20) students who wish to Major (specialize) in Botany are required to register for the following course units:

Course units	Course title	Hours
SBT101	Survey of the Plant Kingdom	45
SBT102	Introductory Biochemistry &	45
SBT103	Lower Plants	45
CCS001	Communication skills	45
CCS009	Elements of Economics	45
CCS010	HIV/AIDS	45
Elective		
SBT104	Principles of Plant Ecology	45
<p>Other courses can be taken from the following Schools/Departments:</p> <ul style="list-style-type: none">- School of Biological Sciences (Zoology Units)- School of Mathematics- Department of Meteorology- Department of Geology- Department of Chemistry- Department of Geography <p>Students are required to take a minimum of 12 units. Kindly consult the Schools/Departments on the course units to be registered.</p>		

2.6.8 Zoology option

Bachelor of Science (I20) students who wish to major in Zoology are required to register for the following course unit.

Course units	Course title	Hours
SZL101	Invertebrate Zoology	45
SZL102	Vertebrate Zoology	45
SZL103	Fundamentals of Ecology	45
CCS001	Communication skills	45
CCS009	Elements of Economics	45
CCS010	HIV/AIDS	45
Elective		
SBT104	Principles of Plant Ecology	45
Other courses can be taken from the following Schools/Departments: <ul style="list-style-type: none">- School of Biological Sciences (Botany Units)- School of Mathematics- Department of Meteorology- Department of Geology- Department of Chemistry- Department of Geography- Students are required to take a minimum of 12 units. Kindly consult the Schools/Departments on the course units to be registered.		

2.7 BSc. IN MICROPROCESSOR TECHNOLOGY & INSTRUMENTATION (I39)

The Department of Physics, in conjunction with the Industrial Electronics Unit, runs a Bachelor of Science in Microprocessor Technology and Instrumentation. This course covers extensively the subjects of computer technology and applications in business as well as in industrial and scientific microprocessor-based instrumentation and provides an avenue for graduate studies in the areas of Computer Technology, Scientific and Industrial Instrumentation, Solid State and Semiconductor Device Physics, and advanced technologies for electronic devices and new materials.

In First year Students of Microprocessor Technology & Instrumentation are required to register for the following courses units in their first year:

Course units	Course title	Hours
SPH101	Mechanics I	45
SPH102	Electricity & Magnetism I	45
SPH103	Waves and Optics	45
SPH105	Mathematics	45
SPH106	Introduction to Computers	45
SPH110	Communication Skills	45
SPH111	Entrepreneurship I	45
SPH113	Data Structure & Algorithms	45
SPH114	Computer Laboratory I	45
CCS010	HIV/AIDS	45
Electives		
SPH107	Programming Methods	45
SPH108	Information Systems Analysis & Design	45
SPH109	Introduction to Operating Systems	45
SPH112	Selected Scientific Instruments	45

2.8 BSc. IN ASTRONOMY AND ASTROPHYSICS (I44)

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

In First year Students of Astronomy & Astrophysics are required to register for the following courses units in their first year:

Course units	Course title	Hours
SPA101	Introductory Astronomy	45
SPA102	Gravitation and the Solar System	45
SPH101	Mechanics I	45
SPH102	Electricity & Magnetism I	45
SPH103	Waves and Optics	45
SPH107	Programming Methods	45
SMA103	Calculus I	45
SMA104	Calculus II	45
SMA140	Introduction to Probability and Statistics	45
CCS001	Communication skills	45
CCS009	Elements of Economics	45
CCS010	HIV/AIDS	45

2.9 BSc. IN CHEMISTRY (I64)

Bachelor of Science in Chemistry is a foundational course in chemistry that has material covering the traditional branches of chemistry namely organic, inorganic and physical. It seeks to explain factors that cause reactions to occur, how they occur and their adverse and non-adverse effects on our well being.

In First year Students of BSc. Chemistry are required to register for the following courses units in their first year:

Course units	Course title	Hours
SCH101	General and Inorganic Chemistry	45
SCH102	Introduction to Organic Chemistry, Chemistry of Alkanes and Cycloalkanes	45
SCH103	General and Physical Chemistry	45
SCA101	Safety methods in the Laboratory	45
SCI101	Elements of Physics I	45
SCI104	Foundations of Computer Science	45
SMA101	Basic Mathematics	45
SMA103	Calculus I	45
SMA104	Calculus II	45
CCS001	Communication Skills	45
CCS009	Elements of Economics	45
CCS010	HIV and AIDS	45

3. COURSE REGISTRATION

- 3.1 The course shall be evaluated in terms of units; a course unit being defined as a series of 35 one – hour lecture equivalents. For this purpose one 1-hour lecture is equivalent to one 2-hour tutorial or one 3-hour practical or any combination of these that may be recommended by the School Academic Board and approved by Senate.
- 3.2 Candidates for the Bachelor of Science degree shall take a minimum of 44 units during the four years study, for more details regarding distribution, read the University Calendar for 2013/2014 pages 448-449. The University Calendar can be found in our libraries.

4. EXAMINATIONS

- 4.1 All courses shall be examined by Ordinary Examinations during the academic year in which they are taken. Such Ordinary Examinations shall consist of continuous assessments and a TWO-HOUR end of semester examination for EACH UNIT. Unless otherwise stated, end of semester examinations will comprise 70% of the total course marks whereas continuous assessment will account for 30%. Continuous assessment shall consist of several evaluations based on a suitable combination of practical sessions, tutorials, assignments, and class tests.
- 4.2 Each unit shall be graded out of a maximum of 100 marks, and the pass mark for each unit shall be 40%. Marks shall be translated into letter grades as follows:-

70 – 100%	A
60 – 69%	B
50 – 59%	C
40 – 49%	D
39% and below	E

- 4.3 A candidate may, on the recommendation of the School Board of Examiners and approval by Senate, be admitted to Special Examinations, at the next appropriate end of semester examination, in the courses for which the candidate failed to sit Ordinary Examinations at the prescribed time. Special Examinations shall be graded as Ordinary Examinations.
- 4.4 A candidate who, whether by Ordinary or Special examinations or after repeating the year of study;
- (a) Passes in at least TEN units in the 1st or 2nd year of study, or at least EIGHT units in the 3rd year of study shall, on the recommendation of the School Board of Examiners and approval by Senate, be allowed to proceed to the subsequent year of study;
 - (b) Passes in at least EIGHT units in the 4th year of study shall, on the recommendation of the School Board of Examiners and approval by Senate, be considered for award of a degree.
- 4.5 A candidate who whether by Ordinary or Special examinations;
- (a) Passes in SEVEN to NINE units in the 1st or 2nd year of study, or in SIX to SEVEN units in the 3rd year and fourth year of study shall, on the recommendation of the School Board of Examiners and approval by Senate, be admitted to supplementary examinations in the courses failed.
 - (i) For units which a candidate sits supplementary examinations the marking shall be out of 100% but the continuous assessment marks shall not be considered. Any score exceeding 40% shall be indicated as 40%, whereas any score less than 40% shall be left as such.
 - (ii) A candidate who after sitting a supplementary examination in the first or second year passes in less than ten units shall be required to repeat the year.

(iii) A candidate who after sitting a supplementary examination in the third or fourth year passes in less than eight units shall be required to repeat the year.

(iv) A candidate shall be allowed to repeat a year of study ONLY ONCE.

4.6 A candidate shall on the recommendation of the School Board of Examiners and approval by Senate, be allowed to repeat the year of study if,

(a) The candidate passes in FIVE to SIX units in the 1st and or 2nd year of study

(b) The candidate passes FOUR to FIVE units in the 3rd or 4th year of study,

(c) For any other reasons,

Subject to the following conditions:

(i) Normally a candidate shall be allowed to repeat a year of study ONLY ONCE.

(ii) A candidate repeating a particular year of study will be required to take only the units previously failed or not completed and shall not be allowed to register for additional units.

(iii) Any repeated unit shall be marked like an ordinary Examination.

4.7 A candidate shall normally be required to discontinue from University if:

(a) In any year of study the candidate passes in less than FOUR units.

(b) The candidate failing to acquire the minimum number of units required to proceed after repeating.

(c) The candidate fails to follow the prescribed units.

5. DEGREE AWARD

- 5.1 To qualify for award of a degree, a candidate shall have passed in at least THIRTY SIX units, with a minimum of TEN units passed in each of the 1st and 2nd years of study and a minimum of EIGHT units passed in each of the 3rd and 4th years of study AND shall have obtained an average score of at least 40, as defined in Regulation 5.3.
- 5.2 The degree award and classification shall be based on the average score of ALL the units taken in the 3rd and 4th years of study.
- 5.3 The final award of the degree shall be classified into First Class, Second Class (Upper Division), Second Class (Lower Division) and Pass, based on the average score. Honours shall be awarded to candidates passing in the First Class, Second Class (Upper Division) or Second Class (Lower Division).

The degree shall be graded as follows:-

First Class Honours	70 – 100%
Second Class Honours (Upper Division)	60 – 69%
Second Class Honours (Lower Division)	50 – 59%
Pass	40 – 49%

- (a) The subject areas studied in the third and fourth years shall be indicated in the degree certificate.
- (b) A candidate who repeats the third or fourth year of study on account of inadequate academic performance, or does Supplementary examination after completing the 4th year, in accordance, shall be eligible for a Pass degree only.

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