DEPARTMENT OF PLANT AND MICROBIAL SCIENCES

DEGREE PROGRAMMES

BACHELOR OF SCIENCE (B.SC.)

Entry requirements

A student wishing to study BSc. must satisfy the minimum university requirements and School of Pure and Applied Sciences regulations.
A student to be admitted must satistify ANY OF the following minimum requirements:

1. Must have passed Biology or Biological Sciences with a C+ at KCSE, PLUS at least a C+ in ANY TWO of the following subjects; Physical Sciences, Physics, Chemistry, Geography and Agriculture
2. Have at least 2 principal passes one of which must be Biology in the Kenya Advanced Certificate of Education (KACE)
3. Have a C plain in KSCE (or Division III KCE/EACE) with a credit pass at diploma level in any of the following areas: Education (Biology), Applied Biology, Agriculture, Wildlife, or Wetlands from an institution recognized by the University Senate.

Programme pattern

In each year of study a student is required to take courses in the School of Pure & Applied Sciences amounting to 12 units. All students are also required to take four common University courses, which can be taken at any time before a student graduates.
In the first year the combination of courses to be taken in the Department of Plant and Microbial Sciences is the same for all students. In the second year a student must take four courses (three of which are core) in PMS (as well as four courses in each of two other Science departments). In the third and fourth years, the combination may vary as shown below.
3:3:1:1 Major – Twelve PMS units in each of the third and fourth years.
3:3:2:1 Major – Eight PMS units and four units from another department in the third year, and twelve PMS units in the fourth year.
3:3:2:2 Major – Eight PMS units and four units from another department in each of the third and fourth years.
3:3:2:2 Regular – Six PMS units and six units from another department in each of the third and fourth years.
3:3:2:2 Minor – Four PMS units and eight units from another department in each of the third and fourth years.
3:3:2:0 Minor – Four PMS units and eight units from another department in the third year, and no PMS units in the fourth year.
The 3:3:1:1 and 3:3:2:1 Major programmes will be offered at the discretion of the department.
Unless otherwise stated each course is equivalent to one unit.

Programme Structure

University Common Units

UCU 100: Communication Skills
UCU 101: Developmental Studies
UCU 103: Introduction to Critical and Creative Thinking
UCU 104: Entrepreneurship

Level 100

Core courses
SBT 100: Cellular Basis of Life
SBT 101: Survey of the Plant Kingdom
SBT 102: Plant Morphology and Anatomy.
SBT 103: Botanical Techniques

Level 200

Core courses
SBT 200: Plant Ecology
SBT 201: Plant Function
SBT 202: General Microbiology.
Elective courses
SBT 204: Pteridophytes and Bryophytes
SBT 205: Phytopathogens

Level 300

Core courses
SBT 300: Cell Biology and Genetics
SBT 301: Taxonomy of Higher Plants
Elective courses (Choose any two units)
SBT 302: Mycology
SBT 303: Principles of Plant Pathology
SBT 304: Biosystematics and Palynology
SBT 305: Bacteriology
SBT 306: Economic Botany
SBT 307: Biostatistics (Compulsory for students wishing to major in Botany in their final year)
SBT 308: Plant Growth and Development
SBT 309: Advanced Plant Ecology
SBT 310: Plant Biochemistry and Physiology

Level 400

All final year courses are elective, and with the exception of SBT 400, all count as 1 unit.
SBT 400: Research Project (2 units, over 2 semesters).
SBT 401: General Genetics
SBT 402: Phycology
SBT 403: Ecophysiology
SBT 404: Phytochemistry
SBT 405: Morphogenesis and Developmental Anatomy
SBT 406: Evolution

SBT 407: Arid Land Ecology
SBT 408: Forest Ecology
SBT 409: Rangeland Ecology
SBT 410: Marine Botany
SBT 411: Aquatic Botany
SBT 412: Applied Microbiology
SBT 413: Environmental Microbiology
SBT 414: Medical Microbiology
SBT 415: Fermentation
SBT 416: Secondary Metabolism
SBT 417: Advanced Genetics
SBT 418: Microbial Genetics
SBT 419: Cytogenetics and Molecular Biology
SBT 420: Biotechnology
SBT 421: Plant Breeding
SBT 422: Virology
SBT 423: Diagnosis and Control of Plant Diseases
SBT 424: Pesticides
SBT 425: Cell and Tissue Culture.

BACHELOR OF EDUCATION (B.ED. SCIENCE)

Entry Requirements

A student wishing to study for the Bachelor of Education (Science) must satisfy the minimum university requirements and School of Education regulations.

Programme Pattern

In each year of the programme, students are required to take courses in the School of Education in addition to a programme of courses in the School of Pure and Applied Sciences.
Botany and Zoology students (in the Departments of Plant and Microbial Sciences and Zoological Sciences) will be required to take three courses from each of the two Departments in each year. In addition to these, they must take two courses in each academic year in a second teaching subject (either Geography, Chemistry, Mathematics or Agriculture) and four common university courses.
Unless otherwise stated each course is equivalent to one unit.

Programme Structure

Level 100

Core courses
SBT 100: Cellular Basis of Life
SBT 101: Survey of the Plant Kingdom.
SBT 102: Plant Morphology and Anatomy.

Level 200

Core courses

SBT 200: Plant Ecology
SBT 201: Plant Function
SBT 202: General Microbiology

Level 300

Core courses.
SBT 300: Cell Biology and Genetics
SBT 301: Taxonomy of Higher Plants
Elective courses (Choose any one unit)
SBT 302: Mycology
SBT 303: Principles of Plant Pathology
SBT 304: Biosystematics and Palynology
SBT 305: Bacteriology
SBT 306: Economic Botany
SBT 307: Biostatistics (Compulsory for students wishing to major in Botany in their final year)
SBT 308: Plant Growth and Development
SBT 309: Advanced Plant Ecology
SBT 310: Plant Biochemistry and Physiology.

Level 400 (Choose any three units)

All fourth year units are electives. B.Ed students in PMS are required to take any **THREE** units.
Electives
SBT 400: Research Project (2 units, over 2 semesters)
SBT 401: General Genetics
SBT 402: Phycology
SBT 403: Ecophysiology
SBT 404: Phytochemistry
SBT 405: Morphogenesis and Developmental Anatomy
SBT 406: Evolution
SBT 407: Arid Land Ecology
SBT 408: Forest Ecology
SBT 409: Rangeland Ecology
SBT 410: Marine Botany
SBT 411: Aquatic Botany
SBT 412: Applied Microbiology
SBT 413: Environmental Microbiology
SBT 414: Medical Microbiology
SBT 415: Fermentation
SBT 416: Secondary Metabolism
SBT 417: Advanced Genetics
SBT 418: Microbial Genetics
SBT 419: Cytogenetics and Molecular Biology
SBT 420: Biotechnology
SBT 421: Plant Breeding
SBT 422: Virology
SBT 423: Diagnosis and Control of Plant Diseases
SBT 424: Pesticides

SBT 425: Cell and Tissue Culture.

Second Teaching Subject Courses for PMS Students

Botany and Zoology students (from the PMS and Zoological Sciences Departments) will take 2 units in 1st, 2nd 3rd and 4th year of their study in a second teaching subject. The second teaching subject can either be Chemistry, Mathematics, Geography or Agriculture. The list of units to be taken in each of the above departments is as below.

Geography

Level 100

AGE 100: Introduction to Statistics, Cartography and Map Analysis
AGE 102: Physical Geography

Level 200

AGE 200: Statistics and Cartography
AGE 203: Geography of East Africa

Level 300

AGE 300: Air Photo Interpretation and Field course
AGE 303: Geography of Development.

Level 400 (Choose any two units)

AGE 400: Remote Sensing and Resource Management
AGE 401: Environmental Conservation
AGE 402: Surveying.

Mathematics

Level 100

SMA 102: Basic Mathematics
SMA 104: Calculus I

Level 200

SMA 200: Calculus II
SMA 202: Linear Algebra I

Level 300

SMA 335: Ordinary Differential Equation I
SMA 336: Ordinary Differential Equation II

Level 400

SMA 432: Partial Differential Equation I
SMA 433: Partial Differential Equation II

Chemistry

Level 100

SCH 100: Fundamentals of Inorganic Chemistry
SCH 101: Introduction to Physical Chemistry.
SCH 102: Organic Chemistry 1

Level 200

SCH 200: Atomic Structure and Chemical Bonding (Prerequisite SCH 100)
SCH 201: Chemical Thermodynamics (Prerequisite SCH 101)

Level 300

SCH 300: Chemistry of S and P Block Elements (Prerequisite SCH 200)

Level 400

SCH 400: Comparative Study of Transition Elements (Prerequisite SCH 301)
SCH 401: Electrochemistry (prerequisite SCH 101)

Agriculture

Level 100

KRM 101: Introduction to Agriculture and Enterprise Development
KRM 102: Farming Systems

Level 200

KRM 201: Agriculture Field Engineering
KRM 202: Principles of Crop Production
KRM 203: Principles and Practices of Animal Production

Level 300

KRM 300: Soil Fertility and Nutrition

Level 400:

KRM 402: Conservation Agriculture and Agroforestry
KST 402: Agriculture Extension and Rural Development

BACHELOR OF SCIENCE (B.SC. MICROBIOLOGY)

Entry Requirements

A student wishing to study Microbiology must satisfy the minimum university entry requirements for the School of Pure and Applied Sciences regulations.
A student to be admitted must satistify ANY OF the following minimum requirements:

1. Must have passed Biology or Biological Sciences with a C+ at KCSE, PLUS at least a C+ in ANY TWO of the following subjects; Physical Sciences, Physics, Chemistry, Geography and Agriculture
2. Have at least 2 principal passes one which must be Biology in the Kenya Advanced Certificate of Education (KACE),
3. Have C plain in KSCE (or Division III KCE/EACE) with a credit pass at diploma level in any of the following areas: education (Biology), Applied Biology, Agriculture, or Microbiology from an institution recognized by the University Senate.

Programme of Study and Degree Pattern

Students taking B.Sc. (Microbiology) must complete 48 departmental units in addition to the 4 University common units.

In both the first and second year 100 level and the 200 level, all students taking B.Sc. (Microbiology), must complete 4 core units in Zoological Sciences and Chemistry.
The degree pattern shall be 3:3:1:1. The courses offered are as shown below. Unless otherwise stated, each course is one unit.

Program Structure

University Common Units

UCU 100: Communication Skills
UCU 101: Developmental Studies
UCU 103: Introduction to Critical and Creative Thinking
UCU 104: Entrepreneurship

Level 100

Core Courses
SBT 100: Cellular Basis of Life
SBT 101: Survey of Plant Kingdom
SBT 102: Plant Morphology and Anatomy
SBT 103: Botanical Techniques
SZL 100: General Zoology
SZL 101: Introduction to Ecology and Bioanalysis
SZL 103: Introduction to Histology
SZL 105: Laboratory Methods and Techniques in Zoology
SCH 100: Fundamentals of Inorganic Chemistry
SCH 101: Introduction to Physical Chemistry
SCH 102: Organic Chemistry I
SCH 103: Introduction to Classic Analysis and Separation Techniques

Level 200

Core Courses
SBT 200: Plant Ecology
SBT 201: Plant Function
SBT 202: General Microbiology
SBT 205: Phytopathogens
SZL 200: Vertebrate Zoology
SZL 201: Invertebrate Zoology
SZL 202: Comparative Physiology
SZL 206: Principles of Molecular Genetics.
SCH 200: Atomic Structure and Chemical Bonding
SCH 201: Chemical Thermodynamics
SCH 202: Organic Chemistry II
SCH 203: Theory of Spectroscopic Methods

Level 300

Core Courses
SBT 300: Cell Biology and Genetics
SBT 302: Mycology
SBT 305: Bacteriology

SBT 307: Biostatistics
SBT 333: Introduction to Virology
SBT 334: Principles of Immunology
SZL 315: Introduction to Parasitology

Elective Courses (Choose any five units)

SBT 303: Principles of Plant Pathology
SBT 326: Agricultural Microbiology
SBT 327: Immunohaematology
SBT 328: Immunochemistry
SBT 329: Microbial Ecology
SBT 330: Microbial Physiology
SBT 331: Medical Bacteriology
SBT 332: Plant Virology
SZL 303: Essentials of Molecular Biology

Level 400

Core Courses

SBT 412: Applied Microbiology
SBT 413: Environmental Microbiology
SBT 418: Microbial Genetics
SBT 420: Biotechnology

Elective Courses (Choose any eight units)

SBT 400: Research Project (2 units, over 2 semesters)
SBT 402: Phycology
SBT 423: Diagnosis and Control of Plant Diseases
SBT 424: Pesticides
SBT 429: Post harvest Fungi and Mycotoxicology
SBT 437: Industrial Microbiology
SBT 438: Diagnostic Virology
SBT 439: Viral Immunology
SBT 440: Control of Parasitic infections
SBT 441: Food Microbiology
SBT 442: Aquatic Microbiology
SBT 443: Applied Virology
SBT 444: Medical Virology
SBT 445: Epidemiology
SBT 446: Cellular Immunology
SBT 447: Immunology of Parasitic and Microbial diseases
SBT 448: Medical and Veterinary Nematodes
SBT 449: Medical Mycology
SBT 450: Applied Mycology
SZL 405: Medical Protozoology
SZL 406: Medical Helminthology
SZL 408: Applied Immunology

BACHELOR OF SCIENCE (CONSERVATION BIOLOGY)

Entry Requirements

A student wishing to pursue a degree in Conservation Biology (B. Sc Conservation Biology) must satisfy the mininimum Kenyatta University and School of Pure and Applied Sciences entry requirements.

A student to be admitted must satistify ANY OF the following minimum requirements:

1. Must have passed Biology or Biological Science at K.C.S.E with C+ in Biology, PLUS at least a C+ in ANY TWO of the following subjects; Physical Sciences, Physics, Chemistry, Geography and Agriculture
2. Have a minimum of 2 principal passes one which must be biology in the Kenya Advanced Certificate of Education (KACE),
3. Have a C plain in KSCE (or Division III KCE/EACE) with a credit pass at diploma level in any of the following areas: Forestry, Education (Biology, Agriculture), Wildlife, or Wetlands or any other relevant applied science programme from an institution recognized by the University Senate.

Course Requirements

A student who meets minimum entry requirements 2 and 3 above may at the discretion of the Department be eligible for credit waiver as per the Kenyatta University Policy on credit waiver.
In each year of study, a student will be required to take all the twelve (12) core units. Each student will also be required to enroll for the required University Common Units. In addition, a field attachment for 3 months at the end of third year of study is compulsory in order to qualify for the award of the degree. During the fourth year of the study, student will be required to take a project lasting two semesters. The project will be equivalent to 2 taught units.

Program Structure

University Common Units

UCU 100: Communication Skills
UCU 101: Developmental Studies
UCU 103: Introduction to Critical and Creative Thinking
UCU 104: Entrepreneurship

LEVEL 100 COURSES

SMA 100 Mathematics for Sciences I (Existing)
AGE 102 Physical Geography I (Existing)
SCB 100 Man and Wilderness (New)
SCB 101 Energy and Environment (New)
SCB 102 Diversity of Plant Kingdom (New)
SCB 103 Diversity of Animal Kingdom (New)
SCB 104 Laboratory and Field Techniques in Ecology (New)
SCB 105 Computer Application in Ecology (New)
SCB 106 Introduction to Soil Science (New)
SCB 107 Climatology (New)
SCB 108 Cell Biology (New)
SCB 109 Fundamentals of Ecology (New)

LEVEL 200 COURSES

SCB 200 History of Nature (New)
SCB 201 Introduction to Aquatic Systems (New)
SCB 202 Structure and Dynamics of Tropical Savannas (New)
SCB 203 Tropical Rainforest Ecology (New)
SCB 204 Introduction to Fisheries, Forestry and Wildlife Resources (New)
SCB 205 Ecology of Extreme Tropical Environments (New)
SCB 206 Population and Community Ecology (New)
SCB 207 Ecological Anthropology (New)
SCB 208 Introduction to Environmental Economics (New)
SCB 209 Wildlife Ecology (New)
SCB 210 Evolution and Conservation (New)
SCB 211 Natural Resources Management Practices (New)

LEVEL 300 COURSES

SBT 301 Taxonomy of Higher Plants (Existing)
SCB 300 Wetland Ecology and Management (New)
SCB 301 Tropical Ecology and Conservation (New)
SCB 302 Conservation Principles (New)
SCB 303 Geographic Information Systems in Natural Resources (New)
SCB 304 Environmental Sociology and Communications (New)
SCB 305 Restoration Ecology (New)
SCB 306 Quantitative Methods in Biology (New)
SCB 307 Conservation of Genetic Resources (New)
SCB 308 Tropical Agroforestry (New)
SCB 309 Conservation Areas (New)
SCB 310 Rangeland Resource Management (New)

LEVEL 400 COURSES

SCB 400: Research Project (2 Units)
SCB 401 Nature Based Enterprises and Tourism (New)
SCB 402 Environmental Policy and Law (New)
SCB 403 Emerging Global Environmental Issues (New)
SCB 404 Environmental Impact Assessment (New)
SCB 405 Tropical Landscape Ecology and Management (New)
SCB 406 Aquatic Resources Conservation and Management (New)
SCB 407 Biodiversity and Conservation Biology (New)
SCB 408 Biological Resource Management (New)
SCB 409 Ecosystem Management (New)
SCB 410 Dryland Agriculture (New)