BACHELOR OF SCIENCE (AGRICULTURAL RESOURCE MANAGEMENT) PROGRAMME

Course Description

Level 100

KCU 100: History and Development of East Africa Agriculture

Climate and soils of East Africa; history and development of agriculture in Kenya: agricultural production systems, agriculture and the Kenyan economy; factors limiting crop and animal production in Kenya; agriculture and enterprise development: nature of entrepreneurship development in agriculture, agriculture and wealth creation, characteristics of entrepreneurs; agricultural organization and research.

KCU 101: Fundamentals of Mathematics

Basic concepts of algebra; equations and inequalities; functions; algebraic and quadratic expressions, polynomial functions, exponential and logarithmic functions, vector calculus and applications, matrices; systems of equations; linear programming; differential and integral calculus; introduction to probability and statistics.

KRM 102: Farming Systems

Classification of important crops in Kenya, importance to the national economy and human diet: field crops, horticultural, and plantation crops; agronomic requirements influencing crop selection; centres of crop production; farming systems and patterns in Kenya; principles and potentials of organic farming; potentials of medicinal and aromatic plants; suitable animals, principles of animal based integrated farming systems: types, components, nutrient availability, bio-resource flow, resource allocation; advantages, potential and constraints, field studies to different agricultural related enterprises.

KAP 100: Introduction to Animal Production

Definitions of animal production, husbandry, production, management and veterinary science. Animal science disciplines. The role of animal production in agriculture and the national economy. Crops versus animal production. The role of animal production in human nutrition. Animal products and national requirements. A survey of Animal production systems.

KBT 100: Principles of Agribusiness Economics

KST 101`: Agricultural Zoology

KST 103: Fundamentals of Physics

KST 104: Fundamentals of Chemistry

KST 110: Introduction to Crop Protection

KST 112: Basic Botany

UCU 100: Communication Skills

UCU 101: Development Studies

UCU 103: Critical and Creative Thinking

Level 200

KCU 200: Statistics for Agriculture

Concept of variability, basic principles of sampling, parameters and estimates, measures of centre and dispersion, frequency distributions; types of variables: discrete and continuous; concepts of probability: probability distributions and probability density functions; normal distributions: *t* and *F* distributions; concept of hypothesis testing: testing means, Z-test, and t-test, testing homogeneity of variance *F*- test, types of errors and power of the test; studying linear relationships: simple linear regression and correlation

KCU 201: Principles of Crop Production

Economic importance of crops in Kenya; Agro-climatic zones in Kenya; impact of climate on crop production in tropics, crop environment and effects on yields, crop propagation methods, crop husbandry, land preparation, tillage; intercropping, multi cropping, effects on yield, crop rotation vs soil productivity, plantation cropping; dry-land crop production; importance of crop calendar; fertilization and fertilizer use by crops; crop-water relations; weeds and their control, crop protection, crop storage; field crops - annual and perennial, their production in Kenya; Agribusiness and value chain addition.

KCU 202: Principles of Soil Science

Introduction to soil science, soil forming factors and processes; soil components; minerals and organic matter; forms of soil aggregate; peds and pores; chemical reactions on the soil colloidal surfaces; soil aeration; drying and wetting of soil; soil physical properties; water holding capacity, bulk density electrical conductivity and texture; soil chemical properties: pH, cation exchange capacity; bases and soil oxides; plant nutrients; soil organisms.

KRM 201: Agricultural Machinery

Land suitability for agriculture; types of land development and preparations, timing of cultivation, seedbed establishment; seeding, planting, weeding. farm operations and performance; machinery and farm tools; land survey and design of foundations; suitable farm structures for different types of uses, engineering drawings and farm structures, tillage and soil consistency, overview of machines and mechanized systems for agricultural production (field trip).

KRM 203: Principles of Animal Production

Present status, existing potentials and constraints in major agro-ecological regions of Kenya for production and management of livestock, poultry and fish; classification of farm animals, characteristics of different breeds; environmental effects on farm animal production and reproduction; planning and establishing an animal enterprise; farm survey.

KRM 204: Principles of Animal Breeding

Concepts and principles; theory of quantitative traits; genetic parameters; prediction of breeding values; selection: genetic response, estimation of genetic change, multiple traits selection, marker assisted selection, construction of selection indices; mating systems: inbreeding, cross breeding; application of breeding methods to improve traits of economic importance; national and international breeding programmes, computation of predicted difference of breeding values; advances and application of biotechnology; policy, legal and institutional framework in animal breeding practice.

KRM 205: Aquatic Resources Management

Definitions and classifications of fish; aquatic ecology, aquatic resources in E. Africa; aquatic resource conservation and management; principles of aquaculture; fisheries legislation; economics of various fish populations, water quality parameters; impact of human use of aquatic resources, water pollution, effects of deforestation, irrigation, reclamation, canalization, damming, effects of agriculture, tourism, management options to relate the impact, fishing gear and crafts; aquaculture based farming systems.

KAP 204: Animal Nutrition and Feeds

Definitions; classification of feeds; digestion, absorption, utilization, assimilation, requirement and functions of nutrients; deficiencies and toxicities; unidentified growth factors; feed additives; protein and energy evaluation for livestock and poultry; present status of feed industry, feed resources, feed formulation and mixing, feeding standards, composition of formulate feeds.

KBT 203: Agricultural Production Economics

KBT 208: Farm Management

SBC 120: Introduction to Genetics

SMB 303: Agricultural Microbiology

ASC 205: Rural Sociology

LEVEL 300

KCU 300: Field Attachment (1 unit)

(*This unit is taken after a student has successfully completed at least 39 units*)

The purpose of the field attachment is to expose students to actual issues and problems related to agricultural resources management. Students will learn to utilize skills and techniques necessary to understand and solve agricultural resources management problems. The practicum will normally last for duration of three months and be supervised **THREE** times. The practicum will be graded according the University system.

KRM 300: Soil Fertility and Plant Nutrition

Definition of soil fertility; essential plant nutrients and their availability in soil; essential elements and their influence on plant growth; non-essential elements and elements toxic to plant, nutrient uptake by plant; physiological functions of essential elements in plants, their deficiency symptoms and toxicity; soil organic matter and importance of humus in soil, microbiological transformation in the soil and nutrients cycling. Methods of manure and inorganic fertilizers application and their fate in soil, crop response and fertilizer use recommendations.

KRM 301: Ruminant Animal Production

Routine management practices and tools used; types of housing; management of cattle and camels: herd composition, new born calf, weaning, calf management, heifer management and breeding, pregnant and lactating cow management, clean milk production and milking, stud bull management, semen collection, artificial insemination, draught animal management; goat and sheep management: herd management; techniques used in determining age, body weight, body condition, production and reproduction performance of farm animals; farm records and planning.

KRM 303: Field Crops Production

Historical background of field crops; world production and distribution; economic importance of field crop; genetic improvement; variety, types production systems, agronomy and protection; harvesting and processing; cereals; maize, wheat, barley, oats, sorghum and millet; legumes; field beans, pigeon pea, chickpea and cowpeas; oil crops; coconuts, ground nuts, sunflower; fibre crops; cotton; beverage crop; coffee, tea; sugarcane; root and tubers and narcotics.

KRM 306: Principles of Forage Production and Conservation

Common grasses and legumes used as animal feed: agronomic description, establishment and management; Factors affecting quantity and quality; role of legumes in pasture production; defoliation and grazing management; Principles and techniques of forage conservation; estimation of yield and quality of forage.

KRM 307: Non-Ruminant Animal Production

Management of functional groups of poultry: parent stock, incubation, brooder stock, growers, layers and broilers; egg quality determination; incubator and brooder management;

management of different functional groups of swine management of boar, sow, piglings, growers/fatteners; head composition; culling of unproductive poultry and swine; housing systems for poultry and pigs; identification systems for poultry and pigs; Farm planning and record keeping in poultry and pig farms; rabbit production; apiculture.

KBT 300: Applied Agribusiness

KST 300: Seed Science and Technology:

KST 301: Agricultural Entomology

KST 305: Plant Breeding

SBT 303: Principles of Plant Pathology

ENS 300: Environmental Impact assessment and Auditing

ENS 349: Rangeland Resources Management

LEVEL 400

KCU 400: Research Project (equivalent to 2 units)

All students in the Department will undertake a research project. The choice of topic will be made after a visit and interaction with a farming community and in consultation with assigned supervisors in the department during the first semester. Students will be required to develop and present research proposals, make oral presentations in a departmental seminar. In the second semester, students will analyse data, write and submit final project reports for assessment and grading.

KRM 401: General Soil Management

Soil survey and soil classification systems; classification of soils of Kenya; Soils, water and air pollution due to agricultural and other activities; fate of pollutants in soil; impacts of pollutants on soil, water and air quality: soil degradation and erosion, eutrophication and global warming; pollution control; potentials and limitations of Kenyan soils for land use planning with special emphasis on agricultural management.

KRM 403: Principles of Irrigation and Drainage

Factors that condition irrigation, drainage, irrigation history and status in Kenya, irrigation methods and suitability for crop production, surface, sub-surface, overhead trickle/drip irrigation; evapo-transpiration and crop water requirement, soil and plant factors affecting evaporation, consumptive use; the Blaney-criddle method, penman's method and lysimeter method; evaluation of water available in plant, classification of soil water, quality, scheduling of irrigation, measurement of infiltration rate, saline and alkali soils, management of saline and

alkali soils, leaching requirements; drainage, drainage functions, requirements and field designs.

KBT 402: Organizational Management and Teambuilding

KBT 416: Macro-Economics

KBT 419: Agricultural Land Economics

KBT420: International Trade in Agriculture

KST 401: Post Harvest Technology

KST 413: Agricultural Policy and Law

ESU 400: Environmental Conflicts and Peace Building

KCU 301: Research Methods