MASTER OF SCIENCE DEGREE IN DRYLAND AGRICULTURE

(BY THESIS)

KCU 800 Biostatistics

Importance of biostatistics; Descriptive and inferential statistics, Measures of central tendency and dispersion, Types of distribution, Computer packages (eg spread sheets, Genstat, SPSS, CANOCO, SAS), Hypotheses testing: Parametric, Non-parametric tests, ANOVA, Factorial experiments, experimental designs, Correlation, Regression, Mean separation tests, Data classification: Ordination, Multivariate data analysis; Discriminant analysis, Logistic regression, Principal component analysis, Detrended correspondence analysis, Detrended canonical correspondence analysis, Modeling and Simulation.

KCU 801/ PUCU Research Methods

Types; social and scientific, observation, experimental and survey. Main steps of research projects; identification of research problems, formulation of research questions, hypotheses, and objectives, planning, literature review. Sampling strategies & designs. Methods of data collection. Data cleaning and management. Data analysis, interpretation, report writing: Writing technical reports, Styles of writing and referencing. Dissemination: publication, seminars, information packaging. Research ethics. Intellectual Property Rights (IPR).

KRM 808 Soil and Water Conservation

Principles of water and soil conservation; water and wind erosion, effects of erosion on land productivity, and on water and air quality, influence of soil characteristics on soil erosion, control; cropping systems and soil fertility; water harvesting and control run-off; irrigation and drainage; water use efficiency of crops; methods of soil and moisture conservation; hands-on experience with erosion & productivity

KRM 803 Advanced Soil Fertility and Plant Nutrition

Soil fertility principles; Plant nutrition principles, nutrient mobility in the soil and nutrient uptake by plants; physical and physiochemical characteristics of soil; Plant elemental requirements and associated elements; Methods of soil fertility and plant nutrition assessment; Amendments for soil fertility maintenance; Methods of soilless plant production; Dryland weather and climatic conditions; (Practicals, projects and field visits).

KRM 850 Management of Livestock Diseases in the Drylands

Introduction to animal health, agriculture, and national economy; classification of diseases; the disease system; disease surveillance and epidemiology concepts; major tick borne diseases of livestock in the dry lands; trypanosomiasis; diseases of production, health problems in camels;

notifiable diseases in Kenya and health related legislation; transboundary diseases; herd health management; disease prevention and control measures

KRM 851 Dryland Feed Resources and Animal Feeding

Animal digestive systems in relation to diets consumed; nutrient requirement of animals; dynamics of natural pastures and pasture-rainfall relations in drylands; grazing management; factors affecting production and nutritive value of natural pastures and roughages; succulent crops and concentrates; supplementation; dryland fodder crops/plants and their nutritive value (anti-nutritional factors) and utilization; crop residues (quality, processing and utilization); feed conservation; matching animal production and feed availability/quality; Livestock – environment interactions; Dryland feeding strategies; Recent advances in animal nutrition in drylands.

KRM 852 Modelling Dryland Agricultural Production Systems

Systems approach, Model development, Numerical simulation, Dynamic models; sensitivity analysis, parameter estimation, evaluation, application, Crop modeling; state variables, development, Dry matter accumulation; photosynthesis, respiration, Light use efficiency, partitioning of dry matter, Other crop model components, Animal growth and composition modeling, Examples of whole farm models.

KRM 853 Dryland Livestock Production Systems II

Concepts and principles, sheep, goat, beef, camel and dairy production in dryland systems, poultry and bees production, systems of animal production in dryland environments, production constraints in the drylands; non-conventional and emerging livestock species in dryland systems (termites, ostrich farming, rabbits); livestock–wildlife integrated production systems, livestock marketing strategies and constraints.

KST 866 Crop Pests and Disease Management

Economic importance of pests and diseases: morphology and biology of pests, pest damage, damage symptoms, signs of infestation; role of insects in disease transmission: Crop diseases; infectious diseases; non-infectious disorders; epiphytology; symptomatology; etiology: nematodes, fungi , bacteria, viruses; bird and mammal pests of field crops and stored products; forecasting of pests and diseases; pest and disease management systems; biological, chemical, cultural, genetic; crop loss assessment. yield loss; crop protection techniques; chemical, cultural, biological, mechanical, scouting, Integrated pests and disease management (IPDM).

KST 867 Applied Dryland Crop Production

Introduction, definition and importance, dryland farming environment, Constraints limiting crop production in drylands, Types of drought, drought management strategies, Effects of drought on crop production Crop and varietal choice, cropping systems in drylands tillage and seeding practices in drylands, soil management, land degradation versus crop production, classification of

degradation processes, evapotranspiration and measures to reduce evapotranspiration, soil and water conservation measures in drylands cropping systems, water harvesting and supplemental irrigation in the drylands, fertilizer use in the drylands

ECD 522 Environmental Conflicts and Peace Building

KRM 830 Thesis

Selection of research topic will be done by the student in consultation with supervisors. Research and thesis writing will be done in year two of the study culminating with thesis submission. The thesis will be examined according to the university regulation that is written and oral presentation.