
Background

The Faculty of Agriculture and Natural Resources was established in 1992 as one of the first two Faculties. At its inception, the Faculty was offering a four year Bachelor Science in Agriculture and Natural Resources degree. After a curriculum review the degree was restructured to a 3 year programme with majors in crop production, horticulture, animal production, agribusiness, wildlife management and irrigation and water management. The Africa University Bachelor of Science degree (B.Sc.) in Agriculture and Natural Resources is a unique blend of theory, practical training and exposure to continental issues. The programme prepares young women and men for careers and contributions in agricultural production, processing, marketing, policy, management, teaching, research, development and service. In response to the growing challenges of environmental degradation and food security, the faculty has introduced a BSc Programme in Natural Resources Management. The new degree programme prepares young women and men for careers and contributions in **Environmental Management, Wildlife, Forestry and Fisheries Management**. The first graduate programs were introduced in 2001. The Faculty started with the Master of Science (M.Sc.) in Crop Production and Master of Philosophy (M.Phil.) degrees.

Mission Statement

The Faculty of Agriculture and Natural Resources at Africa University seeks to promote a holistic approach to life and recognise the sacredness of our environment. It intends to achieve this by establishing a dynamic community of learning committed to teaching, research and outreach by addressing the challenges of food production to meet the nutritional requirements of Africa and encouraging income generation to improve the quality of life of current and future generations through improved agricultural practices and the sustainable management of natural resources.

Goals

- To prepare men and women for careers and contributions in agricultural production, processing, marketing, policy, management, teaching, research, development and service.
- To bring its expertise to bear on rural and urban development through teaching, research and outreach.
- To create an understanding of a holistic, integrated systems approach to agriculture and related resource management.
- To complement and supplement learning opportunities of students and faculty in universities, colleges and other training institutions.
- To address issues of equity and poverty reduction through actions which affirm the importance of small-scale farmers and other disadvantaged groups, and recognizing gender.
- To produce students who have an appropriate balance between theory and practical application of knowledge and entrepreneurial skills.

- To develop a training process which will produce moral and ethical graduates who possess a willingness to respond to the needs and welfare of people.
To contribute to the critical skills gap in natural resources management in Africa through production of graduates with skills in: i) environmental management, and, ii) wildlife, fisheries, forestry and tourism management.

UNDERGRADUATE PROGRAMMES

B.Sc. AGRICULTURE AND NATURAL RESOURCES

The Faculty of Agriculture and Natural Resources offers a 3 Year undergraduate programme leading to the award of either a general or honours Bachelor of Science (B.Sc.) degree in Agriculture and Natural Resources. Areas of specialisation are Agribusiness, Animal Production, Crop Production, Food and Human Nutrition, Horticulture, Irrigation and Water Management, and Natural Resources Management.

Entry Requirements

To be admitted to the Faculty of Agriculture and Natural Resources, candidates must possess:

- a. *Passes with credit in at least five GCE Ordinary Level subjects chosen from each of the following five categories:*
 - i. English Language,
 - ii. Chemistry/Physical Science/Physics with Chemistry/Physics,
 - iii. Biology/Rural Biology/Zoology/Botany/Agriculture,
 - iv. Mathematics/Applied Mathematics/Pure Mathematics/Applied Statistics,
 - v. Environmental Studies/Geography/Economic Geography/Economics/Commerce/Accounts/ French/Portuguese, AND

At least two GCE Advanced Level/High School or equivalent passes chosen from any two of the following three categories;

 - i. Biology/Botany/Zoology/Agriculture,
 - ii. Chemistry (A pass at Advanced Level in Chemistry will normally be an advantage).
 - iii. Physics/Mathematics/Geography/Economics.

With respect to High School, it is expected that a candidate should have spent 13 -14 years of school from Primary.

OR

- b. A Two-Year Diploma (with Credit) in Agriculture after “A” level *or* a Three Year Diploma (with Credit) after “O” level, in related fields (e.g., Horticulture/Wildlife Management/Natural Resources/Fisheries/Forestry/Beekeeping/Animal Health) recognised by Africa University Senate.

NB: The faculty emphasises practical training as an intergral part of all programs offered in the faculty and students will be required to successfully undertake and complete field attachments / internships to quality for the award of a degree.

B.Sc. NATURAL RESOURCES

The B.Sc. in Natural Resources is a three-year program that seeks to respond to the growing challenges of environmental degradation and food security; effects of habitat fragmentation on wildlife and fisheries; effects of agro-chemicals on ecosystems; environmental consequences of tourism, mining, urbanization; desertification and methods of control; Wildlife/protected area design, planning and management; Water resource protection and management; Human population dynamics and land use changes; Environmental impact assessment and sustainable development. The degree programme is designed such that at the end of the first two years students are required to choose specialization courses in **Environmental Management** or **Wildlife and Fisheries Management**.

Undergraduate BSc Agriculture and Natural Resources Curriculum

- 1.1 Students follow a common programme for the first two years and then in the third year students can major in any of the following Options: Agribusiness, Animal Production, Crop Production, Food and Human Nutrition, Horticulture, Irrigation and Water Management, and Natural Resources Management.
- 1.2 To qualify for entry into an Honours programme, a student must have accumulated a CGPA of at least 3.2 by the end of Year II.
- 1.3 All students doing the Honours programme must do a Research Project during year III.
- 1.4 The courses are coded as follows:

Key to the codes

ACP 101

A = Agriculture and Natural Resources Faculty

CP = Crop Production; EC Agribusiness; AS –Animal Science; HC-Horticulture,

AE – Agricultural Engineering; NR –Natural Resources; NE- Environmental Management

1 = Year I Course

01 = Course Number

List of Undergraduate Courses

Year One: Required Courses – BSc Agriculture and Natural Resources

Semester 1

HAS 100 Introduction to African Studies, HCS 101 Communication Skills I. HIT 100 Introduction to Information Technology, HESL 111 English as a Second Language I or HFR 111 French for Beginners I or HPO 111 Portuguese for Beginners I, ACP 101 Introduction to Soil Science, AAE 101 Introduction to Agricultural Engineering, ACP 103 Practical Agriculture I, ACP 206 Ecology; AAS 101 Anatomy and Physiology of Farm Animals.

Semester 2

HESL 112 English as a Second Language II or HFR 112 French for Beginners II or HPO 112 Portuguese for Beginners II, AEC102 Communication Skills for Agriculture and Natural Sciences, AEC 101 Introduction to Agricultural Economics, AAS 201 Agricultural Biochemistry, ACP 102 Agricultural Botany and Plant Physiology, ACP 104 Practical Agriculture II. *10 weeks Attachment during long vacation.*

Year Two – Semester 1 – Required Courses BSc Agriculture and Natural Resources

TEV 200 Ethics and Christian Values, MAC 101 Foundations of Accounting I, AAS 201 Animal Production, ACP 201 Crop Physiology, ACP 202 Biometry, ACP 207 Genetics and Biotechnology, AAE 201 Farm Power and Machinery

Year Two - Semester 2- Crop Production, Horticulture, and Irrigation and Water Management Options

AEC 301 Farm Management and Farm Planning, AEC 201 Introduction to Agribusiness Management, ACP 203 Principles of Crop Production, ANR 201 Environmental Science and Pollution. ACP 209 Soil Fertility and Plant Nutrition, ACP 204 Research Methods, AHC 301 Introduction to Horticulture. *10 weeks Attachment during long vacation.*

Year Two – Semester 2-Animal production Option

AEC 301 Farm Management and Farm Planning, AEC 201 Introduction to Agribusiness Management, ACP 203 Principles of Crop Production, ANR 201 Environmental Science and Pollution. AAS 304 Pasture and Range Management, AAS203 Principles and Techniques of Wildlife Management, ACP 204 Research Methods, *10 weeks Attachment during long vacation.*

Year Two – Semester 2-Agribusiness Option

AEC 301 Farm Management and Farm Planning, AEC 201 Introduction to Agribusiness Management, MAC102 Foundations of Accounting II, MKT 102 Principles of Marketing, ACP 203 Principles of Crop Production, ANR 201 Environmental Science and Pollution, ACP 204 Research Methods. *10 weeks Attachment during long vacation.*

Year Three Crop Production Option

Semester 1

AAE 302 Irrigation Water Management, AEC 302 Project Appraisal and evaluation, ACP 303 Entomology, ACP 302 Soil Biology, ACP 305 Plant Breeding Methods and Biotechnology, ACP208 Weed Science, ACP 307 Field Crop Production

Semester 2:

AAE 301 Agricultural Processing and Technology, MMS401 Entrepreneurship and Small Business Development, ACP 304 Plant Pathology, ACP 306 Seed Science and Technology, AEC202 Agricultural Education and Extension, ACP308 Agroforestry, ACP 300 Research Project.

Year Three Horticulture Option

Semester 1:

AAE 302 Irrigation Water Management, AEC 302 Project Appraisal and Evaluation, ACP 303 Entomology, ACP 305 Plant Breeding Methods and Biotechnology, AHC 302 Vegetable Production, AHC 303 Harvesting and Postharvest Techniques, AHC 304 Fruit Production, ACP208 Weed Science.

Semester 2: AAE 301 Agricultural Processing and Technology, MMS401 Entrepreneurship and Small Business Development, ACP 304 Plant Pathology, ACP 306 Seed Science and Technology, AHC 305 Floriculture and Principles of Landscaping, AEC202 Agricultural Education and Extension, AHC 300 Research Project.

Year Three Animal Production Option

Semester 1:

AEC 302 Project Appraisal and Evaluation, AWL 304 Freshwater Ecology and Fisheries Management, AAS 302 Ruminant Animal Production, AAS 303 Non-Ruminant Animal Production, AAS 301 Applied Animal Nutrition, AAS 305 Animal Health, AAE 202 Farm Structures and Buildings

Semester 2:

AAE301 Agricultural Processing and Technology, MMS401 Entrepreneurship and Small Business Development, AAS 306 Animal Breeding, AAS 307 Dairy Management, AWL309 Principles of Aquaculture, AEC202 Agricultural Education and Extension, ACP 308 Agroforestry, AAS 300 Research Project.

Year Three Agribusiness Option

Semester 1:

AEC 308 Project Appraisal and Evaluation, AEC 304 Production Economics MAC 204 Business Finance, AEC 302 Agricultural marketing, AEC 309 Agricultural policy analysis, ANR 305 Environmental Impact Assessment, AHC 303 Harvesting and Postharvest Techniques.

Semester 2:

AAE301 Agricultural Processing and Technology, MMS 401 Entrepreneurship and Small Business Development, MMS302 Human Resources and Industrial Relations Management, MMS201 Organisational Behaviour, AEC 304 Econometrics, AEC 305 Agribusiness strategy, AEC202 Agricultural Education and Extension, AEC 300 Research Project.

Year Three Irrigation and Water Management Option

Semester 1:

AEC 302 Project Appraisal and Evaluation, AAE302 Irrigation water management, AAE 303 Fluid Mechanics, AAE 304 Hydrology, AAE 305 Introduction to Land Surveying, ANR 305 Environmental Impact Assessment, AAE 306 Engineering Drawing.

Semester 2:

AAE 301 Agricultural Processing and Technology, MMS 401 Entrepreneurship and Small business development, AAE 307 irrigation Systems design, AAE 308 Environmental engineering, ANR304 GIS, AEC202 Agricultural Education and Extension , AAE 300 Research Project.

BSc Natural Resources

Year One – Semester 1 - Required Courses – BSc Natural Resources

HESL 111 or HPO 111 or HFR 111, HCS101: Communication Skills I, HAS 100 Introduction to Africa Studies, ACP206: Ecology, ACP101: Introduction to Soil Science, AAS201: Agricultural Biochemistry.

Year One – Semester 2 - Required Courses – BSc Natural Resources

HESL 112 or HPO 112 or HFR 112, AEC102: Communication Skills in Agriculture and Natural Sciences, HIT100: Introduction to Information Technology, ACP102: Botany and Plant Physiology, AEC101: Introduction to Agricultural Economics, ANE 101: Principles of Environmental Planning and Management, ANR 101: Field Practice in Environmental Conservation I – (First Industrial Attachment (10 weeks)).

Year 2 – Semester 1 – Required Courses - B.Sc Natural Resources

TEV 200 Ethics and Christian Values, ACP 202 Biometry, Mac 101 Foundations of Accounting I, AAS203 Principles and Techniques of Wildlife Management, ANE 201 Tourism and Environment, ANE204 Management of Solid and Hazardous Waste, ANE 206 Energy and Environmental Pollution

Year 2 – Semester 2 – Wildlife and Fisheries Mgt Option

ANR 201 Environmental Science and Pollution, ACP204 Research Methods, AAS304 Pasture and Range Management, ANR 203: Plant and Animal Resources of Africa,

AEC301 Farm Planning and Management, ANE 208 Community Development, ANE 207 Biotechnology and the Environment, ANR 205 Field Practice in Environmental Conservation **II** (Second Industrial Attachment 10 weeks).

Year 2 – Semester 2 - Environmental Management Option -

ANR 201 Environmental Science and Pollution, ACP204 Research Methods, ANE 203 Urban Environment and Rural-Urban Linkages, ANE205 Disaster Preparedness, Management and Mitigation, ANE 208 Community Development, ANE 207 Biotechnology and the Environment, ANR 205 Field Practice in Environmental Conservation **II** (Second Industrial Attachment 10 weeks).

Year 3 – Semester 1 - Wildlife and Fisheries Management Option

AWL 304: Freshwater Ecology and Fisheries Management, AWL 308: Wildlife Ecology and Management, ANR305 Environmental Impact Assessment, ANR302 Conservation Biology, ANR 303 Surveying and Remote Sensing, AAE 304 Hydrology, AEC 308 Project Appraisal and Evaluation

Year 3 – Semester 2 - Wildlife and Fisheries Management Option

ANR304 Geographic Information Systems, ANR 309 Environmental and Natural Resource Economics, AWL305 Ecotourism and Hospitality management, AWL309 Principles of Aquaculture, AFR301: Forestry Resources and Management, ACP308 Agroforestry, MMS401 Entrepreneurship and Small Business Development, ANR 300 Research Project.

Year 3 – Semester 1 - Environmental Management Option

ANR305 Environmental Impact Assessment, ANR 303 Surveying and Remote Sensing, ANE 301 Environmental and Ecological Rehabilitation, ANE 303 Management of Drainage Basins and Water Resources, ANR302 Conservation Biology, ANR 306 Community-Based Natural Resources Management, AEC 308 Project Appraisal and Evaluation.

Year 3 – Semester 2 - Environmental Management Option

ANR 304 Geographical Information Systems, ANR 309 Environmental Economics and Natural Resource ANE 304 Environmental Policy and Resource Management, AWL305 Ecotourism and Hospitality Management, AWL307 Principles of Aquaculture, ACP308 Agroforestry, MMS401 Entrepreneurship and Small Business Development, ANE 300 Research project.

DESCRIPTION OF UNDERGRADUATE COURSES

ACP 101 Introduction to Soil Science (3 Credit hours)

The course covers: Soil formation; Physical properties of soils; Mineralogy of soils. Soil Water relations. Soil air and temperature. Soil organic matter. Chemical properties of soils. Plant mineral nutrition. Management of fertility. Soil pH. Soil classification. Soil surveys. Management of saline and sodic soils.

ACP 102 Agricultural Botany and Plant Physiology (2.5 Credit hours)

The course covers; Taxonomy, Plant morphology, Floral morphology. Floral diagrams and formulae. Flower induction. Pollination, fertilization and seed formation. Types of fruits and placentation. Plant growth regulators: their nature and function, and introduction to their use in crop protection and production.

ACP 103 Practical Agriculture I (1 Credit hour)

The course is instructional and equips students with practical knowledge and hands-on skills on: Usage of agricultural equipment and its calibration, Land tillage techniques, Management of crop pests and diseases, Livestock system operations, Crop production, Wildlife and Fishery production systems, Horticultural production systems, and Food processing and preservation techniques, farm budgeting systems

ACP 104 Practical Agriculture II (1 Credit hour)

ACP 103 is a requisite course. ACP 104 is an instructional course, continuing on equipping students with practical knowledge and hands-on skills covering those activities not covered during the ACP 103 course.

AAE 101 Introduction to Agricultural Engineering (2.5 Credit hours)

Course introduces students to application of Engineering to Agriculture; Engineering concepts; properties of agriculture systems; analysis of systems using conservation of mass, conservation of energy and the laws of motion; fluid systems; analysis of fluid systems using continuity and Bernoulli Equations.

AAS 101 Anatomy and Physiology of Farm Animals (2.5 Credit hours)

The course deals with: Histology, morphology and function of various vertebrate tissues. Comparative physiology of circulatory, respiratory, urinary and digestive systems. Adaptation in farm animals. Physiology of reproduction and elements of embryology in farm animals.

AAS 102 Agricultural and Environmental Microbiology (2 Credit hours)

Basic units of living systems; classification of microorganism; structure, reproduction, growth; Nutrition and metabolism in microorganisms. Environmental microbiology; Sewage and waste water microbiology, Agricultural microbiology; rumen microbes,

N-fixation-soil dynamics, Microbes in animal health, Food and industrial microbiology; Food production and preservation, Medical microbiology and food poisoning.

AEC 101 Introduction to Agricultural Economics (2 Credit hours)

The course introduces students to Economic systems and Organization; Theory of supply and demand, market equilibrium, Microeconomics, Macroeconomics, The consumption, investment and saving functions, The International Economy, Monetary and fiscal policies, Employment and growth policies, The role of Agricultural industry in the national economy.

AEC102 Communication Skills in Agriculture and Natural Sciences (3 Credit hours)

Thinking and writing skills in Agriculture and Natural sciences; Inductive and deductive reasoning, the argumentative essay. Process writing techniques in Agriculture and Natural resources (drafting, re-writing and editing). Writing Agriculture research papers and proposals: planning, foot-notes, bibliography, etc. Agribusiness communication: letters, interviewing, taking minutes, writing curriculum vitae, preparing for interview, administering an interview. Theories of the agriculture project proposals and scientific publications.

AFN 101 Introduction to Food Science and Nutrition (2 Credit hours)

Nutrition, health and agriculture; carbohydrates, proteins, fats, minerals and vitamins in human nutrition. Alcohol and toxic compounds. Classification of food compounds. Anti-nutrients in foods; Processing and biotechnology in food production; Nutritional disorders; food security.

ANE 101 Principles of Environmental Planning and Management (2.5 Credit hours).

Concepts of environment, sustainable development, planning and management. Genesis and evolution of environmental protection movements. Types of theories in environmental planning and management. Designating environmental problems of planning regions.

ANR101 Field Practice in Environmental Conservation I (2 Credit hours)

Students will be attached to various Governments, NGOs and Private Wildlife, Fisheries, Tourism and Environmental agencies / areas, where they will be required to follow, listen, and observe and participate in various natural resources and environmental conservation activities and tasks.

ACP 201 Crop Physiology (2.5 Credit hours)

Course deals with: Physiological basis of crop yields; Crop plants in relation to the environment. Growth analysis; Factors affecting crop growth, Blackman's concept,

Mitoshcherlich's yield equation. Light interception. Growth and nutrient responses. Plant population studies, plant competition. Crop growth modelling.

ACP 202 Biometry (3 Credit hours)

The course deals with: Data collection and summarisation. Descriptive statistics. Normal, standard normal, binomial and Poisson distributions. Probability and applications. Central limit theorem. Hypothesis testing: t-tests and chi square tests. Design and analyses of experiments. Treatment comparisons. Linear regression and correlation.

ACP 203 Principles of Crop Production (2.5 Credit hours)

The course covers: Cropping systems and crop distribution in Africa; Subsistence farming systems. Main agronomic practices relating to crop production systems such as tillage, planting and transplanting, mulching, fertilizing and manuring, weed control, pruning, pest control, harvesting and processing, cropping pattern, cropping intensity and crop rotation.

ACP 204 Research Methods (2 Credit hours)

Course exposes students to Research proposal formulation, Methods of collecting data; Questionnaire formulation and interviewing techniques. Sampling procedures for formal surveys, organization and implementation of the survey. Experimental designs. Data quality control, analyses and interpretation. Statistical software: SPSS/SAS/MSTAT/GENSTAT.

ACP 205 Practical Agriculture III (1 Credit hour)

The ACP 104 is prerequisite to ACP 205. The focus will be on developing farm or specific enterprise case studies, financial appraisal of farms, production processes and farm activities, evaluation with support or participation of commercial banks, developing cost saving strategies for specific enterprises, the use of extension and advisory services as training tools. Provide leadership in problem-solving and in decision-making processes at different agricultural enterprises. Preparation of Field reports.

ACP 206 Ecology (2.5 Credit hours)

The course introduces students to concepts in Applied Ecology, and covers: Biotic and abiotic factors in tropical regions. Energy Flow, Population Ecology, Ecology and Evolution, Ecology and Nature Conservation, Ecosystem Management, Ecology and Public Health Welfare and Human Societies.

ACP207 Genetics and Biotechnology (2.5 Credit hours)

The course covers; Cell division. Mendelian principles. Dominance relations and multiple alleles. Pedigree analysis. Environmental effects and gene expression. Gene

interaction and lethality. Sex determination and sex related inheritance. Gene structure and function. Biotechnology: Gene cloning, recombinant DNA technology and genetically modified organisms.

ACP 208 Weed Science (2.5 Credit hours)

Economic importance of weeds; effects of weeds on crop growth; common weeds of arable lands. Classification, characteristics, adaptations of weeds. Identification of common weeds in Southern Africa. Weed Ecology and management. Weed crop competition. Principles of weed control methods; Herbicides in crop production; Application of herbicides and herbicides resistance. Environmental issues in herbicide uses. Parasitic weeds.

ACP 209 Soil Fertility and Plant Nutrition. (3 Credit hours)

The course builds on ACP 101, and covers: Functions of nutrients in plants, soil reactions, soil organic matter, Macro and micro nutrients, functions, sources, transformation reaction in soil and methods of application, maintenance of soil fertility, soil-plant relations affecting nutrient uptake, fertilizer use and recommendations.

AAE 201 Power and Machinery (2.5 Credit hours)

Emphasis of the course is the mechanisation of agricultural operations. Course covers: Power sources; Tractor construction; Operational features. Internal combustion engine. Farm machinery. Tillage equipment. Equipment for sowing, planting. Equipment for applying fertilizers and manure. Equipment for crop protection. Harvesting and transport equipment. Machinery selection and management.

AAE 202 Farm Structures and Buildings (2.5 Credit hours)

Principles of farmstead planning. Farm buildings; Weather and farm buildings; security from pests; Buildings; livestock production and processing houses; Services to farm buildings; Uses and generation of farm power. Electrical components and basic electrical circuits. Safety; construction technology; Foundation types and uses. Building components, roof types and roofing framing. Footpaths and farm roads. Boundary walls, fencing and cattle grids.

AAS 201 Agricultural Biochemistry (2.5 Credit hours)

The course introduces students to the basic elements of biochemistry and biochemical reactions as they apply to food and nutrition. Components of animal and plant tissues, aspects basic to biochemical reactions, General concepts and design of metabolism, Photosynthetic pathways, Enzymes., Hormone and hormone functions, Vitamins and minerals in metabolic reactions

AAS 202 Animal Production (3 Credit hours)

The course introduces students to principles of livestock production, and covers livestock classes and/or types. Factors limiting production. Rearing systems. Dairy, beef, pig, small ruminants and poultry production. Feeds: composition, analyses and feeding. Breeding. Nutrient requirements. Digestion. Animal product synthesis.

AAS 203 Principles and Techniques of Wildlife Management (2.5 Credit hours)

Wildlife Values, Characteristics of population structure and dynamics; Population ecology; Wildlife and Fisheries habitats and Carrying Capacity; Utilization and economic analysis; Management problems – historical, economic, and sociological framework; Population estimation and analysis; Animal capture and care; Habitat analysis and manipulation; Process and care of wildlife and fish products. Control of populations.

AEC 201 Introduction to Agribusiness Management (2.5 Credit hours)

The course introduces students to financial management applied to agro based enterprises. Legal forms, organisation and management of an agribusiness. Procurement of financial and human resources. Methods of designing, planning and managing agricultural marketing systems. Marketing research. Role of agribusiness in developing economies.

AEC 202 Agricultural Education and Extension (2.5 Credit hours)

The course exposes students to Agricultural extension philosophy and scope of responsibilities. Organisation and administration of agricultural extension systems: comparative extension systems. The communication process. Extension methods. Extension planning and evaluation. Training of extension staff. Farmer training.

ANR 201 Environmental Science and Pollution (2.5 Credit hours)

Course covers: Sustainable development; Urban and Rural Environmental problems; Environmental consequences related to; Mining, Agriculture; Deforestation. Climatic changes. Soil erosion. Desertification. Pollutive effects of agricultural chemicals, domestic and industrial wastes. Acid rain.

ANR 202 Introduction to Natural Resource Management (2.5 Credit hours)

Areas of interest include; Social and Institutional aspects of Integrated Natural Resources Management; interactions of agriculture, forestry, wildlife and fisheries with soil and water; Conservation and Environmental protection; Land capability assessment; Environmental Impact Assessment; Population growth, Wildlife-damage and control methods.

ANR 203 Plant and Animal Resources of Africa (2.5 Credit hours)

Biodiversity; Why we need Wildlife; endangered and extinct species; human causes of species extinction; Wildlife conservation and management; measures to protect

declining biodiversity; vanishing tropical forests, Wildlife re-introductions, Botanical Gardens and Captive breeding programs – role in conservation of endangered species. Wildlife rehabilitation. Wildlife ranching / Game farms as a way of preserving biodiversity in Africa. Major vegetation types and Wildlife Habitats in Southern Africa; Local, regional and global threats to biological diversity in Southern Africa.

ANR204 Ecological Techniques and Environmental Monitoring (2.5 Credit hours)

Project design and data Analysis techniques for Conservation Monitoring, Assessment and Research; Types of Monitoring; Quantitative analysis of forests and grasslands vegetation; Methodology and Application Modified-Whittaker plots; and Gentry Transects; Sampling protocols for terrestrial arthropod including pan and pitfall traps, Malaise traps; Sorting and Identifying Arthropods samples; Biomonitoring; Indices of biotic integrity; Chemical and physical water quality, Aquatic macroinvertebrate sampling protocols, Macroinvertebrate collection, Identification and data processing; Bird Census techniques; Point Counts and Transects; Sampling protocols for small and large mammals; Radio Telemetry, Distance sampling, Use of scats, calls, Hydrobotanical methods, ecological mapping, monitoring and modeling, Remote sensing

ANR205 Field Practice in Environmental Conservation II (2 Credit hours)

The second attachment will give students another opportunity to put into practice the skills they acquired over the first year and second year period of training. During the industrial attachment period students will be required to undertake a research project within the scope of the industrial attachment.

ANE201 Tourism and Environment (2.5 Credit hours)

Growth and development of tourism. Types of Tourism; nature tourism and ecotourism. Tourism resources: Wildlife, coastal, cultural and historical sites. Socio-economic and environmental impact of tourism activities on the environment. Environment and wildlife conservation policies and prices. Community participation in conservation and tourism. The role of governmental, non governmental organizations and international agencies on tourism development and the environment.

ANE 203 Urban Environment and Rural-Urban Linkages (2.5 Credit hours)

Urban growth and urban structure. Concepts and theories of urbanization: population composition and structure in urban areas. Physical setting. Housing, transport, electricity, etc. Socio-economic setting. Public services, water, health, education, market, trade and waste disposal. Employment: The formal and informal sectors. Urban agriculture. Urban-rural linkages: migration, national urban policy. Management of environmental issues in urban areas. The future and growth of urban centers in Zimbabwe, Sub-Saharan Africa.

ANE 204 Management of Solid and Hazardous Wastes (2.5 Credit hours)

Origin, collection, transportation and disposal or storage of solid and hazardous chemicals; resource recovery; waste and health; administrative and legal aspects; transfrontier transport, enforcement of waste management regulations. Students to visit rubbish dumps to observe the transportation of urban solid waste, sorting, and among other processes.

ANE 205 Disaster Preparedness, Management and Mitigation (2.5 Credit hours)

Planning for managing disasters. Types of disasters; famine, floods, earthquakes and wars. Global historical perspectives on monitoring techniques and remote sensing and international and national disaster preparedness. National machinery. Actors. Perceptions of victims and relief agencies. Reconstruction. Selected case studies.

ANE 206 Energy and Environmental Pollution (2.5 Credit hours)

Global energy, renewable and non-renewable sources of energy; hydroelectric power, solar, biomass, etc; environmental consequences of overuse of fossil fuels, energy conservation strategies, technology and problems; problems of shortages and high cost of fossil fuel in Southern Africa in relation to dev efforts, alternative energy sources.

ANE 207 Biotechnology and the Environment (2.5 Credit hours)

Introduction to biotechnology; applications of biotechnology to living organism and industrial processes, food and energy production. Modern concepts of gene; enhancer, promoter and structure part. Gene manipulation techniques (genetic engineering) for increased agricultural production and improved animal and human health.: genomic and DNA libraries. Antibodies and hydridoma techniques. Disease and diagnostics, treatment and pathogen monitoring. Microbial ecology: Biogeochemical cycles, agro bacterium / Rhizobium plant interacts. Biodegradation of organic compounds, engineering microbes for environmental management. Environmental implications of biotechnology; release of genetically modified organisms (GMOs) into the environment.

ANE 208 Community Development (2 Credit hours)

This course explores what it means for a society to develop in the light of material, economic and political, social and cultural factors. Development trends highlight historical and contemporary socio-economic and social change perspectives, macro and micro economic policies, entrepreneurship, and technological change, education as an economic and change agent; social change and innovation. Research strategies and practical approaches related to rural development; assessment of the successes and failures in attempts to bring development to rural communities. Community-

based natural resource enterprises and rural development. NGOs, Community development and environment.

ACP 300 Research Project (3 Credit hours)

Undertake independent studies in any branch of Crop or Soil Science, and summarize results in a dissertation. Dissertation is examined in final year, but preparation starts during second year by developing suitable topics and preliminary literature search. During final year, student devotes 90 hours in data collection and/or experimentation, data analyses and dissertation write-up, for submission before the start of formal FINAL University examinations, and may be required to appear for an oral examination.

ACP 301 Soil and Fertility Management (2.5 Credit hours)

The course builds on ACP 209, and covers; Factors affecting soil fertility and productivity. Fertilizers and manures: types, applications economics, reactions with the soil. Maintenance of soil fertility. Soil - plant relations. Nutrient elements functions and requirements of different crops. Plant nutrient analysis. Design of fertilizer trials.

ACP 302 Soil Biology (2.5 Credit hours)

Course introduces students to; Soil micro biology and Fauna, and covers: rhizosphere soil population, effects of soil conditions and management on soil micro organisms. Techniques of studying soil micro organisms. Formation of soil organic matter. Biochemical properties of soil organic matter. Solid nitrogen fixation. Biological fertilizers. Microbial reclamation of contaminated soils.

ACP 303 Entomology (3 Credit hours)

Course exposes students to; Biology of invertebrate pests, and covers; morphology of insects, mites with special reference to structures used in identification. Characteristics of major insect orders and families. Internal anatomy. Ecology, physiology and behaviour. Biology of selected crop pests in relation to control. Insect Pest Management.

ACP 304 Plant Pathology (3 Credit hours)

The course exposes students to; Fungal diseases; symptoms and methods of control. Viruses infecting plants: composition, structure, transmission, strains and geographical distribution; diagnosis and symptoms; serology and serological tests, indexing and viral disease control. Plant pathogenic and parasitic bacteria, control of bacterial diseases. Nematology.

ACP 305 Plant Breeding Methods and Biotechnology (3 Credit hours)

The role of plant breeding. Genetic concepts. Genetic diversity of crop plants. Systems of pollination control and their applications. Breeding objectives. Breeding methods

for self and cross-pollinated crops. Inbreeding depression and heterosis. Biotechnology as a tool in plant breeding - progress, problems and prospects.

ACP 306 Seed Science and Technology (2.5 Credit hours)

Areas of to cover include; Gamete formation, fertilization and seed development. Seed structure, germination, vigour, dormancy and longevity. Formal and informal seed systems. Components of a seed industry. Certified and quality declared seed. Management and technical considerations in seed production. Tests for purity, germination capacity and vigour.

ACP 307 Field Crop Production (2.5 Credit hours)

The course builds on ACP 203, and covers; Classification, importance, growth and development of selected groups of annual field crops. Regional and national potential and limitations to production. Yield and yield components. The agronomy of cereals, oilseed crops, fibre crops, root and tuber crops, legumes and tobacco.

ACP 308 Agroforestry (2 Credit hours)

Land use systems related to agroforestry. Role of trees in soil productivity and conservation. Soil productivity and management in agroforestry. Ecosystem structure and functioning interactions relevant to agroforestry. Multi purpose tree species. Case studies of different agroforestry systems.

AHC 300 Research Project (3 Credit hours)

Undertake independent studies in any branch of Horticulture, and summarize results in a dissertation. Dissertation is examined in final year, but preparation starts during second year by developing suitable topics and preliminary literature search. During final year, student devotes 90 hours in data collection and/or experimentation, data analyses and dissertation write-up, for submission before the start of formal FINAL University examinations, and may be required to appear for an oral examination.

AHC 301 Introduction to Horticulture (2.5 Credit hours)

Definition and importance of horticulture. Horticultural classification. Factors influencing horticultural production. Nursery management. Sexual and asexual methods of propagation. Pruning and training of horticultural crops. Plant growth substances and their applications. Harvesting and post harvesting handling and marketing.

AHC 302 Vegetable Production (2 Credit hours)

Classification of vegetable crops, importance and types of vegetables grown in the region. Vegetable management and production methods and seed technology, with examples from solanaceous, leguminous, cole, bulb, vine, leaf and root vegetable crops. Miscellaneous vegetables (indigenous and introduced).

AHC 303 Harvesting and Post-harvest Technology (3 Credit hours)

Post harvest behaviour of fruit and vegetables; ripening process. Maturity determination of horticultural plants and plant products. The nature, evaluation and control of physiological changes. Methods of harvesting and storage including refrigeration, controlled atmosphere, hypobaric, radiation storage and the common methods in the region.

AHC 304 Fruit Production (2.5 Credit hours)

Principles of fruit crop establishment. Intercropping with other crops. Development and diversification of fruit production. Production of tropical, subtropical and temperate fruits of economic importance to the region: citrus, banana, mango, pineapple, grape, avocado, papaya, peach, apple, pear, plum and under exploited minor fruit species.

AHC 305 Floriculture and Principles of Landscaping (3 Credit hours)

The course covers: Cut flower production: Improvement, botany, ecological requirements, propagation, cultural practices and marketing. Introduction to landscape planning. Plant materials design and functional use. Ornamental plants: identification, systematics, adaptability, production, use and care for landscape and interior decoration.

AAE 300 Research Project (3 Credit hours)

Undertake independent studies in any branch of Agricultural Engineering, and summarize results in a dissertation. Dissertation is examined in final year, but preparation starts during second year by developing suitable topics and preliminary literature search. During final year, student devotes 90 hours in data collection and/or experimentation, data analyses and dissertation write-up, for submission before the start of formal FINAL University examinations, and may be required to appear for an oral examination.

AAE 301 Agricultural Processing and Technology (2.5 Credit hours)

Overview on food processing and technology; importance of properties of agricultural materials in processing. Principles of food preservation storage. Unit operation in food processing. Food additives. Quality control. Packaging. Hygiene and waste disposal. Nutrition policy and dietary habits.

AAE 302 Irrigation and Water Management (2.5 Credit hours)

Course covers; Water resources; Hydrological cycle; Measurement of precipitation, runoff, estimation of surface runoff and yield. Evapotranspiration: methods of estimating Evapotranspiration, crop factors. Soil erosion; raindrop, rill, gully erosion.

rainfall erosivity. Soil erodibility. Soil loss prediction. Strategies for soil conservation; erosion control by mechanical means and agronomic methods.

AAE 303 Fluid Mechanics (3 Credit hours)

The course deals with basic properties of fluids. Hydrostatics. Principles of fluids in motion. Flow in pipes. Flow in channels. Froude number, hydraulic jump. Hydraulic structures: water level and discharge control sluice gates, weirs and flumes. Pumps: types, principles of operation, operating characteristics, Cavitation.

AAE 304 Hydrology (2.5 Credit hours)

Course covers: Elementary meteorology, rainfall, and evaporation. Hydrological cycle. Statistical concepts. Thiessen polygons, isohyets, depth area relationships. Run off: Measurement, estimation and analysis. Infiltration. Ground water, occurrence, porosity, permeability, aquifers, flow lines and equi-potentials. Evaporation and transpiration.

AAE 305 Introduction to Land Surveying (3 Credit hours)

The course deals with: Topographic surveys, maps and plans, chain surveying, leveling, theodolite and use, optical distance measurement, tacheometry, sectioning, areas and volumes, setting out. Aerial photos: Interpretation, land use planning. Social surveys. Elementary sampling methods.

AAE 306 Engineering Drawing (3 Credit hours)

The course covers: Principles of engineering drawing and sketching. Pictorial representation, isometric, oblique and perspective. Simple geometric construction, orthographic projection, sections: dimensioning. Introduction to elementary architectural drafting with emphasis on plans and simple building details; technical illustrations.

AAE 307 Irrigation Systems Design (3 Credit hours)

Introduction to irrigation. Methods of water application. Scheme water requirements. Crop water use, effective rainfall, losses of water and efficiencies. Irrigation systems design. Effect of system design on management, continuous flow, rotation, on demand, case studies. Surface irrigation. Land grading. Sprinkler Irrigation. Trickle irrigation.

AAE 308 Environmental engineering (2.5 Credit hours)

This course covers engineering perspectives on environmental issues. Renewable and non-renewable resources. Environmental problems. Role of professions. Environmental Impact assessment and auditing; Social environment, waste management; environmental protection legislation. Ethical considerations to engineering activities.

AAS 300 Research Project (3 Credit hours)

Undertake independent studies in any branch of Animal Science, and summarise results in a dissertation. Dissertation is examined in final year, but preparation starts during second year by developing suitable topics and preliminary literature search. During final year, student devotes 90 hours in data collection and/or experimentation, data analyses and dissertation write-up, for submission before the start of formal FINAL University examinations, and may be required to appear for an oral examination.

AAS 301 Applied Animal Nutrition (2.5 Credit hours)

Feed intake. Utilization of forage and crop residues. Forage conservation and quality. Evaluation of animal feeds. Concentrates. Formulation and mixing of diets. Feeding plans to supply adequate energy, protein, mineral and vitamins for maintenance, growth, lactation, reproduction wool, farm power, and meat and egg production.

AAS 302 Ruminant Animal Production (2.5 Credit hours)

Population and distribution of small ruminants in Africa. Major constraints to small ruminant production. Goat and sheep production and breeding systems. Production performance, feeding requirements and practices of goats and sheep. Milk and wool production. Housing of small ruminants. Smallholder production of small ruminants in Africa.

AAS 303 Non-Ruminant Animal Production (2.5 Credit hours)

Types and breeds of pigs. Management of sow, piglets, growers and boar. Breeding programmes. Carcass evaluation. Grading and handling. Poultry management for meat and egg -production. Physiology of egg formation, egg grading and handling. Processing, grading and handling of broilers. Formulation and compounding rations.

AAS 304 Pasture and Range Management (2.5 Credit hours)

Plant growth and responses to defoliation. Plant identification, quality differences among species, management variables and levels of animal production. Management of grasslands and artificial pastures, animal nutrition, intake and diet preferences. Forage preservation and utilization. Forage analyses.

AAS 305 Animal Health (2.5 Credit hours)

Topics covered include; Causes of diseases; Transmissions and diagnostic methods; Disease prevention and control. Immune responses. Biology of vectors and parasites of livestock. Hygiene and prophylaxis in production units and other habitats. Care and treatment of sick animals. Toxicology, bacteriology and virology. Economics of livestock diseases.

AAS 306 Animal Breeding (3 Credit hours)

The course covers: Mendelian genetics; Sex determination, sex linked and lethal genes. Gene and genotype frequencies. Qualitative and quantitative inheritance. Selection, G x E interaction, maternal effects, inbreeding, inbreeding depression, cross breeding and heterosis. Breeding dairy and beef cattle, poultry, sheep, goats and pigs. Genetic engineering.

AAS307 Dairy Management (2.5 Credit hours)

Dairy cattle breeds, cow and calf management, reproductive physiology, lactation, ration formulation, factors in milk production, dairy cattle feeding systems, breeding practices, record keeping, dairy cattle housing and milking parlor designs, manure disposal, milking practices and handling, hygiene and sanitation, dairy products, milk composition, pasteurization, fermented milk products.

AEC 300 Research Project (3 Credit hours)

Students undertake independent studies in any branch of Agricultural Economics, and summarize results in a dissertation. Dissertation is examined in final year, but preparation starts during second year by developing suitable topics and preliminary literature search. During final year, student devotes 90 hours in data collection and/or experimentation, data analyses and dissertation write-up, for submission before the start of formal FINAL University examinations, and may be required to appear for an oral examination.

AEC 301 Farm Management and Farm Planning (2.5 Credit hours)

The course introduces students to Farm Management in tropical agriculture. Topics covered include: farm decision- making process, economic principles applied to farm management, farm records and accounts, valuation of assets, labour requirements, efficiency and work simplification, farm planning, budgeting and programme planning and gross margin analysis.

AEC 302 Agricultural Marketing (3 Credit hours)

The course examines policies that affect marketing of agricultural products, role of agricultural marketing in national economic development, approaches to the study of marketing including sub sector and institutional approaches, marketing margins, marketing efficiency and the overall performance of marketing system, agricultural marketing policies, market liberalisation and market failures.

AEC 303 Production Economics (3 Credit hours)

A theoretical course that equips students with knowledge on theories underlying economic decisions, and covers; the theory of the firm, factors of production, production decisions and concept of costs, decision theory, risk and uncertainty

management, farm planning techniques and linear programming and its use in smallholder agriculture.

AEC 304 Econometrics (3 Credit hours)

Topics covered include: Matrices algebra and multiple regression, Regression theory and use of dummy variables. Econometric analysis of supply, demand; price specification and estimation of demand and supply functions. Reduced forms and price forecasting equations. Problems of regression analysis. Combining econometric and time series analysis.

AEC 305 Agribusiness Strategy (2.5 Credit hours)

The course provides students with an analytical framework for understanding strategic management decisions in an agribusiness environment in both the private and public sector. Course covers: SWOT analysis. Mission and vision statements. Comparative strategies, managerial decision making, communication, teamwork and leadership skills. Visits to agribusiness firms.

AEC 306 Agribusiness Management (2 Credit hours)

The course builds on AEC 201 and covers; financial management techniques applied to agro-based enterprises. Legal forms, organisation and management of an agribusiness, procurement and control of financial and human resources; Design, planning and management of an agricultural marketing system. Marketing research, sales, forecasting and distribution channels.

AEC 307 Entrepreneurship and Small Business Development (2.5 Credit hours)

The course aims at allowing students to be confident and discover themselves with a view to self-employment. Some aspects covered include business formations, growths phases/stages, causes of failure, financial planning and management, case studies, human resources management and the role of small enterprises in the economy.

AEC 308 Project Appraisal and Evaluation (2.5 Credit hours)

The course covers Project concept; identification, appraisal, implementation, monitoring and evaluation. Fundamental aspects of project worth. Financial and economic aspects of project analysis, shadow pricing in financial and economic or socio benefit cost analysis. Problems of cut off periods and tangible and intangible measurements.

AEC 309 Agricultural Policy Analysis (3 Credit hours)

The course will build on earlier courses in economic theory and agricultural marketing, policy in the agricultural and natural resources sectors of less developed countries, macro-economic influences on the agricultural sector, balance of payments, exchange

rate issues, policy analysis matrix technique, ESAP as it relates to rural economic transformation.

AEC 310 Agricultural Development and Trade (3 Credit hours)

Introduction to theory of development, development planning policies and techniques especially with reference to Africa countries; the role of agriculture in the economic development process, planning techniques and models. International trade and Ricardo's theory and Herksher-olin theory. Welfare implications of trade and trade barriers implications of agricultural issues and policies on international trade.

ANR 300 Research Project (3 Credit hours)

Undertake independent studies in any branch of Natural Resources, and summarise results in a dissertation. Dissertation is examined in final year, but preparation starts during second year by developing suitable topics and preliminary literature search. During final year, student devotes 90 hours in data collection and/or experimentation, data analyses and dissertation write-up, for submission before the start of formal FINAL University examinations, and may be required to appear for an oral examination.

ANR 301 Economics and Utilisation of Natural Resources (2.5 Credit hours)

The course examines the wealth- generating capacities of natural resources; It covers Social and Economic trade-offs of the development and conservation of these resources; Wildlife value; Forms of wildlife utilisation; Cost Benefit-Analysis. Wildlife Capture, Transportation, Protection and Propagation in captivity; Trade in wildlife and wildlife products.

ANR 302 Conservation Biology and Natural Resources Management (2.5 Credit hours)

The course introduces students to an integrative approach to the protection and management of Biodiversity and Natural Resources. It covers landuse planning, Criteria for selection of conservation areas, Island Biogeography and Reserve Design, Planning and Management of Wildlife Protected Areas including Buffer zones, Corridors. Feasibility studies for new areas.

ANR 303 Surveying and Remote Sensing in Natural Resource Management (2.5 Credit hours)

This course introduces students to the concepts and foundations of Remote Sensing Methods of Resource Monitoring. Course covers principles of electromagnetic radiation, interaction with atmosphere, water and vegetation. The multispectral concept; Earth resource satellites, Image Processing and Interpretation. Use of remote sensing in agriculture, forestry, wildlife, etc.

ANR 304 Geographical Information Systems (GIS) (2.5 Credit hours)

This course introduces students to spatial, analytical techniques using GIS. Course covers definition and purpose of GIS, Overlays, computer coding, digital data, vectors and raster forms. Data base creation and management, Data analysis, presentation of information products. Applications in land use planning, Setting up a GIS.

ANR 305 Environmental Impact Assessment (EIA) (2 Credit hours)

The course covers concepts, and functions of EIA; Steps in EIA; Primary Impact Evaluation, Mitigation, Measures, Assessment, Comparison of externalities, documentation and decision-making. Environmental protection legislation, Case studies such as EIA of water resources, agriculture dev, energy dev, mining, paper, wood, etc. projects.

ANR 306 Community-Based Natural Resources Management (2.5 Credit hours)

The nature and structure of community organisation. Indigenous Knowledge Systems (IKS); Approaches to community mobilization and participation in resources management: empowerment, ownership, rights and decision-making. Strategies of community participation in development. Incentive regimes for community participation. Provision of community based infrastructural facilities. Community participation in soil, water, and wildlife management and conservation. The role of the community in agroforestry and afforestation programmes. The impact of policies and institutional framework on community participation. NGOS, Community development and environment

ANR307 Biogeography and Protected Area Planning (2.5 Credit hours)

Global patterns of biodiversity; Biodiversity hot-spots; Species distribution; Criteria or basis for identification and selection of Conservation Areas; Types and Functions of Protected Areas; IUCN / UNESCO Categories / classification of Protected Areas; Conservation Area Management Planning; Island Biogeography theory and Conservation Area planning; Types of planning; Protected Area Management planning process; Planning and management of Buffer Zones; Wildlife corridors; Zoning: Integrated approaches to Natural Resource Conservation.

ANR 308 Digital Image Processing of Remotely Sensed Data (2.5 Credits hours)

The Image as Information; Image generation, processing; image restoration; Pre-processing, radiometric corrections, geometric corrections, co-ordinate transformation, enhancement. Overlays and mosaics. The digital image: digitization, resampling, quantization. Data formats; Band sequential (BSQ), Band Interleaved by Line (BIL), Interleaved by Pixel (BIP). Image analysis and classification: Spatial techniques, spectral techniques, statistical classification; Applications of image processing to environmental problems.

ANR 309 Environmental and Natural Resource Economics (2.5 Credit hours)

Theory of environmental economics, welfare economics and optimization theory in relation to resources. Its nature and application for developing countries. Poverty and affluence in developing countries; inflation, unemployment, poverty and environmental degradation, market structure, commodity price, and pricing of resources; general equilibrium, Pareto optimality and resource conservation. The urban and rural environment. Transportation, housing, energy issues; food, water supply, conservation, pollution. Linkages between economic planning, environmental management and development.

AFR 300 Research Project (3 Credit hours)

Undertake independent studies in any branch of Forestry, and summarise results in a dissertation. Dissertation is examined in final year, but preparation starts during second year by developing suitable topics and preliminary literature search. During final year, student devotes 90 hours in data collection and/or experimentation, data analyses and dissertation write-up, for submission before the start of formal FINAL University examinations, and may be required to appear for an oral examination.

AFR 301 Forest Resources Management (2.5 Credit hours)

Forest resources and products. Forest management techniques. Silvi-cultural systems and tending operations. Bee keeping; the importance and potential of bee keeping industry. Traditional and modern methods of bee keeping. Bee management practices.

AFR 302 Tropical Forest Ecology and Silviculture (2.5 Credit hours)

Forest ecology. Classification of plant communities. Biotic and abiotic factors. Vegetation structure, species diversity and gradient analysis. Application of ecological principles to woodland and forest management. Management of exotic tree plantations. Silvicultural systems, coppice systems, clearfelling, shelterwood and selection systems.

AFR 303 Nursery Management (2.5 Credit hours)

Seed physiology. Seed testing. Vegetative propagation: grafting, budding, stem cutting and clonal propagation. Nursery site selection, design and layout. Preparation of growing media. Pre treatment of seed, sowing techniques and seed germination. Nursery practices. Seedlings protection, nursery records and seedling marketing.

AFR 304 Forest Resources Assessment (2.5 Credit hours)

Mensuration and inventory techniques; sampling and statistical concepts. Use of remote sensing and aerial photographs in forest inventory, forest classification, evaluation of stock and forest damage. Use of inventory data for management planning. Tree measurement, volume estimations, yield tables, stem analysis and yield predictions.

AFR 305 Forestry Legislation (2.5 Credit hours)

National goals, policies and strategies. National forest action plans. Customary forest resources management practices. Strategies for promoting tree growing and tree care by communities. The Forest Act. Forestry contracts and contract administration. International conventions. Forest products utilisation and licensing.

AFR 306 Social Forestry and Extension (2.5 Credit hours)

Social forestry, tree tenure, traditional uses of trees. Trees on farms and outside forests. Role of trees in rural development; rural sociology and gender analysis. Community based forest resources management. Afforestation, agroforestry, woodland management. Participatory and multi-disciplinary approaches to forest extension. Training needs assessment, evaluation and impact assessment. Role of government and non-governmental organisations in social forestry and extension.

AFR 307 Timber Harvesting and Road Engineering (2.5 Credit hours)

Forest roads planning, construction and maintenance. Roading economics, road density and spacing. Timber harvest planning, low impact harvesting systems, harvesting systems analysis. Felling techniques and extraction. Log transportation systems; loading and off loading. Work study; machine costing and ergonomics.

AFR 308 Processing of Forestry Products (2.5 Credit hours)

Forest resources, classification, world, regional and local resources statistics. Wood and non-wood products; harvesting, processing and marketing. Accessory benefits of forest. Concept of sustainable forest management. Non-wood forest products and their contribution to household economies.

AWL 300 Research Project (3 Credit hours)

Undertake independent studies in any branch of Wildlife, and summarize results in a dissertation. Dissertation is examined in final year, but preparation starts during second year by developing suitable topics and preliminary literature search. During final year, student devotes 90 hours in data collection and/or experimentation, data analyses and dissertation write-up, for submission before the start of formal FINAL University examinations, and may be required to appear for an oral examination.

AWL 301 Vertebrates Population Dynamics (2.5 Credit hours)

Concept of population: Birth and death rates, life tables; Population characteristics; structure, dispersal, growth models and dynamics, rate of fluctuations, size, density and distribution, survival and mortality, predator-prey interactions, survivorship curves and K-factor analysis. Vertebrate population assessment and monitoring techniques. Bird Census techniques; Point Counts and Transects; Sampling protocols for small and large mammals; Radio Telemetry, Distance sampling, Use of scats, calls,

etc Vertebrate preservation methods: Taxidermy – Preparation and mounting of skeletons of birds, mammals and reptiles; stuffing of vertebrate skins in life-like forms.

AWL 302 Wildlife Biology and Behavioural Ecology (2.5 Credit hours)

The course covers; Taxonomy and Zoogeography of terrestrial and marine fauna; Ecosystems; Trophic structures, populations and biological balance, factors influencing population dynamics. Ethnology and sociobiology; depletion and wildlife; inherent factors; environmental degradation and commercial exploitation; wildlife conservation; its relevance and methodology; wildlife study techniques.

AWL 303 Range Ecology and Management (2.5 Credit hours)

The course focuses on the ecology of the African range lands; Physiological responses of plants to grazing and browsing systems; Forage production, nutritive values. Rangeland development and improvement. Carrying capacity. Fire as a management tool. Wildfire causes, risks and hazards. Fire prevention, detection and control.

AWL 304 Freshwater Ecology and Fisheries Management (2.5 Credit hours)

The course covers Freshwater fish diversities in different geographic regions, Fish production in running waters, flood plains, lakes and man made reservoirs. Management of tropical fish resources, Integration of fish culture/agriculture/livestock farming, Physical and chemical properties of water and their effect on fish production.

AWL 305 Ecotourism and Hospitality Management (2.5 Credit hours)

The course introduces students to nature oriented tourism, and covers: Cost-benefit analysis of ecotourism. Visitor needs in ecotourism. Political, Social and Ecological impacts of ecotourism. Planning, development and management of tourism in parks and other protected areas. Community participation in Tourism and conservation activities.

AWL306 Mammology and Avian Management (2.5 Credit hours)

Mammalian and Avian Orders and characteristics: Anatomy, form and function; classification, Home range and behavior, predator and anti-predator behavior. Assessment and monitoring techniques including Distance Sampling and Telemetry. Evolution, Systematic and Taxonomy; Anatomy, physiology, histology, embryology, reproduction and behavior; Distribution , abundance and bird ecology. Avian Management. Field Identification: Assessment and Monitoring Techniques

AWL307 Principles of Aquaculture (2.5 Credit hours)

Overview of world Aquaculture, extensive, semi-intensive and integrated aquaculture; production Units; Ponds, Cages, Pens, Raceways, Recirculating systems; Selection of species for aquaculture; Site selection; water quality and quantity; Pond design,

construction and maintenance; Algae / Aquatic weed control; Predator control; Control of environmental factors; Harvesting techniques and strategies.

AWL 308 Wildlife Ecology and Management (2.5 Credit hours)

Habitat management; the wildlife range, carrying capacity, habitat requirements of animals; Habitat improvements; vegetation control; impacts of land use practices (forest, agriculture, urbanization, tourism); population management; factors limiting vertebrate population; effects of predation, predator management and exploitation dynamics, Overpopulation and control methods; People management: Human-Wildlife conflicts; Urban wildlife resources; buffer zones and dispersal areas; Translocation and exotic wildlife. Management of endangered species and ecosystems. Causes of threats and extinction. Management of protected area facilities.

AFS 300 Research Project (3 Credit hours)

Students undertake independent studies in any branch of Food Science, and summarise results in a dissertation. Dissertation is examined in final year, but preparation starts during second year by developing suitable topics and preliminary literature search. During final year, student devotes 90 hours in data collection and/or experimentation, data analyses and dissertation write-up, for submission before the start of formal FINAL University examinations, and may be required to appear for an oral examination.

AFS 301 Human Nutrition (3 Credit hours)

Dietary standards: concept of reference men and women, recommended daily intakes/ reference values and their determination. Nutritional requirements; energy, protein, vitamins and minerals. Water and electrolyte balance. Food security. Nutrition and working efficiency, urbanisation, old age, and mental health.

AFS 302 Food Science (3 Credit hours)

Post harvest technology: principles of food handling, processing and storage. Food preservation: traditional, improved and modern methods. Food additives. Food and drugs legislation. Food quality control. Food poisoning. Food hygiene. Institutional catering; menu planning, kitchen planning, legislation, kitchen safety, personal and kitchen hygiene.

AFS 303 Community Nutrition (3 Credit hours)

Aetiology of community nutritional problems: food production and distribution; nutritional deficiency diseases; socio cultural and economic influences; gender concerns. Assessment of community nutrition and nutritional intervention. National nutrition policies; food security, role of government and non-governmental organisations.

AFS 304 Dietetics (3 Credit hours)

Principles of meal planning; food and nutrient requirements; modification of normal diets; infant feeding; dietary requirements for therapeutic conditions. Assessment of dietary intake: weighed food intake, diet diaries, dietary history, 24 hour recall, dietary questionnaires, duplicate food methods.

AFS 305 Principles of Food Processing (3 Credit hours)

Food Processing and processing methods. Nutritional and chemical aspects of food processing. Synthetic foods. Food additives. Nutrition policy and dietary habits.

AFS 306 Public Health Nutrition (3 Credit hours)

Nutrition and health. Nutritional assessment. Malnutrition; rehabilitation centres. Nutritional disorders; nutrition and immunity, water purity and sanitation. HIV infection and AIDS: nutritional implications. Family planning: child spacing, implication of family planning on health and nutrition.

AFS 307 Nutrition Education (2.5 Credit hours)

Planning and implementation of nutrition education programs; audio--visual aids and equipment; presentation of talks and group discussions; planning and management of exhibitions. Assessment of nutrition education programs. Evaluation of the impact of rural development programmes on nutrition.

ANE 300 Research Project (3 Credit hours)

Students undertake independent studies in any branch of Forestry, and summarize results in a dissertation. Dissertation is examined in final year, but preparation starts during second year by developing suitable topics and preliminary literature search. During final year, student devotes 90 hours in data collection and/or experimentation, data analyses and dissertation write-up, for submission before the start of formal FINAL University examinations, and may be required to appear for an oral examination.

ANE 301 Environmental and Ecological Rehabilitation (2.5 Credit hours)

Causes and consequences of habitat degradation, simplification and destruction. Ecological restoration of degraded ecosystems and communities. Afforestation, reforestation and re-introduction of species. Rehabilitation of abandoned Mining areas, Restoration of areas from terrestrial and aquatic alien invasive. Restoration techniques of degraded wetlands and freshwater ecosystems and resources; Hypolimnetic Withdrawal; Dilution and flushing; Phosphorus precipitation and inactivation; Aeration, and Sediment removal; Restoration science, plans and Projects.

ANE 302 Landscape Designs and Environmental Planning (2.5 Credit hours)

Concepts and principles of landscape planning. Assessment of landscape conditions and their uses. Methods and techniques of assessing ecological, aesthetics and historical values of landscapes. Physical planning aspects of landscapes.

ANE 303 Management of Drainage Basins and Water Resources (2.5 Credit hours)

The drainage basin as a unit for environmental planning and management. Geographical, physical and legal delimitations and framework. Regional Development Authorities. Sources and nature of water. Traditional and modern perception of water use. International institutions and effort. Non-governmental organizations. Government institutions and policies. Human activities: agriculture, mining; industry; fisheries. Water extraction and distributions. Water-land use and impact of agrarian transformation. Urban and rural water supply and sanitation; Water pollution. Water resource management. Determinants of urban and rural water planning. Waste management and pollution control. Selected case studies.

ANE 304 Environmental Policy and Resource Management (2.5 Credit hours)

Public policies related to resource management and environmental issues; process and policy alternatives. Role of the government in policy formulation related to the management of natural resources and the environment. Fiscal and monetary policies and impact in natural resource conservation. International policy on resource conservation. Adaptation of natural environment for human needs; Ecological basis for environmental policy, allocation for natural resources for investment in environmental quality improvement. Externalities of contemporary environmental policies. Costs and benefits of reconstruction and / or reclamation policies. Policies leading to sustainability of resource management.

ANE 305 Non-Governmental Organizations, Development and Environment (2.5 Credit hours)

Philosophies and practices of NGOs. Environmental agitation of NGOs; factors determining success and failure. Policy and legislation governing NGOs and their activities. Overview of environmental NGOs in Southern Africa. Role of NGOs on the environment. International environmental issues and forums and their implications for the environment and development. International and NGO coalitions for environmental programmes. Comparative selected case studies of NGOs, their activities and impacts on the environment in the developing and developed world. Responses of NGOs to the African crises in environment and development.

SPECIAL REGULATIONS FOR MASTER OF SCIENCE DEGREES IN THE FACULTY OF AGRICULTURE AND NATURAL RESOURCES

1. **Preamble**

1.1 These regulations should be read in conjunction with the General Regulations for Graduate Degree Programmes.

1.2 These Special Regulations do not take precedence over the General Academic Regulations.

1.3 The Faculty of Agriculture and Natural Resources offers Master of Science (MSc) degrees in Agribusiness, Agricultural Economics, Crop Production, Animal Production, Forestry, Horticulture, Irrigation and Water Management, and Wildlife Management.

NB: Not all Programmes may be available every year.

2. **Entry Requirements**

2.1 **Minimum Entry Qualifications**

As spelt out in the general graduate regulations.

2.2 **Additional Entry Requirements for Specific Programmes**

2.2.1 Master of Science (MSc) in Agribusiness or Agricultural Economics
A Bachelor's degree in Agriculture/Agricultural Economics/ Economics/ Business Studies.

2.2.2 Master of Science (MSc) in Crop Production or Horticulture
A Bachelor's degree in Agriculture/Biological Science in appropriate subjects.

2.2.3 Master of Science (MSc) in Animal Production
A Bachelor's degree in Agriculture/Veterinary Science/Biological Science in appropriate subjects.

2.2.4 Master of Science (MSc) in Irrigation and Water Management
A Bachelor's degree in Agriculture/Agricultural Engineering/Engineering.

2.2.5 Master of Science (MSc) in Wildlife Management
A Bachelor's degree in Agriculture with relevant Animal Science or Natural Resources or Wildlife courses/Natural Resources/Fisheries/Biological Science in appropriate subjects.

2.3 **Language**

English is the language of instruction at Africa University. Candidates without proficiency in English may be provisionally admitted pending successful completion of the Intensive English Programme.

3. **Application Procedures**

Prospective students should apply to the University through the Office of the Assistant Registrar (Academic Affairs) and follow the procedures stipulated in the General Regulations for Graduate Degree Programmes.

4. **Transfer to Africa University From a Graduate Programme of Another Institution**

A student who wishes to transfer to the Faculty of Agriculture and Natural Resources from a graduate programme of another institution must follow the procedure stipulated in the General Regulations for Graduate Degree Programmes.

5. **Structure of the Programmes**

5.1 **Duration**

The MSc degree programmes are offered on a full-time basis and will run for two academic years. Candidates who fail to complete their dissertations within the specified period may apply for an extension of registration period to Senate through the Faculty. The maximum duration of the registration period for full-time study shall normally not exceed three academic years.

5.2 **Place of Study**

- (i) Lectures and taught classes will be taken at Africa University or at any other approved institution.
- (ii) Students may be allowed to conduct part or all of their research projects at other institutions in and outside Zimbabwe, provided that a competent Supervisor is available to oversee the work on a regular basis.

5.3 **Coursework and Research Project**

- (i) In order to graduate, the candidate must have completed 30-36 credit hours. Of these credit hours, 12 credit hours will be reserved to the dissertation.
- (ii) The programme of study shall consist of two parts. Part I shall be the coursework component and Part II shall be the research component.

5.3.1 **Part I:**

(a) **Coursework**

- (i) Part I of the programme shall normally be completed in the two semesters of the first academic year. It shall consist of course work including the preparation of a research proposal.

- (ii) Students shall take 9 - 12 Credit hours per semester. A student may carry up to 15 credit hours with the permission of the Dean.
- (iii) Before the end of the first academic year, students shall present their draft research proposals in an open seminar in the Faculty for purposes of discussion and advice.

(b) **Assessment**

- (i) Each course assessment shall normally consist of both continuous assessment and end of semester examination. The continuous assessment shall count for 40% of final assessment.
- (ii) Evaluation methods or criteria may include practicals, class participation, exercises, tests, written reports, class presentations, seminars, term papers and examinations as the Faculty may deem appropriate for each course.
- (iii) Grades will be assigned to students' work and weighted in accordance with the Academic General Regulations.
- (iv) Each course must be passed with a minimum mark of 60 percent (C⁺).
- (v) The formal examinations shall normally be held at the end of the semester in which the course is taken.
- (vi) Examinations shall be conducted in accordance with the regulations in force.

5.3.2

Part II:

(a) **Research Project**

- (i) Part II shall comprise research and the preparation of the dissertation.
- (ii) In special circumstances, extension of the research period may be considered by the Senate on the recommendation of the Faculty.
- (iii) Each student shall conduct a research project as approved by the Faculty.
- (iv) The dissertation should normally be submitted by the end of the second academic year.

(b) **Supervision**

- (i) The Dean shall assign a supervisor to each student before the candidate has completed coursework.
- (ii) Where a student is permitted to work at another institution, there shall be at least two supervisors one of whom shall be a member of staff within the Faculty and the other (an External Supervisor) attached to the institution.

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- (iii) The Dean shall monitor student progress through reports submitted by the supervisor(s).

5.4 **Progression**

- a) To be in good academic standing, a student must maintain a minimum cumulative grade-point average (CGPA) of 2.6 throughout his/her studies.
- b) A student whose CGPA at the end of any semester falls between 2.3 and 2.59 inclusive will be put on probation. Such a student will need to raise his/her CGPA to 2.6 at the end of the next semester or be discontinued.
- c) A student whose CGPA falls below 2.3 at any time shall be discontinued.
- d) In order to proceed from coursework (Part I) to the dissertation (Part II), a student must pass all the core courses.

5.5 **Dissertation**

5.5.1 Format of presentation

5.5.1.1 A candidate who qualifies to proceed to the dissertation level shall be required to submit a dissertation within the registration period.

5.5.1.2 The form of presentation of the dissertation shall be as prescribed in the General Regulations for Graduate Degree Programmes and the Faculty handbook on Thesis Preparation.

5.5.1.3 The dissertation shall normally not exceed 30 000 words.

5.5.2 Submission of a dissertation for examination

5.5.2.1 At least two months before submitting the dissertation, a candidate shall (through his/her supervisor) notify, in writing, the Dean of his/her intention to submit the dissertation.

5.5.2.2 Every dissertation submitted must be accompanied by a declaration by the candidate stating that it is the candidate's original work and that it has neither been submitted nor being concurrently submitted for any degree in any other institution. The dissertation must be submitted in three loose bound copies within a suitable cover.

5.5.2.3 The dissertation shall contain a statement of copyright by the author.

5.5.3 Examination of a dissertation

5.5.3.1 Every dissertation submitted shall be assessed by at least two examiners recommended by the Faculty and approved by Senate. At least one of the examiners must be external to the University.

5.5.3.2 A candidate may be required to appear before a panel of examiners for a *viva voce* examination.

- 5.5.3.3 The examiners shall be required to submit their reports about the dissertation within a maximum period of two months from the date of receipt. If the reports are not received within three months, new examiners shall be appointed.
- 5.5.3.4 Each examiner shall be required to summarise his/her report about the dissertation with definite recommendation for one of the following:
- (i) the degree be awarded to the candidate unconditionally;
 - (ii) the degree be awarded subject to typographical corrections/minor revisions;
 - (iii) the candidate be required to revise and resubmit his/her dissertation for re-examination;
 - (iv) the dissertation be rejected outright.
- 5.5.3.5 The dissertation shall normally be assessed by the Faculty Board of Examiners on the basis of reports from the internal and external examiners.
- 5.5.3.6 Where the examiners are not in agreement in their overall recommendations, the Dean shall examine and recommend one of the following actions:
- (i) appointment of an additional external examiner, or
 - (ii) the establishment of a panel of examiners to assess the candidate orally.
- 5.5.3.7 Work rejected by examiners after re-submission shall not be accepted for re-examination.
- 5.5.3.8 Dissertations recommended for major corrections, revision or re-writing must be re-submitted within six months.
- 5.5.3.9 **Oral Examinations**
- (i) When a student is required to undergo a *viva voce* examination, the oral examination shall be conducted by a Panel of Examiners composed of the Dean (as Chairperson), Chairperson of Department concerned, the Supervisor(s), all Internal Examiners and the External Examiner(s).
 - (ii) In the oral examination, the candidate will be assessed principally on the merits of his/her dissertation, but questions may also be asked to test general knowledge of the subject. The oral examination shall be assessed on a pass or fail basis.
 - (iii) After the oral examination, the Dean shall immediately convene a Board of Examiners meeting and decide whether the candidate passes or fails, and make an appropriate recommendation to Senate.
- 5.5.4 **Final Submission**
- 5.5.4.1 After completing to the satisfaction of the Internal Examiner all the recommended corrections, the candidate shall submit three (3) full bound copies of the dissertation to the Dean of the Faculty. Each copy shall be bound in black.

5.5.4.2 The spine shall be embossed in gold lettering showing; the surname and initials of the candidate, the degree for which the dissertation report has been submitted, and the year of the degree award.

5.5.4.3 The writing on the spine shall read from the top to the bottom.

5.5.4.4 The title of the work shall be printed in gold letters on the front cover of the bound volume.

6. **Graduation Requirements**

To qualify for the award of a Master's degree, a student must have:

- (i) successfully completed 30-36 credit hours,
- (ii) obtained a minimum cumulative grade-point average (CGPA) of 2.6, and
- (iii) satisfactorily completed all the required coursework and dissertation.

7. **Classification of Degree**

The MSc degree shall not be classified.

8. **Publication of Results and Award of Degree**

8.1 The final decision on the award of the master's degree shall be made by Senate on the recommendation of the Faculty Board of Examiners.

8.2 Results shall be published and degrees awarded in accordance with provisions of the General Academic Regulations.

9. **The MSc Curriculum**

9.1 All MSc students must accumulate at least eighteen (18) credit hours of graduate level courses.

9.2 Following is a list of all courses for the MSc programmes.

Key to the codes

ACP 501

A = Agriculture and Natural Resources Faculty

CP = Crop Production Course

5 = MSc Level

01 = Course Number

9.2.1 **Coursework for MSc in Agribusiness**

Code	Core Course	Credits
AEC 500	Dissertation	12
MBA 503	Quantitative Methods	3

AEC 501	Research Methods	3
AEC 502	Agribusiness Strategy and Policy	3
AEC 503	Agricultural Industrial Project Design	3
AEC 504	Food Systems Seminar	3
MAC 501	Financial Accounting	3
MAC 502	Financial Management	3
MMS 503	Marketing Management	3
	Total	36

9.2.2 Coursework for MSc in Agricultural Economics

Code	Core Course	Credits
AEC 500	Dissertation	12
MEC 504	International Trade and Finance	3
MEC 503	Development Economics	3
MMS 503	Marketing Management	3
MBA 503	Quantitative Methods	3
AEC 506	Advanced Agricultural Policy Analysis	3
AEC 505	Applied Econometrics	3
AEC 502	Agribusiness Strategy and Policy	3
AEC 501	Research Methods	3
	Total	36

AEC 500 Dissertation (12 Credit hours)

Each student will conduct a research project as approved by the Faculty and submit a dissertation by the end of the second academic year.

MBA 503 Quantitative Methods (3 Credit hours)

Problem identification and formulation; problem solving using an appropriate tool (quantitative methods learned). It introduces the more important quantitative methods available to assist in managerial decision-making and places emphasis on the practical application of the various methods and use of information generated.

AEC 501 Research Methods (3 Credit hours)

Formulation of a research proposal from problem statement to final project will be covered. Emphasis is on primary and secondary research, report writing, presentation techniques and skills. Use of visual materials, references and biographies are reviewed. Oral and written presentations are required. Data collection procedures, survey methods and statistical applications of data on SPSS.

AEC 502 Agribusiness Strategy and Policy (3 Credit hours)

Formulation of competitive strategy from the perspective of the agribusiness manager. Integrates knowledge from functional areas such as finance, marketing, operations management and organizational theory. Industry and competitive analysis and critical success factor analysis applied to agro-industrial environments. Business and corporate strategy issues are addressed.

AEC 503 Applied Econometrics (3 Credit hours)

Regression theory, econometric analysis of supply and demand, price forecasting, time series analysis and dynamic forecasting. Applications from developing world settings will be stressed.

AEC 504 Advanced Agricultural Policy Analysis (3 Credit hours)

Analysis of macro-economic policies in relationship to trade liberalization, marketing and price-decontrol, agricultural production and marketing structures, agrarian reform, and extension and research. The changing impacts of IMF and World Bank Structural Adjustment Programmes.

MAC 501 Financial Accounting (3 Credit hours)

Basic accounting concepts, inventory models, financial statements analysis, cashflow statements, cost systems, cost behaviour, and cost-volume-profit analysis, profit reporting for management analysis, budgeting and cost management.

MAC 502 Financial Management (3 Credit hours)

The role of finance, sources of finance, cost of capital, capital budgeting, financial forecasting and planning, risk analysis, working capital dividend and bonus policy, taxation, financial ratios, appraisal of firms, and financial restructuring.

MMS 503 Marketing Management (3 Credit hours)

Marketing concept and philosophy, monitoring and responding to changes and differences in marketing information, marketing of services, and strategic planning and management of the marketing function of pricing, promotion, product and service offerings and physical distribution.

MMS 507 International Marketing (3 Credit hours)

Marketing in a global world. Effects of competition in the global market place affects both multinational corporations and local businesses. Planning, organizing, and implementing marketing ventures across cultural boundaries. Entering markets, standardizing offerings, adapting offerings to local conditions and managing and integrating global marketing operations are the major topics addressed.

MEC 504 International Trade and Finance (3 Credit hours)

Notions of International Trade Relations and Policy will be covered without necessarily dipping into the theoretical underpinning of the discipline. In this regard, Trade theory and BOP issues will be covered in non-technical fashion.

MEC 503 Development Economics (3 Credit hours)

The focus of the course is mainly on topics such as poverty, inequality, unemployment, population growth, environmental decay, and rural stagnation. It discusses essential principles and concepts of Economics relevant to the analysis of development problems in Third World nations.

MPA 501 Policy Analysis (3 Credit hours)

The importance of public policy in Africa. Theories of public policy, public policy actors, formulation, implementation and evaluation of public policy, cost benefit analysis, role of bureaucrats, ethics and morality in public policy. Case studies of public policy in African countries.

MPA 502 Issues in Public Sector Management (3 Credit hours)

Contemporary issues in public sector management in Africa. Public finance, structure of budget, public debt management, globalization, regionalisation and the new World Economic order. International Aid and Development; Good governance; the rule of law; human rights; ethics and morality; structural adjustment; commercialization and privatization and the Civil Service Reform.

9.2.3 Coursework for MSc in Horticulture

Code	Core Course	Credits
AHC 500	Dissertation	12
AHC 501	Biostatistics	3
AHC 502	Horticultural Crop Improvement	3
AHC 503	Ornamental Horticulture and Landscaping	3
AHC 504	Postharvest Technology of Fruit, Flowers and Vegetables	2
AHC 505	Pomology	2
AHC 506	Olericulture	2
	Electives	9
	Total	36

9.2.4 Coursework for MSc in Crop Production

Code	Core Course	Credits
ACP 500	Dissertation	12
ACP 501	Biostatistics	3

ACP 502	Advanced Plant Pathology	3
ACP 503	Weed Ecology and Management	3
ACP 504	Insect Pest Management	3
ACP 505	Crop Production	3
ACP 506	Crop Improvement	3
ACP 507	Soil Fertility Management	3
AAE 506	Irrigation Agronomy	3
	Total	36

AHC 500 Dissertation (12 Credits hours)

Each student will conduct a research project as approved by the Faculty and submit a dissertation by the end of the second academic year.

AHC 502 Horticultural Crop Improvement (3 Credit hours)

Concepts of genetics and principles of plant breeding. Breeding programmes for the improvement of horticultural crops. Biotechnology principles and their application in horticulture; socio-economic, environmental and ethical issues.

AHC 503 Ornamental Horticulture and Landscaping (3 Credit hours)

Design principles and methodologies of landscaping. Importance of ornamental horticulture. Classification of ornamental plants. Layout and maintenance of home and public gardens. Propagation, nutrition and care of ornamental plants and lawn. Growing of economic flowering plants like Roses, Proteas, Chrysanthemum, Orchids and carnations.

AHC 504 Postharvest Technology of Fruits, Flowers and Vegetables (2 Credit hours)

Theoretical and applied aspects of methods used for enhancing the quality and shelf-life of harvested fruits and vegetables. Quality determination. Grades and standards. Marketing systems. Factors affecting the longevity of produce and technology used to control these factors and reduce deterioration of produce between harvest and consumption/processing to be emphasized.

AHC 505 Pomology (2 Credit hours)

Climatic adaptation of tropical, subtropical and deciduous fruits. Orchard planning and management. Tree nutrition and physiology. Special techniques for regulating flowering and fruiting. Cultivation details of fruit crops: varieties, origin, climate and soil requirements, propagation methods, planting and early care of orchards, fertilization/fertigation, intercultural operations, pests and pest control.

AHC 506 Vegetable Production – Olericulture (2 Credit hours)

Vegetables in human diet. Vegetable growing; new techniques and research. Planning commercial enterprises. Taxonomy, importance, cultivars and cultural practices of the

important groups like Cole groups, solanaceae, alliaceae, libiaceae, curcubitaceae, legumes, compositae, cheropodiaceae, umbelliferae, malvaceae and poaceae.

ACP 500 Dissertation (12 Credits hours)

Each student will conduct a research project as approved by the Faculty and submit a dissertation by the end of the second academic year.

ACP 501 Biostatistics (3 Credit hours)

Experimental design, data analyses and interpretation; randomization, replication, factorial experiments, design selection, analysis of variance, estimation and comparisons of treatment means. Regression techniques; linear regression and correlation, multiple regression. Combined experiments.

ACP 502 Advanced Plant Pathology (3 Credit hours)

Classification of plant diseases. Parasites and disease development. The disease cycle; effects of pathogen on plant physiological function, plants defence mechanisms. Plant disease epidemiology. Specific plant diseases caused by fungi, viruses, bacteria, nematodes, and their control. Application of biotechnology in plant pathology.

ACP 503 Weed Ecology and Management (3 Credit hours)

Weeds in agro-ecosystem. Ecological survey of principal weeds. Crop-weed interaction. Allelopathy. Noxious weeds. Control of weeds. Herbicides: classification, mechanism and mode of action, effect on soil, microbes, growth and nutrition of plants. Adjuvants and herbicide protectants. Integrated weed management in cropping systems.

ACP 504 Insect Pest Management (3 Credit hours)

Integrated pest management; economic injury and threshold levels. Ecological aspects of pest management. Pest incidence and management. Crop resistance and biological management of pests in IPM. Insecticides in IPM. Uses of attractants and repellents in IPM. Pest management in selected crops.

ACP 505 Advanced Crop Production (3 Credit hours)

Principles of crop production. Physiological basis of crop yield. Modelling and prediction of crop responses to environmental change. Strategies for dealing with crop production in the changed environment. Microclimate and crop production systems. Sustainable systems of crop production; permaculture and organic farming. Cropping systems.

ACP 506 Crop Improvement (3 Credit hours)

Qualitative and quantitative genetics. Methods of breeding self- and cross-pollinated crop plants. Breeding for resistance and tolerance to biotic and abiotic stresses. Development of new crops and cultivars using recombinant DNA technology; socio-economic, environmental and ethical issues. Agro-biodiversity conservation.

ACP 507 Advanced Soil Fertility Management (3 Credit hours)

Soil fertility concepts. Organic matter, animal manures and chemical fertilizers. Major and trace elements. Soil pH and liming. Fertilizer choice and application. Diagnosis of soil fertility problems. Design and layout of fertilizer trials. Fertility maintenance and soil management. Fertility aspects of specific important African soils.

7.2.5 Coursework for MSc in Animal Science

Code	Core Course	Credits
AAS 500	Dissertation	12
AAS 501	Nutritional Physiology and Metabolism	3
AAS 502	Advanced Quantitative Genetics	3
ACP 501	Biostatistics	3
AAS 503	Principles and Methods in Animal Physiology	3
AAS 50	Microbial Ecology and Forage Chemistry	3
AAS 507	Principles in Rangeland Management	3
MMS 504	Entrepreneurship and Small Business Management	3
	Sub Total	33
	Electives (At least 3 Credit hours)	
	Total Credit Hours	36
	<i>Electives</i>	
AAS 505	Meat Science and Technology	3
AAS 506	Livestock and the Environment	3

AAS 500 Dissertation (12 Credit hours)

Each student will conduct a research project as approved by the Faculty and submit a dissertation by the end of the second academic year.

AAS 501 Nutritional Physiology and Metabolism (3 Credit hours)

Current topics in comparative animal nutrition. Poultry and swine nutrition. Digestion and metabolism in the ruminant. Techniques in animal nutrition research. Biotechnology in Feed industry; biological additives, novel applications, ethical issues. Modeling ruminant digestion and metabolism.

AAS 502 Advanced Quantitative Genetics (3 Credit hours)

Population and quantitative genetics. Linear Models. Model building. Estimation of variance components; Henderson's methods 1,2,3 and 4, Maximum likelihood, restricted maximum likelihood, MIVQUE, MINQUE. Selection index theory; models for predicting breeding values and genetic progress. Breeding goals, plans and strategies.

AAS 503 Principles and Methods in Animal Physiology (3 Credit hours)

Reproductive Physiology. Physiology of lactation. Growth Physiology. Behavioural dynamics. Endocrinology; vertebrate endocrine system, physiological roles of hormones. Methodologies for measuring hormones in biological fluids. General mechanisms of hormone action. Classes of hormones. Hormones and sex differentiation. Immunology.

AAS 504 Microbial Ecology and Forage Chemistry (3 Credit hours)

Phytochemistry of grass and forage crops. Classification of microbes. Rumen microbes and protozoa: metabolism of carbohydrates, proteins, lipids. Methods of defaunation and management of defaunated animals. Genetic manipulation of microbes; feed additives. Pathological conditions in ruminants. Silage microbiology.

AAS 505 Meat Science and Technology (4 Credit hours)

Meat in society. Muscle biology and meat quality. Raw and cooked meat products and meat technology. Integrated quality control and modern meat inspection. Evaluation of current meat inspection and grading procedures. Evaluation and use of slaughter by-products. Sensory research and consumer acceptance. Research developments in meat science ; PIGMAP.

AAS 506 Livestock and the Environment (3 Credit hours)

Environmental physiology. Physical environmental variables. Regulation of body temperature in homeotherms. Environmental effects on animal production and reproduction; immune response, livestock pathology and carcass quality, Livestock housing and transport. Environmental contamination, measurement and control; soil, air and water pollution.

AAS 507 Principles in Rangeland Management (3 Credit hours)

Rangeland productivity. Savanna ecosystems. Evaluation of range resources; case studies from Africa. Range animal production systems. Range resource management; common and private property management. Range degradation; causes, indicators, effects and rehabilitation, Range management tools.

MMS 504 Entrepreneurship and Small Business Management (3 Credit hours)

The course will examine the concept of entrepreneurship, its roles in the contemporary African Environment, identifying and analyzing market opportunities, sourcing for finance, planning for business, basic marketing skills and small business management skills. The problems of entrepreneurs and small to medium-sized enterprises will be analyzed in an effort to suggest ways of overcoming them and awaken the entrepreneurial spirit in students.

7.2.6 Coursework for MSc in Irrigation and Water Management

Code	Core Course	Credits
AAE 500	Dissertation	12
AAE 501	Information Systems	2
AAE 502	Hydrology and Water Resources	3
AAE 503	Hydraulics	3
AAE 504	Soil Water Relations and Soil Physics	3
AAE 505	Economics and Socio-Economics of Water	2
AAE 506	Irrigation Agronomy	3
AAE 507	Irrigation Engineering	3
AAE 508	Integrated Water Resources Planning and Analysis	3
AAE 509	Soil Conservation, Management and Reclamation	2
	Total	36

AAE 500 Dissertation (12 Credit hours)

Each student will conduct a research project as approved by the Faculty and submit a dissertation by the end of the second academic year.

AAE 501 Information Systems (2 Credit hours)

Types of satellites; physics of remote sensing; satellite orbits, atmospheric radiation, spectral channels, temporal and spatial resolution; remote sensing instruments. Image processing, interpretation and processing software. Applications of remote sensing data. Database management systems. Geographic information systems.

AAE 502 Hydrology and Water Resources (3 Credit hours)

Hydrological cycle. Statistical concepts. Precipitation. Run-off; measurement, estimation and analysis. Flood routing. Ground water. Evaporation and transpiration. Predicting evapotranspiration.

AAE 503 Hydraulics (3 Credit hours)

Properties of fluids. Hydrostatics. Fluids in motion. Flow in pipes. Uniform flow in channels. Empirical formulae, best hydraulic section, enclosed conduits; Non-uniform flow in channels. Specific energy, critical depth, Froude number, hydraulic jump; Hydraulic structures. Water level and discharge control. Pumps. Hydraulic models.

AAE 504 Soil Water Relations and Soil Physics (3 Credit hours)

Soil water. Plant Water Relations. Plant water potential and transport. Soil physics and water movement. Infiltration. Soil water measurement; tensiometry, resistance blocks, Neutron probe, lysimetry. Crop water requirements. Evapotranspiration, measurement, estimation.

AAE 505 Economics and Socio-economics of Water (2 Credit hours)

Social approaches to IWRM. Socio-economic aspects. Models of social planning. Socio-cultural aspects of water. Economic aspects of water use. Resource valuation and pricing. Economic theory of decision making. Gender and equity. Natural resource management approaches. Natural disasters. Institutions in development, stakeholders, government, NGOs. Capacity building.

AAE 506 Irrigation Agronomy (3 Credit hours)

Agricultural benefits of irrigation; alternatives to irrigation. Crop and project water requirements. Theory energy balance and aerodynamic methods. Practice, design and management of irrigation projects. Irrigation agronomy experiments. Irrigation scheduling theory and practice. Crop responses to water stress. Irrigation of selected crops.

AAE 507 Irrigation Engineering (3 Credit hours)

Irrigation and agricultural development. Irrigation systems. Scheme water requirements. Crop water use. Irrigation canals. Hydraulic control structures. Water level and discharge control. Irrigation systems design. On-farm water management. Surface irrigation. Sprinkler irrigation. Trickle irrigation.

AAE 508 Integrated Water Resources Planning and Analysis (3 Credit hours)

IWRM principles; definitions, terms, concepts and tools. Water using activities, and water users; agriculture, industry, energy generation. Water quality. Water supply; management, policies and laws. Catchment management. Value of water/water pricing. Problem analysis. Research and development.

AAE 509 Soil Conservation, Management and Reclamation (2 Credit hours)

Saline and alkali soils. Cropping and soil problems. Acid sulfate soils; formation, occurrence, identification, management and reclamation. Peats and marine sediments.

Swelling and shrinking soils. Weak structured soils. Soil conservation/mechanization/drainage interactions. Field layouts and management techniques.

7.2.7 Coursework for MSc in Wildlife Management

Code	Core Course	Credits
AWL 500	Dissertation	12
AWL 501	Research Methods	3
AWL 502	Advanced Biostatistics	3
AWL 503	Graduate Seminar	3
AWL 504	Advanced Wildlife Physiology and Nutrition	3
AWL 505	Human and Social Dimensions of Wildlife and Park Management	3
AWL 506	Wildlife Management Planning	3
	Electives	6
	Total	36
	<i>Electives</i>	
AWL 507	African Plant and Wildlife Community Ecology	3
AWL 508	Advanced Population Dynamics and Analysis	3
AWL 509	Environmental Interpretative Methods	3
AWL 510	Ethoecology	3

AWL 500 Dissertation (12 Credit hours)

Each student will conduct a research project as approved by the Faculty and submit a dissertation by the end of the second academic year.

AWL 501 Research Methods (3 Credit hours)

Wildlife research techniques; experimental design, data recording, analyses and presentation. Sampling wildlife population and habitats; quadrat, line intercept, line transect, mark recapture, aerial survey, home range and movement. Case studies of wildlife research projects in Africa and elsewhere.

AWL 502 Advanced Biostatistics (3 Credit hours)

Linear and multiple regression; log linear models; analysis of variance; disjunct analysis; factor analysis; use of computers for data analysis.

AWL 503 Graduate Seminar (3 Credit hours)

Contemporary issues concerning philosophy, management and research problems of wildlife; presentation of individual studies on assigned topics.

AWL 504 Advanced Wildlife Physiology and Nutrition (3 Credit hours)

Cell, tissue and organ function in animals. Structure, production and action of hormones in animals. Physiological responses of animals to natural and extreme changes of physical environment. Energy, nitrogen and mineral nutrition of wildlife; nutrient requirements for various body function.

AWL 505 Human and Social Dimensions of Wildlife and Park Management (3 Credit hours)

Public attitudes towards wildlife; environmental ethics; philosophy and thinking of important wildlife conservationists. Public involvement in wildlife management; personnel management, supervision and leadership; use of questionnaires. Case studies in the human dimensions of wildlife management.

AWL 506 Wildlife Management Planning (3 Credit hours)

Principles and methods for developing comprehensive wildlife management plans; strategic and operational planning.

AWL 507 African Plant and Wildlife Community Ecology (3 Credit hours)

Structure, composition and dynamics of African plant wildlife communities; dominant flora and fauna of major communities. Influence of plant communities on social organizations of animals.

AWL 508 Advanced Population Dynamics and Analysis (3 Credit hours)

Quantitative analysis of vital statistics and mechanisms promoting stability and fluctuations in wildlife population; evaluation of wildlife habitat, diet, harvest, population density, natality; survival and mortality. Development and application of population models to wildlife management. Population and genetic aspects of conservation biology.

AWL 509 Environmental Interpretative Methods (3 Credit hours)

Communication skills for interpreter, naturalists, tour guides, wildlife biologists and managers to various public. Methods of influencing public opinion; conduct of public meetings.

AWL 510 Ethoecology (3 Credit hours)

Relationship of Behavioural patterns of animal species to the environment; mating systems; intraspecific and interspecific interactions, social organization, spatial and habitat requirements; implications for management.

Special Regulations for the Degrees of Master of Philosophy (MPhil) in the Faculty of Agriculture And Natural Resources**1. Preamble**

- 1.1 **These regulations should be read in conjunction with the General Academic Regulations for Graduate Degree Programmes.**
- 1.2 The Senate shall be the final authority for the interpretation of these regulations.
- 1.3 The Senate has the power to exempt any student from any of these regulations.

2. General Provisions

- a) The MPhil degree is a graduate degree carried out primarily through supervised research. A student may be required to undertake and pass some coursework in order to enhance his/her research studies, provided that such coursework shall not exceed three (3) courses.
- b) Studies may be pursued on a full-time or on a part-time basis.
- c) Fields of study for research are Agribusiness, Agricultural Economics, Crop Production, Animal Science, Forestry, Horticulture, Irrigation, Water Management, Wildlife Management and Natural Resources.
- d) All prospective graduate students shall be expected to demonstrate proficiency in English in order to pursue their studies at Africa University.

3. Entry Requirements

Applicants may be considered who hold a:

- 1) BSc Agriculture and/or Natural Resources or equivalent Honours degree in the **First** or **Upper second** class division;
- 2) BSc Agriculture and/or Natural Resources or equivalent Honours degree in the **Lower second** class division provided performance in the intended subject of study was **B grade** or above.
- 3) General BSc Agriculture and/or Natural Resources or equivalent degree provided that a grade of **B** or above was attained in the intended subject of study;
- 4) Other approved equivalent qualifications and have at least three years relevant experience.
- 5) Applicants may be required to pass a University qualifying examination.

4. Submission of Applications for Admission

- a) Applications must be submitted on the official forms. With the forms, the applicant must submit evidence of his/her qualification and a brief outline of the proposed research of between 300 and 1200 words in length.
- b) Applications can be submitted at any time.
- c) Applications shall be processed through the office of the Assistant Registrar (Academic Affairs).

- d) Decisions on the applications shall be made by the Senate on the recommendation of the Faculty Board.
- e) Applicants will be notified of the result of their application by the Assistant Registrar (Academic Affairs).
- f) Successful applicants should then proceed with registration within one calendar year from the date of the application's approval. Any registration for MPhil not taken up within a calendar year will lapse and the student has to re-apply.

5. **Registration**

- a) The applicant must complete the necessary registration formalities and pay appropriate fees before registration for MPhil is effected.
- b) Retro-active registration will normally not be allowed.
- c) Transfer of registration to an MPhil at Africa University from another recognized graduate level programme may be considered by the Faculty Board on the production of official documentation and references.
- d) A graduate student may receive a financial award from outside the University, provided that the conditions of the grant do not compromise academic freedom and that no conditions are placed on the presentation of the thesis or its deposition in the University library for public reference.
- e) A student registered may apply through the Faculty to carry out research for the MPhil at an outside institution provided that:
 - (i) facilities at the institution are suitable for the research
 - (ii) proposed,
 - (iii) the location of the institution allows easy contact between the student and Africa University,
 - (iv) except with the agreement of Senate, no restriction is placed by the authorities of the institution or laboratory concerned upon presentation of a thesis resulting from the candidate's work, or upon its deposition in the University Library for public reference, and
 - (v) the applicant satisfies all other conditions in the General Academic Regulations.

6. **Duration of Programmes**

a) **Master of Philosophy Degree**

The duration of the Master of Philosophy programmes shall normally be:

Full-time	-	1.5 to 2 years 3 years (maximum)
Part-time	-	3 years 5 years (maximum)

7. Programme of Study

- a) Each student shall be required to pursue a prescribed research programme under the guidance of a supervisor who shall be a member of staff.
- b) Each student shall maintain a regular contact with the Faculty and shall be required to present seminars as directed by the supervisor.
- c) A student may be allowed to suspend registration for a maximum period of one year on the approval of Senate, after a recommendation from the Faculty Board.
- d) A full-time graduate student may be hired to work within the University, provided that the maximum number of hours does not exceed six per week.
- e) A graduate student who is employed outside the University or a staff member on full-time employment can only be registered on a part-time basis.

8. Supervision

- a) A supervisor, who shall be a member of staff of the appropriate discipline, shall be appointed by the Dean of Faculty on the recommendation of the Faculty Board.
- b) Where a student is carrying out a major part of his/her research in another institution or where the University does not possess expertise in the area of research being carried out, an additional external supervisor(s) may be appointed from outside the University.
- c) In exceptional circumstances, a change of supervisor may be necessary. In such cases, the Faculty Board may nominate a new supervisor for appointment by the Dean.
- d) The supervisor shall report on each student's progress every six months to GSC through the Faculty Board.

9. Thesis

- a) **Submission of a Title and Abstract**
The title and a provisional abstract of about 500 words must be submitted, through the Faculty to GSC at least six months before the submission of the thesis.
- b) **Format and Content of the Thesis**
The content and format of presentation of the thesis shall be as prescribed in the General Regulations for MPhil .
 - i) **Language:** The Thesis must be written in English.
 - ii) **Originality and Scholarship:**
An acceptable MPhil thesis must provide evidence that the candidate has mastered relevant research techniques, has shown scholarship, has developed a capacity for criticism of his/her own work and other work, and

- has widened his/her knowledge and understanding of literature in his/her subject of study.
- iii) Length of the thesis: The thesis presented for an MPhil degree should be in the range of 20 000 to 40 000 words.
 - iv) Declarations: In the preface to the thesis the candidate must declare “This thesis is my original work except where sources have been acknowledged, and that the work has never been submitted nor will it be submitted to any university for an award”.
 - v) Copyright: The thesis shall contain a statement of copyright by the author as follows: “No part of this Thesis may be reproduced, stored in any retrieval system, or transmitted in any form or by any means without prior written permission of the author or, for scholarly purposes, by Africa University on the author’s behalf”
 - vi) The Title page: The title page must include the title of the thesis, the author’s name, the supervisor’s name, the degree, the date of submission or re-submission, the name of the Department/Faculty and University. The title page should also include a declaration that the thesis is in fulfilment of the degree requirement. All the above must be in capital letters.
 - vii) Abstract: There shall be an abstract of not more than 500 words. It should highlight the essential points of the thesis
 - viii) Other aspects of format
 1. Line spacing: The thesis must be typed and double-spaced in font size 12 Times New Roman. Only the abstract, quotations, footnotes and endnotes should be single- spaced.
 2. Paper size The size of paper used should be A4 except for maps and illustrations, which can be any size.
 3. Margins: The left hand margin must be 4.0 cm from the left edge of the paper, the right hand margin 2.5 cm from the right edge, the top margin 2.5 cm from the top of the page and the bottom margin 4.0 cm from the bottom of the paper.
 4. Pagination: Paginate the preliminaries (portions preceding the introduction) in lower case Roman numerals (i.e., “i”, “ii”, etc) beginning with the title page, abstract, declaration, copyright page, acknowledgement, dedication (if any), table of contents, list of tables, list of figures and list of appendices, in that order. Number pages of the body of the thesis in Arabic numerals (i.e., “1”, “2”, etc) consecutively throughout. The page numbers should appear at the centre of the lower margin.
 5. Table of contents: The table of contents should correspond to the headings and sub-headings in the thesis, referring to specific pages. If there are tables, or figures or appendices, these should be listed in the order in which they appear in the thesis.

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6. Reference citation: Consult the Faculty for specific guide lines.
 7. The thesis submitted for examination purposes shall be loose-bound (three copies) within a suitable cover.
 8. Format: The final copy of the thesis submitted after successful completion of the examination must have the following format: buckram binding or cloth overcast; edges uncut; lettered boldly down the spine in gold and should be from 5 mm to 10 mm in size indicating NAME, DEGREE and YEAR, in that order.
 9. The candidate must also submit a Flash disk containing the thesis. The disk shall be labelled with the NAME, DEGREE, YEAR and SOFTWARE PACKAGE USED, in that order.
- c) Thesis Examination
- i) **Submission of Thesis for Examination**
 1. Application for examination of the thesis must be made on an appropriate form obtained from the office of the Assistant Registrar (Academic Affairs).
 2. The completed application form together with three loose-bound copies of the thesis must be submitted to the Dean of the Faculty.
 - ii) **Appointment of Examiners**

There shall be **two** examiners which at least one must be external. The examiners shall be appointed by Senate on the recommendation of the Faculty Board.
 - iii) **Panel and Board of Examiners**

The Panel and Board of examiners, degree, shall be chaired by the Chairperson of the Graduate Studies Committee, and shall consist of not less than four persons selected from the following:

 - Appointee of the Dean
 - Head of Department/Co-ordinator
 - Supervisor(s)
 - **Internal examiner(s)**
 - External examiner(s).
 - iv) **Examination and determination of candidate's results**
 1. The external examiner(s) and internal examiner(s), after reading the thesis critically, are expected to submit independently written reports to the Dean of the faculty concerned. Each examiner shall be required to summarize his/her report about the thesis with definite recommendation for **one** of the following:
 - 1.1 the degree be awarded to the candidate unconditionally;
 - 1.2 the degree be awarded subject to typographical corrections/ minor revisions (referred for minor correction);

- 1.3 the degree be not awarded but the candidate be allowed to revise and resubmit the thesis for re-examination (referred for major modification);
 - 1.4 the thesis be rejected outright.
The examiners shall be required to submit their reports about the thesis within a maximum period of three months from the date of receipt. If the reports are not received within three months, new examiners may be appointed.
2. The Board of Examiners shall consider reports of examiners. If there is a conflict between the reports of the examiners the Board of Examiners may appoint an additional examiner.
 3. The Panel of examiners shall test the candidate orally. In the oral examination, the candidate will be assessed principally on the merits of his/her thesis, but questions may also be asked to test general knowledge of the subject. The oral examination shall be assessed on a pass or fail basis.
 4. After the oral examination, the Chairperson of the Graduate Studies Committee shall immediately convene a Board of Examiners meeting and decide whether the candidate passes or fails and make an appropriate recommendation to Senate.
 5. A candidate who fails the oral examination may be given an opportunity to present himself/herself again after six months.
 6. In very exceptional circumstances, the Board of Examiners may require further examination through written papers or practical examinations or both.
 7. After the examination(s) the Dean of Faculty will retrieve the loose-bound copies of the thesis and reports from the examiners.
 8. A thesis referred for minor amendment shall be submitted to the internal examiner, who shall certify that all the corrections have been made.
 9. A thesis that is referred for major amendments must be re-submitted within a period of six months to one year.

10. **Classification of the Degree**

The MPhil degree shall not be classified.

11. **Notification of Results And Award of Degree**

- i. A candidate will be notified of his/her examination results by the Registrar, after the report from the Board of Examiners has been approved by Senate.
- ii. A graduate student has the right to appeal to Senate on decisions taken under these regulations provided that such appeal is lodged within three months from the notification of the results.

12. Lodgement And Distribution of the Thesis

- i. The student will be required to submit, to the Dean, three bound copies of the thesis and a diskette within three months after examination results.
- ii. After receiving the bound thesis, the Dean of the Faculty will deposit one copy and the diskette to the Library, the second copy in the Department concerned, and the third copy to the Supervisor.
- iii. The thesis deposited in the Library will be open to public reference, but not taken away on loan.