SCHOOL OF AGRICULTURAL SCIENCES

Animal Science

Plant Science

Food Science & Nutrition

Agricultural Economics & Extension

Soil Science

School Handbook – 2020

Contents

1. INTRODUCTION

The School of Agricultural Sciences was established in 1971 at the Great East Road Campus of the University of Zambia in Lusaka.

The School offers undergraduate majors of five-year duration leading to the Degree Bachelor of Agricultural Sciences (Agricultural Economics, Agricultural Extension, Animal Science, Plant Science and Soil Science), Bachelor of Food Science and Technology and, Bachelor of Human Nutrition

The School offers four Master of Science programmes of two-year duration in Agronomy (with the option to specialize in either Crop Science or Soil Science), Animal Science, Agricultural Economics, Integrated Soil Fertility Management and Human Nutrition. The Crop Science option has been developed into a SADC Regional MSc. programme training students from the SADC region.

Students following the undergraduate programme do their first year in the School of Natural Sciences where they follow basic courses in biology, chemistry, physics and mathematics. The School also enrols students with relevant Diplomas at second year level. In the second year, they follow introductory courses in agricultural sciences. At the end of the second year they choose to follow any one of the five undergraduate majors being offered. In addition they do a minimum of 30 weeks of vacation practical which include a research project before they graduate. This is intended to enable students gain some practical farming skills and to expose them to the rural community for which they are being trained to serve.

Students following the postgraduate programmes spend their first year taking courses which they have to pass before proceeding to the second year. The second year is entirely devoted to thesis research and writing.

The teaching staff of the School is actively engaged in research projects which are directed at answering some of the problems facing agriculture in Zambia. In addition, the staff performs public services in various areas of national development. These efforts constitute one of the School's major contributions towards the University's motto of Service and Excellence.

In 1990 the School developed an in-service training programme in nine areas: Principles and practices of animal nutrition, Beef and dairy production, Project planning and appraisal, Practical experimental design and statistical analysis, Crop protection principles and interpretation, Soil and plant analysis and interpretation, Principles and practices of land husbandry for sustainable agricultural production, Principles and practices of drought alleviation, and Micro computer applications in business. The main objective of the courses is to update the participants with new developments in their disciplines and improve their practical skills. These courses have been institutionalised in the core activities of the School and are offered during vacation periods.

2. HISTORICAL NOTE

The first students were registered in the School of Agricultural Sciences in 1968, but it was not until 1971 that the School was established as a separate entity at the Great East Road Campus in Lusaka. Even at the time of its establishment, there were plans to develop the School by integrating into the University the Natural Resources Development College and locating there a greatly enlarged School of Agricultural Sciences. Steps were being taken to implement these plans but these were over-taken in 1975 by a decision to re-constitute the University on a federal basis, with constituent institutions in Lusaka, Ndola and at a rural location in Solwezi District. It was decided that in the newly organised University, the School of Agricultural Sciences, together with the Schools of Veterinary Medicine and Forestry, would be located in Solwezi District.

However, due to the deteriorating economic situation it was not possible to proceed at once with developments in Solwezi District. Moreover, an analysis of agricultural and environmental factors at Solwezi District revealed that this would not be a suitable location for regular undergraduate programmes in Veterinary Medicine and Agricultural Sciences. Hence, without prejudice to eventual developments in Solwezi District it was decided in 1980 that these two Schools should be developed in Lusaka as an integral part of the University of Zambia at the Great East Road Campus.

Following this decision construction of Phase I of the School building started in January 1984. It was completed in January 1987. This Phase consists of five teaching laboratories, two classrooms, two sets of research laboratories, ancillary rooms and offices for the Departments of Crop Science and Soil Science. It also accommodates the School administration offices. Phase II is yet to be developed for lack of resources at present.
Phase II is meant to contain three teaching laboratories, three classrooms, an audio visual workroom, one set of research laboratories, specialist rooms and offices for the Departments of Animal Science and Agricultural Economics and Extension Education as well as some centralised facilities.

The University Farm, commonly referred to as Liempe Farm, was officially acquired by the University as a gift from the then Project Division of the Ministry of Rural Development on 1st August 1976. The farm has over the years served as a production, teaching and research facility for the School.

3. OBJECTIVES AND MISSION OF THE SCHOOL OF AGRICULTURAL SCIENCES

The University of Zambia Strategic Plan for the period 2018-2022 presents the objectives and mission of the School as follows:

a) To commence the degree programme in Food Science and Technology, the student intake being drawn from the regular School quota;
b) To develop, in conjunction with the School of Natural Sciences, mathematics and science clinics for its students in Years One and Two. This is necessary to reduce the attrition rate, and thereby raise the enrolments in Years Two to Five to between 45 and 50 students;
c) To increase the proportion of female students in all years;
d) To phase out the Agricultural Engineering specialisation in view of a relevant degree programme in the School of Engineering;
e) To offer short-duration in-service courses of two to six weeks for agricultural and extension personnel;
f) To develop multi-disciplinary research projects;
g) To further develop consultancy services, including contract research;

h) To conduct needs surveys and, if appropriate, mobilise resources for the construction in the subsequent plan period of Phases II of the School.

The attainment of the objectives outlined above will contribute to a more cost-effective use of staff and other resources. At the same time, the School will, by a review of its curriculum, reduce the number of specialisations since enrolments will not rise during the plan period.

4. OFFICERS OF THE UNIVERSITY

4.1 Central Administration

CHANCELLOR	Dr. Jacob M. Mwanza MA, Ph. D
CHAIRMAN OF THE COUNCIL	Ms. Namuchana C. Musiwa
VICE CHANCELLOR	Prof. Luke E. Mumba PhD (Cambridge), M.Sc. (Wales), B.Sc. (UNZA
DEPUTY VICE CHANCELLOR	Dr Tamala T. Kambikambi, PhD
REGISTRAR	Mr. Sitali Wamundila BALis, BA (Hons) MA
LIBRARIAN	Ms. Christine W. Kanyengo MLIS, BALIS
BURSAR	Mr. Arnold Kapambwe
DEAN OF STUDENTS AFFAIRS	Dr. Mwanza

4.2 Deans of Schools

AGRICULTURAL SCIENCES	Dr Benson H. Chishala, PhD Aberdeen, BAgricSc. UNZA
EDUCATION	Dr. Bentry Nkhata BA. Ed. Zambia M.ed (London) PhD (Virginia Tech)
ENGINEERING.	Dr. Micheal N. Mulenga MASCE FEIZ RENG
GRADUATE SCHOOL OF BUSINESS	Dr. Habazoka, PhD
HEALTH SCIENCES	Prof. E.M Nkandu, PhD (Stellenbosch), MSc (Western Cape)
HUMANITIES AND SOCIAL SCIENCES	Dr. F. Masiye, PhD Cape Town, MA,BA

LAW	Prof: Himonga Chuma PhD (London) London School of Economics and Political Sciences (London) .L.LM (Kings College, London) LLB, UNZA (Zambia)
MEDICINE	Dr. Kafumukache. PhD
MINES	Dr. B. Besa B. Mining Sciences (UNZA) M. Mining Sciences (UNZA) PhD (Curtin, Australia)
NATURAL SCIENCES	Dr Munyati, PhD , MSc, BSc,
NURSING SCIENCES	Dr. C.M Ngoma, PhD
PUBLIC HEALTH	Dr. Hikabasa Halwiindi, PhD
VETERINARY MEDICINE	Prof. King S. Nalubamba PhD Edinburgh, MVetMed, BVM

4.3 Directors

INSTITUTE FOR ECONOMIC AND SOCIAL RESEARCH	Dr. Jolly Kamwanga BA. UNZA MA. Demography, Australia PhD Health Economics and Policy, University of London.
INSTITUTE FOR DISTANCE EDUCATION	Prof. B. Namangala, PhD Brussels, MSc London, BVetMed.
DIRECTORATE OF RESEARCH AND GRADUATE STUDIES	Prof. Henry M. Sichingabula PhD (Simon Fraser), M. SC. (Simon Fraser) B.A.ED (UNZA) Dip International Trade (London)

COMPUTER CENTRE	Mr. Collins Chinyama, B. Sc. (UNZA) MSc. (UNZA)
BUSINESS DEVELOPMENT	Mr. Nkonde Nkumbu BA (UNZA), MBA

5. SCHOOL OF AGRICULTURAL SCIENCES

5.1 Deans of the School of Agricultural Sciences: 1971-Present

1971-72	Prof. M.R. Shalash
1972-74	Prof. H. Beringer
1974-76	Dr. M.A. Taha, B. Sc. Agric (London), PhD. (Nott.)
1976-78	Dr. F.A. Bailly, Dip. Agric. (Hann), Ph D. (Hann)
1978-80	Mr. J. Nsereko, BSc, MSc, Dip .Agric. (Acting)
1980-81	Dr. P.J. Mathai, PhD.
1981-83	Dr. R. Nadaaraja, B.V. Sc (Sri Lanka), MSc, PhD. (Sask.)
1983-86 (March)	Dr. Ochetim, B. Sc, M. Sc (Makerere), PhD. (Sask.)
1986-1989	Dr. W.N.M. Mwenya, B. Agric. Sc (UI' MSc (Edin.), PhD. (Illinois.), (Acting)
l989- 1998	Prof. V.R.N. Chinene, B. Agric. Sc (UNZA) (Wageningen), PhD. (Hawaii)
1999-2001	Dr. Faustin Mwape, B. Agric. Sc (UNZA), MSc. (Oklahoma), PhD (Manitoba)
2002-2004	Prof Lungu O. I. M, MSc Newcastle, PhD California, BAgricSc UNZA
2005-2010	Dr. Judith C.N. Lungu, B. Agric. Sc (UNZA), MSc. (Mass), PhD (Manitoba)
2011-2016	Dr. Mick S. Mwala B. Agric Sc (UNZA), MSc. (South Dakota), PhD (Missouri)
2017- to Present	Dr Benson Chishala, PhD Aberdeen, BAgricSc. UNZA

5.2 Office of the Dean

Dean	Dr Benson H. Chishala
Assistant Dean (Postgraduate)	Dr. Shepande Chizumba
Assistant Dean (Research)	Dr. John Shindano
Assistant Dean (Undergraduate)	Mrs. Bubala T. Hamaimbo-Mulonda
Assistant Registrar	Mrs. Mwitwa Musongole Chanshika
Management Secretary	Ms. Mercy Muntanga
Secretary I	Mrs. Cecilia K. Phiri
Senior Administrative Officer	Mr. Stephen Phiri
Accountant	Mr. Victor Njovu
Accountant Clerk	Mr. Adam Kamanga
Assistant Administrative Officer	Mr. Alfred Tembo
Sales Assistant	Ms. Caroline Mwamba
Cleaner/Messenger	Mr. Lusale C. Kanyanta
Cleaner/Messenger	Ms. Erica C. Kankonki
Driver	Mr. Kelly Sinyangwe
Driver	Mr. Augustine Phiri

5.3 Departments

5.3.1 Department of Agricultural Economics and Extension

Head of Department and Senior Lecturer	Tembo, G., PhD Oklahoma State, MSc Oklahoma State, BAgricSc UNZA
Associate Professors	Kalinda, T.H., PhD Guelph, MSc Guelph, BAgricSc UNZA
Senior Lecturer	Maimbo, F., MSc Guelph, MPhil Reading, BA UNZA Kuntashula, E., PhD Pretoria, MSc Zimbabwe, BAgricSc UNZA
Lecturers	Banda, D.J., MSc Reading, BA UNZA Likulunga, M.L., MA Wisconsin-Madison, BA UNZA Lubinda, R.K., Dip Netherlands, MBA Makerere, BScAgric (Hons) Makerere

	Nkonde, C., PhD Michigan State, MSc Purdue, BAgricSc UNZA Nhlane, R., MSc. Stellenbosch, BAgricSc UNZA
Special Research Fellows	Hamukwala, P., MSc Alabama A&M, BAgricSc UNZA Mulenga, B., MSc Ohio State, BAgricSc UNZA Ng'ombe, J., MSc UNZA, BAgricSc UNZA Ngcobo, M., MSc Michigan State, BAgricSc UNZA
Staff Development Fellow	------

5.3.2 Department of Animal Science

Head of Department	Chibinga, O., PhD Nairobi, MSc Norway,
Senior Lecturers	Simbaya, J., MSc PhD Manitoba, B. Agric. Sc. Mwenya Wilson N.M., B. Agric. Sc., MSc., PhD
Lecturers	Walubita, K.M., BSc. Agric. Malawi, MSc. Edinburgh Sianangama, Pharao B. Agric. Sc., MSc., PhD PgDip Ntherlands,B. Agric. Sc Kanyinji, F., BAgricSc, Post. Grad. Dip. Netherlands, MSc Hiroshima, PhD Hiroshima Chishiba, Ashley, B. Agric. Sc. Harrison, Sylvia, B. Agric. Sc. Eva Nambeya, B. Agric. Sc Musukwa, Martha S., B. Agric. Sc., MSc. PhD
Special Research Fellows	
Staff Development Fellow	Musenge I Chimbaka, B.Agric. Sc (UNZA)

Chief Scientist	Mungili D. S, B. Agric. Sc, MSc. (UNZA)
Technicians	Annie Maliti, Dip. Science lab Tech
	Eunice Mazwarira, Dip. Agric Science
	Oscar Moonga, Dip. Animal Science
Animal Attendants	Holly Twaambo
	Emmanuel Musheke
	Proud Simweelera
	Marvin Banda
	Peter Mulenga
	James Nyafulu
	Royd Tiki

5.3.3 Department of Food Science & Nutrition

Head of Department and Lecturer:	Hachibanba, Twambo, PhD (Pretoria), MSc (Ghent), BSc (Unza)
Lecturers	Shindano, John., BSc. (Unza), MSc, PhD (Ghent), MBA (ESAMI/Maastricht)
	Moonga, H. Benard. PhD (Wageningen), MSc (Ghent), B. Agric. Sc. (Unza)
	Mkandawire, Nyambe, PhD (Nebraska), MSc, (Ghent), BSc (Unza)
	Hikeezi, Doreen, BSc., MSc (Kansas), PhD (Pretoria)
	Nyau, Vincent, BFST(Unza) MSc (Ghent/KULeuven), PhD (UCT)
	Sadoki, Aubrey, BSc. MSc. (MUCTR, Moscow)
	Mwale, Mercy M., PhD (Free State), MSc (Tuskegee), BSc (Unza)
	Chirwa, Taonga, BFST (Unza), MSc (Texas State)
	Marinda Pamela, BSc (Moi), MSc (Kenyatta), PhD (Hohenheim)
	Nthani Dorothy, BSc (Surrey), MSc (Leeds Metropolitan)

	Zgambo Mwelwa, Lukonde, B. Agric.Sc (Unza), MPH (Nutrition) Queensland Konkola, Cornelius, BFST (UNZA), MSc (KULeuven) Chiza Kumwenda, BSc (Malawi), MSc (Glasgow), PhD (Tampere) Keiron Audain, BSc, MRSc (Imperial College), PhD (KZN) Murambiwa Nyati, BFST (UNZA), MSc (Kenyatta) Nixon Miyoba, BFST (UNZA), MSc (Kenyatta) Bubala T. Hamaimbo, BFST, MSc (UNZA)
Staff Development Fellows	
Chief Scientist	Nachibanga, Ian, BSc (Unza)
Scientist	Moses Banda, BSc (Unza)
Technologist	Jereman Zulu
Technician	Barhat Chipeta, Adv Cert. Sci lab (Hone)
Laboratory Assistant	Lister K. Musonda

5.3.4 Department of Plant Science

Head of Department	Kachapulula, P. MSc Makerere, B. Agric. Sc. UNZA
Senior Lecturers	Lungu, D. M., PhD Manitoba, MSc Nebraska-Lincoln B.Agric Sc. UNZA
	Mwala, M. S., PhD Missouri, MSc South Dakata, B. Agric. Sc. UNZA
	Mataa, M., PhD, MSc Kagoshima, B Agric Sc. UNZA

	Kambikambi, T. T., PhD UNZA, MSc, B Agric Sc. UNZA
	Munyinda, K., PhD McGill, MSc USSR, MSc Reading, B. Agric Sc UCIUC
Lecturers	Ng'andu, Shirley H., MSc. USA, B. Agric. Sc.
	Sohati, P. H., PhD UNZA, MSc McGill, B Agric Sc. UNZA
	Zimba, K., MSc Rhodes, B. Agric Sc. UNZA
	Tembo, L., PhD Makerere University, MSc. Nottingham, B. Agric. Sc. UNZA
	Kamfwa, K., PhD Michigan, MSc Makerere, B. Agric.Sc, UNZA
Special Research Fellows	Banda, K., MSc Stellenbosch, B. Agric UNZA
Staff Development Fellows	Brian Mwense, B. Agric UNZA
	Silva Hamambwe, B. Agric UNZA
Chief Scientist	Tobias Alubi , MSc. Horticultural, BSc. Horticultural
	Dip. Agric
	Dip. Project Management
	Cert. in genera Agric
Technicians	Matenga Sharon, BA, Dip. In General Agric.
	Dip. In Tech Teachings
	Gorret Mulenga, BSc. Lib and PA, Cert. Management studies
	Derrick Mwape, Dip. In General, Cert. in Book keeping
	Alex Bwalya, Cert. Business Administration Management
Technologists	Sydney Mpimpa, Dip. Science Lab Tech, Advanced Cert. Science Lab, Dip. Teaching Methods

	Ngoi Chibalange, Dip. Science Tech Advanced Cert. Science Lab Tech

5.3.5 Department of Soil Science

Head of Department & Lecturer:	Yengwe, Jones, MSc Ghent, BAgricSc UNZA,
Professor	Lungu O. I. M, PhD California, MSc Newcastle, BAgricSc UNZA Chinene V.R.N, PhD Hawaii, MSc Wageningen, BAgricSc UNZA
Senior Lecturers:	Chishala, B. H., PhD Aberdeen, BAgricSc. UNZA Phiri, E., PhD Gent, MSc., B. Agric. Sc Mweetwa A.M PhD Vigenia Tech, MSc Miami, BSc Agric
Lecturers:	Shepande C, PhD (Minnesota) BSc Agric Patrice Lumumba MSc (ITC), Kaluba, Peter, BAgricSc., MSc Ghent Sinda, Mabvuso. MSc. Sokoine, BAgricSc UNZA, Miyanda, Moombe MSc Ben-Gurion, BAgricSc UNZA, Phiri, Miriam MSc UNZA, BAgricSc UNZA, Lydia M. Chabala PhD, UNZA; MSc., Sokoine University, BSc Agric, UNZA
Special Research Fellows:	Kamanga, Olipa L., MSc. Gent, BAgricSc. UNZA, Chalwe, Hendrix, MSc. Gent, BAgricSc. UNZA,
Chief Technician	Gideon Musukwa MSc ,BAgricSc UNZA
Scientists	Mary Chishala , MSc. Soil Science, BSc. Education Chabu Kamfwa, BSc Agric
Technicians	Charity Nachalwe, Dip. Lab Tech Edward Bwalya Queen Isoni

6. MEMBERS OF THE BOARD OF STUDIES

- The Dean of the School is the Chairperson
- All academic members of staff of the School
- Special Research Fellows of the School
- Staff Development Fellows of the School
- One representative from each of the following Schools: Engineering, Education, Humanities and Social sciences, Medicine, Mines, Natural Sciences, Veterinary Medicine
- One representative from the Directorate of Distance Education
- The Librarian
- The Dean of Students
- The Farm Manager
- Vice-Chancellor's representative
- Permanent Secretary, Ministry of Agriculture
- Director of Agriculture
- Two representatives from the Natural Resources Development College
- Assistant Director of Agriculture Research, Ministry of Agriculture
- Five student representatives
- Ex- Student representative
- One representative from the Zambia National Farmers' Union

7. CURRICULUM

In 1988 the Senate of the University of Zambia directed the different Schools to review their programmes in order to make them more relevant to the country's national development efforts.

In May 1989 the School's Board of Studies appointed, an ad-hoc committee to review the existing undergraduate curriculum in Agricultural Sciences. Excluded from this review were the two options offered by the Department of Agricultural Economics and Extension Education namely, the options in Agricultural Economics which was started in January 1987 and the programme in Agricultural Extension Education which started in 1990/91 academic year.

The objectives of the review were:

a) To find out whether the general undergraduate programme which had been in place since 1971 was successful in preparing students for the type of responsibilities which they are expected to assume after leaving school, and in equipping them with the necessary skills to advance within the system; and
b) To identify a set of learning, competencies, and skills needed by graduates which would serve as the basis for subsequent identification of courses needed in the curriculum and potential programme options.

In the first phase the committee conducted a survey to identify those areas of training in which graduates are typically adequately prepared and those usually found to be lacking. Based upon information from the survey, descriptions of student learning needs were developed by the different Departments. These areas of learning were then assessed to determine whether the training could be provided within the Department or would require reliance on other Departments. For those learnings that fell within the department's area of teaching responsibility, potential courses were identified by grouping learnings that could logically be provided within a given course. Topical outlines and broad course objectives were then prepared. In areas requiring that learnings be provided by other Departments, existing courses were assessed and where necessary new course proposals were discussed or developed in cooperation with relevant Departments.

The next step involved identification, definition, and specification of potential programme options within the agricultural sciences programme, based on results of the survey and on discussions with employers.

Upon completion of the initial set of course proposals and programme options, a draft reflecting the proposed structure of the undergraduate programme was developed.
This was presented for written and oral critique to the School faculty and Departments outside the School that would be affected by the revision. Concurrent with the critique of the proposed curriculum, the committee undertook to reconcile the optimum model of courses and programme options with immediate and long-term resource availabilities. This involved determining availability of faculty to deliver the proposed set of courses, assessing the extent to which other Departments would cooperate in course changes, and estimating space and equipment availabilities.

Several new features of the revised curriculum are noteworthy. The School now has a short and medium-term plan for its undergraduate programme. While various facets will be implemented in phases, a specific direction has been taken and a commitment has been made.

The restructured curriculum reflects the needs expressed by the employers of Agricultural Sciences graduates as stated in the Curriculum Review Survey and at the same time maintains the academic strength of the previous curriculum. The new curriculum is designed to meet the demand for agricultural scientists by Government ministries, agricultural state, parastatals, and private agribusinesses. It gives students sufficient skills to go into farming if they so wish and is recognized internationally.

The curriculum includes a first year in the School of Natural Sciences with basic courses in Biology, Chemistry, Mathematics, and Physics. In the second year students get an introduction into the different disciplines of agricultural sciences (Animal Science, Crop Science, Soil Science, Agricultural Economics, Rural Sociology and Agricultural Extension Education). In the third year students are offered an opportunity to major in any one of the five disciplines of agricultural sciences. From third to fifth year, students are progressively introduced to in depth courses in their option, supplemented by relevant courses from other disciplines of agricultural sciences. Thus, the B. Agric. Science degree holder from the different options can be still classified as a "general agriculturist".
Also included are three vacation Practical that include learning various basic agricultural skills, experience on commercial farms, data collection for research projects, and exposure to the use of computers.
Students in all options take 4.0 units (16.6%) basic science courses, 1.5 units (6.3%) statistics and mathematics, and 1.0 unit for their research projects.

In the Crop Science option students take in addition a total of 7.5 units (31.3%) crop science courses, 3.5. units (14.8%) soil science courses, 3.0 units (12.5%) animal science courses, 2.5 units (10.4%) agricultural economics and extension education courses, and 1.0 unit (4.2%) agricultural engineering courses.

Students in the Animal Science option take 8.5 units (35.4%) in animal science courses, 3.0 units (12.5%) crop science courses, 2.5 units (10.4%) soil science courses, 2.5 units (10.4%) agricultural economics and extension education courses, and 1.0 unit (4.2%) in agricultural engineering courses.

In the Land Management option students take 9.5 units (39.6%) land management courses, 2.5 units (10.4%) crop science courses, 2.5 units (10.4%) animal science courses, 2.5 units (10.4%) agricultural economics and extension education courses, and 0.5 units (2.0%) in agricultural engineering courses.

Between year three and five the students in all options (except Agricultural Economics and Extension Education) take the following compulsory courses (6 course units in total): Statistical Analysis, Agro-Climatology, Pig and Poultry Production, Ruminant Production, Farm Power and Machinery, Field Crop Production, Horticultural Science, Soil Fertility, Farm Management, Land Evaluation.

In the Agricultural Economics option students take a total of 11 units (45.8%) agricultural and general economics courses, 2 units in crop science courses, 2 units in animal science courses, 1 unit in soil science courses, 1 unit in agricultural engineering courses, 1 unit in agricultural extension courses and 2 units of other courses.

In the Agricultural Extension Education option students take a total of 8 units (33.3%) in agricultural and general economics courses, 3 units in agricultural extension education courses, 2.5 units in crop science courses, 2.5 units in animal science courses, 1.5 units in soil science courses, 1 unit in agricultural engineering courses and 1.5 units of other courses.

In order that students develop a lively and realistic interest in the problems of the agricultural industry they are required to complete a minimum period of thirty weeks of practical training on approved farms before they graduate. The emphasis of the degree programme is on promoting an understanding of the basic scientific principles of the various disciplines and learning how best to utilise scarce resources in order to maximise agricultural production in the Zambian context. The objective of the extended periods of farm practicals is to ensure that students learn the applications of their theoretical knowledge within the limitation imposed by real farming conditions.

Currently (2016), there are 309 undergraduate students in the school and up to 1995 the School had graduated 666 students, 55 of whom were female. The intake into the second year of study has been constrained by the shortage of physical facilities.

In 1990 the University Senate approved the establishment of the Department of Food Science and Technology and an undergraduate degree programme in the same. By establishing this Department the School intends to be the regional centre for training of food scientists and technologists in the SADC region. Efforts are being made to find donor assistance for the Department.

The objective of the Department is the acquisition and dissemination of scientific knowledge on storage and processing of products of primary agriculture and fisheries, on the safety and nutritive value of food and on quality assessment of food.

The Department is intended to perform several roles in the short term:

(a) Administer an undergraduate programme in food science and technology and provide suitable courses;
(b) Acquire basic and applied knowledge through scientific research on food in cooperation with government agencies and food companies; and
(c) Support the food industry through consultation, short in-service courses and workshops.

In the long term the Department should mount a postgraduate programme in food science and technology.

Since 2010, the department introduced a novel but unique programme in Human nutrition. This serves a complimentary role to strengthen the Department but also the school as a whole. Being interdisciplinary in nature, the programme addresses components of physiology, anatomy and biochemistry but also the applied aspects of sociology, nutrition assessment and clinical nutrition. The total package endows the learners with knowledge and skills of how to identify issues besetting communities and individuals, plan, deliver and manage targeted interventions

On the basis of the strength in staffing, equipment, and research programmes, graduate programmes at the Master of Science level are offered in Agronomy and in Animal Science. These are two- year programmes devoted to course work and research. Course work has compulsory and elective components. The programme in Agronomy is offered jointly by the Departments of Crop Science and Soil science. The programme in Animal science is offered by the Department of Animal Science. It also has the flexibility for specialization in specific areas of Animal science.

The objectives of the Master of Science programme are to:

(a) Train research scientists, College, and, University teachers, as well as personnel for more specialized advisory positions;
(b) Develop the agricultural research capability of the School for the purpose of supporting regional and national development efforts; and
(c) Generate and increase the scientific information base for sound agricultural planning and project implementation.

The programme started in 1988/89 academic year with three students. In 1989/90 academic year five students were enrolled while in 1990/91 academic year seven students were registered. Currently (2016 there are 117 students postgraduate students in the school.

8. UNDERGRADUATE ENTRANCE REQUIREMENTS AND DEGREE REGULATIONS

8.1 General

To qualify for the Degree of B. Sc. Agric. A student shall have fulfilled all requirements for admission to the University of Zambia and the School of Agricultural Sciences and subsequently shall have completed to the satisfaction of the examiners and Senate, such courses of study as are prescribed and approved by Senate and published in the School Handbook.

The normal length of the undergraduate programme of studies shall be five years subject to modification arising from the application of regulations concerning exemptions from courses, credit for courses completed elsewhere and progression from one semester to the next. A student shall normally take eight Semester courses in the first year of study; ten courses each in the 31, and 4 years of studies, and eight semester courses in the 5 year of study in addition to the final year research project.

Without any deviation from the normal pattern of course registration, progression from semester to semester may only be granted on the recommendation of the Board of Studies of the School of Agricultural Sciences and the approval of the Senate.

In addition to the requirements given above, a student shall complete to the satisfaction of the Board of Studies a practical vacation training of 30 weeks duration.

8.2 Entrance Requirements

In addition to satisfying the general University entrance requirements candidates for admission to the School of Agricultural Sciences must satisfy the following School's requirements:

8.2.1 School Leavers

Possess FIVE (5) acceptable '0' level passes or FIVE (5) acceptance credits at Cambridge School Certificate or FIVE (5) acceptance subject passes at an approved standard in another examination deemed equivalent by Senate.

In the above categories, subjects offered for admission must include:

(a) English Language;
(b) Mathematics;
(c) Chemistry and Physics, Physical Sciences or Science;
(d) Biology or Agricultural Sciences;
(e) Any other approved subject from schedule C and D in the section dealing with general requirements of the University.

Passes in the above subjects must be at credit level or better.

8.2.2 The Particular Direct Entrance Requirements for 'A' Level Holders, Diplomas and Other Non-School Leavers

In addition to satisfy the General Entrance Requirements for admission to programmes of study leading to degrees, the specific School requirements as set out below must be met:

8.2.3 Entry requirements for diploma holders

UNZA Diploma holders with Credit or better from a recognised agricultural institution may enter any of the Bachelor of Sciences Degree programmes at second year of any programme provided such applicants have:

i. Five (5) 'O' level passes, which include English, Chemistry, Physics, Mathematics and Biology or Agricultural Science; and

ii. At least one year proven relevant working experience.

Candidates who wish to change options need to apply for direct entry into first year in the School of Natural Sciences

8.2.4 Entry requirements for 'A' Level Holders

'A' level candidates may also enter any Bachelor of Sciences Degree programme at second year of any programme if they have:

(a) 3 'A' Level passes in Chemistry, Biology or Agricultural Science and Mathematics or Physics;
(b) At least Credit in '0' Level Mathematics or Physics if not taken in (i) above.

8.3 Explanation of Course Codes

The course coding system has seven distinct characters explained bellow:

The first three (3) characters are letter acronyms which identify the Department in which the course is offered. For instance, acronyms such as AGA, AGC, AGE, AGF, AGN, AGS, would identify the Departments of Animal Science, Plant Science, Agricultural Economics and Extension, Human Nutrition and Soil Science, respectively, in the School.

- AGA - Course in Animal Science
- AGC - Course in Crop Science
- AGE - Course in Agricultural Economics & Extension Education
- AGF - Course in Food Science and Technology
- AGG - General Agricultural Course
- AGN - Course in Human Nutrition
- AED - Course in Education (School of Education)
- AGS - Course in Soil Science
- ECN - Course in Economics (School of Humanities & Social Sciences)
- AEN - Course in Agricultural Engineering (School of Engineering

The fourth (4^{th}) character or the first (1^{st}) digit identify the year or level of study at which the course is offered/taken. The 4^{th} character or the digit ranges from 1 (1^{st} year) through 5^{th} (5^{th} year).

The fifth (5^{th}) and sixth (6^{th}) characters or the second (2^{nd}) and third (3^{rd}) digits uniquely identify the course and would range from 00 to 99 allowing for one hundred options of course identification. The second (2^{nd}) and third (3^{rd}) digits further recognise the course title and description. For instance, the 2^{nd} digit singly refers to a sub-field or the subject area or discipline and the 3^{rd} digit refer to the series in the sub-field or subject area.

The seventh (7^{th}) character or the fourth (4^{th}) digit indicates the time and duration when a course is offered. It indicates whether the course is either full or half course, and time when a course is offered. If the fourth (4^{th}) digit is zero (O) it means that the is offered for the whole year; if it is 3 then the course is offered during the long vacation break at the end of the academic year; or 9 for a course offered both in first and second half of the academic year. The fourth digit '4' is, however, restricted for practical project courses only, such as

AGG 2004, AGG 3004 and AGG 4004 offered during the long vacation break. The fourth digit '4' is also, however, restricted for final year project courses only, such as AGA 5004, AGC 5004, AGE 5004, AGF 5004, AGN 5004 and AGS 5004. If the fourth (4^{th}) digit is '9' it means that it is a half course that is offered throughout the academic year.

Summary of the meaning of course codes:

4^{th} Digit	**Meaning of the 4^{th} Digit**
0	Full course offered the whole academic year
1	Half course offered in the first half of the academic year
2	Half course offered in the second half of the academic year
3	Half or full course offered during the break and/or long vacation
4	Project Course
5	Course offered either in the first or second half of the academic year
9	Half course offered throughout the academic year

For example, AGS 4221 (Plant and Soil Analysis)

Code	**AGS**	**Course in the Department of Soil Science**
1^{st} Digit	4	Course taken at fourth (4^{th}) year
2^{nd} Digit	2	Course is in the discipline of Chemistry
3^{rd} Digit	2	Course is the second in the series of Chemistry courses
4^{th} Digit	1	Course to be taken in the first (1^{st}) half of the academic year

8.4 Features of the Term System

- Half courses shall run for half of the academic year
- The long vacation shall be part of the academic year
- Residential School sessions shall be held during the inter-term breaks each taking three (3) weeks
- Examinations for full courses shall take place at the end of the academic year with some provisions for:

a) Examinations conducted at the end of the Second Term for completed half courses taken in the first half of the academic year; and

b) Examinations conducted at the end of the academic year for and half courses completed in the Third Term.

8.5 Course Load and Credit Units

- The normal full course load is five (5) full courses;
- Thirty (30) credit hours shall constitute one (1) credit unit;
- A full-time student shall take a minimum twelve (12) credit units per academic year; and
- Course credit units shall be used for weighting course work in the determination of Grade Point Averages (GPAs) and for student progression from one academic year to the next.

8.6 Course Grading and GPA System of the School

LETTER GRADE	**AVERAGE MARK CLASSES (%)**		**COURSE GRADE POINT VALUES**		COURSE GRADE DESCRIPTIONS
	Undergraduate	Postgraduate	Half Course	Full Course	
A^+	90 – 100	86 - 100	2.5	5.0	Distinction
A	80 – 89	75 - 85	2.0	4.0	Distinction
B^+	70 – 79	70 - 74	1.75	3.5	Meritorious
B	60 – 69	65 - 69	1.5	3.0	Credit
C^+	55 – 59	55 - 64	1.25	2.5	Credit
C	50 – 54	50 - 54	0.75	1.5	Pass
D^+	45 – 49	45 – 49	0	0	Fail
D	Below 45	Below 45	0	0	Fail

8.6.1 Grade Point Average System of the University of Zambia

GPA	CUM GPA	GPA CLASSES	DEGREE CLASSIFICATION
5.0	35 – 40	≥4.25	Upper Distinction
4.0	31 – 34	3.75 - 4.24	Lower Distinction
3.5	26 – 30	3.25 - 3.74	Meritorious
3.0	22 – 25	2.75 - 3.24	Credit
2.5	18 – 21	2.25 - 2.74	Upper Pass
1.5	6 – 17 (<18)	0.75 - 2.24	Lower pass

8.7 Contact Hours

Each course will have three lectures (each 50 minutes long) and 3 hours practicals/tutorial per week. Half courses shall be taught for are taught for 15 weeks whereas full courses shall be taught for 30 weeks. Practicals and Projects I, II and III shall be offered at the end of the academic year, i.e. AGG 2004, AGG 3004 and AGG 4004. Final year research courses shall run for one full year (for example, AGC 5004). For first year courses, refer to School of Natural Sciences Handbook.

8.8 Normal Course Load

The normal full course load is 5 courses per academic year. However, a student may take one extra course with the permission of the Dean of the School after careful consideration.

8.9 Examinations and Progression.

8.9.1 Examinations

a) Final Examinations

Final examinations are held in each course, normally at the end of the academic year, and are conducted by means of such written, oral and practical examinations as the examiners may specify, save that the final research project course grading is based on a seminar presentation and write-up of the research project report.

b) Supplementary Examinations

A proceed student will qualify to write Supplementary Examination in a one course equivalent if he/she meets all conditions bellow:

i. Obtains a D^+ in the course for which a Supplementary Examination is being requested;

ii. Passes in at least two (2) full course equivalents with a Grade of C+ or better; and

iii. Passes the Continuous Assessment component of the course in which a Supplementary Examination is being requested for.

Performance in a Supplementary Examination will be graded as Pass (P) or Fail (F). A fail in a Supplementary Examination does not count as a second fail in relation to Regulation 1.4, 1(b) of the University of Zambia calendar Handbook.

c) Deferred Examinations

i. A student who has been prevented by illness or other unavoidable cause from presenting himself/herself for any ordinary sessional examination and who satisfies the Senate that it would be great hardship for him/her to wait for the next ordinary sessional examination may apply to the Senate to grant him/her a deferred examination.

ii. The number of examiners for deferred examinations shall be the same as for the ordinary sessional examinations and the examination itself shall be of the same standard.

iii. Not more than one session of deferred examinations shall be granted to any candidate in one academic year.

iv. Application for a deferred examination or notification on behalf of a student who is unable to make application himself/herself must be submitted together with supporting medical certificates to the Registrar before the commencement of the ordinary sessional examinations for that year.

8.9.2 Progression

(a) Normal Progression (Clear Pass)

A student who has passed all the courses taken during the academic year and has no previously failed courses to repeat will progress to the next year of study.

(b) Proceed

A student proceeds if he/she has cleared all taught courses in an academic year but still has to complete a practical course (AGG 2004, AGG 3004 or AGG 4004) offered in that academic year.

(c) Proceed and Repeat

In order to proceed to the next academic year of study a student taking five full course equivalents in an academic year must pass in at least four full equivalents in an academic year with a grade of at least C+. Such a student will be permitted to repeat one full course equivalent provided his/her course load, including the courses that are being repeated, do not exceed five full-course equivalents.

(d) Repeat Course (s)

A student who fails a course that is a pre-requisite to a higher course must repeat and pass the failed course before being allowed to take the higher course.

(e) Withdrawal from studies

A student who is unable to continue with his/her studies on medical grounds or other circumstances shall be granted permission by the Dean of the School to withdraw from studies for a maximum of one academic year provided:

i. He/she notifies the Dean of the School in writing;

ii. He/she provides evidence certified by the University Medical Officer; and

iii. For non-medical reasons, they provide recommendation from the Dean of Students Affairs.

(f) Part-time

A student is put on part-time studies if he/she fails two (2) course equivalents or still has arrears after the fifth year. A student on part-time studies is allowed to register in not more than the two full course equivalents.

(g) Exclude Programme

A student is excluded from Programme if he/she fails in two and half full course equivalents out of five or 50% of the total load.

(h) Exclude School

A student is excluded from School if he/she withdraws from school for at least three (3) or more consecutive weeks or five (5) or more weeks intermittently throughout the academic year without permission.

(i) Maximum period of study

The maximum allowable period of study for the degree of the Degrees offered in the School is seven (7) years for full-time students or eight (8) years for part-time students.

8.10 Exemption from Taking Some Courses in the Programme

A candidate who has, prior to admission to the University of Zambia, attended courses of instruction and passed examinations at a recognized institution offering courses equivalent to those offered under any programme in the School of Agricultural Sciences of the University of Zambia, may be exempted from attendance of classes and sessional examinations in these courses. Such exemptions must to be approved by Senate on the recommendation of the Board of Studies of the School of Agricultural Sciences. Exemptions shall be limited to four full courses in an academic year.

8.11 Examination and Grading

A student's grade shall normally be determined by the examiner's assessment of his/her work throughout the course (Continuous Assessment) as well as his/her performance in the Final Examination. Examinations shall be conducted at any time by writing, oral or practical.

The distribution of Continuous Assessment marks between practical assignments and tests is the responsibility of individual Departments from whom information should be sought. For those courses which are examined by external examiners, all materials contributing to the Continuous Assessment grades must be retained for possible presentation to the External Examiner.

8.12 Evaluation of Vacation Practical Courses (AGG 2004 and 3004)

Students' practical training is graded as **SATISFACTOR**Y (S) or **UNSATISFACTORY** (U) on the basis of:

(a) Individual student's written report,
(b) Field supervisor's confidential report and
(c) The report of the staff member visiting the student during the practical training.

If the Vacation Practical Courses Committee feels it necessary, a student is interviewed on his practical training and the final decision on grading of practical training is made by the Farm Practicals Committee of the School.

8.13 Evaluation of Communication & Research Methods (AGG 4004)

Students' vacation training in Communication & Research Methods is graded as **SATISFACTOR**Y (S) or **UNSATISFACTORY** (U) on the basis of:

(a) Individual student's attendance of two weeks training period
(b) Individual student's submission of a concept note in the preferred area of research at the end of the training.

8.14 Vacation Practical I, II and III (Applicable to all students in the School)

A student is required to successfully complete thirty (30) weeks of practical farm training during her/his study in the School of Agricultural Sciences. This training is carried out during the long vacations that follow the second, third and fourth years of study, each training period lasting for ten (10) weeks.

The first of these training periods is spent on the University Campus where the students receive an introduction to general agricultural practices. The emphasis during the second training period is on management and farm operations and the student is placed at a more specialised farm or research stations. After the fourth year, all the students begin the final year project of supervised research.

At the end of each vacation period the student is required to submit a written report of their activities during that period. The submitted report by the student, together with reports from the field supervisor and from visiting School staff, shall form the basis for assessing the performance of the students during the training period. In exceptional circumstances the School may require a student to undergo an interview in relation to the practical training.

8.15 Final Year Project (For all fifth year students)

Each final year student in the School of Agricultural Sciences must conduct and complete a project assignment within his specialised field of study. The student is required to conduct a seminar to present and discuss the findings of his/her project. This is equivalent to one full course and a grade is awarded on its completion.

8.16 Special Regulations for the Degree of Bachelor of Sciences in Agriculture (B. Sc. Agric.)

To qualify for the award of the degree of Bachelor of Science in Agriculture a candidate shall:

(a) Follow a programme of study approved by the Board of Studies of the School of Agricultural Sciences, attend at least eighty per cent (80%) of the lectures and tutorials conducted in each course, and carry out all the required assignments, practical and fieldwork;

(b) Pass in all the twenty-four (24) full course equivalents.

(c) Complete satisfactorily a farm practical training programme, as specified below. Unless granted exemption by Senate on the basis of particular or general regulations a candidate shall follow the curriculum indicated below. Schematically the annual requirements are as follows;

First year: Four (4) full course equivalents offered by the School of Natural Sciences.

Second year: Five full course equivalents, four full course equivalents are offered by the School of Agricultural Sciences and two by the School of Natural Sciences.

Long vacation: Vacation Projects I (10 weeks)

Third year: Five full course equivalents, all offered by the School of Agricultural Sciences, School of Humanities and Social Sciences and School of Education as the case may be.

Long vacation: Vacation Projects II (10 weeks)

Fourth year: Five full course equivalents, all offered by the School of Agricultural Sciences School of Humanities and Social Sciences and School of Education as the case may be.

Long vacation: Communication and Research Methods (10 weeks)

Fifth year: Four (4) full course equivalents offered by the School in addition to the final year research project. Exceptions exist in the Soil Science option where students take courses from the School of Engineering

8.17 List of Courses for the Years I — V

Undergraduate Programmes Curricular

8.17.1 First Year

The first year of study is offered in the School of Natural Sciences in the following courses:

BIO	1401	Cells and Biomolecules
BIO	1412	Molecular Biology and Genetics
CHE	1000	Introductory Chemistry
MAT	1100	Foundation Mathematics
PHY	1010	Introductory Physics

Refer to School of Natural Sciences Handbook

8.17.2 Second Year

The courses offered in each program and year of study are:

Bachelor of Science in Agriculture Programme (BSc. Agric)

Second Year

AGA	2110	Anatomy and Physiology of Farm Animals
AGC	2110	Fundamentals of Plant Science
AGS	2110	Fundamentals of Soil Science
CHE	2001	Agricultural and Veterinary Chemistry
CHE	2112	Introductory Biochemistry
AGE	2111	Fundamental of microeconomics
AGE	2122	Fundamentals of macro-economics
AGG	2004	Vacation Practical

8.17.3 The Animal Science Option Third Year

AGA	3201	Principles of Animal Nutrition
AGA	3212	Applied Animal Nutrition
AGC	3121	Crop Production
AGG	3822	Agricultural Extension
AGG	3811	Rural Sociology
AGG	3832	Forage Crop Production & Range Management
AGS	3711	Agro-Climatology
AGC	3342	Crop Protection
AEN	3331	Farm Power & Machinery
AGG	3842	Introductory Statistics for Agriculture
AGG	3004	Field Attachment

Fourth Year

AGA	4511	Beef & Small Ruminant Production
AGA	4522	Dairy Production
AGA	4311	Principles of Genetics
AGA	4532	Pig and Poultry Production
AGA	4531	Introduction to Aquaculture
AGA	4542	Game Ranching
AGG	4851	Experimental Design & Statistical Analysis
AGA	4552	Animal Products and By-products
AEN	4131	Farm Structures
AGS	4232	Soil Fertility and Amendments
AGG	4004	Communication & Research Methods

Fifth Year

AGA	5321	Applied Animal Reproduction
AGA	5562	Integrated Aquaculture & Fish Nutrition
AGE	5241	Principles of Farm Management
AGA	5322	Animal Breeding
AGA	5121	Advances in Animal Nutrition
AGA	5712	Animal Health
AGE	5251	Agricultural Project Planning & Appraisal
AGE	5272	Project Monitoring & Evaluation
AGA	5004	Research Project

8.17.4 The Plant Science Option

Third Year

AGA	3201	Principles of Animal Nutrition
AGC	3412	Introductory Horticulture
AGS	3711	Agro-Climatology
AGS	3312	Soil Physics
AGG	3811	Rural Sociology
AGG	3842	Introductory Statistics for Agriculture
AEN	3331	Farm Power and Machinery
AGG	3832	Forage Crop Production & Range Management
AGC	3121	Crop Production
AGC	3312	Plant Pathology
AGG	3004	Field Attachment

Fourth Year
AGC 4320 Principles & Application of Entomology
AGC 4219 Plant Biotechnology & Molecular Genetics
AEN 4131 Farm Structures
AGA 4532 Pig and Poultry Production
AGA 4511 Beef and Small Ruminant Production
AGE 5442 Livelihood Systems Research and Extension or AGE 5172 Agricultural Policy Analysis
AGE 5241 Principles of Farm Management
AGE 5262 Intermediate Farm Management
AGG 4851 Experimental Designs & Statistical Analysis
AGG 4004 Communication & Research Methods

Fifth Year
AGC 5220 Plant Breeding & Quantitative Genetics
AGC 5421 Advanced Horticulture
AGC 5712 Post harvest tech and Physiology
AGC 5331 Weed Science
AGC 5612 Seed Science and Technology
AGE 5251 Agricultural Project Planning and Appraisal
AGE 5272 Project Monitoring and Evaluation or AGC 5125 Sustainable Crop Production
AGC 5004 Research Project

8.17.5 The Soil Science Option

Third Year
AGC 3121 Crop Production
AGC 3342 Crop Protection
AGS 3711 Agro-Climatology
AGG 3842 Introductory Statistics for Agriculture
AEN 3331 Farm Power & Machinery
AGG 3822 Agricultural Extension
AGA 3201 Principles of Animal Nutrition
AGG 3832 Forage Crop Production & Range Management
AGG 3811 Rural Sociology
AGS 3312 Soil Physics
AGG 3004 Field Attachment

Fourth Year

AGS	4210	Soil Mineralogy and Chemistry
AGE	5231	Principles of Farm Management
AGA	4532	Pig and Poultry Production
AGA	4511	Beef and Small Ruminant Production
AGC	3412	Introductory Horticulture
AGG	4851	Experimental Design & Statistical Analysis
AGE	5262	Intermediate Farm Management
AGS	4221	Soil and Plant Analysis
AGS	4232	Soil Fertility and Amendments
AGG	4004	Communication & Research Methods

Fifth Year

AGS	5121	Soil Genesis & Classification
GEE	4812	Principles of Geomatics
AGS	5131	Soil Survey & GIS Techniques
AGS	5622	Land Evaluation & Improvement
AGS	5511	Agricultural Hydraulics and Irrigation Design
AGS	5612	Integrated Land Husbandry
AGS	5411	Soil Microbiology
AGS	5522	Management of Irrigation and Drainage Systems
AGS	5004	Research Project

8.17.6 The Agricultural Economics Option

Third Year

ECN	2311	Mathematics for Economics I
ECN	2322	Mathematics for Economics II
AGG	3811	Rural Sociology
AGG	3822	Agricultural Extension
AGC	3121	Crop Production
AGA	4532	Pig and Poultry Production
ECN	2115	Intermediate Microeconomic Theory
ECN	2215	Intermediate Macroeconomic Theory
AGE	3381	Research Methodology
AGG	3842	Introductory Statistics for Agriculture
AGG	3004	Field Attachment

Fourth Year

AGA	4511	Beef & Small Ruminant Production
AGE	4142	Agricultural Marketing and Pricing
AGE	4211	Introduction to Agribusiness Management
AGE	4222	Intermediate Agribusiness Management
AGE	4131	Production Economics
ECN	4235	Development Economics or ECN 4145 Environmental Economics
AGE	4311	Quantitative Methods in Agricultural Economics
AGS	5612	Land Evaluation and Improvement
ECN	3311	Econometrics
AGE	4322	Applied Econometrics
AGG	4004	Communication & Research Methods

Fifth Year

AGE	5231	Agricultural Organization and Administration
AGE	5162	Agricultural Finance
AGE	5241	Principles of Farm Management
AGE	5262	Intermediate Farm Management
AGE	5151	International Agricultural Markets, Trade and Development
AGE	5172	Agricultural Policy Analysis
AGE	5251	Agricultural Project Planning and Appraisal
AGE	5272	Project Monitoring and Evaluation
AGE	5004	Research Project

8.17.7 The Agricultural Extension Option

Third Year

AED	3110	Participatory Approaches to Development
AGG	3811	Rural Sociology
AGG	3822	Agricultural Extension
AGC	3121	Crop Production
AGC	3342	Crop Protection
AGA	3201	Principles of Animal Nutrition
AGA	3212	Applied Animal Nutrition
AEN	3331	Farm Power and Machinery
AGG	3842	Introductory Statistics for Agriculture
AGG	3004	Field Attachment

Fourth Year

AGA	4511	Beef & Small Ruminant Production
AGE	4142	Agricultural Marketing and Pricing
AGE	4211	Introduction to Agribusiness Management
AGE	4222	Intermediate Agribusiness Management
AGA	4531	Introduction to Aquaculture
AGA	4532	Pig and Poultry Production
AGG	4851	Experimental Design & Statistical Analysis
AGA	5712	Animal Health
AEN	4131	Farm Structures
AGS	4232	Soil Fertility and Amendments
AGG	4004	Communication & Research Methods

Fifth Year

AGE	5231	Agricultural Organization and Administration
AGC	5612	Seed Science & Technology
AGE	5241	Principles of Farm Management
AGE	5442	Livelihood Systems Research and Extension
AGE	5451	Advanced Aspects of Rural Sociology
AGE	5462	Extension Communication
AGE	5251	Agricultural Project Planning and Appraisal
AGE	5272	Project Monitoring and Evaluation
AGE	5004	Research Project

8.17.8 Bachelor of Food Science and Technology (B.F.Sc.T)

Second Year

AGF	2251	Fundamentals of Electrical Engineering for Food Science
AGF	2262	Fundamentals of Engineering Drawing for Food Science
AGF	2015	Fundamentals of Organic Chemistry
CHE	2615	Basic Physical Chemistry
AGE	2111	Fundamental of microeconomics
AGE	2122	Fundamentals of macro-economics
AGF	2401	Introduction to Information Technology and Communication
AGC	3135	Fundamentals of Crop Production
AGA	3335	Fundamentals of Animal Production
CHE	2112	Introductory Biochemistry
AGG	2004	Field Attachment

Third Year

AGF	3100	General and Food Microbiology
AGE	4211	Introduction to Agribusiness Management
AGE	4222	Intermediate Agribusiness Management
AGF	3021	Chemical Techniques in Food Analysis
AGF	3042	Instrumental Methods in Food Analysis
AGF	3031	Food Chemistry
AGF	3412	Food Toxicology
AGF	3201	Technical Thermodynamics
AGG	3842	Introductory Statistics for Agriculture
AGG	3004	Field Attachment

Fourth Year

AGF	4300	Food Processing and Packaging
AGF	4210	Unit Operations in Food Engineering
AGF	4221	Process Control and Instrumentation
AGF	4232	Biochemical Engineering
AGF	4065	Nutrition
AGF	4422	Water and Food Waste Management
AGG	4911	Experimental Design & Statistical Analysis
AGF	4052	Sensory Evaluation of Foods
AGG	4004	Communication and research methods

Fifth Year

AGF	5310	Technology of Plant Products and Beverages
AGF	5071	Food Colloids
AGF	5321	Technology of Dairy and Egg Products
AGF	5241	Food Plant Design and Environmental Management
AGF	5332	Technology of Meat and Fish
AGF	5432	Food Safety and Quality Management
AGF	5342	Technology of Fermented Foods
AGF	5004	Research project

8.17.9 Bachelor of Science in Human Nutrition (BSc. H.Nu)

Second Year

AGN	2110	Fundamentals of human anatomy and physiology
AGF	3100	General and food microbiology
AGE	2111	Fundamental of microeconomics
AGE	2122	Fundamentals of macro-economics
AGF	2015	Fundamentals of organic chemistry
AGN	2212	Principles of human nutrition
AGF	2401	Introduction to Information Technology and Communication

CHE 2112 Introduction to Biochemistry
AGG 2004 Field Attachment

Third Year
AGN 3510 Nutrition communication and health promotion
AGN 3311 Nutrition assessment
AGN 3222 Human Nutrition
AGF 3031 Food chemistry
AGN 3232 Principles of dietetics
AGG 3811 Rural sociology
AGG 3842 Introductory statistics for agriculture
AGF 3021 Chemical techniques in food analysis
AGF 3042 Instrumental methods in food analysis
AGG 3004 Field Attachment

Fourth Year
AGN 4410 Diet formulation and dietetic management
AED 3110 Participatory approaches to development
AGN 4520 Public health and nutrition
AGN 4241 Nutrition disorders
AGN 4122 Nutrient and drug interactions
AGN 4321 Research methods and epidemiology for nutritionists
AGF 5432 Food safety and quality management
AGG 4004 Communication and research methods

Fifth Year
AGN 5421 Food service systems management
AGN 5432 Hospital-based dietary management or AGN 5542 World food issues
AGN 5531 Food and nutrition security
AGN 5442 Obstetric and pediatric nutrition care or AGN 5552 Nutrition in emergencies
AGE 5251 Project planning and appraisal
AGN 5452 Nutrition care in general medicine or AGE 5272 Project Monitoring and Evaluation
AGF 5615 Processing & preservation of plant products
AGN 5462 Nutrition in oncology, trauma and surgery or AGF 5625 Processing and preservation of animal products
AGN 5004 Research project

9. POSTGRADUATE PROGRAMMES

The 45th School Board of graduate studies recognised the need for starting a Master of Science Degree Programme. On the basis of the strength in staffing, equipment and research programmes at the Master of Science level were started in 1988/89 academic year. Currently, six Master of Science programmes are offered by the School. These programmes include two in Agronomy (crops and soils option), Master of Science in Animal Nutrition, Master of Science in Integrated Soil Fertility Management, Master of Science in Plant Breeding and Seed Systems, Master of Science in Agricultural Economics and Master of Science in Human Nutrition. These two-year programmes are devoted to one year course work and one year research. Course work has compulsory and elective components for some of the programmes.

9.1 The objectives of the Master of Science programme are to:

1. Train research scientists, college and university teachers, as well as personnel for more specialised advisory positions.

2. Develop the agricultural research capability of the school to support regional and national development efforts; and

3. Generate and increase the scientific information base for sound agricultural planning and project implementation.

The master's programme started in the 1988/89 academic year with three students in Agronomy. In 1989/90 academic year five students were enrolled. The school is the centre of excellence in Master of Science in Agronomy in the Southern African Development Committee (SADC) region. This programme has produced over a hundred graduates from the region since its inception in 1988. Students studying agronomy have received funding from various bodies such as SADC/GTZ, CG Partners, IPGRI and Rockefeller Foundation.

The School has a Field Station adjacent to its buildings, which provides facilities for teaching, research and practical work in animal, crop and soil sciences. The School maintains cattle, poultry, swine and goats at the Field Station and has sufficient irrigated land to be able to allocate an experimental plot to each student. In addition, the School utilizes the 660 Ha University Farm for training and research.

The departmental laboratories provide soil and plant analyses, food chemistry, nutrition and micro biology analysis, animal feed analysis, production of mushroom spawn and tissue culture services. The food chemistry and microbiology laboratories are in the process of accreditation and participate in the inter-laboratory testing schemes through Agriculture Laboratories of Southern Africa (Agril.ASA).

9.2 Postgraduate Entrance Requirements

Applicants are eligible for admission as candidate for the degree of Master of Science if they:

(a) Have been admitted to the degree of Bachelor of Agricultural Sciences with credit or better from the University of Zambia or another recognised university;
(b) Possess qualifications deemed equivalent to the degree of Bachelor of Agricultural Sciences with credit or better;
(c) Have had three years of experience after receiving the degree of Bachelor of Agricultural Sciences; or otherwise
(d) Satisfy the University Senate of their ability to pursue postgraduate studies in their fields.

Notwithstanding paragraphs (a) to (d) above, the School, at the request of a department may require applicants, as a condition for admission to a particular master's programme to take a pre-requisite course or qualifying examination at the discretion of the Board of Studies, subject to approval of Senate.

9.3 Postgraduate Programmes Offered

9.3.1 Master of Science in Agronomy (MSC Agronomy)

The two-year Master of Science in Agronomy program has been designed to produce specialists with knowledge in crops and soils. Graduates from this programme have a broadly-based background and are better equipped to tackle agronomic problems. The programme is structured in such a way that it promotes multi-disciplinary research, which is a more effective way of investigating agronomic problems.

The programme has two areas of specialization, crops and soils:

MSc Agronomy – Crop Science Option

Following is a list of all courses for the programme:

FIRST HALF COURSES

Compulsory Courses
AGG 6811 Biostatistics
AGC 6111 Plant Physiology
AGS 6211 Plant Nutrition
AGG 6820 Seminars and Communications Skills

Electives (Select One)
AGG 6715 Agro-Climatology
AGC 6121 Physiology of Yield
AGC 6425 Horticultural Science
AGC 6711 Post Harvest Technology
AGE 6311 Agribusiness Management

SECOND HALF COURSES

Compulsory Courses
AGC 6322 Plant Protection
AGC 6815 Research Methodology
AGG 6820 Seminar and Communication Skills

Electives (Select One)
AGC 6125 Sustainable Agriculture
AGC 6625 Seed Science & Technology
AGE 6242 Project Planning and Management

Second Year
AGC 7000 Thesis/Research

MSc Agronomy – Soil Science Option

FIRST HALF COURSES

Compulsory Courses
AGS 6211 Plant Nutrition
AGS 6715 Agro-Climatology
AGS 6411 Soil Microbiology
AGS 6221 Soil Chemistry
AGG 6820 Seminar and Communication Skills
AGG 6811 Biostatistics

SECOND HALF COURSES

Compulsory Courses
AGS 6612 Soil and Water Conservation
AGS 6242 Soil Mineralogy
AGS 6512 Crop Water Requirements
AGG 6820 Seminar and Communication Skills
AGS 6232 Soil Amendments and Fertilizer Technology
Elective Courses
AGS 6115 Soil Survey Mapping
AGS 6122 Soil Classification and Land Evaluation

Second Year
AGS 7000 Thesis/Research

9.3.2 Master of Science in Integrated Soil Fertility Management

The MSc programme in ISFM seeks to integrate the use of physical, chemical and biological resources in sustainable agricultural production systems. Thus, the programme is deliberately designed with new courses and components aimed at providing an integrated approach to soil fertility management in agricultural production. Unlike the traditional technical approach to soil fertility management, this programme also addresses social economic aspects in courses such as production economics and addresses broader issues of land management in applied soil and water management. The programme contributes to capacity building of a cadre of agricultural professionals who more effectively contribute to increasing agricultural productivity, reducing poverty and increasing food security.

FIRST HALF COURSES

Compulsory Courses
AGS 6211 Plant Nutrition
AGS 6311 Applied Soil Physics
AGS 6221 Applied Soil Chemistry
AGS 6411 Soil Microbiology
AGS 6811 Biostatistics
AGS 6820 Seminar and Communication Skills

SECOND HALF COURSES

Compulsory Courses
AGS 6612 Soil & Water Conservation
AGS 6252 Advanced Soil and Plant Analysis
AGS 6232 Soil Amendments & Fertilizer Technology
AGS 6820 Seminar & Communication Skills
AGE 6062 Production Economics

Elective Courses
AGS 6115 Soil Survey & Mapping
AGS 6512 Crop Water Requirements

Second Year
AGS 7000 Thesis/Research

9.3.3 Master of Science in Plant Breeding and Seed Systems

Changing climate patterns and socio-economic conditions have necessitated the need for accelerated constant development of new and better adopted high performance crop varieties to both small-scale and commercial farmers. This ensures that farmers have access to quality seed. Plant breeding is one of the key components of crop improvements programmes. Upgraded human resources that seek to provide critical skills enhance effectiveness of different poverty alleviation strategies including agriculture. The main goal of the MSc Plant Breeding and Seed Systems programme is to produce scientists who meet the immediate human resource demands of the public and private sectors through crop improvement and related disciplines. This goal is realized through research and teaching programmes that link advances in fundamental and applied biological sciences.

FIRST HALF COURSES

Compulsory Courses
AGG 6811 Biostatistics
AGC 6111 Plant Physiology
AGC 6211 Plant Breeding Methods
AGE 6311 Agribusiness Management
AGG 6820 Seminars and Communication Skills

Elective Courses
AGG 6715 Agro-Climatology
AGC 6135 Physiology of Yield
AGC 6425 Horticultural Science
AGC 6711 Post Harvest Technology

SECOND HALF COURSES

Compulsory Courses
AGC 6222 Molecular Genetics and Biotechnology
AGC 6815 Research Methodology
AGC 6612 Seed Systems
AGC 6322 Plant Protection
AGC 6125 Sustainable Agriculture
AGC 6235 Plant Cytogenetics
AGC 6515 Conservation and Collection of Plant Genetic Resources
AGE 6242 Project Planning and Management

Second Year
AGG 7000 Research/Thesis

9.3.4 Master of Science in Animal Nutrition

The programme of Master of Science in Animal Science is designed to produce animal scientists with advanced knowledge in animal nutrition, physiology, genetics and breeding. The programme aims at training students in methodologies of problem solving in animal science. Graduates from this programme are equipped with both theoretical and technical skills to critically analyze and evaluate animal production and research problems to formulate optimal solutions.

Graduates opting for Animal Nutrition shall have a basis in either monogastric or ruminant nutrition.

FIRST HALF COURSES

Compulsory Courses

AGG 6211 Biostatistics
AGA 6601 Laboratory Techniques in Animal Science
AGA 6111 Non-Ruminant Nutrition and Metabolism
AGA 6101 Energy Metabolism and Energetics

SECOND HALF COURSES

Compulsory Courses

AGA 6102 Ruminant Nutrition and Range Management
AGA 6132 Minerals and Vitamins Metabolism
AGA 6142 Amino Acids and Protein Metabolism
AGA 6012 Endocrine and Hormone Metabolism
AGA 6000 Graduate Seminar

Second Year

AGA 7000 Research/Thesis

9.3.5 Master of Science in Agricultural Economics

The Department of Agricultural Economics and Extension offers a Master of Science degree in Agricultural Economics. The overall objective of the programme is to provide a rigorous, stimulating and enjoyable training in agricultural economics and quantitative and qualitative research techniques. The knowledge and skills offered through the programme equip students to function as professionals in research, policy analysis and management and also enhance their chances of being admitted to PhD programmes.

FIRST HALF COURSES

Compulsory Courses

ECN 5015 Advanced Microeconomics Theory
ECN 5052 Macroeconomics
ECN 5101 Statistics
ECN 5201 Mathematical Techniques & Programming
AGE 6041 Issues in Agricultural and Applied Economics
AGE 6091 International Trade

SECOND HALF COURSES

Compulsory Courses
AGE 6122 Agricultural Policy Analysis
AGE 6132 Production Economics
AGE 6252 Research Methodology
AGE 6332 Econometrics
AGE 6222 Institutional & Behavioural Economics

Second Year
AGE 7000 Thesis/Research

9.3.6 Master of Science in Human Nutrition

To provide well-trained senior-level professionals with a thorough understanding of the food and nutrition needs of Zambia, so as to enable them to take a leadership role in reducing malnutrition and improving food security.

FIRST YEAR
FULL COURSES
AGN 6210 Biostatistics and Research Methods
AGN 6410 Socio-Economic Dimensions of Nutrition
AGN 6420 Management, Nutrition Policy and Planning

HALF YEAR COURSES: FIRST HALF OF ACADEMIC YEAR 1

AGN 6111 Advanced Nutrition Metabolism
AGN 6511 Advanced Topics In Maternal and Child Nutrition

HALF YEAR COURSES: SECOND HALF OF ACADEMIC YEAR 2

AGN 6312 Advanced Clinical Nutrition
AGN 6522 Seminars in Food and Nutrition

9.4 Research in Postgraduate Programmes

In order to avoid exceeding the two-year of study demanded in the programme, candidates in Master's degree programmes are required to identify their research topics as early as possible. This makes it possible for them to plan their research activities and complete their work within the stipulated time.

However, in special circumstances, extension of research period shall be considered by the Senate on recommendation of the Board of Studies and candidates are required to pay for their continued registration in the programme.

10.0 THE UNIVERSITY OF ZAMBIA FARM

In 1975 the University acquired Liempe Farm, some 15 kilometres east of the main Lusaka Campus. The farm is 660 hectares in extent and is run as a mixed farm with sections allocated to beef and dairy cattle, pig, sheep, goats and poultry; field and horticultural crops and fruits. It serves three purposes within the University: as a teaching resource, as a research resource, and as a commercial production unit providing supplies for market. Although managed independently of the school of Agricultural Sciences it interacts closely with the school and provides the base for many of its activities.

11.0 FIELD STATION

The School has a field station adjacent to its buildings at the University. The station provides facilities for teaching, research and practical work in animal, crop and soil sciences. The school maintains poultry, goats and pigs at the Field station and has sufficient irrigated land to be able to allocate an experimental plot to each student.