

# CROP/PASTURE PRODUCTION AND SUSTAINABLE ENVIRONMENT

## M.AgSE

<b>Module/Course Title: CROPPING SYSTEMS</b>					
module/ course code (CRP 801)	Student work- load 120 hours	Credits (ECTS) 4.0	Semester First Sem.	Frequency Each first Semester	Duration 15 weeks
<b>1</b>	<b>Types of courses</b> Lectures , Seminar, Practical	Contact	hours	Independent study	Class size
		30 hours		90 hours	Avg. of 4 (Max 15)
<b>2</b>	<b>Prerequisites for participation</b> Basic principles on crop production				
<b>3</b>	<b>Learning outcomes</b> The student should be able to make decisions on the best and effective way to grow crops within a given system				
<b>4</b>	<b>Subject aims/Content</b>				
	Land tenure systems in West Africa, Soil and water conservation, Mechanized farming for various cropping systems e.g Agroforestry, Alley farming, Mixed vs sole cropping systems, Mixed farming, Zero-tillage farming (Conservation agriculture), Plantation agriculture and Organic Agriculture. Greenhouse (controlled environment) crop production, Agronomy of specific crops of importance to African food security. Crop protection, Crop nutrition. Thematic term papers and seminars on regional cropping systems of West Africa, developing resilient farming systems in West Africa etc.				
<b>5</b>	<b>Teaching methods</b> Lectures, discussions, Practical				
<b>6</b>	<b>Assessment methods</b> Continuous assessment test (30%) and Written Examination (70%)				
<b>7</b>	<b>This module/course is used in the following degree programme/s as well</b> ...				
<b>8</b>	<b>Responsibility for module/course</b> Prof. F. O. Olasantan olasantan@yahoo.com				
<b>9</b>	<b>Other information</b> <a href="https://www.sanfoundry.com/best-reference-books-cropping-systems-sustainable-agriculture/">https://www.sanfoundry.com/best-reference-books-cropping-systems-sustainable-agriculture/</a>  This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote a total of 120 hours of learning to the course, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-				

study (assigned reading, personal studies, assignments, group work and practical). Hence, the course is of 4.0 ECTS credit equivalent.

Module/Course Title Seed Production					
module/ course code (CRP802)	Student work- load 120 hours	Credits (ECTS) 4.0	Semester Second Sem.	Frequency Each second Semester	Duration 15 weeks
1	<b>Types of courses</b> Lectures and Practicals	Contact hours 30hours	Independent study 90 hours	Class size Avg. of 4 (Max 15)	
2	<b>Prerequisites for participation</b> Basic course in Seed Science requires English Language				
3	<b>Learning outcomes</b> The Student would be acquainted with the underlying, principles in production and maintenance of good quality seeds				
4	<b>Subject aims/Content</b> National and regional variety release systems in West African countries; ECOWAS Harmonized seed laws. Conditions for seed production, Controlled seed multiplication, Evaluating and maintaining genetic purity during seed production; Seed Certification; Principles of seed processing, outlay of seed processing plants, Seed Pre-cleaning, conditioning, grading and sizing equipment and operations. Commercial seed treatments. Seed store and gene bank operation: seed germination testing, viability and quality control. Viability modelling, seed drying, packaging and transportation. Hybrid seed production: Genetic basis of hybrids, Population genetic analysis in hybrid production, Hybrid purity and GMO testing. Thematic term papers and seminars on specialized seed industries like organic seed production, Seed cooperatives, Public-private partnerships (PPP), National and regional seed business incentives, Farm management/cost benefit analysis and other topical seed enterprise development issues etc.				
5	<b>Teaching methods</b> Lectures, group work, individual presentation and Practical				
6	<b>Assessment methods</b> Continuous Assessment Tests (40%) and Written Examination (60%)				
7	<b>This module/course is used in the following degree programme/s as well</b> Master of Agriculture in Seed Technology				
8	<b>Responsibility for module/course</b> Prof. M. A. Adebisi adebisima@funaab.edu.ng				
9	<b>Other information</b> <a href="https://www.amazon.com/Seed-Production-Principles-Miller-McDonald/dp/0412075512">https://www.amazon.com/Seed-Production-Principles-Miller-McDonald/dp/0412075512</a>				

This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote a total of 120 hours of learning to the course, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice in the Laboratory). Hence, the course is of 4.0 ECTS credit equivalent.

<b>Module/Course Title</b> <b>PRINCIPLES OF CULTIVAR DEVELOPMENT</b>					
<b>module/ course code</b> (CRP 803)	<b>Student work- load</b> 180 hours	<b>Credits</b> (ECTS) 6.0	<b>Semester</b> First Sem.	<b>Frequency</b> Each first Semester	<b>Duration</b> 15 weeks
<b>1</b>	<b>Types of courses</b>  Lectures and Practical	<b>Contact hours</b>  45 hours	<b>Independent study</b>  135 hours	<b>Class size</b> Avg. of 4 (Max 15)	
<b>2</b>	<b>Prerequisites for participation</b> Basic course in cell biology				
<b>3</b>	<b>Learning outcomes</b> The student should be able to demonstrate skills in the process of varietal identification, development and release				
<b>4</b>	<b>Subject aims/Content</b> Plant Genetic Resources, Line development and recurrent selection, Plant breeding methods-back crossing, cultivar developments for dicot and monocot crop plants, mutation breeding and hybridization, introduction to genetic engineering, exploiting cytological and genetic methods in crop improvement (induction and utilization of male sterility, polyploidy, double haploids breeding, apomixes), Variety release and variety integrity maintenance, Analysis of crosses, expectation for line cross means, heterosis, inbreeding depression, Marker based analysis; molecular markers, Genetic maps, Marker-trait association				
<b>5</b>	<b>Teaching methods</b> Lectures, group assignments and hands-on practical				
<b>6</b>	<b>Assessment methods</b> Continuous Assessment Tests (15%), Practical (15%), Term papers (10%) and Written Examinations (60%)				
<b>7</b>	<b>This module/course is used in the following degree programme/s as well</b> ...				
<b>8</b>	<b>Responsibility for module/course</b> Prof. O. J. Ariyo ariyojo@yahoo.com				
<b>9</b>	<b>Other information</b>				

1. *Principles of Cultivar Development*, vol. 1, Theory and Technique. JUSTIN JAMES R.; Fehr, Walter R. Soil Science: May 1988 - Volume 145 - Issue 5 - ppg 390
2. <https://www.amazon.com/Principles-Cultivar-Development-Theory.../B00374RYXC>

This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote a total of 180 hours of learning to the course, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice in the Screen-house and Field. Hence, the course is of 6.0 ECTS credit equivalent

<b>Module/Course Title: FIELD EXPERIMENTATION</b>					
<b>module/ course code</b> (CRP804)	<b>Student work- load</b> 120 hours	<b>Credits</b> (ECTS) 4.0	<b>Semester</b> Second Sem.	<b>Frequency</b> Each second Semester	<b>Duration</b> 15 weeks
<b>1</b>	<b>Types of courses</b> Lectures, group participation, <b>Practical</b>	<b>Contact hours</b> 30 hours	<b>Independent study</b> 90 hours	<b>Class size</b> Avg. of 4 (Max 15)	
<b>2</b>	<b>Prerequisites for participation</b> Basic statistics and Research methods				
<b>3</b>	<b>Learning outcomes</b> The student should be able to apply the appropriate design and layout agricultural experiments. Also, gain knowledge in data analysis and drawing of suitable inferences				
<b>4</b>	<b>Subject aims/Content</b> Hypothesis testing, Experimental designs: Completely Randomized Design (CRD), Randomized Block Design (RBD), Latin Square Design, Factorial experiments, Split plots designs, Analysis of Variance (ANOVA) and Mean comparisons. Regression and correlation. Mixed models, confounding variables, Use of statistical package programmes.				
<b>5</b>	<b>Teaching methods</b> group work, lectures, discussion.				
<b>6</b>	<b>Assessment methods</b> Continuous Assessment Tests, Practicals and Examination				
<b>7</b>	<b>This module/course is used in the following degree programme/s as well</b> Master of Agriculture in Plant Breeding				
<b>8</b>	<b>Responsibility for module/course</b> <a href="#">Dr. E. O. Idehen</a> <a href="mailto:ideheneo@funaab.edu.ng">ideheneo@funaab.edu.ng</a>				
<b>9</b>	<b>Other information</b> -Statistical Procedures for Agricultural Research, 2nd Edition. Kwanchai A. Gomez, Arturo A. Gomez. ISBN: 978-0-471-87092-0. Feb 1984. 704 pages -Applied Statistics for Scientific Studies. T. A. T. Wahua. Afrika Link Publishers, University of Ibadan , Nigeria. ISBN: 978-2915-15-7				

This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote a total of 120 hours of learning to the course, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using statistical software to analyse data). Hence, the course is of 4.0 ECTS credit equivalent.

<b>Module/Course Title: CROP PROTECTION AND PRODUCTIVITY</b>					
<b>module/ course code</b> (CRP 805)	<b>Student work- load</b> 120 hours	<b>Credits</b> (ECTS) 4.0	<b>Semester</b> First Sem.	<b>Frequency</b> Each first Semester	<b>Duration</b> 15 weeks
<b>1</b>	<b>Types of courses</b>  Lectures, Practical	<b>Contact hours</b>  30 hours	<b>Independent study</b>  90 hours	<b>Class size</b> Avg. of 4 (Max 15)	
<b>2</b>	<b>Prerequisites for participation</b> Principles of Pest and Disease management				
<b>3</b>	<b>Learning outcomes</b> The student should be able to effectively manage fields from pests and diseases, using the best cost effective and environmentally friendly approach				
<b>4</b>	<b>Subject aims/Content</b> Pests and pathogens in crop protection and productivity. Plant-nematode relations or interactions; population dynamics of nematodes; methods of nematode control in agricultural soils. Definition and categorization of insect pests; development of pest status. Economics of insect pest attack; forecasting Insect pest outbreak. Fungi diseases of national and international importance. Classification and nomenclature of plant parasitic fungi. Morphology, Biology and Ecology of fungi. Classification and properties of plant pathogenic bacteria. Growth, reproduction and genetics of plant pathogenic bacteria. Kinds of inoculum produced and dissemination. Bacteria diseases of national and international importance. The nature of viruses' growth and reproduction. The genetics of viruses. Kinds of inoculum produced. Dissemination, Virus diseases of national and international importance. Control measures, quarantine, cultural, chemical, host plant resistance, etc.in crop protection and productivity. Basic crop protection equipments, maintenance and repairs. <b>Practicals:-</b> Sampling for nematodes and nematodes extraction from soil and plant. Isolation, purification and identification of major plant pathogens (bacteria and fungi). Creation of insect museum of agricultural importance. Identification of insect body parts. Virus isolation and transmission. Virus purification. Application of molecular and plant tissue culture techniques in plant disease diagnosis.				

5	<b>Teaching methods</b> Lectures, group work, discussions, practicals.
6	<b>Assessment methods</b> Continuous Assessment Tests, Practicals and examination
7	<b>This module/course is used in the following degree programme/s as well</b> Master of agriculture in Crop Protection
8	<b>Responsibility for module/course</b> Prof. Mrs. E. I. Ayo-John eiayojohn@hotmail.com
9	<b>Other information</b> <a href="https://www.elsevier.com/books/crop...and-crop-protection/.../978-0-444-82095-2">https://www.elsevier.com/books/crop...and-crop-protection/.../978-0-444-82095-2</a>  This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote a total of 120 hours of learning to the course, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-study (assigned reading, personal studies, assignments and group work.). Hence, the course is of 4.0 ECTS credit equivalent.

Module/Course Title: <b>SOIL FERTILITY MANAGEMENT AND CROP NUTRITION</b>					
module/ course code (CRP 806)	Student work- load 120 hours	Credits (ECTS) 4.0	Semester Second Sem.	Frequency Each second Semester	Duration 15 weeks
1	<b>Types of courses</b> a) Lectures and Practical	Contact hours 30 hours	hours	Independent study 90 hours	Class size Avg. of 4 (Max 15)
2	<b>Prerequisites for participation</b> Basic Knowledge of Agricultural Science				
3	<b>Learning outcomes</b> The student should be able to characterize soils based on their fertility status and make recommendation for management of different types of soils based on crop requirements.				
4	<b>Subject aims/Content</b> Essentiality of plant nutrition, Basic concepts in soil plant relationships Soil fertility and productivity Soil organic matter; Fertilizers and lime use; Organic fertilizer and compost production and use; Integrated soil fertility management: Cropping Systems, Biological fertilization; Soil fertility evaluation; Soil characterization; Soil fertility mapping and Land use planning;				
5	<b>Teaching methods</b> Lectures and practical				
6	<b>Assessment methods</b> Continuous Assessment Tests (20%), practical (20%) and Written Examination (60%)				

7	This module/course is used in the following degree programme/s as well
8	<b>Responsibility for module/course</b> Prof. C. O. Adejuyigbe coadejuyigbe@yahoo.com
9	<b>Other information</b> <i>Plant Nutrition and Soil Fertility Manual, Second Edition - CRC Press Book. ... Reference - 304 Pages - 10 B/W Illustrations</i> This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote a total of 120 hours of learning to the course, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice). Hence, the course is of 4.0 ECTS credit equivalent.

Module/Course Title: Physiology of Crop Production					
module/ course code (CRP 807)	Student work- load 120 hours	Credits (ECTS) 4.0	Semester First Sem.	Frequency Each first Semester	Duration 15 weeks
1	<b>Types of courses</b> a) Lecture b)Term paper c) Seminar	<b>Contact hours</b> 30 hours	<b>Independent study</b> 90 hours	<b>Class size</b> Avg. of 4 (Max 15)	
2	<b>Prerequisites for participation</b> Basic knowledge of principles of crop physiology				
3	<b>Learning outcomes</b> The student would be able to understand the principles of physiological basis of crop production				
4	<b>Subject aims/Content</b> Physiological mechanism underlying crop yield: growth, development, assimilate partitioning and carbon economy, Canopy carbon assimilatory process and effect of environmental factors; light (Photosynthetic photon flux density), water and nutrient availability, Irradiance response curve model and analysis of canopy carbon assimilation, Canopy architecture and carbon assimilation, coefficient of extinction, LAI, Sunlighted leaf area, leaf orientation and canopy carbon assimilation, Leaf area duration, relative leaf growth rate, Canopy respiration and yield; growth and maintenance respiration, factors affecting them and implication towards yield, Carbon balance				

	and yield, Stress physiology and ameliorative process, Water balance: water deficit and flooding. Physiology of crop response, adaptation and acclimation and its consequent on crop yield, water use efficiency and yield. Irrigation and yield, Energy balance: UV and other lethal electromagnetic radiation, shading. Physiology of crop response and effect on yield. Radiation use efficiency and yield. Nutrient response curve, indicating different zones of uptake; deficiency, poverty adjustment, luxury consumption and toxicity zone with emphasis on essential macro nutrients. Nutrient use efficiency; nutrient uptake and utilisation, dimensions of nutrient use efficiency (Agronomic, Partial factor productivity, Physiological, internal, recovery and economic nutrient efficiency). Iron and aluminium toxicity specifically in rice production and its implication on crop yield. Fertiliser application (inorganic and organic agriculture) and crop yield, Effect of reactive oxygen species on crop yield, Crop Ecophysiology and Introductory crop modelling, Environmental factors and crop yield, System theory, system dynamics concepts and principles, Crop simulation models in Agricultural research and management, Fundamentals of DSSAT model, Yield analysis of some selected field crops; yield component of some selected arable crops and its implication towards yield formation, Physiological bases of agronomic management practises; spacing, fertiliser application, irrigation, variation in planting date etc.
5	<b>Teaching methods</b> Lectures and Practical
6	<b>Assessment methods</b> Continuous Assessment Tests, assignments and Examination
7	<b>This module/course is used in the following degree programme/s as well</b> Master of Agriculture in Plant Physiology
8	<b>Responsibility for module/course</b> Dr. Olalekan Sakariyawo <a href="mailto:adetanwa@yahoo.co.uk">adetanwa@yahoo.co.uk</a>
9	<b>Other information</b> <i>Physiology of Crop Production</i> . Crop Science. By N K Fageria, V C Baligar, and , R B Clark. Food Products Press. Binghamton (New York): Haworth Press  This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote a total of 120 hours of learning to the course, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-study (assigned reading, personal studies, assignments). Hence, the course is of 4.0 ECTS credit equivalent.

Module/Course Title: Agronomy, Ecology and Physiology of Pastures					
module/ course code (CRP808)	Student work- load 180 hours	Credits (ECTS) 6.0	Semester Second Sem.	Frequency Each second Semester	Duration 15 weeks
1	<b>Types of courses</b> a) Lecture b) Practical	<b>Contact hours</b> 45 hours	<b>Independent study</b> 135 hours	<b>Class size</b> Avg. of 4 (Max 15)	
2	<b>Prerequisites for participation</b> Basic course on Principles of Agronomy				



3	<b>Learning outcomes</b> Skills are acquired in the physiological basis and distribution of pastures
4	<b>Subject aims/Content</b> Agronomy and adaptation of tropical pasture plants and their pattern of geographical distribution. Origin and domestication of forage plants. Genetic variation and mode of reproduction in pasture plants. Natural and sown pasture compared. Establishment and management of improved pastures - land requirement, land preparation, planting materials and planting, etc. Degradation and persistence of pastures. Role of legumes in tropical pasture production. Pasture condition, species inter- relations environmental influences. Pasture as an ecosystem, species interrelationships and succession. Animal-soil-plant interactions. Influence of edaphic, physiographic and biotic factors in pasture productivity
5	<b>Teaching methods</b> Lectures and Practical
6	<b>Assessment methods</b> <a href="#">Continuous Assessment Tests (20%), Practical (20%) and Written Examinations (60%)</a>
7	<b>This module/course is used in the following degree programme/s as well</b> Master of Agriculture in Pasture and Range Management
8	<b>Responsibility for module/course</b> <a href="#">Prof. O. M. Arigbede</a> <a href="mailto:arigbede2002@yahoo.com">arigbede2002@yahoo.com</a>
9	<b>Other information</b> <a href="#">This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote a total of 180 hours of learning to the course, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned reading, personal studies, assignments and group work. Hence, the course is of 6.0 ECTS credit equivalent</a>

<b>Module/Course Title: <a href="#">PASTURE PRODUCTION, EVALUATION AND UTILIZATION</a></b>					
<b>module/ course code</b> (CRP 809)	<b>Student work- load</b> <a href="#">180 hours</a>	<b>Credits</b> (ECTS) <a href="#">6.0</a>	<b>Semester</b> First Semester	<b>Frequency</b> <a href="#">Each first Semester</a>	<b>Duration</b> <a href="#">15 weeks</a>
<b>1</b>	<b>Types of courses</b> a) Lectures b) Practicals	<b>Contact hours</b> <a href="#">45 hours</a>	<b>Independent study</b> <a href="#">135 hours</a>	<b>Class size</b> <a href="#">Avg. of 4 (Max 15)</a>	
<b>2</b>	<b>Prerequisites for participation</b>				

	None
<b>3</b>	<b>Learning outcomes</b> <a href="#">Skills are acquired in the effective production and management of Pastures</a>
<b>4</b>	<b>Subject aims/Content</b> Role of pastures in animal production, factors influencing choice of species for sown pastures. Steps in pasture establishment and management - weed management, fertilizer management and grazing management. Pasture research methodology and evaluation techniques. Pasture quality evaluation and factors affecting quality. Animals and pasture measurements under experimentation and statistical analysis. Utilization techniques - <i>in situ</i> grazing and grazing systems, cut-and-carry system, conservation and utilization techniques
<b>5</b>	<b>Teaching methods</b> Lectures and Practical
<b>6</b>	<b>Assessment methods</b> <a href="#">Continuous Assessment Tests (20%), Practical (20%) and Written Examination (60%)</a>
<b>7</b>	<b>This module/course is used in the following degree programme/s as well</b> Master of Agriculture in Pasture and Range Management
<b>8</b>	<b>Responsibility for module/course</b> <a href="#">Prof. J. A. Olanite</a> <a href="mailto:jimolanite@yahoo.com">jimolanite@yahoo.com</a>
<b>9</b>	<b>Other information</b> This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote a total of 180 hours of learning to the course, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using statistical software to analyse data). Hence, the course is of 6.0 ECTS credit equivalent

Module/Course Title: <b>ENGINEERING APPLICATION IN CROP/PASTURE PRODUCTION</b>					
<b>module/ course code</b> (CRP 810)	<b>Student work- load</b> 180 hours	<b>Credits</b> (ECTS) 6.0	<b>Semester</b> Second Sem.	<b>Frequency</b> Each second Semester,	<b>Duration</b> 15 Weeks

1	<b>Types of courses</b> a) Lectures b) practical	<b>Contact hours</b> 45 hours	<b>Independent study</b> 135 hours	<b>Class size</b> Avg. of 4 (Max 15)
2	<b>Prerequisites for participation</b> None			
3	<b>Learning outcomes</b> The student should be able to apply the basic field operations in a cost effective manner in the production of crops. Also, the use of appropriate designs for drainage systems.			
4	<b>Subject aims/Content</b> Field mechanization: Land clearing operations; Tillage operations – ploughing, harrowing, planting, ; Equipment for mechanized agricultural production – The tractor and accessory implements, Conservation agriculture equipment; Intensive mechanization equipment for large scale farming Irrigation: Classifications & types of irrigation system; Merits & demerits of irrigation system; Criteria for the selection of irrigation system; water use efficiency; Crop water requirements, crop coefficient, field water requirements, field irrigation methods; irrigation scheduling, conveyance structures, Soil, water and plant relationship Drainage: Principles of soil and land drainage; Surface drainage, drainage methods, crop row drain system, Subsurface drainage criteria, Drainage and erosion control, Drainage types and classifications; selection of drainage systems Soil and water conservation on cropland, Soil and water conservation on pasture and rangeland, Flood control: Causes of flood; Flood and the associated disasters; Identification of flood prone areas; Climate change and flood; Flood control techniques and facilities Farm structures for crop/ pasture production: Dams, canals and other hydraulic systems; Farm workshop for equipment servicing, repairs and maintenance; Storage structures for crops and hays, Selection criteria for location of farm structures and construction materials.			
5	<b>Teaching methods</b> Lectures and Practical			
6	<b>Assessment methods</b> Continuous Assessment Tests (15%), Practical (25%) and Written Examinations (60%)			
7	<b>This module/course is used in the following degree programme(s) as well</b>			
8	<b>Responsibility for module/course</b> Dr. P.O.O. Dada piusdadaariyo@gmail.com			
9	<b>Other information</b> This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote a total of 180 hours of learning to the course, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using statistical software to analyse data). Hence, the course is of 6.0 ECTS credit equivalent			

<b>Module/Course Title: CROP/PASTURE PROCESSING TECHNOLOGY</b>					
<b>module/ course code</b> (CRP 811)	<b>Student work- load</b> 180 hours	<b>Credits</b> (ECTS) 6.0	<b>Semester</b> First Sem.	<b>Frequency</b> Each first Semester	<b>Duration</b> 15 weeks
<b>1</b>	<b>Types of courses</b> a) Lecture b) Practical	<b>Contact hours</b> 45 hours	<b>Independent study</b> 135 hours	<b>Class size</b> Avg. of 4 (Max 15)	
<b>2</b>	<b>Prerequisites for participation</b> None				
<b>3</b>	<b>Learning outcomes</b> The students will be able to apply the principles employed in crop and pasture processing, maintenance and Storage				
<b>4</b>	<b>Subject aims/Content</b> Crop/ Pasture Harvesting Equipment: Traditional harvesting equipment; tractor Mounted harvesters; combine harvester, Principles and techniques of handling crop/ pasture production equipments Primary processing equipment; Choppers, grain shellers and threshers, grain separators and sorters, dryers, pelletizers; Maintenance and servicing of the identified equipment; Secondary processing equipment: Types and principle of operation of expellers, extractors, extruders, hay balers; Maintenance and servicing of the identified equipment; Storage Facilities: Classification of storage systems, Traditional storage system – Bags, guard traditional crib, rhombus, etc; Improved storage system – Improved crib, Evaporative Coolant system; Modern storage system – Refrigeration, cold storage system, silo, ware house; cooling vans; Storage facilities for root and tuber crops – barn, shelf, pit or underground storage system, etc.				
<b>5</b>	<b>Teaching methods</b> Lectures, group work and practicals				
<b>6</b>	<b>Assessment methods</b> Continous assessment (15%), Practicals (15%) and Written examination (70%)				
<b>7</b>	<b>This module/course is used in the following degree programme/s as well</b>				
<b>8</b>	<b>Responsibility for module/course</b> Prof. B. A. Adewunmi				

	<a href="mailto:babatunde_adewumi@yahoo.com">babatunde_adewumi@yahoo.com</a>
<b>9</b>	<b>Other information</b> This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote a total of 180 hours of learning to the course, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using statistical software to analyse data). Hence, the course is of 6.0 ECTS credit equivalent

Module/Course Title: <b>NEW FRONTIERS IN CROP PRODUCTION</b>					
module/ course code (CRP 812)	Student work- load 120 hours	Credits (ECTS) 4.0	Semester Second Sem.	Frequency Each second Semester	Duration 15 weeks
<b>1</b>	<b>Types of courses</b> a) Lectures b) Practical	<b>Contact hours</b> 30 hours	<b>Independent study</b> 90 hours	<b>Class size</b> Avg. of 4 (Max 15)	
<b>2</b>	<b>Prerequisites for participation</b> Basic knowledge of plant cell and genetics.				
<b>3</b>	<b>Learning outcomes</b> At the end of this course the students should understand the structure and function of DNA. Also, to be able to use molecular markers in selection of genotypes as well as the underlying principles of tissue culture technology.				
<b>4</b>	<b>Subject aims/Content</b> Marker Assisted Selection (MAS), DNA technology on tissue culture in Crop and forage production, Genetic Engineering, Genotyping and phenotyping of crop and pasture of essential attributes				
<b>5</b>	<b>Teaching methods</b> Lectures and Practicals				
<b>6</b>	<b>Assessment methods</b> Continous assessment test (20%), Practical (20%) and Written Examination (60%)				
<b>7</b>	<b>This module/course is used in the following degree programme(s) as well</b>				
<b>8</b>	<b>Responsibility for module/course</b> <a href="mailto:ideheneo@funaab.edu.ng">Dr. E. O. Idehen</a> <a href="mailto:ideheneo@funaab.edu.ng">ideheneo@funaab.edu.ng</a>				
<b>9</b>	<b>Other information</b> This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote a total of 120 hours of learning to the course, including participation in 30 hours of course lectures and demonstrations, and 90				

hours of self-study (assigned reading, personal studies and assignments, group work. Hence, the course is of 4.0 ECTS credit equivalent.

<b>Module/Course Title: PASTURE IN FARMING SYSTEMS AND ENVIRONMENTAL MANAGEMENT</b>					
<b>module/ course code</b> (CRP 813)	<b>Student work- load</b> 120 hours	<b>Credits</b> (ECTS) 4.0	<b>Semester</b> First Sem.	<b>Frequency</b> Each first Semester	<b>Duration</b> 15 weeks
<b>1</b>	<b>Types of courses</b> a) Lectures b) Practicals	<b>Contact hours</b>  30 hours	<b>Independent study</b>  90 hours	<b>Class size</b>  Avg. of 4 (Max 15)	
<b>2</b>	<b>Prerequisites for participation</b>				
<b>3</b>	<b>Learning outcomes</b> The student should be able to manage various farming systems				
<b>4</b>	<b>Subject aims/Content</b> Role of crop-livestock system in sustainable production, role of legumes, integration of pastures in plantation and animal crops. Intensive feed garden, fodder bank system. Sustainable use of crop residues in enhancing dry season feeding. Animal grazing and crop productivity. Managing animals in crop production environments. Animal grazing and ecosystem stability, traditional animal production system, environmental health, and rural livelihoods. Effect of fire in natural pasture management. Ruminant production and global warming, desertification				
<b>5</b>	<b>Teaching methods</b> Lectures, practical, individual presentation.				
<b>6</b>	<b>Assessment methods</b> CAT (20%), Practical (20%) and Written Examination (60%).				
<b>7</b>	<b>This module/course is used in the following degree programme/s as well</b>				
<b>8</b>	<b>Responsibility for module/course</b> Prof. A. O. Jolaosho ajolaosho@yahoo.com				
<b>9</b>	<b>Other information</b> This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote a total of 120 hours of learning to the course, including participation in 30 hours of course lectures and demonstrations, and 90				

hours of self-study (assigned reading, personal studies and assignments). Hence, the course is of 4.0 ECTS credit equivalent.

Module/Course Title: <b>BIOMETRICAL GENETICS</b>					
module/ course code (CRP 814)	Student work- load 120 hours	Credits (ECTS) 4.0	Semester Second Sem.	Frequency Each second semester	Duration 15 weeks
1	<b>Types of courses</b> a) Lectures b) Tutorials	<b>Contact hours</b>  30 hours	<b>Independent study</b>  90 hours	<b>Class size</b>  Avg. of 4 (Max 15)	
2	<b>Prerequisites for participation</b>				
3	<b>Learning outcomes</b> a) The student should be to understand the underlying principles for gene action b) Use appropriate mating designs for breeding experiments.				
4	<b>Subject aims/Content</b> Sources of variation, Additive Dominance Model, Epistasis, Interaction, G x E, Line x tester analysis, Experimental population-BIPS, NC I, NC II, Diallel				
5	<b>Teaching methods</b> Lectures and discussion.				
6	<b>Assessment methods</b> CAT(30%) and Written Examination (70%)				
7	<b>This module/course is used in the following degree programme/s as well</b> This course is also used for M.Agric. (Plant Breeding) in FUNAAB				
8	<b>Responsibility for module/course</b> Dr. E. O. Idehen <a href="mailto:ideheneo@funaab.edu.ng">ideheneo@funaab.edu.ng</a>				
9	<b>Other information</b> Biometrical Genetics: The Study of Continuous Variation by Mather and Jinks  This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote a total of 120 hours of learning to the course, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using statistical software to analyse data). Hence, the course is of 4.0 ECTS credit equivalent.				

