LANDMARK UNIVERSITY, OMU-ARAN

COURSE COMPACT

COLLEGE: SCIENCE AND ENGINEERING

DEPARTMENT: AGRICULTURAL AND BIOSYSTEMS ENGINEERING

PROGRAMME: AGRICULTURAL ENGINEERING

COURSE COMPACT for: ABE 521 - AGRICULTURAL LAND CLEARING AND DEVELOPMENT

Course

Course Code: ABE 521

Course Title: Agricultural Land Clearing and Development

Credit Unit: 2 Credits

Course Status: Compulsory (C)

Course Duration

Three hours- (2 hours lecture) per week for 15 weeks (30 hours)

Lecturers Data

Engr. T.A. Adekanye B.Eng., M.Eng. Reg Engr. (COREN)
Department of Agricultural and Biosystems Engineering
College of Science and Engineering
E-mail: adekanye.timothy@lmu.edu.ng
Office Location: Room A216, New College Building.
Consultation Hours: Tuesdays: 1- 3 pm, Thursdays: 11 am – 1 pm.

Dr. David A. Okunade Dipl., B.Sc, MSc, Ph.D, Reg Engr. (COREN)
Department of Agricultural and Biosystems Engineering
College of Science and Engineering
E-mail: *okunade.david@lmu.edu.ng*
Office Location: A021a - Engineering Workshop Building (Intercom 4167)
Consultation Hours: Wed. 10 - 12 noon and Thurs. 10 - 12 noon.

Course Content:

Land resources and Land Use Act in relation to Nigerian Agriculture. Objectives, methods of land clearing and development. Equipment for land clearing and development. (Land scaping and levelling) Machinery selection, mechanics of operation and vegetation types. Performance criteria, economics of land clearing, machinery maintenance procedures. Site Studies. (with reports). 30h (T). C.

Course Description:

Agricultural Engineering is a unique discipline because it involves the application of almost all aspects of other engineering disciplines including Animal Science, Soil Science, Agricultural Economics, etc. One of the most important problems in developing countries is the level of awareness and importance given to agricultural development. The role of agricultural education is vital as it is directly linked to the effectiveness of the economy in providing the requirement of trained manpower for the development process. In modern agricultural production, power is very important for an appropriate level of mechanization to be achieved. It is therefore inevitable that any practicing agriculturist should know the relevant power sources available for agricultural work.

Course Justification:

Land clearing and development is an important aspect of mechanized or large scale agriculture. It highly depends on the natural environment for land, nutrients, water for irrigation, and other ecological services. Land clearing and development process can result in serious environmental risks and problems if not done properly. The environmental impacts and human health related issues arising either directly or indirectly by land clearing and its subsequent development can be tremendous.

Land acquisition and clearing constitute a major bottleneck to the development of Agribusiness in Nigeria. Several would-be investors had been discouraged by the enormous cost and the associated risk in land clearing and development. Procedure for estimating land clearing and development for agriculture remain cumbersome, while decision process on method of clearing, ownership or leasing of clearing equipment, land sourcing, is freight with many unsustainable assumptions. In this course, students will be introduced to the rules/laws guiding land acquisition and development for agriculture in Nigeria. Vegetation distribution and characteristic of soil profiles in Nigeria, Techniques for deciding method of land clearing, proposal and budgeting for land clearing, machine and equipment for land clearing and development, procedure for land development, Farm planning etc.

Course objectives

1. To provide a sound knowledge in the study of agricultural power and machinery in order to facilitates students interest in agricultural engineering,
2. To introduce students to laws guiding land acquisition and development for Agriculture in Nigeria,
3. Introduce students to the process for preparing technical and financial proposals for land clearing and development for agriculture,

4. To introduce students to technical procedure for determining the methods of land clearing,
5. Identify various types of environmental hazard related to improper land clearing and development procedures
6. Help students to select, use, repair and maintain appropriate agricultural land clearing machinery,

Course Requirements:

1. Students must have a minimum 70% attendance and participate in all practical classes.
2. No student shall be allowed in for this lecture 20 minutes after the allocated time or entrance of the course teacher.
3. Assignment that was not submitted and delivered to the course teacher within the stipulated time frame shall not be graded.
4. Students shall be required to read beyond what is provided in class or compliment class jottings by making reference to text books for better grade standing.

Method of Grading-

S/N	GRADING	SCORE
1.	**Continuous Assessments** • C.AI • C.AII (Mid-Semester Test) • C.AIII	 **7%** **15%** **8%**
2.	**Assignment**	**10%**
3.	**Final Examination**	**60%**
4.	**Total**	**100%**

Course Delivery Strategies:
Lecturing method complimented with field practical work will be adopted. There shall be Power point presentations especially in illustrative topics coupled with note dictations.

LECTURE CONTENT
<u>Module 1</u> - Overview and Introduction
General overview of the course
Brief introduction to communication
The course description, justification, objectives, requirements, and expectations

Week 1: Course Introduction - Land resources and Land Use Act in relation to Nigerian Agriculture

Objectives - The students at the end of the lecture for the week should be able to:

1. give an overview of what the course is about
2. know the course description, content, expectation, delivery strategies, objectives and justification
3. Explain land resources in Nigeria with respect to agriculture
4. Explain the Land Use Act

- **Description**

First hour:
General Introduction to the course
Second hour
General overview continues
Feedback from the lecture

Study Questions:

1. Mention land resources
2. Write short note on Nigerian Land Use Act

Week 2: Land resources and Land Use Act in relation to Nigerian Agriculture - **Continue**

Reading List:

1. Introduction to Agricultural Mechanization. 1985. R.N. Kaul, C. O. Egbo. Macmillan Intermediate Agriculture Series.
2. Elements of Agricultural Engineering by Jagdishwar, S. 2010. Standard Publishers Distributors, Delhi
3. Farm Power Machinery Volume-I by ISAE; Jain brothers

Week 3: Land Tenure System

Objectives
The students at the end of the lectures for the week should be able to;

1. Explain land resources in Nigeria with respect to agriculture
2. Explain the Land Use Act

Description
First hour:

Definition of terms
Importance of Land Use Act

Second hour
Some disadvantages of Land Use Act
Feedback from the lecture.

Study Questions:

1. Mention land resources
2. Write short note on Nigerian Land Use Act

Week 4: Land clearing: Objectives, methods and factors

Objectives
The students at the end of the lectures for the week should be able to;

1. Explain the objectives of agricultural land clearing
2. Highlight methods of agricultural land clearing
3. Explain the advantages of each method of agricultural land clearing.

Description
First hour:
Definition of terms
Objectives of Land clearing operations

Second hour
Methods of land clearing operations
Factors that influence consider in land clearing.

Study Questions:

1. Mention 5 objectives of agricultural land clearing
2. Highlight 5 methods applicable to agricultural land clearing
3. Which of the methods of agricultural land clearing would you consider as the best? Give reasons for your answer.

Reading List:

1. Engineering Principles of Agricultural Machines by Ajit, K. Srivastava, Carrol, E. Goering, Roger, P. Rohrbach and Dennis, R. Buckmaster. ASABE.
2. Elements of Agricultural Engineering by Jagdishwar, S. 2010. Standard Publishers Distributors, Delhi.
3. Fundamentals of Engineering for Agriculture by A.P. Onwualu, C.O. Akubuo and I.E. Ahaneku. 2006. Immaculate publications Limited, Enugu - Nigeria

Week 5: Land clearing: Objectives, methods and factors - **Continue**

Week 6: Land clearing and development operations

Objectives

The students at the end of the lectures for the week should be able to;

1. Explain the objectives of agricultural land clearing
2. Highlight methods of agricultural land clearing
3. Explain the advantages of each method of agricultural land clearing.

Description

First hour:

Definition of terms
Land clearing operations

Second hour

Dos and don'ts of land clearing operations
Feedback from the lecture.

Study Questions:

1. Mention 5 objectives of agricultural land clearing
2. Highlight 5 methods applicable to agricultural land clearing
3. Which of the methods of agricultural land clearing would you consider as the best? Give reasons for your answer.

Reading List:

1. Engineering Principles of Agricultural Machines by Ajit, K. Srivastava, Carrol, E. Goering, Roger, P. Rohrbach and Dennis, R. Buckmaster. ASABE.
2. Elements of Agricultural Engineering by Jagdishwar, S. 2010. Standard Publishers Distributors, Delhi.

Week 7: Levelling

Objectives

The students at the end of the lectures for the week should be able to;

4. Explain the objectives of agricultural land clearing
5. Highlight methods of agricultural land clearing
6. Explain the advantages of each method of agricultural land clearing.

Description

First hour:

Definition of terms
Importance of Land levelling

Second hour

Land levelling and land clearing

Errors in land levelling
Feedback from the lecture.

Study Questions:

1. Mention 5 objectives of agricultural land clearing
2. Highlight 5 methods applicable to agricultural land clearing
3. Which of the methods of agricultural land clearing would you consider as the best? Give reasons for your answer.

Reading List:

1. Engineering Principles of Agricultural Machines by Ajit, K. Srivastava, Carrol, E. Goering, Roger, P. Rohrbach and Dennis, R. Buckmaster. ASABE.
2. Elements of Agricultural Engineering by Jagdishwar, S. 2010. Standard Publishers Distributors, Delhi.
3. Fundamentals of Engineering for Agriculture by A.P. Onwualu, C.O. Akubuo and I.E. Ahaneku. 2006. Immaculate publications Limited, Enugu - Nigeria

Week 8: Land clearing and development operations - **Continue**

Week 9: Mid – Semester Examination

Week 10: Equipment for land clearing and development.

Objectives

The students at the end of the lectures for the week should be able to;

1. Identify different equipment for agricultural land clearing
2. Explain the operation of agricultural land clearing equipment

Description

First hour:

Some relevant equipment for land clearing

Second hour

Operation of land clearing equipment
Feedback from the lecture.

Study Questions:

1. Describe 5 equipment of agricultural land clearing

Reading List:

2. Engineering Principles of Agricultural Machines by Ajit, K. Srivastava, Carrol, E. Goering, Roger, P. Rohrbach and Dennis, R. Buckmaster. ASABE.
3. Elements of Agricultural Engineering by Jagdishwar, S. 2010. Standard Publishers Distributors, Delhi.

4. Fundamentals of Engineering for Agriculture by A.P. Onwualu, C.O. Akubuo and I.E. Ahaneku. 2006. Immaculate publications Limited, Enugu - Nigeria

Week 11: Machinery Selection and Management

Objectives - The students at the end of the lectures for the week should be able to;

1. Understand causes of agricultural machinery breakdown
2. Select appropriate agricultural machinery
3. Maintain agricultural machinery
4. Do cost analysis of agricultural machinery and
5. Replace agricultural machinery.

Description

First hour:

Definition of terms
Selection of appropriate agricultural machinery

Maintenance of agricultural machinery

Second hour

Do cost analysis of agricultural machinery and

Replace agricultural machinery.

Study Questions:

1. Identify and discuss factors responsible for the premature failure of agricultural machinery in Nigeria.
2. What factors would you consider in selecting agricultural machinery?

Reading List:

1. Fundamentals of Engineering for Agriculture by A.P. Onwualu, C.O. Akubuo and I.E. Ahaneku. 2006. Immaculate publications Limited, Enugu - Nigeria
2. Elements of Agricultural Engineering by Jagdishwar, S.2010. Standard Publishers Distributors, Delhi.

Week 12: Machinery Selection and Management - Continue

Week 13: Land clearing Machinery maintenance procedures.

Objectives - The students at the end of the lectures for the week should be able to;

1. Understand the importance of maintenance of farm machinery
2. Understand various types of maintenance
3. Maintain agricultural machinery
4. Carry out performance evaluation of agricultural machinery breakdown
5. Do cost analysis of agricultural machinery and
6. Replace agricultural machinery
7. Do cost analysis of agricultural machinery and

Description
First hour:
Definition of terms
Selection of appropriate agricultural machinery

Maintenance of agricultural machinery

Second hour
Performance evaluation of agricultural machinery breakdown

Study Questions:
1. Identify and discuss factors responsible for the premature failure of agricultural machinery in Nigeria.
2. What factors would you consider in selecting agricultural machinery?

Week 14: Land clearing Machinery maintenance procedures – Continue

Week 15: Examination

Objectives: To examine the students on all that has been taught during the semester.

Reading List:

1. Principles of Farm Machinery by Kepner R. A., Bainer R., and Barger E. L. 1997. 2nd Ed. AVI Publishers Connecticut. USA.
2. Tractors and Their Power Units by Liljedahl J. B., Carlton W. M., Turnquist P. K., and Smith D.W. 1997. 3rd Ed. John Wiley. New York
3. Agricultural Engineers Yearbook by Richey L. B., Jacobson R., Hall C. W. McGraw Hill Co. USA
4. Machines for Power Farming by Stone A. A. and Culvin H. E. 3rd Ed. John Wiley. New York.
5. Engineering Principles of Agricultural Machines by Ajit, K. Srivastava, Carrol, E. Goering, Roger, P. Rohrbach and Dennis, R. Buckmaster. ASABE.

6. Elements of Agricultural Engineering by Jagdishwar, S.2010.. Standard Publishers Distributors, Delhi.
7. Fundamentals of Engineering for Agriculture by A.P. Onwualu, C.O. Akubuo and I.E. Ahaneku. 2006. Immaculate publications Limited, Enugu - Nigeria
8. Element of Farm Machinery by A.C.Srivastava and Raju Primlari; Oxford &IBH Publishing Co. Pvt Ltd, New Delhi
9. Elements of Agricultural Engineering Part 1 & 2 by Dr. O.P. Singhal and Naresh Chandra Aggarwal; Mumford Ganj, Allahabad
10. Principle of Agricultural Engineering Volume-I by A.M. Michael & T.P.Ojha; Jain brothers.
11. Principle of Agricultural Engineering Volume-II by A.M. Michael & T.P.Ojha ; Jain brothers.
12. Farm Power Machinery Volume-I by ISAE; Jain brothers
13. Farm Power Machinery & Surveying by Irshad Ali; Kitab Mahal, Nai Sarak, Delhi
14. Farm Machinery by Smith
15. Tillage System in the Tropics by FAO; Oxford and IBH Publication Co.

HOD's COMMENTS:

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Name: _____ Signature _____Date……...