

COURSE COMPACT

Course: ABE 513 - AGRICULTURAL LAND DRAINAGE (2 UNITS)

Course status - Compulsory

Course Duration: Two hours- (2 hours per week for 15 weeks (30 hours)

Lecturer: Engr. T.A. Adekanye B.Eng., M.Eng.

Department of Agricultural and Biosystems Engineering

College of Science and Engineering

E-mail: adekanye.timothy@[lmu.edu.ng](mailto:adekanye.timothy@lmu.edu.ng)

Office Location: Room 107, CSE Building.

Consultation Hours: Thursdays: 11 am – 1 pm

Course Content:

Introduction to drainage: Definitions, drainage problems, causes of waterlogging, prevention and control of waterlogging. Objectives of drainage: need of drainage, purpose of drainage, effects of poor drainage, and benefits of drainage. Drainage systems: types of drainage systems: surface drainage, subsurface drainage. Design of drainage systems: design considerations. Envelop materials and their design. Loads on conduits. Drainage pumping. Construction and installation of drains. Maintenance of drains.

Course Description:

Irrigation and drainage are two opposite terminologies that are indispensable in crop production. Irrigation is used to supplement natural rainfall in periods of drought stress. Where there is too much water, there is the need to reduce the water level to safe limits through drainage.

Land drainage deals with the control of waterlogging and soil salinization in agricultural lands. In flatlands, a first problem emerges if soil infiltration rates are low and rainfall or irrigation water stands on the ground surface, generally in small depressions or at the edges of the irrigation basin. This problem can be solved by levelling and smoothing the land and providing it with a uniform slope for excess water to flow through furrows or shallow ditches toward the surface drainage outlet. Surface water is discharged into a collector drain through pipes to prevent the erosion of the open ditch bank.

Waterlogging of the root zone due to the presence of perched water tables also occurs if

The percolation rate is lower than the amount of water infiltrated, because of poor internal Drainage of the soil. In flat lands, percolation can be improved by means of sub soiling to break hard pans and other types of less pervious layers of the topsoil. Thus, the soil structure, porosity, and hydraulic conductivity are enhanced and thus are water percolation.

Course Justification:

The topics covered in this course will enable students to understand the basic principles of drainage engineering. This course will also help students to understand the relationship between irrigation and drainage. It will show them how to assess the need for drainage, and will help them understand how drainage systems function.

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.	Test	15
2.	Assignment	5
3.	Practical	10
4.	Final Examination	70
	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.

LIST OF PRACTICALS

- 1.

Note: attendance in the practical is compulsory for students.

Week 1: Introduction to drainage

Week 2: Objectives of drainage

Week 3: Drainage systems

Week 4: Drainage systems - continue

Week 5: Drainage systems – Continue

Week 6: Practical I and II

Week 7: Design of drainage systems

Week 8: - Design of drainage systems

Week 9: Mid Semester Examination

Week 10: Construction and installation of drains.

Week 11: Practical III and IV

Week 12: Maintenance of drains

Week 13: Maintenance of drains

Week 14: Revision

Week 15: Examination

Reading List:

1. S.K. Garg. Irrigation Engineering and Hydraulic Structures. 14th Edition. 2006.
2. IOE .1995. Hill Irrigation Engineering. Institute of Engineering, Pulchowk Campus.

3. Michael A M and S D Khepar. 1989. Water well and Pump Engineering. Tata Mc GrawHill Publishing Company Limited New Delhi, India.
4. Michael, A M and T P Ojha, 1987. Principles of Agricultural Engineering- Vol-1, Jain Brothers, New Delhi, India.
5. Michael, A M. 1999. Irrigation Theory and Practice, Vikas Publishing House Private Limited, New Delhi, India.
6. Murthy V. V. N. 1985. Land and Water Management Engineering. Kalyani Publishers, Newdelhi, India.
7. Schwab, G O et al. 1981. Soil and Water Conservation Engineering, John Wily & Sons.
8. Subramanya K. 1994. Engineering Hydrology. Tata McGraw-Hill Publishing Company Limited, New Delhi, India.
9. USDA, 1981. A Manual on conservation of Soil & water. Oxford Book Company, London.
10. USDA. 1978. Drainage Manual. Oxford & IBH Publishing Co. Pvt. Ltd.
11. J.Wijdieks and M.G.Bos, 1994. *Pumps and Pumping Stations*. In: H.P.Ritzema (ed.), Drainage Principles and Applications, ILRI Publication 16, p.965-1000. International Institute for Land Reclamation and Improvement (ILRI). Wageningen. The Netherlands. [ISBN 90-70754-33-9](https://doi.org/10.1007/978-94-017-1339-9)