**AEN 1202 CLIMATOLOGY AND FIELD ENGINEERING**

Lecturers Mr. Wanyama Joshua (B.Sc. Agric. Eng, M.Sc)

Miss Ayaa Fildah (B.Sc. Agric. Eng)

**Course Type**: **CORE (B.Sc. Agric. LUM, FOR, HORT)**

**1. COURSE DESCRIPTION**

**Course Credits (CU)**: **3 CU i.e. 45 Contact Hours per semester**

**Course Duration**: **15 weeks (45 hours) i.e. 30 LH, 30 PH**

**COURSE DESCRIPTION**

**2. COURSE OBJECTIVES**

At the end of the course, students will be able to use and interpret climatic data, and appreciate irrigation principles.

The **specific objectives** are to:

1. To appreciate the significance of weather and climate for agriculture;
2. To understand the application of climatology and its principles to the solution of practical problems in agriculture;
3. To understand the basic hydrological processes and their practical application in agriculture;
4. To understand the basic irrigation and drainage as well as soil and water conservation principles.

**3. RECOMMENDED REFERENCES FOR READING**

* Ayoade, J.O.1979. Introduction to Climatology for the Tropics.
* Barry R.G. and Chorlay, J.R. 1987. Atmosphere, Weather and Climate. Methuen and co. Ltd London.
* Brouwer, C., A. Goffeau, J. Plusje and M. Heibloem 1985. Irrigation Water Management Training Manuals No. 3. Irrigation Water Needs. FAO Publication.
* Brouwer, C., A. Goffeau, J. Plusje and M. Heibloem. 1985. Irrigation Water Management Training Manuals Nos. 2. Elements of Topographic Surveying. FAO Publication.
* Christehfield H.J. 1974. General Climatology Practice. Hall Inc Englewood cliffs, NJ
* Jackson, I.J. 1989. Climate, Water, Agriculture in the Tropics. Longman Group, UK, Ltd.
* Michael A.M. 1993. Irrigation Theory and Practice. Vikas Publishing House Ltd.
* Schwab, G.O, Frevert R.K., Edminister T .W. and Barnes K.K. 1981. Soil and Water Conservation Engineering. 3rd edition. John Wiley & Sons, Inc.
* Withers, B. and S.Vipond 1988. Irrigation Design and Practice.B T Batsford Ltd.

**4. COURSE CONTENT, METHODS OF INSTRUCTION, TOOLS AND EQUIPMENT REQUIRED**

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| **TOPIC** | **CONTENT** | **METHOD OF INSTRUCTION / Time allocated** | **TOOLS / EQUIPMENT NEEDED** |
| ***Lecture 1***Introduction to meteorology and climate | * Terminologies
* Nature and scope of climatology
* Developments in climatology
* Weather, climate and Agriculture
 | Interactive lectures (6 hrs)Seminar ( 3 hrs) | Chalk / BB or LC-projector  |
| ***Lecture 2.*** Atmosphere and the earth energy budget | * Composition and structure of the atmosphere
* The earth’s energy budget
 | Interactive lectures ( 3 hrs)Seminar (3 hrs) | Chalk / BB or LC-projector and laptop |
| ***Lecture 3.*** Climatic data collection and analysis | * Introduction to weather observations
* Data collection, analysis and interpretation
* Weather forecasting
 | Interactive lectures (9 hrs)Seminar / tutorial(3 hrs)Field trip( 6 hrs) | Chalk / BB or laptop and projectorTransport (Faculty bus) |
| Lecture 4hydrology | * Introduction to hydrology
* Hydrological cycle
* Evapotranspiration
* Groundwater resources
* Run off and surface storage
 | Interactive lectures (6 hrs)Tutorial(6 hrs) | Chalk / BB or laptop and projector  |
| **Lecture 5**Irrigation and drainage principles | * Introduction
* Surface and subsurface drainage
* Irrigation principles and methods
 | Interactive lectures (6 hrs)Field Trip (6 hrs) | Chalk / BB or laptop and projectorTransport (Faculty bus) |
|  | * Evaluation
 | Tests (3 hrs) |  |

**5. SUMMARY OF TIME NEEDED**

Interactive lectures covering theory 30 hrs

Field visits 12 hrs

Seminars 15 hrs

Evaluation 03 hrs

**6. OVERALL COURSE EVALUATION**

Continuous Assessment Test and assignments 40%

Final examination 60%