

**MAKERERE UNIVERSITY
DEPARTMENT OF CROP SCIENCE**

**CRS 3250: SUSTAINABLE TROPICAL FARMING SYSTEMS
Science and Practice**

Instructor: Assoc. Prof. Charles Ssekabembe
Department of Crop Science, Makerere University, Uganda

Pre-requisite: First year Biology

Course Description:

The role of specific sustainable and integrated farming systems in the tropics will be reviewed. They include sustainable low-input small holder agriculture under the tropical environment. Emphasis will be placed on what makes the tropical farming systems sustainable as well as the biological basis of these farming systems. Selected specific farming systems will be covered in great detail. Besides lectures, experiential learning during the course will include field visits to small holder farms, agricultural experiential stations and the World Agroforestry Center in Nairobi.

Course outline:

Section 1

- Ecology – the tropical agroecosystem
 - Limitations of the tropical climate
 - Limitations of soils in the tropics
- Centres of origin and distribution of crop plants
 - Centres of origin of annual crops
 - Factors that determine distribution or location of crop production

Section II

- Challenges of small holder tropical agriculture
 - Problems and pertinent solutions to biological, edaphic, environmental and socio-economic challenges
 - Gender issues

Section III

- Sustainable crop production
 - The concept of sustainability
 - Requirements for sustainable farming systems
 - Illustration of the concept with agroforestry

Section IV

- Multiple cropping
- Biological basis of intercropping yield advantages
- Shifting cultivation and alternatives to slash-and-burn
- The fuelwood crisis/domestic fuelwood production

- Agroforestry approach to land use
 - General aspects
 - Utilization of biophysical resources
 - Soil fertility aspects and improved fallows
 - Biomass transfer technologies
 - Soil erosion control aspects/barrier hedges
 - Other agroforestry technologies, e.g taungya and boundary plantings
 - Efficient use of nutrients in agroforestry
 - Indigenous knowledge
 - Socio-economic limitations
 - Scaling-up agroforestry adoption
 - Attributes of multipurpose trees and shrubs
 - Shade trees

Note:

There will be two examinations: continuous (40%) and final (60%).