

## CRS 2105 CROP SCIENCE FOR ENGINEERS

### 2. COURSE CODE:

### 3. INSTRUCTORS:

- i) Dr. Jeninah Karungi (BSc Agric, MSc Crop Science, PhD, MUK), specialist in pest management.
- ii) Dr James Ssebuliba (BSc Agric, MSc Crop Science, PhD, MUK), specialist in agronomy.

### 4. COURSE TYPE: CORE (B.Sc. Agric. Engineering II)

### 5. COURSE STRUCTURE

3 Credit units: 30 lecture hours (2 contact hours per week for 15 study weeks) and 30 practical hours (1 contact hour per week for 15 study weeks) = 45 contact hours. Practical excursions will be conducted in the fields of research institutes, commercial estates, and farmer's fields.

### 6. COURSE DESCRIPTION:

**Farming systems in Uganda. Review of the agronomic principles. Discussions on planting time, seeding rate and depth, plant populations and arrangements, soil fertility management, crop sequences. Case studies of selected crops. Basic principles of plant protection. Pest status: weeds, insects, diseases, nematodes. Management tactics for the pests: cultural measures, host plant resistance, physical/mechanical tactics, biological control, chemical control, integrated pest management.**

### 7. SPECIFIC COURSE OBJECTIVES:

- To provide undergraduate students of BSc. Agricultural Engineering with the knowledge and skills in crop production with the aim of ensuring that they are well equipped with the insight to design appropriate implements and structures for improved crop husbandry.
- To provide undergraduate students of BSc. Agricultural Engineering with the knowledge and skills in crop protection with the aim of ensuring that they are well equipped with the insight to design appropriate implements, equipment and structures for improved crop protection techniques.

### 8. READING LIST

- Entomology and Pest Management by Pedigo, L. 1996. 2nd edition, Prentice Hall.
- Introduction to Agronomy- Principles and Practices. By Charles K. Ssekabembe. 2009. Fountain Publishers, Kampala, Uganda.
- Weed Management in Organic Cropping Systems. Agronomy Facts 64. © The Pennsylvania State University 2004. <http://cropsoil.psu.edu/extension/facts/AgFacts64.cfm>

### 9. COURSE OUTLINE

TOPIC	CONTENT	METHOD OF INSTRUCTION / Time allocated	TOOLS / EQUIPMENT NEEDED
Course Introduction	<ul style="list-style-type: none"><li>▪ Discussion of the course objectives</li><li>▪ Characteristics of agriculture in Uganda</li><li>▪ Ways of improving agricultural production in Uganda</li></ul>	Interactive lectures (2 hrs)	LCD projector BB/chalk Paper for printing handouts Printer cartridge
Farming systems of Uganda	<ul style="list-style-type: none"><li>▪ Characteristics of the different farming systems in Uganda</li></ul>	Interactive lectures (2 hrs)	LCD projector BB/chalk Paper for printing

	<ul style="list-style-type: none"> <li>▪ Distribution of crops according to agro-ecological zones</li> </ul>		handouts
Tillage practices	<ul style="list-style-type: none"> <li>▪ Introduction of the agronomic principles</li> <li>▪ Seed storage and quality aspects</li> <li>▪ Objectives and factors influencing tillage</li> <li>▪ Characteristics of a good seed bed</li> <li>▪ Types of tillage and the implements used</li> </ul>	Lectures (2 hrs)	LCD projector BB/chalk Paper for printing handouts
Seeds and sowing/planting	<ul style="list-style-type: none"> <li>▪ Seed quality and storage</li> <li>▪ Time of planting and its importance</li> <li>▪ Advantages of early planting</li> <li>▪ Factors that lead to late planting</li> </ul>	Lectures (2 hrs)	LCD projector BB/chalk Paper for printing handouts
Sowing/planting techniques	<ul style="list-style-type: none"> <li>▪ Arrangement, populations and their effect on crop production</li> <li>▪ Calculation of seed rates</li> </ul>	Lectures (2 hrs)	LCD projector BB/chalk Paper for printing handouts
Fertilizers and their importance	<ul style="list-style-type: none"> <li>▪ Manures, fertilizers and their use in crop production</li> <li>▪ Fertilizer application</li> </ul>	Lectures (2 hrs)	LCD projector BB/chalk Paper for printing handouts
Cropping systems	<ul style="list-style-type: none"> <li>▪ The concept of cropping systems and terminology of multiple cropping</li> <li>▪ Crop rotations</li> <li>▪ Intercropping/mixed cropping</li> <li>▪ Project Assignments: Case studies (agronomic practices) of selected crops</li> </ul>	Lectures (2 hrs)  Field excursions for the case studies on agronomic principles for selected crops and thereafter seminar presentations(15 hrs)	LCD projector BB/chalk Paper for printing handouts  Transport: 30 seater Coaster
Crop protection: Weed management	<ul style="list-style-type: none"> <li>▪ Definition of pests</li> <li>▪ Pests of crops and their status</li> <li>▪ Importance of weeds</li> <li>▪ Weeds ecology and classification</li> <li>▪ Methods of weed control</li> </ul>	Interactive lectures (2 hrs)	LCD projector BB/chalk Paper for printing handouts
Pest Management techniques for insects and diseases	<ul style="list-style-type: none"> <li>▪ Pest management principles and practices</li> <li>▪ Pest management tactics</li> <li>▪ Cultural practices for pest management</li> </ul>	Lectures (2 hrs)	LCD projector BB/chalk Paper for printing handouts
Pest Management techniques for insects and diseases	<ul style="list-style-type: none"> <li>▪ Principles of host plant resistance</li> <li>▪ Types of host plant resistance</li> </ul>	Lectures (2 hrs)	LCD projector BB/chalk Paper for printing handouts
Pest Management techniques for insects and diseases	<ul style="list-style-type: none"> <li>▪ Principles of biological control</li> <li>▪ Biological control agents</li> <li>▪ Techniques of biological control</li> </ul>	Lectures (2 hrs)	LCD projector BB/chalk Paper for printing

			handouts
Pest Management techniques for insects and diseases	<ul style="list-style-type: none"> <li>▪ Mechanical/physical control</li> <li>▪ Managing insects using traps and barriers</li> </ul>	Lectures (2 hrs)	LCD projector BB/chalk Paper for printing handouts
Pest Management techniques for insects and diseases	<ul style="list-style-type: none"> <li>▪ Chemical control</li> <li>▪ Types of pesticides and their modes of action</li> <li>▪ Disadvantages of chemical control and how to reverse their effects</li> </ul>	Lectures (2 hrs)	LCD projector BB/chalk Paper for printing handouts
Pest Management techniques for insects and diseases	<ul style="list-style-type: none"> <li>▪ Principles and practices of Integrated pest management</li> <li>▪ Implementing integrated pest management programs</li> </ul>	Lectures (2 hrs)	LCD projector BB/chalk Paper for printing handouts
	Allocation of topics for researching IPM case studies of selected crops	<p>Interactive discussions (2 hrs)</p> <p>Seminars of IPM case studies (15 hours)</p>	LCD projector BB/chalk Paper for printing handouts Electronic resources (journals papers, etc)

#### SUMMARY OF TIME NEEDED

Interactive lectures covering theory	30 hrs
Practicals in form of case studies and seminar presentations	30 hrs

#### OVERALL COURSE EVALUATION

Continuous Assessment Test	20%
Case study report/Seminar presentation	20%
Final examination	60%