1. **FST 3103 SANITATION AND WASTE MANAGEMENT**
2. **COURSE INSTRUCTOR**

Mr. Andrew Mwebesa MUHAME [BSc. Agric. in Food Sc & Tech; MSc. Food Quality Management.]

1. **COURSE TYPE:**

Core course for Year 111 BSc. Food Science & Technology

1. **COURSE STRUCTURE:**

Course is 3 credit units (3 CU): 2 lecture hours and 2 practical hours per week for 15 study weeks; [i.e. 30 lecture hours & 30 practical hours, equivalent to 45 contact hours].

1. **COURSE DESCRIPTION:**

Introduction to food plant sanitation, Principles of cleaning and sanitation, Types of sources of water for food processing, purification and treatment, waste disposal treatment, Low-Moisture food plant sanitation, Dairy processing plant sanitation, Meat & poultry plant sanitation, Sea food plant sanitation, fruit & vegetable plant sanitation, beverage sanitation, food service sanitation, Waste disposal and treatment, Biotechnological applications in waste treatment, Legislation and cost-benefit analysis in waste treatment, By-product utilization.

1. **COURSE OBJECTIVES**

* To provide sanitation information needed to ensure hygienic practices in food processing and preparation operations
* To develop a working knowledge in plant and equipment design and materials, cleaners and cleaning techniques, sanitizers, monitoring cleanliness, pests and their control, HACCP and personal hygiene
* To develop ability in selecting, establishing and maintaining a suitable program of sanitation

1. **RECOMMENEDED REFERENCES**

* Troller, J.A., 1993. Sanitation in Food Processing.—2nd ed. ACADEMIC PRESS, INC.
* Marriot, N.G. Essentials of Food Sanitation/ Robertson, G., Consulting editor. International Thomson Publishing
* Marriot, N.G., Gravani, R.B., 2006. Principles of Food Sanitation.—5th ed. Springer Science+ Business Media, Inc.

1. **COURSE CONTENT, METHODS OF INSTRUCTION, TOOLS AND**

**EQUIPMENT**

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| **TOPIC** | **CONTENT** | **METHOD OF INSTRUCTION/ Time allocation**  **(i.e. contact hours)** | **TOOLS/ Equipment needed** |
| 1. Introduction | * Common terms used in sanitation * Role of sanitation in food plant * Sources of contamination in a food plant * Assignment (Individual take home) | -Interactive lectures  (2 hrs)  Practical (2 hours) | LCD projector/ BB/ White boards / Flip |
| 1. Principles of cleaning and disinfection | * Methods of cleaning and practical applications * Factors influencing cleaning * Types of soil and cleaning compounds * Handling and storage precautions of cleaning compounds * Guided tour to DFST pilot plant for demonstration | -Interactive lectures  (2hrs )  Practical (2 hours) | LCD projector/ BB/ White boards / Flip charts  Pilot plant manager  Cleaning materials |
| 1. Water resources | * Types of sources of water for food processing, purification & treatment * Water treatment methods * Waste water components and analysis * Microorganisms of importance in waste water treatment * Field trip to National Water and Sewerage cooperation | -Interactive lectures  (2 hrs)  Practical (2 hours) | LCD projector/ BB/ White boards / Flip charts  Transport depending on the number of students  -bottles of water for the field trip |
|  | * Microorganisms of importance in waste water treatment * A case study related to waste water treatment | Case study analysis in form of group assignment- Practical (2 hours) | LCD projector/ BB/ White boards / Flip charts + a laptop computer |
| 1. Sanitary design and construction for food processing | * Site selection and preparation * Building construction considerations * Processing and design considerations * Construction materials * Pest control design * Pilot plant demonstration on design of equipment | -Interactive lectures  (2 hrs)  Practical (2 hours) | LCD projector/ BB/ White boards  Pilot plant manager |
| 1. Waste disposal and treatment | * Strategy of waste disposal * Solid-waste disposal * Liquid-waste disposal * Industrial field trip to Mukwano industry | - Interactive lecture  (2 hrs)  Practical (2 hours) | LCD projector/ BB/ White boards / Flip charts  Transport for a defined number of students (approximately a 50 sitter bus) |
| 1. Mid semester evaluation | * Exam | (2 hrs) | Answer sheets |
| 1. Low –moisture food sanitation | * Sanitary design construction considerations * Receipt and storage of raw materials * Cleaning of Low-Moisture food manufacturing plants | -Interactive lecture  (2 hrs) | LCD projector/ BB/ White boards / Flip charts |
| 1. Dairy processing sanitation | * Major pathogens * Plant construction * Sanitation management * Cleaning equipment * Field trip to Uganda Dairy Cooperation | -Interactive lectures  (2 hrs)  Practical (3 hrs)  Individual field report | LCD projector/ BB/ White boards / Flip charts  Transport ( approximately a 50 sitter bus or less depending on the number of students, packed water/juice + snacks |
| 1. Meat and poultry plant sanitation  * Sea food plant sanitation | * Common pathogens * Sanitation management * Sanitizers for meat & poultry plants * Sources of sea food contamination * An industrial trip to meat packers | -Interactive lectures  (2hr)  Practical ( 3 hours)  Field report | LCD projector/ BB/ White boards / Flip charts  Transport ( approximately a 50 sitter bus or less depending on the number of students, packed water/juice + snacks |
| 1. Fruit and vegetable processing plant sanitation | * Plant construction * Sanitation management * Cleaning considerations * Cleaning of fresh fruits in the pilot plant | -Interactive lectures  (2 hrs)  Practical (2 hours) | LCD projector/ BB/ White boards / Flip charts  Fresh tomatoes, utensils |
| 1. Beverage sanitation | * Mycology of beverage manufacture * Brewery and winery sanitation * A trip to Uganda breweries | Interactive lectures  (1 hr)  Field report -Practical ( 2 hours) | LCD projector/ BB/ White boards  Transport ( a 50 sitter bus), water |
| 1. Food service sanitation | * Buying ingredients * Receipt and storage of ingredients * Group assignment presentations | Interactive lectures  (1 hr)  practical (2 hrs) | LCD projector/ BB/ White boards / Flip charts |
| 1. Application of Biotechnology principles   in waste treatment | * Biosensors * Bioremediation * Genetically modified (an)aerobic bacteria * Other biotechnology applications * By-product utilization * Individual Assignment | -interactive lectures  (2 hrs)  Practical (3 hours) | LCD projector/ BB/ White boards / Flip charts |
| 1. Legislation and cost-benefit analysis in waste management | * Total quality management * Hazard Analysis Critical Control Points (HACCP) * Development of a HACCP program * Cost benefit mathematical models * Individual assignment presentations | Interactive lecture  (2 hrs)  Practical (3 hours) | LCD projector/ BB/ White boards / Flip charts+ a laptop computer |
| 1. Management and Sanitation | * Management requirements * Employee selection * Total quality management * Summary on the management of a sanitation program | Interactive lecture ( 2 hours) | LCD projector/ BB/ White boards / Flip charts |

1. **SUMMARY OF T IME (as contact hours) NEEDED**

* Lecture hours 30 hrs
* Practical hours 30 hrs

1. **OVERALL COURSE EVALUATION**

* Individual assignments and presentations 10%
* Group assignment and presentations 10%
* Field reports 05%
* Mid semester exam 15%
* Final exam 60%