**FST 1203 FOOD MICROBIOLOGY 1**

**2. COURSE INSTRUCTOR(S)**

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**3. COURSE TYPE**:

* Core course for Year 1 BSc. Food Science & Technology
* Prerequisite knowledge: Basic qualification for undergraduate course in Food Science & Technology.

**4. 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].

**5. COURSE DESCRIPTION**

**Overview of microbiology:** definition of microbiology; the various aspects of microbiology (Basic and applied microbiology); the importance of microbiology. **Classification of micro-organisms:** Introduction to cell biology; eukaryotic and prokaryotic cells. **Aseptic techniques in microbiology:** Methods of sterilization; types of microbial culture media and media preparation; growth of cultures. **Characterization, identification and classification of microorganisms**: Microbial culture characterization (colony type); microscopy, simple and Gram staining techniques. **Types of microorganisms associated with food:** bacteria, yeasts, moulds;distinguishing characteristics (morphological, physiological) of microorganisms associated with food. **Groups of microorganisms associated with food:** Synopsis of - specific spoilage microorganisms, microorganisms of industrial application, food-borne pathogens

**6. COURSE OBJECTIVES**

**General objective:**

The **overall objective** of this course is to introduce microbiology to first year students as a bridge to subsequent higher level microbiology and related courses, and help them appreciate other courses which hinge on microbiological principles for better understanding.

The **specific objectives** are to:

1. Introduce the students to basic principles of microbiology
2. Enable students understand the ubiquitous nature of microorganisms and how they can be isolated for study,
3. Introduce students to common aseptic techniques used in the microbiology laboratory.
4. Enable students to grow and study microbiological cultures/colonies and characterize them.
5. Enable students understand the basic techniques used in observation and identification of microorganisms.

**7. RECOMMENDED REFERENCES FOR READING**

**Core reading**

**Madgan B. and Parker M.** (1994). Biology of Microorganisms (Seventh Edition). Pretince Hall. Englewood Cliffs, New Jersey.

**Atlas M. R., Brown E. A., Dobra W., K. and Miller L.** (1988). Experimental Microbiology: Fundamentals and Applications (second Edition). Macmillan Publishing Company, New York; Collier Macmillan Publishers, London.

**Frazier W.C. and Westhorf D.C.** (1988). Food Microbiology (Fourth Edition). McGraw Hill Book Company, New York.

**Jay J. M.** (1997). Morden Food Microbiology (Fifth Edition). Chapman and Hall, New York.

**Background reading**

**Uganda National Bureau of Standards (UNBS).** Food Microbiology Laboratory Manual.

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

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| **TOPIC No.** | **CONTENT (Sub-topics)** | **METHOD OF INSTRUCTION / Time allocation** | **TOOLS / EQUIPMENT NEEDED** |
| 1. **Overview of microbiology** | * definition of microbiology;
* the various aspects of microbiology (Basic and applied microbiology);
* the importance of microbiology
 | Lecture (3 hrs)Practical (2 hrs) | Visual aids [LCD projector/ white board & WB markers]  |
| 2. **Classification of micro-organisms** | * Introduction to cell biology;
* Eukaryotic and prokaryotic cells
 | Lecture (3 hrs)Practical (2 hrs) | Visual aids [LCD projector/ white board & WB markers] |
| 3. **Aseptic techniques in microbiology** | * Methods of sterilization;
* types of microbial culture media and media preparation;
* growth of cultures
 | Lecture (6 hrs)Practical (4 hrs) | Visual aids [LCD projector/ white board & WB markers] |
| 4. **Characterization, identification and classification of microorganisms** | * Microbial culture characterization (colony type);
* microscopy, simple and Gram staining techniques
 | Lecture (6 hrs)Practical (4 hrs) | Visual aids [LCD projector/ white board & WB markers] |
| **5. Types of microorganisms associated with food** | * bacteria, yeasts, moulds;
* distinguishing characteristics (morphological, physiological) of microorganisms associated with food
 | Interactive lecture (6 hrs)Practical (4hrs) | Visual aids [LCD projector/ white board & BB markers] |
| 6. **Groups of microorganisms associated with food** | Synopsis of: * specific spoilage microorganisms,
* microorganisms of industrial application,
* food-borne pathogens
 | Lecture (6 hrs)Practical (4 hrs) | Visual aids [LCD projector/ white board & BB markers] |

**9. SUMMARY OF TIME NEEDED**

Interactive lectures covering theory 30 hrs

Laboratory-based practicals 20 hrs

Pilot plant-based 10 hrs

**10. OVERALL COURSE EVALUATION**

Continuous Assessment Test 20%

Class practicals, laboratory reports 20%

Final examination 60%