

Subject Description Form

Subject Code	ABCT3405
Subject Title	Food Microbiology
Credit Value	4
Level	3
Pre-requisite	Microbiology (ABCT2134) or Clinical Microbiology (SN206)
Objectives	This subject aims to enable students to gain an appreciation of the importance of the interrelationships of microorganisms with foods and the role of microorganisms in food safety, food spoilage and food production.
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a) Identify the important pathogens and spoilage microorganisms in foods and understand the role of environmental factors (i.e. aw, pH, temperature) on the growth and response of microorganisms; b) Understand the characteristics of foodborne pathogens and diseases they caused, foodborne pathogen detection methods and the epidemiology, regulation and control of foodborne diseases c) Understand the conditions, under which the important pathogens and spoilage microorganisms are commonly inactivated, killed or made harmless in foods; d) Utilize laboratory techniques to identify microorganisms in foods; e) Understand beneficial use of microorganisms in food production; <p>Apply and incorporate the principles of food microbiology in practical, real-world situations and problems and recognize current topics of importance in food microbiology</p>
Subject Synopsis/ Indicative Syllabus	<p>Introduction 2 hours Microbes in foods, characteristics and sources</p> <p>Microbial Growth Response in the Food Environment 7 hours Microbial growth; factors influencing microbial growth in food; microbial metabolism of food components; microbial spores; microbial stress response in the food environment.</p> <p>Food Spoilage 7 hours Important factors affecting food spoilage; spoilage of different food groups and associated microorganisms; spoilage bacteria in refrigerated foods; food spoilage by microbial enzymes; indicators</p>

of microbial food spoilage.

Food Poisoning and Foodborne diseases **20 hours**
 Important facts in foodborne diseases (causes of foodborne diseases, role of microorganisms, importance of predisposing factors in the occurrence of a foodborne disease); foodborne intoxications; foodborne infections; new and emerging foodborne pathogens; detection methods and methods of control; indicators of bacterial pathogens; epidemiology, regulation and control of foodborne diseases.

Control of Microorganisms in Foods **12 hours**
 Cleaning and sanitation; physical removal; heat; low temperature; Aw; low pH and organic acids; modified atmosphere; antimicrobial preservatives; irradiation.

Beneficial use of microorganisms in food **4 hours**
 Use of microbiology in food production and food industry

Teaching/Learning Methodology
 The instructors attempt to bring the latest information to the course via slides and handouts. Students are gradually introduced to a topic and then more detailed information. Some students chose to do background outside reading. However, all exam questions can be responded to accurately IF students come to class, understand lectures, study appropriately and consult the handouts.

Assessment Methods in Alignment with Intended Learning Outcomes

Assessment	% weight	Intended subject learning outcomes to be assessed				
		a	b	c	d	e
Midterm	20%	√	√	√	√	√
Lab reports	15%			√	√	√
Quiz	15%	√	√	√	√	√
Final	50%	√	√	√	√	√
	100%					

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Midterm and quizzes
 Midterm and quizzes will be the close book test and related to each section of study.

Lab report
 The lab report accounts for 15% of the subject assessment and each individual needs to write their own lab report. The criteria

	<p>for the assessment are as following:</p> <ol style="list-style-type: none"> 1. The report is in a logical format 2. Adequate and appropriate background information 3. Objective(s) is clearly stated 4. The experimental procedures and information are clearly written in correct English 5. Raw data and results are included and in a systemic and easily comprehensive format 6. Tables, charts, diagrams, picture, photos are clearly presented with proper labeling and description in text 7. Result analysis is thorough, logical and step by step 8. Significant findings, summaries or conclusions are clearly stated and are logical 9. Discussions are logical and not far-fetched, on the results and not on the experimental procedures 10. With proper listing of references if necessary <p>Final exam The final exam accounts for 50% of the subject assessment and covers the whole lecture content, but with focus on the lectures, which are not covered by midterm. Final exam also contains questions related to the laboratory practices. The examination will comprise of short, long and case study question, which mainly assess your understanding of concepts and the ability to analyze and apply concepts.</p>	
Student Study Effort Expected	<p>Class contact:</p> <ul style="list-style-type: none"> ▪ Lectures ▪ Tutorials ▪ Laboratory <p>Other student study effort:</p> <ul style="list-style-type: none"> ▪ Report writing ▪ Self-study <p>Total student study effort</p>	<p>26 Hrs.</p> <p>5 Hrs.</p> <p>21 Hrs.</p> <p>21 Hrs</p> <p>80 Hrs.</p> <p>153 Hrs.</p>
Reading List and References	<p>Essential (Lecture text book) Bibek Ray and Arun K. Bhunia. Fundamental Food Microbiology. CRC Press 2014</p> <p>Essential (Laboratory text book) Bell, C., Neaves, P. and Williams, A.P. Food Microbiology and Laboratory Practice. Blackwell publishing, 2005</p> <p>Supplementary Thomas, J. and Montville, K.M. Food Microbiology: An Introduction. ASM Press 2005</p>	