Subject Description Form

<table>
<tr><td>Subject Code</td><td>ABCT3642</td></tr>
<tr><td>Subject Title</td><td>Microbiological Techniques</td></tr>
<tr><td>Credit Value</td><td>2</td></tr>
<tr><td>Level</td><td>3</td></tr>
<tr><td>Co-requisite</td><td>ABCT3641 Microbiology and Toxicology</td></tr>
<tr><td>Objectives</td><td>To enable students to understand the integration of microbiology, molecular biology and immunology to be applied in the modern microbiological techniques for detection, identification and qualification of microbiological hazards from different environment samples.</td></tr>
<tr><td>Intended Learning Outcomes</td><td>Upon completion of the subject, students will be able to:
a) Apply the fundamental principles of modern microbiological techniques for detection and analysis of microorganisms, as well as proper aseptic laboratory techniques.
b) Carry out DNA-based methods in detection of microbial pathogens.
c) Analyse food and environmental samples by basic immunological methods.
d) Apply the knowledge and skills acquired to analyze and interpret the experimental results obtained from different microbiological techniques;</td></tr>
<tr><td>Subject Synopsis/ Indicative Syllabus</td><td><u>Overview of Microbiological Techniques (6 hr)</u>
Aseptic laboratory techniques; use of cultures and staining techniques for identification of microbes; culture methods; application of PCR on the detection of microbial pathogens; methods for antigen-antibody detection: Enzyme Linked Immunosorbent Assay (ELISA) and further application.

<u>Indicative Titles of Experiments</u>
▪ Bacterial Enumeration
▪ Staining methods in bacterial pathogens
▪ Isolation and molecular identification of foodborne pathogens
▪ Antimicrobial Susceptibility Tests
▪ Immunological detection of allergens</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>The core information of different microbiological techniques will be introduced and explained to the students in lectures. Basic microbiological techniques and laboratory skills for detection of food allergens and microorganisms, as well as antimicrobial tests for different materials will be provided in the practical.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weight</td><td colspan="4">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td></tr>
<tr><td>Lab Quizzes</td><td>10</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Lab Reports</td><td>50</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Lab Skill Tests</td><td>40</td><td>√</td><td>√</td><td>√</td><td>√</td></tr>
<tr><td>Total</td><td>100</td><td colspan="4"></td></tr>
</table>
Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:
Lab quizzes, lab reports and lab skill tests are used to evaluate how much students have learnt the basic concept, and the ability to demonstrate various basic laboratory and modern microbiological techniques.</td></tr>
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Student Study Effort Expected	Class contact:	
	▪ Lectures	6 Hrs.
	▪ Practical	21 Hrs.
	▪ Lab Skill Tests	9 Hrs.
	▪ Other student study effort:	
	▪ Lab reports	20 Hrs.
	▪ Self-study	32 Hrs.
	Total student study effort	88 Hrs.
Reading List and References	Sharma, D.K. Microbiology Oxford 2013 Prescott, L.M.; Harley, J.P. and Klein, D.A. Microbiology (8th ed.) McGraw Hill 2010. Khan, Firdos Alam. Biotechnology fundamentals (2nd ed.), CRC Press, Taylor & Francis Group, 2016.	