

## **Subject Description Form**

<b>Subject Code</b>	FSN5015
<b>Subject Title</b>	Foodborne Chemical and Microbial Hazards: Case Studies
<b>Credit Value</b>	3
<b>Level</b>	5
<b>Pre-requisite/ Co-requisite/ Exclusion</b>	Nil
<b>Objectives</b>	The subject is designed to enable students to understand the importance of the foodborne chemical and microbial hazards and the interaction between the two. Role of microorganisms in food safety and environment, with emphases on the characterization of foodborne toxicants and adverse effect of these toxicants on human health, as well as techniques commonly used to detect these toxicants will be brought out using case examples.
<b>Intended Learning Outcomes</b>	Upon completion of the subject, students will be able to: <ul style="list-style-type: none"> <li>a. understand how foodborne chemical and microbial hazards occur</li> <li>b. discuss the major types of toxicants from microorganisms and the modes of their actions on human;</li> <li>c. assess the human risks from pathogenic microorganisms of health significance;</li> <li>d. recognize the common analytical, biochemical and cell-based techniques for detection of microbial toxicants.</li> </ul>
<b>Subject Synopsis/ Indicative Syllabus</b>	<p><b>Key knowledge areas to be covered using case studies:</b></p> <p><u>One Health Initiative</u></p> <p>Concept of One World One Health; how to forge the food safety into the multidisciplinary of One Health Initiative.</p> <p><u>Environmental Contaminants and Drug Residues in Food</u></p> <p>Common environmental contaminants (e.g. heavy metals) and drugs residues (e.g. pesticides; antibiotics) in foods; their health impacts and risk assessment; abusive use of veterinary drugs (e.g. malachite green in fish; Salbutamol and Clenbuterol in pork) and other contaminants in food.</p> <p><u>Food Additives and Toxicants Formed During Food Processing</u></p> <p>Common food additives (e.g. coloring) and their safety issues; process-induced food toxicants (e.g. acrylamine; carcinogens) and their health concerns.</p> <p><u>Food Allergies and Sensitivities</u></p>

	<p>Natural sources and chemistry of food allergens; handle of food allergies; food sensitivities (anaphylactoid reactions, metabolic food disorders and idiosyncratic reactions); issues related to sulfites in foods.</p> <p><u>Introduction of Pathogenic Microorganism</u></p> <p>Microorganisms that post threats to human health through food; emerging and re-emerging infectious diseases originated from food animals. (e.g. avian influenza); animal pathogens causing diseases in human. (e.g. <i>E. coli</i> O157:H7); detection and control of foodborne infections; indicators for microbial contamination in food.</p> <p><u>Food Poisoning and Foodborne Diseases</u></p> <p>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; epidemiology, regulation and control of foodborne diseases.</p> <p><u>Food Spoilage</u></p> <p>Important factors affecting food spoilage; spoilage of different food groups and associated microorganisms; food spoilage by microbial enzymes; indicators of microbial food spoilage.</p>																																		
Teaching/Learning Methodology	<p>The core information in different topics will be explained and presented to students in lectures. Students will be gradually guided to learn different topics and eventually the integration between different topics. Tutorials are designed to assist students to refresh the lecture contents and brain-storm to solve questions that may happen in real life.</p>																																		
Assessment Methods in Alignment with Intended Learning Outcomes	<table><tr><th rowspan="2">Specific assessment methods/tasks</th><th rowspan="2">% weight</th><th colspan="4">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th></tr><tr><th>a</th><th>b</th><th>c</th><th>d</th></tr><tr><td>Group presentation</td><td>40%</td><td>√</td><td>√</td><td>√</td><td>√</td></tr><tr><td>Lecture (In-class online exercise)</td><td>20%</td><td>√</td><td>√</td><td>√</td><td>√</td></tr><tr><td>Individual assignment</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> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p>	Specific assessment methods/tasks	% weight	Intended subject learning outcomes to be assessed (Please tick as appropriate)				a	b	c	d	Group presentation	40%	√	√	√	√	Lecture (In-class online exercise)	20%	√	√	√	√	Individual assignment	40%	√	√	√	√	Total	100%				
Specific assessment methods/tasks	% weight			Intended subject learning outcomes to be assessed (Please tick as appropriate)																															
		a	b	c	d																														
Group presentation	40%	√	√	√	√																														
Lecture (In-class online exercise)	20%	√	√	√	√																														
Individual assignment	40%	√	√	√	√																														
Total	100%																																		

	Quiz, lecture-continuous assessment and examination are used to evaluate how much student have learnt basic concept of pathogenic microorganisms, major types of toxins and their actions on human and principles and application of different common techniques for microbial toxicants detections.	
<b>Student Study Effort Expected</b>	Class contact:	
	▪ Lecture	30 Hrs.
	▪ Tutorial	9 Hrs.
	Other student study effort:	
	▪ Self study	60 Hrs.
	▪ Total student study effort	99 Hrs.
<b>Reading List and References</b>	<p>Prescott, L.M.; Harley, J.P. and Klein, D.A. Microbiology, 8<sup>th</sup> edition, McGraw Hill, 2010.</p> <p>Hans Marquardt; Siegfried G. Schäfer; Roger O. McClellan; Frank Welsch. Toxicology. Academic Press, c1999.</p> <p><u>Useful websites</u></p> <p>Centre for Food Safety: <a href="http://www.cfs.gov.hk">http://www.cfs.gov.hk</a></p> <p>China Food and Drug Administration: <a href="http://www.cfda.gov.cn">www.cfda.gov.cn</a></p> <p>European Food Safety Authority: <a href="http://www.efsa.europa.eu/">http://www.efsa.europa.eu/</a></p> <p>China Food and Drug Administration: <a href="https://www.fda.gov/">https://www.fda.gov/</a></p> <p>World Health Organization: <a href="https://www.who.int">https://www.who.int</a></p>	