

Subject Description Form

Subject Code	FSN3419 (ABCT3419)
Subject Title	Food Engineering and Processing I Laboratory
Credit Value	1
Level	3
Co-requisite	Food Engineering and Processing I (FSN3418 / ABCT3418)
Exclusion	None
Objectives	This subject aims to apply and demonstrate the principles and processing techniques introduced in ABCT3418. Students are allowed to gain direct experience in engineering operations related to food production.
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> Apply the food engineering principles and unit operations to liquid and solid food materials in a laboratory. Enhance the knowledge of food engineering principles and processing techniques. Appreciate the effects of processing methods and conditions on food property and quality. Develop skills in planning and conducting experiments, collecting experimental data, analyzing and interpreting results, and writing technical reports.
Subject Synopsis/ Indicative Syllabus	<ul style="list-style-type: none"> Fluid Flow Unit: to determine the friction losses by measurement of the pressure drops in fluid transportation systems with various pipes, fittings and other mechanical parts; to apply and verify the equations of fluid flow and energy balance. Heat Exchanger: to study heat transfer rate and effectiveness in a double pipe heat exchanger in various conditions; to learn and apply the methods for measurement of heat transfer process parameters Evaporation: to concentrate a liquid food in a rising-film evaporator; to study energy balance and heat transfer in a rising film evaporator in various conditions. Demonstration of a pilot spray dryer for the drying of liquid foods: The mechanical structure of a spray dryer, the components and functions of the spray drying system, the operation and efficiency of the drying process and the changes in the liquid food product.

Teaching/Learning Methodology	Laboratory classes provide the students the practical skills in food processing, and help to develop their ability to conduct experiment, observe and analyze experimental results and to write scientific reports.						
Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)				
			a	b	c	d	
	1. Lab performance	15				√	
	2. Lab report	60	√	√	√	√	
	3. Lab quiz	25	√		√	√	
	Total	100 %					
	Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes: Class performance is to assess outcome (a) (d); lab reports are used to assess all outcomes.						
Student Study Effort Expected	Class contact:						
	▪ Laboratory			12 Hrs.			
	▪ Tutorial			3 Hrs.			
	▪ Quiz			1 Hr.			
	Other student study effort:						
	▪ Report writing			15 Hrs.			
	▪ Self-study			15 Hrs.			
	Total student study effort			46 Hrs.			
Reading List and References	<u>Essential</u>						
	1. Barbosa-Canovas G. Food Engineering Laboratory Manual, CRC Press 1997, eBook Published 2017.						
	2. Toledo RT, Singh R, Kong F: Fundamentals of Food Process Engineering, 4 th ed. Springer, 2018.						
	<u>Supplementary</u>						
	3. Fellows, P.J., Food Processing Technology: Principles and Practice (3 rd ed.), Woodhead 2017.						
	4. Singh RP, Heldman DR: Introduction to Food Engineering 4th Ed. Academic Press, 2009.						