



UNIVERSITI TEKNOLOGI MARA

FST269: INTRODUCTION TO UNIT OPERATIONS

Course Name (English)	INTRODUCTION TO UNIT OPERATIONS APPROVED
Course Code	FST269
MQF Credit	3
Course Description	This module covers the principles, applications and equipment that related to unit operations used in the food industry.
Transferable Skills	Dependability and team work.
Teaching Methodologies	Lectures, Lab Work, Project-based Learning
CLO	CLO1 Describe common unit operations, principle and operations of selected equipment used in unit operations. CLO2 Demonstrate selected equipment to be used in food processing operations. CLO3 Prepare product that utilised the unit operations equipment.
Pre-Requisite Courses	No course recommendations
Topics	
1. Introduction 1.1) Definition of unit operations. 1.2) Type of unit operations. 1.3) Process sheets / flow diagram. 1.4) Plan layout.	
2. Centrifugation 2.1) Definition and principle of centrifugation. 2.2) Types of centrifuge and centrifugal equipment. 2.3) Application of centrifugation.	
3. Filtration 3.1) Theory and principle in filtration. 3.2) Filter media. 3.3) Types of filtration. 3.4) Applications of filtration. 3.5) Theory of sieving. 3.6) Principle of powder flowability.	
4. Extraction 4.1) Theory and principle in solvent extraction. 4.2) Types of equipment in solvent extraction. 4.3) Theory and principle in mechanical expression. 4.4) Types of equipment in mechanical expression.	
5. Size reduction 5.1) Principle and application of size reduction (milling). 5.2) Size reduction equipment. 5.3) Milling equipment and its applications 5.4) Principle and application of size reduction for liquid (emulsification). 5.5) Types of emulsification equipment.	
6. Mixing 6.1) Principle and application of liquid (wet) mixing. 6.2) Liquid (wet) mixing equipment. 6.3) Principle and application of solid (dry) mixing. 6.4) Solid (dry) mixing equipment.	

7. Heat transfer

- 7.1) Theory and principle of heat transfer.
- 7.2) Heat transfer equipment and its applications.

8. Evaporation

- 8.1) Theory and principle of evaporation.
- 8.2) Evaporation equipment and its applications.

9. Material handling

- 9.1) Principles of material handling and storage of materials.
- 9.2) Types of equipment used for materials transport (bulk commodity).

10. Basic preparative operations

- 10.1) Principle of cleaning.
- 10.2) Cleaning methods / equipment.
- 10.3) Principle of sorting.
- 10.4) Sorting methods / equipment.
- 10.5) Principle of grading.
- 10.6) Grading standards.

11. Extrusion

- 11.1) Principles of extrusion.
- 11.2) Types of extruders.
- 11.3) Application of extruder.

Assessment Breakdown	%
Continuous Assessment	70.00%
Final Assessment	30.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Group Project	Group Project	15%	CLO3
	Practical	Practical skill test	25%	CLO2
	Test	Test	30%	CLO1

Reading List	Reference Book Resources
	<ul style="list-style-type: none"> • Berk, Z. 2018, <i>Food Process Engineering and Technology</i>, 3rd Edition Ed., Elsevier Ltd London. • Fellows, P.J. 2016, <i>Food Processing Technology: Principles and Practice</i>, 4th Edition Ed., Elsevier Ltd London. • Saravacos, D.G. & Kostaropoulos, A.E. 2015, <i>Handbook of Food Processing Equipment</i>, Springer Science business Media, LLC New York. • Varzakas, T. & Tzia, C. 2014, <i>Food Engineering Handbook: Food Process Engineering</i>, CRC Press New York. • Earle, R.L. 2013, <i>Unit Operations in Food Processing</i>, 2nd Edition Ed., Pergamon Press Oxford. • Singh, R.P & Heldman, D.R. 2013, <i>Introduction to Food Engineering (Food Science and Technology)</i>, 5th Edition Ed., Academic Press New York.
Article/Paper List	This Course does not have any article/paper resources
Other References	This Course does not have any other resources