



FAKULTI PENGURUSAN DAN INDUSTRI HALAL

PROGRAM	Diploma in Halal Product Manufacturing
COURSE NAME	Unit Operation
COURSE CODE	DHM 3023
CREDIT HOUR	3
SYNOPSIS	This subject covers requirement on the principle of halal product operation which involve the variety of principle processing of manufacturing and selection of equipment for product.
COURSE STRUCTURE	
CHAPTER	TOPICS
1	Raw Material Preparation for Processing Unit 1.1 definition of cleaning 1.2 Function and type of cleaning 1.3 Shape and size sorting 1.4 Grading
2	Size Reduction and Screening 2.1 Definition and objective of size reduction and screening 2.2 Principle of size reduction 2.3 Equipment selection 2.4 Size reduction equipment 2.5 Screening equipment
3	Mixing and Emulsification 3.1 Definition and objective 3.2 Degree of uniformity 3.3 Type of mixing system 3.4 Type of paddle of mixing system 3.5 Type of viscosity liquid or paste 3.6 Mixer 3.7 Emulsification 3.8 Influence factor of emulsion 3.9 Method of emulsification 3.10 Equipment for emulsification 3.11 Application of emulsification



4	Solid and liquid separation unit 4.1 Definition of separation 4.2 Rate of filtration 4.3 Type of filtration 4.4 Filtration at a constant flow rate 4.5 Choosing of filter equipment 4.6 Definition of centrifugation 4.7 Type of centrifugation
5	Expression and extraction unit 5.1 Objective and definition extraction 5.2 Extraction rate 5.3 Type of extraction equipment 5.4 Application in food industry
6	Evaporation Unit 6.1 definition and objective 6.2 influence factors of feed liquor properties on evaporation 6.3 type of evaporation 6.4 application in food industry
7	Food Plant Facilities and Equipment Unit 7.1. Definition and objective 7.2. Hygiene design factors 7.3. Pest control 7.4. Equipment design 7.5. Plant construction 7.6. Installation of equipment 7.7. Installation of pipe work 7.8. Plant cleaning and sterilization 7.9. Waste characteristics 7.10. Type of industrial waste 7.11. Waste disposal 7.12. Type of waste disposal
8	Presentation for assignment
References:	1. Fellows, P. J. (2017). Food Processing Technology: Principles and Practice (Fourth ed.). Cambridge: Woodhead Publishing. 2. Earle, Richard Laurence. Unit operations in food processing. Elsevier, 2013. 3. Good Manufacturing Practices For Food (MS1514:2009). Department of Standard Malaysia, Putrajaya 4. Pharmaceutical engineering (2009). Unit Operation and Unit Process. Dr Jasmina Khanam.



	<ol style="list-style-type: none">5. Doyel, John S. "Food processing unit." U.S. Patent No. 4,212,431. 15 Jul. 1980.6. Ibarz, Albert, and Gustavo V. Barbosa-Cánovas. Unit operations in food engineering. Crc Press, 2002.
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