



UNIVERSITAS NEGERI YOGYAKARTA
 FACULTY OF MATHEMATICS AND NATURAL SCIENCES
 DEPARTMENT OF CHEMISTRY
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Bachelor of Science in Chemistry

MODULE HANDBOOK

Module name:	Chemical Engineering Operations
Module level, if applicable:	Undergraduate
Code:	KIM6245
Sub-heading, if applicable:	-
Classes, if applicable:	-
Semester:	6 th
Module coordinator:	Ir. Endang Dwi Siswani, M.T
Lecturer(s):	Ir. Endang Dwi Siswani, M.T
Language:	English and Bahasa Indonesia
Classification within the curriculum:	Elective Course
Teaching format / class hours per week during the semester:	Lectures: 100 minutes lectures, 120 structured activities and 120 individual study per week
Workload:	Total workload of the activity is 90,67 hours per semester which consists of 100 minutes lectures, 120 structured activities and 120 individual study per week for 16 weeks
Credit points:	2 SKS (3 ECTS)
Prerequisites course(s):	-
Course Outcomes	<p>After taking this course, the students have ability to:</p> <p>CO1. able to explain correctly about the scope of Unit Operations, and the benefits of Unit Operations in the chemical industry</p> <p>CO2. Able to explain correctly the concept of a mass balance and are able to do calculations using the concept of a mass balance</p> <p>CO3. able to explain and do calculations correctly about the vapor-liquid equilibrium</p> <p>CO4. able to explain and do calculations in the distillation</p> <p>CO5. able to determine the number and mass fraction of components that come out of a distillation process.</p> <p>CO6. able to explain correctly about the concept of evaporation</p> <p>CO7. able to do calculations correctly in the evaporation process</p> <p>CO8. able to explain correctly the concepts and benefits of pumping liquids in the chemical industry</p> <p>CO9. able to calculate correctly the power needed by a centrifugal pump to do certain work</p>
Content:	Unit Operations course contains material about: Introduction, Concepts of Mass balance, Steam-Liquid Balance and Distillation, Evaporation Process, Liquid Pumping
Study / exam achievements:	The final mark will be weight as follow:

No	CO	Assessment Object	Assessment Technique	Weight
1	CO1, CO2, CO3, CO4,	Structural assignment: ability to describing	Assignment	15%
2	CO5, CO6, CO7, CO8, CO9,	Structural assignment: ability to applying the formula according to context	Assignment	15%
3		Structural assignment: ability to collaborate, analyze, rasionalize, and communicate	Assignment	15%
4		Individual assignment: skill to collect literacy, understanding, and describing	Assignment	15%
5		Mid term exam	Written test	20%
6		Final exam	Written test	20%
			Total	100%
Forms of media:		Board, LCD Projector, handouts, PPT slides, and stationaries		
Reference:		<p>A. Ray Sinnott, Gavin Towler, (2019), Chemical Engineering Design, Elsevier</p> <p>B. Warren L. Mc. Cabe, Julian C. Smith, Peter Harriot, (2005), Unit Operationsof Chemical Engineering, McGraw-Hill, Inc.</p> <p>C. Zhu, Z., Li, G., Dai, Y. Et al, (2020), Determination of a suitable index for a solvent via two-column extractive distillation using a heuristic method, <i>Front. Chem. Sci. Eng</i>, 14</p> <p>D. Vlasov, V. A. (2019), Modeling of evaporation and condensation processes: a chemical kinetics approach. <i>Heat Mass Transfer</i>, 55</p> <p>E. Kala, K., Voskov, D. (2020), Element Balance Formulation in reactive compositional Flow and transport with parameterization Technique, <i>Comput Geosci</i>, 24</p> <p>F. Endang Dwi Siswani, (2017), Diktat Kuliah Operasi Teknik Kimia, Yogyakarta: Jurusan Pendidikan Kimia FMIPA UNY.</p>		

PLO and CO mapping

CO	PLO									
	Attitude	Generic Skills		Knowledge				Specific Skills		
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
C01					✓					
C02					✓					
C03									✓	
C04									✓	
C05									✓	
C06							✓			
C07									✓	
C08							✓			
C09									✓	