

Module Course

	UNIVERSITAS JEMBER FACULTY OF AGRICULTURAL TECHNOLOGY DEPARTMENT OF AGRICULTURAL PRODUCT TECHNOLOGY		KODE DOKUMEN F1.03.05
Module Course			
COURSE	Name	Mixing and Extrusion Technology	
	Kode	TPU 1405	
	Credit (SKS)	2 SKS Face to Face; 1 SKS Practice	
	Semester	4	
Person(s) Teaching			
- Dr. Triana Lindriati, S.T.,M.P. - Ir. Mukhammad Fauzi, MSi - Ardiyan Dwi Masahid, STp, MP. - Nurud Dinniyah, STp. MP. PhD			
DESCRIPTION OF COURSE			
This course studies the principles of design, equation calculation and optimization as well as the operating principles of equipment in the unit operation of stirring, size reduction, sieving and extrusion.			
LO – Programme Learning Outcome			
No LO	Statement of Learning Outcome (LO)		
LO-4	Able to design food products and agricultural products based on local agro-industry commodities		
LO-8	Able to evaluate principles in food engineering and agricultural products		
Course Learning Outcome (CLO)			
No CLO	Statement of CLO		
CLO-1	Using mixing and extrusion equipment and unit operations		
CLO-2	Explain the principle of engineering operations in the unit operation of mixing and extrusion		
CLO-3	Evaluating parameters in mixing and extrusion operations		
SUB COURSE LEARNING OUTCOME (Sub-CLO)			
No Sub-CLO	Statement of Sub-CLO		
1	Students can determine the optimum conditions for operating mixing, sizing, sifting and extrusion equipment		
2	Students can explain the principle of unit operation of size reduction, sieving, solid-solid mixing, solid-liquid mixing, liquid-liquid mixing and extrusion		
3	Students can explain the unit operation of mixing and extraction in the flour and pasta industry		
4	Students can perform parameter calculations in the unit operation of mixing and extrusion		
LEARNING TOPIC			

- Mixing solid - solid - Mixing solid - liquid - Mixing liquid - liquid - The concept of rheology in mixing - Size reduction - Sifting - Extrusion - Flour and pasta industry		
MAIN REFERENCES		
- Triana Lindriati dan Septy Handayani, 2018. Teknologi Ekstrusi dalam Pengolahan Pangan. Caremedia Communication - R.L. Earle, 1983. Unit Operation in Food Processing. The New Zealand Institute of Food Science & Technology (Inc.) - P.J. Cullen, 2009. Food Mixing: Principle and Application. John Wiley and Sons. Ltd. Publication - Christie, J. Geankoplis, 1993. Transport Processes and Unit Operation. Prentice Hall International, Inc.		
ADDITIONAL REFERENCES		
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PREREQUISITES COURSE (If any)		
- Basic physics - Mathematics - Technical principles		
TIMELINE		
WEEK(s)	Components	Person(s)
1	Definition and scope of operation unit size reduction, sifting, solid-solid mixing, solid-liquid mixing, liquid-liquid mixing and extrusion. Application of unit operations of size reduction, sieving, solid-solid mixing, solid-liquid mixing, liquid-liquid mixing and extrusion in industry	Dr. Triana Lindriati, S.T.,M.P.
2	Size reduction and sieving. Types of sieving and size reduction equipment. Changes that occur during the operation	Ir. Mukhammad Fauzi, MSi
3	Calculation of energy requirements in size reduction and particle surface area	Ir. Mukhammad Fauzi, MSi
4	Calculation of particle size distribution and sieving efficiency	Ir. Mukhammad Fauzi, MSi
5	Size reduction practicum Practicum calculation of particle size distribution	Ir. Mukhammad Fauzi, MSi
6	Rheology of foodstuffs Selection of stirrer according to its rheology	Dr. Triana Lindriati, S.T.,M.P.

7	The concept of solid-solid, solid-liquid and liquid-liquid mixing	Ardiyan Dwi Masahid, STp, MP.
8	Puniformity index calculation with practice questions	Ardiyan Dwi Masahid, STp, MP.
9	Calculation of tank dimensions Reynolds number, Power Number and number Calculation of rotational speed and blade size in liquid-liquid mixing	Ardiyan Dwi Masahid, STp, MP.
10	Practicum for determining uniformity index Reynolds number practicum in stirring	Ardiyan Dwi Masahid, STp, MP.
11	Extrusion principle Type of extraction equipment Components of the extruder	Dr. Triana Lindriati, S.T.,M.P.
12	Change during extrusion Description of the process of making various types of extruded food	Dr. Triana Lindriati, S.T.,M.P.
13	Explanation of the process of making wheat flour Block diagram of the wheat flour industry Size reduction and sifting equipment in the wheat flour industry	Nurud Dinniyah, STp. MP. PhD
14	Explanation of the noodle-making process Block diagram of the noodle industry Stirring and extrusion equipment in the noodle industry	Nurud Dinniyah, STp. MP. PhD
15	Explanation of the process of making extruded snacks Block diagram of the extruded snack industry Mixing and extrusion equipment in the extruded food industry	Nurud Dinniyah, STp. MP. PhD
16	Noodle and pasta-making practicum	Nurud Dinniyah, STp. MP. PhD

Jember, October 2022

Chief of Department

Person(s) coordinator

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