


## COURSE LEARNING PLAN

	UNIVERSITY OF BRAWIJAYA FACULTY OF ANIMAL SCIENCE DEPARTMENT OF ANIMAL SCIENCE UNDERGRADUATE STUDY PROGRAM OF ANIMAL SCIENCE LESSON PLAN – MEAT PROCESSING INDUSTRY			
Course	Code	Weight (credits)	Semester	Compilation Date
Meat Processing Industry	PET60017	3 (2-1)	Odd/Even	August 26, 2020
Authorization	Course Coordinator		Head of Undergraduate Study Program of Animal Science	Vice Dean 1
	Prof. Dr. Ir. Djalal Rosyidi, MS, IPU, ASEAN Eng.		Dr. Herly Evanuarini, S.Pt, MP	Dr. Ir. M. Halim Natsir, S.Pt., MP., IPM., ASEAN Eng.
Learning Outcomes (LO)	PLO			
	After completing this course the students are: LO 4: Able to develop comprehensive insight and mindset according to the science and field of the animal industry LO 12: Able to design and conduct experiments, analyze and interpret data to make correct decisions in solving problems in the field of animal science, meet ethics, and have environmental insight. LO 13: Able to apply animal technology that is oriented towards improving production, efficiency, quality, and sustainability based on mastery of animal science including breeding, feed, processing of products, marketing management and organizing a sustainable animal production system, and applying entrepreneurial concepts			
	CLO			
	After completing this course, students will be able to: 1. Explain the potential of the meat processing industry in Indonesia. 2. Plan the establishment of a meat supply industry and a business plan. 3. Describe the flow diagram, equipment, and machines used in the process of meat processing on an industrial scale. 4. Provide an example of the profile/success of well-established meat processing industries and develop products.			
Brief Course Description	This course provides (1) Knowledge of how to plan the establishment of a meat processing industry. (2) Knowledge of flow diagrams, equipment, and machines used in the process of meat processing on an industrial scale of restructured meat, intermediate moisture meat, ready-to-eat meat origin foods, and meat canning processes. (3) Knowledge to establish chicken carcass industry, beef carcass, and mutton.			
Topics	1. Description of the course learning of the Meat Processing Industry and the potential of the Meat Processing Industry.			

	<div>2. Meat Processing Industry Planning</div> <div>3. Slaughterhouse and Chicken Slaughterhouse Industry</div> <div>4. Fresh Meat and Carcass Industry and the production process of fresh meat/carcass</div> <div>5. Restructured Meat Industry (Sausage, meatballs, nuggets, Meat Block)</div> <div>6. IMM (Intermediate Moisture Meat) Industry (Jerky and Shredded meat)</div> <div>7. Fermented and Smoked Meat Processing Industry (Salami and Sei)</div> <div>8. Meat HORECA Industry (Steak, Fried Chicken, Burger, and Traditional Products)</div> <div>9. Meat Canning Industry (Corned Beef, Sausage, and Traditional Products)</div> <div>10. Variety meat (offal)</div>					
References	<div>1. Soeparno. Ilmu dan Teknologi Daging</div> <div>2. Hari Purnomo. Ilmu dan Teknologi Pengolahan Daging</div> <div>3. Fidel Toldra. Handbook of Meat Processing</div>					
Learning Media	Software			Hardware		
	Video			Projector and screen Laptop/Computer		
Teaching Team	<div>1. Prof. Dr. Ir. Djalal Rosyidi, MS, IPU, ASEAN Eng.</div> <div>2. Dr. Ir. Imam Thohari, MP, IPM, ASEAN Eng.</div> <div>3. Dr. Agus Susilo, S.Pt., MP, IPM, ASEAN Eng.</div> <div>4. Dr. Ir. Mustakim, MP, IPM</div> <div>5. Dr. Khotibul Umam Al-Awwaly, S.Pt., M.Si</div> <div>6. Dr. Herly Evanuarini, S.Pt., MP</div> <div>7. Ir. Aris Sri Widati, MS</div> <div>8. Ir. Eny Sri Widyastuti, MP</div> <div>9. Dr. Dedes Amertaningtyas, S.Pt, MP</div> <div>10. Mulia Winirsya Apriliyani, S.Pt, MP</div> <div>11. Dicky Tri Utama, S.Pt., Ph.D</div>					
Prerequisite course	Animal Product Technology (PET60006)					
Week (s)	Sub-Course Learning Outcomes (SCLO)	Indicators	Learning Materials/ Topics	Learning Methods	Criteria & Form of Assessment	Weighted Scores (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)


1	Able to explain the potential of the meat processing industry in Indonesia	Have a broad and current insight about the development of the meat processing industry in Indonesia	Description of the course learning of Meat Processing Industry and the potential of the Meat Processing Industry in Indonesia	Lectures and discussions	<ul style="list-style-type: none"> <li>• Quizzes (insight about the development of the meat processing industry in Indonesia)</li> <li>• Student engagement/active learning</li> </ul>	
2	Able to plan small/large industrial establishment	1. Able to explain the tree of the meat industry 2. Able to plan small/large industrial establishment based on the applicable regulations	Meat Processing Industry Planning	Lectures, tutorials, and discussions	<ul style="list-style-type: none"> <li>• Structured assignments (individual paper) about meat processing industry planning</li> <li>• Student engagement/active learning</li> </ul>	
3	Able to plan small/large industrial establishment	Able to make a meat processing industry business plan in accordance with applicable regulations	Meat Processing Industry Planning (business plan)	Lectures, tutorials, and discussions	<ul style="list-style-type: none"> <li>• Structured assignments (individual) about making meat processing industry business plan</li> <li>• Student engagement/active learning</li> </ul>	
4	Able to plan the establishment of the slaughterhouse industry and the chicken slaughterhouse industry	Able to plan the establishment of the slaughterhouse and chicken slaughterhouse industry in accordance with	The slaughterhouse industry and the chicken slaughterhouse industry	Lectures, tutorials, and discussions	<ul style="list-style-type: none"> <li>• Structured assignments (individual paper) about the plan of the establishment of the standard slaughterhouse and</li> </ul>	

		applicable regulations			chicken slaughterhouse industry ● Student engagement/active learning	
5	Able to plan the establishment of fresh meat and carcass industry	1. Able to calculate the supply of fresh meat from living animals 2. Able to plan the establishment of a fresh meat supply industry in accordance with applicable regulations	Fresh meat and carcass industry and the production process of fresh meat/carcass	Lectures, tutorials, and discussions	● Structured assignments (individual paper) about the estimation of demand and supply of fresh meat ● Student engagement/active learning	
6	Able to plan the development of restructured meat product	1. Understand various existing sausage and meatball products and able to analyze raw materials and their processing 2. Able to design innovative products according to the standards	Restructured Meat Industry (Sausage and meatballs)	Lectures and discussions	● Structured assignments (Lecture by Guest Professor) about an overview (economic potential, processes, market) of <i>dry aging</i> industry in the world ● Student engagement/active learning	
7	Able to plan the development of restructured meat product	1. Understand various existing nugget and meat block products and	Restructured Meat Industry (nugget and meat block)	Lectures and discussions	● Structured assignments (in groups) on designing the recipe	

		able to analyze raw materials and their processing 2. Able to design innovative products according to the standards			for innovative restructured meat products (template refers to the PKM-KC proposal) <ul style="list-style-type: none"> <li>• Student engagement/active learning</li> </ul>	
<b>MIDTERM EXAM</b>						
8	Able to understand IMM meat processing	Good understanding of IMM meat processing	IMM Industry (Intermediate Moisture Meat) (Jerky meat)	Lectures and discussions	<ul style="list-style-type: none"> <li>• Student engagement/active learning</li> </ul>	
9	Able to understand fermented and smoked meat processing	Good understanding of fermented and smoked meat processing	Fermented and smoked meat processing industry (salami and sei)	Lectures and discussions	<ul style="list-style-type: none"> <li>• Quizzes on raw materials, equipment, and processes for the manufacture of fermented and smoked meat products</li> <li>• Student engagement/active learning</li> </ul>	
10	Able to understand the HORECA meat processing	Good understanding of HORECA meat processing	Meat Industry in Hotel, Restaurant, and Catering (Steak)	Lectures and discussions	<ul style="list-style-type: none"> <li>• Student engagement/active learning</li> </ul>	
11	Able to understand the meat processing in resto	Good understanding of meat processing in resto	Meat Industry in Restaurant (Fried Chicken)	Lectures and discussions	<ul style="list-style-type: none"> <li>• Quizzes on raw materials, equipment, and processes for</li> </ul>	



## RUBRICS FOR ASSESSMENT

	UNIVERSITY OF BRAWIJAYA FACULTY OF ANIMAL SCIENCE DEPARTMENT OF ANIMAL SCIENCE UNDERGRADUATE STUDY PROGRAM OF ANIMAL SCIENCE		
Course	Meat Processing Industry		
Score Level	CLO and PLO	Conversion	PLO score
PLO 4: Able to develop comprehensive insight and mindset according to the science and field of the animal industry CLO 1: Able to explain the potential of the meat processing industry in Indonesia			
Very Good (4)	Show <b>comprehensive</b> insights about the potential of the meat processing industry in Indonesia characterized by: 1) Ability to name the components of the tree of the meat processing industry properly. 2) Ability to describe the tree of the meat processing industry in Indonesia properly. 3) Ability to describe the image of the meat processing industry tree in Indonesia properly. 4) Provide examples of well-established industries in Indonesia and explain their development.	80-100	1
Good (3)	Shows <b>good</b> insights about the potential of the meat processing industry in Indonesia characterized by: 1) Ability to name the components of the tree of the meat processing industry properly.	70-79	0.75

	2) Ability to describe the tree of the meat processing industry in Indonesia properly. 3) Ability to describe the image of the meat processing industry tree in Indonesia properly.		
Moderate (2)	Show <b>limited</b> insights about the potential of the meat processing industry in Indonesia characterized by: 1) Ability to name the components of the tree of the meat processing industry properly. 2) Ability to describe the tree of the meat processing industry in Indonesia properly.	60-69	0.5
Poor (1)	Show <b>very limited</b> insights about the potential of the meat processing industry in Indonesia characterized by the ability to name the components of the tree of the meat processing industry properly.	<60	0.25
Score Level	CLO and PLO	Conversion	PLO score
PLO 4: Able to develop comprehensive insight and mindset according to the science and field of the animal industry  PLO 12: Able to design and conduct experiments, analyze and interpret data to make correct decisions in solving problems in the field of animal science, meet ethics, and have environmental insight  PLO 13: Able to apply animal technology that is oriented towards improving production, efficiency, quality, and sustainability based on mastery of animal science including breeding, feed, processing of products, marketing management and organizing a sustainable animal production system, and applying entrepreneurial concepts  CLO 2 Able to plan/establish a meat supply industry and a business plan.			



Very Good (4)	Show <b>comprehensive</b> ability characterized by: <ol style="list-style-type: none"> <li>1) Awareness of laws and regulations and the need to establish a meat supply industry.</li> <li>2) Ability to explain the methods of slaughtering animals properly and correctly</li> <li>3) Understand the commercial designation of each part of the meat and its use in processed products.</li> <li>4) Able to design a business plan for the establishment of commercial slaughterhouses.</li> </ol>	80-100	1
Good (3)	Show <b>good</b> ability characterized by: <ol style="list-style-type: none"> <li>1) Awareness of laws and regulations and the need to establish a meat supply industry.</li> <li>2) Ability to explain the methods of slaughtering animals properly and correctly</li> <li>3) Understand the commercial designation of each part of the meat and its use in processed products.</li> </ol>	70-79	0.75
Moderate (2)	Show limited ability characterized by: <ol style="list-style-type: none"> <li>1) Awareness of laws and regulations and the need to establish a meat supply industry.</li> <li>2) Ability to explain the methods of slaughtering animals properly and correctly</li> </ol>	60-69	0.5
Poor (1)	Show <b>very limited</b> ability that is only characterized by the awareness of laws and	<60	0.25

	regulations and the need to establish a meat supply industry.		
Score Level	CLO and PLO	Conversion	PLO score
<p>PLO 4: Able to develop comprehensive insight and mindset according to the science and field of the animal industry</p> <p>PLO 12: Able to design and conduct experiments, analyze and interpret data to make correct decisions in solving problems in the field of animal science, meet ethics, and have environmental insight</p> <p>PLO 13: Able to apply animal technology that is oriented towards improving production, efficiency, quality, and sustainability based on mastery of animal science including breeding, feed, processing of products, marketing management and organizing a sustainable animal production system, and applying entrepreneurial concepts</p> <p>CLO 3 Able to explain the flow diagram, equipment, and machines used in the process of meat processing on an industrial scale.</p>			
Very Good (4)	<p>Able to explain <b>comprehensively</b> which is characterized by:</p> <ol style="list-style-type: none"> <li>1) Ability to make a production flow chart properly.</li> <li>2) Familiarity with the equipment and machinery of the meat processing industry.</li> <li>3) Ability to explain the method of operation of the meat processing industry equipment and machines.</li> <li>4) Ability to explain the control of the production process and product quality.</li> </ol>	80-100	1
Good (3)	<p>Able to explain <b>properly</b> which is characterized by:</p> <ol style="list-style-type: none"> <li>1) Ability to make a production flow chart properly.</li> </ol>	70-79	0.75

	2) Familiarity with the equipment and machinery of the meat processing industry. 3) Ability to explain the method of operation of the meat processing industry equipment and machines.		
Moderate (2)	Able to explain <b>limited</b> , which is characterized by: 1) Ability to make a production flow chart properly. 2) Familiarity with the equipment and machinery of the meat processing industry.	60-69	0.5
Poor (1)	Able to explain very <b>limited</b> , which is only characterized by the ability to make a production flow chart properly.	<60	0.25
Score Level	CLO and PLO	Conversion	PLO score
PLO 4: Able to develop comprehensive insight and mindset according to the science and field of the animal industry PLO 12: Able to design and conduct experiments, analyze and interpret data to make correct decisions in solving problems in the field of animal science, meet ethics, and have environmental insight PLO 13: Able to apply animal technology that is oriented towards improving production, efficiency, quality, and sustainability based on mastery of animal science including breeding, feed, processing of products, marketing management and organizing a sustainable animal production system, and applying entrepreneurial concepts  CLO 4 Provide an example of the profile/success of well-established meat processing industries and develop products.			
Very Good (4)	Show <b>comprehensive</b> ability characterized by:	80-100	1

	1) Know the business actors and traditional and modern processed meat products on the market. 2) Analyzing the raw materials and production processes of traditional and modern processed meat products on the market. 3) Able to design similar products. 4) Able to make plans for new product development.		
Good (3)	Show <b>good</b> ability characterized by: 1) Know the business actors and traditional and modern processed meat products on the market. 2) Analyzing the raw materials and production processes of traditional and modern processed meat products on the market. 3) Able to design similar products.	70-79	0.75
Moderate (2)	Show <b>limited</b> ability characterized by: 1) Know the business actors and traditional and modern processed meat products on the market. 2) Analyzing the raw materials and production processes of traditional and modern processed meat products on the market.	60-69	0.5
Poor (1)	Show <b>very limited</b> ability which is only characterized by knowing the business actors and traditional and modern processed meat products on the market.	<60	0.25

How to Calculate the PLO Score :  $\frac{Score\ Level}{\Sigma Score\ Level} \times \frac{\Sigma CLO}{\Sigma PLO}$


### Calculation of CLO Score

Components assessed	Component Weights	CLO Weight against Score			
		CLO 1	CLO 2	CLO 3	CLO 4
Midterm Exam	0.30	0.15	0.45	0.20	0.20
Final Exam	0.30	0.10	0.10	0.40	0.40
Practicum	0.20			0.40	0.60
Assignments	0.10		0.50	0.25	0.25
Quizzes	0.05	0.25		0.50	0.25
Activeness/Discipline	0.05	0.25	0.25	0.25	0.25
CLO WEIGHT					

### Calculation of PLO Score

CLO	CLO Score	CLO Weight	PLO		
			PLO 4	PLO 12	PLO 13
CLO 1			1.00		
CLO 2			0.20	0.40	0.40
CLO 3			0.20	0.40	0.40
CLO 4			0.20	0.40	0.40

## Lecture Portfolio

		<b>UNIVERSITY OF BRAWIJAYA</b> <b>FACULTY OF ANIMAL SCIENCE</b> <b>STUDY PROGRAM OF ANIMAL SCIENCE</b>		
Course: Meat Processing Industry		Code: PET 60017	RMK:	Semester: 5/6
Lecturer	<ol style="list-style-type: none"><li>1. Prof. Dr. Ir. Djalal Rosyidi, MS, IPU, ASEAN Eng.</li><li>2. Dr. Ir. Imam Thohari, MP, IPM, ASEAN Eng.</li><li>3. Dr. Agus Susilo, S.Pt., MP, IPM, ASEAN Eng.</li><li>4. Dr. Ir. Mustakim, MP, IPM</li><li>5. Dr. Khotibul Umam Al-Awwaly, S.Pt., M.Si</li><li>6. Dr. Herly Evanuarini, S.Pt., MP</li><li>7. Ir. Aris Sri Widati, MS</li><li>8. Ir. Eny Sri Widyastuti, MP</li><li>9. Dr. Dedes Amertaningtyas, S.Pt, MP</li><li>10. Mulia Winirsya Apriliyani, S.Pt, MP</li><li>11. Dicky Tri Utama, S.Pt., Ph.D</li></ol>			
<b>Introduction</b> <p>This course provides (1) Knowledge of how to plan the establishment of a meat processing industry. (2) Knowledge of flow diagrams, equipment, and machines used in the process of meat processing on an industrial scale of restructured meat, intermediate moisture meat, ready-to-eat meat origin foods, and meat canning processes. (3) Knowledge to establish chicken carcass industry, beef carcass, and mutton.</p>				

1	<b>Objectives</b>
	<p>After completing this course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Describe the potential of the meat processing industry in Indonesia.</li> <li>2. Plan the establishment of a meat supply industry and a business plan.</li> <li>3. Describe the flow diagram, equipment, and machines used in the process of meat processing on an industrial scale.</li> <li>4. Provide an example of the profile/ success of well-established meat processing industries and develop products.</li> </ol>
2	<b>Learning Strategies</b>
	The learning strategies conducted in this course is lectures, discussion, structured assignments, quizzes, and group presentations
3	<b>Lecture Management</b>
	<ol style="list-style-type: none"> <li>1. Lecture: Duration 100 minutes/meeting (14 meetings)</li> <li>2. Practicum 150 minutes/meeting (14 meetings)</li> <li>3. Structured Assignments/Quizzes/Group Presentations</li> <li>4. Attendance: 80 % of the total attendance</li> </ol> <p>The role of lecturer: deliver lecture material, accompany students in the discussion, provide instruction for the assignments, assess the quizzes and exams</p> <p>The role of students: carry out the assignments, discuss, and become a moderator for discussion and assess their friend's presentation</p>
4	<b>Lecture Contents</b>
	<ol style="list-style-type: none"> <li>1. Description of the course learning of the Meat Processing Industry and the potential of the Meat Processing Industry.</li> <li>2. Meat Processing Industry Planning</li> <li>3. Slaughterhouse and Chicken Slaughterhouse Industry</li> </ol>



	<ol style="list-style-type: none"> <li>4. Fresh Meat and Carcass Industry and the production process of fresh meat/carcass</li> <li>5. Restructured Meat Industry (Sausage, meatballs, nuggets, Meat Block)</li> <li>6. IMM (Intermediate Moisture Meat) Industry (Jerky and Shredded meat)</li> <li>7. Fermented and Smoked Meat Processing Industry (Salami and Sei)</li> <li>8. Meat HORECA Industry (Steak, Fried Chicken, Burger, and Traditional Products)</li> <li>9. Meat Canning Industry (Corned Beef, Sausage, and Traditional Products)</li> <li>10. Variety meat (offal)</li> </ol>
5	<b>Lecture Participants</b> The participants of this course are students in semester 5/6 who have passed the Animal Product Technology course (PET60006)
6	<b>Percentage of Attendance</b> (% attendance of lecturers;% attendance of students) Lecturer attendance: 100% Students attendance: Min 80%
7	<b>Evaluation System</b> (explain homework, quizzes, group assignments, practicum, etc.) <ol style="list-style-type: none"> <li>1. Midterm Exam: 30%</li> <li>2. Final Exam: 30 %</li> <li>3. Pass the Practicum Exam: 20 %</li> <li>4. Structured Assignments: 10%</li> <li>5. Quizzes: 5%</li> <li>6. Active participation: 5%</li> </ol>
8	<b>Class Observation</b> (explain important and interesting things encountered during the lecture) <i>example:</i>

	<ol style="list-style-type: none"> <li>1. 100% of students attended and followed the quiz using Google Form at the 3rd meeting (proof of response in the attachment)</li> <li>2. 5 students (Name and Student Identification Number) answer lecturer questions correctly as a reflection of lectures at each meeting (proof of student's name and Student Identification Number in the attachment)</li> <li>3. Distribution (graph) of student feedback (pre-test: student interest in the topic/ method of lectures and post-test)</li> <li>4. etc.</li> </ol>
9	<p><b>Learning Outcomes</b> (explain the achievement of the objectives that have been set and include the learning outcomes that can be explained)</p> <p><i>Outcomes</i></p> <p><i>Description of outcomes</i></p>
10	<p><b>Obstacles</b> (Describe the main barriers to learning)</p> <p><i>Example:</i></p> <ol style="list-style-type: none"> <li>1. When the course materials are delivered online, some students have difficulty in accessing the internet.</li> <li>2. The size of the course material is too large because the lecture duration is too long.</li> </ol>
11	<p><b>Distribution of score</b> (provide the distribution of score following the learning outcomes of this course)</p> <p><i>Example:</i></p> <p><i>Graph of the distribution of final scores (how many get A, B, C D...)</i></p> <p><i>Graph of CLO and PLO scores achieved</i></p>
12	<p><b>Conclusion</b></p> <p>Describes the success of making the students achieve learning outcomes</p>
13	<b>Recommended Improvement</b>

	<p>Example:</p> <p>LO-x is difficult to achieve so it needs to be fixed</p>
	<p><b>Appendices:</b></p> <ol style="list-style-type: none"> <li>1. Student assignments and records of the evaluation process</li> <li>2. Attendance list</li> <li>3. PowerPoint assignments, documentation of presentation, and assessment form</li> </ol> <p>Etc.</p>