COURSE LEARNING PLAN

	UNIVERSITY OF BRAWIJAYA FACULTY OF ANIMAL SCIENCE DEPARTMENT OF ANIMAL SCIENCE UNDERGRADUATE STUDY PROGRAM OF ANIMAL SCIENCE LEARNING PLAN IN ODD SEMESTER OF 2019/2020

Course	Code	Weight (credits)	Semester	Compilation Date
Animal Product Technology		3 (2-1) credits	Odd	

Authorization	Subject Coordinator	Head of Undergraduate Study Program of Animal Science	Vice Dean 1
	Dr. Imam Thohari, S.Pt.,MP., IPM	Dr. Herly Evanuarini, S.Pt, MP	Dr. Ir. M. Halim Natsir, S.Pt., MP., IPM., ASEAN Eng.

Learning Outcomes (LO)	PLO
	LO (5): Able to examine the implications of the development or implementation of science and technology that consider and apply humanities values in accordance with their expertise based on scientific principles, procedures, and ethics to produce excellent solutions and ideas LO (11): Able to show performance, both independently and in teamwork (inter- and multi-disciplinary), identify and analyze to solve problems in quality and measurable way 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
	Able to recognize and understand technology in processing and preserving animal products Able to apply technology in the processing of animal products Able to evaluate the process and quality of processed animal products Have the ability to work in groups/team and convey ideas
Brief Course Description	The Animal Product Technology Course (MK) discusses technology and changes in raw materials into food and non-food materials in all commodities including milk, meat, eggs, by-products and honey using technology applications.
Topics	Intermediate Moisture Meat Restructured Meat

	Meat smoked and Indigenous Product Fermented Meat Dairy product using Heat Treatment Technology Dairy Products using Cold and Frozen Processing Technology Dairy Products using Fermentation Technology and Traditional Milk Products Dairy Products using Drying Technology Eggshell Processing Products Eggshell-Free Processing Products Modern Technology and Traditional Egg Processing Processing of Animal Skins and By-Products for Food Processing of Animal Hides and By-Products for Non-Food Processed Products Honey drink, Crystallized honey, Royal Jelly, Bee Pollen, Propolis	
References	Thohari, I., Padaga, M., Mustakim, Rahayu, P.P. 2017. Buku Ajar Teknologi Hasil Ternak. UB Press. Malang Journal of Milk and Food Technology: Official Bimonthly Publication of the International Association of Milk Sanitarians, Volume 12 G Feiner. 2006. Meat Products Handbook - 1st Edition. Woodhead Publishing. Varnam, A., Sutherland, J.M. 1995. Meat and Meat Products: Technology, Chemistry and Microbiology. Springer US William J Stadelman, Debbie Newkirk, Lynne Newby. 1995. Egg Science and Technology, Fourth Edition. CRC Press NIIR Board of Consultants Engineers. 2011. Leather Processing & Tanning Technology Handbook: How to Start Leather Production, Processing & Tannery Business, Leather bag business plan, Leather Based Small Scale Industries Projects, Leather business Ideas, Leather Export Business Ideas, Leather Making Small Business Manufacturing, Leather. Niir Project Consultancy Services, 2011 Baglio, Ettore. 2018. Chemistry and Technology of Honey Production. Springer International Publishing	
Learning Media	Software	Hardware
	Video	LCD Laptop/Computer
Teaching Team	Prof. Dr. Ir. Lilik Eka Radiati, MS., IPU. Prof. Dr. Ir. Djalal Rosyidi, MS., IPU., ASEAN Eng. Dr. Khotibul Umam Al-Awwaly, S.Pt., M.Si. Dr. Ir. Imam Thohari, MP, IPM, ASEAN Eng. Dr. Agus Susilo, S.Pt., MP, IPM, ASEAN Eng. Dr. Ir. Purwadi, MS. Dr. Ir. Mustakim, MP., IPM. Dr. Ir. Manik Erry Sawitri, MP.	

	Dr. Herly Evanuarini, S.Pt., MP. Dr. Abdul Manab, S.Pt, MP. Dr. Dedes Amertaningtyas, S.Pt, MP. Dr. Premy Puspitawati Rahayu, S.Pt, MP. Ria Dewi Andriani, S.Pt, M.Sc. Mulia Winirsya Apriliyani, S.Pt, MP. Dicky Tri Utama, S.Pt., Ph.D
Prerequisite Course	Biology

Week	Sub-Course Learning Outcomes (SCLO)	Indicator	Material/Learning Topic	Learning Method	Criteria & Assessment Form	Weighted Score (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Be able to explain coherently about the processing of meat into Intermediate Moisture Meat products, Be able to explain the principles of processing, characteristics and quality.	Correct explanation about processing of meat into Intermediate Moisture Meat products (processed meat with moderate moisture content)	Course Learning Guideline of Handling of Animal Products -Competence to be achieved -The scope of teaching materials - lecture, assignment, and assessment arrangements Material: Intermediate Moisture Meat	Lecture Tutorial of Intermediate Moisture Meat	Describe about Intermediate Moisture Meat including principles, processes, affecting factors, quality and test parameters to determine the quality of IMM products assessment: Short answer test	7
2	Be able to explain and understand *restructured meat* starting from principles, processes, factors that determine quality Applying technology of *restructured meat*	Correct explanation about processing of meat into restructured meat products (such as meatballs, sausages and nuggets).	Restructured Meat	Lecture Case Study	Describe Restructured Meat, such as process, affecting factors, quality and test parameters to determine the quality of the product assessment: reviewing journal	8

3	Be able to explain and understand about meat smoke and Indigenous Product starting from the principles, processes, factors that determine quality Able to apply meat smoke and indigenous product technology	Explanation about meat smoke and indigenous products (e.g *se'i* and sequences)	Meat Smoke Indigenous Product	Lecture Case Study	Understand meat smoke and indigenous products including principles, processes, influencing factors, quality and test parameters to determine the quality of the product	5
4	Be able to explain and understand Fermented Meat starting from the principles, processes, factors that determine quality Be able to apply Fermented Meat technology	Explanation about meat processing using the fermentation method	Fermented Meat	Lecture	Understand Fermented Meat and Indigenous Products include principles, processes, affecting factors, quality and test parameters to determine the quality of the product	5
5	Be able to explain Milk processing using heat technology starting from the principles, processes, factors that determine quality Be able to apply heat transfer technology to dairy products	Explanation of milk processing using heat technology that includes pasteurization, sterilization and UHT	Dairy Products using Heat Processing Technology	Group Discussion Lecture	Understand about milk processing using heat technology including principles, processes, affecting factors, quality and test parameters to determine the quality of the product	10

6	Be able to explain Processing of milk using chilled and frozen technology starts from the principles, processes, factors that determine quality Be able to apply cold and frozen processing technology to dairy products	Explanation about milk processing using cold and frozen technology	Dairy Products using Cold and Frozen Processing Technology	Lecture Playing video related to milk processing using chilled and frozen technology	Understand processing of milk using cold and frozen technology includes principles, processes, affecting factors, quality and test parameters to determine the quality of the product.	10
7	Be able to explain milk processing using fermentation technology, traditional milk products starting from the principles, processes, factors that determine quality Be able to apply fermentation technology, traditional milk products	Correct explanation about dairy product using fermentation technology and native Indonesian dairy products (example: curd, *dali* and *dangke*	Dairy Products using Fermentation Technology Traditional Milk Product	Discussion	Understand milk processing using fermentation technology and native Indonesian milk products including principles, processes, affecting factors, quality and test parameters to determine the quality of the product	10
MID-TERM TEST						
8	Be able to explain milk processing using drying technology, starting from the principles, processes, factors	Correct explanation about milk processing using drying technology (example: powdered milk)	Dairy Products using Drying Technology	Case Study	Explain about milk processing using drying technology, modern technology, and native Indonesian milk products include	10

	that determine quality Be Able to apply drying technology to dairy products				principles, processes, influencing factors, quality and test parameters to determine the quality of the product.	
9	Be able to explain Whole egg processing (with the shell) starting from the principles, processes, factors that determine quality	Correct explanation about processing eggs with shells for example: salted eggs, *pindan eggs*	Processed Egg products with egg shells	Discussion	Understand whole egg processing (with the shell) including principles, processes, affecting factors, quality and test parameters to determine the quality of the product	5
10	Be able to explain egg processing without shell starting from the principles, processes, factors that determine quality	Correct explanation about egg processing without shells for example: powdered eggs	Eggshell-Free Processing Products	Lecture Discussion	Understand egg processing without shell including principles, processes, influencing factors, quality and test parameters to determine the quality of the product	5
11	Be able to explain egg processing using modern technology and traditional egg products) starting from the principles, processes, factors that determine quality Be able to apply modern technology	Correct explanation about egg processing using modern technology (emulsion system for example: mayonnaise), and traditional egg products	Product from Traditional and Modern Technologies	Case study	Understand about egg processing using modern technology (emulsion system), and traditional egg products including principles, processes, affecting factors, quality and test parameters to	5

	and traditional egg products				determine the quality of the product	
12	Be able to explain processing of skin and by-products into food) starting from the principles, processes, factors that determine quality	Correct explanation about processing of skin and by-products into food, for example: *rambak* crackers, gelatin	Processing of Animal Skins and By-Products for Food	Lecture Discussion	Explaining about processing of skin and by-products into food including principles, processes, affecting factors, quality and test parameters to determine the quality of the product	5
13	Be able to explain processing of skin and by-products (non-food) starting from the principles, processes, factors that determine quality	Correct explanation about processing of leather and by-products into non-food, for example the tanning process that will be used for leather products including shoes, bags, jackets etc.	Processing of Animal skin and By-Products for Non-Food	Case study	Understand about processing of skin and by-products into non-food products including principles, processes, affecting factors, quality and test parameters to determine the quality of leather	7.5
14	Be able to explain processed honey and honey crystallization products), Royal Jelly, Bee Pollen, Propolis extraction starting from the principles, processes, factors that determine quality	Correct explanation about processing of honey drink products and handling crystallized honey, further processing related to Royal Jelly, Bee Pollen, Propolis extraction	Processed Products Honey Drink and Crystallized Honey, Royal Jelly, Bee Pollen, Propolis	Lecture Case study	Understand about processing of honey beverage products and handling crystallized honey, processing honey products including Royal Jelly, Bee Pollen, Propolis covering principles, processes, affecting factors, quality and testing parameters to determine quality	7.5

					Students are given task about Factors that cause damage to honey, Royal Jelly, Bee Pollen, Propolis	
FINAL EXAM						

ASSESSMENT RUBRIC

	UNIVERSITY OF BRAWIJAYA FACULTY OF ANIMAL SCIENCE DEPARTMENT OF ANIMAL SCIENCE UNDERGRADUATE STUDY PROGRAM OF ANIMAL SCIENCE LEARNING PLAN IN EVEN SEMESTER OF 2019/2020		
Course	Animal Product Technology		
Score Level	CLO and PLO	Conversion	PLO Score
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 1: Able to recognize and understand technology in processing and preserving animal products.			
Very Good (4)	Show the understanding about technology in processing and preserving animal products (Technology for Processing and Preservation of Milk, Meat, Eggs, Honey and By-Products), **very well**	80-100	1
Good (3)	Show understanding about technology in processing and preserving animal products (Technology for Processing and Preservation of Milk, Meat, Eggs, Honey and By-Products), **well**	70-79	0.75
Moderate (2)	Show **limited** understanding about technology in processing and preservation of animal products (Processing and Preservation Technology of Milk, Meat, Eggs, Honey and By-Products),	60-69	0.5
Poor (1)	Show **very limited** understanding about technology in processing and preserving animal products (Technology for Processing and Preservation of Milk, Meat, Eggs, Honey and By-Products),	<60	0.25
Score level	CLO and PLO	Conversion	PLO Score
PLO 6: Able to apply biological science, physiology, nutrition science, breeding science, animal raising management to comprehend the concept and implement it in the field of animal science CLO 2: Able to apply technology in animal product processing			
Very Good (4)	Show **very good** ability in applying and determining technology base on characteristics of animal products, so as to produce quality products	80-100	1
Good (3)	Show **good** ability in apply and apply technology in accordance with the characteristics of animal products to produce good quality products	70-79	0.75
Moderate (2)	Show **limited** ability in the application and applying technology appropriate to the characteristics of animal products	60-69	0.5

Poor (1)	Show **very limited** ability in applying and apply technology in accordance with the characteristics of animal products	<60	0.25
Score Level	CLO and PLO	Conversion	PLO Score
PLO 11: Able to show performance, both independently and in teamwork (inter- and multi-disciplinary), identify and analyze to solve problems in quality and measurable way CLO 3: Able to evaluate process and quality of processed animal products			
Very Good (4)	Show the understanding in evaluating process and quality of processed animal products **very well**	80-100	1
Good (3)	Show the understanding in evaluating process and quality of processed animal products **well**	70-79	0.75
Moderate (2)	Show **limited** understanding in evaluating process and quality of processed animal products	60-69	0.5
Poor (1)	Show **poor** understanding in evaluating process and quality of processed animal products	<60	0.25
Score level	CLO and PLO	Conversion	PLO Score
PLO 6: Able to apply biological science, physiology, nutrition science, breeding science, animal raising management to comprehend the concept and implement it in the field of animal science CLO 4: Have the ability to work in team and convey ideas			
Very Good (4)	Show **very good** ability in team work and convey the ideas	80-100	1
Good (3)	Show **good** ability in team work and convey the ideas	70-79	0.75
Moderate (2)	Show **poor** ability in team work and convey the ideas	60-69	0.5
Poor (1)	Show **very poor** ability in team work and convey the ideas	<60	0.25

Counting PLO Score: $\frac{Level\ Skor}{\sum level\ skor} \times \frac{\sum CLO}{\sum PLO} \frac{Level\ Skor}{\sum level\ skor} \times \frac{\sum CLO}{\sum PLO}$

CLO Score Calculation

Assessed component	Component weight	CLO Weight on the Score			
		CLO 1	CLO 2	CLO 3	CLO 4
Mid-Term Test	25	25	25	25	25
Final Exam	25	25	25	25	25
Practice	25	25	25	25	25
ASSIGNMENT	15	25	25	25	25
Quiz	5	50		50	
Activeness/behavior/discipline	5	100			
CLO Weight					

The orange color must be filled by management team

Steps to fill:

Assessment component = what components will be assessed in one course? (e.g Midterm Test, Final Exam, percentages, quizzes, etc.)

Component weight = Determine the weight of each component where the total of all components is 1.

CLO weight toward score

Show the number of CLO in each subject (for example, the animal feed industry course has 4 CLO).

Determine the components of the assessment to achieve any number of CLO

The total weight of the CLO value for each component is 1

PLO Score Calculation

CLO	CPMK Score	CPMK Weight	PLO		
			PLO 5	PLO 11	PLO 13
CLO 1			35	35	30
CLO 2			35	35	30
CLO 3			35	35	30
CLO 4			35	35	30

The orange color must be filled by management team

Steps to fill:

CLO = write down the number of CPMK in each course (refer to the previous table)

PLO = Write down the number of CP-PS in each course based on the RPS (semester learning plan)

PLO weight

Present the number of PLO in each course (for example, the animal feed industry course has 3 PLOs).

Determine the components of the assessment aimed at achieving any PLO number

Total weight of the PLO value for each component is 1

Lecture Portfolio

	UNIVERSITAS BRAWIJAYA **FACULTY OF ANIMAL SCIENCE** **DEPARTMENT OF ANIMAL SCIENCE**		
Course: Animal Product Technology	Code: PET60012	RMK:	Semester: 5
Lecturers	Prof. Dr. Ir. Lilik Eka Radiati, MS., IPU. Prof. Dr. Ir. Djalal R, MS., IPU., ASEAN Eng. Dr. Khotibul Umam A, S.Pt., M.Si. Dr. Ir. Imam T, MP, IPM, ASEAN Eng. Dr. Agus Susilo, S.Pt., MP, IPM, ASEAN Eng. Dr. Ir. Purwadi, MS. Dr. Ir. Mustakim, MP., IPM. Dr. Ir. Manik Erry Sawitri, MP. Dr. Herly Evanuarini, S.Pt., MP. Dr. Abdul Manab, S.Pt, MP. Dr. Dedes Amertaningtyas, S.Pt, MP. Dr. Premy Puspitawati R, S.Pt, MP Ria Dewi Andriani, S.Pt, M.Sc Mulia Winirsya Apriliyani, S.Pt, MP Dicky Tri Utama, S.Pt, Ph.D		

INTRODUCTION

MK THT (Animal Product Technology Course) discusses technology and changes in raw materials into food and non-food ingredients in all commodities including milk, meat, eggs, by-products and honey using technology applications

1	Objectives
	After completing this course, the students are able to: Know and understand technology in processing and preserving animal products Apply technology in the processing of animal products Evaluate the process and quality of processed animal products Have the ability to work in groups and convey ideas / ideas
2	**Learning Strategy**
	The learning strategies conducted in lectures are giving lectures on the pulpit, discussions, structured assignments, quizzes, and group presentation
3	**Lecture Management**
	Lecture: 100 minutes/meeting (14 meetings) Practice 150 minutes/meeting (14 meetings) Structured assignments/quizzes/group presentation Presence: 80 % of total meetings Management: Lecturer's task: speaker, assistant, facilitator, director Students' tasks: looking for references, doing assignments, taking Midterm-Test and Final Test, and being involved in discussions/presentations.
4	**Lecture content** (explain the suitability with the applicable curriculum)

	Topics: Intermediate Moisture Meat Restructured Meat Meat smoked and Indigenous Product Fermented Meat Dairy Products using Heat Processing Technology Dairy Products using Cold and Frozen Processing Technology Dairy Products using Fermentation Technology and Traditional Milk Products Dairy Products using Drying Technology Eggshell Processing Products Eggshell-Free Processing Products Modern Technology and Traditional Egg Processing Processing of Animal Skins and By-Products for Food Processing of Animal Skins and By-Products for Non-Food Processed Products Honey drink, Crystallized honey, Royal Jelly, Bee Pollen, Propolis
5	**Lecture Participants**
	The lecture participants are 5th semester students who have passed the Introduction to ENT and Animal Product Handling courses
6	**Attendance Percentage**
	% Lecturer Attendance: 100% % Students Attendance: 80%
7	**Evaluation System**
	MID-TERM test: 25% Final Test: 25% Practice: 25% Assignment: 15% Quiz: 5% Activeness/Behavior/Discipline: 5%
8	**Class Observation**
	Students attend 100% Students take a complete quiz Students answer questions from lecturers correctly as a form of lecture reflection at each meeting (proof of student's name and NIM in the attachment) Conducting a pretest to students via Google Form (about interest in the Constitutional Court, so that there is conditioning
9	**Learning Outcomes**
	Expected learning outcome are as follow: LO (5): Able to examine the implications of the development or implementation of science and technology that consider and apply humanities values in accordance with their expertise based on scientific principles, procedures, and ethics to produce excellent solutions and ideas LO (11): Able to show performance, both independently and in teamwork (inter- and multi-disciplinary), identify and analyze to solve problems in quality and measurable way 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
10	**Obstacles**
	The obstacle is the limitation of tool
11	**Score Distribution**
	The percentage of students with successful Learning Outcomes, then data processing and evaluation. Score distribution, based on achievement if A equivalent to CLO… B equivalent to CLO… others
12	**Conclusion**
	The student success to achieve Learning Outcomes
13	**Improvement Recommendation**
	Learning Outcomes are difficult to achieve, thus they need to be improved
	Appendices:
	Student assignments and the task evaluation process / assignment evaluation track record Quiz The results of the learning process etc.