



ACADEMIC CURRICULUM DEVELOPMENT

LECTURING PLAN
ANIMAL PRODUCT TECHNOLOGY STUDY PROGRAM

APPENDIX 3 LECTURING OUTLINE AND LECTURING AGENDA UNIT

FACULTY OF ANIMAL AGRICULTURE
DIPONEGORO UNIVERSITY

Semarang
2007

COURSE : Farming Area Science

COURSE CODE : PTP 228

CREDIT : 2 (2-0)

TEACHING PROGRAM OUTLINE

- Title of Subject** : Farming Area Science
- Number Code /CSS** : PTP 228 / 2(2-0)
- Brief Description** : Farming Area Science is study about physical environment and climate especially tropical climate and the relation of livestock and ecosystem, thermal management and production, the effect of environment to livestock directly or indirectly, the adaptation to new environment and how to eliminate the bad effect from environment. To understand, student must master the basic knowledge about biology and physiology.
- General Instructional Object** : After following this lecture, student can explain about climate in general and tropical climate especially and its (the influence to livestock and how to eliminate of its (the negativity influence)
- References** :
1. Cole, D.J.A. and G.C. Brander. 1986. Bio-industrial Ecosystem. Elsevier, Amsterdam.
 2. Curtis, E.S. 1981. Environmental Management in Animal Agriculture. Iowa State Univ. Press. Ames, Iowa.
 3. Hafez, E.S.E. 1968. Adaptation of Domestic Animals. Lea & Febiger, Philadelphia.
 4. McLRoy. `1980. Pengelolaan Padang Rumput. Pradnya Paramita, Jakarta.
 5. Yousef, M.K. 1985. Stress Physiology in Livestock. CRC Press Inc. Boca Raton, Florida.

NO.	SPECIFIC INSTRUCTIONAL OBJECT	MAIN DISCUSSION	SUB DISCUSSION	TIME ESTIMATION	REFERENCES
1.	After following this lecture student has knowledge and able to explain truly about interrelationship between climates and livestock in ecosystem	ecosystem	Ecosystem the component of ecosystem	1 x 120 minutes	
2.	After following this lecture student can explain the definition and the relation of climate and living in ecosystem	Bio climate	Biotic and a biotic environment	1 x 120 minutes	
3.	After following this lecture student can explain the temperature and can decide the comfortable area for breeding	Temperature zone	Cold stress and low critical temperature Hot stress and high critical temperature	2 x 120 minutes	
4.	After following this lecture student can explain the thermal production and	Thermoregulation	Thermal production Thermal circulation	2 x 120 minutes	

	balances, thermoregulation by biological and physical		Thermal balances		
5.	After following this lecture student can explain nervous system, relation of nervous system and behavior, milk, meat, eggs production process.	The effect of environment to livestock	Behavior, nervous system and production Lactation and milk production Growth Fowl production	2 x 120 minutes	
6.	After following this lecture student can explain about adaptation and where livestock will be placed	Adaptation in environment	Adapt to environment Adapt to extreme environment Special adaptation	2 x 120 minutes	
7.	After following this lecture student can make a strategy to anticipate a stress(the excess of extreme temperature) through cage and feed and environment modification	Environment and feed manipulation	Environment manipulation Feed manipulation	2 x 120 minutes	

COURSE : Meat and Draught Animal
Production

COURSE CODE : PTF 305 P

CREDIT : 3 (2-1)

LECTURING PROGRAM OUTLINE

Subject	: Meat and Draught Animal Production
Code / Semester Credit Unit	: PTF 305P/3 (2-1)
Syllabus	: This lecture discusses breeds, animal response of production and environment factors to develop meat animal production
General Instructional Objective	: At the end of the lecturing program, students are expected to be able to understand breeds of meat and draught animal, physiology system, animal response to environment factor, animal housing, feeding, growth and development, matting system, and animal management

LECTURING PROGRAM

Meeting	Topic of Discussion	Sub-topic of Discussion	Duration (minutes)
1	Introduction	General description of subject lecture, explaining lecture contract, practical, and assignment	50
1-2	Breeds	Types and breeds of meat and draught animal	150
3	Balance of physiology system	Thermal balance, thermoregulation, heart rate, body temperature, comfort zone, and effect of environment to animal production	100
4	Animal response to climate	The effect of climate to animal production	100
5-6	Animal housing and equipment	Location of animal barn, function, lay out, type of construction, type of barn	200
7-8	Animal Growth and Development	Definition of growth and development, compensatory growth, growth of bone, meat and fat, factors affecting growth and development, and manipulation growth to production	200
9.	EVALUATION I		100
10.	Digestive system of meat animal	Digestive system and process of feed digestive on meat animal	100
11-12.	Feedstuff and animal response to feed	Kind of feed, factors affecting feed consumption, feed requirement, feeding management, and feed evaluation (feed conversion ratio, feed efficiency)	200
13.	Matting management of meat animal	Matting time, methods of matting, sex ratio, post partum matting	100
14-15.	Care of meat animal	Care of animal at parturition, care of animal (sheep, goat, cattle, buffalo, pig and horse) from birth to mature, handling, dehorning, recording, identification, shearing, hoof trimming, etc.	200
16.	EVALUATION II		100

LECTURING AGENDA UNITS

Subject	: Meat and Draught Animal Production
Code / Semester Credit Unit	: PTF 305P/3 (2-1)
Syllabus	: This lecture discusses breeds, animal response of production and environment factors to develop meat animal production
General Instructional Objective	: At the end of the lecturing program, students are expected to be able to understand breeds of meat and draught animal, physiology system, animal response to environment factor, animal housing, feeding, growth and development, matting system, and animal management

Topic	: Introduction
Sub Topics	: - Greetings and introducing the lecturers - General Explanation about the Subject Materials - Conditions
Meeting No.	: 1
Duration	: 50 minutes
General Instructional Objective	: At the end of the lecturing program, students are expected to be able to understand and explain thoroughly the mechanism and interaction of factors affecting meat animal production.
Specific Instructional Objective	: After joining the lecture, students understand the scope of the subject, conditions to fulfill, obligations to do and right to obtain.

Lecture Activities

Phase	Lecturer's Activities	Students' Activities	Lecturing Media and Facilities
Introduction	1. Introducing lecturers themselves	Paying attention	Whiteboard
Presentation	2. Distributing Lecture Contract 3. Explaining general description of the lecture, 4. Explaining lecture contract, 5. Explaining practical, and 6. Explaining assignments	Paying attention, making notes, delivering responses and questions	OHP
Conclusion	7. Explaining briefly the subject content of next meeting	Paying attention, making notes	-

Topic	: Breeds
Sub Topics	: Types and breeds of meat and draught animal
Meeting No.	: 1, 2
Duration	: 150 minutes
General Instructional Objective	: At the end of the lecturing program, students are expected to be able to understand breeds of meat and draught animal, physiology system, animal response to environment factor, animal housing, feeding, growth and development, matting system, and animal management
Specific Instructional Objective	: At the end of the lecture, students are able to understand and explain breeds of meat and draught animal (cattle, buffalo, goat, sheep, pig, and horse)

Class Activities

Phase	Lecturer's Activities	Students' Activities	Lecturing Media and Facilities
Introduction	1. Explaining the scope of the subject	Paying attention	Whiteboard
Presentation	2. Explaining breeds of meat and draught animal: <ul style="list-style-type: none"> - Cattle - Buffalo - Sheep - Goat - Pig - Horse 3. Delivering questions	Paying attention, making notes, delivering responses and questions Answering questions	OHP, transparent sheet, whiteboard
Conclusion	3. Concluding the meeting <ul style="list-style-type: none"> - Delivering summary - Giving assignment 	- Paying attention and making notes.	-

Topic	: Balance of physiology system
Sub Topics	: Thermal balance, thermoregulation, heart rate, body temperature, comfort zone, and effect of environment to animal production
Meeting No.	: 3
Duration	: 100 minutes
General Instructional Objective	: At the end of the lecturing program, students are expected to be able to understand breeds of meat and draught animal, physiology system, animal response to environment factor, animal housing, feeding, growth and development, matting system, and animal management
Specific Instructional Objective	: At the end of the lecture, students are able to understand and explain thermal balance, thermoregulation, heart rate, body temperature, comfort zone, and effect of environment on production

Class Activities

Phase	Lecturer's Activities	Students' Activities	Lecturing Media and Facilities
Introduction	1. Explaining the scope of subject	Paying attention	Whiteboard,
Presentation	2. Explaining thermal balance, thermoregulation, heart rate, body temperature, comfort zone, and effect of environment to animal production 3. Delivering questions	Paying attention, making notes, delivering responses and questions Answering questions	Computer, projector, screen, whiteboard
Conclusion	4. Concluding the meeting - Summarizing materials - Giving assignment	- Paying attention, making notes,	Whiteboard

Topic	: Animal response to climate
Sub Topics	: The effect of climate to animal production
Meeting No.	: 4
Duration	: 100 minutes
General Instructional Objective	: At the end of the lecturing program, students are expected to be able to understand breeds of meat and draught animal, physiology system, animal response to environment factor, animal housing, feeding, growth and development, mating system, and animal management
Specific Instructional Objective	: At the end of the lecture, students are able to explain the effect of climate to animal production

Class Activities

Phase	Lecturer's Activities	Students' Activities	Lecturing Media and Facilities
Introduction	1. Explaining the scope of subject	Paying attention	Whiteboard,
Presentation	2. Explaining the effect of climate to animal production 3. Delivering questions	Paying attention, making notes, delivering responses and questions Answering questions	Computer, projector, screen, whiteboard
Conclusion	4. Concluding the meeting - Summarizing materials - Giving assignment	- Paying attention, making notes,	Whiteboard

Topic	: Animal housing and equipment
Sub Topics	: Location of animal barn, function, lay out, type of construction, type of barn
Meeting No.	: 5-6
Duration	: 200 minutes
General Instructional Objective	: At the end of the lecturing program, students are expected to be able to understand breeds of meat and draught animal, physiology system, animal response to environment factor, animal housing, feeding, growth and development, matting system, and animal management
Specific Instructional Objective	: At the end of the lecture, students are able to explain location of animal barn, function, lay out, type of construction, type of barn of meat animal

Class Activities

Phase	Lecturer's Activities	Students' Activities	Lecturing Media and Facilities
Introduction	1. Explaining the scope of subject	Paying attention	Whiteboard,
Presentation	2. Explaining Location of animal barn, function, lay out, type of construction, type of barn of animal production 3. Delivering questions	Paying attention, making notes, delivering responses and questions Answering questions	Computer, projector, screen, whiteboard
Conclusion	4. Concluding the meeting - Summarizing materials - Giving assignment	- Paying attention, making notes,	Whiteboard

Topic	: Animal growth and development
Sub Topics	: Definition of growth and development, compensatory growth, growth of bone, meat and fat, factors affecting growth and development, and manipulation growth to production
Meeting No.	: 7-8
Duration	: 200 minutes
General Instructional Objective	: At the end of the lecturing program, students are expected to be able to understand breeds of meat and draught animal, physiology system, animal response to environment factor, animal housing, feeding, growth and development, matting system, and animal management
Specific Instructional Objective	: At the end of the lecture, students are able to explain definition of growth and development, compensatory growth, growth of bone, meat and fat, factors affecting growth and development, and manipulation growth to production

Class Activities

Phase	Lecturer's Activities	Students' Activities	Lecturing Media and Facilities
Introduction	1. Explaining the scope of subject	Paying attention	Whiteboard,
Presentation	2. Explaining definition of growth and development, compensatory growth, growth of bone, meat and fat, factors affecting growth and development, and manipulation growth to production 3. Delivering questions	Paying attention, making notes, delivering responses and questions Answering questions	Computer, projector, screen whiteboard
Conclusion	4. Concluding the meeting - Summarizing materials - Giving assignment	- Paying attention, making notes,	Whiteboard

Topic	: Digestive system of meat animal
Sub Topics	: Digestive system and process of feed digestive on meat animal
Meeting No.	: 10
Duration	: 100 minutes
General Instructional Objective	: At the end of the lecturing program, students are expected to be able to understand breeds of meat and draught animal, physiology system, animal response to environment factor, animal housing, feeding, growth and development, matting system, and animal management
Specific Instructional Objective	: At the end of the lecture, students are able to understand and explain digestive system and process of feed digestive on meat animal

Class Activities

Phase	Lecturer's Activities	Students' Activities	Lecturing Media and Facilities
Introduction	1. Explaining the scope of subject	Paying attention	Whiteboard,
Presentation	2. Explaining digestive system and process of feed digestive on meat animal 3. Delivering questions	Paying attention, making notes, delivering responses and questions Answering questions	Computer, projector, screen, whiteboard
Conclusion	4. Concluding the meeting - Summarizing materials - Giving assignment	- Paying attention, making notes,	Whiteboard

Topic	: Feedstuff and animal response to feed
Sub Topics	: Kind of feed, factors affecting feed consumption, feed requirement, feeding management, and feed evaluation (feed conversion ratio, feed efficiency)
Meeting No.	: 11-12
Duration	: 200 minutes
General Instructional Objective	: At the end of the lecturing program, students are expected to be able to understand breeds of meat and draught animal, physiology system, animal response to environment factor, animal housing, feeding, growth and development, matting system, and animal management
Specific Instructional Objective	: At the end of the lecture, students are able to understand and explain kind of feed, factors affecting feed consumption, feed requirement, feeding management, and feed evaluation (feed conversion ratio, feed efficiency)

Class Activities

Phase	Lecturer's Activities	Students' Activities	Lecturing Media and Facilities
Introduction	1. Explaining the scope of subject	Paying attention	Whiteboard,
Presentation	2. Explaining kind of feed, factors affecting feed consumption, feed requirement, feeding management, and feed evaluation (feed conversion ratio, feed efficiency) 3. Delivering questions	Paying attention, making notes, delivering responses and questions Answering questions	Computer, projector, screen, whiteboard
Conclusion	4. Concluding the meeting - Summarizing materials - Giving assignment	- Paying attention, making notes,	Whiteboard

Topic	: Matting management of meat animal
Sub Topics	: Matting time, methods of matting, sex ratio, post partum matting
Meeting No.	: 13
Duration	: 100 minutes
General Instructional Objective	: At the end of the lecturing program, students are expected to be able to understand breeds of meat and draught animal, physiology system, animal response to environment factor, animal housing, feeding, growth and development, matting system, and animal management
Specific Instructional Objective	: At the end of the lecture, students are able to understand and explain matting time, methods of matting, sex ratio, post partum matting

Class Activities

Phase	Lecturer's Activities	Students' Activities	Lecturing Media and Facilities
Introduction	1. Explaining the scope of subject	Paying attention	Whiteboard,
Presentation	2. Explaining matting time, methods of matting, sex ratio, post partum matting 3. Delivering questions	Paying attention, making notes, delivering responses and questions Answering questions	Computer, projector, screen, whiteboard
Conclusion	4. Concluding the meeting - Summarizing materials - Giving assignment	- Paying attention, making notes,	Whiteboard

Topic	: Care of meat animal
Sub Topics	: Care of animal at parturition, care of animal (sheep, goat, cattle, buffalo, pig and horse) from birth to mature, handling, dehorning, recording, identification, shearing, hoof trimming, etc.
Meeting No.	: 14-15
Duration	: 200 minutes
General Instructional Objective	: At the end of the lecturing program, students are expected to be able to understand breeds of meat and draught animal, physiology system, animal response to environment factor, animal housing, feeding, growth and development, matting system, and animal management
Specific Instructional Objective	: At the end of the lecture, students are able to understand and explain care of animal at parturition, care of animal (sheep, goat, cattle, buffalo, pig and horse) from birth to mature, handling, dehorning, recording, identification, shearing, hoof trimming, etc.

Class Activities

Phase	Lecturer's Activities	Students' Activities	Lecturing Media and Facilities
Introduction	1. Explaining the scope of subject	Paying attention	Whiteboard,
Presentation	2. Explaining care of animal at parturition, care of animal (sheep, goat, cattle, buffalo, pig and horse) from birth to mature, handling, dehorning, recording, identification, shearing, hoof trimming, etc. 3. Delivering questions	Paying attention, making notes, delivering responses and questions Answering questions	Computer, projector, screen, whiteboard
Conclusion	4. Concluding the meeting - Summarizing materials - Giving assignment	- Paying attention, making notes,	Whiteboard

Evaluation:

Evaluations are taken 3 times, i.e.

1. on the 9th meeting; evaluating the students' understanding on the subjects delivered from the 1st to the 8th meetings
2. on the 16th meeting; evaluating the students' understanding on the subjects delivered from the 10th to the 15th meetings.
3. on the semester examination; evaluating the students' overall understanding on the subjects of lecture.

References

1. Battaglia, R.A., dan V.B. Mayrose. 1981. Handbook of Livestock Management Techniques. Prentice Hall, Inc. New Jersey.
2. Edey, T.N. 1983. Tropical Sheep and Goat Production. Australian Vice-Chancellor' Committee-AUIDP, Canberra.
3. Goodwin, D.H., 1977. Beef Management and Production. A practical guide for farmers and students. 1st Ed. Hutchinson & Co. Ltd, London
4. Haresign, W. 1983. Sheep Production. Butterworths, London
5. Pond, W.G., D.C. Church, dan K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4th Ed. John Wiley and Sons, New York.
6. Pond, W.G. dan J.H. Maner. 1974. Swine Production in Temperate and Tropical Environments. W.H. Freeman and Company, San Francisco.
7. Preston, T.R., dan M.B. Willis. 1979. Intensif Beef Production. 2nd. Pergamon Press, Oxford.
8. Ross, C.V. 1989. Sheep Production and Management. Prentice Hall, Englewood Cliffs.
9. MacDonald, I. and J. Low. 1994. Livestock Rearing in The Tropics. The Macmillan Press LTD, London

COURSE : Basic of Biochemistry

COURSE CODE : PTF 202 P

CREDIT : (2-1)3

TEACHING PROGRAM OUTLINE

- Title of Subject** : Basic of Biochemistry
- Number Code /CSS** : PTF 202 P / 3(2-1)
- Brief Description** : This subject study about bio organic metabolism, for example carbohydrate, protein, lipid, nucleate acid, and cholesterol. Also present about enzyme and the function in the life cell and the anticipation of its. Photosynthesis in the life cell also presented.
- General Instructional Object** : After following this lecture student can explain the carbohydrate metabolism, protein, lipid, nucleate acid, and cholesterol, enzyme and photosynthesis process in life cell correctly. Student will able to do carbohydrate, protein and lipid digestion.
- References** :
1. Girindra, A. 1986. Biokimia. PT Gramedia, Jakarta.
 2. Fennemma, O.R. 1986. Principles of Food Science. Marcel Dekker, Inc, New York.
 3. Eskin, N.A.M., H.M. Henderson dan R.J. Towrisend. 1971. Biochemistry of Foods. Academic Press, New York.
 4. Mayes, P.A., D.K. Granner., V.W. Rodwel., dan D.W. Martin. 1987. Biokimia "Harper". EGC, Jakarta (diterjemahkan oleh I. Darmawan.
 5. Winarno, F. G. 1983. Enzim Pangan. PT Gramedia, Jakarta.
 6. Whitaker, J. R. 1972. Principle og Enzymologi for the Food Science. Marcel Dekker, Inc., New York.
 7. Daulay, D. 1991. Fermentasi Keju. PAU Pangan dan Gizi. IPB, Bogor.
 8. Lehninger, M. 1992. Dasar-dasar Biokimia. PT Gramedia, Jakarta (diterjemahkan oleh M. Thenawaijaya).
 9. Thenawijaya, M. 1989. Dasar-dasat Biokimia. PAU Ilmu Hayati, IPB, Bogor.
 10. Winarno, F.G. 1983. Enzim Pangan. PT Gramedia, Jakarta

NO.	SPECIFIC INSTRUCTIONAL OBJECT	MAIN DISCUSSION	SUB DISCUSSION	TIME ESTIMATION	REFERENCES
1.	After attending the lecture, student can explain about the structure of monosaccharide, disaccharide, oligosaccharides, polysaccharides and able to explain the classification and nomenclature of carbohydrate.	carbohydrate	Structure of carbohydrate Classification of carbohydrate	2x50 minutes	1,2
2.	After attending the lecture, student can explain about the digestion of carbohydrate by saliva amylase,	Carbohydrate	Digestion of carbohydrate	2x50 minutes	3,4

	pancreas amylase and intestine enzyme correctly.				
3.	After attending the lecture, student can explain the metabolism (catabolism and anabolism) correctly.	Carbohydrate	Metabolism (catabolism and anabolism)	2x50 minutes	3,4
4.	After attending the lecture, student can explain the structure (units of enzyme) and classification (nomenclature and the kinds of enzyme)	Enzyme	Structure and classification of enzyme	2x50 minutes	3,5,6,7
5.	After attending the lecture, student can count the enzyme activity and the utilization	Enzyme	Enzyme activity	2x50 minutes	3,5,6,7
6.	After attending the lecture, student can explain the relation of enzyme activity and the factor that influence its, and enzyme specification as a bio catalyst	Enzyme	Factors that influence enzyme activity Enzyme specification	2x50 minutes	3,5,6,7
7.	After attending the lecture, student can explain the application of enzyme in food industry, feed, chemical and medicine	Enzyme	Factors that influence enzyme activity Enzyme specification	2x50 minutes	3,5,6,7
8.	After attending the lecture, student can explain the kinds of amino acids, and the classification base on character and the degree of complexity	Protein	Structure of protein and classification of protein	2x50 minutes	4,8,9
9.	After attending the lecture, student can explain about the digestion of protein correctly	Protein	Digestion of protein	2x50 minutes	4,8,9
10.	After attending the lecture, student can explain about the protein metabolism	Protein	Protein metabolism	2x50 minutes	4,8,9
11.	After attending the lecture, student can explain about the nucleate acid	nucleate acid	The kinds of nucleate acid Structure of nucleate acid Function of nucleate acid	2x50 minutes	4,8,9
12.	After attending the lecture, student can explain about the lipid	Lipid	Structure of lipid Classification of lipid	2x50 minutes	4,8,9

13.	After attending the lecture, student can explain about the digestion and metabolism of lipid	Lipid	Digestion of lipid Metabolism of lipid	2x50 minutes	4,8,9
14.	After attending the lecture, student can explain about the cholesterol (structure, function, mechanism of formation)	Lipid	Structure and kinds of cholesterol Function of cholesterol Mechanism of formation	2x50 minutes	4,8,9
15.	After attending the lecture, student can explain about the photosynthesis (light and dark reaction)	photosynthesis	light and dark reaction	2x50 minutes	9

SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic of Biochemistry
 TEACHING SUBJECT CODE / SCS : PTF 202 P / 3 (2-1) SCS
 MEETING TIME : 2 x 50 minutes
 MEETING : 1

A. OBJECT

1. General Instructional Object : After following this lecture, student will be able to explain about basic structure and classification of carbohydrate correctly.
2. Specific Instructional Object : After attending the lecture, student can explain about the structure of monosaccharide, disaccharide, oligosaccharides, polysaccharides and able to explain the classification and nomenclature of carbohydrate.

B. MAIN SUBJECT : carbohydrate

C. SUB SUBJECT : Structure of carbohydrate
 Classification of carbohydrate

D. CLASS ACTIVITY:

PHASE	TEACHING ACTIVITY	STUDENTS ACTIVITY	TOOLS
Introduction	Explain about the definition and characters of carbohydrate	Pay attention Write Ask	
Topic presentation	Explains about the basic structure of carbohydrate (monosaccharide, disaccharide, oligosaccharides, polysaccharides), nomenclature, classification, and explain the kinds of simple and complex of carbohydrate	Pay attention Write Ask Answer the questions	OHP Transparency Hand out White board Exercise paper
Conclusions	Make a conclusion and gives image of the next lecture	pays attention	

E. EVALUATION

F. REFERENCES

1. Girindra, A. 1986. Biokimia. PT Gramedia, Jakarta
2. Fennemma, O.R. 1986. Principles of Food Science. Marcel Dekker, Inc, New York.

SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic of Biochemistry
 TEACHING SUBJECT CODE / SCS : PTF 202 P / 3 (2-1) SCS
 MEETING TIME : 2 x 50 minutes
 MEETING : 2

B. OBJECT

1. General Instructional Object : After following this lecture, student will be able to explain about the digestion of carbohydrate correctly
2. Specific Instructional Object : After attending the lecture, student can explain about the digestion of carbohydrate by saliva amylase, pancreas amylase and intestine enzyme correctly.

B. MAIN SUBJECT : Carbohydrate

C. SUB SUBJECT : Digestion of carbohydrate

D. CLASS ACTIVITY:

PHASE	TEACHING ACTIVITY	STUDENTS ACTIVITY	TOOLS
Introduction	Explain about the definition of digestion and carbohydrate digestion	Pay attention Write Ask	
Topic presentation	Explains about the mechanism of digestion of complex carbohydrate in the digestive tracts by enzyme, the intermediate and main product of carbohydrate digestion and the mechanism and absorption of its in intestines. Compare the simple and complex carbohydrate digestion.	Pay attention Write Ask Answer the questions	OHP Transparency Hand out White board Exercise paper
Conclusions	Make a conclusion and gives image of the next lecture	pays attention	

E. EVALUATION

F. REFERENCES

1. Eskin, N.A.M., H.M. Henderson dan R.J. Townsend. 1971. Biochemistry of Foods. Academic Press, New York.
2. Mayes, P. A. , D. K. Graner, V. W. Rodwel, dan D. W. Martin. 1987. Biokimia Harper. EGC, Jakarta (diterjemahkan oleh I. Darmawan)

SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic of Biochemistry
 TEACHING SUBJECT CODE / SCS : PTF 202 P / 3 (2-1) SCS
 MEETING TIME : 2 x 50 minutes
 MEETING : 3

C. OBJECT

1. General Instructional Object : After following this lecture, student will be able to explain the metabolism of carbohydrate correctly
2. Specific Instructional Object : After attending the lecture, student can explain the metabolism (catabolism and anabolism) correctly.

B. MAIN SUBJECT : Carbohydrate

C. SUB SUBJECT : Metabolism (catabolism and anabolism)

D. CLASS ACTIVITY:

PHASE	TEACHING ACTIVITY	STUDENTS ACTIVITY	TOOLS
Introduction	Explain about the definition of metabolism	Pay attention Write Ask	
Topic presentation	Explains about the catabolism of carbohydrate (glycolysis, glycogenolysis, Krebs cyclic) and anabolism (glycogenesis, glycogeneogenesis) in life cells. Explain about differences of aerobe and anaerobe glycolysis, ATP/energy formation and give the example of utilization of its for food and feed treatment.	Pay attention Write Ask Answer the questions	OHP Transparency Hand out White board Exercise paper
Conclusions	Make a conclusion and gives image of the next lecture	pays attention	

E. EVALUATION

F. REFERENCES

1. Eskin, N.A.M., H.M. Henderson dan R.J. Townsend. 1971. Biochemistry of Foods. Academic Press, New York.
2. Mayes, P. A. , D. K. Graner, V. W. Rodwel, dan D. W. Martin. 1987. Biokimia Harper. EGC, Jakarta (diterjemahkan oleh I. Darmawan)

SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic of Biochemistry
 TEACHING SUBJECT CODE / SCS : PTF 202 P / 3 (2-1) SCS
 MEETING TIME : 2 x 50 minutes
 MEETING : 4

D. OBJECT

1. General Instructional Object : After following this lecture, student will be able to explain the structure and classification of enzyme correctly
2. Specific Instructional Object : After attending the lecture, student can explain the structure (units of enzyme) and classification (nomenclature and the kinds of enzyme)

B. MAIN SUBJECT : Enzyme

C. SUB SUBJECT : Structure and classification of enzyme

D. CLASS ACTIVITY:

PHASE	TEACHING ACTIVITY	STUDENTS ACTIVITY	TOOLS
Introduction	Explain about the definition of enzyme and the role of enzyme in metabolism	Pay attention Write Ask	
Topic presentation	Explain the structure (units of enzyme), classification (nomenclature and the kinds of enzyme), characteristic, and give the example of utilization	Pay attention Write Ask Answer the questions	OHP Transparency Hand out White board Exercise paper
Conclusions	Make a conclusion and gives image of the next lecture	pays attention	

E. EVALUATION

F. REFERENCES

1. Eskin, N.A.M., H.M. Henderson dan R.J. Townsend. 1971. Biochemistry of Foods. Academic Press, New York.
2. Winarno, F. G. 1983. Enzim Pangan. PT Gramedia, Jakarta.
3. Whitaker, J. R. 1972. Principle og Enzymologi for the Food Science. Marcel Dekker, Inc., New York.
4. Daulay, D. 1991. Fermentasi Keju. PAU Pangan dan Gizi. IPB, Bogor.

SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic of Biochemistry
TEACHING SUBJECT CODE / SCS : PTF 202 P / 3 (2-1) SCS
MEETING TIME : 2 x 50 minutes
MEETING : 5

E. OBJECT

1. General Instructional Object : After following this lecture, student will be able to explain the enzyme activity correctly
2. Specific Instructional Object : After attending the lecture, student can count the enzyme activity and the utilization

B. MAIN SUBJECT : Enzyme

C. SUB SUBJECT : Enzyme activity

D. CLASS ACTIVITY:

PHASE	TEACHING ACTIVITY	STUDENTS ACTIVITY	TOOLS
Introduction	Explain about the definition of enzyme activity	Pay attention Write Ask	
Topic presentation	Explain the method of counting enzyme activity, cinematic curve, give the example and the utilization	Pay attention Write Ask Answer the questions	OHP Transparency Hand out White board Exercise paper
Conclusions	Make a conclusion and gives image of the next lecture	pays attention	

E. EVALUATION : Give the task to count the rennet enzyme activity

F. REFERENCES

1. Eskin, N.A.M., H.M. Henderson dan R.J. Townsend. 1971. Biochemistry of Foods. Academic Press, New York.
2. Winarno, F. G. 1983. Enzim Pangan. PT Gramedia, Jakarta.
4. Whitaker, J. R. 1972. Principle og Enzymologi for the Food Science. Marcel Dekker, Inc., New York.
4. Daulay, D. 1991. Fermentasi Keju. PAU Pangan dan Gizi. IPB, Bogor.

SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic of Biochemistry
 TEACHING SUBJECT CCDE / SCS : PTF 202 P / 3 (2-1) SCS
 MEETING TIME : 2 x 50 minutes
 MEETING : 6

F. OBJECT

1. General Instructional Object : After following this lecture, student will be able to explain about the factor that influence the enzyme activity and enzyme specification
2. Specific Instructional Object : After attending the lecture, student can explain the relation of enzyme activity and the factor that influence its, and enzyme specification as a bio catalyst

B. MAIN SUBJECT

: Enzyme

C. SUB SUBJECT

: Factors that influence enzyme activity
 Enzyme spesification

D. CLASS ACTIVITY:

PHASE	TEACHING ACTIVITY	STUDENTS ACTIVITY	TOOLS
Introduction	Explain about the relation of enzyme and the factor that influence of its.	Pay attention Write Ask	
Topic presentation	Explain about factor that increase enzyme activity (substrate concentration, enzyme concentration, optimal temperature, activity curve) , and explain the factors that inhibit the enzyme activity (temperature changing, denaturizing of protein or enzyme, asynchronies between enzyme and substrate and other factor) Explain the mechanism of enzyme-substrate work and the product.	Pay attention Write Ask Answer the quetions	OHP Transparency Hand out White board Exercise paper
Conclusions	Explain the advantages of studying enzyme activity and gives image of the next lecture	pays attention	

E. EVALUATION

: Give the task to count the rennet enzyme activity

F. REFERENCES

1. Eskin, N.A.M., H.M. Henderson dan R.J. Townsend. 1971. Biochemistry of Foods. Academic Press, New York.
2. Winarno, F. G. 1983. Enzim Pangan. PT Gramedia, Jakarta.
5. Whitaker, J. R. 1972. Principle og Enzymologi for the Food Science. Marcel Dekker, Inc., New York.
4. Daulay, D. 1991. Fermentasi Keju. PAU Pangan dan Gizi. IPB, Bogor.

SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic of Biochemistry
 TEACHING SUBJECT CODE / SCS : PTF 202 P / 3 (2-1) SCS
 MEETING TIME : 2 x 50 minutes
 MEETING : 7

G. OBJECT

1. General Instructional Object : After following this lecture, student will be able to explain about the application of enzyme for industry
2. Specific Instructional Object : After attending the lecture, student can explain the application of enzyme in food industry, feed, chemical and medicine

B. MAIN SUBJECT

: Enzyme

C. SUB SUBJECT

: Factors that influence enzyme activity
 Enzyme spesification

D. CLASS ACTIVITY:

PHASE	TEACHING ACTIVITY	STUDENTS ACTIVITY	TOOLS
Introduction	Explain about the relation of enzyme and the factor that influence of its.	Pay attention Write Ask	
Topic presentation	Explain about factor that increase enzyme activity (substrate concentration, enzyme concentration, optimal temperature, activity curve) , and explain the factors that inhibit the enzyme activity (temperature changing, denaturizing of protein or enzyme, asynchronies between enzyme and substrate and other factor) Explain the mechanism of enzyme-substrate work and the product.	Pay attention Write Ask Answer the quetions	OHP Transparency Hand out White board Exercise paper
Conclusions	Explain the advantages of studying enzyme activity and gives image of the next lecture	pays attention	

E. EVALUATION

: Give the task to count the rennet enzyme activity

F. REFERENCES

1. Eskin, N.A.M., H.M. Henderson dan R.J. Townsend. 1971. Biochemistry of Foods. Academic Press, New York.
2. Winarno, F. G. 1983. Enzim Pangan. PT Gramedia, Jakarta.
6. Whitaker, J. R. 1972. Principle og Enzymologi for the Food Science. Marcel Dekker, Inc., New York.
4. Daulay, D. 1991. Fermentasi Keju. PAU Pangan dan Gizi. IPB, Bogor.

SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic of Biochemistry
TEACHING SUBJECT CODE / SCS : PTF 202 P / 3 (2-1) SCS
MEETING TIME : 1 x 50 minutes
MEETING : 8

H. OBJECT

1. General Instructional Object : After following this lecture, student will be able to explain about the application of enzyme for industry

2. Specific Instructional Object : Mid-Examination

B. MAIN SUBJECT : Presentation 1st until 7th

C. SUB SUBJECT :

D. CLASS ACTIVITY:

PHASE	TEACHING ACTIVITY	STUDENTS ACTIVITY	TOOLS
Introduction			
Topic presentation			
Conclusions			

E. EVALUATION :

F. REFERENCES

SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic of Biochemistry
TEACHING SUBJECT CODE / SCS : PTF 202 P / 3 (2-1) SCS
MEETING TIME : 2 x 50 minutes
MEETING : 9

I. OBJECT

1. General Instructional Object : After following this lecture, student will be able to explain about protein
2. Specific Instructional Object : After attending the lecture, student can explain the kinds of amino acids, and the classification base on character and the degree of complexity.

B. MAIN SUBJECT : Protein
C. SUB SUBJECT : Structure of protein and classification of protein

D. CLASS ACTIVITY:

PHASE	TEACHING ACTIVITY	STUDENTS ACTIVITY	TOOLS
Introduction	Explain about the definition of protein	Pay attention Write Ask	
Topic presentation	Explain the kinds of amino acids, and the classification base on character and the degree of complexity.	Pay attention Write Ask Answer the quetions	OHP Transparency Hand out White board Exercise paper
Conclusions	Explain the the relation of amino acid and protein	pays attention	

E. EVALUATION : Give the task to count the rennet enzyme activity

F. REFERENCES

1. Mayes, P. A., D.K. Granner, V.W. Rodwel, dan D.A. Martin. 1987. Biokimia "Harper". EGC Jakarta (diterjemahkan oleh I. Darmawan)
2. Thenawijaya, M. 1989. Dasar-dasar Biokimia. PAU Ilmu Hayati. IPB, Bogor
3. Lehninger, M. 1992. Dasar-dasar Biokimia. PT Gramedia, Jakarta (diterjemahkan oleh M. Thenawijaya).

SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic of Biochemistry
TEACHING SUBJECT CODE / SCS : PTF 202 P / 3 (2-1) SCS
MEETING TIME : 2 x 50 minutes
MEETING : 10

J. OBJECT

1. General Instructional Object : After following this lecture, student will be able to explain about protein
2. Specific Instructional Object : After attending the lecture, student can explain about the digestion of protein correctly

B. MAIN SUBJECT : Protein

C. SUB SUBJECT : Digestion of protein

D. CLASS ACTIVITY:

PHASE	TEACHING ACTIVITY	STUDENTS ACTIVITY	TOOLS
Introduction	Explain about the basic principle digestion of protein and the product	Pay attention Write Ask	
Topic presentation	Explain about the mechanism of protein digestion in digestive tract	Pay attention Write Ask Answer the questions	OHP Transparency Hand out White board Exercise paper
Conclusions	Explain the the relation of amino acid and protein	pays attention	

E. EVALUATION : Give the task to count the renne' enzyme activity

F. REFERENCES

1. Mayes, P. A., D.K. Granner, V.W. Rodwel, dan C.A. Martin. 1987. Biokimia "Harper". EGC Jakarta (diterjemahkan oleh I. Darmawan)
2. Theñawijaya, M. 1989. Dasar-dasar Biokimia. PAU Ilmu Hayati. iPB, Bogor
3. Lehninger, M. 1992. Dasar-dasar Biokimia. PT Gramedia, Jakarta (diterjemahkan oleh M. Theñawijaya).

SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic of Biochemistry
TEACHING SUBJECT CODE / SCS : PTF 202 P / 3 (2-1) SCS
MEETING TIME : 2 x 50 minutes
MEETING : 11

K. OBJECT

1. General Instructional Object : After following this lecture, student will be able to explain about protein
2. Specific Instructional Object : After attending the lecture, student can explain about the protein metabolism

B. MAIN SUBJECT : Protein

C. SUB SUBJECT : Protein metabolism

D. CLASS ACTIVITY:

PHASE	TEACHING ACTIVITY	STUDENTS ACTIVITY	TOOLS
Introduction	Explain about the basic principle digestion of protein and the product	Pay attention Write Ask	
Topic presentation	Explain about the protein metabolism	Pay attention Write Ask Answer the questions	OHP Transparency Hand out White board Exercise paper
Conclusions	Explain the advantages study protein metabolism	pays attention	

E. EVALUATION : Give the task to count the rennet enzyme activity

F. REFERENCES

1. Mayes, P. A., D.K. Granner, V.W. Rodwel, dan D.A. Martin. 1987. Biokimia "Harper". EGC Jakarta (diterjemahkan oleh I. Darmawan)
2. Thenawijaya, M. 1989. Dasar-dasar Biokimia. PAU Ilmu Hayati. IPB, Bogor
3. Lehninger, M. 1992. Dasar-dasar Biokimia. PT Gramedia, Jakarta (diterjemahkan oleh M. Thenawijaya).

SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic of Biochemistry
TEACHING SUBJECT CODE / SCS : PTF 202 P / 3 (2-1) SCS
MEETING TIME : 2 x 50 minutes
MEETING : 12

L. OBJECT

1. General Instructional Object : After following this lecture, student will be able to explain about the application of enzyme for industry

2. Specific Instructional Object : After attending the lecture, student can explain about the nucleate acid

B. MAIN SUBJECT : nucleate acid

C. SUB SUBJECT : The kinds of nucleate acid
Structure of nucleate acid
Function of nucleate acid

D. CLASS ACTIVITY:

PHASE	TEACHING ACTIVITY	STUDENTS ACTIVITY	TOOLS
Introduction	Explain about the definition of nucleate acid and position in body	Pay attention Write Ask	
Topic presentation	Explain about : The kinds of nucleate acid Structure of nucleate acid Function of nucleate acid	Pay attention Write Ask Answer the questions	OHP Transparency Hand out White board Exercise paper
Conclusions	Resume the lecture	pays attention	

E. EVALUATION : Give the task to count the rennet enzyme activity

F. REFERENCES

1. Mayes, P. A., D.K. Granner, V.W. Rodwel, dan D.A. Martin. 1987. Biokimia "Harper". EGC Jakarta (diterjemahkan oleh I. Darmawan)
2. Thenawijaya, M. 1989. Dasar-dasar Biokimia. PAU Ilmu Hayati. IPB, Bogor
3. Lehninger, M. 1992. Dasar-dasar Biokimia. PT Gramedia, Jakarta (diterjemahkan oleh M. Thenawijaya).

SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic of Biochemistry
TEACHING SUBJECT CODE / SCS : PTF 202 P / 3 (2-1) SCS
MEETING TIME : 2 x 50 minutes
MEETING : 13

M. OBJECT

1. General Instructional Object : After following this lecture, student will be able to explain about the application of enzyme for industry
2. Specific Instructional Object : After attending the lecture, student can explain about the lipid

B. MAIN SUBJECT : Lipid

C. SUB SUBJECT : Structure of lipid
Classification of lipid

D. CLASS ACTIVITY:

PHASE	TEACHING ACTIVITY	STUDENTS ACTIVITY	TOOLS
Introduction	Explain about the definition of lipid	Pay attention Write Ask	
Topic presentation	Explain about : Structure of lipid Classification of lipid	Pay attention Write Ask Answer the questions	OHP Transparency Hand out White board Exercise paper
Conclusions	Resume the lecture	pays attention	

E. EVALUATION : Give the task to count the rennet enzyme activity

F. REFERENCES

1. Mayes, P. A., D.K. Granner, V.W. Rodwel, dan D.A. Martin. 1987. Biokimia "Harper". EGC Jakarta (diterjemahkan oleh I. Darmawan)
2. Thenawijaya, M. 1989. Dasar-dasar Biokimia. PAU Ilmu Hayati. IPB, Bogor
3. Lehninger, M. 1992. Dasar-dasar Biokimia. PT Gramedia, Jakarta (diterjemahkan oleh M. Thenawijaya).

SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic of Biochemistry
TEACHING SUBJECT CODE / SCS : PTF 202 P / 3 (2-1) SCS
MEETING TIME : 2 x 50 minutes
MEETING : 14

N. OBJECT

1. General Instructional Object : After following this lecture, student will be able to explain about the lipid
2. Specific Instructional Object : After attending the lecture, student can explain about the digestion and metabolism of lipid

B. MAIN SUBJECT : Lipid

C. SUB SUBJECT : Digestion of lipid
Metabolism of lipid

D. CLASS ACTIVITY:

PHASE	TEACHING ACTIVITY	STUDENTS ACTIVITY	TOOLS
Introduction	Explain about the digestion of lipid and metabolism	Pay attention Write Ask	
Topic presentation	Explain about : Digestion of lipid Metabolism of lipid	Pay attention Write Ask Answer the questions	OHP Transparency Hand out White board Exercise paper
Conclusions	Resume the lecture	pays attention	

E. EVALUATION : Give the task to count the rennet enzyme activity

F. REFERENCES

1. Mayes, P. A., D.K. Granner, V.W. Rodwel, dan D.A. Martin. 1987. Biokimia "Harper". EGC Jakarta (diterjemahkan oleh I. Darmawan)
2. Thenawijaya, M. 1989. Dasar-dasar Biokimia. PAU Ilmu Hayati. IPB, Bogor
3. Lehninger, M. 1992. Dasar-dasar Biokimia. PT Gramedia, Jakarta (diterjemahkan oleh M. Thenawijaya).

SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic or Biochemistry
 TEACHING SUBJECT CODE / SCS : PTF 202 P / 3 (2-1) SCS
 MEETING TIME : 2 x 50 minutes
 MEETING : 15

O. OBJECT

1. General Instructional Object : After following this lecture, student will be able to explain about the cholesterol

2. Specific Instructional Object : After attending the lecture, student can explain about the cholesterol (structure, function, mechanism of formation)

B. MAIN SUBJECT : Lipid

C. SUB SUBJECT : Structure and kinds of cholesterol
 Function of cholesterol
 Mechanism of formation

D. CLASS ACTIVITY:

PHASE	TEACHING ACTIVITY	STUDENTS ACTIVITY	TOOLS
Introduction	Explain about the digestion of cholesterol	Pay attention Write Ask	
Topic presentation	Explain about Structure and kinds of cholesterol Function of cholesterol Mechanism of formation	Pay attention Write Ask Answer the questions	OHP Transparency Hand out White board Exercise paper
Conclusions	Resume the lecture	pays attention	

E. EVALUATION

Give the task to count the rennet enzyme activity

F. REFERENCES

1. Mayes, P. A., D.K. Granner, V.W. Rodwel, dan D.A. Martin. 1987. Biokimia "Harper". EGC Jakarta (diterjemahkan oleh I. Darmawan)
2. Thenawijaya, M. 1989. Dasar-dasar Biokimia. PAU Ilmu Hayati. IPB, Bogor
3. Lehninger, M. 1992. Dasar-dasar Biokimia. PT Gramedia, Jakarta (diterjemahkan oleh M. Thenawijaya).

SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic of Biochemistry
TEACHING SUBJECT CODE / SCS : PTF 202 P / 3 (2-1) SCS
MEETING TIME : 2 x 50 minutes
MEETING : 16

P. OBJECT

1. General Instructional Object : After following this lecture, student will be able to explain about the photosynthesis
2. Specific Instructional Object : After attending the lecture, student can explain about the photosynthesis (light and dark reaction)

B. MAIN SUBJECT : photosynthesis

C. SUB SUBJECT : light and dark reaction

D. CLASS ACTIVITY:

PHASE	TEACHING ACTIVITY	STUDENTS ACTIVITY	TOOLS
Introduction	Explain about the digestion of light and dark reaction	Pay attention Write Ask	
Topic presentation	Explain about light and dark reaction and give the example	Pay attention Write Ask Answer the questions	OHP Transparency Hand out White board Exercise paper
Conclusions	Resume the lecture	pays attention	

E. EVALUATION : Give the task to count the rennet enzyme activity

F. REFERENCES

Thenawijaya, M. 1989. Dasar-dasar Biokimia. PAU Ilmu Hayati. IPB, Bogor.

COURSE : Animal Product Knowlwdge

COURSE CODE :

CREDIT :

SET OF TEACHING INSTRUCTION

Name of Course : **Animal Product Knowledge**
Course Code :
SKS : 3 sks
Meeting Time : 100 minute
Meeting Number : 1

A. Target

1. Course Main Goal: After following this course student able to explain and analyses about basic animal product knowledge i.e. physical, chemical, and physicochemical and also do the quality measurement animal product and animal by product.
2. Course Specific Goal : Able to explain relationship between this course and others of eye and also its application in animal product processing.

B. Main Subject: Introduction

- C. Sub Subject: - Relation with the other course
- Application of this course.
- Course role

D. Teaching activity :

Teaching Step	Teacher Activity	Student Activity	Teaching Media
Introductions	Introduction, Course Information	Note down, Listening, Discusion	OHP Blackboard
Presentation	Explaining relationship this course with others	Note down, Listening, Discusion	OHP Blackboard
Conclusion	Giving substance for the next meeting	Discusion	Blackboard

E. Evaluation : Quiz

F. References :

1. Hadiwiyoto.S. 1983. Hasil hasil Olahan Susu, Ikan, Daging dan Telur. Liberti. Yogyakarta
2. Stadelman dan Cotterill. 1994. Egg science and Technology

SET OF TEACHING INSTRUCTION

Name of Course : **Animal Product Knowledge**
Course Code :
SKS : 3 sks
Meeting Time : 100 minute
Meeting Number : II

A. Target

1. Course Main Goal: After following this course student able to explain and analyses about basic animal product knowledge i.e. physical, chemical, and physicochemical and also do the quality measurement animal product and animal by product.
2. Course Specific Goal : Able to explain relationship between this course and others of eye and also its application in animal product processing.

B. Main Subject: Introduction

- C. Sub Subject: - Eggs physical properties
- Eggs chemical properties
- Eggs microbial properties

D. Teaching activity:

Teaching Step	Teacher Activity	Student Activity	Teaching Media
Introductions	Explaining about hatching eggs and consuming eggs.	Note down, Listening, Discusion	OHP Black board
Presentation	Explaining physical eggs properties Explaining chemical eggs properties Explaining microbiology eggs properties	Note down, Listening, Discusion	OHP Black board
Conclusion	Commenting and concluding result of discussion. Giving substance for the next meeting	Discusion	Black board

E. Evaluation : Quiz

F. References :

1. Hadiwiyoto.S. 1983. Hasil hasil Olahan Susu, Ikan, Daging dan Telur. Liberti. Yogyakarta
2. Stadelman dan Cotterill. 1994. Egg science and Technology
3. National and international journal

SET OF TEACHING INSTRUCTION

Name of Course : **Animal Product Knowledge**
 Course Code :
 SKS : 3 sks
 Meeting Time : 100 minute
 Meeting Number : III

A. Target

1. Course Main Goal: After following this course student able to explain and analyses about basic animal product knowledge i.e. physical, chemical, and physicochemical and also do the quality measurement animal product and animal by product.
2. Course Specific Goal : Able to explain relationship between this course and others of eye and also its application in animal product processing.

B. Main Subject: Introduction Eggs Technology

C. Sub Subject: Quality standard, Test Quality

D. Teaching activity:

Teaching Step	Teacher Activity	Student Activity	Teaching Media
Introductions	Explaining quality standard	Note down, Listening, Discusion	OHP Black board
Presentat	Explaining eggs quality measurement method	Note down, Listening, Discusion	OHP Black board
Conclusion	Commenting and concluding result of discussion. Giving substance for the next meeting	Discusion	Black board

E. Evaluation ; Quiz

F. References:

1. Hadiyoto.S. 1983. Hasil hasil Olahan Susu, Ikan, Daging dan Telur. Liberti. Yogyakarta
2. Stadelman dan Cotterill. 1994. Egg science and Technology
3. National and international Journal.

COURSE : Processing of Animal Product

COURSE CODE :

CREDIT : 2 (1-1)

SESSION UNITY OF LEARNING

Subject : Processing of Animal Product

code of subject : -

SKS : 2 (1-1)

Time of session : 100 minutes

Session : I

A. object

1. TIU : By following this session, students can know principles of subject, related to others subject, contract of lecturer and students, method of study and evaluation.

2. TIK :

- a. Students can say principles of subject.
- b. Students can make structure of relation inter subject related to this subject.
- c. Students can know description of lecture contract until one semester.
- d. Students can say tuton method and evaluation of this subject.

B. Principal of subject : Introduction

C. Sub subject :

- Description of subject
- Relation inter subject
- Lecture contract
- Tuton method and evaluation

D. Education activity :

Stage	Lecturer activity	Students activity	Tool and media of education
introduction	to expalin all of matter will give at this session.	To attent and write	OHP and white board
	To Introduce the lecturer of this subject.	To attent and write	OHP and white board
Naration	To explain background of this subject why give at this study programme To explain description of this subject	To attent and write	OHP and white board

	<p>subject</p> <p>To Give actual examples</p> <p>To make structure of relation inter subject</p> <p>To expalin lecture contract of this subject</p> <p>To expalin of method education</p> <p>To make small group discussion (5-7 students/group)</p>	<p>To do making permanent group based on lecturer instruction.</p>	
Inclosed	<p>To ask anything that need clarification or explanation to much more detail.</p> <p>To ask many things for actual examples to 2-3 students</p> <p>To Give review about sub subject were discussed at this session</p>	<p>To ask</p> <p>To answer</p> <p>To attent and write</p>	

E. Evaluation :

This session was tended to students can know all of the matters that will be given at this subject for one semester full.

SESSION UNITY OF LEARNING

Subject : Processing of Animal Product
 code of subject : -
 SKS : 2 (1-1)
 Time of session : 100 minutes
 Session : II

A. Object

1. TIU : After following this session, students can explain principles of meat processing, meat preservation and variety of meat product.
2. TIK :
 - a. Students can say variety meat products
 - b. Students can explain object and principles of meat processing.

B. Principal of Subject : Technology of meat Processing

C. Sub Subject :

- Principle and object
- Variety of meat products

D. Learning activity :

stage	Lecturer activity	Student activity	Media and tool of learning
Introduction	To Explain all of matters at this session.	To attent and write	OHP and white board
Naration	To explain principle and object of meat processing To explain their aplications included variety of meat products.	To attent and write	OHP and white board
In closing	To ask many problems and give clarifications To give duty about another product that it has the same principle proprocessing. Review and discuss about matters at this session.	To ask To attent and write To attent and write	

E. Evaluation

:

This session tended to make students can explain principle and object of meats processing included their applications. Example ; dendeng, abon, petis, meat ball ect.

F. Literatures

:

1. Buckle, K.A., Edwards, R.A., Fleet, G.H. and Wooton, M. 1978. Food Science. Watson Ferguson and Co., Brisbane.
2. Hadiwijoto, S. 1983. Hasil-hasil Olahan Susu, ikan, Daging, Telur. Liberty, Yogyakarta.
3. Hadiwijoto, S. 1994. Teori dan Pengujian Mutu
4. Lawrie, R.A. 1995. Meat Science. (diterjemahkan oleh Parakkasi A. dan Y. Amwila-Ilmu Daging, UI Press Jakarta

SESSION UNITY OF LEARNING

Subject : Processing of Animal Product
 code of subject : -
 SKS : 2 (1-1)
 Time of session : 100 minutes
 Session : III

A. Object

1. TIU : After following this session, students can do and explain principles of meat processing
2. TIK :
 - a. Students can do handling and processing of meat products..
 - b. Students can identify quality of meats products according to SNI

B. Principal of subject : Technology of meat processing

C. Sub subject : Handling of fresh meat
 Procedures of meat processing (abon, kyuring, dendeng, meat ball, exct)

D. Learning Activity :

stage	Lecturer activity	Student activity	Media and tool of learning
Introduction	To Explain all of matters at this session.	To attent and write	OHP and white board
Naration	To explain procedures of fresh meat handling (cooling and freezing) To explain Procedures of meat processing (abon, bakso, dendeng exct) To disccus about standardization of meat products quality	To attent and write	OHP and white board
In closing	To give clarification or detail informations Review all of matters at this session.	To ask To attent and write	

E. Evaluation

:

This session tended to make students can do principles of meats processing. Example ; dendeng, abon, petis, meat ball ect.

F. Literatures :

1. Buckle, K.A., Edwards, R.A., Fleet, G.H. and Wooton, M. 1978. Food Science. Watson Ferguson and Co., Brisbane.
2. Hadiwiyoto, S. 1983. Hasil-hasil Olahan Susu, ikan, Daging, Telur. Liberty, Yogyakarta.
3. Hadiwiyoto, S. 1994. Teori dan Pengujian Mutu
4. Lawrie, R.A. 1995. Meat Science. (diterjemahkan oleh Parakkasi A. dan Y. Amwila- Ilmu Daging, UI Press Jakarta

SESSION UNITY OF LEARNING

Subject : Processing of Animal Product
 code of subject : -
 SKS : 2 (1-1)
 Time of session : 100 minutes
 Session : IV

A. Object

1. TIU : After following this session, students can explain and do principles of milk processing..
2. TIK :
 - a. Students can say principles of milk processing.
 - b. Students can explain aplicatios of the principles to milk products.

B. Principal of subject : Technology of milk Processing

C. Sub subject :

- Princiles and object
- Variety of milk products

D. Learning activity :

stage	Lecturer activity	Student activity	Media and tool of learning
Introduction	To Explain all of matters at this session..	To attent and write	OHP and white board
Naration	To explain Principles and object of milk processing To explain variety of milk products.	To attent and write	OHP and white board
In closing	To give clarification or detail informations Review ail of matters at this session.	To ask To attent and write	

E. Evaluation :

This session tended to make students can explain principles and object of milk processing and their applications to some milk products.

F. Literatures :

1. Adnan, M. 1984. Kimia dan Teknologi Pengolahan Air Susu. Andi Offset Yogyakarta.
2. Arbuckle, M. 1966. Ice Cream. Avi Publ. Co., Westport, Connecticut.
3. Berg. Van den. 1988. Dairy Technology in the Tropics and Subtropics. Pudoc, Wageningen.
4. Buckle, LA, RA Edward, GH Fleet dan M Wootton. 1985. Ilmu Pangan. Universitas Indonesia, Jakarta. (Diterjemahkan oleh Purnomo dan Adiyono).
5. Hadiwiyoto, S. 1983. Hasil-hasil Olahan Susu, Ikan, Daging, Telur. Penerbit Liberty, Yogyakarta.
6. Hadiwiyoto, S. 1994. Teori dan Prosedur Pengujian Mutu Susu dan Hasil Olahannya. Penerbit Liberty, Yogyakarta.
7. Robinson, RK. 1986. Modern Dairy Technology. Vol I & II. Elsevier Applied Sci. Publ. London, New York.
8. Soeparno. 1992. Prinsip Kimia dan Teknologi Susu. PAU Pangan dan Gizi UGM, Yogyakarta.

SESSION UNITY OF LEARNING

Subject : Processing of Animal Product
 code of subject : -
 SKS : 2 (1-1)
 Time of session : 100 minutes
 Session : V

A. Object

1. TIU : After following this session, students can explain and do principles of milk processing..

2. TIK :

- a. Student can do handling and processing of milk.
- b. Students can identify quality of milk product according to SNI .

B. Principal of Subject : Technology of milk Processing

C. Sub Subject : Handling of fresh milk
 Procedures of milk processing (pasteurized milk, UHT, yogurt, kefir, butter, ice cream, chesse ect.)
 Quality of milk products.

D. Learning Activity :

stage	Lecturer activity	Student activity	Media and tool of learning
Introduction	To Explain all of matters at this session.	To attent and write	OHP and white board
Naration	To explain procedures of fresh milk handling To explain Procedures of milk processing To discus about standardization of milk products quality	To attent and write	OHP and white board
In closing	To give clarification or detail informations Review all of matters at this session.	To ask To attent and write	

E. Evaluation :

This session tended to make students can do principles of milk processing.

F. Literatures :

1. Adnan, M. 1984. Kimia dan Teknologi Pengolahan Air Susu. Andi Offset Yogyakarta.
2. Arbuckle, M. 1966. Ice Cream. Avi Publ. Co., Westport, Connecticut.
3. Berg, Van den. 1988. Dairy Technology in the Tropics and Subtropics. Pudoc, Wageningen.
3. Buckle, LA, RA Edward, GH Fleet dan M Wootton. 1985. Ilmu Pangan. Universitas Indonesia, Jakarta. (Diterjemahkan oleh Purnomo dan Adiyono).
4. Hadiwiyoto, S. 1983. Hasil-hasil Olahan Susu, Ikan, Daging, Telur. Penerbit Liberty, Yogyakarta.
5. Hadiwiyoto, S. 1994. Teori dan Prosedur Pengujian Mutu Susu dan Hasil Olahannya. Penerbit Liberty, Yogyakarta.
6. Robinson, RK. 1986. Modern Dairy Technology. Vol I & II. Elsevier Applied Sci. Publ. London, New York.
7. Soeparno. 1992. Prinsip Kimia dan Teknologi Susu. PAU Pangan dan Gizi UGM, Yogyakarta.

SESSION UNITY OF LEARNING

Subject : Processing of Animal Product
code of subject : -
SKS : 2 (1-1)
Time of session : 100 minutes
Session : VI

A. object

1. TIU : -
2. TIK : -

B. Principal of subject : Midterm test

C. Sub of subject :

D. Learning activity :

SESSION UNITY OF LEARNING

Subject : Processing of Animal Product
 code of subject : -
 SKS : 2 (1-1)
 Time of session : 100 minutes
 Session : VII

A. Object

1. TIU : After following this session, students can explain and do principles of egg handling and processing.

2. TIK :

- c. Students can say principles of egg processing
- d. Students can explain their applications to egg products.

B. Principal of subject : Technology of egg processing

C. Sub subject :

- Principles and object
- Variety of egg products

D. Learning activity :

stage	Lecturer activity	Student activity	Media and tool of learning
Introduction	To Explain all of matters at this session..	To attend and write	OHP and white board
Naration	To explain Principles and object of egg processing To explain variety of egg products.	To attend and write	OHP and white board
In closing	To give clarification or detail informations Review all of matters at this session.	To ask To attend and write	

E. Evaluation :

This session tended to make students can explain principles and object of egg processing and their applications to some egg products.

F. Literatures :

1. Card, C. E. dan M.C. Nesheim. 1973. Poultry Production. Lea and Febiger. Philadelphia.
2. Or, H.L dan D.A. Fletcher. 1973. Eggs and Egg Products. Canada Department of Agriculture, Canada.
3. Sarwono, B., B.A. Murtidjo dan A. Daryanto. 1986. Telur, Pengawetan dan Manfaatnya. Penebar Swadaya, Jakarta.
4. Romanoff, H.A.L dan A.J. Romanoff. 1963. The Avian Egg. Jhon Willey and Sons, Inc. New York.
5. Stadelman. WJ. dan OJ. Catterill. 1977. Egg Science and Technology. Avi Publ. Co., Connecticut.

SESSION UNITY OF LEARNING

Subject : Processing of Animal Product
 code of subject : -
 SKS : 2 (1-1)
 Time of session : 100 minutes
 Session : VIII

A. Object

1. TIU : After following this session, students can explain and do principles of egg processing.
2. TIK :
 - a. Student can do handling and processing of egg.
 - b. Student can identify quality of egg according to SNI and USDA.

B. Principal of subject : Technology of egg processing. S

C. Sub Pokok Bahasan : Egg handling
 Procedures of egg processing (salty egg, pindang, egg powder, pitan or century egg ect)
 Egg quality (SNI, USDA)

G. Learning Activity :

stage	Lecturer activity	Student activity	Media and tool of learning
Introduction	To Explain all of matters at this session.	To attent and write	OHP and whiteboard
Naration	To explain procedures of egg handling To explain Procedures of egg processing To disccus about standardization of egg products quality	To attent and write	OHP and whiteboard
In closing	To give clarification or detail informations Review all of matters at this session.	To ask To attent and write	

E. Evaluation : :

This session tended to make students can do principles of egg handling and processing

F. Literatures : :

1. Card, C. E. dan M.C. Nesheim. 1973. Poultry Production. Lea and Fabiqes. Piladelphia.
2. Or, H.L dan D.A. Fletcher. 1973. Eggs and Egg Products. Canada Department of Agriculture, Canada.
3. Sarwono, B. B.A. Murtidjo dan A. Daryanto. 1986. Telur, Pengawetan dan Manfaatnya. Penebar Swadaya, Jakarta.
4. Romanoff, H.A.L dan AJ. Romanoff. 1963. The Avian Egg. Jhon Willey and Sons, Inc. New York.
5. Stadelman. WJ. dan OJ. Catterill. 1977. Egg Science and Technology. Avi Publ. Co., Connecticut.

SESSION UNITY OF LEARNING

Subject : Processing of Animal Product
 code of subject : -
 SKS : 2 (1-1)
 Time of session : 100 minutes
 Session : IX

A. Object

1. TIU : After following this session, student can explain and do principles of animal by product handling and processing.
2. TIK :
 - a. Students can do handling and processing of animal by products.
 - b. Students can identify quality of animal by products.

B. Principal of Subject : Technology of animal by product

C. Sub subject : Handling of animal by product
 Procedures of animal by product processing (bone meal, gelatine, ect.)
 Quality of animal by product (SNI)

D. Learning activity :

stage	Lecturer activity	Student activity	Media and tool of learning
Introduction	To Explain all of matters at this session.	To attent and write	OHP and whiteboard
Naration	To explain procedures of animal by product handling To explain Procedures of animal by product processing To disccus about standardization of animal by product quality	To attent and write	OHP and whiteboard
In closing	To give clarification or detail informations Review all of matters at this session.	To ask To attent and write	

E. Evaluation :

This session tended to make students can do principles of animal by product handling and processing

F. Literatures :

1. Lawrie, R.A. 1995. Meat Science. (diterjemahkan oleh Parakkasi A. dan Y. Amwila-Ilmu Daging, UI Press Jakarta).
2. Man, I. 1980. Processing and Utilization of Animal by Product. FAO.

SESSION UNITY OF LEARNING

Subject : Processing of Animal Product
 code of subject : -
 SKS : 2 (1-1)
 Time of session : 100 minutes
 Session : X

A. Object

1. TIU : After following this session, Students can explain and do procedures of hide handling and processing.
2. TIK :
 - a. Can explain Principles and object of hide preservation or processing..
 - b. Can do preservation of hide.
 - c. Can do Processing of hide (tanning, gelatin)

B. Principal of subject : Technology of hide Processing

C. Sub Subject :

- Principles and object
- Hide preservation
- Tanning

D. Learning Activity :

stage	Lecturer activity	Student activity	Media and tool of learning
Introduction	To Explain all of matters at this session.	To attent and write	OHP and whiteboard
Naration	To explain procedures of hide preservation To explain Procedures of hide processing(tanning) To disccus about standardization of leather and hide quality	To attent and write	OHP and whiteboard
In closing	To give clarification or detail informations Review all of matters at this session.	To ask To attent and write	

E. Evaluation :

This session tended to make students can do principles of hide preservation and processing (tanning)

F. Literatures

1. Sharpouse (1971). Leather technisian and handbook 1st ed, 9th Thomas Street London.
2. Suwarastuti A. (1996). Teknologi Pasca Panen Hasil Ikutan Ternak. Diktat kuliah.
3. Yudoamijoyo R.M. (1981). Teknik Penyamakan Kulit untuk Pedesaan. Penerbit Angkasa Bandung.
4. Purnomo E. (1984). Penyamakan Kulit Kaki Ayam . Penerbit Kanisius.
5. Sri Untari (1996). Penyamakan/Pengawetan Kulit Kelinci dan Ikan Pari. BPPKP Yogyakarta.

SESSION UNITY OF LEARNING

Subject : Processing of Animal Product
code of subject : -
SKS : 2 (1-1)
Time of session : 100 minutes
Session : XI

A. Object

1. TIU : -

B. Principal of subject : test

C. Sub subject :
• session I to IX

D. learning activity :

COURSE : Animal Product Knowledge

COURSE CODE : PTF 209 P

CREDIT : (2-1)3

ANIMAL AGRICULTURE OF DIPONEGORO UNIVERSITY MAIN ROLE OF TEACHING PROCESS

- Name of Course : **Animal Product Knowledge**
 Code/sks : PTF 209 P / 3 (2 – 1)
 Short Description : Discussion : meat science and technology, milk, eggs, hide and animal by product, physical, chemical and microbiology properties and basic quality of meat, milk, eggs, hide and animal by product and basic processing of meat, milk, eggs, hide and animal by product
 Course Main Goal : After following this course student can explain about basic animal product technology i.e. Physical, chemical and microbiology properties and basic quality of meat, milk, eggs, hide and animal by product and do measurement of animal product quality.
 References :
 1. Hadiwiyoto, S, 1983. Hasil-hasil Olahan Susu, Ikan, Daging, Telur. Penerbit: Liberti Yogyakarta.
 2. Hadiwiyoto, S, 1994. Teori dan Prosedur Pengujian Mutu Susu dan Hasil Olahannya. Penerbit: Liberti Yogyakarta.
 3. Buckle, LA, RA. Edward, G.H Fleet dan M. Wootton. 1985. Ilmu Pangan. Universitas Indonesia. Jakarta (Diterjemahkan oleh Purnomo dan Adiyono).
 4. Judo Amidjoyo M. 1981. Defek-defek Pada Kulit Mentah dan Samak. Penerbit Batara Karya Aksara. Jakarta.
 5. Lawrie, R.A. 1981. Meat Science.
 6. Mann, I. 1950. Processing and Utilization of Animal by Product, FAO.
 7. Suparno, 1994. Ilmu dan Teknologi Daging. Gajahmada University Press.
 8. Suwarastuti, A. dan Dwiloka, B. 1989. Dasar-dasar Teknologi Hasil Ikutan Ternak. Diktat Kuliah.
 9. Winarno, F.G. 1980. Pengantar Teknologi Pangan. Penerbit PT. Gramedia.
 10. Berbagai jurnal ilmiah nasional dan internasional.

No.	Course Specific Goal	Main Subject	Sub Subject	Time Estimation	References
1.	Student can explaining meat, meat classification, understands physical and chemical properties of meat.	Meat basic technology	Definition, classification, composition, physical And chemical properties of meat.	3 x 100 minute	1,2,5,7,9,10
2.	Student can explaining animal by product, animal by product classification, understands physical and chemical properties of animal by product.	Animal by product basic technology	Definition, classification, composition, physical And chemical properties of animal by product.	3 x 100 minute	4,6,8,10
3.	Student can explaining eggs, eggs classification, understands physical and chemical properties of eggs.	Eggs basic technology	Definition, classification, composition, physical And chemical properties of eggs.	3 x 100 minute	1,3,10
4.	Student can explaining milk, milk classification, understands physical and chemical properties of milk.	Milk basic technology	Definition, classification, composition, physical And chemical properties of milk.	3 x 100 minute	1,2,3,9,10
5.	Student can understand basic of storage and processing of animal product and animal by product. Can explaining method of handling, storage and processing of animal product and animal by product.	Basic Processing	Basic processing and storage of animal and animal by product. Method and process of animal and animal by product.	3 x 100 minute	1-10

COURSE : BIOCHEMISTRY

COURSE CODE : IPN 35-P

CREDIT : 3 (2-1)

**FACULTY OF ANIMAL SCIENCE DIPONEGORO UNIVERSITY
COURSE OUTLINE**

- COURSE** : BIOCHEMISTRY
- COURSE CODE / CREDIT** : IPN35-P / (2-1) 3
- BRIEF DESCRIPTION** : Studying the metabolism of lipid, carbohydrate, protein and nucleotides in living organism as well as photosynthetic process as source of macronutrients formation
- GENERAL OBJECTIVE** : After completing this course, the students can describe metabolism of nutrients, describe the class and the action of enzymes involved, and explain photosynthetic process

No	Specific Objectives	Main Topic	Sub Topic	Allocated Time (100 minutes/ lecture)	References
1	After completing this topic, the student can: <ul style="list-style-type: none"> ▪ Explain macro & micro nutrients and their functions ▪ Defining metabolism, catabolism, anabolism, and digestion ▪ Describe the roles of biochemistry in animal science 	Introduction	Course overview and Evaluation Macro and micro nutrients, and their function in living organism Understanding metabolism, catabolism, anabolism, and digestion, Roles of biochemistry in animal science	1 x	<ul style="list-style-type: none"> ▪ Pictures on transparency ▪ Modules ▪ Hand-outs
2	After completing this topic, the student can explain : <ul style="list-style-type: none"> ▪ Structure and organization of cells ▪ Cell components and their function 	Cell	<ul style="list-style-type: none"> ▪ Structure and organization of cells ▪ Cell components and their functions 	1x	<ul style="list-style-type: none"> ▪ Modules ▪ Hand-outs

No	Specific Objectives	Main Topic	Sub Topic	Allocated Time (100 minutes/ lecture)	References
3	After completing this topic, the student can explain : definition, function and factors that affect the function of an enzyme, Enzyme classification and nomenclature	Enzyme	Enzyme: definition, function and factors that affect the function of an enzyme, Enzyme classification and nomenclature	1x	<ul style="list-style-type: none"> ▪ Modules ▪ Hand-outs
4	After completing this topic, the student can explain : <ul style="list-style-type: none"> • Lipid classification and chemical structures • Lipid oxidation to produce energy • Triglyceride anabolism • Definition and function of cholesterol • Cholesterol metabolism 	Lipid	Lipid classification and chemical structures Lipid oxidation to produce energy Triglyceride anabolism Definition and function of cholesterol Cholesterol metabolism	3 x	<ul style="list-style-type: none"> ▪ Modules ▪ Hand-outs
5	After completing this topic, the student can explain : <ul style="list-style-type: none"> ▪ Carbohydrate classification and chemical structures ▪ Carbohydrate catabolism via glycolysis and TCA cycle ▪ Carbohydrate anabolism 	Carbohydrate	Carbohydrate: Carbohydrate classification and chemical structures Carbohydrate catabolism via glycolysis and TCA cycle Carbohydrate anabolism	3 x	<ul style="list-style-type: none"> ▪ Modules ▪ Hand-outs
6	First Evaluation			1x	

No	Specific Objectives	Main Topic	Sub Topic	Allocated Time (100 minutes/lecture)	References
7	After completing this topic, the student can explain : Amino acid structures Protein digestion and metabolism	PROTEIN	Protein: Amino acid structures Protein Digestion and metabolism	2x	<ul style="list-style-type: none"> ▪ Modules ▪ Hand-outs
8,9	After completing this topic, the student can explain : <ul style="list-style-type: none"> • the structure of nucleic acid DNA & RNA, nucleic acid metabolism • protein synthesis (from DNA translation) 	NUCLEIC ACID	Structure of nucleic acid: nucleotide, DNA, RNA, nucleic acid metabolism Protein synthesis (from DNA translation)	2x	<ul style="list-style-type: none"> ▪ Modules ▪ Hand-outs
10	After completing this topic, the student can explain : <ul style="list-style-type: none"> • definition & unit of enzyme activity • factors affecting enzyme activities • Micheles Menten Equation 	ENZYME KINETICS	Enzyme activity, Unit of enzyme activity Factors affecting enzyme activities Micheles Menten equation	1x	<ul style="list-style-type: none"> ▪ Modules ▪ Hand-outs
FINAL EVALUATION				1X	
TOTAL LECTURES IN CLASS				16x	

*** REFERENCES :**

1. Lehninger, A. L. 1970. Biochemistry. 1st edition. Worth Publ. inc. New York.
2. Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. 2003. Harper's Illustrated Biochemistry.

FAKULTAS PETERNAKAN UNIVERSITAS DIPONEGORO
TEACHING PROGRAM OUTLINE

- Title of Subject : **Basic of Biochemistry Practicum**
 Number of Code /CSS : **PTF 202 P / 3 (2 – 1)**
 Brief Description : **This subject apply the method or compose the reagent for biochemistry practicum, doing digestion of biochemistry process, examine the lactic acid in biochemistry of milk damaged, examine acetate acid in cassava fermentation correctly.**
 Specific Instructional Object : **After following this practicum student can make reagent, doing digestion of biochemistry process, examine the lactic acid in biochemistry of milk damaged, examine acetate acid in cassava fermentation correctly.**
 Books material :
 1. Apriyanto A., D. Fardiaz, N.L. Puspitasari, Sedarnawati, dan S. Budiyanto. 1989. Analisis Pangan. PAU Pangan dan Gizi. IPB, Bogor.
 2. Petunjuk Praktikum Biokimia. 1991. Laboratorium Biokimia. PS Kimia. FMIPA. UNDIP, Semarang.
 3. Petunjuk Praktikum Biokimia. 2005. Laboratorium Fisiologi dan Biokimia. Fakultas Peternakan. UNDIP, Semarang.
 4. Ruck, J.A. 1963. Chemical Methods for Analysis of Fruit and Vegetable Products. Canada Dep. Agric. Summerland.
 5. West, E. S. dan W.R. Todd. 1961. Textbook of Biochemistry. The Mac Millon Book Co, New York.

No.	Specific Instructional Object	Main Discussin	Sub Discussion	Time Estimation	Books Material
1.	After following this practicum student can make reagent	Make reagent practicum	1. Make reagent for digestion practicum 2. Make reagent for examine acid test	2 x 50 minutes	1, 2, 3, 4, and 5
2.	After following this practicum doing digestion of biochemistry process	Digestion	1. Carbohydrate digestion 2. Protein digestion 3. Lipid digestion	6 x 50 minutes	2 and 3
3.	After following this practicum examine the lactic acid in biochemistry of milk damaged, examine acetate acid in cassava fermentation correctly.	Examine acid	1. Fresh milk damaged observation 2. cassava fermentation observation 3. Examine the lactic acid in fresh and damaged milk 4. Examine the lactic acid in cassava meal and fermented cassava	4 x 50 minutes	1, 2, 3, and 4

COURSE : NUTRITION BIOCHEMISTRY

COURSE CODE : PTM 301 P

CREDIT : (2-1)3

COURSE OUTLINE

Subject studied	:	Nutrition Biochemistry
Code of Subject	:	PTM 301P (2-1)
Description	:	To study metabolism processes in the animal and its interrelated on animal product, especially meat, milk, egg and energy for work, and its control metabolism
General Objective	:	After lectured the student can afford explained nutrient metabolism in animal and its interrelated on biosynthesis of animal product (meat, milk, egg) and energy for work, and analyze its product based on metabolism principles.

No.	Specific Objective	Topics	Subtopics	Allocated time	Reference
1.	After completing this topic the student can explain the objective and the importance of nutrition biochemistry, interrelated another science, bioconversion process of nutrient to animal product and energy for work	Introduction	<ul style="list-style-type: none"> • Objective and advantages in studying nutrition biochemistry • Interrelation of nutritional biochemistry and other field science • Metabolic pathway of nutrient conversion into animal product 	2 x 50 menit	Lehninger, A.L. 1970. Biochemistry. 1st edition. Worth Publ. Inc. New York. Riis, P.M. 1983. Dynamic Biochemistry of Animal Production. Elsevier Sci. Publ. Amsterdam.
2.	After completing this topic the student can explain the growth metabolic processes of tissue (bone, meat, adipose) and its control metabolism; to make mention of the influence factors of growth	The growth of tissue (meat, bone and adipose)	<ul style="list-style-type: none"> • The physiology of growth and influencing factors • Biosynthesis of bone, meat and adipose tissue 	6 x 50 menit	Linder, M.C. 1992. Biokimia Nutrisi dan Metabolisme. Universitas Indonesia Press. Jakarta. (Diterjemahkan oleh A. Parakkasi). Forrest et al. 1975. Principles of Meat Science. WH. Freeman and Company, San Fransisco.

No.	Specific Objective	Topics	Subtopics	Allocated time	Reference
3.	After completing this topic the student can explain nutrient metabolism and milk biosynthesis in animal and its metabolism control	Milk biosynthesis	<ul style="list-style-type: none"> • Lactation physiology • Milk components and their precursor • Biosynthesis of milk components and factors that affect milk production • Vitamin and mineral secretion 	8 X 50 menit	<p>Larson, B.L. (Ed.). 1990. Lactation. The Iowa State Univ. Press-ames.</p> <p>Smith, G.H. 1971. Biology of Lactation. W.H. Freeman and Co., San Fransisco.</p>
4.	After completing this topic the student can explain nutrient metabolism and egg biosynthesis in animal and its metabolism control	Egg biosynthesis	<ul style="list-style-type: none"> • Egg physiology and biosynthesis • Component of eggshell, yolk and egg albumin • Influencing factors in egg synthesis and its hormonal control 	8 x 50 menit	<p>Linder, M.C. 1992. Biokimia Nutrisi dan Metabolisme. Universitas Indonesia Press. Jakarta. (Diterjemahkan oleh A. Parakkasi).</p> <p>Riis, P.M. 1983. Dynamic Biochemistry of Animal Production. Elsevier Sci. Publ. Amsterdam.</p>

No.	Specific Objective	Topics	Subtopics	Allocated time	Reference
5.	After completing this topic the student can explain nutrient metabolism and energy biosynthesis in animal and its metabolism control	Energy biosynthesis	<ul style="list-style-type: none"> • Physiology and mechanism of muscle contraction • Biosynthesis of energy and nutrient requirement for muscle contraction • Influencing factors in energy synthesis 	4 x5 menit	<p>Linder, M.C. 1992. Biokimia Nutrisi dan Metabolisme. Universitas Indonesia Press. Jakarta. (Diterjemahkan oleh A. Parakkasi).</p> <p>Forrest et al. 1975. Principles of Meat Science. WH. Freeman and Company, San Fransisco.</p> <p>Miffin, H. 1978. Biology of Physical Activity. Houghton Miffin Co. Boston.</p>

Nutrition Biochemistry Laboratory
Animal Science Faculty
Diponegoro University

COURSE : NUTRITION AND FEED SCIENCE

COURSE CODE :

CREDIT : (2-1)3

**FACULTY OF ANIMAL SCIENCE DIPONEGORO UNIVERSITY
COURSE OUTLINE**

COURSE NAME : Nutrition and Feed Science
COURSE CODE / CREDIT : --- / 3(2-1)
BRIEF DESCRIPTION : Studying comparative anatomy, physiology, nutrient requirements, feed source, and composing nutrient requirements for poultry, swine, equine, and ruminants
GENERAL OBJECTIVE : After completing this course the students can explain requirements and nutrient use in poultry, swine, equine, and ruminants according to production purpose

No.	Specific Objectives	Topics	Sub Topics	Allocated Time (100 minutes/lecture)	References
1.	After completing this topic the student can explain the scope and importance of nutrition and feed science	Introduction	The scope and importance of studying nutrition and feed science for poultry, swine, equine, and ruminants	1x	Prawirokusumo, S. 1994. Ilmu Gizi Komparatif. BPFE UGM. Yogyakarta. Scott, M.L.; M.C. Neshein and R.J. Young. 1982. Nutritiopn of the chicken. Scott and Associate. New York. Cunha, T.J. 1997. Swine feeding and nutrition. Academic Press. New York.
2.	After completing this topic the student can : ▪ compare the anatomy of digestive system among poultry, swine, equine, and ruminants ▪ explain the factors that affect digestive system	Comparative anatomy of digestive system	▪ Comparative anatomy of digestive system in poultry, swine, equine, and ruminants ▪ Comparative factors that affect digestive system	2x	Church, DC. 1988. The ruminant animal Digestive physiology and nutrition. A Reston Book. Penambul Banerjee, G.C. 1978. Animal Nutrition. New Delhi Cunha, T.J. 1997. Swine feeding and nutrition. Academic Press. New York.

No.	Specific Objectives	Topics	Sub Topics	Allocated Time (100 minutes/ lecture)	References
3.	After completing this topic the student can : compare the physiology of digestive system among poultry, swine, equine, and ruminants explain the factors that affect digestive physiology	Comparative physiology of digestive system	<ul style="list-style-type: none"> • Comparative physiology of digestive system in poultry, swine, equine, and ruminants • Comparative factors that affect digestive physiology 	2x	<p>Church, DC. 1988. The ruminant animal Digestive physiology and nutrition. A Reston Book. Penambul</p> <p>Banerjee, G.C. 1978. Animal Nutrition. New Delhi</p> <p>Scott, M.L.; M.C. Neshein and R.J. Young. 1982. Nutritiopn of the chicken. Scott and Associate. New York.</p> <p>Cunha, T.J. 1997. Swine feeding and nutrition. Academic Press. New York.</p>
4.	After completing this topic the student can : <ul style="list-style-type: none"> ▪ compare the metabolism of nutrients in poultry, swine, equine, and ruminants ▪ explain the factors that affect absorpction and production 	Comparative nutrient metabolism	<ul style="list-style-type: none"> ▪ Comparative metabolism of nutrients (carbohydrate, protein, lipid) in digestive system of poultry, swine, equine, and ruminants • Comparative absorption of metabolites and their effects on production 	3x	<p>Church, DC. 1988. The ruminant animal Digestive physiology and nutrition. A Reston Book. Penambul</p> <p>Scott, M.L.; M.C. Neshein and R.J. Young. 1982. Nutritiopn of the chicken. Scott and Associate. New York.</p> <p>Cunha, T.J. 1997. Swine feeding and nutrition. Academic Press. New York.</p>

No.	Specific Objectives	Topics	Sub Topics	Allocated Time (100 minutes/ lecture)	References
5.	After completing this topic the student can determine nutrient requirement of livestock	Comparative nutrient requirements of livestock (poultry, swine, equine, and ruminants)	<ul style="list-style-type: none"> • Determining nutrient requirement for poultry (layer, broiler, duck) and the use of data from Table Nutrient Requirement • Determining nutrient requirement for swine and equine and the use of data from Table Nutrient Requirement • Determining nutrient requirement of ruminants (dairy, beef, goat/ sheep) and the use of data from Table Nutrient Requirement 	4x	Nutrient Requirement Table for livestock (NRC 1994 , 2001); Kearn, 1988). Scott, M.L.; M.C. Nesheim and R.J. Young. 1982. Nutrition of the chicken. Scott and Associate. New York. Cunha, T.J. 1997. Swine feeding and nutrition. Academic Press. New York.
6.	After completing this topic the student can describe the sources of feeds for livestock (poultry, swine, equine, and ruminants)	Feed source for poultry, swine, equine, and ruminants	<ul style="list-style-type: none"> • Conventional feed for livestock and their nutritional value • Inconventional feed for livestock and their nutritional value 	2x	Banerjee, G.C. 1978. Animal Nutrition. New Delhi Sutardi et al. 1983. Standardisasi Mutu Protein Bahan Pakan di Indonesia
7.	After completing this topic the student can calculate nutrient consumption of livestock (poultry, swine, equine, and ruminants)	Determination of nutrient consumption according to physiological state	<ul style="list-style-type: none"> • Determination of feed consumption in poultry, swine, equine, and ruminants • Factors that affect feed consumption in poultry, swine, equine, and ruminants 	2x	Parakkasi, A. 1983. Ilmu Nutrisi dan Makanan Ternak Monogastrik. 1B. Penerbit UI Press. Jakarta. Parakkasi, A. 1983. Ilmu Gizi Ternak Ruminansia Pedaging. UI Press. Jakarta
			Total lectures	16 x	

COURSE : Feed Processing Technology

COURSE CODE :

CREDIT : 3 (2-1)

TEACHING OUTLINE PROGRAMS

COURSE'S TITLE : FEED PROCESSING TECHNOLOGY

COURSE'S CODE / Credit : / 3 (2-1)

Semester Unit

Description : Knowledge of processing technique in physical, chemical, biological from various feedstuffs, including of concentrate, forage and also waste and by product to maintain the quality and improve the nutrition value.

General Instruction : After attending the course student will be able to explain and differentiate the processing technique of various feedstuffs and finally determine the strategy to maintain the quality and also improve the feed nutrition value.

No.	Specific Instruction	Main Subject	Main Sub Subject	Duration	Literatures
1.	After attending the course student will be able to explain the definition of feed technology processing, processing management and feed preservation.	Introduction	1. Definition of feed technology processing 2. Feedstuffs management, definition of processing and preservation.	4 x 50 minutes	<ul style="list-style-type: none"> • McElhiary, R.R. 1994. Feed Manufacturing Technology IV. Am. Feed Industry Assoc. Inc. Arlington • Pfost, H.B. 1964. Feed Production Handbook. Feed Production School Inc. Kansas city.
2.	After attending the course student will be able to explain about the strategy of cereal, forage and waste/by product processing.	Strategy of feedstuffs and waste/by product processing.	1. Strategy of cereal processing. 2. Strategy of forage processing. 3. Strategy of waste/by product processing.	6 x 50 minutes	<ul style="list-style-type: none"> • McElhiary, R.R. 1994. Feed Manufacturing Technology IV. Am. Feed Industry Assoc. Inc. Arlington • Pfost, H.B. 1964. Feed Production Handbook. Feed Production School Inc. Kansas city

					<ul style="list-style-type: none"> • BoGohl. 1975. Tropical Feed Information Summaries and Nutritives Value. FAO=UN. Rome
3.	After attending the course student will be able to explain about feed technology processing for concentrate systematically from grinding up to packaging.	Technology of cereal processing and preservation	<ol style="list-style-type: none"> 1. Feed technology processing of concentrate. 2. Flowchart of material processing and physical mechanic processing (grinding, mixing, pelleting) 	8 x 50 minutes	<ul style="list-style-type: none"> • McElhiary, R.R. 1994 Feed Manufacturing Technology IV. Am. Feed Industry Assoc. Inc. Arlington • Romindo Primavetcom. RPAN Seminar (A New Concept in Poultry Feed Technology). 1994. Romindo Primavetcom Co. Jakarta. Unpublished. • Harding, H.A. 1978. Manajemen Produksi (Seri Manajemen No.35). Penerbit Balai Aksasra. Jakarta. • Pfost, H.B. 1964. Feed Production Handbook. Feed Production School Inc. Kansas city
4.	After attending the course student will be able to explain about technology of forage processing and preservation physically, chemically, biologically.	Technology of forage processing and preservation.	<ol style="list-style-type: none"> 1. Technology of physically forage processing and preservation. 2. Technology of chemically forage processing and preservation. 3. Technology of biologically forage processing and preservation. 	6 x 50 minutes	<ul style="list-style-type: none"> • McElhiary, R.R. 1994 Feed Manufacturing Technology IV. Am. Feed Industry Assoc. Inc. Arlington • Komar, A. 1984. Teknologi Pengolahan Jerami sebagai Makanan Ternak. Cetakan pertama. Yayasan Dian Grahit, Bandung. • Woolford, M.E. 1984. The Silage Fermentation. Marcel Dekker, Inc.

					<p>New York</p> <ul style="list-style-type: none"> • McDonald, P.1981. Biochemistry of Silage. John Willey & Sons, New York • Harding, H.A.1978. Manajemen Produksi (Seri Manajemen No.35). Penerbit Balai Aksasra. Jakarta.
5.	After attending the course student will be able to explain about feed technology processing to produce complete feed systematically from grinding up to packaging.	Technology processing of complete feed	<ol style="list-style-type: none"> 1. Definition of Complete Feed 2. Technology of Complete Feed processing 	4 x 50 minutes	<ul style="list-style-type: none"> • McElhiary, R.R. 1994. Feed Manufacturing Technology IV. Am.Feed Industry Assoc. Inc. Arlington • Pfost, H.B. 1964. Feed Production Handbook. Feed Production School Inc. Kansas city.
6.	After attending the course student will be able to explain the advance development of feed technology processing	Prospect and the development of feed technology processing for feedstuffs and waste/by product.	<ol style="list-style-type: none"> 1. Prospect and development of feed technology processing 2. Prospect and development of waste/by product technology processing as feedstuffs. 	4 x 50 minutes	<ul style="list-style-type: none"> • Hodges, J dan Han IK. 2000. Livestock, Ethics and Quality of Life. CABI Publishing. New York. • McElhiary, R.R. 1994. Feed Manufacturing Technology IV. Am.Feed Industry Assoc. Inc. Arlington • FAO. 1980. Fish Feed Technology. FAO-ACDP UNDP. Food and Agriculture Organization-UN. Rome

Lecturing Program Outline (SAP)

COURSE : Technology of Feed Processing
 CODE COURSE / SKS : / 3 SKS (2-1)
 DURATION : 2 x 50 minutes
 MEETING : 1

A: OBJECTIVE

1. GENERAL INSTRUCTION (TIU) : After attending the course student will be able to explain and differentiate the processing technique of various feedstuffs and finally determine the strategy to maintain the quality and also improve the feed nutrition value.

2. SPECIFIC INSTRUCTION (TIK) : After attending the course student will be able to explain the definition and differentiate techniques of various feedstuffs processing, management of processing and preservation minimal 90% correct.

B. MAIN SUBJECT : Introduction

C. SUB MAIN SUBJECT : Course agreement.
 Correlation among main subject, definition of Feed Processing Technology.
 Management of feed processing and preservation.

D. LEARNING AND TEACHING ACTIVITY:

Activity	Lecturer Activity	Student Activity	Learning Equipments
Introduction			
<ul style="list-style-type: none"> • Description 	Explaining the content on lecturing material of 1 st Meeting.	Noticing	Power point presentation
<ul style="list-style-type: none"> • Relevancy 	Explaining correlation among Main Subject	Noticing / questioning	Power point presentation
<ul style="list-style-type: none"> • TIK 	Explaining the competency on TIU and TIK for 2 nd Meeting.	Noticing / questioning	Power point presentation

Presentation	• Description	Explaining the importance of feed processing	Noticing / questioning	Power point presentation
		Explaining the main idea of feed processing management regarding with the processing and preservation	Noticing / questioning	Power point presentation
		<ol style="list-style-type: none"> 1. Asking student the understanding of feed processing. 2. Asking student the understanding of feed processing management. 3. Explaining 1 and 2 	<p>Answering question</p> <p>Answering question</p> <p>Noticing / giving suggestion</p>	<p>Power point presentation</p> <p>Power point presentation</p> <p>Power point presentation</p>
	• Example	Providing Example about the importance of feed processing technology.	Noticing / giving suggestion	Power point presentation
		Providing Example about processing & preservation.	Noticing / giving suggestion	Power point presentation
	• Task	Discussing example of specific case on feed processing management	Working group, summarizing short report	
Closing	• Test / Exercise	Address the delegation of working group to present the result of the discussion.	Presenting solution of the case study as the result of the discussion.	Power point presentation
		Inviting comments or questions from other student	Providing comments or questions concerning with case's solution presented	Power point presentation

• Evaluation	Giving evaluation and comments regarding the case's solution presented.	Noticing, giving suggestion and note lecturer's comment	
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E. EVALUATION : Instrument used ⇒ essay Test to evaluate case's solution made by student which had been revised according to suggestion/ comment by lecturer and other students comparing with theory which was given.

F. REFERENCES : Pfost, H.B. 1964. Feed Production Handbook. Feed Production School Inc. Kansas City
 McElhiary, R.R. 1994 Feed Manufacturing Technology IV. Am. Feed Industry Assoc. Inc. Arlington

MEETING : II, III, IV

A: OBJECTIVE

1. GENERAL INSTRUCTION (TIU): After attending the course student will be able to explain and differentiate the processing technique of various feedstuffs and finally determine the strategy to maintain the quality and also improve the feed nutrition value.

2. SPECIFIC INSTRUCTION (TIK) : After attending the course with the sub main subject of cereal processing strategy student will be able to explain and differentiate techniques of cereal and concentrate processing systematically from grinding up to packaging minimal 90% correct.

B. MAIN SUBJECT : Cereal processing strategy.

C. SUB MAIN SUBJECT : Cereal processing strategy
 Concentrate processing, flowchart of feed processing and physical processing (grinding, mixing, etc).
 Processing (pelleting, crumbling, etc), equipments & processing machine, packaging.

D. LEARNING AND TEACHING ACTIVITY:

Activity	Lecturer Activity	Student Activity	Learning Equipments
Introduction <ul style="list-style-type: none"> • Description • Relevancy • TIK 	Explaining content of material on 2nd Meeting Explaining correlation among Main Subject Explaining competencies on TIU and TIK for 2nd, 3rd and 4th Meeting.	Noticing Noticing / questioning Noticing / questioning	Power point presentation Power point presentation Power point presentation
Presentation <ul style="list-style-type: none"> • Description • Example • Task 	1. Explaining the understanding of cereal processing strategy. 2. Explaining the understanding of flowchart on feed processing. 3. Explaining the understanding of physical feedstuffs processing. 4. Asking the understanding of student about equipments & machine on concentrate processing. 5. Explaining 4 Providing Example about cereal processing. Providing Example about packaging. Discuss Example of case study on improving pellet	Noticing / questioning Noticing / questioning Noticing / questioning Answering question Noticing / giving suggestion Noticing / giving suggestion Working group, short summary report.	Power point presentation Power point presentation Power point presentation Power point presentation Power point presentation Power point presentation In Focus & PC

	quality.		
Closing			
• Test / Exercise	Addressing group delegation to present result of the discussion. Inviting comment or question from other student.	Presenting case's solution as result of the discusion. Providing comments or question about case's solution presented.	Power point presentation
• Evaluation	Giving evaluation and comments regarding the case's solution presented.	Noticing, giving suggestion and note lecturer's comment	Power point presentation

E. EVALUATION

: Instrument used ⇒ essay Test to evaluate case's solution made by student which had been revised according to suggestion/ comment by lecturer and other students comparing with theory which was given.

F. REFERENCES

: Pfost, H.B. 1964. Feed Production Handbook. Feed Production School Inc. Kansas city
 McElhiary, R.R. 1994. Feed Manufacturing Technology IV. Am. Feed Industry Assoc. Inc. Arlington
 Harding, H.A. 1978. Manajemen Produksi (Seri Manajemen No.35). Penerbit Balai Aksara. Jakarta.
 Romindo Primavetcom. RPAN Seminar (A New Concept in Poultry Feed Technology). Romindo Primavetcom Co. Jakarta. Unpublished.
 Pujaningsih, R.I. 2006. Pengelolaan Pakan Bijiian. Cetakan 1. Penerbit Alif Press. Semarang.

MEETING

: V, VI, VII and VIII

A: OBJECTIVE

1. GENERAL INSTRUCTION (TIU) : After attending the course student will be able to explain and differentiate the processing technique of various feedstuffs and finally determine the strategy to maintain the quality and also improve the feed nutrition value.
2. SPECIFIC INSTRUCTION (TIK) : After attending the course with main sub subject forage processing strategy student will be able to explain

	quality.		
Closing			
• Test / Exercise	Addressing group delegation to present result of the discussion. Inviting comment or question from other student.	Presenting case's solution as result of the discussion. Providing comments or question about case's solution presented.	Power point presentation
• Evaluation	Giving evaluation and comments regarding the case's solution presented.	Noticing, giving suggestion and note lecturer's comment	Power point presentation

E. EVALUATION

: Instrument used ⇒ essay Test to evaluate case's solution made by student which had been revised according to suggestion/ comment by lecturer and other students comparing with theory which was given.

F. REFERENCES

: Pfost, H.B. 1964. Feed Production Handbook. Feed Production School Inc. Kansas city
 McElhiary, R.R. 1994. Feed Manufacturing Technology IV. Am. Feed Industry Assoc. Inc. Arlington
 Harding, H.A. 1978. Manajemen Produksi (Seri Manajemen No.35). Penerbit Balai Aksara. Jakarta.
 Romindo Primavetcom. RPAN Seminar (A New Concept in Poultry Feed Technology). Romindo Primavetcom Co. Jakarta. Unpublished.
 Pujaningsih, R.I. 2006. Pengelolaan Pakan Bijian Cetakan 1. Penerbit Alif Press. Semarang.

MEETING

: V, VI, VII and VIII

A: OBJECTIVE

1. GENERAL INSTRUCTION (TIU) : After attending the course student will be able to explain and differentiate the processing technique of various feedstuffs and finally determine the strategy to maintain the quality and also improve the feed nutrition value.
2. SPECIFIC INSTRUCTION (TIK) : After attending the course with main sub subject forage processing strategy student will be able to explain

about processing and preservation technology by drying, biologic, fermentation, silage processing and waffering minimal 90% correct.

B. MAIN SUBJECT : Forage processing strategy

C. SUB MAIN SUBJECT : Forage processing strategy
Forage processing and preservation by using hay production technology, fermentation and waffering.

D. LEARNING AND TEACHING ACTIVITY:

Activity	Lecturer Activity	Student Activity	Learning Equipments
Introduction <ul style="list-style-type: none"> • Description • Relevancy • TIK 	Explaining content of material on 5 th Meeting Explaining correlation among Main Subject Explaining competencies on TIU and TIK for 5th, 6th, 7th and 8th Meeting.	Noticing Noticing / questioning Noticing / questioning	Power point presentation Power point presentation Power point presentation
Presentation <ul style="list-style-type: none"> • Description 	1. Explaining about forage processing strategy. 2. Explaining about hay processing technology, amoniation, fermentation, wafering and the application 3. Asking the understanding of student about forage processing & preservation technology & application 4. Explaining 3	Noticing / questioning Noticing / questioning Answering question Answering question	Power point presentation Power point presentation Power point presentation Power point presentation

<ul style="list-style-type: none"> • Example 	Providing example about application of forage processing technology	Noticing / giving suggestion	In Focus & PC
<ul style="list-style-type: none"> • Task 	Discuss example of case's study on forage processing & preservation	Working group, short summary report.	
Closing <ul style="list-style-type: none"> • Test / Exercise 	Addressing group delegation to present result of the discussion. Inviting comment or question from other student.	Presenting case's solution as result of the discussion. Providing comments or question about case's solution presented.	Power point presentation
<ul style="list-style-type: none"> • Evaluation 	Giving evaluation and comments regarding the case's solution presented.	Noticing, giving suggestion and note lecturer's comment	Power point presentation

E. EVALUATION

: Instrument used ⇒ oral Test to evaluate case's solution made by student which had been revised according to suggestion/ comment by lecturer and other students comparing with theory which was given.

F. REFERENCES

: McElhiary, R.R. 1994 Feed Manufacturing Technology IV. Am. Feed Industry Assoc. Inc. Arlington
Harding, H.A. 1978. Manajemen Produksi (Seri Manajemen No.35). Penerbit Balai Aksasra. Jakarta.

MEETING

: IX, X, XI and XII

A: OBJECTIVE

1. GENERAL INSTRUCTION: After attending the course student will be able to explain and differentiate the processing technique of various feedstuffs and finally determine the strategy to maintain the quality and also improve the feed nutrition value.

2. SPECIFIC INSTRUCTION : After attending the course student will be able to explain about prospect and the development of agricultural & industry waste/by product processing technology for feed minimal 80% correct.

B. MAIN SUBJECT : Agriculture waste/by product processing strategy.

C. SUB MAIN SUBJECT : Agriculture waste/by product processing strategy.
Feed processing of agriculture & industry feedstuffs.
Prospect & Technology development of Feed Processing

D. LEARNING AND TEACHING ACTIVITY:

Activity	Lecturer Activity	Student Activity	Learning Equipments
Introduction			
<ul style="list-style-type: none"> Description 	Explaining content of material on 6 th Meeting	Noticing	Power point presentation
<ul style="list-style-type: none"> Relevancy 	Explaining correlation among Main Subject	Noticing / questioning	Power point presentation
<ul style="list-style-type: none"> TIK 	Explaining competencies on TIU and TIK for 9th, 10th, 11th and 12th Meeting.	Noticing / questioning	Power point presentation
Presentation			
<ul style="list-style-type: none"> Description 	1. Explaining about agriculture & industrial waste/by product processing strategy.	Noticing / questioning	Power point presentation
	2. Explaining about prospect & Technology development of Feed Processing	Noticing / questioning	Power point presentation
	3. Asking the understanding of student about waste/by product processing strategy, application & prospect	Answering question	Power point presentation

		5. Explaining 3	Noticing / giving suggestion	Power point presentation
	• Example	Providing example about application of using agriculture & industrial waste/by product as feed	Noticing / giving suggestion	In Focus & PC
	• Task	Discuss example of case's study on using agriculture & industrial waste/by product as feed	Working group, short summary report.	
Closing				
	• Test / Exercise	Addressing group delegation to present result of the discussion. Inviting comment or question from other student.	Presenting case's solution as result of the discussion. Providing comments or question about case's solution presented.	Power point presentation
	• Evaluation	Giving evaluation and comments regarding the case's solution presented.	Noticing, giving suggestion and note lecturer's comment	Power point presentation

E. EVALUATION

: Instrument used \Rightarrow oral Test to evaluate case's solution made by student which had been revised according to suggestion/ comment by lecturer and other students comparing with theory which was given.

F. REFERENCES

: Nurtjahya, E., Rumetor, SD., Salamena, JF., Hernawan, E., Darwafi, S., dan Soenarno, SM. 2003. Pemanfaatan Limbah Ternak Ruminansia untuk Mengurangi Pencemaran Lingkungan. Makalah Pengantar Falsafah Sains. Program Pasca Sarjana / S3. Institut Pertanian Bogor
Yuwono, SD. 2002. Penerapan life cycle assessment pada pemanfaatan limbah pertanian menjadi furfural. Jurnal IPTEKS.

COURSE : Statistics Method

COURSE CODE :

CREDIT : 3 (2-1)

**FACULTY OF ANIMAL AGRICULTURE DIPONEGORO UNIVERSITY
GARIS BESAR PROGRAM PENGAJARAN**

COURSE OUTLINE

Subject studied : Statistics Method
 Code number/ SCS : / 3 (2-1)
 Course Outline : Statistics Method explaining about methods in collecting the fact/ data, how to organize and analyze, concluding the conclusion and also the making of reasonable conclusion according to the fact and the analyses being done. Statistics Method has relationships with mathematics and Experimental Design.

General Instruction : After following this course, student will be able to explain and use Statistics Method in analyzing the result of experiment both of observational and experimental.

Reading Source : 1. Dajan, A. 1996. Pengantar Metode Statistika. 1st Edition. Penerbit PT.Pustaka LP3ES, Jakarta.
 2. Dajan, A. 1996. Pengantar Metode Statistika. 2nd Edition. Penerbit PT.Pustaka LP3ES, Jakarta.
 3. Dixon, W.J. and F.J. Massey, Jr. 1997. Pengantar Analisis Statistik. Being translated by: Sri Kustantini S.and Zanzawi S. Gadjah Mada University Press, Yogyakarta.
 4. Sokal R.R. and F.J. Rohlf. 1991. Pengantar Biostatistika. 2nd Edition. Being translated by: Nasrullah and Setyono Setyc Sunarto. Gadjah Mada University Press, Yogyakarta.
 5. Spiegel, M.R., I. Y. Susila and E. Gunawan. 1961. Statistik Edisi SI (Metrik). Schaum Publishing Company, Edinburg.
 6. Steel R.G.D. and J.H. Torrie. 1991. Prinsip and Prosedur Statistika Suatu Pendekatan Biometrik. Being translated by: B.Sumantri. Penerbit PT Gramedia, Jakarta.
 7. Sudjana. 1975. Metode Statistika. Penerbit Tarsito. Bandung.
 8. Walpole, R.E. 1988. Pengantar Statistika. Being translated by: B.Sumantri. Penerbit PT. Gramedia, Jakarta.

No.	Specific Instruction	Major Topic	Minor Topic	Time Estimation	Reading Source
1.	After following this course, student will be able to explain the definition of Biostatistics (Biometric), the developmental history of Statistics and Data in Statistics.	Preface	1. Definition of Biostatistics (Biometric) 2. The history of Statistics development 3. Data in Statistics	1 x 50 minutes	1,2,3,4,5 and 7
2.	After following this course, student will be able to explain data in Biostatistics.	Data in Biostatistics	1. Sample and Population 2. Variable in Biostatistics 3. The accuracy and precision of data 4. Frequency distribution 5. Data handling	1 x 50 minutes	1,2,3,4,5 and 7
3.	After following this course, student will be able to explain and calculating data using central tendency and dispersion.	Statistics Descriptive	1. Central tendency (mean, median and modus) 2. Statistics dispersion (range, deviation standard and coefficient of variance)	2 x 100 minutes	1,3,4,5 and 7

FACULTY OF ANIMAL AGRICULTURE DIPONEGORO UNIVERSITY

4.	After following this course, student will be able to explain and calculating distribution Probability Distribution.	Probability Distribution	<ol style="list-style-type: none"> 1. Binomial Distribution 2. Poisson Distribution 3. Frequency Distribution Continuous Variable (Normal Distribution) 4. The characteristic of Normal Distribution 5. The probability calculation of Normal Distribution 	2 x 100 minutes	3,4,5,6 and 7
5.	After following this course, student will be able to explain the reason and method of sampling, and also how to calculate the sampling distribution.	Sampling and Sampling Distribution	<ol style="list-style-type: none"> 1. Sampling (definition, reason, method of sampling and the use of stratified random sampling) 2. Sampling distribution (Sampling distribution of mean and Central Limit Theorem) 	1 x 100 minutes	1,3,4 5,6 and 7
6.	After following this course, student will be able to explain the definition of confidence interval and calculate the confidence interval based on sample statistic.	Confidence Interval Theory	<ol style="list-style-type: none"> 1. The characteristic of confidence interval 2. The method of confidence interval (point and interval) 3. Confidence interval with big sample 4. Confidence interval with small sample 	2 x 100 minutes	2,3,4,5,6 and 7
7.		Mid-Semester Test		1 x 100 minutes	
8.	After following this course, student will be able to explain the definition of hypothesis test and calculate hypothesis test with big sample and small ones.	Hypothesis Test	<ol style="list-style-type: none"> 1. Error type I and type II 2. The steps of hypothesis test 3. Hypothesis test with big sample 4. Hypothesis test with small sample 	2 x 100 minutes	2,3,4,5,6 and 7
9.	After following this course, student will be able to calculate the normality test, variance homogeneity test, and independence test.	Chi Square Distribution	<ol style="list-style-type: none"> 1. Variance Homogeneity Test 2. Normality Test 3. Independence Test 	1 x 100 minutes	2,3,4,5,6 and 7
10.	After following this course, student will be able to calculate linear regression equations and its significance test.	Regression Analysis	<ol style="list-style-type: none"> 1. Linear Regression Equations 2. Significance Test in Linear Regression 	2 x 100 minutes	1,3,4,5,6 and 7
11.	After following this course, student will be able to calculate the coefficient of correlation.	Correlation Analysis	<ol style="list-style-type: none"> 1. Product moment coefficient correlation 	2 x 100 minutes	1,3,4,5,6 and 7

COURSE : Research Design

COURSE CODE :

CREDIT :

LECTURING AGENDA UNIT (SAP)

Subject Studied : RESEARCH DESIGN
 Code number :
 Session Duration : 100 minutes x 1 session
 Session : 1

A. Instructional Objective :

1. General : After following this course, student will be able to explain the definition of research
2. Specific : After following this course, student will be able to explain and calculate the scientific truth, the definition of research, the function, classification, and the importance of research

B. Major Topic :

1. Preface

C. Minor Topic :

1. Human's passion to reveal the secret of nature
2. The scientific truth
3. The definition of research
4. The function, classification, and importance of research

D. Teaching Activity, Media, and Teaching Aids :

Stage	Lecturer Activity	Student Activity	Media and Teaching Aids
Preface	Explain the scope of material, purpose, benefit, and introduction of research	Paying attention and writing	Blackboard and OHP
Presentation	Explain the human's passion to reveal the secret of nature, the scientific truth, the definition of research, the function, classification, and importance of research	Paying attention and writing, giving response, asking question	Blackboard and OHP
Closing	Summarize, giving questions and knowledge of the future benefits	Writing, answering question, asking question, and giving feed back	Blackboard and OHP

E. Evaluation :

Giving grades for the written answer in examination test.

F. References :

1. Kerlinger, F.N. 1973. Foundation of Behavioral Research. Second Edition. Holt Rinehart and Winstons, Inc. New York.
2. Leedy, P. 1974. Practical Research: Planning and Design. Mac Milan Publishing Co. Inc. New York.
3. Mardalis. 1995. Metode Penelitian. Suatu Pendekatan Proposal. Penerbit Bumi Aksara. Jakarta..

LECTURING AGENDA UNIT (SAP)

Subject Studied : RESEARCH DESIGN
 Code number :
 Session Duration : 100 minutes x 1 session
 Session : 2

A. Instructional Objective :

1. General : After following this course, student will be able to explain menjelaskan pengertian Prinsip Penelitian Ilmiah
2. Specific: Setelah mengikuti kuliah mahasiswa mampu menjelaskan dan menghitung kebenaran ilmiah, definisi penelitian, fungsi, jenis dan pentingnya penelitian

B. Major Topic :

1. Prinsip Penelitian Ilmiah

C. Minor Topic :

1. The Scientific research attitude
2. The scientific thinking pattern
3. The essence of research
4. The principles of design and report

D. Teaching Activity, Media and Teaching Aids :

Stage	Lecturer Activity	Student Activity	Media and Teaching Aids
Preface	Explain the scope of material, purpose, benefit of The Principles of Scientific Research	Paying attention and writing	Blackboard and OHP.
Presentation	Explain about the Scientific research attitude, the scientific thinking pattern, the essence of research, the principles of design and report	Paying attention and writing, giving response, asking question	Blackboard and OHP.
Closing	Summarize, giving questions and knowledge of the future benefits	Writing, answering question, asking question, and giving feed back	Blackboard and OHP.

E. Evaluation :

Giving grades for the written answer in examination test.

F. References :

1. Kerlinger, F.N. 1973. Foundation of Behavioral Research. Second Edition. Holt Rinehart and Winstons, Inc. New York.
2. Leedy, P. 1974. Practical Research: Planning and Design. Mac Milan Publishing Co. Inc. New York.
3. Mardalis. 1995. Metode Penelitian. Suatu Pendekatan Proposal. Penerbit Bumi Aksara. Jakarta.

LECTURING AGENDA UNIT (SAP)

Subject Studied : RESEARCH DESIGN
 Code number :
 Session Duration : 100 minutes x 1 session
 Session : 3

A. Instructional Objective :

1. General : After following this course, student will be able to explain the phase of research preparation processes
2. Specific: After following this course, student will be able to explain identify the selection and abbreviation of the problems, library study, identify, classify, and giving operational definition research variable

B. Major Topic :

1. The Research Processes phases: The phases of preparation

C. Minor Topic :

1. Identify the selection and abbreviation of the problems
2. Library study
3. Identify, classify, and giving operational definition
4. Research variable

D. Teaching Activity, Media and Teaching Aids :

Stage	Lecturer Activity	Student Activity	Media and Teaching Aids
Preface	Explain the scope of material, purpose, benefit of this topic	Paying attention and writing	Blackboard and OHP.
Presentation	Explain about identify the selection and abbreviation of the problems, library study, identify, classify, and giving operational definition, and research variable	Paying attention and writing, giving response, asking question	Blackboard and OHP.
Closing	Summarize, giving questions and knowledge of the future benefits	Writing, answering question, asking question, and giving feed back	Blackboard and OHP.

E. Evaluation :

Giving grades for the written answer in examination test.

F. References :

1. Mardalis. 1995. Metode Penelitian. Suatu Pendekatan Proposal. Penerbit Bumi Aksara. Jakarta.
2. Singarimbun, M. 1982. Metode Penelitian Survei. LP3ES. Jakarta.
3. Suryabrata, S. 1983. Metodologi Penelitian. Universitas Gadjah Mada, CV.Rajawali. Jakarta.
4. Hadi, S. 1975. Metode Research. Jilid I. Gadjah Mada University Press. Yogyakarta.

LECTURING AGENDA UNIT (SAP)

Subject Studied : RESEARCH DESIGN
 Code number :
 Session Duration : 100 minutes x 1 session
 Session : 4

A. Instructional Objective :

1. General : After following this course, student will be able to explain the phase of research implementation processes
2. Specific : After following this course, student will be able to select/ develop data instrument collector, composing research design, determining sample, collecting data, tabulating and analysis data, interpretation the result of analysis, and composing the report

B. Major Topic :

1. The Research Processes phases: The phases of implementation

C. Minor Topic :

1. Selection/ developing the tools to collect data
2. Composing research design
3. Determining sample
4. Collecting data
5. Tabulating and analysis data
6. Interpretation the result of analysis
7. Composing the report

D. Teaching Activity, Media and Teaching Aids :

Stage	Lecturer Activity	Student Activity	Media and Teaching Aids
Preface	Explain the scope of material, purpose, benefit of this topic	Paying attention and writing	Blackboard and OHP.
Presentation	Explain about selection/ developing the tools to collect data, composing research design, determining sample, collecting data, tabulating and analysis data interpretation the result of analysis composing the report	Paying attention and writing, giving response, asking question	Blackboard and OHP.
Closing	Summarize, giving questions and knowledge of the future benefits	Writing, answering question, asking question, and giving feed back	Blackboard and OHP.

E. Evaluation :

Giving grades for the written answer in examination test.

F. References :

1. Mardalis. 1995. Metode Penelitian. Suatu Pendekatan Proposal. Penerbit Bumi Aksara. Jakarta.
2. Singarimbun, M. 1982. Metode Penelitian Survei. LP3ES. Jakarta.
3. Suryabrata, S. 1983. Metodologi Penelitian. Universitas Gadjah Mada, CV.Rajawali. Jakarta.
4. Hadi, S. 1975. Metode Research. Jilid I. Gadjah Mada University Press. Yogyakarta.

LECTURING AGENDA UNIT (SAP)

Subject Studied : RESEARCH DESIGN
 Code number :
 Session Duration : 100 minutes x 1 session
 Session : 5

A. Instructional Objective :

1. General : After following this course, student will be able to explain The Completely Randomized Design (CRD) and data transformation
2. Specific: After following this course, student will be able to explain the definition of basic design and treatment, randomization and the ground plan of CRD, the linear model and ANOVA of CRD, basic assumption of ANOVA, the variance homogeneity test, and several procedures of data transformation

B. Major Topic :

1. Experimental Design: Completely Randomized Design.(CRD) and data transformation

Minor Topic :

1. The definition of Basic Design and Treatment
2. Randomization and the ground plan of CRD
3. The linear model and ANOVA of CRD
4. Basic assumption of ANOVA
5. The variance homogeneity test
6. Several procedures of data transformation

C. Teaching Activity, Media and Teaching Aids :

Stage	Lecturer Activity	Student Activity	Media and Teaching Aids
Preface	Explain the scope of material, purpose, benefit of this topic	Paying attention and writing	Blackboard and OHP.
Presentation	Explain about the definition of basic design and treatment, randomization and the ground plan of CRD, the linear model and ANOVA of CRD, basic assumption of ANOVA, the variance homogeneity test, several procedures of data transformation	Paying attention and writing, giving response, asking question	Blackboard and OHP
Closing	Summarize, giving questions and knowledge of the future benefits	Writing, answering question, asking question, and giving feed back	Blackboard and OHP.

D. Evaluation :

Giving grades for the written answer in examination test.

F. References :

1. Gaspersz, V. 1991. Teknik Analisis dalam Penelitian Percobaan. Penerbit Tarsito, Bandung.
2. Gomez, K.A. and A.A. Gomez. 1984. Statisticals Procedures for Agricultural Research Second Edition. An International Rice Research Institute Book. A Wiley-interscience Publication. John Wiley & Sons. New York.
3. Steel, R.G.D. dan J.H. Torrie. 1991. Prinsip dan Prosedur Statistika Suatu Pendekatan Biometrik. Edisi ke-2 (Diterjemahkan oleh B.S.Jmantri). Penerbit PT.Gramedia. Jakarta.
4. Sudjana. 1980. Disain dan Analisis Eksperimen. Edisi Pertama. Penerbit Tarsito Bandung.

5. Yitnosumarto, S. 1991. Percobaan, Perancangan, Analisis dan Interpretasinya. Edisi Pertama. PT.Gramedia Pustaka Utama. Jakarta.

LECTURING AGENDA UNIT (SAP)

Subject Studied : RESEARCH DESIGN
 Code number :
 Session Duration : 100 minutes x 1 session
 Session : 6

A. Instructional Objective :

1. General : After following this course, student will be able to explain Multiple Comparisons and Contrast Comparisons
2. Specific: After following this course, student will be able to explain Least Significance Difference (LSD) test, Turkey test (HSD), Duncan Multiple Range Test, Qualitative treatment contrast, Quantitative treatment contrast

B. Major Topic :

1. Multiple Comparisons and Contrast Comparisons

C. Minor Topic :

1. Least Significance Difference (LSD)
2. Turkey test (HSD).
3. Duncan Multiple Range Test
4. Qualitative treatment contrast
5. Quantitative treatment contrast

D. Teaching Activity, Media and Teaching Aids :

Stage	Lecturer Activity	Student Activity	Media and Teaching Aids
Preface	Explain the scope of material, purpose, benefit of this topic	Paying attention and writing	Blackboard and OHP.
Presentation	Explain about Least Significance Difference (LSD) test, Turkey test (HSD), Duncan Multiple Range Test, Qualitative treatment contrast, Quantitative treatment contrast	Paying attention and writing, giving response, asking question	Blackboard and OHP.
Closing	Summarize, giving questions and knowledge of the future benefits	Writing, answering question, asking question, and giving feed back	Blackboard and OHP.

E. Evaluation :

Giving grades for the written answer in examination test.

F. References :

1. Gaspersz, V. 1991. Teknik Analisis dalam Penelitian Percobaan. Penerbit Tarsito, Bandung.
2. Gomez, K.A. and A.A. Gomez. 1984. Statistical Procedures for Agricultural Research Second Edition. An International Rice Research Institute Book. A Wiley-Interscience Publication. John Wiley & Sons. New York.
3. Steel, R.G.D. dan J.H. Torrie. 1991. Prinsip dan Prosedur Statistika Suatu Pendekatan Biometrik. Edisi ke-2 (Diterjemahkan oleh B.Sumantri). Penerbit PT.Gramedia. Jakarta.
4. Sudjana. 1980. Disain dan Analisis Eksperimen. Edisi Pertama. Penerbit Tarsito Bandung.
5. Yitnosumarto, S. 1991. Percobaan, Perancangan, Analisis dan Interpretasinya. Edisi Pertama. PT.Gramedia Pustaka Utama. Jakarta.

LECTURING AGENDA UNIT (SAP)

Subject Studied : RESEARCH DESIGN
 Code number :
 Session Duration : 100 minutes x 2 session
 Session : 7 & 8

A. Instructional Objective :

1. General : After following this course, student will be able to explain Completely Randomized Block Design (RCBD) and Latin Square Design (LSD)
2. Specific: After following this course, student will be able to explain randomization and ground plan of design, linear model and ANOVA of RCBD, variance difference test , and Latin Square Design

B. Major Topic :

1. Completely Randomized Block Design (RCBD) and Latin Square Design (LSD)

C. Minor Topic :

1. Randomization and ground plan of design
2. Linear model and ANOVA of RCBD
3. Variance difference test
4. Latin Square Design

D. Teaching Activity, Media and Teaching Aids :

Stage	Lecturer Activity	Student Activity	Media and Teaching Aids
Preface	Explain the scope of material, purpose, benefit of this topic	Paying attention and writing	Blackboard and OHP.
Presentation	Explain about randomization and ground plan of design, linear model and ANOVA of RCBD, variance difference test , and Latin Square Design	Paying attention and writing, giving response, asking question	Blackboard and OHP.
Closing	Summarize, giving questions and knowledge of the future benefits	Writing, answering question, asking question, and giving feed back	Blackboard and OHP.

E. Evaluation :

Giving grades for the written answer in examination test.

F. References :

1. Gaspersz, V. 1991. Teknik Analisis dalam Penelitian Percobaan. Penerbit Tarsito, Bandung.
2. Gomez, K.A. and A.A. Gomez. 1984. Statisticals Procedures for Agricultural Research Second Edition. An International Rice Research Institute Book. A Wiley-interscience Publication. John Wiley & Sons. New York.
3. Steel, R.G.D. dan J.H. Torrie. 1991. Prinsip dan Prosedur Statistika Suatu Pendekatan Biometrik. Edisi ke-2 (Diterjemahkan oleh B.Sumantri). Penerbit PT.Gramedia. Jakarta.
4. Sudjana. 1980. Disain dan Analisis Eksperimen. Edisi Pertama. Penerbit Tarsito Bandung.
5. Yitnosumarto, S. 1991. Percobaan, Perancangan, Analisis dan Interpretasinya. Edisi Pertama. PT.Gramedia Pustaka Utama. Jakarta.

LECTURING AGENDA UNIT (SAP)

Subject Studied : RESEARCH DESIGN
 Code number :
 Session Duration : 100 minutes x 1 session
 Session : 9

A. Instructional Objective :

1. General : After following this course, student will be able to explain Factorial Design
2. Specific: After following this course, student will be able to explain randomization and ground plan of design, linear model and ANOVA, and also variance difference test

B. Major Topic :

1. Factorial Design

C. Minor Topic :

1. Randomization and ground plan of design
2. Linear model and ANOVA
3. Variance difference test

D. Teaching Activity, Media and Teaching Aids :

Stage	Lecturer Activity	Student Activity	Media and Teaching Aids
Preface	Explain the scope of material, purpose, benefit of this topic	Paying attention and writing	Blackboard and OHP.
Presentation	Explain about randomization and ground plan of design, linear model and ANOVA, and also variance difference test	Paying attention and writing, giving response, asking question	Blackboard and OHP.
Closing	Summarize, giving questions and knowledge of the future benefits	Writing, answering question, asking question, and giving feed back	Blackboard and OHP.

E. Evaluation :

Giving grades for the written answer in examination test.

F. References :

1. Gaspersz, V. 1991. Teknik Analisis dalam Penelitian Percobaan. Penerbit Tarsito, Bandung.
2. Gomez, K.A. and A.A. Gomez. 1984. Statisticals Procedures for Agricultural Research Second Edition. An International Rice Research Institute Book. A Wiley-interscience Publication. John Wiley & Sons. New York.
3. Steel, R.G.D. dan J.H. Torrie. 1991. Prinsip dan Prosedur Statistika Suatu Pendekatan Biometrik. Edisi ke-2 (Diterjemahkan oleh B.Sumantri). Penerbit PT.Gramedia. Jakarta.
4. Sudjana. 1980. Disain dan Analisis Eksperimen. Edisi Pertama. Penerbit Tarsito Bandung.
5. Yitnosumarto, S. 1991. Percobaan, Perancangan, Analisis dan Interpretasinya. Edisi Pertama. PT.Gramedia Pustaka Utama. Jakarta.

LECTURING AGENDA UNIT (SAP)

Subject Studied : RESEARCH DESIGN
 Code number :
 Session Duration : 100 minutes x 1 session
 Session : 10

A. Instructional Objective :

1. General : After following this course, student will be able to explain Split Plot Design
2. Specific: After following this course, student will be able to explain randomization and ground plan of design, linear model and ANOVA, and also variance difference test

B. Major Topic :

1. Split Plot Design

C. Minor Topic :

1. Randomization and ground plan of design
2. Linear model and ANOVA
3. Variance difference test

D. Teaching Activity, Media and Teaching Aids :

Stage	Lecturer Activity	Student Activity	Media and Teaching Aids
Preface	Explain the scope of material, purpose, benefit of this topic	Paying attention and writing	Blackboard and OHP.
Presentation	Explain about randomization and ground plan of design, linear model and ANOVA, and also variance difference test	Paying attention and writing, giving response, asking question	Blackboard and OHP.
Closing	Summarize, giving questions and knowledge of the future benefits	Writing, answering question, asking question, and giving feed back	Blackboard and OHP.

E. Evaluation :

Giving grades for the written answer in examination test.

F. References :

1. Gaspersz, V. 1991. Teknik Analisis dalam Penelitian Percobaan. Penerbit Tarsito. Bandung.
2. Gomez, K.A. and A.A. Gomez. 1984. Statisticals Procedures for Agricultural Research Second Edition. An International Rice Research Institute Book. A Wiley-interscience Publication. John Wiley & Sons. New York.
3. Steel, R.G.D. dan J.H. Torrie. 1991. Prinsip dan Prosedur Statistika Suatu Pendekatan Biometrik. Edisi ke-2 (Diterjemahkan oleh B.Sumantri). Penerbit PT.Gramedia. Jakarta.
4. Sudjana. 1980. Disain dan Analisis Eksperimen. Edisi Pertama. Penerbit Tarsito Bandung.
5. Yitnosumarto, S. 1991. Percobaan, Perancangan, Analisis dan Interpretasinya. Edisi Pertama. PT.Gramedia Pustaka Utama. Jakarta.

LECTURING AGENDA UNIT (SAP)

Subject Studied : RESEARCH DESIGN
 Code number :
 Session Duration : 100 minutes x 1 session
 Session : 11

A. Instructional Objective :

1. General : After following this course, student will be able to explain Field Research Design: purpose, sampling, and measurement scale
2. Specific: After following this course, student will be able to explain random, purposive, stratification, proportional, multi stage, and measurement scale: Nominal, ordinal, interval, ratio

B. Major Topic :

1. Field Research Design: purpose, sampling, and measurement scale.

C. Minor Topic :

1. Random
2. Purposive
3. Stratification
4. Proportional
5. Multi stage
6. Measurement scale: Nominal, ordinal, interval, ratio

D. Teaching Activity, Media and Teaching Aids :

Stage	Lecturer Activity	Student Activity	Media and Teaching Aids
Preface	Explain the scope of material, purpose, benefit of this topic	Paying attention and writing	Blackboard and OHP.
Presentation	Explain about random, purposive, stratification, proportional, multi stage, and measurement scale: Nominal, ordinal, interval, ratio	Paying attention and writing, giving response, asking question	Blackboard and OHP.
Closing	Summarize, giving questions and knowledge of the future benefits	Writing, answering question, asking question, and giving feed back	Blackboard and OHP.

E. Evaluation :

Giving grades for the written answer in examination test.

F. References :

1. Mardalis. 1995. Metode Penelitian. Suatu Pendekatan Proposal. Penerbit Bumi Aksara. Jakarta.
2. Singarimbun, M. 1982. Metode Penelitian Survei. LP3ES. Jakarta.
3. Suryabrata, S. 1983. Metodologi Penelitian. Universitas Gadjah Mada, CV.Rajawali. Jakarta.
4. Hadi, S. 1975. Metode Research. Jilid I. Gadjah Mada University Press. Yogyakarta.

LECTURING AGENDA UNIT (SAP)

Subject Studied : RESEARCH DESIGN
 Code number :
 Session Duration : 100 minutes x 1 session
 Session : 12

A. Instructional Objective :

1. General : After following this course, student will be able to explain Different μ Analysis
2. Specific: After following this course, student will be able to explain t test: 1 sample, paired sample, independent

B. Major Topic :

1. Different μ Analysis

C. Minor Topic :

1. t test: 1 sample, paired sample, independent

D. Teaching Activity, Media and Teaching Aids :

Stage	Lecturer Activity	Student Activity	Media and Teaching Aids
Preface	Explain the scope of material, purpose, benefit of this topic	Paying attention and writing	Blackboard and OHP.
Presentation	Explain about t test: 1 sample, paired sample, independent	Paying attention and writing, giving response, asking question	Blackboard and OHP.
Closing	Summarize, giving questions and knowledge of the future benefits	Writing, answering question, asking question, and giving feed back	Blackboard and OHP.

E. Evaluation :

Giving grades for the written answer in examination test.

F. References :

1. Dajan, A. 1996. Pengantar Metode Statistika. Jilid I. Cetakan ke-18. Penerbit PT.Pustaka LP3ES, Jakarta.
2. Dajan, A. 1996. Pengantar Metode Statistika. Jilid II. Cetakan ke-18. Penerbit PT.Pustaka LP3ES, Jakarta.
3. Dixon, W.J. dan F.J. Massey, Jr. 1997. Pengantar Analisis Statistik. Cetakan ke-2. Diterjemahkan oleh: Sri Kustantini S. dan Zanzawi S. Gadjah Mada University Press, Yogyakarta.
4. Ostle, B. 1963. Statistics in Research. 2nd Ed. The Iowa State University. Press. Ames.
5. Siegel, S. 1994. Statistik Non Parametrik Untuk Ilmu – Ilmu Sosial. PT. Gramedia, Jakarta.
6. Snedecor, G.W. and W.G. Cochran. 1967. Statisticals Methods. Sixth Edition. Oxford & IBH Publishing Co. Calcutta, Bombay, New Delhi.
7. Sudjana. 1975. Metode Statistika. Cetakan ke-1. Penerbit Tarsito. Bandung.
8. Walpole, R.E. 1988. Pengantar Statistika. Cetakan ke-3. Diterjemahkan oleh: B.Sumantri. Penerbit PT.Gramedia, Jakarta..

LECTURING AGENDA UNIT (SAP)

Subject Studied : RESEARCH DESIGN
 Code number :
 Session Duration : 100 minutes x 1 session
 Session : 13

A. Instructional Objective :

1. General : After following this course, student will be able to explain Different Median Analysis
2. Specific: After following this course, student will be able to explain U-test, W-test, Kruskal-Wallis test and Friedman test.

B. Major Topic :

1. Different Median Analysis

C. Minor Topic :

U-test, W-test, Kruskal-Wallis test and Friedman test

D. Teaching Activity, Media and Teaching Aids :

Stage	Lecturer Activity	Student Activity	Media and Teaching Aids
Preface	Explain the scope of material, purpose, benefit of this topic	Paying attention and writing	Blackboard and OHP.
Presentation	Explain about U-test, W-test, Kruskal-Wallis test and Friedman test	Paying attention and writing, giving response, asking question	Blackboard and OHP.
Closing	Summarize, giving questions and knowledge of the future benefits	Writing, answering question, asking question, and giving feed back	Blackboard and OHP.

E. Evaluation :

Giving grades for the written answer in examination test.

F. References :

1. Dajan, A. 1996. Pengantar Metode Statistika. Jilid I. Cetakan ke-18. Penerbit PT.Pustaka LP3ES, Jakarta.
2. Dajan, A. 1996. Pengantar Metode Statistika. Jilid II. Cetakan ke-18. Penerbit PT.Pustaka LP3ES, Jakarta.
3. Dixon, W.J. dan F.J. Massey, Jr. 1997. Pengantar Analisis Statistik. Cetakan ke-2. Diterjemahkan oleh: Sri Kustantini S. dan Zanzawi S. Gadjah Mada University Press, Yogyakarta.
4. Ostle, B. 1963. Statistics in Research. 2nd Ed. The Iowa State University. Press. Ames.
5. Siegel, S. 1994. Statistik Non Parametrik Untuk Ilmu – Ilmu Sosial. PT. Gramedia, Jakarta.
6. Snedecor, G.W. and W.G. Cochran. 1967. Statisticals Methods. Sixth Edition. Oxford & IBH Publishing Co. Calcutta, Bombay, New Delhi.
7. Sudjana. 1975. Metode Statistika. Cetakan ke-1. Penerbit Tarsito. Bandung.
8. Walpole, R.E. 1988. Pengantar Statistika. Cetakan ke-3. Diterjemahkan oleh: B.Sumantri. Penerbit PT.Gramedia, Jakarta..

LECTURING AGENDA UNIT (SAP)

Subject Studied : RESEARCH DESIGN
 Code number :
 Session Duration : 100 minutes x 1 session
 Session : 14

A. Instructional Objective :

1. General : After following this course, student will be able to explain Regression Analysis
2. Specific: After following this course, student will be able to explain Regression equations and t/ F test

B. Major Topic :

1. Regression Analysis

C. Minor Topic :

1. Regression equations and t/ F test

D. Teaching Activity, Media and Teaching Aids :

Stage	Lecturer Activity	Student Activity	Media and Teaching Aids
Preface	Explain the scope of material, purpose, benefit of this topic	Paying attention and writing	Blackboard and OHP.
Presentation	Explain about Regression equations and t/ F test	Paying attention and writing, giving response, asking question	Blackboard and OHP.
Closing	Summarize, giving questions and knowledge of the future benefits	Writing, answering question, asking question, and giving feed back	Blackboard and OHP.

E. Evaluation :

Giving grades for the written answer in examination test.

F. References :

1. Dajan, A. 1996. Pengantar Metode Statistika. Jilid I. Cetakan ke-18. Penerbit PT.Pustaka LP3ES, Jakarta.
2. Dajan, A. 1996. Pengantar Metode Statistika. Jilid II. Cetakan ke-18. Penerbit PT.Pustaka LP3ES, Jakarta.
3. Dixon, W.J. dan F.J. Massey, Jr. 1997. Pengantar Analisis Statistik. Cetakan ke-2. Diterjemahkan oleh: Sri Kustantini S. dan Zanzawi S. Gadjah Mada University Press, Yogyakarta.
4. Ostle, B. 1963. Statistics in Research. 2nd Ed. The Iowa State University. Press. Ames.
5. Siegel, S. 1994. Statistik Non Parametrik Untuk Ilmu – Ilmu Sosial. PT. Gramedia, Jakarta.
6. Snedecor, G.W. and W.G. Cochran. 1967. Statistical Methods. Sixth Edition. Oxford & IBH Publishing Co. Calcutta, Bombay, New Delhi.
7. Sudjana. 1975. Metode Statistika. Cetakan ke-1. Penerbit Tarsito. Bandung.
8. Walpole, R.E. 1988. Pengantar Statistika. Cetakan ke-3. Diterjemahkan oleh: B.Sumantri. Penerbit PT.Gramedia, Jakarta.

LECTURING AGENDA UNIT (SAP)

Subject Studied : RESEARCH DESIGN
 Code number :
 Session Duration : 100 minutes x 1 session
 Session : 15

A. Instructional Objective :

1. General : After following this course, student will be able to explain Correlation Analysis
2. Specific: After following this course, student will be able to explain the criteria of close relationships and the direction of relationships and also Pearson correlation and Spearman test

B. Major Topic :

1. Correlation Analysis

C. Minor Topic :

1. The criteria of close relationships and the direction of relationships
2. Pearson correlation and Spearman test

D. Teaching Activity, Media and Teaching Aids :

Stage	Lecturer Activity	Student Activity	Media and Teaching Aids
Preface	Explain the scope of material, purpose, benefit of this topic	Paying attention and writing	Blackboard and OHP.
Presentation	Explain about the criteria of close relationships and the direction of relationships and also Pearson correlation and Spearman test	Paying attention and writing, giving response, asking question	Blackboard and OHP.
Closing	Summarize, giving questions and knowledge of the future benefits	Writing, answering question, asking question, and giving feed back	Blackboard and OHP.

E. Evaluation :

Giving grades for the written answer in examination test.

F. References :

1. Dajan, A. 1996. Pengantar Metode Statistika. Jilid I. Cetakan ke-18. Penerbit PT.Pustaka LP3ES, Jakarta.
2. Dajan, A. 1996. Pengantar Metode Statistika. Jilid II. Cetakan ke-18. Penerbit PT.Pustaka LP3ES, Jakarta.
3. Dixon, W.J. dan F.J. Massey, Jr. 1997. Pengantar Analisis Statistik. Cetakan ke-2. Diterjemahkan oleh: Sri Kustantini S. dan Zanzawi S. Gadjah Mada University Press, Yogyakarta.
4. Ostle, B. 1963. Statistics in Research. 2nd Ed. The Iowa State University. Press. Ames.
5. Siegel, S. 1994. Statistik Non Parametrik Untuk Ilmu – Ilmu Sosial. PT. Gramedia, Jakarta.
6. Snedecor, G.W. and W.G. Cochran. 1967. Statisticals Methods. Sixth Edition. Oxford & IBH Publishing Co. Calcutta, Bombay, New Delhi.
7. Sudjana. 1975. Metode Statistika. Cetakan ke-1. Penerbit Tarsito. Bandung.
8. Walpole, R.E. 1988. Pengantar Statistika. Cetakan ke-3. Diterjemahkan oleh: B.Sumantri. Penerbit PT.Gramedia, Jakarta.

FACULTY OF ANIMAL AGRICULTURE DIPONEGORO UNIVERSITY
COURSE OUTLINE

Subject studied	:	Research Design
Code number/ SCS	:	/ 3 (2-1)
Course Outline	:	The truth of knowledge learned by the assumption of scientific method. Scientific research build on the based of rational and empirical thinking patern through systematic procedures of experimental research, field, and library study. The impelementation of scientific research need a brief plan that consist of: treatment, material, sample and analyses based on its statistics.
General Instruction	:	After following this course, student will be able to explain and use the scientific assumptions of statistics in analyzing the result of research both of observation and experimental.
Reading Source	:	<ol style="list-style-type: none">1. Dajan, A. 1996. Pengantar Metode Statistika. 1st Edition. Penerbit PT.Pustaka LP3ES, Jakarta.2. Dajan, A. 1996. Pengantar Metode Statistika. 2nd Edition. Penerbit PT.Pustaka LP3ES, Jakarta.3. Dixon, W.J. and F.J. Massey, Jr. 1997. Pengantar Analisis Statistik. Translated by: Sri Kustantini S. and Zanzawi S. Gadjah Mada University Press, Yogyakarta.4. Gaspersz, V. 1991. Teknik Analisis dalam Penelitian Percobaan. Penerbit Tarsito, Bandung.5. Gomez, K.A. and A.A. Gomez. 1984. Statisticals Procedures for Agricultural Research Second Edition. An International Rice Research Institute Book. A Wiley-interscience Publication. John Wiley & Sons. New York.6. I.P.W.I. 1995. Modul Metodologi Riset Bisnis. Badan Penerbit I.P.W.I. Jakarta.7. Kerlinger, F.N. 1973. Foundation of Behavioural Research. Second Edition. Holt Rinehart and Winstons, Inc. New York.8. Leedy, P. 1974. Practical Research: Planning and Design. Mac Milan Publishing Co. Inc. New York.9. Mardalis. 1995. Metode Penelitian. Suatu Pendekatan Proposal. Penerbit Bumi Aksara. Jakarta.10. Singarimbun, M. 1982. Metode Penelitian Survei. LP3ES. Jakarta.11. Ostle, B. 1963. Statistics in Research. 2nd Ed. The Iowa State University. Press. Ames.12. Siegel, S. 1994. Statistik Non Parametrik Untuk Ilmu – Ilmu Sosial. PT. Gramedia, Jakarta.13. Snedecor, G.W. and W.G. Cochran. 1967. Statisticals Methods. Sixth Edition. Oxford & IBH Publishing Co. Calcutta, Bombay, New Delhi.14. Sokal, R.R. and F.J. Rohlf. 1991. Pengantar Biostatistika. 2nd Edition. Translated by: Nasrullah and Setyono Setyo Sumarto. Penerbit Gadjah Mada University Press Yogyakarta.15. Spiegel, M.R., I. Y. Susila and E. Gunawan. 1961. Statistik Edisi SI (Metrik). Schaum Publishing Company, Edinburg.16. Steel, R.G.D. and J.H. Torrie. 1991. Prinsip dan Prosedur S'tatistika Suatu Pendekatan Biometrik. 2nd Edition. Translated by: B.Sumantri). Penerbit PT.Gramedia. Jakarta.17. Sudjana. 1975. Metode Statistika. Penerbit Tarsito. Bandung.18. Sudjana. 1980. Disain dan Analisis Eksperimen. 1st Edition. Penerbit Tarsito Bandung.19. Suryabrata, S. 1983. Metodologi Penelitian. Universitas Gadjah Mada, CV.Rajawali. Jakarta.20. Hadi, S. 1975. Metode Research. Gadjah Mada University Press. Yogyakarta.21. Walpole, R.E. 1988. Pengantar Statistika. Translated by: B.Sumantri. Penerbit PT.Gramedia, Jakarta.22. Yitnosumarto, S. 1991. Percobaan, Perancangan, Analisis dan Interpretasinya. PT.Gramedia Pustaka Utama. Jakarta.

FACULTY OF ANIMAL AGRICULTURE DIPONEGORO UNIVERSITY

No.	Specific Instruction	Major Topic	Minor Topic	Time Estimation	Reading Source
1.	After following this course, student will be able to explain the definition and importance of research.	Preface	<ol style="list-style-type: none"> 1. Human's passion to reveal the secret of nature 2. The scientific truth 3. The definition of research 4. The function, classification, and importance of research 	1 x 100 minutes	7, 8 and 9
2.	After following this course, student will be able to explain The Principles of Research	The Scientific Research Principles	<ol style="list-style-type: none"> 1. The Scientific research attitude 2. The scientific thinking pattern 3. The essence of research 4. The principles of design and report 	1 x 100 minutes	7, 8 and 9
3.	After following this course, student will be able to explain the phase of research preparation processes	The Research Processes phases: The phases of preparation	<ol style="list-style-type: none"> 1. Identify the selection and abbreviation of the problems 2. Library study 3. Identify, classify, and giving operational definition 4. Research variable 	1 x 100 minutes	9, 10, 19 and 20
4.	After following this course, student will be able to explain the phase of research implementation processes	The Research Processes phases: The phases of implementation	<ol style="list-style-type: none"> 1. Selection/ developing the tools to collect data 2. Composing research design 3. Determining sample 4. Collecting data 5. Tabulating and analysis data 6. Interpretation the result of analysis 7. Composing the report 	1 x 100 minutes	9, 10, 19 and 20
5.	After following this course, student will be able to explain The Completely Randomized Design (CRD) and data transformation	Experimental Design: Completely Randomized Design (CRD) and data transformation	<ol style="list-style-type: none"> 1. The definition of Basic Design and Treatment 2. Randomization and the ground plan of CRD 3. The linear model and ANOVA of CRD 4. Basic assumption of ANOVA 5. The variance homogeneity test 6. Several procedures of data transformation 	1 x 100 minutes	4, 5, 16, 18 and 22
6.	After following this course, student will be able to explain Multiple Comparisons and Contrast Comparisons	Multiple Comparisons and Contrast Comparisons	<ol style="list-style-type: none"> 1. Least Significance Difference (LSD) 2. Turkey test (HSD). 3. Duncan Multiple Range Test 4. Qualitative treatment contrast 5. Quantitative treatment contrast 	1 x 100 minutes	4, 5, 16, 18 and 22

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7.	After following this course, student will be able to explain Completely Randomized Block Design (RCBD) and Latin Square Design (LSD)	Completely Randomized Block Design (RCBD) and Latin Square Design (LSD)	1. Randomization and ground plan of design 2. Linear model and ANOVA of RCBD 3. Variance difference test 4. Latin Square Design	1 x 100 minutes	4, 5, 16, 18 and 22
8.		Mid-Semester		1 x 100 minutes	
9.	After following this course, student will be able to explain Factorial Design	Factorial Design	1. Randomization and ground plan of design 2. Linear model and ANOVA 3. Variance difference test	1 x 100 minutes	4, 5, 16, 18 and 22
10.	After following this course, student will be able to explain Split Plot Design	Split Plot Design	1. Randomization and ground plan of design 2. Linear model and ANOVA 3. Variance difference test	1 x 100 minutes	4, 5, 16, 18 and 22
11.	After following this course, student will be able to explain Field Research Design: aim, sampling, and measurement scale	Field Research Design: aim, sampling, and measurement scale	1. Random 2. Purposive 3. Stratification 4. Proportional 5. Multi stage 6. Measurement scale: Nominal, ordinal, interval, ratio	1 x 100 minutes	9, 10, 19 and 20
12.	After following this course, student will be able to explain Different μ Analysis	Different μ Analysis	t test: 1 sample, paired sample, independent	1 x 100 minutes	1, 2, 3, 11, 12, 13, 15, 17, 21 and 22
13.	After following this course, student will be able to explain Different Median Analysis	Different Median Analysis	U-test, W-test, Kruskal-Wallis test and Friedman test	1 x 100 minutes	1, 2, 3, 11, 12, 13, 15, 17 and 21
14.	After following this course, student will be able to explain Regression Analysis	Regression Analysis	Regression equations and t/F test	1 x 100 minutes	1, 2, 3, 11, 12, 13, 15, 17 and 21
15.	After following this course, student will be able to explain Correlation Analysis	Correlation Analysis	1. The criteria of close relationships and the direction of relationships 2. Pearson correlation and Spearman test	1 x 100 minutes	1, 2, 3, 11, 12, 13, 15, 17 and 21
16.	After following this course, student will be able to implement discussion and develop the material has been given	Discussion of the assignment		1 x 100 minutes	Depend on the student

COURSE : Basic Animal Nutrition

COURSE CODE :

CREDIT : 3 (2-1)

LECTURING AGENDA UNIT

Subject Studied : Basic Animal Nutrition
 Subject Code : _____
 Credits : 3 (2-1)
 Duration : 100 minute (2 x 50 minute)
 Meeting of the : 1st

A. Instrution

1. General Instruction : End of lecture, student could explain about definition, history and development of nutrition science; the objective of learning basic animal nutrition and feedstuffs classification
2. Specific Instruction : End of lecture, student could explain well about definition, history and development of nutrition science; the objective of learning basic animal nutrition: the relation of other sciences and feedstuffs classification

B. Main Topic : The history and development of nutrition science

C. Sub Topic : Course outline; definition, history and development of nutrition science; the objective of learning basic animal nutrition; the relation of other sciences; International feedstuffs classification

D. Teaching Learning Activity :

Steps	Teaching Activity	Student Activity	Teaching Instrument
Introduction	1. Giving the course outline	Listening, question	Copy of course outline
	2. Explain the course outline, schedule, the role and evaluation methode of the whole lecture included the laboratory work	Listening, question	LCD
	3. Explain the general and specisfic intruction of this meeting		
Delivery	4. Giving hand out of this topic	Listening, question	Copy of Hand out about definition, history and development of nutrition science
	5. Explain about definition, history and development of nutrition science	Listening, question and giving an idea	
	6. Explain the usefulness and the objective of studying this subject and the relation of other field of science	Question, giving an idea and discussion	LCD
	7. Giving sample of some field of science and explain the role and the relationship animal nutrition science	Discussion	
	8. Explain and give sample about international feedstuffs clasification		
Closing Remark	9. Stimulate question and comment from student		
	10. Summarize and highlight the importance	Listening, question and giving an idea Writing the comment	LCD
	11. Giving hand out for the next topic	Reading and learning the hand out	Copy of hand out for the next topic

E. Evaluation : using respon card, question and home work that give at the end of each meeting

F. References :

1. Pond, W.G., D.C. Church, and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4th Ed. John Wiley & Sons, New York.
2. Sutardi, T. 1980. Landasan Ilmu Nutrisi. Book 1. Departemen Ilmu Makanan Ternak Fakultas Peternakan Institut Pertanian Bogor, Bogor (Not Published).
3. Tillman, A.D., H. Hartadi, S. Reksোধadiprodo, S. Prawirokusumo and S. Lebdosoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press, Yogyakarta.

LECTURING AGENDA UNIT

Duration : 400 minute (8 x 50 minute)

Meeting of the : 2nd, 3rd, 4th and 5th

A. Instruction

1. General Instruction : End of lecture, student could explain about composition and function of nutrient for animals body
2. Specific Instruction : End of lecture, student could explain about nutrient composition of feedstuffs based on Weende and Van Soest analysis method as well as conversion on nutrient content; Nutrient composition of plant and animal and its function in animal body

B. V in Topi : Composition and function of nutrient for animal body

C. Sub Topic :

- nutrient composition of feedstuffs based on Weende and Van Soest analysis method as well as conversion on nutrient content
- Nutrient composition of plant and animal and its function in animal body

D. Teaching Learning Activity :

Steps	Teaching Activity	Student Activity	Teaching Instrument
Introduction	<ol style="list-style-type: none"> 1. Explain the general and specific instruction of the 2nd to 5th meeting 2. Explain the benefit of studying this topic 	Listening, question	LCD
Delivery	<ol style="list-style-type: none"> 3. Explain about nutrient composition fractionation based on Weende dan Van Soest analysis 4. Giving an example of nutrient composition based on Weende dan Van Soest analysis 5. Explain about the nutrient content of feedstuff based on fresh, air dry and oven dry 6. Explain how to convert nutrient content from fresh to air dry and into oven dry 7. Giving problem on nutrient content conversion 8. Giving home work on computation of nutrient content conversion 9. Stimulate question and comment from student 10. Explain about nutrient composition of plant and animal as well as the function in animal body 11. Giving home work to find at least 3 feedstuffs showing the nutrient composition base on Weende dan Van Soest analysis and explain which kind of animal could eat the feedstuffs and what is the function for the animal of those dominated nutrient in feedstuffs 12. Stimulate question and comment from student 	Listening, question Question and giving idea Question and giving idea Question, giving idea and Discussion Group discussion Question, giving idea and Discussion	Hand out of Composition and function of nutrient in animal body LCD Table of Feedstuffs Composition LCD
Closing Remark	<ol style="list-style-type: none"> 13. Summarize and highlight the importance 14. Giving hand out for the next topic 	Memperhatikan, sumbang saran dan mencatat komentar pengajar	LCD Hand-out-for-the-next-topic

E. Evaluation : using respon card, question and home work that give at the end of each meeting

F. References :

1. AOAC. 2005. Official Methods of Analysis of The Association of Official Agricultural Chemists. AOAC, Washington D.C.
2. Crampton, E.W. dan L.E. Harris. 1969. Applied Animal Nutrition. 2nd Ed. W.H. Freeman and Co., San Fransisco.

3. Cullison, A.E. 1978. Feeds and Feeding. Prentice Hall of Indian Private Ltd., New Delhi.
4. Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4th Ed. John Wiley & Sons, New York.
5. Sutardi, T. 1980. Landasan Ilmu Nutrisi. Book I. Departemen Ilmu Makanan Ternak Fakultas Peternakan Institut Pertanian Bogor, Bogor (Not Published).

LECTURING AGENDA UNIT

Duration : 500 minute (10 x 50 minute)

Meeting of the : 6th , 7th , 8th dan 9th

A. Instruction

1. General Instruction : End of lecture, student could explain about function and process of nutrient digestion and absorption in ruminant and non ruminant

2. Specific Instruction : End of lecture, student was capable to:

- a. Group animals base on the gastric, digestion phisiology and kind of feed eaten
- b. Differentiate the antomy and function of the digestive truct in the different kind of animal
- c. Differentiate the place and process of digestion and nutrient absopction that included carbohydrate, lipid, protein, vitamin and mineral
- d. Mastering of physiology control of feed intake

B. Main Topic : Function and process of nutrient digestion and absorption

C. Sub Topic :

- Anatomy of digestive organ of ruminant, non ruminant, pseudoruminant and poultry
- Digestion process and nutrient (carbohydrate, lipid, protein, vitamin dan mineral) absorption
- Physiology control of feed intake

D. Teaching Learning Activity

Steps	Teaching Activity	Student Activity	Teaching Instrument
Introduction	1. Explain the general and specific intruction of the 6 th to 9 th meeting 2. Explain the benefit of studying this topic	Listening, question	LCD
Delivery	3. Explain animal grouppping based on kind of feed eaten (herbivore, omnivore and karnivore) and give sample of the animals 4. Explain the digestive organs in succession from mout to anus 5. Explain animal grouppping based on their gastric (monogastric and poligastric) and give sample of the animals 6. Explain the meaning of digestion process included the 3 kind general digestion process 7. Explain animal grouppping based on digestion physiology (ruminant, non ruminant, pseudoruminant dan poultry) and give sample of the animals 8. Giving assignment to the group of student as follows: let each group choose a feedstuffs and explain how this feed would be digested in a specific animal (choose one animal per group) 9. Discuss the topic in the group and present the summury in the class 10. Guide the group or class discussion, stimulate question and comment 11. Summarize and highlight the importance 12. Explain the anatomy of digestive organ and its function in ruminant, non ruminant and poutry 13. Explain the nutrien digestion processes included carbohydrate, lipid, protein, vitamin, mineral and water untill it ready to be absorp 14. Explain the absorption process of end product of nutrient digestion and place of absorption along the digestive truct	Listening, question Question and giving idea Question and giving idea Question, giving idea and Discussion Work the assignment Group discussion Present the summary Class discussion Question, giving idea and Discussion Question, giving idea and Discussion Question, giving idea and Discussion	Hand out of this topic LCD Illustration of digestive organ of each animal LCD
Closing Remark	15. Summarize and highlight the importance	Question, giving idea and Discussion	LCD

	16. Giving hand out for the next topic	Giving hand out for the next topic	Hand out for the next topic
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E. Evaluation : using respon card, question and home work that give at the end of each meeting

F. References :

1. Lassiter, J.W., and H.M. Edwards. 1982. Animal Nutrition. Reston Publishing Company Inc. A Prentice-Hall Company, Reston.
2. Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4th Ed. John Wiley & Sons, New York.
3. Prawirokusumo, S. 1994. Ilmu Gizi Komparatif. Cetakan I. BPFE, Yogyakarta.
4. Sutardi, T. 1980. Landasan Ilmu Nutrisi. Book I. Departemen Ilmu Makanan Ternak Fakultas Peternakan Institut Pertanian Bogor, Bogor (Not Published).
5. Tillman, A.D., H. Hartadi, S. Reksohadiprodjo, S. Prawirokusumo and S. Lebdoesoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press, Yogyakarta.

LECTURING AGENDA UNIT

Duration : 200 minute (4 x 50 minute)

Meeting of the : 10th and 11th

A. Instruction

1. General Instruction : End of lecture, student could explain about function and process of nutrient digestion and absorption

2. Specific Instruction : End of lecture, student could classified the nutrient requirement for maintainace (protein dan energy); growth and fattening; Reproduction, lactation and production (work, egg, wool)

B. Main Topic : Nutrient requirement classification based on physiological status of the animal

C. Sub Topic : Nutrient requirement for: maintainace (protein dan energy); growth and fattening; Reproduction, lactation and production (work, egg, wool)

D. Teaching LeaRning Activity :

Steps	Teaching Activity	Student Activity	Teaching Instrument
Introduction	1. Explain the general and specisfic intruction of the 10 th to 11 th meeting 2. Explain the benefit of studying this topic	Listening, question	LCD
Delivery	3. Explain the meaning of nutrient requirement and the benefit for the animal 4. Explain nutrien requirement base on physiological status (maintanace, growth and fattening; Reproduction, lactation and production (work, egg, wool) 5. Explain how to read nutrient requirement in the table of nutrient requirement 6. Giving assignment: looking for nutrient requirement of specific animal at a certain physiological stage 7. Present the result 8. Stimulate questionand comment	Listening, question Question, giving idea and Discussion Group discussion Present the result Question, giving idea and Discussio	Hand out of this topic LCD Table of nutrient requirement of the kind of animal at the different physiological stages LCD
Closing Remark	9. Summarize and highlight the importance 10. Giving hand out for the next topic	Question, giving idea and Discussion Giving hand out for the next topic	LCD Hand out for the next topic

E. Evaluation : using respon card, question and home work that give at the end of each meeting

F. References :

1. Crampton, E.W. and L.E. Harris. 1969. Applied Animal Nutrition. 2nd Ed. W.H. Freeman and Co., San Fransisco.

2. Cullison, A.E. 1978. Feeds and Feeding. Prentice Hall of Indian Private Ltd., New Delhi.

3. Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4th Ed. John Wiley & Sons, New York.

4. Tillman, A.D., H. Hartadi, S. Reksohadiprodo, S. Prawirokusumo and S. Lebdoesoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press, Yogyakarta

LECTURING AGENDA UNIT

Duration : 100 minute (2 x 50 minute)

Meeting of the : 12th

A. Instruction

1. General Instruction : End of lecture, student could explain about the meaning and method used for feed digestion evaluation in ruminant and non ruminant
2. Specific Instruction : End of lecture, student could explain and choose the right digestion method for ruminant and non ruminant based on the available instrument.

B. Main Topic : Feed digestion evaluation method

C. Sub Topic : 1. The meaning of digestion; 2. Digestion method measurement : *In vivo* (indicator, total collection and force feeding), *In vitro*, *In sacco (in situ)*

D. Teaching Learning Activity :

Steps	Teaching Activity	Student Activity	Teaching Instrument
Introduction	<ol style="list-style-type: none"> 1. Explain the general and specific instruction of the 12th meeting 2. Explain the benefit of studying this topic 	Listening, question	LCD
Delivery	<ol style="list-style-type: none"> 3. Explain the meaning and evaluation method of feed digestion 4. Explain several methods of feed digestion {<i>In Vivo</i> (Indicator, Total collection, Force Feeding), <i>In Vitro</i>, <i>In Situ/In Sacco</i>} 5. Explain the benefit and the harmfulness of each method 6. Giving assignment to the student to look for feed digestion evaluation from student last task or journals 7. Present the result 8. Stimulate question and comment from the student 	Listening, question Question, giving idea and Discussion Group discussion Present the result Question, giving idea and Discussion	Hand out of this topic LCD Research report, journals LCD
Closing Remark	<ol style="list-style-type: none"> 9. Summarize and highlight the importance 10. Giving homework : looking a digestion evaluation method used in an experiment 11. Giving hand out for the next topic 	Question, giving idea and Discussion Giving hand out for the next topic	LCD Hand out for the next topic

E. Evaluation : using respon card, question and home work that give at the end of each meeting

F. References :

1. Crampton, E.W. and L.E. Harris. 1969. Applied Animal Nutrition. 2nd Ed. W.H. Freeman and Co., San Francisco.
2. Cullison, A.E. 1978. Feeds and Feeding. Animal Nutrition. Prentice Hall of Indian Private Ltd., New Delhi.
3. Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4th Ed. John Wiley & Sons, New York.
4. Tillman, A.D., H. Hartadi, S. Reksahadiprodjo, S. Prawirokusumo and S. Lebdoockojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press, Yogyakarta

LECTURING AGENDA UNIT

Duration : 100 minute (2 x 50 minute)
 Meeting of the : 13 th

A. Instruction

1. General Instruction : End of lecture, student could explain about feed nutrient balance
2. Specific Instruction : End of lecture, student could compute the nutrient balance especially the balance of N and C, energy and protein as well as mineral

B. Main Topic

: Feed nutrient balance

C. Sub Topic

: Nutrient balance ; N dan C balance; Mineral balance; Energy and protein balance

D. Teaching Learning Activity

Steps	Teaching Activity	Student Activity	Teaching Instrument
Introduction	<ol style="list-style-type: none"> 1. Explain the general and specific instruction of the 131th meeting 2. Explain the benefit of studying this topic 	Listening, question	LCD
Delivery	<ol style="list-style-type: none"> 3. Explain about the meaning of feed nutrient balance 4. Explain about feed nutrient balance, balance of N dan C, mineral, energy and protein 5. Giving sample of computation of each balance (N dan C, mineral, energy and protein) 6. Giving assignment of those computation (1 problem each) 7. Present the result 8. Stimulate question and comment 	Listening, question Question, giving idea and Discussion Discussion Group discussion Present the result Question, giving idea and Discussion	Hand out of this topic LCD Research report, journals LCD
Closing Remark	<ol style="list-style-type: none"> 9. Summarize and highlight the importance 10. Giving hand out for the next topic 	Question, giving idea and Discussion Giving hand out for the next topic	LCD Hand out for the next topic

E. Evaluation

: using respon card, question and home work that give at the end of each meeting

F. References :

1. Cullison, A.E. 1978. Feeds and Feeding. Animal Nutrition. Prentice Hall of Indian Private Ltd., New Delhi.
2. Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4th Ed. John Wiley & Sons. New York.
3. Tillman, A.D., H. Hartadi, S. Reksohadiprodjo, S. Prawirokusumo and S. Lebdoesoekjo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press. Yogyakarta.

LECTURING AGENDA UNIT

Duration : 100minute (2 x 50 minute)
 Meeting of the : 14th

- A. Instruction
1. General Instruction : End of lecture, student could explain about energy value of feedstuff
 2. Specific Instruction : End of lecture, student could choose the right method to evaluate the energy of feedstuffs for the different kind of animal than computed base on the different criteria of energy(Gross Energy, Digestible Energy, Metabolizable Energy, Heat Increment, NetEnergy)
- B. Main Topic : Energy value of feedstuff
 C. Sub Topic : Gross Energy, Digestible Energy, Metabolizable Energy, Heat Increment , Net Energy

D. Teaching Learning Activity

Steps	Teaching Activity	Student Activity	Teaching Instrument
Introduction	<ol style="list-style-type: none"> 1. Explain the general and specific intruction of the 14th meeting 2. Explain the benefit of studying this topic 	Listening, question	LCD
Delivery	<ol style="list-style-type: none"> 3. Explain the meaning of feedstuffs energy value 4. Explain the different kind of energy value in feedstuffs (Gross Energy, Digestible Energy, Metabolizable Energy, Heat Increment, Net Energy) 5. Explain the relationship of those energy values (Gross Energy, Digestible Energy, Metabolizable Energy, Heat Increment, Net Energy) 6. Giving sample of a feedstuffs energy value and explain how to get the value, and let the student categorize the value 7. Giving several cases on grouping feedstuffs energy value wheather it include as GE, DE dan ME 8. Present the result 9. Stimulate question and comment 	Listening, question Question, giving idea and Discussion Question, giving idea and Discussion Discussion Group discussion Present the result Question, giving idea and Discussion	Hand out of this topic LCD Research report, journals LCD LCD LCD
Closing Remark	<ol style="list-style-type: none"> 10. Summarize and highlight the importance 11. Giving hand out for the next topic 	Question, giving idea and Discussion Giving hand out for the next topic	LCD Hand out for the next topic

E. Evaluation : using respon card, question and home work that give at the end of each meeting

F. References :

1. Crampton, E.W. and L.E. Harris. 1969. Applied Animal Nutrition. 2nd Ed. W.H. Freeman and Co., San Fransisco.
2. Cullison, A.E. 1978. Feeds and Feeding. Animal Nutrition. Prentice Hall of Indian Private Ltd., New Delhi.
3. Lassiter, J.W. and H.M. Edwards. 1982. Animal Nutrition. Reston Publishing Company Inc. A Prentice-Hall Co., Reston.
4. Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4th Ed. John Wiley & Sons, New York.
5. Tillman, A.D., H. Hartadi, S. Reksohadiprodjo, S. Prawirokusumo and S. Lebdosoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press, Yogyakarta.

LECTURING AGENDA UNIT

WaDuration : 100 minute (2 x 50 minute)
 Meeting of the : 15th

A. Instruction

1. General Instruction : End of lecture, student could compute and used of energy unit system and protein balance in feed
2. Specific Instruction : End of lecture, student could compute and applied the energy system in relation to balancing with the protein in the feed

B. Main Topic

: Energy unit system and protein balance in feed

C. Sub Topic

: Starch Grade, Milk Grade, Futter Einhet (FE); Total digestible nutrients (TDN) dan protein balance

D. Teaching Learning Activity

Steps	Teaching Activity	Student Activity	Teaching Instrument
Introduction	<ol style="list-style-type: none"> 1. Explain the general and specific instruction of the 15th meeting 2. Explain the benefit of studying this topic 	Listening, question	1.CD
Delivery	<ol style="list-style-type: none"> 3. Explain the meaning of sistem enegy unit and protein balance 4. Explain about the diffrent kind of enegy unit (Starch Grade, Milk Grade, Futter Einhet (FE); Total digestible nutrients/TDN) and protein balance 5. Giving some value of those energy unit and explain or asking the student the meaning of the value 6. Giving problem of Starch Grade, Milk Grade, Futter Einhet (FE); Total digestible nutrients/TDN) and protein balance 	Listening, question Question, giving idea and Discussion Question, giving idea and Discussion Discussion Question, giving idea and Discussion	Hand out of this topic LCD Research report, journals LCD
Closing Remark	<ol style="list-style-type: none"> 7. Summarize and highlight the importance 8. Giving hand out for the next topic 	Question, giving idea and Discussion Giving hand out for the next topic	LCD Hand out for the next topic

E. Evaluation : using respon card, question and home work that give at the end of each meeting

F. References

1. Crampton, E.W. and L.E. Harris. 1969. Applied Animal Nutrition. 2nd Ed. W.H. Freeman and Co., San Fransisco.
2. Cullison, A.E. 1978. Feeds and Feeding. Animal Nutrition. Prentice Hall of Indian Private Ltd., New Delhi.
3. Soelistyono, H.S. 1976. Dasar-dasar Ilmu Makanan Ternak. Cetakan Kedua. Fakultas Peternakan Universitas Diponegoro. Semarang (Not Published).

LECTURING AGENDA UNIT

Duration : 100 minute (2 x 50 minute)
 Meeting of the : 16th

- A. Instruction
 1. General Instruction : End of lecture, student could explain about feed protein evaluation
 2. Specific Instruction : End of lecture, student could choose and apply on feed protein evaluation in ruminant and non ruminant
 B. Main Topic : Feed protein evaluation

C. Sub Topic : Protein quality measurement in ruminant; Protein quality measurement in non-ruminant

D. Teaching Learning Activity

Steps	Teaching Activity	Student Activity	Teaching Instrument
Introduction	1. Explain the general and specific instruction of the 16 th meeting 2. Explain the benefit of studying this topic	Listening, question	LCD
Delivery	3. Explain the meaning of feed protein evaluation 4. Explain the different kind of method on feed protein evaluation included biological value, protein efficiency ratio, nitrogen retention, net protein retention and net protein utilization 5. Giving cases on feed protein evaluation in ruminant a. Ask the student about the right method b. Discuss the answer in terms of the benefit and the harmfulness of the method c. Explain the main principles on doing feed protein evaluation in ruminant d. Summarized and highlight the right method on feed protein evaluation in ruminant e. 6. Giving cases on feed protein evaluation in non ruminant a. Ask the student about the right method b. Discuss the answer in terms of the benefit and the harmfulness of the method c. Explain the main principles on doing feed protein evaluation in non ruminant d. Summarized and highlight the right method on feed protein evaluation in non ruminant	Listening, question Question, giving idea and Discussion Discussion Question, giving idea and Discussion Question, giving idea and Discussion discussion Question, giving idea and Discussion Question, giving idea and Discussion	Hand out of this topic LCD Research report, journals LCD LCD
Closing Remark	7. Summarize and highlight the importance	Question, giving idea and Discussion	LCD

E. Evaluation : using respon card, question and home work that give at the end of each meeting

F. References :

1. Crampton, E.W. and L.E. Harris. 1969. Applied Animal Nutrition. 2nd Ed. W.H. Freeman and Co., San Fransisco.
2. Cullison, A.E. 1978. Feeds and Feeding. Animal Nutrition. Prentice Hall of Indian Private Ltd., New Delhi.
3. Lassiter, J.W. and H.M. Edwards. 1982. Animal Nutrition. Reston Publishing Company Inc. A Prentice-Hall Co., Reston.
4. Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4th Ed. John Wiley & Sons, New York.
5. Tillman, A.D., H. Hartadi, S. Reksohadiprodjo, S. Prawirokusumo dan S. Lebdoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press, Yogyakarta.

COURSE OUTLINE

Subject Studied	:	Basic Animal Nutrition
Subject Code/Credits	:	_____ / 3(2-1)
Description	:	Knowlegde of: (1) Definition of nutrition science, feedstuffs classification, nutrient composition of feedstuffs based of Weende and Van Soest analysis method, computing nutrient content and energy of feedstuffs based on Weende proximate analysis; (2) Digestion system, function and nutrient digestion processes until it absorbed in different kind of animal based on their anatomy, physiology and kind of feed eaten.
General Instruction	:	End of lecture, student could understand and explain about nutrients composition of feedstuff, computing nutrient content and energy of feedstuffs based on Weende proximate and Van Soest analysis; the student could also master and differentiate digestion processes as well as nutrient absorption in the different kind of animal based on its physiological status
Laboratory Topics	:	Introducing and identification the different kind of feedstuff, digestion organs of ruminant, non ruminant, pseudo ruminant and poultry; computing DE, ME and TDN value of feed.

No.	Specific Instruction	Main Topic	Sub Topic	Time Estimation	References
1.	End of lecture, student could explain about definition, history and development of nutrition science; the objective of learning basic animal nutrition; the relation of other sciences and feedstuffs classification	The history and development of nutrition science	<ul style="list-style-type: none"> • Course outline • definition, history and development of nutrition science • the objective of learning basic animal nutrition • the relation of other sciences • International feedstuffs classification 	2 x 50 menit	Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4 th Ed. John Wiley & Sons, New York. Sutardi, T. 1980. Landasan Ilmu Nutrisi. Book 1. Departemen Ilmu Makanan Ternak Fakultas Peternakan Institut Pertanian Bogor, Bogor (Not Published). Tillman, A.D., H. Hartadi, S. Reksohadiprodjo, S. Prawirokusumo and S. Lebdoesoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press, Yogyakarta.
2.	End of lecture, student could explain about composition and function of nutrient for animals body	Composition and function of nutrient for animal body	<ul style="list-style-type: none"> • nutrient composition of feedstuffs based on Weende and Van Soest analysis method as well as conversion on nutrient content • Nutrient composition of plant and animal and its function in animal body 	8 X 50 menit	AOAC. 2005. Official Methods of Analysis of The Association of Official Agricultural Chemists. AOAC, Washington D.C. Crampton, E.W. and L.E. Harris. 1969. Applied Animal Nutrition. 2 nd Ed. W.H. Freeman and Co., San Fransisco. Cullison, A.E. 1978. Feeds and Feeding. Prentice Hall of Indian Private Ltd., New Delhi. Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4 th Ed. John Wiley & Sons, New York. Sutardi, T. 1980. Landasan Ilmu Nutrisi. Book 1. Departemen Ilmu Makanan Ternak .Fakultas Peternakan Institut Pertanian Bogor. Bogor (Not Published).
3.	End of lecture, student could explain about function and process of nutrient digestion and absorption in ruminant and non ruminant	Function and process of nutrient digestion and absorption	<ul style="list-style-type: none"> • Anatomy of digestive organ of ruminant, non ruminant, pseudoruminant and poultry • Digestion process and nutrient (carbohydrate, lipid, protein, vitamin dan mineral) absorption • Physiology of feed intake 	8 x 50 menit	Lassiter, J.W. and H.M. Edwards. 1982. Animal Nutrition. Reston Publishing Company Inc. A Prentice-Hall Company, Reston. Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4 th Ed. John Wiley & Sons, New York. Prawirokusumo, S. 1994. Ilmu Gizi Komparatif. Cetakan 1. BPFE, Yogyakarta. Sutardi, T. 1980. Landasan Ilmu Nutrisi. Book 1. Departemen Ilmu

					Makanan Ternak Fakultas Peternakan Institut Pertanian Bogor, Bogor (Not Published). Tillman, A.D., H. Hartadi, S. Reksohadiprodjo, S. Prawirokusumo and S. Lebdoesoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press, Yogyakarta.
4.	End of lecture, student could explain about function and process of nutrient digestion and absorption	Nutrient requirement classification based on physiological status of the animal	<ul style="list-style-type: none"> • Nutrient requirement for: <ul style="list-style-type: none"> • maintainace (protein dan energy) • growth and fattening • Reproduction, lactation and production (work, egg, wool) 	4 x 50 menit	Crampton, E.W. and L.E. Harris. 1969. Applied Animal Nutrition. 2 nd Ed. W.H. Freeman and Co., San Fransisco. Cullison, A.E. 1978. Feeds and Feeding. Prentice Hall of Indian Private Ltd., New Delhi. Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4 th Ed. John Wiley & Sons, New York. Tillman, A.D., H. Hartadi, S. Reksohadiprodjo, S. Prawirokusumo and S. Lebdoesoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press, Yogyakarta.
5.	End of lecture, student could explain about the meaning and method used for feed digestion evaluation in ruminant and non ruminant	Feed digestion evaluation method	<ul style="list-style-type: none"> • The meaning of digestion • Digestion method measurement : <ul style="list-style-type: none"> • <i>In vivo</i> (indicator, total kolektion and force feeding) • <i>In vitro</i> • <i>In sacco (in situ)</i> 	2 x 50 menit	Crampton, E.W. and L.E. Harris. 1969. Applied Animal Nutrition. 2 nd Ed. W.H. Freeman and Co., San Fransisco. Cullison, A.E. 1978. Feeds and Feeding. Animal Nutrition. Prentice Hall of Indian Private Ltd., New Delhi. Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4 th Ed. John Wiley & Sons, New York. Tillman, A.D., H. Hartadi, S. Reksohadiprodjo, S. Prawirokusumo and S. Lebdoesoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press, Yogyakarta.
6.	End of lecture, student could explain about feed nutrient balance	feed nutrient balance	<ul style="list-style-type: none"> • Nutrient balance • N dan C balance • Mineral balance • Energy and protein balance 	2 x 50 menit	Cullison, A.E. 1978. Feeds and Feeding. Animal Nutrition. Prentice Hall of Indian Private Ltd., New Delhi. Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4 th Ed. John Wiley & Sons, New York. Tillman, A.D., H. Hartadi, S. Reksohadiprodjo, S. Prawirokusumo and S. Lebdoesoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press, Yogyakarta.
7.	End of lecture, student could explain about energy value of feedstuff	Energy value of feedstuff	<ul style="list-style-type: none"> • <i>Gross Energy</i> (GE), <i>Digestible Energy</i> (DE), <i>Metabolizable Energy</i> (ME), Heat Increament (HI), <i>Net Energy</i> (NE) 	2 x 50 menit	Crampton, E.W. and L.E. Harris. 1969. Applied Animal Nutrition. 2 nd Ed. W.H. Freeman and Co., San Fransisco. Cullison, A.E. 1978. Feeds and Feeding. Animal Nutrition. Prentice Hall of Indian Private Ltd., New Delhi. Lassiter, J.W. and H.M. Edwards. 1982. Animal Nutrition. Reston Publishing Company Inc. A Prentice-Hall Co., Reston. Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4 th Ed. John Wiley & Sons, New York. Tillman, A.D., H. Hartadi, S. Reksohadiprodjo, S. Prawirokusumo and S. Lebdoesoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press, Yogyakarta.
8.	End of lecture, student could compute and used energy unit	energy unit system and	<ul style="list-style-type: none"> • Starch Grade, Milk Grade, Futter Einheit (FE) 	2 x 50	Crampton, E.W. and L.E. Harris. 1969. Applied Animal Nutrition. 2 nd Ed. W.H. Freeman and Co., San Fransisco.

	system and protein balance in feed	protein balance in feed	<ul style="list-style-type: none"> Total digestible nutrients (TDN) dan protein balance 	menit	<p>Cullison, A.E. 1978. Feeds and Feeding. Animal Nutrition. Prentice Hall of Indian Private Ltd., New Delhi.</p> <p>Soelistyono, H.S. 1976. Dasar-dasar Ilmu Makanan Ternak. Cetakan Kedua. Fakultas Peternakan Universitas Diponegoro, Semarang (Not Published).</p>
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9.	End of lecture. student could explain about feed protein evaluation	feed protein evaluation	<ul style="list-style-type: none"> • Protein quality measurement in ruminant • Protein quality measurement in non-ruminant 	2 x 50 menit	<p>Crampton, E.W. and L.E. Harris. 1969. Applied Animal Nutrition. 2nd Ed. W.H. Freeman and Co., San Fransisco.</p> <p>Cullison, A.E. 1978. Feeds and Feeding. Animal Nutrition. Prentice Hall of Indian Private Ltd., New Delhi.</p> <p>Lassiter, J.W. and H.M. Edwards. 1982. Animal Nutrition. Reston Publishing Company Inc. A Prentice-Hall Co., Reston.</p> <p>Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4th Ed. John Wiley & Sons, New York.</p> <p>Tillman, A.D., H. Hartadi, S. Reksohadiprodjo, S. Prawirokusumo and S. Lebdoesoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press. Yogyakarta.</p>
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COURSE : Forage Crops

COURSE CODE :

CREDIT : 3 (2-1)

ANIMAL SCIENCE FACULTY – DIPONEGORO UNIVERSITY
COURSE OUTLINE

- Course : Forage Crops
 Code number/credit : ----- / 3(2-1)
 Course Outline : Mastering forage science for the production of forage and seeds (discuss about the adaptation, distribution, systematic, morphology, identification, physiology, reproduction, cultivation of forage crops).
- General Instruction : After finishing this course, student will be able to understand and explain correctly about the adaptation and distribution, systematics, morphology, identification, physiology, reproduction and cultivation of forage crops
- References : 1. Crowder, L. V. And H. R. Chheda. 1982. Tropical Grassland Husbandry. Longman Group Ltd, London.
 2. Humphreys, L. R. 1980.a Tropical Pasture and Fodder Crops. 2nd Ed., ITAS, Longman Group Ltd., London
 3. Humphreys, L. R. 1980.b A Guide to Better pasture for the Tropics and Subtropics. 4th. Ed. Wright Stephenson and Co Pty. Ltd. Australia.
 4. McIlroy, R. L. 1976. Pengantar Budidaya Padang Rumput Tropika. Pradnya Paramita, Jakarta.
 5. Reksohadiprodjo, S. 1981. Produksi Tanaman Hijauan Makanan Ternak Tropik. Bagian Penerbitan Fakultas Ekonomi UGM, Yogyakarta.
 6. Whiteman, P. C. 1980. Tropical pasture Science. Oxford University Press, London.

No.	Specific Instruction	Topic	Sub Topic	Duration	Reference
1.	After finishing this lecture, student will be able to explain correctly about the roles of forage and its production.principle	Introduction	1. Forage crops 2. The role of forage 3. Production process principle	2 x 50 minute	L.R. Humphreys (1980) a pp. 7-12
2.	After finishing this lecture, student will be able to explain correctly about adaptation and distribution of forage crops	Adaptation and distribution of forage crops	1. Adaptation of forage crops 2. Distribution of forage crops	4 x 50 minute	R.J. Mc Ilroy (1976) pp 32-55 L.R. Humphreys (1980) a pp. 1-6
3.	After finishing this lecture, student will be able to explain correctly about systematics and morphology of grasses and legumes	Botany of grasses and legumes	1. Systematics of grasses and legumes 2. Morphology of grasses and legumes	4 x 50 minute	L.V. Crowder and Chheda (1980) pp. 47-62

4.	After finishing this lecture, student will be able to explain correctly about characteristic and adaptation of important types of grasses and legumes as forage crops	Grasses and legumes	1. Forage grasses 2. Forage legumes	4 x 50 minute	R.J. Mc Ilroy (1976) pp. 21-31 L.R. Humphreys (1980) b pp. 24-79
5.	Test			2 x 50 minute	
6.	After finishing this lecture, student will be able to explain correctly physiology of forage crops, the effect of environment for forage crop growth	Physiology of forage crops and environment effect for forage crop growth	1. Physiology of forage crops 2. The edaphic environment 3. The climatic environment	3 x 50 minute	L.V. Crowder and H.R. Chheda (1982) pp. 63-83 G.O. Mott and Popenoe (1977) pp. 157-187
7.	After finishing this lecture, student will be able to explain correctly about forage cultivation technique to build a forage crop land	Basics of making forage crop land	1. Land Preparation 2. Planting material 3. Forage cultivation	4 x 50 minute	L.R. Humphreys (1980) a pp 57-78 L.R. Humphreys (1980) b pp. 10-13
8.	After finishing this course, student will be able to explain correctly forage crop utilisation and take care of forage crop land	The usage and caring of forage crop land	1. Defoliation principle 2. Types of usage 3. The caring of the soil's fertility	4 x 50 minute	R.J. Mc Ilroy (1976) pp 73-89, 114-116 L.R. Humphreys (1980) b pp. 14-21

LECTURING AGENDA UNIT

Course : Forage Crops
 Code Course : ----- / 3 (2-1)
 Credit : 3 (three)
 Duration : 2 x 50 minute
 Session : 1

A. Purpose

1. General Instruction

After finishing this course, student will be able to understand and explain correctly about adaptation and distribution, systematics, morphology, identification, physiology, reproduction and cultivation of forage crops

2. Specific Instruction

After finishing this lecture, student will be able to understand and explain correctly about the role of forage and its production principle.

B. Topics : Introduction

C. Sub Topics

1. Forage crops
2. The role of forage crops
3. Production process principle

D. Teaching Activity

	Lecturer Activity		Student Activity	Media and teaching aids
Preface	1.	Explain the topics in first session	Paying attention	-
	2.	Explain the benefit of studying forage crops	Paying attention	-
	3.	Explain general and specific instruction in the first session	Paying attention	-
Content	4.	Explain definition of forage crops		OHP or LCD
	a.	Ask the student about forage crops	Answer the question	White board
	b.	Discuss student answer		
	c.	Explain the benefit of studying forage crops		
	5.	Explain the role of forage crops in animal production		OHP or LCD
	a.	Ask the student and discuss the answer of forage crops role	Discuss the answers	White board
	b.	Give clues to student about the role of forage crop in animal production	Paying attention	OHP IFP
	6.	Explain production process of forage crops		OHP or LCD
	a.	Ask the student and discuss the answer of forage crops role	Discuss the answer	White board
	b.	Explain the benefit of will be able to understand and explaining forage crops production process	Paying attention	OHP

Closing	7.	Closing first session		
	a.	Ask the student to summarize the lecture content	Give the answer	White board
	b.	Give time to student question	Ask question	
	c.	Explain overview the next lecture	Paying attention	OHP

E. Evaluation

1. Check list and quiz

F. Reference

- . Humphreys, L. R. 1980.a Tropical Pasture and Fodder Crops. 2nd Ed., ITAS, Longman Group td., London

LECTURING AGENDA UNIT

Course : Forage Crops
 Code Course : ----- / 3 (2-1)
 Credit : 3 (three)
 Duration : 4 x 50 minute
 Session : 2 and 3

A. Purpose

1. General Instruction
 After finishing this course, student will be able to understand and explain correctly about adaptation and distribution, systematics, morphology, identification, physiology, reproduction and cultivation of forage crops
2. Specific Instruction
 After finishing this lecture, student will be able to explain correctly about adaptation and distribution of forage crops

B. Topics : Adaptation and distribution of forage crops

C. Sub Topics

1. Adaptation of forage crops
2. Distribution of forage crops

D. Teaching Activity

	Lecturer Activity		Student Activity	Media and teaching aids
Preface	1.	Explain the topics in second and third session	Paying attention	-
	2.	Explain general and specific instruction in the second and third session	Paying attention	-
Content	3.	Explain adaptation of forage crops		OHP or LCD
	a.	Ask the student about forage crops adaptation	Answer the question	White board

	b.	Discuss student answer		
	4.	Explain the distribution of forage crops in world		OHP or LCD
	a.	Ask the student and discuss the answer of forage crops distribution	Discuss the answers	White board
	b.	Give clues to student about the adaptation and distribution of forage crop in world	Paying attention	OHP
Closing	5.	Closing first session		
	a.	Ask the student to summarize the lecture content	Give the answer	White board
	b.	Give time to student question	Ask question	
	c.	Explain overview the next lecture	Paying attention	OHP

E. Evaluation

1. Check list and quiz

F. References

- Humphreys, L. R. 1980.a Tropical Pasture and Fodder Crops. 2nd Ed., ITAS, Longman Group Ltd., London
- McIlroy, R. L. 1976. Pengantar Budidaya Padang Rumput Tropika. Pradnya Paramita, Jakarta.

LECTURINGAGENDA UNIT

Course	:	Forage Crops
Code Course	:	----- / 3 (2-1)
Credit	:	3 (three)
Duration	:	4 x 50 minute
Session	:	4, 5

A. Purpose

1. General Instruction
After finishing this course, student will be able to understand and explain correctly about adaptation and distribution, systematics, morphology, identification, physiology, reproduction and cultivation of forage crops
2. Specific Instruction
After finishing this lecture, student will be able to explain correctly about systematics and morphology of grasses and legumes

B. Topics : Botany of grasses and legumes

C. Sub Topics

1. Systematics of grasses and legumes
2. Morphology of grasses and legumes

D. Teaching Activity

	Lecturer Activity		Student Activity	Media and teaching aids
Preface	1.	Explain the topics in 4th and 5th session	Paying attention	-
	2.	Explain general and specific instruction in this session	Paying attention	-
Content	3.	Explain systematics of grasses		OHP or LCD
	a.	Ask the student about grasses	Answer the question	White board
	b.	Discuss student answer		
	4.	Explain systematics of legumes		OHP or LCD
	a.	Ask the student and discuss the answer	Discuss the answers	White board
	b.	Give clues to student about the systematics of grasses and legumes	Paying attention	OHP IFP
	5.	Explain morphology of grasses and legumes		OHP or LCD
	a.	Ask the student and discuss the answer	Discuss the answer	White board
	b.	Explain the benefit of will be able to understand and explaining morphology of grasses and legumes	Paying attention	OHP
Closing	7.	Closing 4th and 5th session		
	a.	Ask the student to summarize the lecture content	Give the answer	White board
	b.	Give time to student question	Ask question	
	c.	Explain overview the next lecture	Paying attention	OHP

E. Evaluation

2. Check list and quiz

F. References

Crowder, L. V. And H. R. Chheda. 1982. Tropical Grassland Husbandry. Longman Group Ltd, London.

LECTURING AGENDA UNIT

Course : Forage Crops
 Code Course : ----- / 3 (2-1)
 Credit : 3 (three)
 Duration : 4 x 50 minute
 Session : 6, 7

A. Purpose

1. General Instruction

After finishing this course, student will be able to understand and explain correctly about adaptation and distribution, systematics, morphology, identification, physiology, reproduction and cultivation of forage crops

2. Specific Instruction

After finishing this lecture, student will be able to explain correctly about characteristic and adaptation of important types of grasses and legumes as forage crops

B. Topics : Grasses and legumes

C. Sub Topics

1. Forage grasses
2. Forage legumes

D. Teaching Activity

	Lecturer Activity		Student Activity	Media and teaching aids
Preface	1.	Explain the topics in this session	Paying attention	-
	2.	Explain general and specific instruction in the first session	Paying attention	-
Content	3.	Explain characteristic and adaptation of grasses		OHP or LCD
	a.	Ask the student about identification of grasses	Answer the question	White board
	b.	Discuss student answer		
	c.	Explain the benefit of studying characteristic and adaptation of grasses		
	4.	Explain characteristic and adaptation of legumes		OHP or LCD
	a.	Ask the student and discuss the answer	Discuss the answers	White board
	b.	Give clues to student about the characteristic and adaptation of legumes	Paying attention	OHP IFP
Closing	5.	Closing this session		
	a.	Ask the student to summarize the lecture content	Give the answer	White board
	b.	Give time to student question	Ask question	
	c.	Explain overview the next lecture	Paying attention	OHP

E. Evaluation

1. Check list and quiz

F. References

- Humphreys, L. R. 1980. *A Guide to Better pasture for the Tropics and Subtropics*. 4th. Ed. Wright Stephenson and Co Pty. Ltd. Australia
- McIlroy, R. L. 1976. *Pengantar Budidaya Padang Rumput Tropika*. Pradnya Paramita, Jakarta.
- Reksohadiprodjo, S. 1981. *Produksi Tanaman Hijauan Makanan Ternak Tropik*. Bagian Penerbitan Fakultas Ekonomi UGM, Yogyakarta

LECTURING AGENDA UNIT

Course	:	Forage Crops
Code Course	:	----- / 3 (2-1)
Credit	:	3 (three)
Duration	:	8 x 50 minute
Session	:	8, 9, and 10

A. Purpose

1. General Instruction

After finishing this course, student will be able to understand and explain correctly about adaptation and distribution, systematics, morphology, identification, physiology, reproduction and cultivation of forage crops

2. Specific Instruction

After finishing this lecture, student will be able to explain correctly physiology of forage crops, the effect of environment for forage crop growth

B. Topics

Physiology of forage crops and environment effect for forage crop growth

C. Sub Topics

1. Physiology of forage crops
2. The edaphic environment
3. The climatic environment

D. Teaching Activity

	Lecturer Activity		Student Activity	Media and teaching aids
Preface	1.	Explain the topics in this session	Paying attention	-
	2.	Explain general and specific instruction in this session	Paying attention	-
Content	3.	Explain physiology of forage crops		OHP or LCD
	a.	Ask the student about physiology of forage crops	Answer the question	White board
	b.	Discuss student answer		

		c.	Explain the benefit of studying physiology of forage crops		
	4.		Explain the effect of edaphic environment on forage crops		OHP or LCD
		a.	Ask the student and discuss the answer	Discuss the answers	White board
		b.	Give clues to student about the effect of edaphic environment	Paying attention	OHP IFP
	5.		Explain the effect of climatic environment on forage crops		OHP or LCD
		a.	Ask the student and discuss the answer	Discuss the answer	White board
		b.	Explain the benefit of will be able to understand and explaining the effect of climatic environment on forage crops	Paying attention	OHP
Closing	6.		Closing first session		
		a.	Ask the student to summarize the lecture content	Give the answer	White board
		b.	Give time to student question	Ask question	
		c.	Explain overview the next lecture	Paying attention	OHP

E. Evaluation

1. Check list and quiz

F. References

- Crowder, L. V. And H. R. Chheda. 1982. Tropical Grassland Husbandry. Longman Group Ltd, London
- Humphreys, L. R. 1980.a Tropical Pasture and Fodder Crops. 2nd Ed., ITAS, Longman Group Ltd., London

LECTURING AGENDA UNIT

Course	:	Forage Crops
Code Course	:	----- / 3 (2-1)
Credit	:	3 (three)
Duration	:	4 x 50 minute
Session	:	11, 12

A. Purpose

1. General Instruction
After finishing this course, student will be able to understand and explain correctly about adaptation and distribution, systematics, morphology, identification, physiology, reproduction and cultivation of forage crops
2. Specific Instruction
After finishing this lecture, student will be able to explain correctly forage cultivation technique to build forage crop land

B. Topics : Basics of making forage crop land

C. Sub Topics

1. Land Preparation
2. Planting material
3. Forage cultivation

D. Teaching Activity

	Lecturer Activity		Student Activity	Media and teaching aids
Preface	1.	Explain the topics in this session	Paying attention	-
	2.	Explain general and specific instruction in the first session	Paying attention	-
Content	3.	Explain land preparation for grassland	Paying attention	OHP or LCD
	a.	Ask the student about how to set up grassland	Answer the question	White board
	b.	Discuss student answer		
	4.	Explain forage cultivation	Paying attention	OHP or LCD
	a.	Ask the student and discuss forage cultivation	Discuss the answers	White board
	b.	Give clues to student about forage cultivation	Paying attention	OHP IFP
Closing	6.	Closing first session		
	a.	Ask the student to summarize the lecture content	Give the answer	White board
	b.	Give time to student question	Ask question	
	c.	Explain overview the next lecture	Paying attention	OHP

E. Evaluation

1. Check list and quiz

F. References

- Humphreys, L. R. 1980.a Tropical Pasture and Fodder Crops. 2nd Ed., ITAS, Longman Group Ltd., London
- Humphreys, L. R. 1980.b A Guide to Better pasture for the Tropics and Subtropics. 4th. Ed. Wright Stephenson and Co Pty. Ltd. Austr

LECTURING AGENDA UNIT

Course : Forage Crops
 Code Course : ----- / 3 (2-1)
 Credit : 3 (three)
 Duration : 4 x 50 minute
 Session : 13, 14

A. Purpose

1. General Instruction

After finishing this course, student will be able to understand and explain correctly about adaptation and distribution, systematics, morphology, identification, physiology, reproduction and cultivation of forage crops

2. Specific Instruction

After finishing this course, student will be able to explain correctly forage crop utilisation and take care of forage crop land

B. Topics : The usage and caring of forage crop land

C. Sub Topics

1. Types of usage
2. Defoliation principle
3. The caring of soil's fertility

D. Teaching Activity

	Lecturer Activity		Student Activity	Media and teaching aids
Preface	1.	Explain the topics in first session	Paying attention	-
	2.	Explain the benefit of studying The usage and caring of forage crop land	Paying attention	-
	3.	Explain general and specific instruction in the first session	Paying attention	-
Content	4.	Explain types of usage of forage crops		OHP or LCD
	a.	Ask the student about types of usage of forage crops	Answer the question	White board
	b.	Discuss student answer		
	5.	Explain forage crop defoliation		OHP or LCD
	a.	Ask the student and discuss the answer	Discuss the answers	White board
	b.	Give clues to student about the defoliation of forage crop	Paying attention	OHP IFP
	6.	Explain the caring of soil's fertility	Paying attention	OHP or LCD
	a.	Ask the student and discuss the answer of renovation	Discuss the answer	White board
	b.	Explain the benefit of the caring of soil's fertility	Paying attention	OHP
Closing	7.	Closing first session		
	a.	Ask the student to summarize the lecture content	Give the answer	White board

	b.	Give time to student question	Ask question	
	c.	Explain overview the next lecture	Paying attention	OHP

E. Evaluation

1. Check list and quiz

F. References

- Humphreys, L. R. 1980. A Guide to Better pasture for the Tropics and Subtropics. 4th. Ed. Wright Stephenson and Co Pty. Ltd. Australia.
- McIlroy, R. L. 1976. Pengantar Budidaya Padang Rumput Tropika. Pradnya Paramita, Jakarta.

COURSE : Feed Matter and Rations
Formulation

COURSE CODE :

CREDIT : 3 (2-1)

LECTURING AGENDA UNIT

Subject Studied : Feed Matter and Rations Formulation
Code : PTF 405 P
SCS : 3(2-1)
Session Duration : 1 x (2 x 50 minutes)
Session : 1

- A. Objective** :
1. **General Instructional** : At the end of this course, student will be able to categorize feed matter and its nutrition contains used to compose rations and evaluate the quality of feed matter based on proximate analysis.
 2. **Specific Instructional** : At the end of this course, student will be able to explain the feed problems in Indonesia, the aim in learning The Feed Matter and Rations Formulation and the interrelationships with other related field of science.
- B. Major Topic** : Preface
- C. Minor Topic** : Contract of course, definition and feed matter problems, the scope of field of science, aim in learning feed matter and rations formulation

D. Teaching Activity :

Stage	Teacher Activity	Student Activity	Media and Teaching Tools
Preface	1. Giving contract of course	Paying attention	Copy of Course contract, LCD
Presentation	2. Giving the scope of the course's material	Paying attention	LCD
	3. Definition of feed matter, feed nutrients, rations	Paying attention, asking and discussion	
	4. Explaining the problems of feed matter and rations in Indonesia	Paying attention, asking and discussion	
	5. Explaining the interrelationships with other related field of science	Paying attention, asking and discussion	

Closing	6. Giving stressing/ summarizing the result of discussion as mention on preface	Paying attention, giving feed back, and writting teacher's comments	LCD
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E. Evaluation : Using work book or response card toward Student Activity in class and take home test

F. References :

1. Pond, W.G., D.C. Church, and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4th Ed. John Wiley & Sons, New York.
2. Cullison, A.E. 1978. Feeds and Feeding. Animal Nutrition. Prentice Hall of Indian Private Ltd. New Delhi.
3. Tillman, A.D., H. Hartadi, S. Reksohadiprodjo, dan S. Lebdoesoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press. Yogyakarta.

LECTURING AGENDA UNIT

Subject Studied : Feed Matter and Rations Formulation
Code : PTF 405 P
SCS : 3(2-1)
Session Duration : 2 x (2 x 50 minutes)
Session : 2 and 3

- A. Objective** :
1. **General Instructional** : At the end of this course, student will be able to mention classification of feed matter both generally and internationally and able to do feed matter sampling representatively.
 2. **Specific Instructional** : At the end of this course, student will be able to:
 1. Mention correctly about Basis of Feed Matter Classification
 2. Differentiate the criteria of each group/ classification
 3. Do sampling of feed matter/ rations according to the good sampling technique correctly

B. Major Topic : Feed Matter Classification and Sampling

C. Minor Topic : Basis of feed matter classification, the criteria of each group, and sampling technique and the handling of forage and concentrate sample

D. Teaching Activity :

Stage	Teacher Activity	Student Activity	Media and Teaching Aids
Preface	1. Explaining about the basis condition of feed matter and rations according to the goal of farming business	Paying attention - Giving feed back	LCD, Blackboard, OHP
	2. Explaining about the importance of feed classification	Paying attention - Giving feed back	
	3. Explaining about the importance of sampling	Paying attention - Giving feed back	
Presentation	4. Several methods in classify feed matter and rations	Paying attention - Giving feed back	LCD, Blackboard, OHP

	5. Explaining feed matter grouping based on the classification methods and the implementation in rations	Paying attention - Giving feed back	
	6. Explaining how to do sampling based on the correct sampling tehnik appropriate with the classification	Paying attention - Giving feed back	
Closing	7. Making group discussion 8. Giving the students opportunity to ask a question or having discussion with other groups	Discussion and giving response Clarify and getting agreement appropriate with the material	Discussion, LCD

E. Evaluation : Using work book or response card toward Student Activity in class and take home test

F. References :

1. Harris, L.E. 1970. Nutrition Research Techniques for Domestic and Wild Animal. Utah State University, Logan Utah.
2. Tillman, A.D., H. Hartadi, S. Reksohadiprodjo, S. Prawirokoesoemo, dan S. Lebdoesoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjah Mada University Press. Yogyakarta.
3. Jurgens, M.H. 1974. Applied Animal Feeding and Nutrition. 3rd Ed. Kendal/Hunt Publishing Co., Iowa.

FAKULTAS PETERNAKAN UNIVERSITAS DIPONEGORO
 COURSE OUTLINE

- Subject studied** : Feed Matter and Rations Formulation
- Code number/ SCS** : PTF 405 P/ 3(2-1)
- Course Outline** : Studying the limitation in nutrition and livestock feed; the classification of feed matter and its use; testing the quality of feed matter, the principles of proximate analysis; feed supplement and rations formulation.
- General Instruction** : At the end of this course, student will be able to categorize feed matter and its nutrition contains used to compose rations and evaluate the quality of feed matter based on proximate analysis.

No.	Specific Instruction	Major Topic	Minor Topic	Time Estimation	Reading Source
1.	At the end of this course, student will be able to explain the feed problems in Indonesia, the aim in learning The Feed Matter and Rations Formulation and the interrelationships with other related field of science.	Preface	<ul style="list-style-type: none"> Contract of course Definition and Feed Matter Problems The scope of field of science Aim in learning Feed Matter and Rations Formulation 	2x50 minutes	Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. Ed. 4 th John Wiley & Sons, New York. Cullison, A.E. 1978. Feed and Feeding. Animal Nutrition Prentice Hall of Indian Private Ltd. New Delhi. Tillman, A.D., H. Hartadi, S.Reksohadiprodjo, S. Prawirokusumo and Lebdoesoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjahmada University Press. Yogyakarta.
2.	At the end of this course, student will be able to mention classification of feed matter both generally and internationally and able to do feed matter sampling representatively.	Feed Matter Classification and Sampling	<ul style="list-style-type: none"> Basis of Feed Matter Classification The criteria of each group Sampling technique and the handling of forage and concentrate sample 	4x50 minutes	Harris, L.E. 1970. Nutrition Research Techniques for Domestic and Wild Animal. Utah State University, Logan, Utah, USA 2.Tillman, A.D.,H. Hartadi, S.Reksohadiprodjo, S.Prawirokusumo and S.Lebdoesoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjahmada University Press. Yogyakarta. Jurgens, M.H. 1974. Applied Animal Feeding and Nutrition. 3 rd Edition. Kendal/Hunt Publishing Co. Iowa, USA
3.	At the end of this course, student will	Testing The Quality of Feed	<ul style="list-style-type: none"> The aim and methods 		AOAC. 1970. Official Methods of Analysis of The



No.	Specific Instruction	Major Topic	Minor Topic	Time Estimation	Reading Source
	be able to explain the methods of feed quality physically and chemically and also able to do proximate analysis.	Matter	<ul style="list-style-type: none"> • Testing technique and procedures • The factors that influence feed quality • Information about Feed Matter Analysis Table 	6x50 minutes	Association of Official Agricultural Chemists. Washington DC, USA. Harris, L.E. 1970. Nutrition Research Techniques for Domestic and Wild Animal. Utah State University, Logan, Utah, USA. PCAARD. 1987. The Philipines Recommends for Livestocks Feed Formulation. Technical Bulletin No. 64. PCAARD, Los Banos
4.	At the end of this course, student will be able to explain the limitation and mention the plants and animal feed both conventional and in conventional	Plants and Animal Feed Matter	<ul style="list-style-type: none"> • Conventional Plants and Animal Feed Matter • In conventional Plants and Animal Feed Matter 	4x50 minutes	Koloman Bod'a. 1990. Non Conventional Feedstuffs in The Nutrition of Farm Animal. Development in Animal and Veterinary Science. 23. Elsevier Science Publishing Company. Inc. New York. Tillman, A.D.,H. Hartadi, S.Reksohadiprodo,S.Prawirokusumo and S.Lebdosoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjahmada University Press. Yogyakarta.
5.	At the end of this course, student will be able to explain and mention several anti quality factors on feed matter	Anti quality factors on feed matter	<ul style="list-style-type: none"> • The classification of anti quality factors on feed matter • The limitation in using feed matter contains anti quality factors in rations formulation 	2x50 minutes	Cullison, A.E. 1978. Feed and Feeding. Animal Nutrition Prentice Hall of Indian Private Ltd. New Delhi. Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4 th . Edition. John Wiley & Sons, New York. Tilden Wayne Perry. 1982. Feed Formulation. 4 th . Edition. The Interstate Printers and Publisers. Inc. Andville. Illinois.
	At the end of this course, student will be able to explain and mention feed supplements and also use it both nutritive and non nutritive	Feed Supplements	<ul style="list-style-type: none"> • Nutritive feed supplements • Non-nutritive feed supplements • Function and the doses of using 	2x50 minutes	Cullison, A.E. 1978. Feed and Feeding. Animal Nutrition Prentice Hall of Indian Private Ltd. New Delhi. Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. 4 th . Edition. John Wiley & Sons, New York. Tilden Wayne Perry. 1982. Feed Formulation. 4 th . Edition. The Interstate Printers and Publisers. Inc.

FAKULTAS PETERNAKAN UNIVERSITAS DIPONEGORO
 COURSE OUTLINE

No.	Specific Instruction	Major Topic	Minor Topic	Time Estimation	Reading Source
6.	At the end of this course, student will be able to mention and explain the pre requirements of feed matter selection and also explain several methods of rations formulation according to the purpose of animal husbandry business	Basis of Rations Formulation	<ul style="list-style-type: none"> • Basis of feed matter selection • Methods in rations formulation • Trial and error method • Diagonal method (Pearson's square method) • Linear programming method 	12x50 minutes	<p>Andville. Illinois.</p> <p>Cullison, A.E. 1978. Feed and Feeding. Animal Nutrition Prentice Hall of Indian Private Ltd. New Delhi.</p> <p>Pond, W.G., D.C. Church and K.R. Pond. 1995. Basic Animal Nutrition and Feeding. Ed. 4th John Wiley & Sons, New York.</p> <p>Tillman, A.D.,H. Hartadi, S.Reksohadiprodjo, S.Prawirokusumo and S.Lebdosoekojo. 1998. Ilmu Makanan Ternak Dasar. Gadjahmada University Press. Yogyakarta</p> <p>Tilden Wayne Perry. 1982. Feed Formulation. 4th. Edition. The Interstate Printers and Publisers. Inc. Andville. Illinois.</p>

COURSE : Technology and Processing of
Animal Product

COURSE CODE :

CREDIT :

FAKULTAS PETERNAKAN UNIVERSITAS DIPONEGORO
GARIS BESAR PROGRAM PENGAJARAN

The title of subject : **Technology and Processing of animal Product**
 Nomor Kode/sks :
 Description of subject : to study about technology of milk, meat, egg, hide and animal by product processing, preservation and standardization of product according to SNI and WHO.

General instructional object : After following this subject, students can do handling and processing of animal product and can identify standardization of product.

- Literature List :
1. Hadiwiyo, S, 1983. Hasil-hasil Olahan Susu, Ikan, Daging, Telur. Penerbit: Liberty Yogyakarta.
 2. Hadiwiyo, S, 1994. Teori dan Prosedur Pengujian Mutu Susu dan Hasil Olahannya. Penerbit: Liberty Yogyakarta.
 3. Buckle, LA, RA. Edward, G.H Fleet dan M. Wootton. 1985. Ilmu Pangan. Universitas Indonesia. Jakarta (Diterjemahkan oleh Purnomo dan Adiyono).
 4. Judo Amidjoyo M. 1981. Defek-defek Pada Kulit Mentah dan Samak. Penerbit Batara Karya Aksara. Jakarta.
 5. Lawrie, R.A. 1981. Meat Science.
 6. Mann, I. 1950. Processing and Utilization of Animal by Product, FAO.
 7. Suparno, 1994. Ilmu dan Teknologi Daging. Gajahmada University Press.
 8. Suwarastuti, A, dan Dwiloka, B. 1989. Dasar-dasar Teknologi Hasil Ikutan Ternak. Diktat Kuliah.
 9. Winarno, F.G. 1980. Pengantar Teknologi Pangan. Penerbit PT. Gramedia.
 10. Berbagai jurnal ilmiah nasional dan internasional.

No.	General instructional object	Principal of subject	Sub subject	Estimation of time	literature
1.	Students can explain and do handling and processing of meat and can identify standardization of meat product according to SNI or WHO.	Technology and meat Processing	Principles and object of meat processing, variety of meat product, standardization of meat product.	2 x 100 menit	1,2,5,7,9,10
2.	Students can explain and do handling and processing of milk and can identify standardization of milk product according to SNI or WHO.	Technology and milk Processing	Principles and object of milk processing, variety of milk product, standardization of milk product	2x 100 menit	1,2,9,3,10
3.	Students can explain and do handling and processing of egg and can identify standardization of egg product according to SNI or WHO.	Technology and egg Processing	Principles and object of egg processing, variety of egg product, standardization of egg product.	2 x 100 menit	1,3,10

FAKULTAS PETERNAKAN UNIVERSITAS DIPONEGORO

4.	Students can explain and do handling and processing of skin, hide and can identify standardization of hide product according to SNI or WHO..	Technology and leather Processing	Principles and object of hide or skin processing, variety of hide product, standardization of hide product or leather	1 x 100 menit	4,6,8,10
5.	Students can explain and do handling and processing of animal by product and can identify standardization of animal by product quality according to SNI or WHO	Technology and animal by product Processing	Principles and object of animal by product processing, variety of animal by product, standardization of animal by product quality.	1 x 100 menit	4,6,8,10

COURSE : Packaging and Packing

COURSE CODE : PTH 103

CREDIT : 2 (2-0)

DIPONEGORO UNIVERSITY, FACULTY OF ANIMAL AGRICULTURE
OUTLINE OF TECHING PROGRAM

- Title of course : **Packaging and Packing**
 Code/credit : PTH 103 / 2 (2 – 0)
 Short description : Discussing about principles, science and technology of packaging, packing, labeling, material quality, kinds of materials, damages, animal-products storage methods.
 General teaching objective : Joining this course, students could explain and analyze animal products packaging, packing and labeling also mention the kinds of packaging, packing and labeling materials, and products storage methods.
 Reference : 1. Suyitno. 1988. Pengemasan dan Pengepakan. PAU. UGM, Yogyakarta.
 2. Suyitno. . Bahan-bahan Pengemas. PAU. UGM, Yogyakarta.
 3. Stanley Sacharow, BA. M.A dan Roger C. Griffin 1970. Food Packaging. The Avi Publishing Comp Inc. Westport Connecticut.
 4. Paine. A and Paine. Y. 1983. A handbook of Food Packaging. Council of the Institute of Packaging.

No.	Specific objectives teaching	Topics	Sub-topics	Time Estimated
1.	Joining this course, students could mention and explain many aspects and history of packaging, packing and labeling, meaning and definition.	<ul style="list-style-type: none"> • History • Mean and definition • Factors of packaging 	<ul style="list-style-type: none"> • The history of packaging, packing and labeling. • Definition, function and use of packaging, packing and labeling. • Vacuuming, protecting, fumigating, cost and easiness-to-dispose of container. 	4 x 100 minutes
2.	Joining this course, students could mention and explain the kinds of packaging and packing materials.	Packaging and packing materials	Paper, carton, metal, glass, plastic, wood, fiber adn composit.	4 x 100 minutes
3.	Joining this course, students could mention and explain specific problem in packaging.	Specific problem in food packaging.	Problems in packaging and packing and their approach.	1 x 100 minutes
4.	Joining this course, students could mention and explain the shape of packaging and packing.	Shapes of package and pack.	Pouch, sack, box, basket, crate, drum, tray, container.	1 x 100 minutes
5.	Joining this course, students could mention and explain specific problem in packaging.	Specific problem in packaging	Toxicology, carcinogenic.	1 x 100 minutes
6.	Joining this course, students could mention and explain post-harvest packaging and packing.	Post-harvest products packaging and packing.	<ul style="list-style-type: none"> • Meat, poultry, egg, milk. • Methods and approaches. • Determining the storage-time length. 	1 x 100 minutes
7.	Joining this course, students could mention and explain many aspects of labeling.	Labeling	<ul style="list-style-type: none"> • Definition, general guideline in Indonesia • Labeling in USA and Japan. • The role of label in food safety. 	2 x 100 minutes

COURSE : Microbiology of Animal Products

COURSE CODE :

CREDIT : 3 (2-1)

DIPONEGORO UNIVERSITY, FACULTY OF ANIMAL AGRICULTURE
OUTLINE OF TECHING PROGRAM

- Title of course : **Microbiology of Animal Products**
 Code/credit : PTH 308 P / 3 (2 – 1)
 Short description : Discussing about scope of animal products microbiology, contaminant's origins, growth of food microbe, food spoilage, food preservation and its effect on microbes, disease caused y food microbes, utilization of microbes on food industries, food industries sanitation. It also discuss about methods of microbial quantitative measurement.
 General teaching objective : Joining this course, students could explain scope of animal products microbiology, contaminant's origins, growth of food microbe, food spoilage, food preservation and its effect on microbes, disease caused by food microbes, utilization of microbes on food industries, food industries sanitation. It also discuss about methods of microbial quantitative measurement.
 Reference : 1. Frazier, W.C. and D.C. Westhoff. 1988. Food Microbiology. McGraw-Hill Book Co., Singapore
 2. Fardiaz, S. 1989. Analisis Mikrobiologi Pangan. PAU Pangan dan Gizi. IPB, Bogor.
 3. Schelegel, H.G. dan K. Schmidt. 1994. Mikrobiologi Umum . Gadjahmada University Press, Yogyakarta (Terjemahan oleh: T. Baskoro dan J.R. Wattimena)

No.	Specific objectives teaching	Topics	Sub-topics	Time Estimated	References
1.	Joining this course, students could explain the scope of animal products microbiology and the origins of contaminants on animal-products food.	PREFACE	1. The scope of microbiology on animal products. 2. Contaminant's origin	1 x 100 minutes	1
2.	Joining this course, students could explain the growth of microbes on animal-products food.	THE GROWTH OF MICROBES ON ANIMAL-PRODUCTS FOOD	1. The curve of growth 2. The phases of growth	1 x 100 minutes	3
3.	Joining this course, students could explain the factor spoiling animal-products food.	THE SPOILAGE ANIMAL-PRODUCTS FOOD	1. Microbial spoilage 2. non-microbial spoilage	1 x 100 minutes	1,2
4.	Joining this course, students could explain the kinds of preservation on food and their effects on microbial growth.	FOOD PRESERVATION	1. Heat treatment 2. Low temperature treatment 3. preservative agents 4. Fermentation 5. Irradiation	4 x 100 minutes	1,2
5.	Joining this course, students could explain the benefits of sanitation in food industries.	SANITATION IN FOOD INDUSTRIES	1. Physical condition of food processing units 2. Hygiene of employee 3. Sanitation procedure	2 x 100 minutes	1
6.	Joining this course, students could calculate the food microbes .	QUANTIFICATION OF FOOD MICROBES	1. Plate sour method 2. Plate spread method 3. Other methods	2 x 100 minutes	2
7.	Joining this course, students could explain the diseases affected by food microbes.	DISEASES AFFECTED BY FOOD MICROBES	1. Food microbes infection 2. Food microbes poisoning.	2 x 100 minutes	1,2
8.	Joining this course, students could explain the utilization of microbes in industries.	MICROBIAL UTILIZATION	1. Microbial utilization in food industries 2. Microbial utilization in non-food industries	2 x 100 minutes	1,2

UNITS OF TEACHING SESSION

Course : Microbiology of Animal Products
 Code : -
 Credits : 3 (2-1)
 Time allocated : 100 minutes
 Session : 1

A. Objective Teaching

1. General

Joining this course, students could explain the role of microbiology and the effect on animal products.

2. Specific

Joining this course, students could explain:

- a. The scope of microbiology of animal products
- b. The origin of contamination on animal-products food.

B. Topic: Introduction to microbiology of animal products

C. Sub-topics

1. The scope of microbiology of animal products
2. The origin of contamination on animal-products food.

D. Teaching activity

Stage	Teacher's activities	Student's activities	Media and teaching instruments
Preface	1. Explaining generally the roles of microbes on animal-products food spoilage.	Paying attention	Whiteboard
Explanation	2. Explaining generally the utilization of microbes in animal-products processing.	Paying attention	Whiteboard
	3. Explaining generally the possibility of getting infected/poisoned by food microbes.	Paying attention	Whiteboard
	4. Explaining generally the interaction between food microbes and spoilage, the possibility of human-disease growth also utilization of microbes in animal-products processing.	Paying attention	Whiteboard OHP
	5. Identifying the origin of microbes' contamination in animal-products food.	Paying attention	Whiteboard OHP
	6. Resuming of course session.	Paying attention	Whiteboard
Occlusion	7. Explaining next session and its contract.	Paying attention and commenting the contract	

E. Evaluation :

F. References : Fardiaz S. 1992. Mikrobiologi Pangan. PAU Pangan dan Gizi. IPB. Bogor

UNITS OF TEACHING SESSION

Course : Microbiology of Animal Products
 Code : -
 Credits : 3 (2-1)
 Time allocated : 100 minutes
 Session : 2

A. Teaching Objective

1. General

Joining this course, students could explain the growth of animal-products microbes.

2. Specific

Joining this course, students could explain:

- a. Definition of growth generally.
- b. Definition of microbial growth
- c. Microbial growth curve.
- d. Microbial growth phases.

B. Topics: the growth of food microbes.

C. Sub topics:

1. Definition and curve of microbial growth.
2. Microbial growth phases.

D. Teaching activities.

Stage	Teacher's activities	Student's activities	Media and teaching instruments
Preface	1. Explaining the growth factors.	Paying attention Mentioning the growth factors (general microbiology)	White board
Explanation	2. Explaining the definition of growth and microbial growth.	Paying attention.	White board
	3. Explaining the calculation theory of microbial growth.	Paying attention.	White board
	4. Drawing the curve of microbial growth.	Paying attention.	White board
	5. Explaining the phases of microbial growth.	Paying attention.	White board
Occlusion	6. Explaining the use of studying microbial growth in food spoilage and processing.	Paying attention.	White board

E. Evaluation:

Asking the students to do homework in calculating

F. References:

1. Fardiaz S. 1992. Mikrobiologi Pangan, PAU Pangan dan Gizi. IPB. Bogor
2. Nurwantoro dan AS. Djarijah. 1997. Mikrobiologi Pangan Hewani-Nabati, Kanisius. Yogyakarta.

UNITS OF TEACHING SESSION

Course : Microbiology of Animal Products
 Code :-
 Credits : 3 (2-1)
 Time allocated : 100 minutes
 Session : 3

A. Instructional objective

1. General

Joining this course, students could identify whether animal-products food spoiled by microbes.

2. Specific

Joining this course, students could identify whether:

- a. Animal-products food spoiled by microbial growth.
- b. Animal-products food spoiled by physical and mechanical treatment, insects and non-microbial enzyme.

B. Topics: Animal-products food spoilage.

C. Sub topics:

1. Microbial spoilage.
2. Non-microbial spoilage.

D. Teaching activities.

Stage	Teacher's activities	Student's activities	Media and teaching instruments
Preface	1. Introducing spoiling factor of animal-products food to students.	Relating the microbial growth and animal-products food spoilage.	White board
Explanation	2. Explaining the types of animal-products food spoiled by microbial growth and their biochemical reaction.	Paying attention	White board
	3. Explaining the types of animal-products food spoiled by non-microbial growth. (physics, mechanic, insects, enzyme).	Paying attention	White board OHP
Occlusion	4. Resuming the relationship between microbial and non microbial food spoilage to the food spoilage.	Paying attention	White board OHP

E. Evaluation: students asked to mention any example of animal-products food spoilage in occurs in daily life.

F. References: Frazier, WC and DC. Whesthofl. 1988. Food Microbiology. McGraw Hill Book Co. Singapore.

UNITS OF TEACHING SESSION

Course : Microbiology of Animal Products
 Code : -
 Credits : 3(2-1)
 Time allocated : 4 x 100 minutes
 Session : 4, 5, 6, 7

A. Instructional objective:

1. General

Joining this course, students could explain the role of microbes in animal-products food spoilages and whether their preserving treatment to make them storage-longer.

2. Specific

Joining this course, students could explain and mention the example of animal-products food preserving methods and explain their effects on food microbes.

B. Topics : animal-products food preservation

C. Sub topics :

1. Heat treatment preservation method.
2. Low temperature preservation method.
3. Preservation method by addition of preservation agents.
4. Fermentation.
5. Irradiation method.

D. Teaching activities.

Stage	Teacher's activities	Student's activities	Media and teaching instruments
Preface	1. Explaining the effect of preservation to physical, chemical and sensory properties of food and to food microbes.	Paying attention	White board
Explanation	2. Identifying the kinds of food preservation methods.	Paying attention	White board
	3. Explaining the application of heat treatment in animal-products food processing and its effects on microbes.	Paying attention	White board and OHP
	4. Explaining the application of low temperature preservation methods in animal-products food processing and its effects on microbes.	Paying attention and mentioning the examples	White board and OHP
	5. Explaining the kinds of preservative agents could be applied in animal-products food preservation and its effects on microbes.	Paying attention and mentioning the examples	White board and OHP
	6. Explaining the fermentation definition, microbes utilized, biochemical reactions occurs and their effects on microbial growth.	Paying attention and mentioning the examples	White board and OHP

Occlusion	7. Explaining the irradiation as a method of animal-products preservation and its effects in microbes. 8. Resuming the result of course.	Paying attention and mentioning the examples Paying attention	White board and OHP
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E. Evaluation:

Joining this course, students could explain the kinds of preservation methods applied in yogurt fermentation.

F. References:

1. Buckle *et al.* 1987. Ilmu Pangan. UI Press Jakarta (translated by Purnomo and Adiono)
2. Frizier DC. and WC. Westhoff. 1988. Food Microbiology. Mc Graw Hill Book Co. Singapore.

UNITS OF TEACHING SESSION

Course : Microbiology of Animal Products
 Code : -
 Credits : 3 (2-1)
 Time allocated : 2 x 100 minutes
 Session : 8 and 9

A. Instructional objective

1. General

Joining this course, students could explain sanitation practice in animal-products food processing industries.

2. Specific

Joining this course, students could explain sanitation aspects in animal-products food processing industries including:

- a. Identifying physical condition of animal-products food processing units.
- b. Explaining hygiene of employee of animal-products food processing industries.
- c. Practicing sanitation procedures.

B. Topics : Sanitation in animal-products food industries.

C. Sub topics:

1. Physical condition of food processing units.
2. Hygiene of employee.
3. Sanitation procedures.

D. Teaching activities

Stage	Teacher's activities	Student's activities	Media and teaching instruments
Preface	1. Explaining generally sanitation definition and its relation to microbial contamination.	Paying attention	White board
Explanation	2. Explaining and identifying physical condition of animal-products food processing units and their relations to processing room sanitation.	Paying attention and comparing it to teaching room.	White board and OHP
	3. Explaining the use of employee hygiene of food processing units to hygiene and sanitation of processed food.	Paying attention and mentioning the examples	White board and OHP
Occlusion	4. Explaining and mentioning the examples of sanitation procedures practices in food processing.	Paying attention	White board and OHP
	5. Resuming the physical condition of processing room, employee hygiene and sanitation procedures to processed food safety.	Paying attention	White board

E. Evaluation: asking students about the use sanitation to food safety.

F. References: B.S.L. Jenie. 1988. Sanitasi Industri Pangan. PAU Pangan dan Gizi, IPB. Bogor.

UNITS OF TEACHING SESSION

Course : Microbiology of Animal Products
 Codes : -
 Credits : 3 (2-1)
 Time allocated : 2 x 100 minutes
 Session : 10 and 11

A. Instructional objective

1. General

Joining this course, students could practice the method of animal-products food microbial calculation.

2. Specific

Joining this course, students could practice animal-products microbial calculation methods:

- a. Plates pour method.
- b. Plate spread method.
- c. Other methods.

B. Topics : Animal-products food microbial quantification.

C. Sub topics:

1. Plate count methods.
2. Other methods.

D. Teaching activities.

Stage	Teacher's activities	Student's activities	Media and teaching instruments
Preface	1. Introducing many methods of microbial quantification and their uses.	Paying attention	White board
Explanation	2. Explaining and practicing plate pour and plate spread methods including: <ul style="list-style-type: none"> • Instruments and media sterilization • Plating • Interpreting the results. 	Paying attention Practicing microbial quantification	White board and OHP Practicing in laboratory
Occlusion	3. Explaining many other methods of microbial quantification (Most Probable Number, microscope and biochemical). 4. Explaining the advantages and the less of each microbial quantification method.	Paying attention Comparing to plating methods Paying attention	White board and OHP White board

E. Evaluation: Giving an example of plating method microbial calculation.

F. References: Fardiaz, S. 1989. Analisis Mikrobiologi Pangan. PAU Pangan dan Gizi, IPB. Bogor.

UNITS OF TEACHING SESSION

Course : Microbiology of Animal Products
 Code : -
 Credits : 3 (2-1)
 Time allocated : 2 x 100 minutes
 Session : 12 and 13

A. Instructional objective

1. General

Joining this course, students could explain and distinguish infectious disease and poisonous disease affected by food microbes.

2. Specific

Joining this course, students could explain the relations between animal-products food and disease possibility.

B. Topics: Disease affected by animal-products food microbes.

C. Sub topics:

1. Food-microbial infections.
2. Food-microbial poisoned.

D. Teaching activities

Stage	Teacher's activities	Student's activities	Media and teaching instruments
Preface	1. Explaining the relations between consuming animal-products food and disease risk possibility.	Paying attention	White board
Explanation	2. Explaining the definition of food-microbial infection.	Paying attention and giving examples	White board and OHP
	3. Explaining kinds of infecting microbes frequently found in animal-products food.	Paying attention	White board and OHP
	4. Explaining the infectious disease indications.	Paying attention and giving examples	White board and OHP
	5. Explaining the definition of getting food-microbial poisoned.	Paying attention	White board and OHP
	6. Explaining the kinds of poison produced by animal-products food microbes.	Paying attention	White board and OHP
	7. Explaining the poisoned disease indications.	Distinguishing whether infectious disease and poisoned disease.	White board and OHP
	Occlusion	8. Resuming discussion results.	

E. Evaluation:

Students asked to compare infectious disease, poisonous disease and types of infection and poisonous.

F. References:

Frazier W.C. and D.C. Whesthoff. 1988. Food Microbiology. Tate Mc Grow Hill Book Co. Singapore.

UNITS OF TEACHING SESSION

Course : Microbiology of Animal Products
 Code : -
 Credits : 3 (2-1)
 Time allocated : 2 x 100 minutes
 Session : 14 and 15

A. Instructional objective

1. General

Joining this course, students could explain the use of microbes in industries.

2. Specific

Joining this course, students could explain the uses of microbes in food-processing industries and non-food-processing industries.

B. Topics: The utilization of food microbes.

C. Sub topics:

1. Utilization of microbes for food industries.
2. Utilization of microbes for non-food industries.

D. Teaching activities

Stage	Teacher's activities	Student's activities	Media and teaching instruments
Preface	1. Explaining the uses of microbes in industries.	Paying attention	White board
Explanation	2. Explaining the uses of microbes in fermentation industries and their products.	Paying attention and giving examples	White board and OHP
Occlusion	3. Explaining the uses of microbes in non-food industries.	Paying attention and giving examples	White board and OHP
	4. Resuming the discussion results.	Paying attention	White board and OHP

E. Evaluation:

Students asked to distinguish poisoning/pathogenic microbes and chemical-producing microbes.

F. References:

1. Schelegel HG and K. Schmidt. 1994. Mikrobiologi Umum. Gadjahmada University Press. Yogyakarta (translated by T. Baskoro and JK. Wattimena).
2. Sikyta B. et al. 1983. Methods in Industrial Microbiology. John Wiley and Sons. Brisbane.

SET OF EVENT STUDY

Major : The Science and Technology of Meat Products
 Code/Major : PTH 301 P
 SKS : 3 (2-1)
 Time Meeting : 100 minute x 2
 Meeting to : I, II

A. Intention

1. Common Purposed Instruction :
 After attend on the class the student expected can explain lecturing items scope, the related between the other major, contact lecturing system and evaluation. Do the Student Centered Learning (SCL) with approaching Problem Based Learning (PBL) actively. Can explained correctly about the definition of carcasses
2. Spesific Purposed Instruction :
 - a. Participant do the SCL method learning actively with the approaching of PBL.
 - b. Participant can mention lecturing items scope.
 - c. Student can make relation structure between the other major which is related to this major.
 - d. Student can explain contract lecturing during one semester.
 - e. Student can explain about study system and the evaluation.
 - f. Student can defined clearly between meat and carcasses.

B. Topic Discussion : Antecedent, the definition between meat-carcasses the Meat structure, the composition and structure of cell meat

C. Sub Topic Discussion :

1. Scope items lecturing
2. The link between the other major
3. Lecturing description
4. Laboratory activity description
5. Lecturing system and evaluation
6. The definition of meat
7. Structure and contraction of meat
8. Nutritivie value/composition

D. Lecturing Activity

Phase	Lecture's activity	Student's activity	Appliance Instruction
Antecedent	<ol style="list-style-type: none"> 1. Explaining guidance study 2. Explaining about SCL-PBL Method 3. Explaining lecturing this major at last semester 4. Acquaintanceship team lecturer and the students 	Paying attention and noting	OHP/LCD and White/blackboard

Presentation	<ol style="list-style-type: none"> 1. Explaining major scope 2. Making relation structure between the other major 3. Explaining lecturing description 4. Explaining the laboratory activity 5. Make some small group (5-7 student/group) 6. Explaining in general about the definition between meat and carcasses 7. Explaining in general about cell structure and the composition of meat nutrition value. 	<ol style="list-style-type: none"> 1. Paying attention and having note 2. Executing forming of permanent group to the guide from curator 	OHP/LCD and black/white board
Closing	<ol style="list-style-type: none"> 1. Asking something requiring furthermore clarification 2. Commenting a few items to 2-3 students by giving question 3. Giving duty to this topic to discuss next meeting (<i>Assignment 1</i>) <ul style="list-style-type: none"> "The definition of meat" (A1-a) <ul style="list-style-type: none"> • How to compare between meat and carcasses • Is the meaning of meat including fish, shellfish, chicken or the other live-stock • How about the definition white-red meat. • How about the definition of fresh meat "Structure of meat" (A1-b) <ul style="list-style-type: none"> • Crosswise slice meat or muscle • Classification of muscle (<i>skeletal, smooth muscle and cardiac/striated muscle</i>) • Protein in muscle cell (contractile protein), (myosin, actin, actomyosin, etc) • Contraction/relaxation muscle (role of thick and flimsy filament in muscle contraction) "Meat composition" (A1-c) <ul style="list-style-type: none"> • Composition in general analysis covering water, protein, fat, ash and carbohydrate • Composition in minor obstetrical (mineral, vitamin 	<ol style="list-style-type: none"> 1. Inquire 2. In reply 3. Paying attention and having note 4. Start to conduct self-supporting activities with materials book and e-library 	OHP/LCD and blackboard

	and also uppermost the other nutrition) • The differentiation type of fat • Comparing with similar at paddy, maize, vegetable, fish and fruit.	
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E. Evaluation:

1. This meeting is focused the students to know the entire items and event to be passed to; this major during one full of semester. This meeting is also expected can give motivated to all of the students and so this major can being more interested.
2. The student can explain/writing down the definition of meat and also can to distinguish with the other kind of meat like fish, chicken and another.
3. The student can differentiate the definition between meat and carcasses.
4. Student can depict by schematic athwart slice and structure muscle in general
5. Student can explain classification of muscle, protein in muscle cell and principle contraction/relaxation
6. Student can explain in general about the excellence of nutrition component that compare with non meat commodities

F. References:

1. Bintoro, V. P. 2006. Teknologi Pengolahan Daging dan Analisis Produk. Badan Penerbit Universitas Diponegoro, Semarang.
2. Buckle, K. A., R. A. Edward, G. H. Fleet dan M. Wooton. 1985. Ilmu Pangan. Universitas Indonesia, Jakarta.
3. Hadiwiyoto, S. 1983. Hasil-hasil Olahan susu, Ikan, Daging dan Telur. Penerbit Liberti, Yogyakarta.
4. Henrickson, R. L. 1978, Meat, Poultry and Sea Food Technology. Prentice-Hall, Inc, New Jersey.
5. Lawrie, R. A. 1997. Meat Science. Pergamon Press, Oxford.
6. Suparno. 1994. Ilmu dan Teknologi Daging. Gajah Mada University Press.
7. Varnam, A. H. and Sutherland, J. P. 1995. Meat and Meat Products. Chapman and Hall, London

COURSE : The Science and Technology of
Meat Processing

COURSE CODE : PTH 301 P

CREDIT : 3 (2-1)

**FACULTY OF ANIMAL AGRICULTURE DIPONEGORO UNIVERSITY
OUTLINE PROGRAM INSTRUCTION**

Major : The Science and Technology of Meat Processing
 Code/SKS : PTH 301 P/ (2-1)
 Brief description : The Science and Technology of Meat Processing is bearing with the major elementary Technology of Animal Product and previous prerequisite major such as: Biology, Elementary of Animal Physiology, Anatomy and Histology with items emphasis on understanding and knowledge about science and technology of meat processing which is related on handling, processing and preservation method.

Common Purposed Instruction : After attend on the class the student expected can explain again the chemical structure on cell, the composition, the convert of chemical muscle, crabbed growth of meat, fabrication and identification of commercial carcasses, palatability, ripening, microbiological and parasitological, the principal of meat processing, the composition of nutrition value of meat products, technology processing and also the other actual aspects

Materials Book :1. Bintoro, V. P. 2006. Teknologi Pengolahan Daging dan Analisis Produk. Badan Penerbit Universitas Diponegoro, Semarang.
 2. Buckle, K. A., R. A. Edward, G. H. Fleet dan M. Wooton. 1985. Ilmu Pangan. Universitas Indonesia, Jakarta.
 3. Hadiwiyoto, S. 1983. Hasil-hasil Olahan susu, Ikan, Daging dan Telur. Penerbit Liberti, Yogyakarta.
 4. Henrickson, R. L. 1978, Meat, Poultry and Sea Food Technology. Prentice-Hall, Inc, New Jersey.
 5. Lawrie, R. A. 1997. Meat Science. Pergamon Press, Oxford.
 6. Suparno. 1994. Ilmu dan Teknologi Daging. Gajah Mada University Press.
 7. Varnam, A. H. and Sutherland, J. P. 1995. Meat and Meat Products. Chapman and Hall, London

No	Spesific Purposed Instruction	The topics	The sub topics	Time estimation	Materials Book
1.	After attend on class the student expected actively to conduct the study method SCL (Student Center Learning) with the approaching of PBL (Problem Based Learning). Can mention lecturing items scope. Can make relation between the other major. Can explain the major contract during on one semester. Can explain study system and evaluation at this major. Can define between meat and commercial carcasses clearly.	Antecedent, congeniality of meat, The structure and composition of meat	1. The defined of The science and meat processing major 2. The relation between the other major 3. The major contract 4. About laboratory practices 5. System Lecturing and evaluation 6. The defined of meat and commercial carcasses	2 x 100 minute	1-7

			7. Structure and contraction of meat cell 8. Nutritive value		
2.	After attend on class the student expected actively to mention lecturing items scope. Can differentiate the class of meat. Can explain growth produce and national carcass consumption. Can explain the slaughtering and biochemical reaction during the process.	Classification, flesh muscle conversion, slaughtering and the chemistry reaction, meat consumption and production.	1. Slaughtering management (before and after slaughtering) 2. Biochemical changes and physics 3. Glycolysis 4. Rigormortis at the carcass after butchery 5. Meat classification	2 x 100 minute	1-7
3.	After attend on class the student expected actively to explain bone structure relation by the slaughtering method. Can recognize and differentiate cutting commercial carcasses. Can explain the way of identifying species, age, class and sex	Fabrication and identify cutting and also identify the carcass	1. Bone structure 2. Parts of cutting 3. Identify species, sex, class and age	2 x 100 minute	1-7
4.	After attend on class the student expected actively to explain meat palatability aspects. Can explain principles of meat processing and palatability aspects during the process	Palatability, cooking and preservation of meat	1. Palatability's aspect 2. Principal of cooking and preservation of meat 3. Temperature influence and other environmental aspect	2 x 100 minute	1-7
5.	After attend on class the student expected actively to explain microbiological aspect of meat. Can explain meat parasitological. Can explain microbiological aspect relation in meat parasitological during handling process, processing until preservation.	Meat microbiological-parasitological aspects during preparation processing and preservation	1. Microbiological aspects in handling, processing and meat preservation 2. Carcass parasite 3. Definition of preparation, processing and preservation of meat 4. Differentiation between three nature result of livestock	1 x 100 minute	1-7
6.	After attend on class the student expected actively to identify chemistry compound which is intend to be enhanced and have the character of contamination on food processing. Can explain the differentiation of toxic compound and natural un nutritive value. Can explain physics parameter and food safety	chemical parameter and physical food safety.	1. Chemistry compound which is intend to be used 2. Chemical compound effect of contamination 3. Compound poison and natural un nutritive value 4. Physical food safety parameter	2 x 100 minute	1-7
7.	Participant can identify carcass commercial cutting. Can explain of the parameter	Middle Test	Meeting of I-XI	1 x 100 minute	1-7

	of meat products palatability. Can summarize microbiological parameter and meat parasitological. Can summarize handling method, preparation and meat processing.				
8.	After attend on class the student expected actively to explain principle of meat curing. Student can explain principle of meat smocking. Can explain principle of meat irradiation. Can explain principle of using the thermal processing. Can narrate its application at the meat processing industry. Can analyze the changes that happened at meat during preservation process by the various method and then can make the analogy at meat palatability aspects.	Technology of meat preservation	<ol style="list-style-type: none"> 1. The definition of curing, smoking, irradiation, thermal processing and refrigeration 2. The Principal of curing, smocking, irradiation, thermal processing and refrigeration 3. The Application on meat industry processing 4. The changes that happened and the palatability 	2 x 100 minute	1-7
10.	After attend on class the student expected actively to explain the definition, processing method, the changes that happened during the process and the palatability of jerked meat. Can explain the definition, processing method, the changes that happened during the process and the palatability of meat ball. Can explain the definition, processing method, the changes that happened during the process and the palatability of sausages. Can explain the definition, processing method, the changes that happened during the process and the palatability of abon/dried meat.	Meat products (meat ball, jerked meat, abon/dried meat)	<ol style="list-style-type: none"> 1. The definition 2. Materials and appliance 3. Processing procedure 4. Palatability of meat products 	2 x 100 minute	1-7
11.	Final Test		Item Materials Meeting of I-XV		

SET OF EVENT STUDY

Major : The Science and Technology of Meat Products
 Code Major : PTH 301 P
 SKS : 3 (2-1)
 Time Meeting : 100 minute x 2
 Meeting to : III, IV

A. Intention

1. Common Purposed Instruction :

After attend on the class the student expected actively can conduct the method study by Student Center Learning (SCL) with approaching of Problem Based Learning (PBL). After attend on the class, student can explain carcass classification, meat muscle conversion and growth dynamics produce national of meat.

2. Spesific Purposed Intructions:

- a. Participant actively do the study method SCL with approaching PBL
- b. Participant can mention lecturing items scope
- c. Student can differentiate meat classes
- d. Student can explain growth produce and national meat consumption
- e. The student can explain the slaughtering of cattle and the biochemical reaction accompanying

B. Topic discussion : classification, muscle conversion, slaughtering and the reaction, meat consumption and production

C. Sub Topic discussion :

1. Slaughtering management (before and after slaughtering)
2. Biochemical and physics changes
3. Glycolysis
4. Rigorortis at the carcasses after slaughtering
5. Meat classification

D. Lecturing activity :

Phase	Lecture's Activities	Student Activities	Appliance instruction
Antecedent	Explaining the technical of pleno discussion execution	Preparing duty which have been passed to previous meeting	OHP/LCD and blackboard
Presentation	Conducting pleno discussion technically the each group to conduct presentation according to this topic of each discussion continued with discussion	1. Conducting the presentation by showing each officer (moderator, notulen and the presenter)	OHP/LCD and blackboard

		2. Making resume from result of discussion some group upon as an evaluate result	
Closing	<ol style="list-style-type: none"> 1. Asking things requiring furthermore clarifications 2. Giving brief evaluation to the sub chapter which is have discussion 3. Giving duty to the this topic of discussion at next meeting (Assignment 2) <p>" Handling before and after slaughtering" (A2-A)</p> <ul style="list-style-type: none"> - How animal handling before slaughtering?Why that way - Do handling before slaughtering is the same way for all livestock - How occurrence which is ordinary to be done by the society/ RPH/RPA? Is their practice have as according to existing theory - Give your group opinion? - How "glonggong" meat can make reducing quality? - What kind of livestock can being "glonggong" which have been discovered by officer - How the method of handling processing after slaughtering? - How the practice of crosscut after handling processing in society - Do handling processing after slaughtering is the same for all the cattle?Observing on chicken livestock and goat - Are there any essentials things which are you get in society to handling before and after slaughtering <p>" The changes (bio chemical),physics, rigormortis event and meaning and also glycolysis role after slaughtering" (A2-B)</p> <ul style="list-style-type: none"> - Understanding of rigormortis event to quality of meat - How ought to determine treatment of livestock before slaughtering and fabrication with above matter consideration <p>" Meat classification" (A2-C)</p> <ul style="list-style-type: none"> - Definition of classification and the basis of uses - Usefulness of classification and the 	<ol style="list-style-type: none"> 1. Inquire 2. In reply 3. Paying attention and having note 4. Start to conduct self-supporting activities with materials book and e-library 	OHP/LCD dan blackboard

	relation with the quality - Find either existing meat classification from references and also in field - Make some note important several things is differ from meat classification		
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E. Evaluation

1. The focused of this Meeting is student can explain / writing down the definition of meat by differentiating definition of other type of meat for example fish, chicken and another
2. Student can differentiate definition of meat and is crabbed
3. Student can depict by schematic athwart slice and structure a muscle in general
4. Student can explain classification of muscle, protein in muscle cell and contraction principle / muscle relaxation
5. Student can explain in general the excellence of nutrition component at meat (compared to commodity at another meat)
6. Each student have resume result of discussion upon which test later

F. Réferences :

1. Bintoro, V. P. 2006. Teknologi Pengolahan Daging dan Analisis Produk. Badan Penerbit Universitas Diponegoro, Semarang.
2. Buckle, K. A., R. A. Edward, G. H. Fleet dan M. Wooton. 1985. Ilmu Pangan. Universitas Indonesia, Jakarta.
3. Hadiwiyoto, S. 1983. Hasil-hasil Olahan susu, Ikan, Daging dan Telur. Penerbit Liberti, Yogyakarta.
4. Henrickson, R. L. 1978, Meat, Poultry and Sea Food Technology. Prentice-Hall, Inc, New Jersey.
5. Lawrie, R. A. 1997. Meat Science. Pergamon Press, Oxford.
6. Suparno. 1994. Ilmu dan Teknologi Daging. Gajah Mada University Press.
7. Varnam, A. H. and Sutherland, J. P. 1995. Meat and Meat Products. Chapman and Hall, London

SET OF EVENT STUDY

Major : The Science and Technology of Meat Products
 Code Major : PTH 301 P
 SKS : 3 (2-1)
 Time Meeting : 100 minute x 2
 Meeting to : V, VI

A. Intention

1. Common Purposed Instruction :
 After attend on the class the student expected actively can conduct the method study by Student Center Learning (SCL) with approaching of Problem Based Learning (PBL). After attend on the class, student can conduct fabrication and can identify crabbed commercial cutting.
2. Spesific Purposed Intructions:
 - a. Participant actively conducting the study method SCL with approaching of PBL
 - b. Participant can explain bone structure relation by slaughtering of meat
 - c. Student can recognize and differentiate cutting- crabbed commercial cutting
 - d. Student can explain the way of identifying species, age, class and sex

B. Topic discussion : Fabrication and idetification the cutting and also identification commercial carcasses

- C. Sub topic discussion:
1. Bone structure
 2. Parts of cutting
 3. Identify species, sex, class and age

D. Lecturing activities :

Phase	Lecture's Activities	Student Activities	Appliance Instruction
Antecedent	Explaining the technical of pleno discussion execution	Preparing duty which have been passed to previous meeting	OHP/LCD and black board
Presentation	Conducting pleno discussion technically the each group to conduct presentation according to this topic of each discussion continued with discussion	1. Conducting the presentation by showing moderator officer, notulis and presenter. 2. Making resume from result of discussion some group upon which have evaluate	OHP/LCD and blackboard
Closing	1. Asking things requiring furthermore clarification. 2. Giving brief evaluation to the	1. inquire 2. In reply 3. Paying attention and	OHP/LCD and blackboard

	<p>chapter sub which have discussion</p> <p>3. Giving duty to the this topic of discussion at next meeting (Assignment 3) "Fabrication" (A3-a)</p> <ul style="list-style-type: none"> • Fabrication • Slaughtering for grocery (at cow)? Slaughtering for retailer at cow, goat, pig and chicken! • What the base of those slaughtering? • Comparing type of slaughtering with the references and in the field/consumer • Giving the illustration to explain more detail with the slaughtering or fabrication • Giving some example the used of every cutting part • Is there any important thing that you get from the society or from the slaughtering house to the cutting part of carcasses <p>"Meat identification" (A3-b)</p> <ul style="list-style-type: none"> • Carcasses Identification based on sex, species, age and classes • Is there any important thing that you get from the society or from the slaughtering house to the identification of carcasses 	<p>having note</p> <p>4. Start to conduct self-supporting activities with materials book and e-library</p>	
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E. Evaluation :

The focused of this Meeting is student can explain / writing down the handling procedure before and after the slaughtering happened, the changes of biochemical and physics reaction during those slaughtering and also the classification from the references. It is important to studying handling, processing and preservation and also to minimize decreasing of quality.

F. References :

1. Bintoro, V. P. 2006. Teknologi Pengolahan Daging dan Analisis Produk. Badan Penerbit Universitas Diponegoro, Semarang.
2. Buckle, K. A., R. A. Edward, G. H. Fleet dan M. Wooton. 1985. Ilmu Pangan. Universitas Indonesia, Jakarta.
3. Hadiwiyoto, S. 1983. Hasil-hasil Olahan susu, Ikan, Daging dan Telur. Penerbit Liberti, Yogyakarta.
4. Henrickson, R. L. 1978, Meat, Poultry and Sea Food Technology. Prentice-Hall, Inc, New Jersey.
5. Lawrie, R. A. 1997. Meat Science. Pergamon Press, Oxford.
6. Suparno. 1994. Ilmu dan Teknologi Daging. Gajah Mada University Press.
7. Varnam, A. H. and Sutherland, J. P. 1995. Meat and Meat Products. Chapman and Hall, London

SET OF EVENT STUDY

Major : The Science and Technology of Meat Products
 Code Major : PTH 301 P
 SKS : 3 (2-1)
 Time Meeting : 100 minute x 2
 Meeting to : VII, VIII

A. Intention

1. Common Purposed Instruction :
 After attend on the class the student expected actively can conduct the method study by Student Center Learning (SCL) with approaching of Problem Based Learning (PBL). After attend on the class, student can conduct the principle of meat storing and processing in line with the palatability and also the factors of palatability.
2. Specific Purposed Instruction
 - a. Participant actively conducting the study method SCL with approaching of PBL
 - b. Participant actively mention the factors of meat palatability
 - c. Participant actively mention the principle of meat processing in line with the factors of meat palatability.

B. Topic discussion : Palatability, Processing and storing of meat

C. Sub topic discussion :

1. The factors of meat palatability
2. Principle of meat cooking and storing
3. The effect of temperature and another environment factor.

D. Lecturing Activity :

Phase	Lecture's Activities	Student activities	Appliances Instruction
Antecedent	Conducting the technical of pleno discussion execution	Preparing duty which have been passed to previous meeting	OHP/LCD and blackboard
Presentation	Conducting the pleno discussion with the technically from each group do presentation according to this topic of each discussion continued with discussion	<ol style="list-style-type: none"> 1. Conducting the presentation by showing moderator officer, notulis and presenter. 2. Making resume from result of discussion some group upon which have evaluate 	OHP/LCD and blackboard

Closing	<ol style="list-style-type: none"> 1. Asking things requiring furthermore clarification. 2. Giving brief evaluation to the chapter sub which have discussion 3. Giving duty to the this topic of discussion at next meeting (<i>Assignment 4</i>) <ul style="list-style-type: none"> "Palatability" (A4-a) <ul style="list-style-type: none"> • The definition and terminology of palatability • Palatability is very related with consumer acceptability (ex: tenderness on steak food) • The factors of palatability and explaining it • Is aroma-flavor included in palatability determinant • How to determine the palatability of meat products • Is there any important thing that you get from the society "Flavor" (A4-b) <ul style="list-style-type: none"> • The definition of flavor • Whats the related of flavor with the quality of meat products • What of the component that having responsibility to meat flavor • Giving example the comparison of the odor goat male and goat female; specific odor "Meat storing and producing" (A4-c) <ul style="list-style-type: none"> • The definition of food storing • Fresh meat storing • Preservation meat storing • Giving example the applied of meat storing in retailer, traditional market, meat store, supermarket, • Is there any important thing that you get from the society about meat storing 	<ol style="list-style-type: none"> 1. Inquire 2. In reply 3. Paying attention and having note 4. Start to conduct self-supporting activities with materials book and e-library 	OHP/LCD blackboard
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E. Evaluation :

Aroma And flavor represent one of the natural of meat quality product and one of the important thing is flavor which has represent after processing, this have to be searched by its responsibility of the chemical reason or from influence of this condition of meat physics. Student obliged can look for and explain again the

changes of meat flavor during storage and also processing from meat physical chemistry phase.

F. References :

1. Bihoro, V. P. 2006. Teknologi Pengolahan Daging dan Analisis Produk. Badan Penerbit Universitas Diponegoro, Semarang.
2. Buckle, K. A., R. A. Edward, G. H. Fleet dan M. Wooton. 1985. Ilmu Pangan. Universitas Indonesia, Jakarta.
3. Hadiwiyoto, S. 1983. Hasil-hasil Olahan susu, Ikan, Daging dan Telur. Penerbit Liberty, Yogyakarta.
4. Henrickson, R. L. 1978, Meat, Poultry and Sea Food Technology. Prentice-Hall, Inc, New Jersey.
5. Lawrie, R. A. 1997. Meat Science. Pergamon Press, Oxford.
6. Suparno. 1994. Ilmu dan Teknologi Daging. Gajah Mada University Press.
7. Varnam, A. H. and Sutherland, J. P. 1995. Meat and Meat Products. Chapman and Hall, London

SET OF EVENT STUDY

Major : The Science and Technology of Meat Products
 Code Major : PTH 301 P
 SKS : 3 (2-1)
 Time Meeting : 100 minute x 2
 Meeting to : IX, X

A. Intention

1. Common Purposed Instruction :
After attend on the class the student expected actively can conduct the method study by Student Center Learning (SCL) with approaching of Problem Based Learning (PBL). After attend on the class, student can explaining microbiology aspects during handling until preservation.
2. Specific Purposed Instruction:
 - a. Participant actively conducting the study method SCL with approaching of PBL
 - b. Participant actively can explaining the meat microbiology aspects
 - c. Student actively can explaining meat parasitological.
 - d. Student actively can explaining the related microbiology aspects with parasitological during handling processing, cooking until preservation

B. Topic discussion : Meat Microbiology-parasitological during the handling prosesing, cooking until preservation

- C. Sub topic discussion :
1. Microbiology aspects on handling processing, cooking and preservation
 2. Meat Parasitological
 3. The definition of handling, processing and preservation
 4. The diferentiation about three process
 5. Aplication applied

D. Lecturing Activities :

Phase	Lecture's Activities	Student Activities	Appliances Instruction
Antecedent	Conducting the technical of pleno discussion execution	Preparing duty which have been passed to previous meeting	OHP/LCD and blackboard
Presentation	Conducting the pleno discussion with the technically from each group do presentation according to this topic of each discussion continued with discussion	1. Conducting the presentation by showing moderator officer, notulis and presenter. 2. Making resume from result of	OHP/LCD and blackboard

		discussion some group upon which have evaluate	
Closing	<ol style="list-style-type: none"> 1. Asking things requiring furthermore clarification. 2. Giving brief evaluation to the chapter sub which have discussion 3. Giving duty to the this topic of discussion at next meeting (<i>Assignment 5</i>) <ul style="list-style-type: none"> "Meat Microbiology"(A5-a) <ul style="list-style-type: none"> • Microbiological of meat can causes rot of meat • Find out various dominant microbe at meat (chicken, goat, cow and pig) and dry product (dry, semi run dry, etc) • Look for SNI concerning conditions of microbiology I at meat commodity and meat product • Is there any important thing that you get from the society about meat microbiology "Meat Parasitological" (A5-b) <ul style="list-style-type: none"> • Reporting various ordinary parasite type residue in meat (inspection of meat) • Comment briefly the effect of existence of every parasite • Is there any important thing that you get from the society about meat parasitological "The definition of meat preparation, handling, processing and preservation" (A5-C) <ul style="list-style-type: none"> • Is there any important thing that you get from the society about that aspects above 	<ol style="list-style-type: none"> 1. Inquire 2. In reply 3. Paying attention and having note 4. Start to conduct self-supporting activities with materials book and e-library 	OHP/LCD and blackboard

E. Evaluation :

Every participant can look for sampel in various modern and traditional market later then can analyze by laboratory method about the condition of parasitological and microbiological from each sample. Every participant have to can explain factors having an effect on and effort it minimization

F. References :

1. Bintoro, V. P. 2006. *Teknologi Pengolahan Daging dan Analisis Produk*. Badan Penerbit Universitas Diponegoro, Semarang.

2. Buckle, K. A., R. A. Edward, G. H. Fleet dan M. Wooton. 1985. Ilmu Pangan. Universitas Indonesia, Jakarta.
3. Hadiwijoto, S. 1983. Hasil-hasil Olahan susu, Ikan, Daging dan Telur. Penerbit Liberty, Yogyakarta.
4. Henrickson, R. L. 1978, Meat, Poultry and Sea Food Technology. Prentice-Hall, Inc, New Jersey.
5. Lawrie, R. A. 1997. Meat Science. Pergamon Press, Oxford.
6. Suparno. 1994. Ilmu dan Teknologi Daging. Gajah Mada University Press.
7. Varnam, A. H. and Sutherland, J. P. 1995. Meat and Meat Products. Chapman and Hall, London

SET OF EVENT STUDY

Major : The Science and Technology of Meat Products
 Code Major : PTH 301 P
 SKS : 3 (2-1)
 Time Meeting : 100 minute
 Meeting to : XI

A. Intention

1. Common Purposed Instruction :
 By following this meeting, student can express ability in catching and developing items which have been given (Meeting I-X)
2. Specific Purposed Instruction :
 - a. Participant can write down the definition of meat and carcasses
 - b. Participant can identify cutting commercial carcasses
 - c. Participant can explaining palatability parameter on meat product
 - d. Student can embrace microbiological and parasitological parameter
 - e. Student can embrace handling method, preparation, processing of meat

- A. Topic discussion : Middle Test of Semester
 B. Sub Topic discussion : items I-IX
 C. Lecturing Activities :

Phase	Lecture's Activities	Student Activities	Appliances Instruction
Antecedent	Explaining all passed to problem on meeting I-X	Paying attention and doing	Sheet answer problem; OHP dan blackboard
Presentation	Observing and giving answer if there is question about problem clarification	Doing answer	
closing	Giving answers to given problem	Paying attention, asking and having note	

D. Evaluasi

This Meeting is focussed to the student to briefly expresses ability in catching and developing the items lecturing in the major of The Science and Technology of Meat Products (Meeting I-X)

E. References

1. Bintoro, V. P. 2006. Teknologi Pengolahan Daging dan Analisis Produk. Badan Penerbit Universitas Diponegoro, Semarang.
2. Bückle, K. A., R. A. Edward, G. H. Fleet dan M. Wooton. 1985. Ilmu Pangan. Universitas Indonesia, Jakarta.

3. Hadiwiyoto, S. 1983. Hasil-hasil Olahan susu, Ikan, Daging dan Telur. Penerbit Liberty, Yogyakarta.
4. Henrickson, R. L. 1978, Meat, Poultry and Sea Food Technology. Prentice-Hall, Inc, New Jersey.
5. Lawrie, R. A. 1997. Meat Science. Pergamon Press, Oxford.
6. Suparno. 1994. Ilmu dan Teknologi Daging. Gajah Mada University Press.
7. Varnam, A. H. and Sutherland, J. P. 1995. Meat and Meat Products. Chapman and Hall, London

SET OF EVENT STUDY

Major : The Science and Technology of Meat Products
 Code Major : PTH 301 P
 SKS : 3 (2-1)
 Time Meeting : 100 minute x 2
 Meeting to : XI, XII

A. Intention

1. Common Purposed Instruction :
 After attend on the class the student expected actively can conduct the method study by Student Center Learning (SCL) with approaching of Problem Based Learning (PBL). After attend on the class, student can explaining about meat preservation
2. Specific Purposed Instruction
 - a. Participant actively conducting the study method SCL with approaching of PBL
 - b. Participant actively can explain the definition and the principle of meat curing
 - c. Participant actively can explain the definition and the principle of meat smoking
 - d. Participant actively can explain the definition and the principle of meat irradiation
 - e. Participant actively can explain the definition and the principle of using thermal processing
 - f. Student can make narration the application of meat preservation on the meat products industry.
 - g. Student can analyze the changes happened at meat during preservation by various method and then can make analogy at meat palatability aspect

B. Topic discussion : Meat Preservation Technology

- C. Sub topic discussion :
1. The definition of curing, smoking, irradiation, freezing and using thermal processing.
 2. The principle of curing, smoking, irradiation, freezing and using thermal processing
 3. The application on meat processing industry
 4. The changes that happened and the analogy with meat palatability

D. Lecturing Activities :

Phase	Lecture's Activities	Student Activities	Appliances Instruction
Antecedent	Explaining the topic of discussion to be studied at this meeting and to come	Pay attention	LCD/OHP, blackboard
Presentation	1. Explaining in general the definition, principal and usefulness of meat curing	Pay attention, having note and ask-answer some question	LCD/OHP, blackboard

	<p>2. Explaining in general the definition, principal and usefulness of meat smoking</p> <p>3. Explaining in general the definition, principal and usefulness of thermal processing</p> <p>4. Explaining the changes that happened and palatability if conserving meat by various method</p>	question	
closing	<p>1. Asking things requiring furthermore clarification.</p> <p>2. Giving brief evaluation to the chapter sub which have discussion</p> <p>3. Giving duty to the this topic of discussion at next meeting (<i>Assignment 6</i>)</p> <p>"The impact of meat preservation" (A6-a)</p> <ul style="list-style-type: none"> • Can kyuring, thermal processing and smoking conducted in industry processing of scale domestic • Is there any danger from curing processing, thermal processing and smoking to consumer • How the characteristics of meat which have experienced of curing, thermal processing and smoking <p>The changes of physics chemist during curing processing, thermal processing and smoking (A6-B)</p> <p>How the mechanism and another preservation can applied on meat (A6-c)</p>	<p>1. Inquire</p> <p>2. In reply</p> <p>3. Paying attention and having note</p> <p>4. Start to conduct self-supporting activities with materials book and e-library</p>	OHP/LCD and blackboard

E. Evaluation :

Student Participant expected can explain again all method which have been submitted at this meeting and also can look for recent preservation method from result of literature study

F. References :

1. Bintoro, V. P. 2006. *Teknologi Pengolahan Daging dan Analisis Produk*. Badan Penerbit Universitas Diponegoro, Semarang.
2. Buckle, K. A., R. A. Edward, G. H. Fleet dan M. Wooton. 1985. *Ilmu Pangan*. Universitas Indonesia, Jakarta.

3. Hadiwiyoto, S. 1983. Hasil-hasil Olahan susu, Ikan, Daging dan Telur. Penerbit Liberti, Yogyakarta.
4. Henrickson, R. L. 1978, Meat, Poultry and Sea Food Technology. Prentice-Hall, Inc, New Jersey.
5. Lawrie, R. A. 1997. Meat Science. Pergamon Press, Oxford.
6. Suparno. 1994. Ilmu dan Teknologi Daging. Gajah Mada University Press.
7. Varnam, A. H. and Sutherland, J. P. 1995. Meat and Meat Products. Chapman and Hall, London

SET OF EVENT STUDY

Major : The Science and Technology of Meat Products
 Code Major : PTH 301 P
 SKS : 3 (2-1)
 Time Meeting : 100 minute x 2
 Meeting to : XIII, XIV

A. Intention

1. Common Purposed Instruction :
 After attend on the class the student expected actively can conduct the method study by Student Center Learning (SCL) with approaching of Problem Based Learning (PBL). After attend on the class, student can explaining about various meat products
2. Specific Purposed Instruction:
 - a. Participant actively conducting the study method SCL with approaching of PBL
 - b. Participant actively can explaining the definition, method processing, the changes happened during processing and the palatability of jerked meat.
 - c. Participant actively can explaining the definition, method processing, the changes happened during processing and the palatability of meatball
 - d. Participant actively can explaining the definition, method processing, the changes happened during processing and the palatability of sausages
 - e. Participant actively can explaining the definition, method processing, the changes happened during processing and the palatability of died meat

B. Topic discussion : Meat processing products (meat ball, jerked meat, sausages and dried meat)

- C. Sub topic discussion :
1. Definition
 2. Materials and appliances
 3. Processing Procedur
 4. Product palatability

D. Lecturing Activities :

Phase	Lecture's Activities	Student Activities	Appliances Instruction
Antecedent	Explaining the topic of discussion to be studied at this meeting and to come	Pay attention	LCD/OHP, blackboard
Presentation	1. Explaining in general the definition, processing procedure, the changes happened during the process and jerked meat palatability 2. Explaining in general the definition, processing procedure, the changes happened during the process and meat ball palatability 3. Explaining in general the definition,	Pay attention, having note and ask-answer some question	LCD/OHP, blackboard

	<p>processing procedure, the changes happened during the process and dried meat palatability</p> <p>4. Explaining in general the definition, processing procedure, the changes happened during the process and sausages palatability</p>		
closing	<p>1. Asking things requiring furthermore clarification.</p> <p>2. Giving duty to the this topic of discussion at next meeting (Assignment 7) "Dried Meat Product, jerked meat and meat ball" (A7-a)</p> <ul style="list-style-type: none"> • Processing procedure • Is there any things which digressing which you have see in course of its processing • What's youre suggest for the repair of processing <p>" Another meat product which were still seldom be made" (A7-B)</p> <ul style="list-style-type: none"> • Look for Indonesian meat product which were still seldom be recognized by consumer • Look for meat product from Indonesia / international which were represent result of research nowadays <p>" Newly Problem in around meat industry processing of scale domestic in penetrating exporting market (A7-c)</p>	<p>1. Inquire</p> <p>2. In reply</p> <p>3. Paying attention and having note</p> <p>4. Start to conduct self-supporting activities with materials book and e-library</p>	OHP/LCD and blackboard

E. Evaluation :

Student Participant expected can explain again all method which have been submitted at this meeting and also can look for method processing of recently meat from result of literature study and field

F. References :

1. Bintoro, V. P. 2006. Teknologi Pengolahan Daging dan Analisis Produk. Badan Peherbit Universitas Diponegoro, Semarang.
2. Buckle, K. A., R. A. Edward, G. H. Fleet dan M. Wooton. 1985. Ilmu Pangan. Universitas Indonesia, Jakarta.
3. Hadiwiyoto, S. 1983. Hasil-hasil Olahan susu, Ikan, Daging dan Telur. Penerbit Liberti, Yogyakarta.
4. Henrickson, R. L. 1978, Meat, Poultry and Sea Food Technology. Prentice-Hall, Inc, New Jersey.
5. Lawrie, R. A. 1997. Meat Science. Pergamon Press, Oxford.
6. Suparno. 1994. Ilmu dan Teknologi Daging. Gajah Mada University Press.
7. Varnam, A. H. and Sutherland, J. P. 1995. Meat and Meat Products. Chapman and Hall, London

SET OF EVENT STUDY

Major : The Science and Technology of Meat Products

Code, Major : PTH 301 P

SKS : 3 (2-1)

Time Meeting : 100 minute

Meeting to : XV

A. Intention

1. Common Purposed Instruction :
By following this meeting, student can express ability in catching and developing items which have been given (Meeting I-XV)
2. Specific Purposed Instruction :
 - a. Participant can write down the definition of carcasses and meat
 - b. Participant can identify cutting commercial carcasses
 - c. Participant can explaining palatability parameter on meat product
 - d. Student can embrace microbiological and parasitological parameter
 - e. Student can embrace handling method, preparation, processing of meat
 - f. Student can embrace various method of meat preservation
 - g. Student can embrace various method of meat processing

B. Topic discussion : Final Test of Semester

C. Sub Topic discussion : Items I - XIV

D. Lecturing Activities :

Phase	Lecture's Activities	Student Activities	Appliances Instruction
Antecedent	Explaining all passed to problem on meeting I-XIV	Paying attention and doing	Sheet answer problem; OHP dan blackboard
Presentation	Observing and giving answer if there is question about problem clarification	Doing answer	
Closing	Giving answers to given problem	Paying attention, asking and having note	

E. Evaluasi :

This Meeting is focussed to the student to briefly expresses ability in catching and developing the items lecturing in the major of The Science and Technology of Meat Products (Meeting I-XIV)

F. References

1. Bintoro, V. P. 2006. Teknologi Pengolahan Daging dan Analisis Produk. Badan Penerbit Universitas Diponegoro, Semarang.
2. Buckle, K. A., R. A. Edward, G. H. Fleet dan M. Wooton. 1985. Ilmu Pangan. Universitas Indonesia, Jakarta.
3. Hadiwiyoto, S. 1983. Hasil-hasil Olahan susu, Ikan, Daging dan Telur. Penerbit Liberti, Yogyakarta.
4. Henrickson, R. L. 1978, Meat, Poultry and Sea Food Technology. Prentice-Hall, Inc, New Jersey.
5. Lawrie, R. A. 1997. Meat Science. Pergamon Press, Oxford.
6. Suparno. 1994. Ilmu dan Teknologi Daging. Gajah Mada University Press.
7. Varnam, A. H. and Sutherland, J. P. 1995. Meat and Meat Products. Chapman and Hall, London

COURSE : Food Safety

COURSE CODE : PTH 102

CREDIT : (2-0)2

FACULTY OF ANIMAL AGRICULTURE DIPONEGORO UNIVERSITY
OUTLINE PROGRAM INSTRUCTION

Major	:	Food Safety (Choice)
Code/sks	:	PTH 102 / 2 (2 - 0)
Brief description	:	Food consumed by human being as a mean to fulfill requirement for the activities and healthy. Nevertheless since conducting crop up to becoming readily for food consumed, many factor resulting food is not peaceful to human being. In this major is taught about food function and nutritive value, food safety problem and the effort to solve the problems
Common Purposed Instruction	:	After finished this major student expected can explain the important of nutritive value and food to human being; food safety problem; the can causes the problem of food safety; and also strive avoiding it
Materials Book	:	<ol style="list-style-type: none"> 1. Anonymous, 1986. Proceedings Seminar Keamanan Pangan dalam Pengolahan dan Penyajian. Universitas Gadjah Mada Yogyakarta. 2. Anonymous, 1999. Kumpulan Materi Pelatihan Pengendalian Mutu dan Keamanan Pangan bagi Staf Pengajar. PEPG – IPB Bogor. 3. DSA. 1984. Safety and Quality in Food. Elsevier Publishing Co. New York. 4. Dewi, A.I., R.F.E. Axford, I.F, M. Marai dan H. Omed. 1994. Pollution in Livestock Production System. Cab International, Wallingford. 5. Natawigena, H. 1983. Pestisida dan Kegunaannya. Amico, Bandung. 6. Trihendrokesowo. 1988. Penyakit Infeksi Akibat Pangan. PAU Pangan dan Gizi UGM. Yogyakarta. 7. Noor, Z. 1999. Senyawa Antigi. PAU Pangan dan Gizi. UGM, Yogyakarta. 8. Supardi, I dan Sukanto. 1999. Mikroba dalam Pengolahan dan Keamanan Pangan. Penerbit Alumni Bandung. 9. Winamo, F.G dan T.S. Rahayu. 1994. Bahan Tambahan untuk Pangan dan Kontaminan. Pustaka Sinar Harapan, Jakarta

No.	Specific Purposed Instruction	The topics	The sub topics	Time estimation	Materials Book
1.	Student comprehends lecturing items scope and applied lecturing system.	Antecedent	<ol style="list-style-type: none"> 1. Items lecturing scope 2. Relation between the other major 3. Lecturing system and evaluation 	1 x 100 minute	1,3.
2.	Student comprehends about nutrition and food, in importance to human being and the problems of food safety arising out.	The importance of nutrition and food	<ol style="list-style-type: none"> 1. The availability of food 2. Food for human being healthy 3. The effort to solve the problems of food safety 4. The requirements of food to consume 5. Whose the responsibility 	2 x 100 minute	1,2,3.
3.	Student comprehends food safety problems from the chemist factor and the effort to solve the problems.	Food safety from chemist factor	<ol style="list-style-type: none"> 1. Compound Chemistry which is intend to be used 2. Chemical compound contamination 3. Compound poison and natural anti nutrition value 4. The effort to minimize poisonous compound 	4 x 100 minute	1,2,4,5,8,9.
4.	Mid semester test		Evaluation of acceptance major items	1 x 100 minute	-
5.	Student comprehends food safety problems from the microbiological factor and the effort to solve the problems	Food safety from microbiological factor	<ol style="list-style-type: none"> 1. Microbe which is intend to be used in food 2. The effect of microbe contaminant 3. Type infection microbe and type toxic 4. The effort to prevention from contamination of microbe 	2 x 100 minute	1,2,4,6,8.

FACULTY OF ANIMAL AGRICULTURE DIPONEGORO UNIVERSITY

6.	Student comprehends food safety problem from the handling processing, preservation, and serving factor.	Food safety from processing factor	<ol style="list-style-type: none"> 1. Conducting and cropping process 2. Process handling materials and preservation 3. Processing and serving for food 4. The equipments of food processing 	3 x 100 minute	1,2,3,9.
7.	Student comprehends that food safety early from behavioral problem and someone caring	Caring as food safety problem starting points	<ol style="list-style-type: none"> 1. Caring behavior of producer 2. Caring behavior of consumer 3. Behavioral to consume the healthy food 	2 x 100 minute	1,2.

COURSE : The Science and Technology of
Dairy Processing

COURSE CODE : PTH 302 P

CREDIT : 3 (2-1)

Session Unity of learning

Subject : The science and technology of Dairy Processing
Code of Subject : PTH 302 P1/3(2-1)
SKS : 3 (2-1)
Time of session : 100 minutes
Session : II

A. Object

1. TIU : After following this session students can do an modify method of cream separation and the standardization.
2. TIK :
 - Can explain definition of cream, skim, serum , total solid, solid non fat and method, prinsip and advantage of standardization.
 - Can do standardization of cream or fat.

B. Principle of subject : - Separation of milk constituents
- Standardization

C. Sub subject :

- Cream, Skim, TS, SNF
- Method and object of Standardization
- Example of standardization

D. Learning activity :

stage	Lecturer activity	Students activity	Tool and media of learning
Introduction	Menjelaskan definisi , cara, prinsip dan tujuan pemisahan bagian bagian susu dan standarisasi. To explain about definition, method, principles and object of cream separation and standardization.	To attent, write and listening	OHP and white board
Naration	To explain about definition, composition, nutrition and quality of milk constituents.	Attent and write	OHP and white board

	To give example about making milk with fat content 3 5 and raw material milk with fat content 7% and skim. Explain about using, advantage milk constituents.	Discussion Discussion	
enclosed	Review Discussion of this session.	To ask	

E. Evaluation :

Give prolem of standardization .

F. literatures :

1. Berg, Van den .1968. Dairy technology in the topics and subtropics. Pudoc. Wageningen
2. Robinson, RK. 1986. Modern dairy Technology. Vol I & II Elsevier Aplied Sci.Publ. London. New York.

Session Unity of learning

Subject : The science and technology of Dairy Processing
 Code of Subject : PTH 302 P1/3(2-1)
 SKS : 3 (2-1)
 Time of session : 100 minutes
 Session : III

A. Object

1. TIU : After following this session, students can explain about teory of homogenization and pasteurization.
2. TIK :
 - Can explain of definition, method, object and principles of homogenization.
 - Can explain of definition, method, object and principles of pasteurization
 - Can explain of definition, method, object and principles of sterilization

B. Principal of subject : - homogenization, sterilization, pasteurization.

C. sub subject :

- Definition
- Method, object and Principle
- Example of Product

D. Learning activity :

Stage	Lecturer activity	Student activity	Media and Tool of Learning
introduction	To explain definition, principle, method and object of homogenization	To attent, write and listening,	OHP and white board
Naration	To explain definition, principle, method and object of pasteurization	To attent, write and listening,	OHP and white board
	To explain definition, principle, method and object of sterilization	Discussion	
	To explain about packaging and storage of pasteurization and	Discussion	

	sterilization product. To explain about composition and nutrition of product. To explain about quality standard of product.	Discussion Discussion	
enclosed	Review about sub subject at this session	To ask	

E. Evaluation :

To Give post test to student.

F. literatures :

1. Berg. Van den .1968. Dairy technology in the tropics and subtropics. Pudoc. Wageningen
2. Robinson, RK. 1986. Modern dairy Technology. Vol I & II Elsevier Applied Sci.Publ. London. New York.

Session Unity of learning

Subject : The science and technology of Dairy Processing
 Code of Subject : PTH 302 P1/3(2-1)
 SKS : 3 (2-1)
 Time of session : 100 minutes
 Session : IV

A. Object

1. TIU : After following this session, students can do and modify method of making butter.
2. TIK :
 - can explain definition, principle, object and method of making butter
 - can do and modify processing of butter.

B. Principal of subject : - Butter

- C. Sub Pokok Bahasan** :
- Definition
 - composition, procedure, variety, overrun
 - Defect of butter

D. Learning activity :

Stage	Lecturer activity	Student activity	Media and Tool of Learning
Introduction	To explain definition and principle of making butter	To attent, wrte and listening	OHP and white board
Naration	to explain about composition, nutrition and quality of butter to give example of butter variety to expalin about defect of maentega	To attent and write Discussion Discussion	OHP and white board
enclosed	Review this session and to give clarification of the question	To ask	

E. Evaluation :

To give stimulation to student by many problem at processing of butter.

F. Literatures :

1. Berg, Van den. 1968. Dairy Technology in the Tropics and Subtropics. Pudoc, Wageningen
2. Robinson, R.K. 1986. Modern Dairy Technology. Vol I & II Elsevier Applied Sci. Publ. London. New York.

Session Unity of learning

Subject : The science and technology of Dairy Processing
 Code of Subject : PTH 302 P1/3(2-1)
 SKS : 3 (2-1)
 Time of session : 100 minutes

A. Object

1. TIU : After following this session, students can do and modify method of making toned milk ,filled milk, reconstituted dan recombined milk
2. TIK :
 - Can explain about toned milk ,filled milk, reconstituted dan recombined milk

B. principal of subject : - toned milk, filled milk, reconstituted & recombined milk

- C. Sub Subject** :
- Toned milk
 - filled
 - reconstituted & recombined miik

D. Activity of learning :

Stage	Lecturer activity	Student activity	Tool and media of learning
Introduction	To explain about definition, method, princilple and object of toned milk	To attent, write and listening	OHP and white board
Naration	To explain about definition, method, princilple and object of filled milk	To attent, write and listening	OHP and white board
	To explain about definition, method, princilple and object of reconstituted milk	Discussion	
	To explain about definition, method, princilple and object of recombined milk	Discussion	

enclosed	Reviem and to answer about many questions	To ask	
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E. evaluation :

Ask randomly to student about toned milk, filled milk, reconstituted & recombined milk

F. literatures :

1. Berg. Van den .1968. Dairy technology in the topics and subtropics. Pudoc. Wageningen
2. Robinson, RK. 1986. Modern dairy Technology. Vol I & II Elsevier Aplied Sci.Publ. London. New York.
3. Bilund. Handbook of Dairy Technology

Session Unity of learning

Subject : The science and technology of Dairy Processing
Code of Subject : PTH 302 P1/3(2-1)
SKS : 3 (2-1)
Time of session : 100 minutes
Session ; VI

A. Object

1. TIU : After following this session, students can do and modify method of making fermented milk and dairy starter culture.
2. TIK :
 - can explain about definition, procedure, variety and composition of fermented milk.
 - Can choose packaging and storage method for fermented
 - Can make fermented milk and care dairy starter culture.

B. principal of subject : - fermented milk and dairy culture

C. Sub Subject :

- Fermented milk
- Dairy Culture

D. Learning activity :

Stage	Lecturer activity	Student activity	Media and tool of learning
Introduction	To explain definition, method, principle and object of making fermented milk.	To attend and write	OHP and white board
Naration	To explain about method, principles and object of making dairy culture. to explain about packaging and storage. Method of fermented milk and dairy culture	To attend and write Discussion	OHP and white board
enclosed	Review and to give answer about many question and clarification.	To ask	

E. evaluation :

Give duty to review a scientific journal related to fermented milk and dairy culture.

F. literatures :

1. Berg, Van den .1968. Dairy technology in the topics and subtropics. Pudoc. Wageningen
2. Robinson, RK. 1986. Modern dairy Technology. Vol I & II Elsevier Aplied Sci.Publ. London. New York.
3. Bilund. Handbook of Dairy Technology

Session Unity of learning

Subject : The science and technology of Dairy Processing
 Code of Subject : PTH 302 P1/3(2-1)
 SKS : 3 (2-1)
 Time of session : 100 minutes
 Session : VII

A. Object

1. TIU : After following this session, students can do and modify processing of ice cream.
2. TIK :
 - Can explain about ice cream and method of standardization so can compose ice cream according to demand.

B. Principal of subject : Ice Cream

- C. Sub Subject** :
- Definition, variety, Nutrition)
 - Compose Ice Cream dough

D. Activity Learning :

Stage	Lecturer activity	Student activity	Media and tool of learning
Introduction	To explain definition, variety and composition of ice cream considered by it's nutrition..	To attent, write and listen	OHP and white board
Naration	To explain about how to compose ice cream	Discussion/Practice	OHP and white board
enclosed	Review	To ask	

E. evaluation :

Give duty to compose ice cream with diferent criteria.

- F. literatures** :
1. Berg. Van den .1968. Dairy technology in the topics and subtropics. Pudoc. Wageningen
 2. Robinson, RK. 1986. Modern dairy Technology. Vol I & II Elsevier Aplied Sci.Publ. London. New York.
 3. Bilund. Handbook of Dairy Technology

Session Unity of learning

Subject : The science and technology of Dairy Processing
 Code of Subject : PTH 302 P1/3(2-1)
 SKS : 3 (2-1)
 Time of session : 100 minutes
 Session : VIII

A. Object

1. TIU : After following this session stidents can do and modify method of making ice cream
2. TIK :
 - Can make and modify processing of ice cream according to surrounding.
 - Can identify quality of ice cream and prevent degreasing of quality or defect of ice cream.

B. Principal of Subject : Ice cream

C. Sub Subject :

- Procedure of making ice cream
- Criteria of quality and defect

D. Learning activity :

Stage	Lecturer activity	Student activity	Media and tool of learning
Introduction	Mereview duty that given last week	Practice and to attent	OHP and white board
Naration	To explain about procedure of making ice cream To explain about quality and packaging method for frozen storage.	To attent and write Discussion	OHP and white board
enclosed	Review and give clarification	To ask	

E. Evaluation: Give duty about development of ice cream processing is like : frozen yogurt, serbet, Probiotic ice cream..

F. Literatures

1. Berg, Van den .1968. Dairy technology in the tropics and subtropics. Pudoc. Wageningen
2. Robinson, RK. 1986. Modern dairy Technology. Vol I & II Elsevier Applied Sci.Publ. London. New York.
3. Bilund. Handbook of Dairy Technology

Session Unity of learning

Subject : The science and technology of Dairy Processing
Code of Subject : PTH 302 P1/3(2-1)
SKS : 3 (2-1)
Time of session : 100 minutes
Session : IX

A. Object

1. TIU : -
2. TIK : -

B. Principal of subject : Evaluation for midterm session I to VIII

C. Sub Subject : -

D. Learning activity :

Stage	Lecturer activity	Student activity	Media and tool of learning
Introduction	supervision	To do test	
Naration			
enclosed			

E. evaluation :

F. literature :

1. Berg. Van den .1968. Dairy technology in the topics and subtropics. Pudoc. Wageningen
2. Robinson, RK. 1986. Modern dairy Technology. Vol I & II Elsevier Aplied Sci.Publ. London. New York.
3. Bilund. Handbook of Dairy Technology

Session Unity of learning

Subject : The science and technology of Dairy Processing
 Code of Subject : PTH 302 P1/3(2-1)
 SKS : 3 (2-1)
 Time of session : 100 minutes
 Session : X

A. Object

1. TIU : After following this session, student can do and modify processing of making cheese
2. TIK :
 - Can explain variety, definition and nutrition of cheese
 - Can do processing of cheese

B. Principal of subject : - cheese

- C. Sub Subject** :
- definition
 - Variety
 - Nutrition
 - Procedure of making cheese

D. Learning activity :

stage	Lecturer activity	Student activity	Media and tool of learning
introduction	To explain definition, and variety of cheese	To attent, write and listen	OHP and white board
naration	To explain principles and object of making cheese To explain about processing of making cheese	To attent, write and listen Discussion	OHP and white board
enclosed	review	To ask	

E. Evaluation :

To Ask about procedure of making cheese

F. Literatures :

1. Berg. Van den .1968. Dairy technology in the tropics and subtropics. Pudoc. Wageningen
2. Robinsen, RK. 1986. Modern dairy Technology. Vol I & II Elsevier Applied Sci.Publ. London. New York.
3. Bilund. Handbook of Dairy Technology

Session Unity of learning

Subject : The science and technology of Dairy Processing
Code of Subject : PTH 302 P1/3(2-1)
SKS : 3 (2-1)
Time of session : 100 minutes
Session : XI

A. Object

1. TIU : After following this session, student can do and modify processing of making cheese
2. TIK :
Can explain about making cheese, variety cheese and standar quality of cheese.

B. principal of subject : - Cheese

C. Sub Subject :

- Quality of cheese
- Degreasing of quality and defect of cheese
- Packaging and storage

D. Learning activity :

Stage	Lecturer activity	Student activity	Media and tool of learning
introduction	To explain quality of cheese	To attent, write and listen	OHP and white board
Naration	To explain defect and factors that effect to defect To explain packaging and storage	To attent, write and listen Discussion	OHP and white board
enclosed	review	Bertanya	

E. Evaluation :

Give duty to review about scientific journal related to processing of cheese.

F. Literatures :

1. Berg, Van den .1968. Dairy technology in the tropics and subtropics. Pudoc. Wageningen
2. Robinson, RK. 1986. Modern dairy Technology. Vol I & II Elsevier Applied Sci.Publ. London. New York.
3. Bilund. Handbook of Dairy Technology

Session Unity of learning

Subject : The science and technology of Dairy Processing
Code of Subject : PTH 302 P1/3(2-1)
SKS : 3 (2-1)
Time of session : 100 minutes
Session : XII

A. object

1. TIU : After following this session students can do and modify method of condensed milk processing

2. TIK :

- Can explain about definition, variety and compotion of condensed milk
- Can identify quality of condensed milk and avoid defect along storage
- Can choose good packaging for condensed milk.

B. Principal of subject : Condensed milk

C. Sub Subject :

- Definition, variety and composition
- processing
- Quality and defect
- Packaging and storage

D. Learning activity :

Stage	Lecturer activity	Student activity	Nedia and tool of learning
Introduction	To explain sub subject and it's relevancy with others sub subject	To attent, write and listen	OHP and white board
naration	To make many group according number of sub subject Supervise to the discussion	Discussion	Paper, plastic of transparantcy, pen,
enclosed	Review	To ask	

E. Evaluation :

To Make conclusion from result of discussion and to compare with literatures

F. Literatures :

1. Berg. Van den .1968. Dairy technology in the topics and subtropics. Pudoc. Wageningen
2. Robinson, RK. 1986. Modern dairy Technology. Vol I & II Elsevier Applied Sci.Publ. London. New York.
3. Bilund. Handbook of Dairy Technology

Session Unity of learning

Subject : The science and technology of Dairy Processing
 Code of Subject : PTH 302 P1/3(2-1)
 SKS : 3 (2-1)
 Time of session : 100 minutes
 Session : XIII

A. Object

A. object

1. TIU : After following this session students can do and modify method of condensed milk processing
2. TIK :
 - Can explain about definition, variety and compotion of condensed milk
 - Can identify quality of condensed milk and avoid defect along storage
 - Can choose good packaging for condensed milk.

B. Principal of subject : Condensed milk

C. Sub Subject :

- Definition, variety and composition
- processing
- Quality and defect
- Packaging and storage

D. Learning activity :

Stage	Lecturer activity	Student activity	Media and tool of learning
Introduction	To explain about method of tution in this session and review duty last week	To attent, write and listen	OHP and white board
Naration	Give clarification disscussion result to compare in literatures	Discussion	OHP
enclosed	Review	To ask	

E. evaluation :

To make Condensed milk Plant.

F. Literatures :

1. Berg. Van den .1968. Dairy technology in the topics and subtropics. Pudoc. Wageningen
2. Robinson, RK. 1986. Modern dairy Technology. Vol I & II Elsevier Applied Sci.Publ. London. New York.
3. Bilund. Handbook of Dairy Technology

Session Unity of learning

Subject : The science and technology of Dairy Processing
 Code of Subject : PTH 302 P1/3(2-1)
 SKS : 3 (2-1)
 Time of session : 100 minutes
 Session : XIV

A. Object

1. TIU : After following the session, student can do and modify method of milk powder processing.

2. TIK :

- Can explain definition, variety, composition of milk powder
- Can identify quality of milk powder and avoid defect and degreasing quality along storage.
- Can do and modify method of milk powder processing.
- Can choose good packaging for dry milk product specially kilk powder.
-

B. Principal of subject : Milk Powder

C. Sub Subject :

- Definition, variety and composition
- processing
- Quality and defect
- Packaging and storage

D. Learning activity :

Stage	Lecturer activity	Student activity	Nedia and tool of learning
Introduction	To explain sub subject and it's relevancy with others sub subject	To attent, write and listen	OHP and white board
naration	To make many group according number of sub subject Supervise to the discussion	Discussion	Paper, plastic of transparantcy, pen,
enclosed	Review	To ask	

E. Evaluation

To Make conclusion from result of discussion and to compare with literatures

F. literatures

1. Berg. Van den .1968. Dairy technology in the topics and subtropics. Pudoc. Wageningen
2. Robinson, RK. 1986. Modern dairy Technology. Vol I & II Elsevier Aplied Sci.Publ. London. New York.
3. Bilund. Handbook of Dairy Technology

Session Unity of learning

Subject : The science and technology of Dairy Processing
 Code of Subject : PTH 302 P1/3(2-1)
 SKS : 3 (2-1)
 Time of session : 100 minutes
 Session : XV

A. Object

1. TIU : After following the session, student can do and modify method of milk powder processing.
2. TIK :
 - Can explain definition, variety, composition of milk powder
 - Can identify quality of milk powder and avoid defect and degreasing quality along storage.
 - Can do and modify method of milk powder processing.
 - Can choose good packaging for dry milk product specially kilk powder.
 -

B. Principal of subject : Milk Powder

C. Sub Subject :

- Definition, variety and composition
- processing
- Quality and defect
- Packaging and storage

D. Learning activity :

Stage	Lecturer activity	Student activity	Media and tool of learning
Introduction	To explain about method of tution in this session and review duty last week	To attent, write and listen	OHP and white board
Naration	Give clarification discussion result to compare in literatures	Discussion	OHP
enclosed	Review	To ask	

E. evaluation :

To make milk Powder Plant

F. literatures :

1. Berg, Van den .1968. Dairy technology in the tropics and subtropics. Pudoc. Wageningen
2. Robinson, RK. 1986. Modern dairy Technology. Vol I & II Elsevier Applied Sci.Publ. London. New York.
3. Bilund. Handbook of Dairy Technology

Session Unity of learning

Subject : The science and technology of Dairy Processing
Code of Subject : PTH 302 P1/3(2-1)
SKS : 3 (2-1)
Time of session : 100 minutes
Session : XVI

A. Object

1. TIU : -
2. TIK : -

B. Principal of subject : test semester for session IX to XV

C. Sub Subject : -

D. Learning activity :

Stage	Lecturer Activity	Student activity	Media and tool of learning
Introduction	Supervision	Doing test	
Naration			
enclosed			

E. Evaluation :

F. Literatures :

1. Berg. Van den .1968. Dairy technology in the topics and subtropics. Pudoc. Wageningen
2. Robinson, RK. 1986. Modern dairy Technology. Vol I & II Elsevier Aplied Sci.Publ. London. New York.
3. Bilund. Handbook of Dairy Technology

FAKULTAS PETERNAKAN UNIVERSITAS DIPONEGORO
GARIS BESAR PROGRAM PENGAJARAN

The title of subject : The science and technology of Dairy Processing
 Nomor Kode/sks : PTH 302 P1 / 3 (2 – 1)
 Description of subject : To study about principle science and processing method, preservation , defect, and packaging of milk products.
 General instructional object : To help students to:
 - know about the meaning of processing, preservation, and packaging of milk products.
 - know about milk properties included physical properties or chemical properties.
 - Know composition of milk product and to identify their nutrition.
 - do and explain how to storage and package milk product.
 - they are important to target of animal protein

Literature List

1. Adnan, M. 1984. Kimia dan Teknologi Pengolahan Air Susu. Andi Offset Yogyakarta.
2. Arbuckle, M. 1966. Ice Cream. Avi Publ. Co., Westport, Connecticut.
3. Berg, Van den. 1988. Dairy Technology in the Tropics and Subtropics. Pudoc, Wageningen.
4. Buckle, LA, RA Edward, GH Fleet dan M Woolton. 1985. Ilmu Pangan. Universitas Indonesia, Jakarta. (Diterjemahkan oleh Purnomo dan Adiyono).
5. Hadiwiyoto, S. 1983. Hasil-hasil Olahsan Susu, Kean, Daging, Telur. Penerbit Liberty, Yogyakarta.
6. Hadiwiyoto, S. 1994. Teori dan Prosedur Pengujian Mutu Susu dan Hasil Olahannya. Penerbit Liberty, Yogyakarta.
7. Robinson, RK. 1986. Modern Dairy Technology. Vol I & II. Elsevier Applied Sci. Publ. London, New York.
8. Soeparno. 1992. Prinsip Kimia dan Teknologi Susu. PAU Pangan dan Gizi UGM, Yogyakarta.

No.	General instructional object	Principal of subject	Sub subject	Estimation of time
1.	Student can explain definition, principles, object, method, variety, defect of cream, skim, butter, homogenization, pasteurization.	<ul style="list-style-type: none"> • Separation of cream • homogenization, pasteurization • butter 	<ul style="list-style-type: none"> • Object, method, standardization of cream separation. • Definition, procedure, factors of homogenization and pasteurization • Definition, composition, procedure, defect, overrun of butter 	4 x 100 menit
2.	Students can explain about toned milk, filled, reconstituted, recombined milk.	Toned milk, filled, reconstituted, recombined milk	Definition, procedure, variety, composition, defect, packaging of product.	1 x 100 menit
3.	Students can explain variety of fermented dairy starter culture and ice cream	Fermented milk, dairy starter culture, ice cream.	Definition, procedure, variety, composition, defect, packaging of product.	3 x 100 menit
4.	Students can do processing and explain many aspect of cheese.	cheese	Definition, procedure, variety, composition, defect, packaging of product.	2 x 100 menit
5.	Students can do processing and explain many aspect of condensed milk	Condensed milk.	Definition, procedure, variety, composition, defect, packaging of product.	2 x 100 menit
6.	Students can do processing and explain many aspect of dry milk product (milk powder, whey powder)	Milk powder, whey powder dll	Definition, procedure, variety, composition, defect, packaging of product.	2 x 100 menit

Session Unity of learning

Subject : The science and technology of Dairy Processing
 Code of Subject : PTH 302 P1/3(2-1)
 SKS : 3 (2-1)
 Time of session : 100 minutes
 Session : I

A. object

1. TIU : By following this session, students can know principles of subject, related to others subject, contract of lecturer and students, method of study and evaluation.
2. TIK :
 - a. Students can say principles of subject.
 - b. Students can make structure of relation inter subject related to this subject.
 - c. Students can know description of lecture contract until one semester.
 - d. Students can say tution method and evaluation of this subject.

B. Principal of subject : Introduction

C. Sub subject :

- Description of subject
- Relation inter subject
- Lecture contract
- Tution method and evaluation

D. Education activity :

Stage	Lecturer activity	Students activity	Tool and media of education
introduction	to expalin all of matter will give at this session.	To attent and write	OHP and white board
	To Introduce the lecturer of this subject.	To attent and write	OHP and white board
Naration	To explain background of this subject why give at this study programme To explain description of this	To attent and write	OHP and white board

	description of this subject To Give actual examples To make structure of relation inter subject To expalin lecture contract of this subject To expalin of method education To make small group discussion (5-7 students/group)	To do making permanent group based on lecturer instruction.	
Inclosed	To ask anything that need clarification or explanation to much more detail. To ask many things for actual examples to 2-3 students To Give review about sub subject were discussed at this session	To ask To answer To attent and write	

E. Evaluation :

This session was tended to students can know all of the matters that will be given at this subject for one semester full.

Literatures :

1. Berg. Van den .1968. Dairy technology in the topics and subtropics. Pudoc. Wageningen
2. Robinson, RK. 1986. Modern dairy Technology. Vol I & II Elsevier Aplied Sci.Publ. London. New York.

COURSE : Eggs Science and Technology
Processing

COURSE CODE : PTH 303 P

CREDIT : (2-1)3

ANIMAL AGRICULTURE OF DIPONEGORO UNIVERSITY

MAIN ROLE OF TEACHING PROCESS

- Name of Course : Eggs Science and Technology Processing
 Code/sks : PTH 303 P / 3 (2 – 1)
 Short Description : Egg, besides created as poultry propagation, it serves to the human food. As a food its need good handling so it still in a fresh condition until be fresh up processing processing.
 Course Main Goal : By following this course student can understand the science and technology of egg processing and also able to do the several of quality examination.
 References : 1. Card, C. E. dan M.C. Nesheim. 1973. Poultry Production. Lea and Fabiqes. Piladelphia.
 2. Or, H.L dan D.A. Fletcher. 1973. Eggs and Egg Products. Canada Department of Agriculture, Canada.
 3. Sarwono, B., B.A. Murtidjo dan A. Daryanto. 1986. Telur, Pengawetan dan Manfaatnya. Penebar Swadaya, Jakarta.
 4. Romanoff, H.A.L dan A.J. Romanoff. 1963. The Avian Egg. Jhon Willey and Sons, Inc. New York.
 5. Stadelman. WJ. dan OJ. Catterill. 1977. Egg Science and Technology. Avi Publ. Co., Connecticut.

No.	Course Specific Goal	Main Subject	Sub Subject	Time Estimation	References
1.	Student can understand theory and can do handle the fresh eggs.	fresh Egg handling	1. Fresh Egg cleaning 2. Inspection And qualification of fresh egg 3. Fresh Egg packing	4 x 100 minute	1,2,4,5 .
2.	Student can understand the theory about egg preservation and also able to do the various method of eggs preservations.	Preservation of eggs	1. Pickling in low temperature 2. Pickling in high temperature 3. Veneering eggs Shell 4. Soaking in pickle dilution	4 x 100 minute	3,4,5.
3.	Student can understand the theory about egg processing and also able to do the several of egg processing.	Eggs Processing	1. Eggs processing : a. Powder egg b. Briny Egg c. Egg "Pindang"	4 x 100 minute	2,3,4,5.

SET OF TEACHING INSTRUCTION

Name of Course : Eggs Science and Technology Processing
Course Code : PTH 303 P
SKS : 3 sks
Meeting Time : 100 minute
Meeting Number : 1

A. Instructional Target

1. Course Main Goal: To supply student with egg science and knowledge and ability to handle and also to process it.
2. Course Specific Goal: Giving understanding about Course, system and evaluation the course and its benefit

B. Main Subject: Introduction

- C. Sub Subject:
1. Scope of course
 2. Lecturing system and evaluation
 3. Egg definition
 4. Egg Usefulness

D. Teaching activity:

Teaching Step	Teacher Activity	Student Activity	Teaching Media
Introductions	Introduction, Course Information	Note down, Listening, Discusion	OHP Blackboard
Presentation	Explaining relationship this course with others	Note down, Listening, Discusion	OHP Blackboard
Conclusion	Giving substance for the next meeting	Discusion	Blackboard

E. Evaluation : Quiz

F. References :

1. Orr, H.L. and D.A. Fletcher. 1973. Egg and Egg Products. Canada Department of Agriculture, Ottawa.
2. Romanoff, A.L. and A.J. Romanoff. 1963. The Avian Egg. John Wiley & Sons, Inc. New York.
3. Stadelman, W.J. and O.J. Cotterill. 1990. Egg Science and Technology. Food Product Press. New York

SET OF TEACHING INSTRUCTION

Name of Course : Eggs Science and Technology Processing

Course Code : PTH 303 P

SKS : 3 sks

Meeting Time : 100 minute

Meeting Number : II

A. Instructional Target

1. Course Main Goal: To supply student with egg science and knowledge and ability to handle and also to process it.
2. Course Specific Goal: Teaching student to master in the egg component.

B. Main Subject: Structure and egg composition

- C. Sub Subject:
1. Egg component
 2. Physical composition of egg
 3. Chemical composition of egg

D. Teaching activity:

Teaching Step	Teacher Activity	Student Activity	Teaching Media
Introductions	Inviting student to remembering the items of former teaching material. Explaining about importance learn the structure and egg composition	Note down, Listening, Discusion	OHP Blackboard
Presentation	Displaying the draw of egg and explaining it. Explaining component of physical and chemical of egg.	Note down, Listening, Discusion	OHP Blackboard
Conclusion	Commenting and concluding result of discussion. Giving substance for the next meeting	Discusion	Blackboard

E. Evaluation : Quiz

- F. References:
1. Burley, R.W. and D.V. Vadehra. 1989. The Avian Egg: Chemistry and Biology. John Wiley & Sons, Inc. New York
 2. Orr, H.L. and D.A. Fletcher. 1973. Egg and Egg Products. Canada Department of Agriculture, Ottawa.
 3. Romanoff, A.L. and A.J. Romanoff. 1963. The Avian Egg. John Wiley & Sons, Inc. New York.
 4. Stadelman, W.J. and O.J. Cotterill. 1990. Egg Science and Technology. Food Product Press. New York.
 5. Yamamoto, T., L. R. Juneja., H. Hatta and M. Kim. 1997.
 6. Hen Eggs: Their Basic and Applied Science. CRC Press, Washington DC.

SET OF TEACHING INSTRUCTION

Name of Course : Eggs Science and Technology Processing

Course Code : PTH 303 P

SKS : 3 sks

Meeting Time : 2 x 100 minute

Meeting Number : III and IV

A. Instructional Target

1. Course Main Goal: To supply student with egg science and knowledge and ability to handle and also to process it.
2. Course Specific Goal: Teaching student to master in identifying egg quality

B. Main Subject: Egg quality

- C. Sub Subject:
1. Definition
 2. Measurement of egg quality
 3. Keep of the egg quality

D. Teaching activity:

Teaching Step	Teacher Activity	Student Activity	Teaching Media
Introductions	Inviting student to remembering the items of former teaching material. Explaining the importance learn of the egg quality.	Note down, Listening, Discussion	OHP Blackboard
Presentation	Explaining about congeniality of egg quality, its measurement method, factors influencing degradation of egg quality and way of keep the egg quality.	Note down, Listening, Discussion	OHP Blackboard
Conclusion	Commenting and concluding result of discussion. Giving substance for the next meeting.	Discussion	Blackboard

E. Evaluation: Quiz

- F. References:
1. Orr, H.L. and D.A. Fletcher. 1973. Egg and Egg Products. Canada Department of Agriculture, Ottawa.
 2. Romanoff, A.L. and A.J. Romanoff. 1963. The Avian Egg. John Wiley & Sons, Inc. New York.
 3. Stadelman, W.J. and O.J. Cotterill. 1990. Egg Science and Technology. Food Product Press. New York.
 - 4.

SET OF TEACHING INSTRUCTION

Name of Course : Eggs Science and Technology Processing

Course Code : PTH 303 P

SKS : 3 sks

Meeting Time : 2 x 100 minute

Meeting Number : V and VI

A. Instructional Target

1. Course Main Goal: To supply student with egg science and knowledge and ability to handle and also to process it.
2. Course Specific Goal: Teaching student to master in egg properties and able to application this ability in food industry

B. Main Subject: Egg properties

- C. Sub Subject:
1. Coagulation
 2. Emulsion
 3. Others properties

D. Teaching activity :

Teaching Step	Teacher Activity	Student Activity	Teaching Media
Introductions	Inviting student to remembering the items of former teaching material. Explaining the importance learn of the egg properties.	Note down, Listening, Discussion	OHP Blackboard
Presentation	Explaining the egg properties in food	Note down, Listening, Discussion	OHP Blackboard
Conclusion	Commenting and concluding result of discussion. Giving substance for the next meeting.	Discussion	Blackboard

E. Evaluation: Quiz

- F. References:
1. Romanoff, A.L. and A.J. Romanoff. 1963. The Avian Egg. John Wiley & Sons, Inc. New York.
 2. Stadelman, W.J. and O.J. Cotterill. 1990. Egg Science and Technology. Food Product Press. New York.

SET OF TEACHING INSTRUCTION

Name of Course : Eggs Science and Technology Processing

Course Code : PTH 303 P

SKS : 3 sks

Meeting Time : 4 x 100 minute

Meeting Number : VII, VIII, IX and X

A. Instructional Target

1. Course Main Goal: To supply student with egg science and knowledge and ability to handle and also to process it.

2. Course Specific Goal: Teaching student to master in egg preservation

B. Main Subject: Egg preservation

- C. Sub Subject:
1. Egg whole preservation
 - a. Dry packing
 - b. Immersion in preservative dilution
 - c. Cooling
 - d. Shell protection
 2. Egg component preservation
 - a. Pasteurisation
 - b. Freezing
 - c. Drying

D. Teaching activity :

Teaching Step	Teacher Activity	Student Activity	Teaching Media
Introductions	Inviting student to remembering the items of former teaching material. Explaining the importance learn of the egg preservative	Note down, Listening, Discussion	OHP Blackboard
Presentation	Explaining about principles of egg preservative, various method and way of egg preservative.	Note down, Listening, Discussion	OHP Blackboard
Conclusion	Commenting and concluding result of discussion. Giving substance for the next meeting.	Discussion	Blackboard

E. Evaluation: Quiz

- F. References:
1. Orr, H.L. and D.A. Fletcher. 1973. Egg and Egg Products. Canada Department of Agriculture, Ottawa.
 2. Romanoff, A.L. and A.J. Romanoff. 1963. The Avian Egg. John Wiley & Sons, Inc. New York.
 3. Stadelman, W.J. and O.J. Cotterill. 1990. Egg Science and Technology. Food Product Press. New York.

SET OF TEACHING INSTRUCTION

Name of Course : Eggs Science and Technology Processing

Course Code : PTH 303 P

SKS : 3 sks

Meeting Time : 4 x 100 minute

Meeting Number : XI, XII and XIII

A. Instructional Target

1. Course Main Goal: To supply student with egg science and knowledge and ability to handle and also to process it.
2. Course Specific Goal: Teaching student to master in egg processing

B. Main Subject: Egg processing

- C. Sub Subject:
1. Salted egg
 2. Egg "pindang"
 3. Egg Pickling
 4. Omelets, mayonnaise, soufflés and pastry

D. Teaching Activity:

Teaching Step	Teacher Activity	Student Activity	Teaching Media
Introductions	Inviting student to remembering the items of former teaching material. Explaining the importance learn of the egg processing	Note down, Listening, Discussion	OHP Blackboard
Presentation	Explaining about egg processing as whole food or as a part of the other food.	Note down, Listening, Discussion	OHP Blackboard
Conclusion	Commenting and concluding result of discussion. Giving substance for the next meeting.	Discussion	Blackboard

E. Evaluation: Quiz

- F. References:
1. Orr, H.L. and D.A. Fletcher. 1973. Egg and Egg Products. Canada Department of Agriculture, Ottawa.
 2. Romanoff, A.L. and A.J. Romanoff. 1963. The Avian Egg. John Wiley & Sons, Inc. New York.
 3. Stadelman, W.J. and O.J. Cotterill. 1990. Egg Science and Technology. Food Product Press. New York.
 4. Barker, A. 2003. Egg: Wonderful ways with a classic ingredient. Annes Publishing Ltd., London.

SET OF TEACHING INSTRUCTION

Name of Course : Eggs Science and Technology Processing

Course Code : PTH 303 P

SKS : 3 sks

Meeting Time : i x 100 minute

Meeting Number : XIV

A. Instructional Target

1. Course Main Goal: To supply student with egg science and knowledge and ability to handle and also to process it.
2. Course Specific Goal: Teaching student to master in egg processing

B. Main Subject: Egg processing

- C. Sub Subject:
1. Boiling
 2. Poaching
 3. Scrambling
 4. Frying

D. Teaching Activity:

Teaching Step	Teacher Activity	Student Activity	Teaching Media
Introductions	Inviting student to remembering the items of former teaching material. Explaining the importance learn of the egg processing	Note down, Listening, Discussion	OHP Blackboard
Presentation	Explaining about elementary technique cook egg.	Note down, Listening, Discussion	OHP Blackboard
Conclusion	Commenting and concluding result of discussion. Giving substance for the next meeting.	Discussion	Blackboard

E. Evaluation: Quiz

F. References:

1. Romanoff, A.L. and A.J. Romanoff. 1963. The Avian Egg. John Wiley & Sons, Inc. New York.
2. Barker, A. 2003. Egg: Wonderful ways with a classic ingredient. Annes Publishing Ltd., London.

COURSE : Agricultural Extension

COURSE CODE :

CREDIT : 3(2-1)

OUTLINE OF TEACHING PROGRAM

Subject : Agricultural Extension
Code / SKS : / 3 (2 – 1) sks

Description :

Argue about the meaning, purpose and the objective of agricultural extension, education and behavioral change, communication, adoption and diffusion of innovation, method, media, material and extension tools, the planning of extension program, evaluation, government policy in extension

General Instruction :

After attending the course, students be able to understand the importance of the education process and behavioral change through communication, diffusion of innovation, using method, media and extension tools, program planning, and understand the government policy in agriculture, especially in extension program

References :

1. Anomious. 1970. Psikologi pendidikan.
2. Balai Informasi Pertanian. 1989. Pedoman pembinaan kelompok tani nelayan. Deptan. Jakarta.
3. Bloom, B.S., F. D. R. Karthwohl and B. B. Masia. 1965. Taxonomi of educational objectives. New York : David McKay Co., Inc.
4. Direktorat Jenderal Peternakan. 1992. Petunjuk pelaksanaan pembinaan kelompok tani ternak. Dirjen peternakan, Deptan. Jakarta.
5. Gunardi. 1980. Dasar-dasar penyuluhan. IPB. Bogor.
6. Goldberg, A. 1985. Komunikasi kelompok, proses diskusi dan penerapannya. UI. Jakarta.
7. Havelock, R. G., 1969. Planning for innovation. Dissemination and utilization of knowledge. ISR. The University of Michigan, Ann Arbor, Michigan.
8. Hawkins, H. S., A. M. Dunn and J. W. Cary. 1982. Agricultural and livestock extension. Vol. 2. The extension process. Canberra. AUIDP.
9. Hawkins, H. S. and Van den Ban. 1990. Agricultural extension. Co-publish in The United State with Joh Wiley and Son, Inc. New York.
10. Isbandi. 1991. Pendidikan dalam penyuluhan. FP UNDIP. Semarang.
11. Isbandi. 1992. Proses pendidikan penyuluhan. FP UNDIP. Semarang.

12. Isbandi. 1992. Pendidikan, komunikasi dan perencanaan program penyuluhan peternakan. FP UNDIP. Semarang.
13. Jalaluddin, R. 2001. Psikologi komunikasi. Penerbit PT Remaja Rosdakarya. Bandung.
14. Kartasapoetra, A. G. 1994. Teknologi penyuluhan pertanian. Penerbit Bumi Aksara. Jakarta.
15. Lionberger, H. F. 1960. Adoption of new ideas and practices. Iowa : The Iowa State University Press.
16. Mardikanto, T. 1993. Penyuluhan pembangunan pertanian. SMU Press, Surakarta.
17. Sastraatmadja, E. 1993. Penyuluhan pertanian. Falsafah, masalah dan strategi. Alamuni. Bandung.
18. Slamet, M. 1978. Penyuluhan pertanian. Kumpulan bahan bacaan penyuluhan.. Edisi III. IPB. Bogor
19. Satmoko, S. 1996. Komunikasi penyuluhan. Diktat kuliah penyuluhan. FP UNDIP. Semarang.
20. Soedijanto, P., 1997. Media penyuluhan pertanian. Universitas Terbuka.
21. Soedijanto, P., 1999. Evaluasi penyuluhan pertanian. Universitas Terbuka.

No.	Specific Instruction	Topics	Subtopics	Duration
1.	Students be able to understand and explain the meaning of agricultural extension	The meaning of agricultural extension	<ul style="list-style-type: none"> ▪ Agricultural development, especially in animal husbandry ▪ The relation of extension and other sciences ▪ Purpose, Objectives, function, principles, philosophy and extension ethics 	100 minutes
2.	Students be able to understand and explain the function of education related with behavioral domains	Education and behavioural domain	<ul style="list-style-type: none"> ▪ Education and behavioral change process ▪ Types of education and their processes ▪ Behavioral domain and the phase of change 	100 minutes
3.	Students be able to understand and explain about communication, adoption, diffusion of innovation in the agricultural extension	Communication, adoption and diffusion of innovation	<ul style="list-style-type: none"> ▪ The definition of communication, adoption and diffusion of innovation ▪ Communication functions ▪ Adoption and diffusion of innovation processes 	100 minutes
4.	Students be able to understand and explain about extension method	Extension method	<ul style="list-style-type: none"> ▪ Meaning of extension method ▪ Types of extension method and its practices ▪ Strategy of the use of the methods in behavioral change 	200 minutes

5.	Students be able to understand and explain about extension media	Extension Media	<ul style="list-style-type: none"> ▪ Definition of extension media ▪ Various media and their applicationa ▪ Strategy of the use of media 	200 minutes
6.	Students be able to understand and explain about material, tools and education kits	Material, tools and extension kits	<ul style="list-style-type: none"> ▪ Definiton of material, tools and extension kits ▪ Types of material, sources and the selection of materials ▪ Types of Material, tools and extension kits 	200 minutes
7.	Students be able to understand and explain about extension program planning	Extension program planning	<ul style="list-style-type: none"> ▪ Definition of extension program ▪ The formation of program planning ▪ Steps in program planning 	200 minutes
8.	Students be able to understand and explain extension program evaluation	Evaluation in extension program	<ul style="list-style-type: none"> ▪ Definition of extension program evaluation ▪ Formation of extension program evaluation 	200 minutes
9.	Students be able to understand and explain government policy in extension, agriculture and food security	extension program evaluation	<ul style="list-style-type: none"> ▪ Identifying the work's place ▪ Physical, infrastructure, institutional and human resources ▪ Organisation and Adminstration ▪ Facilities and work system 	100 minutes
10.	Students recognize the practice of agricultural extension	Capita Selecta	The practice of extension programs	100 minutes

TEACHING AGENDA

Subject : Agricultural Extension
Code : / 3 (3-1) SKS
Duration : 12 – 14 x (2 x 1) x 100 minutes

TEACHING AGENDA I

DESCRIPTION :

Talks about definition, meaning and objectives of extension in agriculture, related with theories of education and agricultural development

GENERAL INSTRUCTION :

After attending the class, students be able to understand the importance of educational process and behavioral change for farmers and their families

SPECIFIC INSTRUCTION

Students be able to understand and able to explain the concepts of educational process and behavioral change of the farmers

Subtopics

1. The meaning of development and agricultural development
2. The meaning of education (Formal, Non-formal dan Informal)
3. The meaning of behavioral change

Teaching activities

No.	Phases	Lecturere Activities	Students activities	Media / education kits
1.	Introduction	Explaining: The meaning of development and agricultural development The meaning of education (Formal, Non-formal dan Informal) The meaning of behavioral change	Listening and responding	Whiteboard OHP LCD
2.	Presentation			

TEACHING AGENDA II

WEEKS	TOPIC	SUBTOPIC	LECTURER
I	The meaning of extension, especially in the field of animal husbandry	<ul style="list-style-type: none"> ▪ Agricultural development, especially in animal husbandry ▪ The relation of extension and other sciences ▪ Purpose, Objectives, function, principles, philosophy and extension ethics 	ISB
II	Types of education and behavioral domain	<ul style="list-style-type: none"> ▪ Education and behavioral change process ▪ Types of education and their processes ▪ Behavioral domain and the phase of change 	ISB
III	Communication, adoption and diffusion of innovation	<p>The definition of communication, adoption and diffusion of innovation</p> <ul style="list-style-type: none"> ▪ Communication functions ▪ Adoption and diffusion of innovation processes 	ISB
IV dan V	Extension method	<ul style="list-style-type: none"> ▪ Meaning of extension method ▪ Types of extension method and its practices ▪ Strategy of the use of the methods in behavioral change 	ISB
VI dan VII	Extension Media	<ul style="list-style-type: none"> ▪ Definition of extension media ▪ Various media and their applications ▪ Strategy of the use of media 	ISB
VIII	MID SEMESTER		
IX dan X	Material, and educational kit in extension	<ul style="list-style-type: none"> ▪ Definition of material, tools and extension kits ▪ Types of material, sources and the selection of materials ▪ Types of Material, tools and extension kits 	TSE
XI dan XII	Extension Program	<ul style="list-style-type: none"> ▪ Definition of extension program ▪ The formation of program planning ▪ Steps in program planning 	TSE
XIII dan XIV	Extension program evaluation	<ul style="list-style-type: none"> ▪ Definition of extension program evaluation ▪ Formation of extension program evaluation 	TSE
XV	Government policy in agricultural extension	<ul style="list-style-type: none"> ▪ Identifying the work's place ▪ Physical, infrastructure, institutional and human resources ▪ Organisation and Administration 	TSE

		▪ Facilities and work system	
XVI	Capita Selecta	The practice of extension programs	TSE

KRITERIA PENILAIAN :

1. Ujian MID Semester : 30 %
2. Ujian Akhir Semester: 30 %
3. Tugas : 10 %
4. Praktikum : 30%
- Jumlah : 100%

BUKU PUSTAKA :

- Anomious. 1970. Psikologi pendidikan.
- Balai Informasi Pertanian. 1989. Pedoman pembinaan kelompok tani nelayan. Deptan. Jakarta.
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- Havelock, R. G., 1969. Planning for innovation. Dissemination and utilization of knowledge. ISR. The University of Michigan, Ann Arbor, Michigan.
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- Isbandi. 1991. Pendidikan dalam penyuluhan. FP UNDIP. Semarang.
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- Isbandi. 1992. Pendidikan, komunikasi dan perencanaan program penyuluhan peternakan. FP UNDIP. Semarang.
- Jalaluddin, R. 2001. Psikologi komunikasi. Penerbit PT Remaja Rosdakarya. Bandung.
- Kartasapoetra, A. G. 1994. Teknologi penyuluhan pertanian. Penerbit Bumi Aksara. Jakarta.
- Lionberger, H. F. 1960. Adoption of new ideas and practices. Iowa : The Iowa State Univbersity Press.
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- Satmoko, S. 1996. Komunikasi penyuluhan. Diktat kuliah penyuluhan. FP UNDIP. Semarang.
- Soedijanto, P., 1997. Media penyuluhan pertanian. Universitas Terbuka.
- Soedijanto, P., 1999. Evaluasi penyuluhan pertanian. Universitas Terbuka.

COURSE : ENTREPRENEURSHIP

COURSE CODE :

CREDIT : 2(2-0)

COURSE OUT LINE

SUBJECT STUDIED : ENTREPRENEURSHIP
 CODE NO. : MWU 109
 SCS : 2(2-0)

SHORT DISCREPTION:

It is study about autonomy and share of business to perspective of entrepreneurship related to business of failure and success, to livestock enterprise especially.

GENERAL INSTRUCTION GOALS:

After joint in this lecture, student may knew and understood the role of entrepreneurship, to livestock enterprise especially, and to develop and to motivate for made business.

REFERENCES:

1. Birah Paul, Brian Clegg, 1996. business Creativity. PT Gramedia pustaka Utama, Jakarta
2. Djatmiko, D. wirausaha dan Pembangunan. CV Alfabeta, Bandung
3. Drucher, PF. 1996. Inovasi dan Kewirausahaan, Erlangga. Jakarta.
4. Geoffrey G.M, et al. 1992. Kewirausahaan Teori dan Praktek Seni Manajemen no. 97. PT Pustaka Binaman Pressindo
5. Histick, R.D., Peters MP. 1995. Entrepreneurship. Irwin. Chicago.
6. Alma, B. 2000. Kewirausahaan. Penerbit Alfabeta, Bandung.
7. Wiratmo, M. 1996. pengantar kewirausahaan, kerangka Dasar memasuki Dunia Bisnis., BPFE, Yogyakarta.
8. Virgilio. V. Vitung dkk. 1988 (editor). Agribussiness Opportunities. A practical how to book on likelihood and agricultural business ventures. Agriscoope, Quezon City.
9. Longenecker J.R., C.W. Moore dan J.W. Petty. Kewirausahaan, Manajemen Usaha Kecil (terjemahan). Buku 1 dan 2. Salemba Empat, Jakarta.

NO.	SPECIFIC INSTRUCTION GOALS	TOPICS	SUB-TOPICS	TIME ESTIMATION	REFE RENCES
1.	At the end of lectures, students know and can explain terms of entrepreneurship, to livestock enterprise especially.	Introduction	1. Sense and term of entrepreneurship 2. Scope based pattern of entrepreneurship 3. Entrepreneurship as culture	2x100minutes (2 times of meeting)	5, 6, 7

2.	At the end of lectures, students know and can explain the role and goals of entrepreneurship	Role and goals of entrepreneurship	<ol style="list-style-type: none"> 1. be interested in to entrepreneurship 2. Crisis factors to start to business 3. measuring for interested business person 	2x100minutes (2 times of meeting)	5, 6, 7
3.	At the end of lectures, students know and can explain how to become business person	Personalities of business person	<ol style="list-style-type: none"> 1. Characters of business person 2. Attitude, temperament and personalities of business person 	1x100minutes	5, 6, 7
4.	At the end of lectures, students know and can explain how to become entrepreneurship	To move of motivate	<ol style="list-style-type: none"> 1. Social motivate 2. achievement 3. to rise power of motivation 4. to motivate other person 	2x100minutes (2 times of meeting)	5, 6, 7
5.	At the end of lectures, students know and can explain how to identification business share	identification of business share	<ol style="list-style-type: none"> 1. Change as innovation 2. Sources of innovation 3. Failure of business share 	2x100minutes (2 times of meeting)	3
6.	At the end of lectures, students know and can explain concepts and challenge of business	The concepts and challenge of business	<ol style="list-style-type: none"> 1. Opportunities to business 2. Reward and Challenge 3. Livestock enterprises Model 	2x100minutes (2 times of meeting)	9 (Book 1)
7.	At the end of lectures, students know and can explain how to build farm enterprise	Build farm enterprise	<ol style="list-style-type: none"> 1. New farm business 2. Family business 3. Buy farm business 	2x100minutes (2 times of meeting)	9 (Book 1)
8.	At the end of lectures, students know and can explain to build consumer loyalty	Build consumer loyalty	<ol style="list-style-type: none"> 1. Component of consumer satisfy 2. Commitment of servicing 3. Knowing consumer 4. Build product supply (make value added) 	2x100minutes (2 times of meeting)	9 (Book 2)

SET OF STUDY PROGRAMS

Subject of study : Entrepreneurship
 Code of Study : MWU 109
 SCS : 2(2-0)
 Time schedule : 2 x 100 minute
 Meeting times : 1 & 2

A. GOALS

1. GIG: Student may know and understand the role and goals of entrepreneurship, to livestock enterprise especially, and develop attitude and motivate become business person.
2. SIG: At the end of lectures, students know and can explain terms of entrepreneurship, to livestock enterprise especially

B. SUB-TOPICS:

1. Sense and term of entrepreneurship
2. Scope based of entrepreneurship pattern
3. Entrepreneurship as culture

C. D. Learning and teaching activity:

STEPS	TEACHING ACTIVITY	STUDENT ACTIVITY	MEDIA AND TEACHING TOOLS
Introduction	Explain about : 1. Introduction of entrepreneurship to course 1 & 2 2. Competency GIG and SIG	Pay attention	White Board, OHP/LCD, felt-tip marker
Presentation	1. Explain about sense and term of entrepreneurship 2. Explain Scope based of entrepreneurship pattern 3. Entrepreneurship as culture	Pay attention Writing	White Board, OHP/LCD, felt-tip marker
Closing	Opportunities to student make question and answering the question from course	Asking & Answering Discussing	Notes

Evaluation:

References:

1. Alma, B. 2000. Kewirausahaan. Penerbit Alfabeta, Bandung.
2. Histick, R.D., Peters MP. 1995. Enterpreneurship. Irwin. Chicago.
3. Wiratmo, M. 1996. pengantar kewirausahaan, kerangka Dasar memasuki Dunia Bisnis., BPFE, Yogyakarta.

SET OF STUDY PROGRAMS

Subject of study: Entrepreneurship
 Code of Study: MWU 109
 SCS : 2(2-0)
 Time schedule : 2 x 100 minute
 Meeting times : 3 & 4

GOALS

1. GIG: Student may know and understand the role and goals of entrepreneurship, to livestock enterprise especially, and develop attitude and motivate become business person.
2. SIG: At the end of lectures, students know and can explain role and goals of entrepreneurship, to livestock enterprise especially,

SUB-TOPICS:

1. Be interested in to entrepreneurship
2. Crisis factors to start to business
3. Measuring for interested business person

Learning and teaching activity:

STEPS	TEACHING ACTIVITY	STUDENT ACTIVITY	MEDIA AND TEACHING TOOLS
Introduction	Explain about Competency GIG and SIG	Pay attention Writing	White Board, OHP/LCD, felt-tip marker
Presentation	1. Explain about be interested in to entrepreneurship 2. Explain about crisis factors to start to business 3. Explain about how to measuring for interested business person	Pay attention Writing	White Board, OHP/LCD, felt-tip marker
Closing	Opportunities to student make question and answering the question from course	Asking & Answering question Discussing	Notes

Evaluation:

References:

1. Alma, B. 2000. Kewirausahaan. Penerbit Alfabeta, Bandung.
2. Histick, R.D., Peters MP. 1995. Enterpreneurship. Irwin. Chicago.
3. Wiratmo, M. 1996. pengantar kewirausahaan, kerangka Dasar memasuki Dunia Bisnis., BPFE, Yogyakarta.

SET OF STUDY PROGRAMS

Subject of study: Entrepreneurship

Code of Study: MWU 109

SCS : 2(2-0)

Time schedule : 2 x 100 minute

Meeting times : 5

GOALS

1. GIG: Student may know and understand the role and goals of entrepreneurship, to livestock enterprise especially, and develop attitude and motivate become business person.
2. SIG: At the end of lectures, students know and can explain how to be business person

SUB-TOPICS:

1. Characters of business person
2. Attitude, temperament and personalities of business person

Learning and teaching activity:

STEPS	TEACHING ACTIVITY	STUDENT ACTIVITY	MEDIA AND TEACHING TOOLS
Introduction	Explain about Competency GIG and SIG	Pay attention Writing	White Board, OHP/LCD, felt-tip marker
Presentation	1. Explain about what characters must be own by business person 2. Explain about what attitude, temperament and personalities of business person	Pay attention Writing	White Board, OHP/LCD, felt-tip marker
Closing	Opportunities to student make question and answering the question from course	Asking & Answering question Discussing	Notes

Evaluation:

Instrument used: student ability to asking and answering question from materials

References:

1. Alma, B. 2000. Kewirausahaan. Penerbit Alfabeta, Bandung.
2. Histick, R.D., Peters MP. 1995. Enterpreneurship. Irwin. Chicago.
3. Wiratmo, M. 1996. pengantar kewirausahaan, kerangka Dasar memasuki Dunia Bisnis., BPFE, Yogyakarta.

SET OF STUDY PROGRAMS

Subject of study : Entrepreneurship
 Code of Study : MWU 109
 SCS : 2(2-0)
 Time schedule : 2 x 100 minute
 Meeting times : 6 & 7

GOALS

1. GIG: Student may know and understand the role and goals of entrepreneurship, to livestock enterprise especially, and develop attitude and motivate become business person.
2. SIG: At the end of lectures, students know and can explain how become entrepreneurship

SUB-TOPICS:

1. Social motivate
2. Achievement
3. to rise power of motivation
4. to motivate other person

LEARNING AND TEACHING ACTIVITY:

STEPS	TEACHING ACTIVITY	STUDENT ACTIVITY	MEDIA AND TEACHING TOOLS
Introduction	Explain about Competency GIG and SIG	Pay attention Writing	White Board, OHP/LCD, felt-tip marker
Presentation	Explain about: 1. Social motivate 2. how to achievement 3. how to rise power of motivation 4. how to motivate other person	Pay attention Writing	White Board, OHP/LCD, felt-tip marker
Closing	Opportunities to student make question and answering the question from course	Asking & Answering question Discussing	Notes

Evaluation:

Instrument used: student ability to asking and answering question from materials

References:

1. Alma, B. 2000. Kewirausahaan. Penerbit Alfabeta, Bandung.
2. Histick, R.D., Peters MP. 1995. Entrepreneurship. Irwin. Chicago.
3. Wiratmo, M. 1996. pengantar kewirausahaan, kerangka Dasar memasuki Dunia Bisnis., BPFE, Yogyakarta.

SET OF STUDY PROGRAMS

Subject of study : Entrepreneurship
 Code of Study : MWU 109
 SCS : 2(2-0)
 Time schedule : 2 x 100 minute
 Meeting times : 8 & 9

GOALS

1. GIG: Student may know and understand the role and goals of entrepreneurship, to livestock enterprise especially, and develop attitude and motivate become business person.
2. SIG: At the end of lectures, students know and can explain to identification business share

SUB-TOPICS:

1. Change as innovation
2. Sources of innovation
3. Failure of business share

LEARNING AND TEACHING ACTIVITY:

STEPS	TEACHING ACTIVITY	STUDENT ACTIVITY	MEDIA AND TEACHING TOOLS
Introduction	Explain about Competency GIG and SIG	Pay attention Writing	White Board, OHP/LCD, felt-tip marker
Presentation	Explain about: 1. Change as innovation 2. Sources of innovation 3. Failure of business share	Pay attention Writing	White Board, OHP/LCD, felt-tip marker
Closing	Opportunities to student make question and answering the question from course	Asking & Answering question Discussing	Notes

Evaluation:

Instrument used: student ability to asking and answering question from materials

References:

Drucher, PF. 1996. Inovasi dan Kewirausahaan, Erlangga. Jakarta.

SET OF STUDY PROGRAMS

Subject of study : Entrepreneurship
 Code of Study : MWU 109
 SCS : 2(2-0)
 Time schedule : 2 x 100 minute
 Meeting times : 10 & 11

GOALS

1. GIG: Student may know and understand the role and goals of entrepreneurship, to livestock enterprise especially, and develop attitude and motivate become business person.
2. SIG: At the end of lectures, students know and can explain concepts and challenge of business

SUB-TOPICS:

1. Opportunities to business
2. Reward and Challenge
3. Livestock enterprises Model

LEARNING AND TEACHING ACTIVITY:

STEPS	TEACHING ACTIVITY	STUDENT ACTIVITY	MEDIA AND TEACHING TOOLS
Introduction	Explain about Competency GIG and SIG	Pay attention Writing	White Board, OHP/LCD, felt-tip marker
Presentation	Explain about: 1. how to opportunities business 2. Reward and Challenge 3. Livestock enterprises Model	Pay attention Writing	White Board, OHP/LCD, felt-tip marker
Closing	Opportunities to student make question and answering the question from course	Asking & Answering question Discussing	Notes

Evaluation:

Instrument used: student ability to asking and answering question from materials

References:

Longenecker J.R., C.W. Moore dan J.W. Petty. Kewirausahaan, Manajemen Usaha Kecil (terjemahan). Buku 1. Salemba Empat, Jakarta.

SET OF STUDY PROGRAMS

Subject of study : Entrepreneurship
 Code of Study : MWU 109
 SCS : 2(2-0)
 Time schedule : 2 x 100 minute
 Meeting times : 12 & 13

GOALS

1. GIG: Student may know and understand the role and goals of entrepreneurship, to livestock enterprise especially, and develop attitude and motivate become business person.
2. SIG: At the end of lectures, students know and can explain how to build farm enterprise

SUB-TOPICS:

1. New farm business
2. Family business
3. Buy farm business

Learning and teaching activity:

STEPS	TEACHING ACTIVITY	STUDENT ACTIVITY	MEDIA AND TEACHING TOOLS
Introduction	Explain about Competency GIG and SIG	Pay attention Writing	White Board, OHP/LCD, felt-tip marker
Presentation	Explain about: 1. New farm business 2. Family business 3. how to buy farm business	Pay attention Writing	White Board, OHP/LCD, felt-tip marker
Closing	Opportunities to student make question and answering the question from course	Asking & Answering question Discussing	Notes

Evaluation:

Instrument used: student ability to asking and answering question from materials

References:

Longenecker J.R., C.W. Moore dan J.W. Petty. Kewirausahaan, Manajemen Usaha Kecil (terjemahan). Buku 1. Salemba Empat, Jakarta.

SET OF STUDY PROGRAMS

Subject of study : Entrepreneurship
 Code of Study : MWU 109
 SCS : 2(2-0)
 Time schedule : 2 x 100 minute
 Meeting times : 14 & 15

GOALS

1. GIG: Student may know and understand the role and goals of entrepreneurship, to livestock enterprise especially, and develop attitude and motivate become business person.
2. SIG: At the end of lectures, students know and can explain to build consumer loyalty

SUB-TOPICS:

1. Component of consumer satisfy
2. Commitment of servicing
3. Knowing consumer
4. Build product supply (make value added)

LEARNING AND TEACHING ACTIVITY:

STEPS	TEACHING ACTIVITY	STUDENT ACTIVITY	MEDIA AND TEACHING TOOLS
Introduction	Explain about Competency GIG and SIG	Pay attention Writing	White Board, OHP/LCD, felt-tip marker
Presentation	Explain about: 1. Component of consumer satisfy 2. Commitment of servicing 3. How to Know consumer 4. How to build product supply (make value added)	Pay attention Writing	White Board, OHP/LCD, felt-tip marker
Closing	Opportunities to student make question and answering the question from course	Asking & Answering question Discussing	Notes

Evaluation:

Instrument used: student ability to asking and answering question from materials

References:

Longenecker J.R., C.W. Moore dan J.W. Petty. Kewirausahaan, Manajemen Usaha Kecil (terjemahan). Buku 2. Salemba Empat, Jakarta.

CONTRACT STUDY

Study Program : S1 Social Economics of Animal Husbandry
 Date schedule : Thursday
 Time schedule : 1 - 3 PM
 Place :
 Lecturer :

SHORT DISCREPTION:

It is study about autonomy and share of business to perspective of entrepreneurship related to business of failure and success, to livestock enterprise especially.

GENERAL INSTRUCTION GOALS:

After joint in this lecture, student may knew and understood the role of entrepreneurship, to livestock enterprise especially, and to develop and to motivate for made business.

SET OF COURSES PROGRAMS

Weeks	Topics	Sub-topics	Lecturer
1	Introduction	1. Sense and term of entrepreneurship 2. Scope based pattern of entrepreneurship 3. Entrepreneurship as culture	WSM
3 & 4	Role and goals of entrepreneurship	1. be interested in to entrepreneurship 2. Crisis factors to start to business 3. measuring for interested business person	WSM
5	Personalities of business person	1. Characters of business person 2. Attitude, temperament and personalities of business person	WSM
6 & 7	To move of motivate	1. Social motivate 2. achievement 3. to rise power of motivation 4. to motivate other person	
8	identification of business share	1. Change as innovation 2. Sources of innovation 3. Failure of business share	

9 & 10	The concepts and challenge of business	<ol style="list-style-type: none"> 1. Opportunities to business 2. Reward and Challenge 3. Livestock enterprises Model 	
13 & 14	Build farm enterprise	<ol style="list-style-type: none"> 1. New farm business 2. Family business 3. Buy farm business 	
15 & 16	Build consumer loyalty	<ol style="list-style-type: none"> 1. Component of consumer satisfy 2. Commitment of servicing 3. Knowing consumer 4. Build product supply (make value added) 	

Evaluation:

Mid-test: 50%

Last-test: 50%

REFERENCES:

1. Birah Paul, Brian Clegg, 1996. business Creativity. PT Gramedia pustaka Utama, Jakarta
2. Djatmiko, D. wirausaha dan Pembangunan. CV Alfabeta, Bandung
3. Drucher, PF. 1996. Inovasi dan Kewirausahaan, Erlangga. Jakarta.
4. Geoffrey G.M, et al. 1992. Kewirausahaan Teori dan Praktek Seni Manajemen no. 97. PT Pustaka Binaman Pressindo
5. Histick, R.D., Peters MP. 1995. Enterpreneurship. Irwin. Chicago.
6. Alma, B. 2000. Kewirausahaan. Penerbit Alfabeta, Bandung.
7. Wiratmo, M. 1996. pengantar kewirausahaan, kerangka Dasar memasuki Dunia Bisnis., BPFE, Yogyakarta.
8. Virgilio. V. Vitung dkk. 1988 (editor). Agribusiness Opportunities. A practical how to book on likelihood and agricultural business ventures. Agriscoope, Quezon City.
9. Longenecker J.R., C.W. Moore dan J.W. Petty. Kewirausahaan, Manajemen Usaha Kecil (terjemahan). Buku 1 dan 2. Salemba Empat, Jakarta.

COURSE : INTRODUCTION ECONOMICS

COURSE CODE :

CREDIT : 2 (2-0)

COURSE OUTLINE

SUBJECT STUDIED : INTRODUCTION ECONOMICS

CODE NUMBER/SYSTEM OF SEMESTER CREDIT : PTF 108 / 2 (2-0)

DESCRIPTION : Introduction Economics discuss relation to economics development, production and consumption, marketing, national economic welfare, economy cycle, economic policy, monetary and banking aspect.

AIM OF GENERAL INSTRUCTION : At the end of study, the student can understand to economic concept and economic development, production and consumption, marketing, national economic welfare, economy cycle, economic policy, monetary and banking aspect.

No	Aim of Specific Instruction	Topic	Sub topic	Time Estimation	References
1.	Student understand to economic introduction and economic concept, economic history, economic problems and aim of economy	Economic scoupe	1. Introduction and economic history 2. Economic problems and aim of economy	2 x 100 munit	1. Partadiredja, A. 1994. Pengantar Ekonomika. BPFE. Yogyakarta. 2. Sukirno, S. 1997. Pengantar Teori Makro Ekonomi. PT Radja Grafindo. Persada. Jakarta. 3. Sudarsono. 1983. Pengantar Ekonomi Mikro. LP3ES. Jakarta. 4. Debertin, D.L. 1986. Agricultural Production Economics. Macmillan Publishing Company. New York. 5. Bilas, R.A. 1986. Teori
2.	Student understand to production and production process, production factors, cost of production, supply and supply elasticity	Production, production process and supply	1. production concept and production factors 2. Cost of production, supply and supply elasticity	2 x 100 munit	
3.	Student understand to utility concept and services and goods consumption utility, demand and elasticity elasticity and factors of demand influencing	Demand and consumption	1. utility concept and demand utility 2. Factors of demand influencing 3. demand elasticity	2 x 100 munit	

COURSE OUTLINE

- SUBJECT STUDIED** : INTRODUCTION ECONOMICS
- CODE NUMBER/SYSTEM OF SEMESTER CREDIT** : PTF 108 / 2 (2-0)
- DESCRIPTION** : Introduction Economics discuss relation to economics development, production and consumption, marketing, national economic welfare, economy cycle, economic policy, monetary and banking aspect.
- AIM OF GENERAL INSTRUCTION** : At the end of study, the student can understand to economic concept and economic development, production and consumption, marketing, national economic welfare, economy cycle, economic policy, monetary and banking aspect.

No	Aim of Specific Instruction	Topic	Sub topic	Time Estimation	References
1.	Student understand to economic introduction and economic concept, economic history, economic problems and aim of economy	Economic scoupe	1. Introduction and economic history 2. Economic problems and aim of economy	2 x 100 munit	1. Partadiredja, A. 1994. Pengantar Ekonomika. BPFE. Yogyakarta. 2. Sukirno, S. 1997. Pengantar Teori Makro Ekonomi. PT Radja Grafindo. Persada. Jakarta.
2.	Student undestand to production and production process, production factors, cost of production, supply and supply elasticity	Production, production process and supply	1. production concept and production factors 2. Cost of production, supply and supply elasticity	2 x 100 munit	3. Sudarsono. 1983. Pengantar Ekonomi Mikro. LP3ES. Jakarta.
3.	Student understand to utility concept and services and goods consumption utility, demand and elasticity elasticity and factors of demand influencing	Demand and consumption	1. utility concept and demand utility 2. Factors of demand influencing 3. demand elasticity	2 x 100 munit	4. Debertin, D.L. 1986. Agricultural Production Economics. Macmillan Publishing Company. New York. 5. Bilas, R.A. 1986. Teori

4.	Student understand to determine of market price, the market functions, market classification and farm business equilibrium	Marketing theory	1. market price determination 2. market functions 3. market classification 4. farm business equilibrium	2 x 100 munit	Ekonomi Mikro. Erlangga. Jakarta.
5.	Student understand the indicators of economic growth and economic development, economic welfare and factors of economic growth determination.	National economic welfare	1. indicators of economic growth and economic development 2. welfare indicators 3. factors of economic growth determination	2 x 100 munit	6. Mangkoesobroto, G dan Algifari. 1998. Teori Ekonomi Makro. STIE YKPN. Yogyakarta. 7. Darmawan, I. 1992. Pengantar Uang dan Perbankan. Rineka Cipta. Jakarta.
6.	Student understand 2, 3 and 4 sectors of economic cycle and fiscal and monetary policy.	Economic cycle and economic policy.	1. the economic system of 2, 3 and 4 sectors. 2. fiscal and monetary policy.	3 x 100 munit	8. Simorangkir, O.P.. 2000. Pengantar Lembaga Keuangan Bank dan NonBank. Ghalia Indonesia. Jakarta.
7.	Student understand to the kinds and functions of money, banking and financing institution, inflation and deflation.	Banking and financing	1. the concept of money, kinds and functions of money 2. banking and financing institution 3. Inflation and dan deflation	3 x 100 munit	

SUBJECT STUDIED CONTRACT

SUBJECT STUDIED : INTRODUCTION TO ECONOMICS
S C S : 2 (2-0) / PTF 108
STUDY PROGRAM : Technology of Livestock Post Harvest
DAY/TIME : Friday / 07.00-09.00 WIB
ROOM : E1.01
LECTURER : Ir. Mukson, MS (MKS)*
 Ir. B. Mulyatno S, MS (BMS)

1. **SYLLABUS** : Introduction to Economics discuss relation to economics development, production and consumption, marketing, economic welfare, economy cycle, economic policy, monetary and banking aspect.

AIM OF GENERAL INSTRUCTION :

At the end of study, the student can understand to economic concept and economic development, production and consumption, marketing, economic welfare, economy cycle, economic policy, monetary and banking aspect.

3. LECTURING AGENDA UNIT

Week	Topic and Sub Topic	Lecturer
1-2	Economic Scoupe 1. Introduction and economic history 2. Economic problems and aim of economy	MKS
3-4	Consumption and demand 1. utility concept and demand utility 2. factors of demand influencing 3. demand elasticity	MKS
5-6	Production, production process and supply 1. production concept and production factors 2. Cost of production, supply and supply elasticity	MKS
7	Consumer utility theory	MKS
8	Market Theory 1. market price determination 2. market functions 3. market clssification 4. farm business equilibrium	MKS
9	MID – TEST SEMESTER	TIM
10-11	Economics Welfare 1. indicators of economic growth and economic development 2. welfare indicators 3. factors of economic growth determination	BMS
12-14	Economic cycle and economic policy 1. the economic system of 2, 3 and 4 sectors. 2. fiscal and monetery policy.	BMS
15-16	Banking and Financing	BMS

	1. the concept of money, kinds and functions of money 2. banking and financing institution 3. Inflation and dan deflation	
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4. REFERENCES :

- a. Partadiredja, A. 1994. Pengantar Ekonomika. BPFE. Yogyakarta.
- b. Sukirno S. 1995. Pengantar Teori Mikro Ekonomi. PT. Radja Grafindo Persada, Jkt.
- c. Sukirno S. 1997. Pengantar Teori Makro Ekonomi, PT. Radja Grafindo Persada, Jkt.
- d. Darmawan I, 1992, Pengantar Uang dan Perbankan, Rineka Cipta, Jakarta.

5. EVALUATION :

- 1. Assignment/problem : 10 %
- 2. Mid semester : 40 %
- 3. Final Exam : 50 %

Final Evaluation : 100 %

LECTURING AGENDA UNIT I

Subject Studied : Introduction Economic
 Code of Subject : PTF 108
 System of Credit Semester : 2 SCS
 Time Schedule : 2 x 100 munite
 Schedule of meeting : 1 and 2

- A. AIM : Introduction Economics discuss relation to economics development, production and consumption, marketing, economic welfare, economy cycle, economic policy, monetary and banking aspect.
1. Aim of General Instruction : development, production and consumption, marketing, economic welfare, economy cycle, economic policy, monetary and banking aspect.
2. Aim of Specific Instruction : Student can understand and explain to the economic introduction and economic history, economic problems and aim of economy
- B. Topic : Introduction and Economic scoupe
- C. Sub Topic : 1. Introduction and economic history
 2. Economic problems, aim and scoupe of economy

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	Describe and explain the subject material: <ul style="list-style-type: none"> • Introduction economics • to explain the competence of topic and sub topic • explain the lectured contract 	<ul style="list-style-type: none"> ▪ Take note of ▪ written ▪ Take note of 	White board, OHP / LCD, board maker.
Presentation	<ol style="list-style-type: none"> 1. explain the introduction and economic history 2. describe and clarify the scoupe of economy, economic problems and aim of economy 	<ul style="list-style-type: none"> ▪ give suggestion ▪ discussion ▪ written 	White board, OHP / LCD, board maker.
The closing of the session	<ol style="list-style-type: none"> a. closing of session b. randomly point toward the student to present the group discussion report c. the comment from other student d. give an assignment to revise the group discussion report completed by textbook e. describe the next subject lectured 	<ul style="list-style-type: none"> ▪ presentation ▪ give comment or question related to introduction and scoupe of economic ▪ doing an assignment ▪ take not eof 	<ul style="list-style-type: none"> ▪ group report ▪ written the comment and question

E. Evaluation :

The Instrument usage : check list for evaluating an assignment student capability

F. References :

- Partadiredja, A. 1992. Pengantar Ekonomika. BPFE. Yogyakarta.
- Hartowo,. 1979. Cakrawala Ekonomi. Fakultas Ekonomi UNDIP. Semarang.
- Darmawan I, 1992, Pengantar Uang dan Perbankan, Rineka Cipta, Jakarta.
- Sadono Sukirno. 1997. Pengantar Teori Makro Ekonomi

LECTURING AGENDA UNIT II

Subject Studied : Introduction Economic
 Code of Subject : PTF 108
 System of Credit Semester : 2 SCS
 Time Schedule : 2 x 100 munit
 Schedule of meeting : 3 and 4

A. AIM

1. Aim of General Instruction : Introduction Economics discuss relation to economics development, production and consumption, marketing, economic welfare, economy cycle, economic policy, monetary and banking aspect.
2. Aim of Specific Instruction : At the end of study, the student can understand and explain to factors and cost of production, product, optimizing and supply function.

B. Topic : Production and production process

- C. Sub Topic : 1. production factors
 2. cost of production and product
 3. optimizing and supply function

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	<ol style="list-style-type: none"> 1. to explain the competence of topic and sub topic 2. to explain the production and process 	<ul style="list-style-type: none"> ▪ take note of ▪ take note of 	White board, OHP / LCD, board maker.
Presentation	Describe and explain : <ol style="list-style-type: none"> 1. production factors 2. cost of production and product 3. optimizing and supply function 	<ul style="list-style-type: none"> ▪ give suggestion ▪ discussion ▪ written 	White board, OHP / LCD, board maker. Form of student self evaluation
The closing of the session	<ol style="list-style-type: none"> 1. closing of session 2. randomly point toward the student to present the group discussion report 3. the comment from other student 4. give an assignment to revise the group discussion report completed by textbook or journal 5. describe the next subject lectured 	<ul style="list-style-type: none"> ▪ presentation ▪ give comment or question related to production, optimizing and supply ▪ doing an assignment ▪ take note of 	<ul style="list-style-type: none"> ▪ group report ▪ written the comment and question

E. Evaluation :

The Instrument usage : check list for evaluating an assignment student capability

F. References :

- Partadiredja, A. 1992. Pengantar Ekonomika. BPFE. Yogyakarta.
- Hartowo,. 1979. Cakrawala Ekonomi. Fakultas Ekonomi UNDIP. Semarang.
- Darmawan I, 1992, Pengantar Uang dan Perbankan, Rineka Cipta, Jakarta.
- Sadono Sukirno. 1997. Pengantar Teori Makro Ekonomi

LECTURING AGENDA UNIT III

Subject Studied : Introduction Economic
 Code of Subject : PTF 108
 System of Credit Semester : 2 SCS
 Time Schedule : 2 x 100 munite
 Schedule of meeting : 5 and 6

A. AIM

1. Aim of General Instruction : Introduction Economics discuss relation to economics development, production and consumption, marketing, economic welfare, economy cycle, economic policy, monetary and banking aspect.
2. Aim of Specific Instruction : Student can understand and explain utility concept and services and goods consumption utility, demand and elasticity elasticity and factors of demand influencing

B. Topic : Consumption and demand

- C. Sub Topic** :
1. utility concept and demand utility
 2. Value and price of goods and services
 3. demand function

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	<ol style="list-style-type: none"> 1. describe the competence of topic and sub topic 2. describe utility, consumption and demand 	<ul style="list-style-type: none"> ▪ take note of ▪ take note of 	White board. OHP / LCD. board maker.
Presentation	Explain the subject lectured, such : <ol style="list-style-type: none"> 1. utility concept and demand utility 2. Value and price of goods and services 3. demand function 	<ul style="list-style-type: none"> ▪ give suggestion ▪ discussion for observing student capability ▪ written 	White board. OHP / LCD. board maker. Form of student self evaluation
The closing of the session	<ol style="list-style-type: none"> 1. closing of session 2. randomly point toward the student to present the group discussion report 3. the comment from other student 4. give an assignment to revise the group discussion report 	<ul style="list-style-type: none"> ▪ presentation ▪ give comment or question related to utility, consumption and demand ▪ doing an assignment ▪ take note of 	<ul style="list-style-type: none"> ▪ group report ▪ written the comment and question

	completed by textbook or journal 5. describe the next subject lectured		
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E. Evaluation :

The Instrument usage : check list for evaluating an assignment student capability

F. References :

- Partadiredja, A. 1992. Pengantar Ekonomika. BPFE. Yogyakarta.
- Hartowo,. 1979. Cakrawala Ekonomi. Fakultas Ekonomi UNDIP. Semarang.
- Darmawan I, 1992, Pengantar Uang dan Perbankan, Rineka Cipta, Jakarta.
- Sadono Sukirno. 1997. Pengantar Teori Makro Ekonomi

LECTURING AGENDA UNIT IV

Subject Studied : Introduction Economic
 Code of Subject : PTF 108
 System of Credit Semester : 2 SCS
 Time schedule : 2 x 100 munite
 Schedule of meeting : 7 and 8

A. AIM

1. Aim of General Instruction : Introduction to Economics discuss relation to economics development, production and consumption, marketing, economic welfare, economy cycle, economic policy, monetary and banking aspect.

2. Aim of Specific Instruction : Student understand to determine of market price, the market functions, market classification and farm business equilibrium

B. Topic : Marketing

C. Sub Topic : 1. market price determination
2. market functions
3. market classification
4. farm business equilibrium

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	1. describe the competence of topic and sub topic 2. describe market concept and classification of market	<ul style="list-style-type: none"> ▪ take note of ▪ take note of 	White board, OHP / LCD, board maker.
Presentation	Explain the subject lectured, such : 1. market price determination 2. market functions 3. market classifications	<ul style="list-style-type: none"> ▪ give suggestion ▪ discussion for observing student capability ▪ written 	White board, OHP / LCD, board maker. Form of student self evaluation
The closing of the session	1. closing of session 2. randomly point toward the student to present the group discussion report 3. the comment from other student 4. give an assignment to revise the group discussion report completed by textbook or	<ul style="list-style-type: none"> ▪ presentation ▪ give comment or question related to marketing concept ▪ doing an assignment ▪ take note of 	<ul style="list-style-type: none"> ▪ group report ▪ written the comment and question

	journal 5. describe the next subject lectured		
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E. Evaluation :

The Instrument usage : check list for evaluating an assignment student capability

F. References :

- Partadiredja, A. 1992. Pengantar Ekonomika. BPFE. Yogyakarta.
- Hartowo,. 1979. Cakrawala Ekonomi. Fakultas Ekonomi UNDIP. Semarang.
- Darmawan I, 1992, Pengantar Uang dan Perbankan, Rineka Cipta, Jakarta.
- Sadono Sukirno. 1997. Pengantar Teori Makro Ekonomi

LECTURING AGENDA UNIT V

Subject Studied : Introduction Economic
 Code of Subject : PTF 108
 System of Credit Semester : 2 SCS
 Time Schedule : 4 x 50 munit
 Schedule of meeting : 9 and 10

A. AIM

1. Aim of General Instruction : At the end of study, student can understand and explain about national economic welfare
2. Aim of Specific Instruction : Student understand the indicators of economic growth and economic development, economic welfare and factors of economic growth determination.

B. Topic : National Economic Welfare

- C. Sub Topic :
1. indicators of economic growth and economic development
 2. welfare indicators
 3. factors of economic growth determination

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	<ol style="list-style-type: none"> 1. describe the competence of topic and sub topic 2. describe the nationaleconomic welfare 	<ul style="list-style-type: none"> ▪ take note of ▪ take note of 	White board, OHP / LCD, board maker.
Presentation	<ol style="list-style-type: none"> 1. describe and explain the indicators of economic growth and economic development <ul style="list-style-type: none"> ▪ give an indicators of economic growth question ▪ discussion and give an aswere of the economic growth indicators 2. describe and explain the economic welfare indicators <ul style="list-style-type: none"> ▪ give an indicators of economic welfare question ▪ discussion and give an aswere the economic welfare indicators 	<ul style="list-style-type: none"> ▪ give suggestion ▪ discussion for observing student capability ▪ written and summary up of the economic growth and welfare and economic growth determination 	White board, OHP / LCD, board maker. Form of student self evaluation

	<p>3 describe and explain the factors of economic growth determination</p> <ul style="list-style-type: none"> ▪ give question about how to determine the economic growth ▪ discussion and give an aswere of the economic growth determination 		
The closing of the session	<ol style="list-style-type: none"> 1. closing of session 2. randomly point toward the student to present the group discussion report 3. the comment from other student 4. give an assignment to revise the group discussion report completed by textbook or journal 5. describe the next subject lectured 	<ul style="list-style-type: none"> ▪ presentation ▪ give comment or question related to marketing concept ▪ doing an assignment ▪ take note of 	<ul style="list-style-type: none"> ▪ group report ▪ written the comment and question

E. Evaluation :

The Instrument usage : check list for evaluating an assigment student capability

F. References :

- Partadiredja, A. 1992. Pengantar Ekonomika. BPFE. Yogyakarta.
- Hartowo,. 1979. Cakrawala Ekonomi. Fakultas Ekonomi UNDIP. Semarang.
- Darmawan I, 1992, Pengantar Uang dan Perbankan, Rineka Cipta, Jakarta.
- Sadono Sukirno. 1997. Pengantar Teori Makro Ekonomi

LECTURING AGENDA UNIT VI

Subject Studied : Introduction Economic

Code of Subject : PTF 108

System of Credit Semester : 2 SCS

Time Schedule : 6 x 50 munite

Schedule of meeting : 11,12 and 13

A. AIM

1. Aim of General Instruction : At the end of study, student can undestand and explain about economic cycle and economic policy
2. Aim of Specific Instruction : Student can understand explain the 2, 3 and 4 sectors of economic cycle and fiscal and monetry policy.

B. Topic : Economic cycle and economic policy

- C. Sub Topic :
1. Economy system of the 2, 3 and 4 sectors
 2. Fiscal and monetry policy.

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	<ol style="list-style-type: none"> 1. describe the competence of topic and sub topic 2. describe the economic cycle and economic policy 	<ul style="list-style-type: none"> ▪ take note of ▪ take note of 	White board, OHP / LCD, board maker.
Presentation	<ol style="list-style-type: none"> 1. describe and explain the 2,3, and 4 sectors of economic <ul style="list-style-type: none"> ▪ give a question of the 2,3 and 4 economic sectors ▪ discussion, give an aswere and conclusion of the 2, 3 and 4 economic sectors 2. describe and explain thefiscal and monetry policy <ul style="list-style-type: none"> ▪ give a question of the fscal and monetry policy ▪ discussion and give an aswere and conclusion of the fiscal and monetry policy 	<ul style="list-style-type: none"> ▪ give suggestion ▪ discussion an simulation for observing student capability ▪ written and summary up of the 2,3 and 4 economic sector and fiscal and monetry policy 	White board, OHP / LCD, board maker. Form of student self evaluation

The closing of the session	<ol style="list-style-type: none"> 1. closing of session 2. randomly point toward the student to present the group discussion report 3. the comment from other student 4. give an assignment to revise the group discussion report completed by textbook or journal 5. describe the next subject lectured 	<ul style="list-style-type: none"> ▪ presentation ▪ give comment or question related to marketing concept ▪ doing an assignment ▪ take note of 	<ul style="list-style-type: none"> ▪ group report ▪ written the comment and question
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E. Evaluation :

The Instrument usage : check list for evaluating an assignment student capability

F. References :

- Mangkoesobroto, G dan Algifari.1998. Teori Ekonomi Makro. STIE YKPN. Yogyakarta.
- Sadono Sukirno. 1997. Pengantar Teori Makro Ekonomi. PT Radja Grafindo, Persada, jakarta.

LECTURING AGENDA UNIT VII

Subject Studied : Introduction Economic

Code of Subject : PTF 108

System of Credit Semester : 2 SCS

Time Schedule : 6 x 50 munit

Schedule of meeting : 14,15 and 16

A. AIM

1. Aim of General Instruction : At the end of study, student can understand and explain about banking and financing

2. Aim of Specific Instruction : Student understand to the kinds and functions of money, banking and financing institution, inflation and deflation.

B. Topic : Banking and financing

C. Sub Topic : 1. the concept of money, kinds and functions of money
2. banking and financing institution
3. Inflation and dan deflation

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	<ol style="list-style-type: none"> 1. describe the competence of topic and sub topic 2. describe the banking economic financing policy 	<ul style="list-style-type: none"> ▪ take note of ▪ take note of 	White board, OHP / LCD, board maker.
Presentation	<ol style="list-style-type: none"> 1. describe and explain of the concept of money, kinds and money functions <ul style="list-style-type: none"> ▪ give a question of the concept, kinds and functions of money ▪ discussion, give an aswere and conclusion of the concept, kinds and functions of money 2. describe and explain the banking and financing institution <ul style="list-style-type: none"> ▪ give a question of the banking and financing ▪ discussion and give an aswere and conclusion of the banking and financing 	<ul style="list-style-type: none"> ▪ give suggestion ▪ discussion an simulation for observing student capability ▪ written and summary up of subject lectured such monay concept, banking and financing, inflation and deflation. 	White board, OHP / LCD, board maker. Form of student self evaluation
	3. describe and explain the	▪ presentation of	

	inflation and deflation <ul style="list-style-type: none"> ▪ give a question of the inflation and deflation ▪ discussion and give an aswere and conclusion of the inflation and deflation 	the simulation report	
The closing of the session	<ol style="list-style-type: none"> 1. closing of session 2. randomly point toward the student to present the group discussion report 3. the comment from other student 4. give an assignment to revise the group discussion report completed by textbook or journal 5. describe the exam material 	<ul style="list-style-type: none"> ▪ presentation ▪ give comment or question related to marketing concept ▪ doing an assignment ▪ take note of 	<ul style="list-style-type: none"> ▪ group report ▪ written the comment and question

E. Evaluation :

The Instrument usage : check list for evaluating an assigment student capability

F. References :

- Darmawan I, 1992, Pengantar Uang dan Perbankan, Rineka Cipta, Jakarta.
- Mangkoesobroto, G dan Algifari.1998. Teori Ekonomi Makro. STIE YKPN. Yogyakarta.
- Partadiredja, A. 1992. Pengantar Ekonomika. BPFE. Yogyakarta.
- Sadono Sukirno. 1997. Pengantar Teori Makro Ekonomi. PT Radja Grafindo, Persada, Jakarta.
- Simorangkir, O.P.. 2000. Pengantar Lembaga Keuangan Bank dan Non Bank. Ghalia Indonesia. Jakarta.

COURSE : ECONOMICS OF FARM BUSINESS

COURSE CODE :

CREDIT : 2 (2-0)

COURSE OUTLINE

- SUBJECT STUDIED** : **ECONOMICS OF FARM BUSINESS**
- CODE NUMBER/SYSTEM OF SEMESTER CREDIT** : **PTE /2 (2-0)**
- DESCRIPTION** : Economics of Farm Business subject studied discuss about definition and farm business characteristic; the aspect and function of farm business; classification of farm business; financial analysis (Profit analysis, Liquid assets, Solvency) and budgeting; risk of farm business; and the application of farm business to livestock farmers in term of cashflow analysis.
- AIM OF GENERAL INSTRUCTION** : At the end of study, the student can understand the basic of economics of farm business in particular of definition and farm business characteristic; the aspect and function of farm business; classification of farm business; financial analysis (Profit analysis, Liquid assets, Solvency) and budgeting; risk of farm business; and the application of farm business to livestock farmers in term of cashflow analysis.
- REFERENCES** :
1. Bambang Riyanto, 1984. Dasar dasar Pembelanjaan Perusahaan. BPFE. Yogyakarta
 2. Madura, J. 2001. Introduction to Business. 2nd. Penerjemah S.W. R Salib. Penerbit Salemba 4. Jakarta.
 3. M. Fuad, Christin H, Nurlala, Sugiarto dan Y.E.F. Paulus, 2000. Pengantar Bisnis. PT Gramedia Utama. Jakarta
 4. Mulia Nasution 1996. Pengantar Bisnis Rencana Pendirian pwerusahaan. Penerbit Djambatan. Jakarta
 5. Murti Sumarni dan J. Soeprihanto. 2000. Pengantar Bisnis (Dasar dasar Ekonomi Perusahaan) Edisi ke -5, Liberty Yogyakarta.
 6. Pandojo, H R., Irawan dan Sukanto Reksohadiprodjo. 1982. Pengantar Ekonomi Perusahaan. BPFE. Yogyakarta.
 7. Soedarsono, 1994 Pengantar Ekonomi Perusahaan. Penerbit PT. Gramedia Pustaka Utama. Jakarta.
 8. Swasta, B dan I Sukotjo, W. 1997. Pengantar Bisnis Modern (Pengantar Ekonomi Perusahaan Modern. Penerbit Liberty. Yogyakarta.

NO.	AIM OF SPECIFIC INSTRUCTION	TOPIC	SUB TOPIC	TIME (MNT)
1.	The student can understand and explain the subject relation to definition of business, environmental aspects of farm business, the characteristic and regulation of farm business and farm business application to the farmers	<ul style="list-style-type: none"> ▪ Introduction ▪ The principle of farm business ▪ The scope of farm business 	<ol style="list-style-type: none"> 1. Definition of business and farm business 2. Application of economic principle to the livestock farmers 3. Business environment and factors influencing business 4. Characteristic, farm business regulation and scope of farm business 5. The economic system influencing farm business development 	2 x 100 mnt
2.	The student can understand and explain the subject relation to farm business classification based on the legal and technical aspect, the opportunity and threat of farm business. Layout of farm and some factors should be considered	<ul style="list-style-type: none"> ▪ Farm business classification based on the legal and technical-economic aspects (business, livestock, agriculture, industry, trade and services) ▪ Layout of farm and some factors should be considered 	<ol style="list-style-type: none"> 1. The legal aspect classification of farm business (PT, CV, Firma, Holding company, Trust, etc) 2. The technical and economic of farm business (business, livestock, agriculture, industry, trade and services) 3. Layout of farm and some factors should be considered 	2 x 100 mnt
3.	The student can understand and explain the subject relation to management aspects and the farm business functions have been done	<ul style="list-style-type: none"> ▪ Management aspects ▪ Farm business functions 	Farm management functions : <ul style="list-style-type: none"> ▪ Planning ▪ Producing ▪ Marketing ▪ Financing ▪ Organising 	3 x 100 mnt
4.	The student can understand and explain the subject relation to cost of production, production cost price and selling cost price and break even point (BEP)	<ul style="list-style-type: none"> ▪ Cost of production ▪ The method of price determination 	<ol style="list-style-type: none"> 1. Definition of cost 2. Cost of production 3. Determination of production and selling cost price and Break Even Point (BEP) 	2 x 100 mnt

5.	The student can understand and explain the subject relation to budgeting, capital and analysis of financial ratios	<ul style="list-style-type: none"> ▪ Budgeting ▪ Analysis of financial ratios 	<ol style="list-style-type: none"> 1. Budgeting 2. Sources of capital 3. Analysis of financial ratios, such as : liquid assets, solvency, profit analysis 	4 x 100 mnt
6.	The student can understand and explain the subject relation to farm development and risks of farm	<ul style="list-style-type: none"> ▪ Farm development ▪ The risks of farm 	<ol style="list-style-type: none"> 1. Farm development model 2. Risk factors and kinds of farm risk 	2 x 100 mnt

SUBJECT STUDIED CONTRACT : ECONOMIC OF FARM BUSINESS (2 SCS)

STUDY PROGRAM : S-1 NUT, PROD, SOSEK, THT
 DAY :
 TIME :
 CLASS :
 LECTURER :

SYLLABUS :

Economic of Farm Business subject studied discuss about definition and farm business characteristic; the aspect and function of farm business; classification of farm business; financial analysis (Profit analysis, Liquid assets, Solvency) and budgeting; risk of farm businss; and the application of farm business to livestock farmers in term of cashflow analysis.

AIM OF GENERAL INSTRUCTION :

At the end of study, the student can understand the basic of economic of farm business in particular of definition and farm business characteristic; the aspect and function of farm business; classification of farm business; financial analysis (Profit analysis, Liquid assets, Solvency) and budgeting; risk of farm businss; and the application of farm business to livestock farmers in term of cashflow analysis.

LECTURING AGENDA UNIT

WEEK	TOPIC	SUB TOPIC	LECTURER
1, 2	1. Introduction 2. The principle of farm business 3. The scoupe of farm business	1. Definition of business and farm business 2. Application of economic principle to the livestock farmers 3. Business environment and factors influencing business 4. Characteristic, farm business regulation and scoupe of farm business 5. The economic system influencing farm business development	
3, 4	1. farm business classification based on the legal and technical aspect, 2. the opportunity and threat of farm business. 3. Layout of farm and some factors should be considered	1. The legal aspect classification of farm business (PT, CV, Firma, Holding company, Trust, etc) 2. The technical and economic of farm business (business, livestock, agriculture, industry, trade and services) 3. Layout of farm and some factors should be considered	

5, 6, 7	Management aspects and the farm business functions have been done	Farm management functions, such planning, producing, marketing, financing and organising	
8	MID SEMESTER		TEAM
9, 10	<ul style="list-style-type: none"> ▪ Cost of production ▪ The method of price determination 	<ol style="list-style-type: none"> 1. Definition of cost 2. Cost of production 3. Determination of production and selling cost price and Break Even Point (BEP) 	
11, 12, 13, 14	budgeting, capital and analysis of financial ratios	<ol style="list-style-type: none"> 1. Budgeting 2. Sources of capital 3. Analisis of financial ratios, such as : liquid assets, solvency, profit analysis 	
15 and 16	farm development and risks of farm	<ol style="list-style-type: none"> 1. Farm development model 2. Risk factors and kinds of farm risk 	

REFERENCES :

1. Bambang Riyanto, 1984. Dasar dasar Pembelanjaan Perusahaan. BPFE. Yogyakarta
2. Madura, J. 2001. Introduction to Business. 2nd. Penerjemah S.W. R Salib. Penerbit Salemba 4. Jakarta.
3. M. Fuad, Christin H, Nurlela, Sugiarto dan Y.E.F. Paulus, 2000. Pengantar Bisnis. PT Gramedia Utama. Jakarta
4. Mulia Nasution 1996. Pengantar Bisnis Rencana Pendirian pwerusahaan. Penerbit Djambatan. Jakarta
5. Murti Sumarni dan J. Soeprihanto, 2000. Pengantar Bisnis (Dasar dasar Ekonomi Perusahaan) Edisi ke -5, Liberty Yogyakarta.
6. Pandojo, H R., Irawar: dan Sukanto Reksohadiprodjo. 1982. Pengantar Ekonomi Perusahaan. BPFE. Yogyakarta.
7. Soedarsono, 1994 Pengantar Ekonomi Perusahaan. Penerbit PT. Gramedia Pustaka Utama. Jakarta.
8. Swasta, B dan I Sukotjo, W. 1997. Pengantar Bisnis Modern (Pengantar Ekonomi Perusahaan Modern. Penerbit Liberty. Yogyakarta

EVALUATION :

- mid semester : 50%
- final exam : 50%

NOTE :

The evaluation of an assignment is part of mid semester or final exam

COURSE : FEASIBILITY STUDY AND
PROJECT EVALUATION (FSPE)
COURSE CODE :
CREDIT : 3 (2-1)

OUTLINE COURSE

- SUBJECT STUDIED : **FEASIBILITY STUDY AND PROJECT EVALUATION (FSPE)**
- CODE NUMBER/SYSTEM OF SEMESTER CREDIT : PTE 308/3(2-1)
- DESCRIPTION : Feasibility Studi and Project Evaluation (FSPE) Subject Studied discuss about farm activity proposal and farm business evaluation in part of benefit and feasible based on time value of money and investment criteria.
- AIM OF GENERAL INSTRUCTION :
 - At the end of study, the student can understand and explain the component, definition and meaning of livestock FSPE
 - Student can understand and compose the livestock farm business FSPE proposal
- BIBLIOGRAPHY :
 1. Clive Gray, Payaman Simanjuntak, Lien K. Sabur, PFL Maspaitela dan RCG Varley. 1997. Pengantar Evaluasi Proyek. Gramedia Jakarta.
 2. Ellen Christina, M. Fuad, Sugiyanto dan E. Sukarno. 2002. Anggaran Perusahaan Suatu Pendekatan Praktis. PT Gramedia Pustaka Utama, Jakarta.
 3. Iman Suharto. 1995. Manajemen Proyek. Dari Konseptual sampai Operasional. Penerbit Erlangga, Surabaya.
 4. Indriyo Gitosudarmo dan Muhamad Najnudin. 2003. Anggaran Perusahaan Teori dan Soal Jawab. BPFE, Yogyakarta
 5. J. Price Gittinger. 1992. Analisa Ekonomi Proyek-Proyek Pertanian. UI Press, Jakarta. (Terjemahan)
 6. Kadariah, Lien Karlina dan Clive Gray. 1978. Pengantar Evaluasi Proyek. FE UI, Jakarta.
 7. Siswanto Sutojo. 1989. Studi Kelayakan Proyek. PT Pustaka Binaman Pressindo. Jakarta.
 8. Soetrisno PH. 1995. Dasar-Dasar Evaluasi dan Manajemen Proyek. Andi Offset. Yogyakarta.
 9. Suad Husnan dan Suwarsono Muhammad. 2000. Studi Kelayakan Proyek. UKPN Yogyakarta.
 10. Yakob Ibrahim. 2003. Studi Kelayakan Bisnis. Rineka Cipta. Jakarta.

	Aim of Special Instruction	Topic	Sub Topic	Time Estimation	Bahan Pustaka
1.	Student can understand and explain the definition and meaning, benefit and scope of FSPE	Introduction	<ul style="list-style-type: none"> • Definition and meaning of Feasibility Study and Project Evaluation (FSPE) and its application for livestock farm business. • Benefit and scope of FSPE 	100 minute	Book no. 1, 3, 5, 6, 7, 8, 9 and 10
2.	Student can understand and explain some aspects of FSPE, such technical aspect, managerial and administration aspect, commercial aspect, financial and economic aspect, legal aspect and environmental aspect	Some aspects of FSPE	<ul style="list-style-type: none"> ▪ Technical aspect, ▪ Managerial and administration aspect, ▪ Commercial aspect, ▪ Financial and economic aspect, ▪ Legal aspect ▪ Environmental aspect 	3 x 100 minute	Book no. 1,3,6 and 9
3.	Student can understand and explain the financial and economic aspects consist of input factors utilizing for livestock farm business, livestock product, opportunity cost and, the differences between financial and economic analysis.	<ul style="list-style-type: none"> ▪ Financial and economic aspect for livestock farm business ▪ Shadow prices 	<ul style="list-style-type: none"> • Input – output livestock farm business • Opportunity cost • The concept, determination and evaluation of shadow price for livestock farm business • the differences between financial and economic analysis. • Determination of financial and economic analysis 	3 x 100 minute	Book no. 1,2, 3, 4,5 and 9
4.	Student can understand and explain. The concept of discounting and undiscounting computation and application of time value of money for livestock farm business investment analysis.	Discounting and undiscounting analysis, time value of money	<ul style="list-style-type: none"> • Compounding interest factor • Annuity and deferred annuity 	100 minute	Book no. 1,3,6 and 9

5.	Student can understand and explain the investment criteria concept consist of NPV, IRR, Gross BC, Net BC and influencing inflation for inevestment	Investment criteria for livestock farm business	<ul style="list-style-type: none"> • Net Present Value (NPV) • Internal Reate of Return (IRR) • Gross Benefit Cost Ratio (Gross BC) • Net Benefit Cost Ratio (Net BC) • Inflation focuss on the investment 	6 x 100 minute	Book no. 1,3,5,6,7, 8,9, and 10
6.	Student can understand and explain investment criteria utilizing for choosing livestock farm business investment possibility	Investment criteria utilizing for choosing livestock farm business investment possibility	<ul style="list-style-type: none"> • IRR and Net BC comparison • Cross over discount rate 	100 minute	Book no. 1,3,5,6,7, 8,9, and 10
7.	Student can understand, explain and compose the Livestock fram business FSPE Proposal	Composing the FSPE Proposal	<ul style="list-style-type: none"> • Composing the FSPE Proposal of livesctok farm business • Evaluating method of livestock Investment Criteria 	100 minute	Book no. 1 and 6

SUBJECT STUDIED CONTRACT
FEASIBILITY STUDY AND PROJECT EVALUATION (3 SCS)

STUDY PROGRAM	:	SOCIAL ECONOMIC ANIMAL AGRICULTURE
DAY	:	
TIME	:	
CLASS	:	
LECTURER	:	

SYLLABUS :

Feasibility study and project evaluation discuss about project planning, some aspects of FSPE, cost and benefit identification for FSPE, Financial and economic analysis, discounting and discounting factor, investment criteria, and composing of FSPE Proposal

AIM OF GENERAL INSTRUCTION :

- At the end of study, the student can understand and explain the component, definition and meaning of livestock FSPE
- Student can understand and compose the livestock farm business FSPE proposal

LECTURING AGENDA UNIT

WEEK	TOPIC	SUB TOPIC	LECTURER
1	Introduction	<ul style="list-style-type: none"> ▪ Definition and meaning of Feasibility Study and Project Evaluation (FSPE) and its application for livestock farm business. ▪ Benefit, scope and project cycle of FSPE 	
2, 3	Some aspects of FSPE	<ul style="list-style-type: none"> ▪ Technical aspect, ▪ Managerial and administration aspect, ▪ Commercial aspect, ▪ Financial and economic aspect, ▪ Legal aspect ▪ Environmental aspect 	
4, 5, 6	<ul style="list-style-type: none"> ▪ Financial and economic aspect for livestock farm business ▪ Shadow prices 	<ul style="list-style-type: none"> • Input – output livestock farm business • Opportunity cost • The concept, determination and evaluation of shadow price for livestock farm business • the differences between financial and economic analysis. 	

		<ul style="list-style-type: none"> • Determination of financial and economic analysis 	
7	Discounting and undiscouting analysis, time value of money	<ul style="list-style-type: none"> • Compounding interest factor • Annuity and deferred annuity 	
8	• MID TEST		TEAM
10, 11, 12, 13, 14	Investment criteria for livestock farm business	<ul style="list-style-type: none"> • Net Present Value (NPV) • Internal Reate of Return (IRR) • Gross Benefit Cost Ratio (Gross BC) • Net Benefit Cost Ratio (Net BC) • Inflation focuss on the investment 	
14, 15	Investment criteria utilizing for choosing livestock farm business investment possibility	<ul style="list-style-type: none"> • IRR and Net BC comparison • Cross over discount rate 	
16	Composing the FSPE Proposal	<ul style="list-style-type: none"> • Composing the FSPE Proposal of livesctok farm business • Evaluating method of livestock Investment Criteria 	

PRACTICAL AGENDA UNIT

- Mahasiswa diberikan bimbingan yang berkaitan dengan kegiatan praktikum lapangan tentang permasalahan dan bagaimana menyusun SKEP yang dapat dikerjakan sebagai tugas.

F. EVALUATION :

1. Assignment and Practice	: 40 %
2. MIDTest	: 30 %
3. Final Exam	: <u>30 %</u>
Total	: 100%

E. BIBLIOGRAPHY :

1. Clive Gray, Payaman Simanjuntak, Lien K. Sabur, PFL Maspaitela dan RCG Varley. 1997. Pengantar Evaluasi Proyek. Gramedia Jakarta.
2. Ellen Christina, M. Fuad, Sugiyanto dan E. Sukarno. 2002. Anggaran Perusahaan Suatu Pendekatan Praktis. PT Gramedia Pustaka Utama, Jakarta.
3. Iman Suharto. 1995. Manajemen Proyek. Dari Konseptual sampai Operasional. Penerbit Erlangga, Surabaya.
4. Indriyo Gitosudarmo dan Muhamad Najnudin. 2003. Anggaran Perusahaan Teori dan Soal Jawab. BPFE, Yogyakarta
5. J. Price Gittinger. 1992. Analisa Ekonomi Proyek-Proyek Pertanian. UI Press, Jakarta. (Terjemahan)

6. Kadariah, Lien Karlina dan Clive Gray. 1978. Pengantar Evaluasi Proyek. FE UI, Jakarta.
7. Siswanto Sutojo. 1989. Studi Kelayakan Proyek. PT Pustaka Binaman Pressindo. Jakarta.
8. Soetrisno PH. 1995. Dasar-Dasar Evaluasi dan Manajemen Proyek. Andi Offset. Yogyakarta.
9. Suad Husnan dan Suwarsono Muhammad. 2000. Studi Kelayakan Proyek. UKPN Yogyakarta.
10. Yakob Ibrahim. 2003. Studi Kelayakan Bisnis. Rineka Cipta. Jakarta.

LECTURING AGENDA UNIT I

Subject Studied : **FEASIBILITY STUDY AND PROJECT EVALUATION**
 Code of Subject : PTE 308 / 2-1
 System of Credit : 3 SCS (2-1)
 Semester :
 Time of Meeting : 1 x 100 munit
 Meeting Schedule : 1

- A. AIM
1. Aim of General Instruction :
 - At the end of study, the student can understand and explain the component, definition and meaning of livestock FSPE
 - Student can understand and compose the livestock farm business FSPE proposal
 2. Aim of Special Instruction : Student can understand and explain the definition and meaning, benefit and project cycle of FSPE
- B. Topic : Introduction
- C. Sub Topic :
 - Definition and meaning of Feasibility Study and Project Evaluation (FSPE) and its application for livestock farm business.
 - Benefit, scope and project cycle of FSPE

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	Describe and explain : <ul style="list-style-type: none"> • The competence of topics and sub topic • the lectured content and textbook for FSPE 	<ul style="list-style-type: none"> ▪ Take note of written and discussion ▪ Take note of 	White board, OHP / LCD, board maker.
Presentation	Describe and explain <ul style="list-style-type: none"> • Definition and meaning of Feasibility Study and Project Evaluation (FSPE) and its application for livestock farm business, benefit, scope and project cycle of FSPE 	<ul style="list-style-type: none"> ▪ give suggestion ▪ discussion ▪ written 	White board, OHP / LCD, board maker.
The closing of the session	<ol style="list-style-type: none"> a. closing of session b. give the conclusion of topic, sub topic and discussion result c. give an assignment related to introduction material d. describe the next subject lectured 	<ul style="list-style-type: none"> ▪ presentation ▪ give comment or question related to introduction and scope of FSPE ▪ doing an assignment ▪ take note of 	<ul style="list-style-type: none"> ▪ group report ▪ written the comment and question

E. Evaluation :

The Instrument usage : check list for evaluating an assignment student capability and student class activity

F. BIBLIOGRAPHY

1. Clive Gray, Payaman Simanjuntak, Lien K. Sabur, PFL Maspaitela dan RCG Varley. 1997. Pengantar Evaluasi Proyek. Gramedia Jakarta.
2. Iman Suharto. 1995. Manajemen Proyek. Dari Konseptual sampai Operasional. Penerbit Erlangga, Surabaya.
3. J. Price Gittinger. 1992. Analisa Ekonomi Proyek-Proyek Pertanian. UI Press, Jakarta.
4. Kadariah, Lien Karlina dan Clive Gray. 1978. Pengantar Evaluasi Proyek. FE UI, Jakarta.
5. Suad Husnan dan Suwarsono Muhammad. 2000. Studi Kelayakan Proyek. UKPN Yogyakarta.

LECTURING AGENDA UNIT II

Subject Studied : **FEASIBILITY STUDY AND PROJECT EVALUATION**
 Code of Subject : PTE 308 / 2-1
 System of Credit Semester : 3 SCS (2-1)
 Time of Meeting : 2 x 100 munite
 Meeting Schedule : 2, 3 and 4

- A. AIM
1. Aim of General Instruction :
 - At the end of study, the student can understand and explain the component, definition and meaning of livestock FSPE
 - Student can understand and compose the livestock farm business FSPE proposal
 2. Aim of Special Instruction : Student can understand and explain some aspects of FSPE, such technical aspect, managerial and administration aspect, commercial aspect, financial and economic aspec, legal aspect and environmental aspect
- B. Topic : Some aspects of FSPE
- C. Sub Topic :
 - Technical aspect,
 - Managerial and administration aspect,
 - Commercial aspect,
 - Financial and economic aspec,
 - Legal aspect
 - Environmental aspect

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	Describe and explain : <ul style="list-style-type: none"> • The competence of topis and sub topic • Some aspects of FSPE 	<ul style="list-style-type: none"> ▪ Take note of written and discussion ▪ Take note of 	White board. OHP / LCD. board maker.
Presentation	Describe and explain <ul style="list-style-type: none"> ▪ Technical aspect, ▪ Managerial and administration aspect, ▪ Commercial aspect, ▪ Financial and economic aspec, ▪ Legal aspect ▪ Environmental aspect ▪ Group discussion ▪ randomly point toward the student to present the group discussion report ▪ describe the next subject lectured 	<ul style="list-style-type: none"> ▪ give suggestion ▪ discussion and prsentation ▪ written and submit of group report 	White board. OHP / LCD. board maker.

The closing of the session	<ul style="list-style-type: none"> a. closing of session b. give the conclusion of topic, sub topic and discussion result c. give an assignment related to some aspects of FSPE d. describe the next subject lectured 	<ul style="list-style-type: none"> ▪ presentation ▪ give comment or question related to some aspects of FSPE ▪ doing an assignment ▪ take note of 	<ul style="list-style-type: none"> ▪ group report ▪ written the comment and question
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E. EVALUATION :

The Instrument usage : check list for evaluating an assignment student capability and student class activity

F. BIBLIOGRAPHY :

1. Clive Gray, Payaman Simanjuntak, Lien K. Sabur, PFL Maspaitela dan RCG Varley. 1997. Pengantar Evaluasi Proyek. Gramedia Jakarta.
2. Iman Suharto. 1995. Manajemen Proyek. Dari Konseptual sampai Operasional. Penerbit Erlangga, Surabaya.
3. J. Price Gittinger. 1992. Analisa Ekonomi Proyek-Proyek Pertanian. UI Press, Jakarta.
4. Kadariah, Lien Karlina dan Clive Gray. 1978. Pengantar Evaluasi Proyek. FE UI, Jakarta.
5. Soetrisno PH. 1995. Dasar-Dasar Evaluasi dan Manajemen Proyek. Andi Offset. Yogyakarta.
6. Suad Husnan dan Suwarsono Muhammad. 2000. Studi Kelayakan Proyek. UKPN Yogyakarta

LECTURING AGENDA UNIT III

Subject Studied : **FEASIBILITY STUDY AND PROJECT EVALUATION**
 Code of Subject : PTE 308 / 2-1
 System of Credit : 3 SCS (2-1)
 Semester :
 Time of Meeting : 2 x 100 munite
 Schedule Meeting : 5, 6 and 7

- a. AIM
1. Aim of General Instruction :
 - At the end of study, the student can understand and explain the component, definition and meaning of livestock FSPE
 - Student can understand and compose the livestock farm business FSPE proposal
 2. Aim of Special Instruction : Student can understand and explain the financial and economic aspects consist of input factors utilizing for livestock farm business, livestock product, opportunity cost and, the differences between financial and economic analysis.
- B. Topic :
 - Financial and economic aspect for livestock farm business
 - Shadow prices
- C. Sub Topic :
 - Input – output livestock farm business
 - Opportunity cost
 - The concept, determination and evaluation of shadow price for livestock farm business
 - the differences between financial and economic analysis.
 - Determination of financial and economic analysis

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	Describe and explain : <ul style="list-style-type: none"> • The competence of topics and sub topic • Financial and economic analysis and shadow prices 	<ul style="list-style-type: none"> ▪ Take note of written and discussion ▪ Take note of 	White board. OHP / LCD. board maker.
Presentation	Describe and explain : <ul style="list-style-type: none"> • Input – output livestock farm business • Opportunity cost • The concept, determination and evaluation of shadow price for livestock farm business • the differences between financial and economic analysis. • Determination of financial and economic analysis • Group discussion 	<ul style="list-style-type: none"> ▪ give suggestion ▪ discussion and presentation ▪ written and submit of group report ▪ submit an assignment 	White board. OHP / LCD, board maker.

	<ul style="list-style-type: none"> • Randomly point toward the student to present group discussion report • Describe next subject lectured 		
The closing of the session	<ol style="list-style-type: none"> a. closing of session b. give the conclusion of topic, sub topic and discussion result c. give an assignment related to financial and economic analysis d. describe the next subject lectured 	<ul style="list-style-type: none"> ▪ presentation ▪ give comment or question related to financial and economic analysis of FSPE ▪ doing an assignment ▪ take note of 	<ul style="list-style-type: none"> ▪ group report ▪ written the comment and question

E. EVALUATION :

The Instrument usage : check list for evaluating an assignment student capability and student class activity

F. BIBLIOGRAPHY :

1. Clive Gray, Payaman Simanjuntak, Lien K. Sabur, PFL Maspaitela dan RCG Varley. 1997. Pengantar Evaluasi Proyek. Gramedia Jakarta.
2. Iman Suharto. 1995. Manajemen Proyek. Dari Konseptual sampai Operasional. Penerbit Erlangga, Surabaya.
3. J. Price Gittinger. 1992. Analisa Ekonomi Proyek-Proyek Pertanian. UI Press, Jakarta.
4. Kadariah, Lien Karlina dan Clive Gray. 1978. Pengantar Evaluasi Proyek. FE UI, Jakarta.
5. Suad Husnan dan Suwarsono Muhammad. 2000. Studi Kelayakan Proyek. UKPN Yogyakarta

LECTURING AGENDA UNIT IV

Subject Studied : **FEASIBILITY STUDY AND PROJECT EVALUATION**
 Code of Subject : PTE 308 / 2-1
 System of Credit : 3 SCS (2-1)
 Semester :
 Time of Meeting : 1 x 100 munit
 Schedule Meeting : 8

- A. AIM
1. Aim of :
 - At the end of study, the student can understand and explain the component, definition and meaning of livestock FSPE
 - Student can understand and compose the livestock farm business FSPE proposal
 2. Aim of Special Instruction : Student can understand and explain the concept of discounting and undiscounting computation and application of time value of money for livestock farm business investment analysis.
- B. Topic : Discounting and undiscounting analysis, time value of money
- C. Sub Topic :
 - Compounding interest factor
 - Annuity and deferred annuity

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	Describe and explain : <ul style="list-style-type: none"> • The competence of topics and sub topic • Discounting and undiscounting factor 	<ul style="list-style-type: none"> ▪ Take note of written and discussion ▪ Take note of 	White board, OHP / LCD, board maker.
Presentation	<ul style="list-style-type: none"> • Compounding interest factor • Annuity and deferred annuity • Group discussion • Randomly point toward the student to present group discussion report • Describe next subject lectured 	<ul style="list-style-type: none"> ▪ Take note of ▪ give suggestion ▪ discussion and presentation ▪ written and submit of group report submit an assignment 	White board, OHP / LCD, board maker.
The closing of the session	<ol style="list-style-type: none"> a. closing of session b. give the conclusion of topic, sub topic and discussion result c. give an assignment related to discounting and undiscounting factor d. describe the next subject lectured 	<ul style="list-style-type: none"> ▪ presentation ▪ give comment or question related to discounting, undiscounting ▪ doing an assignment ▪ take note of 	<ul style="list-style-type: none"> ▪ group report ▪ written the comment and question

E. EVALUATION :

The Instrument usage : check list for evaluating an assignment student capability and student class activity

F. BIBLIOGRAPHY :

1. Clive Gray, Payaman Simanjuntak, Lien K. Sabur, PFL Maspaitela dan RCG Varley. 1997. Pengantar Evaluasi Proyek. Gramedia Jakarta.
2. Iman Suharto. 1995. Manajemen Proyek. Dari Konseptual sampai Operasional. Penerbit Erlangga, Surabaya.
3. J. Price Gittinger. 1992. Analisa Ekonomi Proyek-Proyek Pertanian. UI Press, Jakarta.
4. Kadariah, Lien Karlina dan Clive Gray. 1978. Pengantar Evaluasi Proyek. FE UI, Jakarta.
5. Soetrisno PH. 1995. Dasar-Dasar Evaluasi dan Manajemen Proyek. Andi Offset. Yogyakarta.
6. Suad Husnan dan Suwarsono Muhammad. 2000. Studi Kelayakan Proyek. UKPN Yogyakarta

LECTURING AGENDA UNIT V

Subject Studied : **FEASIBILITY STUDY AND PROJECT EVALUATION**
 Code of Subject : PTE 308 / 2-1
 System of Credit : 3 SCS (2-1)
 Semester :
 Time of Meeting : 6 x 100 munite
 Schedule Meeting : 9, 10, 11, 12, 13, and 14

- A. AIM
1. Aim of General Instruction :
 - At the end of study, the student can understand and explain the component, definition and meaning of livestock FSPE
 - Student can understand and compose the livestock farm business FSPE proposal
 2. Aim of Special Instruction : Student can understand and explain the investment criteria concept consist of NPV, IRR, Gross BC, Net BC and influencing inflation for investment
- B. Topic : Investment criteria for livestock farm business
- C. Sub Topic : Investment concept and investment criteria, such :
- Net Present Value (NPV)
 - Internal Reate of Return (IRR)
 - Gross Benefit Cost Ratio (Gross BC)
 - Net Benefit Cost Ratio (Net BC)
 - Inflation focuss on the investment

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	Describe and explain : <ul style="list-style-type: none"> • The competence of topis and sub topic • Investment criteria 	<ul style="list-style-type: none"> ▪ Take note of written and discussion ▪ Take note of 	White board, OHP / LCD, board maker.
Presentation	Describe and explain relation to Investment concept and investment criteria, such : <ul style="list-style-type: none"> • Net Present Value (NPV) • Internal Reate of Return (IRR) • Gross Benefit Cost Ratio (Gross BC) • Net Benefit Cost Ratio (Net BC) • Inflation focuss on the investment Group discussion Randomly point toward the student to present group discussion report	<ul style="list-style-type: none"> ▪ Take note of ▪ give suggestion ▪ discussion and presentation ▪ written and submit of group report submit an assignment 	White board, OHP / LCD, board maker.

	Describe next subject lectured		
The closing of the session	<ul style="list-style-type: none"> a. closing of session b. give the conclusion of topic, sub topic and discussion result c. give an assignment related to investment criteria d. describe the next subject lectured 	<ul style="list-style-type: none"> ▪ presentation ▪ give comment or question related to investment criteria ▪ doing an assignment ▪ take note of 	<ul style="list-style-type: none"> ▪ group report ▪ written the comment and question

E. EVALUATION :

The Instrument usage : check list for evaluating an assignment student capability and student class activity

F. BIBLIOGRAPHY :

1. Clive Gray, Payaman Simanjuntak, Lien K. Sabur, PFL Maspaitela dan RCG Varley. 1997. Pengantar Evaluasi Proyek. Gramedia Jakarta.
2. Iman Suharto. 1995. Manajemen Proyek. Dari Konseptual sampai Operasional. Penerbit Erlangga, Surabaya.
3. J. Price Gittinger. 1992. Analisa Ekonomi Proyek-Proyek Pertanian. UI Press, Jakarta.
4. Kadariah, Lien Karlina dan Clive Gray. 1978. Pengantar Evaluasi Proyek. FE UI, Jakarta.
5. Soetrisno PH. 1995. Dasar-Dasar Evaluasi dan Manajemen Proyek. Andi Offset. Yogyakarta.
6. Suad Husnan dan Suwarsono Muhammad. 2000. Studi Kelayakan Proyek. UKPN Yogyakarta

LECTURING AGENDA UNIT VI

Subject Studied : **FEASIBILITY STUDY AND PROJECT EVALUATION**
 Code of Subject : PTE 308 / 2-1
 System of Credit : 3 SCS (2-1)
 Semester :
 Time of Meeting : 1 x 100 munit
 Schedule Meeting : 15

- A. AIM
1. Aim of General Instruction :
 - At the end of study, the student can understand and explain the component, definition and meaning of livestock FSPE
 - Student can understand and compose the livestock farm business FSPE proposal
 2. Aim of Special Instruction : Student can understand and explain investment criteria utilizing for choosing livestock farm business investment possibility
- B. Topic : Investment criteria utilizing for choosing livestock farm business investment possibility
- C. Sub Topic :
 - IRR and Net BC comparison
 - Cross over discount rate

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	Describe and explain : <ul style="list-style-type: none"> • The competence of topics and sub topic • Investment criteria utilizing for choosing investment possibility 	<ul style="list-style-type: none"> ▪ Take note of written and discussion ▪ Take note of 	White board, OHP / LCD, board maker.
Presentation	Describe and explain : <ul style="list-style-type: none"> • IRR and Net BC comparison • Cross over discount rate Group discussion Randomly point toward the student to present group discussion report Describe next subject lectured	<ul style="list-style-type: none"> ▪ Take note of ▪ give suggestion ▪ discussion and presentation ▪ written and submit of group report submit an assignment 	White board, OHP / LCD, board maker.
The closing of the session	<ol style="list-style-type: none"> a. closing of session b. give the conclusion of topic, sub topic and discussion result c. give an assignment related to utilizing investment possibility d. describe the next subject lectured 	<ul style="list-style-type: none"> ▪ presentation ▪ give comment or question related to investment criteria possibility ▪ doing an assignment ▪ take note of 	<ul style="list-style-type: none"> ▪ group report ▪ written the comment and question

E. EVALUATION :

The Instrument usage : check list for evaluating an assignment student capability and student class activity

F. BIBLIOGRAPHY :

1. Clive Gray, Payaman Simanjuntak, Lien K. Sabur, PFL Maspaitela dan RCG Varley. 1997. Pengantar Evaluasi Proyek. Gramedia Jakarta.
2. Iman Suharto. 1995. Manajemen Proyek. Dari Konseptual sampai Operasional. Penerbit Erlangga, Surabaya.
3. J. Price Gittinger. 1992. Analisa Ekonomi Proyek-Proyek Pertanian. UI Press, Jakarta.
4. Kadariah, Lien Karlina dan Clive Gray. 1978. Pengantar Evaluasi Proyek. FE UI, Jakarta.
5. Soetrisno PH. 1995. Dasar-Dasar Evaluasi dan Manajemen Proyek. Andi Offset. Yogyakarta.
6. Suad Husnan dan Suwarsono Muhammad. 2000. Studi Kelayakan Proyek. UKPN Yogyakarta

LECTURING AGENDA UNIT VI

Subject Studied : **FEASIBILITY STUDY AND PROJECT EVALUATION**
 Code of Subject : PTE 308 / 2-1
 System of Credit : 3 SCS (2-1)
 Semester
 Time of Meeting : 1 x 100 munit
 Schedule Meeting : 16

- A. AIM
1. Aim of :
 - At the end of study, the student can understand and explain the component, definition and meaning of livestock FSPE
 - Student can understand and compose the livestock farm business FSPE proposal
 2. Aim of Special Instruction : Student can understand, explain and compose the Livestock farm business FSPE Proposal
- B. Topic : Composing the FSPE Proposal
- C. Sub Topic :
 - Composing the FSPE Proposal of livestock farm business
 - Evaluating method of livestock Investment Criteria

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	Describe and explain : <ul style="list-style-type: none"> • The competence of topics and sub topic • Composing the FSPE Proposal 	<ul style="list-style-type: none"> ▪ Take note of written and discussion ▪ Take note of 	White board, OHP / LCD, board maker.
Presentation	Describe and explain : <ul style="list-style-type: none"> • Composing the FSPE Proposal of livestock farm business • Evaluating method of livestock Investment Criteria Group discussion Randomly point toward the student to present group discussion report Describe next subject lectured	<ul style="list-style-type: none"> ▪ Take note of ▪ give suggestion ▪ discussion and presentation ▪ written and submit of group report submit an assignment 	White board, OHP / LCD, board maker.
The closing of the session	<ol style="list-style-type: none"> a. closing of session b. give the conclusion of topic, sub topic and discussion result c. describe the final exam 	<ul style="list-style-type: none"> ▪ presentation ▪ give comment or question related to composing FSPE Proposal ▪ take note of 	<ul style="list-style-type: none"> ▪ group report ▪ written the comment and question

E. EVALUATION :

The Instrument usage : check list for evaluating an assignment student capability and student class activity

F. BIBLIOGRAPHY :

1. Clive Gray, Payaman Simanjuntak, Lien K. Sabur, PFL Maspaitela dan RCG Varley. 1997. Pengantar Evaluasi Proyek. Gramedia Jakarta.
2. Iman Suharto. 1995. Manajemen Proyek. Dari Konseptual sampai Operasional. Penerbit Erlangga, Surabaya.
3. J. Price Gittinger. 1992. Analisa Ekonomi Proyek-Proyek Pertanian. UI Press, Jakarta.
4. Kadariah, Lien Karlina dan Clive Gray. 1978. Pengantar Evaluasi Proyek. FE UI, Jakarta.
5. Soetrisno PH. 1995. Dasar-Dasar Evaluasi dan Manajemen Proyek. Andi Offset. Yogyakarta.
6. Suad Husnan dan Suwarsono Muhammad. 2000. Studi Kelayakan Proyek. UKPN Yogyakarta.

PRACTICAL AGENDA UNIT I

Subject Studied : **FEASIBILITY STUDY AND PROJECT EVALUATION**
 Code of Subject : PTE 308 / 2-1
 Time of Meeting : 1 x 100 munit
 Meeting Schedule : 1

- A. AIM
1. Aim of General Instruction :
 - At the end of practical, the student can compute interest rate, Payback Period, BC ratio, Profitability Indeks, IRR, NPV, Financial and Economis Analisis Ekonomi and compose FSPE proposal.
 -
 2. Aim of Special Instruction : Student can understand and explain present value and future value and interest of rate
- B. Topic : Time value of money
- C. Sub Topic : Present value and future value and interest of rate

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	Describe and give an example of present value, future value and interest rate calculation	<ul style="list-style-type: none"> ▪ Take note of ▪ written and discussion 	White board, OHP / LCD, board maker. Practical guidance
Presentation	Describe and give an example of present value, future value and interest rate calculation	<ul style="list-style-type: none"> ▪ Take note of ▪ Give an answer ▪ Give suggestion 	White board, OHP / LCD, board maker. Practical guidance
The closing of the practical	<ol style="list-style-type: none"> a. give the conclusion of topic, sub topic and discussion result b. give an assignment related to time value of money c. describe the next subject practical 	<ul style="list-style-type: none"> ▪ give comment or question related to time value of money ▪ doing an assignment ▪ take note of 	written the comment and question

E. EVALUATION : doing an assignment and give next an assignment

F. BIBLIOGRAPHY

1. Clive Gray, Payaman Simanjuntak, Lien K. Sabur, PFL Maspaitela dan RCG Varley. 1997. Pengantar Evaluasi Proyek. Gramedia Jakarta.
2. Iman Suharto. 1995. Manajemen Proyek. Dari Konseptual sampai Operasional. Penerbit Erlangga, Surabaya.
3. J. Price Gittinger. 1992. Analisa Ekonomi Proyek-Proyek Pertanian. UI Press, Jakarta.

4. Kadariah, Lien Karlina dan Clive Gray. 1978. Pengantar Evaluasi Proyek. FE UI, Jakarta.
5. Kadarsan, 1996. Evaluasi Proyek-proyek Pertanian, UI Press, Jakarta
6. Suad Husnan dan Suwarsono Muhammad. 2000. Studi Kelayakan Proyek. UKPN Yogyakarta.

PRACTICAL AGENDA UNIT II

Subject Studied : **FEASIBILITY STUDY AND PROJECT EVALUATION**
 Code of Subject : PTE 308 / 2-1
 Time of Meeting : 1 x 100 munit
 Meeting Schedule : 2

- A. AIM
- 1. Aim of General Instruction :
 - At the end of practical, the student can compute interest rate, Payback Period, BC ratio, Profitability Indeks, IRR, NPV, Financial and Economic Analysis and compose FSPE proposal.
 - 2. Aim of Special Instruction : Student can understand, explain and calculate of depreciation method
- B. Topic : Depreciation Method
- C. Sub Topic : Depreciation Method

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	<ul style="list-style-type: none"> ▪ Describe and explain depreciation method ▪ Calculation of depreciation method 	<ul style="list-style-type: none"> ▪ Take note of written and discussion 	White board, OHP / LCD, board maker. Practical guidance
Presentation	Describe, explain and calculate of livestock farm business depreciation	calculate of livestock farm business depreciation	White board, OHP / LCD, board maker. Practical guidance
The closing of the practical	<ul style="list-style-type: none"> a. give the conclusion of topic, sub topic and discussion result b. give an assignment related to depreciation method c. describe the next subject practical 	<ul style="list-style-type: none"> ▪ give comment or question related to depreciation method ▪ doing an assignment ▪ take note of 	written the comment and question

E. EVALUATION : doing an assignment and give next an assignment

F. BIBLIOGRAPHY :

1. Clive Gray, Payaman Simanjuntak, Lien K. Sabur, PFL Maspaitela dan RCG Varley. 1997. Pengantar Evaluasi Proyek. Gramedia Jakarta.
2. Iman Suharto. 1995. Manajemen Proyek. Dari Konseptual sampai Operasional. Penerbit Erlangga, Surabaya.
3. J. Price Gittinger. 1992. Analisa Ekonomi Proyek-Proyek Pertanian. UI Press, Jakarta.

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5. Soetrisno PH. 1995. Dasar-Dasar Evaluasi dan Manajemen Proyek. Andi Offset. Yogyakarta.
6. Suad Husnan dan Suwarsono Muhammad. 2000. Studi Kelayakan Proyek. UKPN Yogyakarta

PRACTICAL AGENDA UNIT III

Subject Studied : **FEASIBILITY STUDY AND PROJECT EVALUATION**
 Code of Subject : PTE 308 / 2-1
 Time of Meeting : 1 x 100 munit
 Meeting Schedule : 3

- A. AIM
- 1. Aim of General Instruction : • At the end of practical, the student can compute interest rate, Payback Period, BC ratio, Profitability Indeks, IRR, NPV, Financial and Economic Analysis and compose FSPE proposal.
 - 2. Aim of Special Instruction : Student can understand, explain and analyse of linear and non regression method for investment forecasting
- B. Topic : Analysis of Investment forecasting
- C. Sub Topic : Definition and meaning of regression analysis, usage and computing of linear and non linear regression for investment forecasting

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	Describe and explain of regression analysis	<ul style="list-style-type: none"> ▪ Take note of ▪ written and discussion 	White board, OHP / LCD, board maker. Practical guidance
The closing of the practical	<ul style="list-style-type: none"> a. give the conclusion of topic, sub topic and discussion result b. give an assignment related to depreciation method c. describe the next subject practical 	<ul style="list-style-type: none"> ▪ give comment or question related to regression analysis ▪ doing an assignment ▪ take note of 	written the comment and question

E. **EVALUATION** : doing an assignment and give next an assignment

F. BIBLIOGRAPHY :

1. Clive Gray, Payaman Simanjuntak, Lien K. Sabur, PFL Maspaitela dan RCG Varley. 1997. Pengantar Evaluasi Proyek. Gramedia Jakarta.
2. Iman Suharto. 1995. Manajemen Proyek. Dari Konseptual sampai Operasional. Penerbit Erlangga, Surabaya.
3. J. Price Gittinger. 1992. Analisa Ekonomi Proyek-Proyek Pertanian. UI Press, Jakarta.
4. Kadariah, Lien Karlina dan Clive Gray. 1978. Pengantar Evaluasi Proyek. FF UI, Jakarta.
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PRACTICAL AGENDA UNIT IV

Subject Studied : **FEASIBILITY STUDY AND PROJECT EVALUATION**
 Code of Subject : PTE 308 / 2-1
 Time of Meeting : 1 x 100 munit
 Meeting Schedule : 4

- A. AIM
1. Aim of General Instruction :
 - At the end of practical, the student can compute interest rate, Payback Period, BC ratio, Profitability Indeks, IRR, NPV, Financial and Economis Analisis Ekonomi and compose FSPE proposal.
 2. Aim of Special Instruction : Student can understand and explain some aspects of FSPE
- B. Topic :
 - Some aspects for activity planning
 - Some aspects for activity realization of livestock investment
- C. Sub Topic : Technical aspect, Managerial and administration aspect, Commercial aspect, Financial and economic aspect, Legal aspect Environmental aspect

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	Describe, explain and give an example of some aspects of FSPE	<ul style="list-style-type: none"> ▪ Take note of written and discussion 	White board, OHP / LCD, board maker. Practical guidance
Presentation	Describe, explain and give an example of some aspects of FSPE	<ul style="list-style-type: none"> ▪ take note of and compose some aspects related to FSPE 	<ul style="list-style-type: none"> ▪ Board ▪ OHP/LCD ▪ Petunjuk Praktikum
The closing of the practical	<ol style="list-style-type: none"> a. give the conclusion of topic, sub topic and discussion result b. give an assignment related to depreciation method c. describe the next subject practical 	<ul style="list-style-type: none"> ▪ give comment or question related to some aspects of FSPE ▪ doing an assignment ▪ take note of 	written the comment and question

E. EVALUATION : doing an assignment and give next an assignment

F. BIBLIOGRAPHY :

1. Clive Gray, Payaman Simanjuntak, Lien K. Sabur, PFL Maspaitela dan RCG Varley. 1997. Pengantar Evaluasi Proyek. Gramedia Jakarta.
2. Imah Suharto. 1995. Manajemen Proyek. Dari Konseptual sampai Operasional. Penerbit Erlangga, Surabaya.

3. J. Price Gittinger. 1992. Analisa Ekonomi Proyek-Proyek Pertanian. UI Press, Jakarta.
4. Kadariah, Lien Karlina dan Clive Gray. 1978. Pengantar Evaluasi Proyek. FE UI, Jakarta.
5. Soetrisno PH. 1995. Dasar-Dasar Evaluasi dan Manajemen Proyek. Andi Offset. Yogyakarta.
6. Suad Husnan dan Suwarsono Muhammad. 2000. Studi Kelayakan Proyek. UKPN Yogyakarta

PRACTICAL AGENDA UNIT V

Subject Studied : **FEASIBILITY STUDY AND PROJECT EVALUATION**
 Code of Subject : PTE 308 / 2-1
 Time of Meeting : 1 x 100 munit
 Meeting Schedule : 5

- A. AIM
- 1. Aim of General Instruction : • At the end of practical, the student can compute interest rate, Payback Period, BC ratio, Profitability Indeks, IRR, NPV, Financial and Economis Analisis Ekonomi and compose FSPE proposal.
 - 2. Aim of Special Instruction : Student can understand and explain the investment criteria of livestock farm business
- B. Topic : ▪ Livestock Investment Criteria
- C. Sub Topic : Some analysis of investment criteria

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	Describe, explain and give an example of investment calculation	<ul style="list-style-type: none"> ▪ Take note of ▪ written and discussion 	White board, OHP / LCD, board maker. Practical guidance
Presentation	Describe, explain and give an example of ROI, NPV, IRR, BC ratios calculation and influencing of inflation to FSPE	<ul style="list-style-type: none"> ▪ take note of and calculate the investment criteria 	<ul style="list-style-type: none"> ▪ Board ▪ OHP/LCD ▪ Petunjuk Praktikum
The closing of the practical	<ul style="list-style-type: none"> a. give the conclusion of topic, sub topic and discussion result b. give an assignment related to depreciation method c. describe the next subject practical 	<ul style="list-style-type: none"> ▪ give comment or question related investment criteria ▪ doing an assignment ▪ take note of 	written the comment and question

E. **EVALUATION** : doing an assignment and give next an assignment

F. BIBLIOGRAPHY :

1. Clive Gray, Payaman Simanjuntak, Lien K. Sabur, PFL Maspaitela dan RCG Varley. 1997. Pengantar Evaluasi Proyek. Gramedia Jakarta.
2. Iman Suharto. 1995. Manajemen Proyek. Dari Konseptual sampai Operasional. Penerbit Erlangga, Surabaya.
3. J. Price Gittinger. 1992. Analisa Ekonomi Proyek-Proyek Pertanian. UI Press. Jakarta.

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PRACTICAL AGENDA UNIT VI

Subject Studied : **FEASIBILITY STUDY AND PROJECT EVALUATION**
 Code of Subject : PTE 308 / 2-1
 Time of Meeting : 1 x 100 munite
 Meeting Schedule : 6

- A. AIM
- At the end of practical, the student can compute interest rate, Payback Period, BC ratio, Profitability Indeks, IRR, NPV, Financial and Economis Analisis Ekonomi and compose FSPE proposal.
1. Aim of General Instruction :
 2. Aim of Special Instruction : Student can understand, explain and compose the FSPE Proposal and calculate livestock farm business in term of financial and economic analysis
- B. Topic : Composing Livestock FSPE Proposal
- C. Sub Topic : Data collecting from farm business or small scale of farming

D. Teaching and Learning Activities

Phase	Lecturer Activities	Student Activities	Media and teaching equipment
1	2	3	4
Introduction	Describe, explain and give an example of FSPE usage for farm business livestock	<ul style="list-style-type: none"> ▪ Take note of ▪ written and discussion 	White board, OHP / LCD, board maker. Practical guidance
Presentation	Student visitation to livestock farm business or livestock small farm scale	<ul style="list-style-type: none"> ▪ visitation and practical to farm 	<ul style="list-style-type: none"> ▪ Board ▪ OHP/LCD ▪ Petunjuk Praktikum
The closing of the practical	<ul style="list-style-type: none"> a. give the conclusion of topic, sub topic and discussion result d. the result of FSPE proposal composing description 	<ul style="list-style-type: none"> ▪ presentation of FSPE Report 	Practical report

E. EVALUATION : doing an assignment and give next an assignment

F. BIBLIOGRAPHY :

1. Clive Gray, Payaman Simanjuntak, Lien K. Sabur, PFL Maspatela dan RCG Varley. 1997. Pengantar Evaluasi Proyek. Gramedia Jakarta.
2. Iman Suharto. 1995. Manajemen Proyek. Dari Konseptual sampai Operasional. Penerbit E-langga, Surabaya.
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