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
<table>
<thead>
<tr>
<th>COURSE</th>
<th>Farming Area Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>COURSE CODE</td>
<td>PTP 228</td>
</tr>
<tr>
<td>CREDIT</td>
<td>2 (2-0)</td>
</tr>
</tbody>
</table>
# 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 References**:


<table>
<thead>
<tr>
<th>NO.</th>
<th>SPECIFIC INSTRUCTIONAL OBJECT</th>
<th>MAIN DISCUSSION</th>
<th>SUB DISCUSSION</th>
<th>TIME ESTIMATION</th>
<th>REFERENCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>After following this lecture student has knowledge and able to explain truly about interrelationship between climates and livestock in ecosystem</td>
<td>ecosystem</td>
<td>Ecosystem the component of ecosystem</td>
<td>1 x 120 minutes</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>After following this lecture student can explain the definition and the relation of climate and living in ecosystem</td>
<td>Bio climate</td>
<td>Biotic and a biotic environment</td>
<td>1 x 120 minutes</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>After following this lecture student can explain the temperature and can decide the comfortable area for breeding</td>
<td>Temperature zone</td>
<td>Cold stress and low critical temperature Hot stress and high critical temperature</td>
<td>2 x 120 minutes</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>After following this lecture student can explain the thermal production and</td>
<td>Thermoregulation</td>
<td>Thermal production Thermal circulation</td>
<td>2 x 120 minutes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>balances, thermoregulation by biological and physical</td>
<td>Thermal balances</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------------------------</td>
<td>------------------</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>After following this lecture student can explain nervous system, relation of nervous system and behavior, milk, meat, eggs production process.</td>
<td>The effect of environment to livestock</td>
<td>Behavior, nervous system and production, Lactation and milk production, Growth, Fowl production</td>
<td>2 x 120 minutes</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>After following this lecture student can explain about adaptation and where livestock will be placed</td>
<td>Adaptation in environment</td>
<td>Adapt to environment, Adapt to extreme environment, Special adaptation</td>
<td>2 x 120 minutes</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>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</td>
<td>Environment and feed manipulation</td>
<td>Environment manipulation, Feed manipulation</td>
<td>2 x 120 minutes</td>
<td></td>
</tr>
</tbody>
</table>
COURSE : Meat and Draught Animal Production

COURSE CODE : PTF 305 P

CREDIT : 3 (2-1)
# LECTURING PROGRAM OUTLINE

<table>
<thead>
<tr>
<th>Subject</th>
<th>Meat and Draught Animal Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code / Semester Credit Unit</td>
<td>PTF 305P/3 (2-1)</td>
</tr>
<tr>
<td>Syllabus</td>
<td>This lecture discusses breeds, animal response of production and environment factors to develop meat animal production</td>
</tr>
<tr>
<td>General Instructional Objective</td>
<td>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</td>
</tr>
</tbody>
</table>

## LECTURING PROGRAM

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Topic of Discussion</th>
<th>Sub-topic of Discussion</th>
<th>Duration (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>General description of subject lecture, explaining lecture content, practical, and assignment</td>
<td>50</td>
</tr>
<tr>
<td>1-2</td>
<td>Breeds</td>
<td>Types and breeds of meat and draught animal</td>
<td>150</td>
</tr>
<tr>
<td>3</td>
<td>Balance of physiology system</td>
<td>Thermal balance, thermoregulation, heart rate, body temperature, comfort zone, and effect of environment to animal production</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Animal response to climate</td>
<td>The effect of climate to animal production</td>
<td>100</td>
</tr>
<tr>
<td>5-6</td>
<td>Animal housing and equipment</td>
<td>Location of animal barn, function, lay out, type of construction, type of barn</td>
<td>200</td>
</tr>
<tr>
<td>7-8</td>
<td>Animal Growth and Development</td>
<td>Definition of growth and development, compensatory growth, growth of bone, meat and fat, factors affecting growth and development, and manipulation growth to production</td>
<td>200</td>
</tr>
<tr>
<td>9</td>
<td>EVALUATION I</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>10</td>
<td>Digestive system of meat animal</td>
<td>Digestive system and process of feed digestive on meat animal</td>
<td>100</td>
</tr>
<tr>
<td>11-12</td>
<td>Feedstuff and animal response to feed</td>
<td>Kind of feed, factors affecting feed consumption, feed requirement, feeding management, and feed evaluation (feed conversion ratio, feed efficiency)</td>
<td>200</td>
</tr>
<tr>
<td>13</td>
<td>Matting management of meat animal</td>
<td>Matting time, methods of matting, sex ratio, post partum matting</td>
<td>100</td>
</tr>
<tr>
<td>14-15</td>
<td>Care of meat animal</td>
<td>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.</td>
<td>200</td>
</tr>
<tr>
<td>16</td>
<td>EVALUATION II</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>
**LECTURING AGENDA UNITS**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Meat and Draught Animal Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code / Semester Credit Unit</td>
<td>PTF 305P/3 (2-1)</td>
</tr>
<tr>
<td>Syllabus</td>
<td>This lecture discusses breeds, animal response of production and environment factors to develop meat animal production</td>
</tr>
<tr>
<td>General Instructional Objective</td>
<td>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</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Topic</th>
<th>Introduction</th>
</tr>
</thead>
</table>
| 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**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer’s Activities</th>
<th>Students’ Activities</th>
<th>Lecturing Media and Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1. Introducing lecturers themselves</td>
<td>Paying attention</td>
<td>Whiteboard</td>
</tr>
</tbody>
</table>
| 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 | - |
**Breed**

**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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer's Activities</th>
<th>Students' Activities</th>
<th>Lecturing Media and Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1. Explaining the scope of the subject</td>
<td>Paying attention</td>
<td>Whiteboard</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presentation</td>
<td>2. Explaining breeds of meat and draught animal:</td>
<td>Paying attention,</td>
<td>OHP, transparent</td>
</tr>
<tr>
<td></td>
<td>- Cattle</td>
<td>making notes,</td>
<td>sheet, whiteboard</td>
</tr>
<tr>
<td></td>
<td>- Buffalo</td>
<td>delivering responses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Sheep</td>
<td>and questions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Goat</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Pig</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Horse</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Delivering questions</td>
<td>Answering questions</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conclusion</td>
<td>3. Concluding the meeting</td>
<td>- Paying attention</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Delivering summary</td>
<td>and making notes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Giving assignment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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

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

### 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

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

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

**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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer’s Activities</th>
<th>Students’ Activities</th>
<th>Lecturing Media and Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1. Explaining the scope of subject</td>
<td>Paying attention</td>
<td>Whiteboard,</td>
</tr>
<tr>
<td>Presentation</td>
<td>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</td>
<td>Paying attention, making notes, delivering responses and questions</td>
<td>Computer, projector, screen whiteboard</td>
</tr>
<tr>
<td></td>
<td>3. Delivering questions</td>
<td>Answering questions</td>
<td></td>
</tr>
<tr>
<td>Conclusion</td>
<td>4. Concluding the meeting</td>
<td>- Paying attention, making notes,</td>
<td>Whiteboard</td>
</tr>
<tr>
<td></td>
<td>- Summarizing materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Giving assignment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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, mating 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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer’s Activities</th>
<th>Students’ Activities</th>
<th>Lecturing Media and Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1. Explaining the scope of subject</td>
<td>Paying attention</td>
<td>Whiteboard,</td>
</tr>
<tr>
<td>Presentation</td>
<td>2. Explaining digestive system and process of feed digestive on meat animal</td>
<td>Paying attention, making notes,</td>
<td>Computer, projector, screen whiteboard</td>
</tr>
<tr>
<td></td>
<td>3. Delivering questions</td>
<td>delivering responses and questions</td>
<td></td>
</tr>
<tr>
<td>Conclusion</td>
<td>4. Concluding the meeting</td>
<td>- Paying attention, making notes,</td>
<td>Whiteboard</td>
</tr>
<tr>
<td></td>
<td>- Summarizing materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Giving assignment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Topic</td>
<td>Feedstuff and animal response to feed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>---------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub Topics</td>
<td>Kind of feed, factors affecting feed consumption, feed requirement, feeding management, and feed evaluation (feed conversion ratio, feed efficiency)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meeting No.</td>
<td>11-12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td>200 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Instructional Objective</td>
<td>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</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific Instructional Objective</td>
<td>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)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Class Activities

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

<table>
<thead>
<tr>
<th>Topic</th>
<th>Matting management of meat animal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub Topics</td>
<td>Matting time, methods of matting, sex ratio, post partum matting</td>
</tr>
<tr>
<td>Meeting No.</td>
<td>13</td>
</tr>
<tr>
<td>Duration</td>
<td>100 minutes</td>
</tr>
<tr>
<td>General Instructional Objective</td>
<td>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</td>
</tr>
<tr>
<td>Specific Instructional Objective</td>
<td>At the end of the lecture, students are able to understand and explain matting time, methods of matting, sex ratio, post partum matting</td>
</tr>
</tbody>
</table>
### Class Activities

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer's Activities</th>
<th>Students' Activities</th>
<th>Lecturing Media and Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1. Explaining the scope of subject</td>
<td>Paying attention</td>
<td>Whiteboard,</td>
</tr>
<tr>
<td></td>
<td>2. Explaining matting time, methods of matting, sex ratio,</td>
<td></td>
<td>Computer, projector, screen,</td>
</tr>
<tr>
<td></td>
<td>post partum matting</td>
<td></td>
<td>whiteboard</td>
</tr>
<tr>
<td></td>
<td>3. Delivering questions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conclusion</td>
<td>4. Concluding the meeting</td>
<td></td>
<td>Whiteboard</td>
</tr>
<tr>
<td></td>
<td>- Summarizing materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Giving assignment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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.
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

<table>
<thead>
<tr>
<th>COURSE</th>
<th>Basic of Biochemistry</th>
</tr>
</thead>
<tbody>
<tr>
<td>COURSE CODE</td>
<td>PTF 202 P</td>
</tr>
<tr>
<td>CREDIT</td>
<td>(2-1)3</td>
</tr>
</tbody>
</table>
# Teaching Program Outline

**Title of Subject**: Basic of Biochemistry  
**Number Code / Code**: 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 References**:


<table>
<thead>
<tr>
<th>NO.</th>
<th>Specific Instructional Object</th>
<th>Main Discussion</th>
<th>Sub Discussion</th>
<th>Time Estimation</th>
<th>References</th>
</tr>
</thead>
</table>
| 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 |
<p>| 2.  | After attending the lecture, student can explain about the digestion of carbohydrate by saliva amylase. | Carbohydrate | Digestion of carbohydrate | 2x50 minutes | 3, 4 |</p>
<table>
<thead>
<tr>
<th></th>
<th>pancreas amylase and intestine enzyme correctly.</th>
<th>Carbohydrate</th>
<th>Metabolism (catabolism and anabolism)</th>
<th>2x50 minutes</th>
<th>3,4</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>After attending the lecture, student can explain the metabolism (catabolism and anabolism) correctly.</td>
<td>Enzyme</td>
<td>Structure and classification of enzyme</td>
<td>2x50 minutes</td>
<td>3,5,6,7</td>
</tr>
<tr>
<td>4.</td>
<td>After attending the lecture, student can explain the structure (units of enzyme) and classification (nomenclature and the kinds of enzyme)</td>
<td>Enzyme</td>
<td>Enzyme activity</td>
<td>2x50 minutes</td>
<td>3,5,6,7</td>
</tr>
<tr>
<td>5.</td>
<td>After attending the lecture, student can count the enzyme activity and the utilization</td>
<td>Enzyme</td>
<td>Factors that influence enzyme activity Enzyme specification</td>
<td>2x50 minutes</td>
<td>3,5,6,7</td>
</tr>
<tr>
<td>6.</td>
<td>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</td>
<td>Enzyme</td>
<td>Factors that influence enzyme activity Enzyme specification</td>
<td>2x50 minutes</td>
<td>3,5,6,7</td>
</tr>
<tr>
<td>7.</td>
<td>After attending the lecture, student can explain the application of enzyme in food industry, feed, chemical and medicine</td>
<td>Enzyme</td>
<td>Structure of protein and classification of protein</td>
<td>2x50 minutes</td>
<td>4,8,9</td>
</tr>
<tr>
<td>8.</td>
<td>After attending the lecture, student can explain the kinds of amino acids, and the classification base on character and the degree of complexity</td>
<td>Protein</td>
<td>Digestion of protein</td>
<td>2x50 minutes</td>
<td>4,8,9</td>
</tr>
<tr>
<td>9.</td>
<td>After attending the lecture, student can explain about the digestion of protein correctly</td>
<td>Protein</td>
<td>Protein metabolism</td>
<td>2x50 minutes</td>
<td>4,8,9</td>
</tr>
<tr>
<td>10.</td>
<td>After attending the lecture, student can explain about the protein metabolism</td>
<td>Protein</td>
<td>The kinds of nucleotide acid Structure of nucleotide acid Function of nucleotide acid</td>
<td>2x50 minutes</td>
<td>4,8,9</td>
</tr>
<tr>
<td>11.</td>
<td>After attending the lecture, student can explain about the nucleotide acid</td>
<td>Nucleotide acid</td>
<td>Structure of lipid Classification of lipid</td>
<td>2x50 minutes</td>
<td>4,8,9</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Subject</td>
<td>Content</td>
<td>Duration</td>
<td>Notes</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------</td>
<td>-------------------------------------------------------------------------</td>
<td>----------------</td>
<td>--------</td>
</tr>
<tr>
<td>13</td>
<td>After attending the lecture, student can explain about the digestion and</td>
<td>Lipid</td>
<td>Digestion of lipid</td>
<td>2x50 minutes</td>
<td>4,8,9</td>
</tr>
<tr>
<td></td>
<td>metabolism of lipid</td>
<td></td>
<td>Metabolism of lipid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>After attending the lecture, student can explain about the cholesterol (</td>
<td>Lipid</td>
<td>Structure and kinds of cholesterol</td>
<td>2x50 minutes</td>
<td>4,8,9</td>
</tr>
<tr>
<td></td>
<td>structure, function, mechanism of formation)</td>
<td></td>
<td>Function of cholesterol</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mechanism of formation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>After attending the lecture, student can explain about the photosynthesis</td>
<td>photosynthesis</td>
<td>light and dark reaction</td>
<td>2x50 minutes</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>(light and dark reaction)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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:

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

E. EVALUATION :

F. REFERENCES
SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

TEACHING SUBJECT : Basic of Biochemistry
TEACHING SUBJECT CODE / SCS : 275 202 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:

<table>
<thead>
<tr>
<th>PHASE</th>
<th>TEACHING ACTIVITY</th>
<th>STUDENTS ACTIVITY</th>
<th>TOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Explain about the definition of digestion and carbohydrate digestion</td>
<td>Pay attention</td>
<td>OHP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Write</td>
<td>Transparency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ask</td>
<td>Hand out</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>White board</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Exercise paper</td>
</tr>
<tr>
<td>Topic presentation</td>
<td>Explain 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.</td>
<td>Pay attention</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Write</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ask</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Answer the questions</td>
<td></td>
</tr>
<tr>
<td>Conclusions</td>
<td>Make a conclusion and gives image of the next lecture</td>
<td>pays attention</td>
<td></td>
</tr>
</tbody>
</table>

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 : 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:

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

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 : 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:

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

E. EVALUATION

F. REFERENCES
SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

<table>
<thead>
<tr>
<th>TEACHING SUBJECT</th>
<th>Basic of Biochemistry</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEACHING SUBJECT CODE / SCS</td>
<td>PTF 202 P / 3 (2-1) SCS</td>
</tr>
<tr>
<td>MEETING TIME</td>
<td>2 x 50 minutes</td>
</tr>
<tr>
<td>MEETING</td>
<td>5</td>
</tr>
</tbody>
</table>

B. MAIN SUBJECT : Enzyme

C. SUB SUBJECT : Enzyme activity

D. CLASS ACTIVITY:

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

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

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: 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 specification

D. CLASS ACTIVITY:

<table>
<thead>
<tr>
<th>PHASE</th>
<th>TEACHING ACTIVITY</th>
<th>STUDENTS ACTIVITY</th>
<th>TOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Explain about the relation of enzyme and the factor that influence its.</td>
<td>Pay attention</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Write</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ask</td>
<td></td>
</tr>
<tr>
<td>Topic presentation</td>
<td>Explain 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.</td>
<td>Pay attention</td>
<td>OHP Transparency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Write</td>
<td>Hand out</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ask</td>
<td>White board</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Answer the questions</td>
<td>Exercise paper</td>
</tr>
<tr>
<td>Conclusions</td>
<td>Explain the advantages of studying enzyme activity and gives image of the next lecture</td>
<td>pays attention</td>
<td></td>
</tr>
</tbody>
</table>

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

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 : 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 specification

D. CLASS ACTIVITY:

<table>
<thead>
<tr>
<th>PHASE</th>
<th>TEACHING ACTIVITY</th>
<th>STUDENTS ACTIVITY</th>
<th>TOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Explain about the relation of enzyme and the factor that influence of its.</td>
<td>Pay attention</td>
<td>OHP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Write</td>
<td>Transparency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ask</td>
<td>Hand out</td>
</tr>
<tr>
<td>Topic</td>
<td>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.</td>
<td>Pay attention</td>
<td>White board</td>
</tr>
<tr>
<td>presentation</td>
<td></td>
<td>Write</td>
<td>Exercise paper</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ask</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Answer the question</td>
<td></td>
</tr>
<tr>
<td>Conclusions</td>
<td>Explain the advantages of studying enzyme activity and gives image of the next lecture</td>
<td>pays attention</td>
<td></td>
</tr>
</tbody>
</table>

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

F. REFERENCES
SET OF TEACHING SCHEDULE

A. OBJECT OF TEACHING SUBJECT

<table>
<thead>
<tr>
<th>TEACHING SUBJECT</th>
<th>Basic of Biochemistry</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEACHING SUBJECT CODE / SCS</td>
<td>PTF 202 P / 3 (2-1) SCS</td>
</tr>
<tr>
<td>MEETING TIME</td>
<td>1 x 50 minutes</td>
</tr>
<tr>
<td>MEETING</td>
<td>8</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>PHASE</th>
<th>TEACHING ACTIVITY</th>
<th>STUDENTS ACTIVITY</th>
<th>TOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Introduction</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Topic presentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conclusions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>PHASE</th>
<th>TEACHING ACTIVITY</th>
<th>STUDENTS ACTIVITY</th>
<th>TOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Explain about the definition of protein</td>
<td>Pay attention Write Ask</td>
<td></td>
</tr>
<tr>
<td>Topic presentation</td>
<td>Explain the kinds of amino acids, and the classification base on character and the degree of complexity.</td>
<td>Pay attention Write Ask Answer the questions</td>
<td>OHP Transparency Hand out White board Exercise paper</td>
</tr>
<tr>
<td>Conclusions</td>
<td>Explain the the relation of amino acid and protein</td>
<td>pays attention</td>
<td></td>
</tr>
</tbody>
</table>

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

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 : 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:

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

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

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 : 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:

<table>
<thead>
<tr>
<th>PHASE</th>
<th>TEACHING ACTIVITY</th>
<th>STUDENTS ACTIVITY</th>
<th>TOOLS</th>
</tr>
</thead>
</table>
| 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
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 nucleotide acid

B. MAIN SUBJECT : nucleotide acid
C. SUB SUBJECT : The kinds of nucleotide acid
Structure of nucleotide acid
Function of nucleotide acid

D. CLASS ACTIVITY:

<table>
<thead>
<tr>
<th>PHASE</th>
<th>TEACHING ACTIVITY</th>
<th>STUDENTS ACTIVITY</th>
<th>TOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Explain about the definition of nucleotide acid and position in body</td>
<td>Pay attention  Write Ask</td>
<td></td>
</tr>
<tr>
<td>Topic presentation</td>
<td>Explain about : The kinds of nucleotide acid Structure of nucleotide acid Function of nucleotide acid</td>
<td>Pay attention  Write Ask Answer the questions</td>
<td>OHP Transparency Hand out White board Exercise paper</td>
</tr>
<tr>
<td>Conclusions</td>
<td>Resume the lecture</td>
<td>pays attention</td>
<td></td>
</tr>
</tbody>
</table>

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

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 : 15

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 lipids

B. MAIN SUBJECT : Lipid
C. SUB SUBJECT : Structure of lipid
Classification of lipid

D. CLASS ACTIVITY:

<table>
<thead>
<tr>
<th>PHASE</th>
<th>TEACHING ACTIVITY</th>
<th>STUDENTS ACTIVITY</th>
<th>TOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Explain about the definition</td>
<td>Pay attention</td>
<td>OHP</td>
</tr>
<tr>
<td></td>
<td>of lipid</td>
<td>Write</td>
<td>Transparency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ask</td>
<td>Hand out</td>
</tr>
<tr>
<td>Topic</td>
<td>Explain about: Structure of</td>
<td>Pay attention</td>
<td>White board</td>
</tr>
<tr>
<td>presentation</td>
<td>lipid</td>
<td>Write</td>
<td>Exercise paper</td>
</tr>
<tr>
<td></td>
<td>Classification of lipid</td>
<td>Ask</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Answer the questions</td>
<td></td>
</tr>
<tr>
<td>Conclusions</td>
<td>Resume the lecture</td>
<td>pays attention</td>
<td></td>
</tr>
</tbody>
</table>

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

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 : 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:

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

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

F. REFERENCES
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:

<table>
<thead>
<tr>
<th>PHASE</th>
<th>TEACHING ACTIVITY</th>
<th>STUDENTS' ACTIVITY</th>
<th>TOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Explain about the digestion of cholesterol</td>
<td>Pay attention</td>
<td>OHP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Write</td>
<td>Transparency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ask</td>
<td>Hand out</td>
</tr>
<tr>
<td>Topic</td>
<td>Explain about</td>
<td></td>
<td>White board</td>
</tr>
<tr>
<td>presentation</td>
<td>Structure and kinds of cholesterol</td>
<td></td>
<td>Exercise paper</td>
</tr>
<tr>
<td></td>
<td>Function of cholesterol</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mechanism of formation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conclusions</td>
<td>Resume the lecture</td>
<td>pays attention</td>
<td></td>
</tr>
</tbody>
</table>

E. EVALUATION

Give the task to count the rennet enzyme activity

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 : 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:

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

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

F. REFERENCES

COURSE : Animal Product Knowledge
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 :

<table>
<thead>
<tr>
<th>Teaching Step</th>
<th>Teacher Activity</th>
<th>Student Activity</th>
<th>Teaching Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductions</td>
<td>Introduction, Course Information</td>
<td>Note down, Listening, Discussion</td>
<td>OHP Blackboard</td>
</tr>
<tr>
<td>Presentation</td>
<td>Explaining relationship this course with others</td>
<td>Note down, Listening, Discussion</td>
<td>OHP Blackboard</td>
</tr>
<tr>
<td>Conclusion</td>
<td>Giving substance for the next meeting</td>
<td>Discussion</td>
<td>Blackboard</td>
</tr>
</tbody>
</table>

E. Evaluation : Quiz
F. References :
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:

<table>
<thead>
<tr>
<th>Teaching Step</th>
<th>Teacher Activity</th>
<th>Student Activity</th>
<th>Teaching Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductions</td>
<td>Explaining about hatching eggs and consuming eggs.</td>
<td>Note down, Listening, Discussion</td>
<td>OHP Black board</td>
</tr>
</tbody>
</table>
| Presentation  | Explaining physical eggs properties
Explaining chemical eggs properties
Explaining microbiology eggs properties | Note down, Listening, Discussion | OHP Black board |
| Conclusion    | Commenting and concluding result of discussion. Giving substance for the next meeting | Discussion | Black board |

E. Evaluation : Quiz

F. References :
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:

<table>
<thead>
<tr>
<th>Teaching Step</th>
<th>Teacher Activity</th>
<th>Student Activity</th>
<th>Teaching Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductions</td>
<td>Explaining quality standard</td>
<td>Note down, Listening, Discussion</td>
<td>OHP Black board</td>
</tr>
<tr>
<td>Presente</td>
<td>Explaining eggs quality measurement</td>
<td>Note down, Listening, Discussion</td>
<td>OHP Black board</td>
</tr>
<tr>
<td>Conclusion</td>
<td>Commenting and concluding result of discussion. Giving substance for the next meeting</td>
<td>Discussion</td>
<td>Black board</td>
</tr>
</tbody>
</table>

E. Evaluation ; Quiz
F. References:
COURSE: Processing of Animal Product
COURSE CODE: 
CREDIT: 2 (1-1)
SESSION UNITY OF LEARNING

Subject : Processing of Animal Product
Code of subject : -
SJK : 2 (1-1)
Time of session : 100 minutes
Session : 1

A. Objective
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 tuition method and evaluation of this subject.

B. Principal of subject : Introduction

C. Sub subject :
   - Description of subject
   - Relation inter subject
   - Lecture contract
   - Tuition method and evaluation

D. Education activity :

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer activity</th>
<th>Students activity</th>
<th>Tool and media of education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>to explain all of matter will give at this session. To Introduce the lecturer of this subject.</td>
<td>To attend and write</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>To explain background of this subject why give at this study programme To explain description of this subject</td>
<td>To attend and write</td>
<td>OHP and white board</td>
</tr>
</tbody>
</table>
subject
To Give actual examples
To make structure of relation inter subject
To explain lecture contract of this subject
To explain 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 attend 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.
SESSION UNITY OF LEARNING

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

<table>
<thead>
<tr>
<th>stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>To Explain all of matters at this session.</td>
<td>To attend and write</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>To explain principle and object of meat processing To explain their applications included variety of meat products.</td>
<td>To attend and write</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>In closing</td>
<td>To ask many problems and give clarifications To give duty about another product that it has the same principle processing. Review and discuss about matters at this session.</td>
<td>To ask</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>To attend and write</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>To attend and write</td>
<td></td>
</tr>
</tbody>
</table>
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

SESSION UNITY OF LEARNING

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

D. Learning Activity :

<table>
<thead>
<tr>
<th>stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>To Explain all of matters at this session.</td>
<td>To attend and write</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>To explain procedures of fresh meat handling (cooling and freezing)</td>
<td>To attend and write</td>
<td>OHP and white board</td>
</tr>
<tr>
<td></td>
<td>To explain Procedures of meat processing (abon, bakso, dendeng ext)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>To discuss about standardization of meat products quality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In closing</td>
<td>To give clarification or detail informations</td>
<td>To ask</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Review all of matters at this session.</td>
<td>To attend and write</td>
<td></td>
</tr>
</tbody>
</table>
E. Evaluation

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

F. Literatures:
SESSION UNITY OF LEARNING

Subject code: Processing of Animal Product
Subject 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 applications of the principles to milk products.

B. Principal of subject: Technology of milk Processing

C. Sub subject:
   - Principles and object
   - Variety of milk products

D. Learning activity:

<table>
<thead>
<tr>
<th>stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>To Explain all of matters at this session</td>
<td>To attend and write</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>To explain Principles and object of milk processing</td>
<td>To attend and write</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>In closing</td>
<td>To give clarification or detail informations Review all of matters at this session</td>
<td>To ask</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>To attend and write</td>
<td></td>
</tr>
</tbody>
</table>
E. Evaluation:
This session tended to make students can explain principles and object of milk processing and their applications to some milk products.

F. Literature:
SESSION UNITY OF LEARNING

Subject code of subject SKS Time of session Session
: Processing of Animal Product : - : 2 (1-1) : 100 minutes : 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, cheese etc.)
   Quality of milk products.

D. Learning Activity :

<table>
<thead>
<tr>
<th>stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>To Explain all of matters at this session.</td>
<td>To attend and write</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>To explain procedures of fresh milk handling</td>
<td>To attend and write</td>
<td>OHP and white board</td>
</tr>
<tr>
<td></td>
<td>To explain Procedures of milk processing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>To discuss about standardization of milk products quality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In closing</td>
<td>To give clarification or detail informations</td>
<td>To ask</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Review all of matters at this session.</td>
<td>To attend and write</td>
<td></td>
</tr>
</tbody>
</table>
E. Evaluation

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

F. Literatures

SESSION UNITY OF LEARNING

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

A. object
1. TIU
2. TIK

B. Principal of subject
C. Sub of subject
D. Learning activity

: Midterm test

:
SESSION UNITY OF LEARNING

Subject code of subject : Processing of Animal Product
S K S              : 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 :

<table>
<thead>
<tr>
<th>stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>To Explain all of matters at this session..</td>
<td>To attend and write</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>To explain Principles and object of egg processing</td>
<td>To attend and write</td>
<td>OHP and white board</td>
</tr>
<tr>
<td></td>
<td>To explain variety of egg products.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In closing</td>
<td>To give clarification or detail informations</td>
<td>To ask</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Review all of matters at this session.</td>
<td></td>
<td>To attend and write</td>
</tr>
</tbody>
</table>
E. Evaluation:

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

F. Literatures:

SESSION UNITY OF LEARNING

Subject code of subject : Processing of Animal Product
S : 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 etc)
   Egg quality (SNI, USDA)

G. Learning Activity :

<table>
<thead>
<tr>
<th>stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>To Explain all of matters at this session.</td>
<td>To attend and write</td>
<td>OHP and whiteboard</td>
</tr>
</tbody>
</table>
| Naration  | To explain procedures of egg handling 
To explain Procedures of egg processing 
To discuss about standardization of egg products quality | To attend and write | OHP and whiteboard         |
| 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 do principles of egg handling and processing.

F. Literatures:

SESSION UNITY OF LEARNING

Subject code: Processing of Animal Product

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, etc.)

   Quality of animal by product (SNI)

D. Learning activity:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>To Explain all of matters at this session.</td>
<td>To attend and write</td>
<td>OHP and whiteboard</td>
</tr>
</tbody>
</table>
| Naration | To explain procedures of animal by product handling  
To explain Procedures of animal by product processing  
To discuss about standardization of animal by product quality | To attend and write    | OHP and whiteboard         |
| 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 do principles of animal by product handling and processing.

F. Literatures:
SESSION UNITY OF LEARNING

Subject code : Processing of Animal Product

SKS : 2 (1-1)

Time of session : 100 minutes

Session : X

A. Object

1. TJIU : 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 :

<table>
<thead>
<tr>
<th>stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>To Explain all of matters at this session.</td>
<td>To attend and write</td>
<td>OHP and whiteboard</td>
</tr>
<tr>
<td>Naration</td>
<td>To explain procedures of hide preservation</td>
<td>To attend and write</td>
<td>OHP and whiteboard</td>
</tr>
<tr>
<td></td>
<td>To explain Procedures of hide processing(tanning)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>To discuss about standardization of leather and hide quality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In closing</td>
<td>To give clarification or detail informations</td>
<td>To ask</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Review all of matters at this session.</td>
<td>To attend and write</td>
<td></td>
</tr>
</tbody>
</table>
E. Evaluation:
This session tended to make students can do principles of hide preservation and processing (tanning).

F. Literatures

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

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

Laboratorium .............../GBPP Mata Kuliah
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

<table>
<thead>
<tr>
<th>No</th>
<th>Specific Objectives</th>
<th>Main Topic</th>
<th>Sub Topic</th>
<th>Allocated Time (100 minutes/lecture)</th>
<th>References</th>
</tr>
</thead>
</table>
| 1  | After completing this topic, the student can:  
- 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 | - Pictures on transparency  
- Modules  
- Hand-outs |
| 2  | After completing this topic, the student can explain:  
- Structure and organization of cells  
- Cell components and their function | Cell | - Structure and organization of cells  
- Cell components and their function | 1x | - Modules  
- Hand-outs |
<table>
<thead>
<tr>
<th>No</th>
<th>Specific Objectives</th>
<th>Main Topic</th>
<th>Sub Topic</th>
<th>Allocated Time (100 minutes/lecture)</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>After completing this topic, the student can explain: definition, function and factors that affect the function of an enzyme, Enzyme classification and nomenclature</td>
<td>Enzyme</td>
<td>Enzyme: definition, function and factors that affect the function of an enzyme, Enzyme classification and nomenclature</td>
<td>1x</td>
<td>• Modules</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Hand-outs</td>
</tr>
<tr>
<td>4</td>
<td>After completing this topic, the student can explain:</td>
<td>Lipid</td>
<td>Lipid classification and chemical structures</td>
<td>3 x</td>
<td>• Modules</td>
</tr>
<tr>
<td></td>
<td>• Lipid classification and chemical structures</td>
<td></td>
<td>Lipid oxidation to produce energy</td>
<td></td>
<td>• Hand-outs</td>
</tr>
<tr>
<td></td>
<td>• Lipid oxidation to produce energy</td>
<td></td>
<td>Triglyceride anabolism</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Triglyceride anabolism</td>
<td></td>
<td>Definition and function of cholesterol</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Definition and function of cholesterol</td>
<td></td>
<td>Cholesterol metabolism</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cholesterol metabolism</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>After completing this topic, the student can explain:</td>
<td>Carbohydrate</td>
<td>Carbohydrate: Carbohydrate classification and chemical structures</td>
<td>3 x</td>
<td>• Modules</td>
</tr>
<tr>
<td></td>
<td>• Carbohydrate classification and chemical structures</td>
<td></td>
<td>Carbohydrate catabolism via glycolysis and TCA cycle</td>
<td></td>
<td>• Hand-outs</td>
</tr>
<tr>
<td></td>
<td>• Carbohydrate catabolism via glycolysis and TCA cycle</td>
<td></td>
<td>Carbohydrate anabolism</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Carbohydrate anabolism</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>First Evaluation</td>
<td></td>
<td>1x</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Specific Objectives</td>
<td>Main Topic</td>
<td>Sub Topic</td>
<td>Allocated Time (100 minutes/lecture)</td>
<td>References</td>
</tr>
<tr>
<td>----</td>
<td>-------------------------------------------------------------------------------------</td>
<td>-----------------</td>
<td>----------------------------------------------------------------</td>
<td>--------------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>7</td>
<td>After completing this topic, the student can explain:</td>
<td>PROTEIN</td>
<td>Protein: Amino acid structures</td>
<td>2x</td>
<td>• Modules</td>
</tr>
<tr>
<td></td>
<td>Amino acid structures</td>
<td></td>
<td>Protein Digestion and metabolism</td>
<td></td>
<td>• Hand-outs</td>
</tr>
<tr>
<td></td>
<td>Protein digestion and metabolism</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8,9</td>
<td>After completing this topic, the student can explain:</td>
<td>NUCLEIC ACID</td>
<td>Structure of nucleic acid: nucleotide, DNA, RNA, nucleic acid metabolism</td>
<td>2x</td>
<td>• Modules</td>
</tr>
<tr>
<td></td>
<td>• the structure of nucleic acid DNA &amp; RNA, nucleic acid metabolism</td>
<td></td>
<td>Protein synthesis (from DNA translation)</td>
<td></td>
<td>• Hand-outs</td>
</tr>
<tr>
<td></td>
<td>• protein synthesis (from DNA translation)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>After completing this topic, the student can explain:</td>
<td>ENZYME KINETICS</td>
<td>Enzyme activity, Unit of enzyme activity</td>
<td>1x</td>
<td>• Modules</td>
</tr>
<tr>
<td></td>
<td>• definition &amp; unit of enzyme activity</td>
<td></td>
<td>Factors affecting enzyme activities</td>
<td></td>
<td>• Hand-outs</td>
</tr>
<tr>
<td></td>
<td>• factors affecting enzyme activities</td>
<td></td>
<td>Michele's Menten equation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Michele's Menten Equation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FINAL EVALUATION</td>
<td></td>
<td></td>
<td>1X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL LECTURES IN CLASS</td>
<td></td>
<td></td>
<td>16x</td>
<td></td>
</tr>
</tbody>
</table>

*REFERENCES:*

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.

<table>
<thead>
<tr>
<th>No.</th>
<th>Specific Instructional Object</th>
<th>Main Discussion</th>
<th>Sub Discussion</th>
<th>Time Estimation</th>
<th>Books Material</th>
</tr>
</thead>
</table>
| 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

<table>
<thead>
<tr>
<th>Subject Studied</th>
<th>Nutrition Biochemistry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code of Subject</td>
<td>PTM 301P (2-I)</td>
</tr>
<tr>
<td>Description</td>
<td>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</td>
</tr>
<tr>
<td>General Objective</td>
<td>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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Specific Objective</th>
<th>Topics</th>
<th>Subtopics</th>
<th>Allocated time</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>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</td>
<td>Introduction</td>
<td>• Objective and advantages in studying nutrition biochemistry</td>
<td>2 x 50 menit</td>
<td>Lehninger, A.L. 1970. Biochemistry. 1st edition. Worth Publ. Inc. New York.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Metabolic pathway of nutrient conversion into animal product</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>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</td>
<td>The growth of tissue (meat, bone and adipose)</td>
<td>• The physiology of growth and influencing factors</td>
<td>6 x 50 menit</td>
<td>Linder, M.C. 1992. Biokimia Nutrisi dan Metabolisme. Universitas Indonesia Press. Jakarta. (Diterjemahkan oleh A. Parakkasi).</td>
</tr>
<tr>
<td>No.</td>
<td>Specific Objective</td>
<td>Topics</td>
<td>Subtopics</td>
<td>Allocated time</td>
<td>Reference</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 3.  | After completing this topic the student can explain nutrient metabolism and milk biosynthesis in animal and its metabolism control                                                                             | Milk biosynthesis | - Lactation physiology  
- Milk components and their precursor  
- Biosynthesis of milk components and factors that affect milk production  
| 4.  | After completing this topic the student can explain nutrient metabolism and egg biosynthesis in animal and its metabolism control                                                                               | Egg biosynthesis | - Egg physiology and biosynthesis  
- Component of eggshell, yolk and egg albumin  
(Diterjemahkan oleh A. Parakkasi).  
<table>
<thead>
<tr>
<th>No.</th>
<th>Specific Objective</th>
<th>Topics</th>
<th>Subtopics</th>
<th>Allocated time</th>
<th>Reference</th>
</tr>
</thead>
</table>
| 5.  | After completing this topic the student can explain nutrient metabolism and energy biosynthesis in animal and its metabolism control | Energy biosynthesis | • Physiology and mechanism of muscle contraction  
• Biosynthesis of energy and nutrient requirement for muscle contraction  

Nutrition Biochemistry Laboratory  
Animal Science Faculty  
Diponegoro University
COURSE: NUTRITION AND FEED SCIENCE

COURSE CODE: 

CREDIT: (2-1)3
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

<table>
<thead>
<tr>
<th>No.</th>
<th>Specific Objectives</th>
<th>Topics</th>
<th>Sub Topics</th>
<th>Allocated Time (100 minutes/lecture)</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>Specific Objectives</td>
<td>Topics</td>
<td>Sub Topics</td>
<td>Allocated Time (100 minutes/lecture)</td>
<td>References</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------------------------------------</td>
<td>---------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 3.  | After completing this topic the student can:                                        | Comparative physiology of digestive system  | • Comparative physiology of digestive system in poultry, swine, equine, and ruminants  
• Comparative factors that affect digestive physiology | 2x                                   | Church, D.C. 1988. The ruminant animal Digestive physiology and nutrition. A Reston Book. Penambul  
| 4.  | After completing this topic the student can:                                        | Comparative nutrient metabolism              | • 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                                   | Church, D.C. 1988. The ruminant animal Digestive physiology and nutrition. A Reston Book. Penambul  
<table>
<thead>
<tr>
<th>No.</th>
<th>Specific Objectives</th>
<th>Topics</th>
<th>Sub Topics</th>
<th>Allocated Time (100 minutes/lecture)</th>
<th>References</th>
</tr>
</thead>
</table>
| 5.  | After completing this topic the student can determine nutrient requirement of livestock | Comparative nutrient requirements of livestock (poultry, swine, equine, and ruminants) | • 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  
| 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 | • Conventional feed for livestock and their nutritional value  
| 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 | • Determination of feed consumption in poultry, swine, equine, and ruminants  

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)

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.

<table>
<thead>
<tr>
<th>No.</th>
<th>Specific Instruction</th>
<th>Main Subject</th>
<th>Main Sub Subject</th>
<th>Duration</th>
<th>Literatures</th>
</tr>
</thead>
</table>
| 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 | • McElhihary, R.R. 1994. Feed Manufacturing Technology IV. Am.Food Industry Assoc. Inc. Arlington  
<table>
<thead>
<tr>
<th></th>
<th>After attending the course student will be able to explain about feed technology processing for concentrate systematically from grinding up to packaging.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>Technology of cereal processing and preservation</td>
</tr>
</tbody>
</table>
|   | 1. Feed technology processing of concentrate.  
2. Flowchart of material processing and physical mechanic processing (grinding, mixing, pelleting) |
|   | 8 x 50 minutes |
|   | • BoGohl. 1975. Tropical Feed Information Summaries and Nutritivves Value. FAO=UN. Rome  
| 4. | Technology of forage processing and preservation. |
|   | 1. Technology of physically forage processing and preservation.  
2. Technology of chemically forage processing and preservation.  
3. Technology of biologically forage processing and preservation. |
<p>|   | 6 x 50 minutes |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 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 | 1. Definition of Complete Feed Processing  
2. Technology of Complete Feed Processing | 4 x 50 minutes |
|   |   |   |   |
| 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. | 1. Prospect and development of feed technology processing  
2. Prospect and development of waste/by product technology processing as feedstuffs. | 4 x 50 minutes |

- 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:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Lecturer Activity</th>
<th>Student Activity</th>
<th>Learning Equipments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Description</td>
<td>Explaining the content on lecturing material</td>
<td>Noticing</td>
<td>Power point presentation</td>
</tr>
<tr>
<td></td>
<td>of 1st Meeting.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Relevancy</td>
<td>Explaining correlation among Main Subject</td>
<td>Noticing /</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>questioning</td>
<td></td>
</tr>
<tr>
<td>• TIK</td>
<td>Explaining the competency on TIU and TIK for 2nd</td>
<td>Noticing /</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Meeting.</td>
<td>questioning</td>
<td></td>
</tr>
</tbody>
</table>

1
<table>
<thead>
<tr>
<th>Presentation</th>
<th>• Description</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Explaining the importance of feed processing</td>
<td>Noticing / questioning</td>
<td>Power point presentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Explaining the main idea of feed processing management regarding with the processing and preservation</td>
<td>Noticing / questioning</td>
<td>Power point presentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Asking student the understanding of feed processing.</td>
<td>Answering question</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Asking student the understanding of feed processing management.</td>
<td>Answering question</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Explaining 1 and 2</td>
<td>Noticing / giving suggestion</td>
<td>Power point presentation</td>
<td></td>
</tr>
<tr>
<td>• Example</td>
<td>Providing Example about the importance of feed processing technology.</td>
<td>Noticing / giving suggestion</td>
<td>Power point presentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Providing Example about processing &amp; preservation.</td>
<td>Noticing / giving suggestion</td>
<td>Power point presentation</td>
<td></td>
</tr>
<tr>
<td>• Task</td>
<td>Discussing example of specific case on feed processing management</td>
<td>Working group, summarizing short report</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closing</td>
<td>• Test / Exercise</td>
<td>Address the delegation of working group to present the result of the discussion.</td>
<td>Presenting solution of the case study as the result of the discussion.</td>
<td>Power point presentation</td>
</tr>
<tr>
<td></td>
<td>Inviting comments or questions from other student</td>
<td>Providing comments or questions concerning with case's solution presented</td>
<td></td>
<td>Power point presentation</td>
</tr>
</tbody>
</table>
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

Kansas City


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:
<table>
<thead>
<tr>
<th>Activity</th>
<th>Lecturer Activity</th>
<th>Student Activity</th>
<th>Learning Equipments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Description</td>
<td>Explaining content of material on 2nd Meeting</td>
<td>Noticing</td>
<td>Power point presentation</td>
</tr>
<tr>
<td>• Relevancy</td>
<td>Explaining correlation among Main Subject</td>
<td>Noticing / questioning</td>
<td>Power point presentation</td>
</tr>
<tr>
<td>• TIK</td>
<td>Explaining competencies on TIU and TIK for 2nd, 3rd and 4th Meeting.</td>
<td>Noticing / questioning</td>
<td>Power point presentation</td>
</tr>
<tr>
<td>Presentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Description</td>
<td>1. Explaining the understanding of cereal processing strategy.</td>
<td>Noticing / questioning</td>
<td>Power point presentation</td>
</tr>
<tr>
<td></td>
<td>2. Explaining the understanding of flowchart on feed processing.</td>
<td>Noticing / questioning</td>
<td>Power point presentation</td>
</tr>
<tr>
<td></td>
<td>3. Explaining the understanding of physical feedstuffs processing.</td>
<td>Noticing / questioning</td>
<td>Power point presentation</td>
</tr>
<tr>
<td></td>
<td>4. Asking the understanding of student about equipments &amp; machine on concentrate processing.</td>
<td>Answering question</td>
<td>Power point presentation</td>
</tr>
<tr>
<td></td>
<td>5. Explaining 4</td>
<td>Noticing / giving suggestion</td>
<td>Power point presentation</td>
</tr>
<tr>
<td>• Example</td>
<td>Providing Example about cereal processing.</td>
<td>Noticing / giving suggestion</td>
<td>Power point presentation</td>
</tr>
<tr>
<td></td>
<td>Providing Example about packaging.</td>
<td>Noticing / giving suggestion</td>
<td>In Focus &amp; PC</td>
</tr>
<tr>
<td>• Task</td>
<td>Discuss Example of case study on improving pellet</td>
<td>Working group, short summary report.</td>
<td></td>
</tr>
<tr>
<td>Closing</td>
<td>quality.</td>
<td>Power point presentation</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>• Test / Exercise</td>
<td>Addressing group delegation to present result of the discussion. Inviting comment or question from other student.</td>
<td>Presenting case's solution as result of the discussion. Providing comments or question about case's solution presented.</td>
<td></td>
</tr>
<tr>
<td>• Evaluation</td>
<td>Giving evaluation and comments regarding the case's solution presented.</td>
<td>Noticing, giving suggestion and note lecturer's comment</td>
<td></td>
</tr>
</tbody>
</table>

E. EVALUATION

F. REFERENCES

MEETING

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
EVALUATION

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

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 wafering 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 wafering.

D. LEARNING AND TEACHING ACTIVITY:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Lecturer Activity</th>
<th>Student Activity</th>
<th>Learning Equipments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Description</td>
<td>Explaining content of material on 5th Meeting</td>
<td>Noticing</td>
<td>Power point presentation</td>
</tr>
<tr>
<td>• Relevancy</td>
<td>Explaining correlation among Main Subject</td>
<td>Noticing / questioning</td>
<td>Power point presentation</td>
</tr>
<tr>
<td>• TIK</td>
<td>Explaining competencies on TIU and TIK for 5th, 6th, 7th and 8th Meeting.</td>
<td>Noticing / questioning</td>
<td>Power point presentation</td>
</tr>
</tbody>
</table>

<p>| Presentation   |                                                                                   |                        |                     |
| • Description  | 1. Explaining about forage processing strategy.                                    | Noticing / questioning | Power point presentation |
|                | 2. Explaining about hay processing technology, amoniation, fermentation, wafering and the application | Noticing / questioning | Power point presentation |
|                | 3. Asking the understanding of student about forage processing &amp; preservation technology &amp; application | Answering question     | Power point presentation |
|                | 4. Explaining 3                                                                     | Answering question     | Power point presentation |</p>
<table>
<thead>
<tr>
<th>Event</th>
<th>Description</th>
<th>Evaluation</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example</td>
<td>Providing example about application of forage processing technology</td>
<td>Noticing / giving suggestion</td>
<td>In Focus &amp; PC</td>
</tr>
<tr>
<td>Task</td>
<td>Discuss example of case's study on forage processing &amp; preservation</td>
<td>Working group, short summary report</td>
<td></td>
</tr>
<tr>
<td>Closing</td>
<td>Addressing group delegation to present result of the discussion.</td>
<td>Presenting case's solution as result of the discussion.</td>
<td></td>
</tr>
<tr>
<td>Test / Exercise</td>
<td>Inviting comment or question from other student.</td>
<td>Providing comments or question about case's solution presented.</td>
<td>Power point presentation</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Giving evaluation and comments regarding the case's solution presented.</td>
<td>Noticing, giving suggestion and note lecturer's comment</td>
<td></td>
</tr>
</tbody>
</table>

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.


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, the student will be able to explain about the prospect and the development of agricultural & industry waste/by product processing technology for feed, with a minimal of 60% 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:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Lecturer Activity</th>
<th>Student Activity</th>
<th>Learning Equipments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction  • Description</td>
<td>Explaining content of material on 6th Meeting</td>
<td>Noticing</td>
<td>Power point presentation</td>
</tr>
<tr>
<td>• Relevancy</td>
<td>Explaining correlation among Main Subject</td>
<td>Noticing / questioning</td>
<td>Power point presentation</td>
</tr>
<tr>
<td>• TIK</td>
<td>Explaining competencies on TIU and TIK for 9th, 10th, 11th and 12th Meeting.</td>
<td>Noticing / questioning</td>
<td>Power point presentation</td>
</tr>
<tr>
<td>Presentation  • Description</td>
<td>1. Explaining about agriculture &amp; industrial waste/by product processing strategy.</td>
<td>Noticing / questioning</td>
<td>Power point presentation</td>
</tr>
<tr>
<td></td>
<td>2. Explaining about prospect &amp; Technology development of Feed Processing</td>
<td>Noticing / questioning</td>
<td>Power point presentation</td>
</tr>
<tr>
<td></td>
<td>3. Asking the understanding of student about waste/by product processing strategy, application &amp; prospect</td>
<td>Answering question</td>
<td>Power point presentation</td>
</tr>
<tr>
<td>Example</td>
<td>Task</td>
<td>5. Explaining 3 Providing example about application of using agriculture &amp; industrial waste/by product as feed</td>
<td>Noticing / giving suggestion Noticing / giving suggestion Working group, short summary report.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>• Example</td>
<td>• Task</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Closing**

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

COURSE: Statistics Method
COURSE CODE: 
CREDIT: 3 (2-1)
# COURSE OUTLINE

**Subject studied**: Statistics Method  
**Code number/SCS**: 13 (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**:  

<table>
<thead>
<tr>
<th>No.</th>
<th>Specific Instruction</th>
<th>Major Topic</th>
<th>Minor Topic</th>
<th>Time Estimation</th>
<th>Reading Source</th>
</tr>
</thead>
</table>
| 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 |
<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 4. | After following this course, student will be able to explain and calculating distribution Probability Distribution. | Probability Distribution | 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 | 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 | 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 | 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 | 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 | 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 | 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:

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:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer Activity</th>
<th>Student Activity</th>
<th>Media and Teaching Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>Explain the scope of material, purpose, benefit, and introduction of research</td>
<td>Paying attention and writing</td>
<td>Blackboard and OHP</td>
</tr>
<tr>
<td>Presentation</td>
<td>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</td>
<td>Paying attention and writing, giving response, asking question</td>
<td>Blackboard and OHP</td>
</tr>
<tr>
<td>Closing</td>
<td>Summarize, giving questions and knowledge of the future benefits</td>
<td>Writing, answering question, asking question, and giving feedback</td>
<td>Blackboard and OHP</td>
</tr>
</tbody>
</table>

E. Evaluation:
Giving grades for the written answer in examination test.

F. References:
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 :

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

E. Evaluation :
Giving grades for the written answer in examination test.

F. References :
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 :

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

E. Evaluation :
Giving grades for the written answer in examination test.

F. References :
LECTURING AGENDA UNIT
(SAP)

Subject Studied: RESEARCH DESIGN
Code number: 
Session Duration: 106 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:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer Activity</th>
<th>Student Activity</th>
<th>Media and Teaching Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>Explain the scope of material, purpose, benefit of this topic</td>
<td>Paying attention and writing</td>
<td>Blackboard and OHP.</td>
</tr>
<tr>
<td>Presentation</td>
<td>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, and composing the report</td>
<td>Paying attention and writing, giving response, asking question</td>
<td>Blackboard and OHP.</td>
</tr>
<tr>
<td>Closing</td>
<td>Summarize, giving questions and knowledge of the future benefits</td>
<td>Writing, answering question, asking question, and giving feedback</td>
<td>Blackboard and OHP.</td>
</tr>
</tbody>
</table>

E. Evaluation:
Giving grades for the written answer in examination test.

F. References:
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:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer Activity</th>
<th>Student Activity</th>
<th>Media and Teaching Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>Explain the scope of material, purpose, benefit of this topic</td>
<td>Paying attention and writing</td>
<td>Blackboard and OHP</td>
</tr>
<tr>
<td>Presentation</td>
<td>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</td>
<td>Paying attention and writing, giving response, asking question</td>
<td>Blackboard and OHP</td>
</tr>
<tr>
<td>Closing</td>
<td>Summarize, giving questions and knowledge of the future benefits</td>
<td>Writing, answering question, asking question, and giving feedback</td>
<td>Blackboard and OHP</td>
</tr>
</tbody>
</table>

D. Evaluation:
Giving grades for the written answer in examination test.

F. References:
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 :

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

E. Evaluation :
Giving grades for the written answer in examination test.

F. References :
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:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer Activity</th>
<th>Student Activity</th>
<th>Media and Teaching Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>Explain the scope of material, purpose, benefit of this topic</td>
<td>Paying attention and writing</td>
<td>Blackboard and OHP.</td>
</tr>
<tr>
<td>Present</td>
<td>Explain about randomization and ground plan of design, linear model and ANOVA of RCBD, variance difference test, and Latin Square Design</td>
<td>Paying attention and writing, giving response, asking question</td>
<td>Blackboard and OHP.</td>
</tr>
<tr>
<td>Closing</td>
<td>Summarize, giving questions and knowledge of the future benefits</td>
<td>Writing, answering question, asking question, and giving feedback</td>
<td>Blackboard and OHP.</td>
</tr>
</tbody>
</table>

E. Evaluation:
Giving grades for the written answer in examination test.

F. References:
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:

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

E. Evaluation:
Giving grades for the written answer in examination test.

F. References:
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:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer Activity</th>
<th>Student Activity</th>
<th>Media and Teaching Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>Explain the scope of material, purpose, benefit of this topic</td>
<td>Paying attention and willingness</td>
<td>Blackboard and OHP.</td>
</tr>
<tr>
<td>Presentation</td>
<td>Explain about randomization and ground plan of design, linear model and ANOVA, and also variance difference test</td>
<td>Paying attention and willingness, giving response, asking question</td>
<td>Blackboard and OHP.</td>
</tr>
<tr>
<td>Closing</td>
<td>Summarize, giving questions and knowledge of the future benefits</td>
<td>Writing, answering question, asking question, and giving feedback</td>
<td>Blackboard and OHP.</td>
</tr>
</tbody>
</table>

E. Evaluation:
Giving grades for the written answer in examination test.

F. References:
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:

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

E. Evaluation:
Giving grades for the written answer in examination test.

F. References:
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:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer Activity</th>
<th>Student Activity</th>
<th>Media and Teaching Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>Explain the scope of material, purpose, benefit of this topic</td>
<td>Paying attention and writing</td>
<td>Blackboard and CHP.</td>
</tr>
<tr>
<td>Presentation</td>
<td>Explain about t test: 1 sample, paired sample, independent</td>
<td>Paying attention and writing, giving response, asking question</td>
<td>Blackboard and CHP.</td>
</tr>
<tr>
<td>Closing</td>
<td>Summarize, giving questions and knowledge of the future benefits</td>
<td>Writing, answering question, asking question, and giving feedback</td>
<td>Blackboard and CHP.</td>
</tr>
</tbody>
</table>

E. Evaluation:
Giving grades for the written answer in examination test.

F. References:
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:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer Activity</th>
<th>Student Activity</th>
<th>Media and Teaching Aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>Explain the scope of material, purpose, benefit of this topic</td>
<td>Paying attention and writing</td>
<td>Blackboard and OHP.</td>
</tr>
<tr>
<td>Presentation</td>
<td>Explain about U-test, W-test, Kruskal-Wallis test and Friedman test</td>
<td>Paying attention and writing, giving response, asking question</td>
<td>Blackboard and OHP.</td>
</tr>
<tr>
<td>Closing</td>
<td>Summarize, giving questions and knowledge of the future benefits</td>
<td>Writing, answering question, asking question, and giving feedback</td>
<td>Blackboard and OHP.</td>
</tr>
</tbody>
</table>

E. Evaluation:
Giving grades for the written answer in examination test.

F. References:
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 :

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

E. Evaluation :
Giving grades for the written answer in examination test.

F. References :

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:

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

E. Evaluation:
Giving grades for the written answer in examination test.

F. References:
FACULTY OF ANIMAL AGRICULTURE DIPONEGORO UNIVERSITY
COURSE OUTLINE

Research Design

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 implemenation 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

<table>
<thead>
<tr>
<th>No.</th>
<th>Specific Instruction</th>
<th>Major Topic</th>
<th>Minor Topic</th>
<th>Time Estimation</th>
<th>Reading Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>After following this course, student will be able to explain the definition and</td>
<td>Preface</td>
<td>1. Human's passion to reveal the secret of nature</td>
<td>1 x 100 minutes</td>
<td>7, 8 and 9</td>
</tr>
<tr>
<td></td>
<td>importance of research.</td>
<td></td>
<td>2. The scientific truth</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. The definition of research</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. The function, classification, and importance of research</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>After following this course, student will be able to explain The Principles of</td>
<td>The Scientific Research Principles</td>
<td>1. The scientific research attitude</td>
<td>1 x 100 minutes</td>
<td>7, 8 and 9</td>
</tr>
<tr>
<td></td>
<td>Research</td>
<td></td>
<td>2. The scientific thinking pattern</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. The essence of research</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. The principles of design and report</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>After following this course, student will be able to explain the phase of research</td>
<td>The Research Processes phases: The</td>
<td>1. Identify the selection and abbreviation of the problems</td>
<td>1 x 100 minutes</td>
<td>9, 10, 19 and</td>
</tr>
<tr>
<td></td>
<td>preparation processes</td>
<td>phases of preparation</td>
<td>2. Library study</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Identify, classify, and giving operational definition</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Research variable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>After following this course, student will be able to explain the phase of research</td>
<td>The Research Processes phases: The</td>
<td>1. Selection/ developing the tools to collect data</td>
<td>1 x 100 minutes</td>
<td>9, 10, 19 and</td>
</tr>
<tr>
<td></td>
<td>implementation processes</td>
<td>phases of implementation</td>
<td>2. Composing research design</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Determining sample</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Collecting data</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Tabulating and analysis data</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6. Interpretation the result of analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7. Composing the report</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>After following this course, student will be able to explain The Completely</td>
<td>Experimental Design: Completely</td>
<td>1. The definition of Basic Design and Treatment</td>
<td>1 x 100 minutes</td>
<td>4, 5, 16, 18,</td>
</tr>
<tr>
<td></td>
<td>Randomized Design (CRD) and data transformation</td>
<td>Randomized Design (CRD) and data</td>
<td>2. Randomization and the ground plan of CRD</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>transformation</td>
<td>3. The linear model and ANOVA of CRD</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Basic assumption of ANOVA</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. The variance homogeneity test</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6. Several procedures of data transformation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>After following this course, student will be able to explain Multiple Comparisons</td>
<td>Multiple Comparisons and Contrast</td>
<td>1. Least Significance Difference (LSD).</td>
<td>1 x 100 minutes</td>
<td>4, 5, 16, 18,</td>
</tr>
<tr>
<td></td>
<td>and Contrast Comparisons</td>
<td>Comparisons</td>
<td>2. Turkey test (HSD).</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Duncan Multiple Range Test</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Qualitative treatment contrast</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Quantitative treatment contrast</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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. Instruction

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 feeds 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 feeds 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 feeds classification

### D. Teaching Learning Activity:

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

### References

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 feeds stuff 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. Vini Topi: Composition and function of nutrient for animal body

C. Sub Topic:
• Nutrient composition of feeds stuff 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:

<table>
<thead>
<tr>
<th>Steps</th>
<th>Teaching Activity</th>
<th>Student Activity</th>
<th>Teaching Instrument</th>
</tr>
</thead>
</table>
| Introduction | 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 | 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 feeds stuff based on fresh, air dry and oven dry  
6. Explain how to convert nutrient content from fresh to air dry and to 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 feeds stuffs showing the nutrient composition based on Weende dan Van Soest analysis and explain which kind of animal could eat the feeds stuffs and what is the function for the animal of those dominated nutrient in feeds stuffs  
12. Stimulate question and comment from student | Listening, question  
Question and giving idea  
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  
Table of Feeds stuffs Composition | LCD  
LCD |
| Closing Remark | 13. Summarize and highlight the importance  
14. Giving hand out for the next topic | Mongerhatikan, sambang saran dan mencatat komentar pengajar | LCD  
Hand out-for-the-next-topic |

E. Evaluation: using response card, question and home work that give at the end of each meeting
F. References:
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 physiology and kind of feed eaten
   b. Differentiate the anatomy and function of the digestive tract in the different kind of animal
   c. Differentiate the place and process of digestion and nutrient absorption that incuded 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

<table>
<thead>
<tr>
<th>Steps</th>
<th>Teaching Activity</th>
<th>Student Activity</th>
<th>Teaching Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1. Explain the general and specific instruction of the 6th to 9th meeting</td>
<td>Listening, question</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>2. Explain the benefit of studying this topic</td>
<td></td>
<td>Hand out of this topic</td>
</tr>
<tr>
<td>Delivery</td>
<td>3. Explain animal grouping based on kind of feed eaten (herbivore, omnivore and carnivore) and give sample of the animals</td>
<td>Listening, question</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>4. Explain the digestive organs in succession from mouth to anus</td>
<td>Question and giving idea</td>
<td>Illustration of digestive organ of each animal</td>
</tr>
<tr>
<td></td>
<td>5. Explain animal grouping based on their gastric (monogastric and polygastric) and give sample of the animals</td>
<td>Question and giving idea</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Explain the meaning of digestion process included the 3 kind general digestion process</td>
<td>Question and giving idea</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Explain animal grouping based on digestion physiology (ruminant, non ruminant, pseudoruminant dan poultry) and give sample of the animals</td>
<td>Work the assignment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8. Giving assignment to the group of student as follows: let each group choose a feedsuffs and explain how this feed would be digested in a specific animal (chose one animal per group)</td>
<td>Group discussion</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>9. Discuss the topic in the group and present the summary in the class</td>
<td>Present the summary</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10. Guide the group or elst discussion, stimulate question and comment</td>
<td>Class discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11. Summarize and highlight the importance</td>
<td>Question, giving idea and Discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12. Explain the anatomy of digestive organ and its function in ruminant, non ruminant and poultry</td>
<td>Question, giving idea and Discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>13. Explain the nutrient digestion processes included carbohydrate, lipid, protein, vitamin, mineral and water until it ready to be absorb</td>
<td>Question, giving idea and Discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14. Explain the absorption process of end product of nutrient digestion and place of absorption along the digestive tract</td>
<td>Question, giving idea and Discussion</td>
<td></td>
</tr>
<tr>
<td>Closing Remark</td>
<td>15. Summarize and highlight the importance</td>
<td>Question, giving idea and Discussion</td>
<td>LCD</td>
</tr>
</tbody>
</table>
E. Evaluation : using response card, question and homework that give at the end of each meeting

F. References:
### LECTURING AGENDA UNIT

**Duration:** 200 minutes (4 x 50 minutes)
**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 maintenance (protein, 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: maintenance (protein, energy); growth and fattening; Reproduction, lactation and production (work, egg, wool).

**D. Teaching Learning Activity:**

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

**E. Evaluation:** Using quiz card, question and home work that give at the end of each meeting.

**F. References:**
## LECTURING AGENDA UNIT

**Duration**: 100 minute (2 x 50 minute)

**Meeting of the**: 12th

**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


**D. Teaching Learning Activity**

<table>
<thead>
<tr>
<th>Steps</th>
<th>Teaching Activity</th>
<th>Student Activity</th>
<th>Teaching Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td>1. Explain the general and specific instruction of the 12th meeting</td>
<td>Listening, question</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>2. Explain the benefit of studying this topic</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Delivery</strong></td>
<td>3. Explain the meaning and evaluation method of feed digestion</td>
<td>Listening, question</td>
<td>Hand out of this topic</td>
</tr>
<tr>
<td></td>
<td>4. Explain several methods of feed digestion <em>In Vivo</em> (Indicator, Total collection, Force Feeding), <em>In Vitro, In Saccoc (in situ)</em></td>
<td>Question, giving idea and Discussion</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>5. Explain the benefit and the harmfulness of each method</td>
<td>Group discussion</td>
<td>Research report, journals</td>
</tr>
<tr>
<td></td>
<td>6. Giving assignment to the student to look for feed digestion evaluation from student last task or journals</td>
<td>Present the result</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Present the result</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8. Stimulate questions and comment from the student</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Closing Remark</strong></td>
<td>9. Summarize and highlight the importance</td>
<td>Question, giving idea and Discussion</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>10. Giving homework: looking a digestion evaluation method used in an experiment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11. Giving hand out for the next topic</td>
<td>Giving hand out for the next topic</td>
<td>Hand out for the next topic</td>
</tr>
</tbody>
</table>

**E. Evaluation**

- using response card, question and homework that give at the end of each meeting

**F. References**

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

<table>
<thead>
<tr>
<th>Steps</th>
<th>Teaching Activity</th>
<th>Student Activity</th>
<th>Teaching Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1. Explain the general and specific instruction of the 13th meeting</td>
<td>Listening, question</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>2. Explain the benefit of studying this topic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery</td>
<td>3. Explain about the meaning of feed nutrient balance</td>
<td>Listening, question</td>
<td>Hand out of this topic</td>
</tr>
<tr>
<td></td>
<td>4. Explain about feed nutrient balance, balance of N dan C, mineral, energy and protein</td>
<td>Question, giving idea and Discussion</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>5. Giving sample of computation of each balance (N dan C, mineral, energy and protein)</td>
<td>Discussion</td>
<td>Research report, journals</td>
</tr>
<tr>
<td></td>
<td>6. Giving assignment of those computation (1 problem each)</td>
<td>Group discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Present the result</td>
<td>Present the result</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8. Stimulate question and comment</td>
<td>Question, giving idea and Discussion</td>
<td></td>
</tr>
<tr>
<td>Closing Remark</td>
<td>9. Summarize and highlight the importance</td>
<td>Question, giving idea and Discussion</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>10. Giving hand out for the next topic</td>
<td>Giving hand out for the next topic</td>
<td>Hand out of the next topic</td>
</tr>
</tbody>
</table>

E. Evaluation: using response card, question and homework that give at the end of each meeting

F. References:
LECTURING AGENDA UNIT

Duration: 100 minutes (2 x 50 minutes)
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, Net Energy).

B. Main Topic: Energy value of feedstuff

D. Teaching Learning Activity

<table>
<thead>
<tr>
<th>Steps</th>
<th>Teaching Activity</th>
<th>Student Activity</th>
<th>Teaching Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1. Explain the general and specific instruction of the 14th meeting</td>
<td>Listening, question</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>2. Explain the benefit of studying this topic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery</td>
<td>3. Explain the meaning of feedstuff's energy value</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Explain the different kind of energy value in feedstuffs (Gross Energy,</td>
<td>Listening, question</td>
<td>Hand out of this topic</td>
</tr>
<tr>
<td></td>
<td>Digestible Energy, Metabolizable Energy, Heat Increment, Net Energy)</td>
<td>Question, giving idea and discussion</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>5. Explain the relationship of those energy values (Gross Energy, Digestible</td>
<td>Question, giving idea and discussion</td>
<td>Research report, journals</td>
</tr>
<tr>
<td></td>
<td>Energy, Metabolizable Energy, Heat Increment, Net Energy)</td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Giving sample of a feedstuffs energy value and explain how to get the value</td>
<td>Group discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and let the student categorize the value</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Giving several cases on grouping feedsstuffs energy value whether it</td>
<td>Present the result</td>
<td></td>
</tr>
<tr>
<td></td>
<td>include as GE, DE dan ME</td>
<td>Question, giving idea and discussion</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>8. Present the result</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9. Stimulate question and comment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closing Remark</td>
<td>10. Summarize and highlight the importance</td>
<td>Question, giving idea and discussion</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>11. Giving hand out for the next topic</td>
<td>Giving hand out for the next topic</td>
<td>Hand out of the next topic</td>
</tr>
</tbody>
</table>

E. Evaluation: using response card, question and homework that give at the end of each meeting

F. References
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 Einheit (FE); Total digestible nutrients (TDN) dan protein balance

D. Teaching Learning Activity

<table>
<thead>
<tr>
<th>Steps</th>
<th>Teaching Activity</th>
<th>Student Activity</th>
<th>Teaching Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1. Explain the general and specific instruction of the 15th meeting</td>
<td>Listening, question</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>2. Explain the benefit of studying this topic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery</td>
<td>3. Explain the meaning of sistem energy unit and protein balance</td>
<td>Listening, question</td>
<td>Hand out of this topic</td>
</tr>
<tr>
<td></td>
<td>4. Explain the different kind of energy unit (Starch Grade, Milk Grade, Futter Einheit (FE); Total digestible nutrients (TDN) and protein balance)</td>
<td>Question, giving idea and Discussion</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>5. Giving some value of those energy unit and explain or asking the student the meaning of the value</td>
<td>Question, giving idea and Discussion</td>
<td>Research report, journals</td>
</tr>
<tr>
<td></td>
<td>6. Giving problem of Starch Grade, Milk Grade, Futter Einheit (FE); Total digestible nutrients (TDN) and protein balance</td>
<td>Question, giving idea and Discussion</td>
<td>LCD</td>
</tr>
<tr>
<td>Closing Remark</td>
<td>7. Summarize and highlight the importance</td>
<td>Question, giving idea and Discussion</td>
<td>LCD</td>
</tr>
<tr>
<td></td>
<td>8. Giving hand out for the next topic</td>
<td>Giving hand out for the next topic</td>
<td>Hand out for the next topic</td>
</tr>
</tbody>
</table>

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

F. References :
### 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

<table>
<thead>
<tr>
<th>Steps</th>
<th>Teaching Activity</th>
<th>Student Activity</th>
<th>Teaching Instrument</th>
</tr>
</thead>
</table>
| Introduction   | 1. Explain the general and specific instruction of the 16th meeting
                | 2. Explain the benefit of studying this topic                                      | Listening, question               | LCD                 |
| Delivery       | 3. Explain the meaning of feed protein evaluation                                  | Listening, question                | Hand out of this topic| LCD                 |
|                | 4. Explain the different kind of method on feed protein evaluation included        | Question, giving idea and discussion| LCD                 |
|                | biological value, protein efficiency ratio, nitrogen retention, net protein        | Discussion                         | Research report, journals  |
|                | retention and net protein utilization                                              |                                    |                     |
|                | 5. Giving cases on feed protein evaluation in ruminant                              | Question, giving idea and discussion| LCD                 |
|                | 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                         | Question, giving idea and Discussion| LCD                 |
|                | 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 |                                    |                     |
| 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:
# COURSE OUTLINE

**Subject Studied:** Basic Animal Nutrition  
**Subject Code/Credits:** 3(2-1)  
**Description:** Knowledge of: (1) Definition of nutrition science, feedstuffs classification, nutrient composition of feedstuffs based on 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.

<table>
<thead>
<tr>
<th>No.</th>
<th>Specific Instruction</th>
<th>Main Topic</th>
<th>Sub Topic</th>
<th>Time Estimation</th>
<th>References</th>
</tr>
</thead>
</table>
| 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 | • Course outline  
• definition, history and development of nutrition science  
• the objective of learning basic animal nutrition  
• the relation of other sciences  
| 2.  | End of lecture, student could explain about composition and function of nutrient for animals body | Composition and function of nutrient for animal body | • nutrient composition of feedstuffs based on Weende and Van Soest analysis method as well as conversion on nutrient content  
| 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 | • Anatomy of digestive organ of ruminant, non ruminant, pseudoruminant and poultry  
• Digestion process and nutrient (carbohydrate, lipid, protein, vitamin dan mineral) absorption  
<table>
<thead>
<tr>
<th>No.</th>
<th>Topic</th>
<th>Details</th>
<th>References</th>
</tr>
</thead>
</table>
| 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: - The meaning of digestion - Digestion method measurement:  
- In vivo (indicator, total collection and force feeding)  
- In vitro  
| 6.  | End of lecture, student could explain about feed nutrient balance | Feed nutrient balance: - Nutrient balance  
- N plus C balance  
- Mineral balance  
| 9. | End of lecture, student could explain about feed protein evaluation | Feed protein evaluation | • Protein quality measurement in ruminant
• Protein quality measurement in non-ruminant | 2 x 50 min

COURSE : Forage Crops
COURSE CODE : 
CREDIT : 3 (2-1)
ANIMAL SCIENCE FACULTY – DIPONEGORO UNIVERSITY
COURSE OUTLINE

Course : Forage Crops
Code number/credit : 72-5 / 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:

<table>
<thead>
<tr>
<th>No.</th>
<th>Specific Instruction</th>
<th>Topic</th>
<th>Sub Topic</th>
<th>Duration</th>
<th>Reference</th>
</tr>
</thead>
</table>
| 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 |
| 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  
<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Grasses and legumes</th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 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 | 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  
| 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 | 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 | P.J. Mc Ilroy (1976)  
pp 73-89, 114-116  
L.R. Humphreys (1980) b  
pp. 14-21 |
LECTURINGAGENDA 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

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

F. Reference
Humphreys, L. R. 1980a 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: 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

<table>
<thead>
<tr>
<th></th>
<th>Lecturer Activity</th>
<th>Student Activity</th>
<th>Media and teaching aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>1. Explain the topics in second and third session</td>
<td>Paying attention</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2. Explain general and specific instruction in the second and third session</td>
<td>Paying attention</td>
<td>-</td>
</tr>
<tr>
<td>Content</td>
<td>3. Explain adaptation of forage crops</td>
<td></td>
<td>OHP or LCD</td>
</tr>
<tr>
<td></td>
<td>a. Ask the student about forage crops adaptation</td>
<td>Answer the question</td>
<td>White board</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>4. Explain the distribution of forage crops in world</td>
<td>OHP or LCD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Ask the student and discuss the answer of forage crops distribution</td>
<td>Discuss the answers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Give clues to student about the adaptation and distribution of forage crop in world</td>
<td>Paying attention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closing 5. Closing first session</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Ask the student to summarize the lecture content</td>
<td>Give the answer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Give time to student question</td>
<td>Ask question</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Explain overview the next lecture</td>
<td>Paying attention</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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


LECTURING AGENDA UNIT

<table>
<thead>
<tr>
<th>Course</th>
<th>Forage Crops</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code Course</td>
<td></td>
</tr>
<tr>
<td>Credit</td>
<td>3 (three)</td>
</tr>
<tr>
<td>Duration</td>
<td>4 x 50 minute</td>
</tr>
<tr>
<td>Session</td>
<td>4, 5</td>
</tr>
</tbody>
</table>

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

3
### D. Teaching Activity

<table>
<thead>
<tr>
<th>Preface</th>
<th>Lecturer Activity</th>
<th>Student Activity</th>
<th>Media and teaching aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Explain the topics in 4th and 5th session</td>
<td>Paying attention</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>Explain general and specific instruction in this session</td>
<td>Paying attention</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Content</th>
<th>3.</th>
<th>Explain systematics of grasses</th>
<th>OHP or LCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Ask the student about grasses</td>
<td>Answer the question</td>
<td>White board</td>
</tr>
<tr>
<td>b.</td>
<td>Discuss student answer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Explain systematics of legumes</td>
<td></td>
<td>OHP or LCD</td>
</tr>
<tr>
<td>a.</td>
<td>Ask the student and discuss the answer</td>
<td>Discuss the answers</td>
<td>White board</td>
</tr>
<tr>
<td>b.</td>
<td>Give clues to student about the systematics of grasses and legumes</td>
<td>Paying attention</td>
<td>OHP IFP</td>
</tr>
<tr>
<td>5.</td>
<td>Explain morphology of grasses and legumes</td>
<td></td>
<td>OHP or LCD</td>
</tr>
<tr>
<td>a.</td>
<td>Ask the student and discuss the answer</td>
<td>Discuss the answer</td>
<td>White board</td>
</tr>
<tr>
<td>b.</td>
<td>Explain the benefit of will be able to understand and explaining morphology of grasses and legumes</td>
<td>Paying attention</td>
<td>OHP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Closing</th>
<th>7.</th>
<th>Closing 4th and 5th session</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Ask the student to summarize the lecture content</td>
<td>Give the answer</td>
<td>White board</td>
</tr>
<tr>
<td>b.</td>
<td>Give time to student question</td>
<td>Ask question</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>Explain overview the next lecture</td>
<td>Paying attention</td>
<td>OHP</td>
</tr>
</tbody>
</table>

### E. Evaluation

2. Check list and quiz

### F. References

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

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

1. Check list and quiz

F. References


LECTURINGAGENDA UNIT

Course Code Course Credit Duration Session
: Forage Crops : 3 (three) : 8 x 50 minute : 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

<table>
<thead>
<tr>
<th>Lecturer Activity</th>
<th>Student Activity</th>
<th>Media and teaching aids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface 1.</td>
<td>Explain the topics in this session</td>
<td>Paying attention</td>
</tr>
<tr>
<td>2.</td>
<td>Explain general and specific instruction in this session</td>
<td>Paying attention</td>
</tr>
<tr>
<td>Content 3.</td>
<td>Explain physiology of forage crops</td>
<td>OHP or LCD</td>
</tr>
<tr>
<td>a.</td>
<td>Ask the student about physiology of forage crops</td>
<td>Answer the question</td>
</tr>
<tr>
<td>b.</td>
<td>Discuss student answer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Explain the benefit of studying physiology of forage crops</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------------------------------</td>
<td>---</td>
</tr>
<tr>
<td>4.</td>
<td>Explain the effect of edaphic environment on forage crops</td>
<td>OHP or LCD</td>
</tr>
<tr>
<td>a.</td>
<td>Ask the student and discuss the answer</td>
<td>Discuss the answers</td>
</tr>
<tr>
<td>b.</td>
<td>Give clues to student about the effect of edaphic environment</td>
<td>Paying attention</td>
</tr>
<tr>
<td>5.</td>
<td>Explain the effect of climatic environment on forage crops</td>
<td>OHP or LCD</td>
</tr>
<tr>
<td>a.</td>
<td>Ask the student and discuss the answer</td>
<td>Discuss the answer</td>
</tr>
<tr>
<td>b.</td>
<td>Explain the benefit of will be able to understand and explaining the effect of climatic environment on forage crops</td>
<td>Paying attention</td>
</tr>
<tr>
<td>Closing</td>
<td>Closing first session</td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>Ask the student to summarize the lecture content</td>
<td>Give the answer</td>
</tr>
<tr>
<td>b.</td>
<td>Give time to student question</td>
<td>Ask question</td>
</tr>
<tr>
<td>c.</td>
<td>Explain overview the next lecture</td>
<td>Paying attention</td>
</tr>
</tbody>
</table>

**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

**LECTURING AGENDA UNIT**

<table>
<thead>
<tr>
<th>Course</th>
<th>Forage Crops</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code Course</td>
<td>-------- / 3 (2-1)</td>
</tr>
<tr>
<td>Credit</td>
<td>3 (three)</td>
</tr>
<tr>
<td>Duration</td>
<td>4 x 50 minute</td>
</tr>
<tr>
<td>Session</td>
<td>11, 12</td>
</tr>
</tbody>
</table>

**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

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

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

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

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

E. Evaluation
1. Check list and quiz

F. References


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:

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

1
<table>
<thead>
<tr>
<th>Closing</th>
<th>6. Giving stressing/ summarizing the result of discussion as mention on preface</th>
<th>Paying attention, giving feedback, and writing teacher's comments</th>
<th>LCD</th>
</tr>
</thead>
</table>

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

F. References:
**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**:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Teacher Activity</th>
<th>Student Activity</th>
<th>Media and Teaching Aids</th>
</tr>
</thead>
</table>
| Preface    | 1. Explaining about the basis condition of feed matter and rations according to the goal of farming business  
2. Explaining about the importance of feed classification  
3. Explaining about the importance of sampling | Paying attention - Giving feed back  
Paying attention - Giving feedback  
Paying attention - Giving feedback | LCD, Blackboard, OHP |
| Presentation | 4. Several methods in classify feed matter and rations                  | Paying attention - Giving feedback | LCD, Blackboard, OHP |
| 5. | Explaining feed matter grouping based on the classification methods and the implementation in rations | Paying attention - Giving feedback |
| 6. | Explaining how to do sampling based on the correct sampling technique appropriate with the classification | Paying attention - Giving feedback |

| Closing | 7. Making group discussion | Discussion and giving response Clarify and getting agreement appropriate with the material |
|         | 8. Giving the students opportunity to ask a question or having discussion with other groups | Discussion, LCD |

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

F. References:

FAKULTI: KETERNAKAN 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.

<table>
<thead>
<tr>
<th>No.</th>
<th>Specific Instruction</th>
<th>Major Topic</th>
<th>Minor Topic</th>
<th>Time Estimation</th>
<th>Reading Source</th>
</tr>
</thead>
</table>
| 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     | - Contract of course  
- Definition and Feed Matter Problems  
- The scope of field of science  
| 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 | - 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  
<p>| 3.  | At the end of this course, student will | Testing The Quality of Feed | - The aim and methods |                 | AOAC. 1970. Official Methods of Analysis of The |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Specific Instruction</th>
<th>Major Topic</th>
<th>Minor Topic</th>
<th>Time Estimation</th>
<th>Reading Source</th>
</tr>
</thead>
</table>
|     | be able to explain the methods of feed quality physically and chemically and also able to do proximate analysis. | Matter | • Testing technique and procedures  
• The factors that influence feed quality  
• Information about Feed Matter Analysis Table | 6 x 50 minutes | Association of Official Agricultural Chemists.  
Washington DC, USA.  
PCAARD. 1987. The Philippines 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 | • Conventional Plants and Animal Feed Matter  
| 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 | • The classification of anti quality factors on feed matter  
|     | 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 | • Nutritive feed supplements  
• Non-nutritive feed supplements  
<table>
<thead>
<tr>
<th>No.</th>
<th>Specific Instruction</th>
<th>Major Topic</th>
<th>Minor Topic</th>
<th>Time Estimation</th>
<th>Reading Source</th>
</tr>
</thead>
</table>
| 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       | • Basis of feed matter selection  
• Methods in rations formulation  
• Trial and error method  
• Diagonal method (Pearson's square method)  
COURSE : Technology and Processing of Animal Product

COURSE CODE :

CREDIT :
The title of subject:

Technology and Processing of animal Product

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:


<table>
<thead>
<tr>
<th>No.</th>
<th>General instructional object</th>
<th>Principal of subject</th>
<th>Sub subject</th>
<th>Estimation of time</th>
<th>literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Students can explain and do handling and processing of meat and can identify standardization of meat product according to SNI or WHO.</td>
<td>Technology and meat Processing</td>
<td>Principles and object of meat processing, variety of meat product, standardization of meat product.</td>
<td>2 x 100 menit</td>
<td>1,2,5,7,9,10</td>
</tr>
<tr>
<td>2.</td>
<td>Students can explain and do handling and processing of milk and can identify standardization of milk product according to SNI or WHO.</td>
<td>Technology and milk Processing</td>
<td>Principles and object of milk processing, variety of milk product, standardization of milk product</td>
<td>2x 100 menit</td>
<td>1,2,9,3,10</td>
</tr>
<tr>
<td>3.</td>
<td>Students can explain and do handling and processing of egg and can identify standardization of egg product according to SNI or WHO.</td>
<td>Technology and egg Processing</td>
<td>Principles and object of egg processing, variety of egg product, standardization of egg product.</td>
<td>2 x 100 menit</td>
<td>1,3,10</td>
</tr>
<tr>
<td>No</td>
<td>Description</td>
<td>Course Title</td>
<td>Content</td>
<td>Duration</td>
<td>Credits</td>
</tr>
<tr>
<td>----</td>
<td>-------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------</td>
<td>-------------------------------------------------------------------------------------------</td>
<td>----------</td>
<td>---------</td>
</tr>
<tr>
<td>4</td>
<td>Students can explain and do handling and processing of skin, hide and can identify standardization of hide product according to SNI or WHO.</td>
<td>Technology and leather Processing</td>
<td>Principles and object of hide or skin processing, variety of hide product, standardization of hide product or leather</td>
<td>1 x 100 menit</td>
<td>4,6,8,10</td>
</tr>
<tr>
<td>5</td>
<td>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</td>
<td>Technology and animal by product Processing</td>
<td>Principles and object of animal by product processing, variety of animal by product, standardization of animal by product quality.</td>
<td>1 x 100 menit</td>
<td>4,6,8,10</td>
</tr>
</tbody>
</table>
COURSE: Packaging and Packing
COURSE CODE: PTH 103
CREDIT: 2 (2-0)
# OUTLINE OF TECHING PROGRAM

**Title of course**: Packaging and Packing  
**Code/credit**: PTH 105/2 (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**  

<table>
<thead>
<tr>
<th>No.</th>
<th>Specific objectives teaching</th>
<th>Topics</th>
<th>Sub-topics</th>
<th>Time Estimated</th>
</tr>
</thead>
</table>
| 1.  | Joining this course, students could mention and explain many aspects and history of packaging, packing and labeling, meaning and definition. | History  
• Mean and definition  
• Factors of packaging | 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. | • 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 | • 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 TEACHING 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 microbes, 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.

General teaching objective: Joining this course, students could explain scope of animal products microbiology, contaminant’s origins, growth of food microbes, 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:

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

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

E. Evaluation:

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.

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

E. Evaluation:
Asking the students to do homework in calculating

F. References:
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.

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

E. Evaluation: students asked to mention any example of animal-products food spoilage in occurs in daily life.
UNIT 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:
2. Low temperature preservation method.
3. Preservation method by addition of preservation agents.
4. Fermentation.
5. Irradiation method.

D. Teaching activities.

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

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

F. References:

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.

D. Teaching activities

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

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

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.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Teacher's activities</th>
<th>Student's activities</th>
<th>Media and teaching instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>1. Introducing many methods of microbial quantification and their uses.</td>
<td>Paying attention</td>
<td>White board</td>
</tr>
<tr>
<td></td>
<td>2. Explaining and practicing plate pour and plate spread methods including:</td>
<td>Paying attention</td>
<td>White board and OHP</td>
</tr>
<tr>
<td></td>
<td>• Instruments and media sterilization</td>
<td>Practicing microbial quantification</td>
<td>Practicing in laboratory</td>
</tr>
<tr>
<td></td>
<td>• Plating</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Interpreting the results.</td>
<td></td>
<td>White board and OHP</td>
</tr>
<tr>
<td></td>
<td>3. Explaining many other methods of microbial quantification (Most Probable Number,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>microscope and biochemical).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Explaining the advantages and the less of each microbial quantification method.</td>
<td>Paying attention</td>
<td></td>
</tr>
<tr>
<td>Explanation</td>
<td></td>
<td>Comparing to plating methods</td>
<td></td>
</tr>
<tr>
<td>Occlusion</td>
<td></td>
<td>Paying attention</td>
<td></td>
</tr>
</tbody>
</table>

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

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

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

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

F. References:
Units of Teaching Session

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

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

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

F. References:
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. Specific 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. Nutritive value/composition

D. Lecturing Activity

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecture's activity</th>
<th>Student's activity</th>
<th>Appliance Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antecedent</td>
<td>1. Explaining guidance study</td>
<td>Paying attention and</td>
<td>OHP/LCD and White/blackboard</td>
</tr>
<tr>
<td></td>
<td>2. Explaining about SCL-PBL Method</td>
<td>noting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Explaining lecturing this major at last semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Acquaintanceship team lecturer and the students</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Presentation | 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. | 1. Paying attention and having note  
2. Executing forming of permanent group to the guide from curator | OHP/LCD and black/white board |
|---|---|---|---|
| Closing | 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 (Assignment 1)  
   "The definition of meat" (A1-a)  
   • 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)  
   • Crosswise slice meat or muscle  
   • Classification of muscle (skeletal, smooth muscle and cardiac/striated muscle)  
   • 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)  
   • Composition in general analysis covering water, protein, fat, ash and carbohydrate  
   • Composition in minor obstetrical (mineral, vitamin | 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:
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:
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**

<table>
<thead>
<tr>
<th>Major Code/SKS</th>
<th>The Science and Technology of Meat Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brief description</td>
<td>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.</td>
</tr>
<tr>
<td>Common Purposed Instruction</td>
<td>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</td>
</tr>
</tbody>
</table>

**Materials Book**

<table>
<thead>
<tr>
<th>No</th>
<th>Specific Purposed Instruction</th>
<th>The topics</th>
<th>The sub topics</th>
<th>Time estimation</th>
<th>Materials Book</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>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 one semester. Can explain study system and evaluation at this major. Can define between meat and commercial carcasses clarity.</td>
<td>Antecedent, congeniality of meat, The structure and composition of meat</td>
<td>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</td>
<td>2 x 100 minute</td>
<td>1-7</td>
</tr>
<tr>
<td></td>
<td>Activity Description</td>
<td>Learning Outcomes</td>
<td>Time Allocation</td>
<td>Grade</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>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.</td>
<td>7. Structure and contraction of meat cell 8. Nutritive value</td>
<td>2 x 100 minute</td>
<td>1-7</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>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</td>
<td>Fabrication and identifying cutting and also identify the carcass</td>
<td>2 x 100 minute</td>
<td>1-7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Bone structure 2. Parts of cutting 3. Identify species, sex, class and age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>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</td>
<td>Palatability, cooking and preservation of meat</td>
<td>2 x 100 minute</td>
<td>1-7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Palatability’s aspect 2. Principal of cooking and preservation of meat 3. Temperature influence and other environmental aspect</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>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.</td>
<td>Meat microbiological-parasitological aspects during preparation processing and preservation</td>
<td>1 x 100 minute</td>
<td>1-7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>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</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>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</td>
<td>Chemical parameter and physical food safety.</td>
<td>2 x 100 minute</td>
<td>1-7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>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</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Participant can identify carcass commercial cutting. Can explain of the parameter</td>
<td>Middle Test</td>
<td>Meeting of I-XI</td>
<td>1 x 100 minute</td>
<td>1-7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>8.</strong></td>
<td><strong>Technology of meat preservation</strong></td>
<td><strong>1. The definition of curing, smoking, irradiation, thermal processing and refrigeration</strong>&lt;br&gt;<strong>2. The Principal of curing, smoking, irradiation, thermal processing and refrigeration</strong>&lt;br&gt;<strong>3. The Application on meat industry processing</strong>&lt;br&gt;<strong>4. The changes that happened and the palatability</strong></td>
<td><strong>2 x 100 minute</strong>&lt;br&gt;<strong>1-7</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>9.</strong></td>
<td><strong>Meat products (meat ball, jerked meat, abon/dried meat)</strong></td>
<td><strong>1. The definition</strong>&lt;br&gt;<strong>2. Materials and appliance</strong>&lt;br&gt;<strong>3. Processing procedure</strong>&lt;br&gt;<strong>4. Palatability of meat products</strong></td>
<td><strong>2 x 100 minute</strong>&lt;br&gt;<strong>1-7</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>11.</strong></td>
<td><strong>Final Test</strong></td>
<td><strong>Item Materials Meeting of I-XV</strong></td>
<td>****</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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. Specific Purposed Instructions:
   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. Rigororts at the carcasses after slaughtering
   5. Meat classification

D. Lecturing activity:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecture's Activities</th>
<th>Student Activities</th>
<th>Appliance instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antecedent</td>
<td>Explaining the technical of pleno discussion execution</td>
<td>Preparing duty which have been passed to previous meeting</td>
<td>CHP/LCD and blackboard</td>
</tr>
<tr>
<td>Presentation</td>
<td>Conducting pleno discussion technically the each group to conduct presentation according to this topic of each discussion continued with discussion</td>
<td>1. Conducting the presentation by showing each officer (moderator, notulen and the presenter)</td>
<td>CHP/LCD and blackboard</td>
</tr>
<tr>
<td>Closing</td>
<td>2. Making resume from result of discussion some group upon as an evaluate result</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Asking things requiring furthermore clarifications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Giving brief evaluation to the sub chapter which is have discussion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Giving duty to the this topic of discussion at next meeting (Assignment 2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;Handling before and after slaughtering&quot; (A2-A)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- How animal handling before slaughtering? Why that way</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Do handling before slaughtering is the same way for all livestock</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- How occurrence which is ordinary to be done by the society RPH/RPA?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is their practice have as according to existing theory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Give your group opinion?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- How “glonggong” meat can make reducing quality?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- What kind of livestock can being “glonggong” which have been discovered by officer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- How the method of handling processing after slaughtering?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- How the practice of crosscut after handling processing in society</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Do handling processing after slaughtering is the same for all the cattle? Observing on chicken livestock and goat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Are there any essentials things which are you get in society to handling before and after slaughtering</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;The changes (bio chemical),physics, rigormortis event and meaning and also glycolysis role after slaughtering&quot; (A2-B)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Understanding of rigormortis event to quality of meat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- How ought to determine treatment of livestock before slaughtering and fabrication with above matter consideration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;Meat classification&quot; (A2-C)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Definition of classification and the basis of uses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Usefulness of classification and the</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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. Références :
Penerbit Universitas Diponegoro, Semarang.
Universitas Indonesia, Jakarta.
Liberti, Yogyakarta.
New Jersey.
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. Specific Purposed Instructions:
   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 explain and differentiate cutting- crabbed commercial cutting
   d. Student can explain the way of identifying species, age, class and sex

B. Topic discussion: Fabrication and identifcation 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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecture's Activities</th>
<th>Student Activities</th>
<th>Appliance Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antecedent</td>
<td>Explaining the technical of pleno discussion execution</td>
<td>Preparing duty which have been passed to previous meeting</td>
<td>OHP/LCD and black board</td>
</tr>
</tbody>
</table>
| 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.      | 1. inquire                                               | OHP/LCD and blackboard                 |
|             | 2. Giving brief evaluation to the statement which have discussion | 2. In reply                                              |                                        |
|             |                                                           | 3. Paying attention and                                  |                                        |

SAP Ilmu Pengetahuan dan Teknologi Pengolahan Daging 7
3. Giving duty to the this topic of discussion at next meeting
   (Assignment 3)
   "Fabrication" (A3-a)
   - 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
   "Meat identification" (A3-b)
   - 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

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:
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:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecture's Activities</th>
<th>Student activities</th>
<th>Appliances Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antecedent</td>
<td>Conducting the technical of pleno discussion execution</td>
<td>Preparing duty which have been passed to previous meeting</td>
<td>OHP/LCD and blackboard</td>
</tr>
</tbody>
</table>
| 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 discussion some group upon which have evaluate | OHP/LCD and blackboard |

SAP Ilmu Pengetahuan dan Teknologi Pengolahan Daging 9
**Closing**

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 (Assignment 4)
   "Palatability" (A4-a)
   - 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)
   - The definition of flavor
   - What's 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)
   - 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

**OHP/LCD blackboard**

1. Inquire
2. In reply
3. Paying attention and having note
4. Start to conduct self-supporting activities with materials book and e-library

---

**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:

SAP Ilmu Pengolahan dan Teknologi Pengolahan Daging
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 processing, 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 differentiation about three process
   5. Aplication applied

D. Lecturing Activities

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecture's Activities</th>
<th>Student Activities</th>
<th>Appliances Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antecedent</td>
<td>Conducting the technical of pleno discussion execution</td>
<td>Preparing duty which have been passed to previous meeting</td>
<td>OHP/LCD and blackboard</td>
</tr>
</tbody>
</table>
| 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 |

SAP ilmu Pengolahan dan Teknologi Pengolahan Daging
### Closing

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 (Assignment 5)
   - Meat Microbiology (A5-a)
     - 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 at meat commodity and meat product
     - Is there any important thing that you get from the society about meat microbiology
   - Meat Parasitological (A5-b)
     - 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)
     - Is there any important thing that you get from the society about that aspects above

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>OHP/LCD and blackboard</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Inquire</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. In reply</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Paying attention and having note</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Start to conduct self-supporting activities with materials book and e-library</td>
<td></td>
</tr>
</tbody>
</table>

### 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

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:

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

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


SAP Ilmu Pengolahan dan Teknologi Pengolahan Daging
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

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

SAP Ilmu Pengetahuan dan Teknologi Pengolahan Daging
| 2. Explaining in general the definition, principal and usefulness of meat smocking | question |
| 3. Explaining in general the definition, principal and usefulness of thermal processing |
| 4. Explaining the changes that happened and palstability if conserving meat by various method |

**closing**

| 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 (Assignment 6) |
| "The impact of meat preservation" (A6-a) |
| - Can kyuring, thermal processing and smocking conducted in industry processing of scale domestic |
| - Is there any danger from curing processing, thermal processing and smocking to consumer |
| - How the characteristics of meat which have experienced of curing, thermal processing and smocking |
| The changes of physics chemist during curing processing, thermal processing and smocking (A6-B) |
| How the mechanism and another preservation can applied on meat (A6-c) |

| 1. Inquire |
| 2. In reply |
| 3. Paying attention and having note |
| 4. Start to conduct self-supporting activities with materials book and e-library |

**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**

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 dried 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 Procedure
   4. Product palatability

D. Lecturing Activities:

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

SAP Ilmu Pengetahuan dan Teknologi Pengolahan Daging 20
<table>
<thead>
<tr>
<th>processing procedure, the changes happened during the process and dried meat palatability</th>
<th>4. Explaining in general the definition, processing procedure, the changes happened during the process and sausages palatability</th>
</tr>
</thead>
<tbody>
<tr>
<td>closing</td>
<td>1. Asking things requiring furthermore clarification.</td>
</tr>
<tr>
<td></td>
<td>2. Giving duty to the this topic of discussion at next meeting (Assignment 7)</td>
</tr>
<tr>
<td></td>
<td>&quot;Dried Meat Product, jerked meat and meat ball&quot; (A7-a)</td>
</tr>
<tr>
<td></td>
<td>• Processing procedure</td>
</tr>
<tr>
<td></td>
<td>• Is there any things which digressing which you have see in course of its processing</td>
</tr>
<tr>
<td></td>
<td>• What's youre suggest for the repair of processing</td>
</tr>
<tr>
<td></td>
<td>&quot; Another meat product which were still seldom be made&quot; (A7-B)</td>
</tr>
<tr>
<td></td>
<td>• Look for Indonesian meat product which were still seldom be recognized by consumer</td>
</tr>
<tr>
<td></td>
<td>• Look for meat product from Indonesia / international which were represent result of research nowadays</td>
</tr>
<tr>
<td></td>
<td>&quot;Newly Problem in around meat industry processing of scale domestic in penetrating exporting market (A7-c)</td>
</tr>
<tr>
<td></td>
<td>1. Inquire</td>
</tr>
<tr>
<td></td>
<td>2. In reply</td>
</tr>
<tr>
<td></td>
<td>3. Paying attention and having note</td>
</tr>
<tr>
<td></td>
<td>4. Start to conduct self-supporting activities with materials book and e-library</td>
</tr>
<tr>
<td></td>
<td>OHP/LCD and blackboard</td>
</tr>
</tbody>
</table>

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:
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:

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

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

COURSE : Food Safety
COURSE CODE : PTH 102
CREDIT : (2-0)2
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 :

<table>
<thead>
<tr>
<th>No.</th>
<th>Spesific Purposed Instruction</th>
<th>The topics</th>
<th>The sub topics</th>
<th>Time estimation</th>
<th>Materials Book</th>
</tr>
</thead>
</table>
| 1.  | Student comprehends lecturing items scope and applied lecturing system. | Antecedent | 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 | 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 | 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 | 1.2.4.5.6.9. |
| 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 | 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. |
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Topic</th>
<th>Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Student comprehend food safety problem from the handling processing, preservation, and serving factor.</td>
<td>Food safety from processing factor&lt;br&gt;1. Conducting and cropping process&lt;br&gt;2. Process handling materials and preservation&lt;br&gt;3. Processing and serving for food&lt;br&gt;4. The equipments of food processing</td>
<td>3 x 100 minute</td>
<td>1,2,3,9.</td>
</tr>
<tr>
<td>7.</td>
<td>Student comprehends that food safety early from behavioral problem and someone caring.</td>
<td>Caring as food safety problem starting points&lt;br&gt;1. Caring behavior of producer&lt;br&gt;2. Caring behavior of consumer&lt;br&gt;3. Behavioral to consume the healthy food</td>
<td>2 x 100 minute</td>
<td>1,2.</td>
</tr>
<tr>
<td>COURSE</td>
<td>The Science and Technology of Dairy Processing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COURSE CODE</td>
<td>PTH 302 P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CREDIT</td>
<td>3 (2-1)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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, prinip 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:

<table>
<thead>
<tr>
<th>stage</th>
<th>Lecturer activity</th>
<th>Students activity</th>
<th>Tool and media of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>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.</td>
<td>To attend, write and listening</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>To explain about definition, composition, nutrition and quality of milk constituents.</td>
<td>Attent and write</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>enclosed</td>
<td>Review Discussion of this session.</td>
<td>To ask</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
</tbody>
</table>

**E. Evaluation**

Give problem of standardization.

**F. Literature**

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 theory of homogenization and pasteurization.
2. TIK:
   - Can explain the definition, method, object, and principles of homogenization.
   - Can explain the definition, method, object, and principles of pasteurization.
   - Can explain the 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:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and Tool of Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>introduction</td>
<td>To explain definition, principle, method and object of homogenization</td>
<td>To attend, write and listening,</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>To explain definition, principle, method and object of pasteurization</td>
<td>To attend, write and listening,</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>To explain definition, principle, method and object of sterilization</td>
<td>Discussion</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>To explain about packaging and storage of pasteurization and</td>
<td>Discussion</td>
<td>OHP and white board</td>
</tr>
</tbody>
</table>
| sterilization product.  
To explain about composition and nutrition of product. | Discussion |
| To explain about quality standard of product. | Discussion |

enclosed | Review about sub subject at this session | To ask |

E. Evaluation
To give post test to student.

F. literatures:
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 :

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and Tool of Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>To explain definition and principle of making butter</td>
<td>To attend, write and listening</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>to explain about composition, nutrition and quality of butter to give example of butter variety to explain about defect of maentega</td>
<td>To attend and write Discussion</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>enclosed</td>
<td>Review this session and to give clarification of the question</td>
<td>To ask</td>
<td></td>
</tr>
</tbody>
</table>

E. Evaluation :
To give stimulation to student by many problem at processing of butter.
F. Literatures


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 milk

D. Activity of learning:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Tool and media of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>To explain about definition, method, principle and object of toned milk</td>
<td>To attend, write and listening</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Narration</td>
<td>To explain about definition, method, principle and object of filled milk</td>
<td>To attend, write and listening</td>
<td>OHP and white board</td>
</tr>
<tr>
<td></td>
<td>To explain about definition, method, principle and object of reconstituted milk</td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>To explain about definition, method, principle and object of recombined milk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>enclosed</td>
<td>Review and to answer about many questions</td>
<td>To ask</td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>------------------------------------------</td>
<td>--------</td>
<td></td>
</tr>
</tbody>
</table>

**E. evaluation**

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

**F. literatures**

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 milk.
   ➢ 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:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>To explain definition, method, principle and object of making fermented milk.</td>
<td>To attend and write</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Narration</td>
<td>To explain about method, principles and object of making dairy culture. To explain about packaging and storage. Method of fermented milk and dairy culture</td>
<td>To attend and write Discussion</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>enclosed</td>
<td>Review and to give answer about many question and clarification.</td>
<td>To ask</td>
<td></td>
</tr>
</tbody>
</table>
E. evaluation

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

F. literatures

Session Unity of learning

Subject : The science and technology of Dairy Processing
Code of Subject : PTH 302 P1/3(2-I)
SKS : 3 (2-I)
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 :

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

E. evaluation :
Give duty to compose ice cream with different criteria.

F. literatures :
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 students 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:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Mereview duty that given last week</td>
<td>Practice and to attend</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>To explain about procedure of making ice cream</td>
<td>To attend and write Discussion</td>
<td>OHP and white board</td>
</tr>
<tr>
<td></td>
<td>To explain about quality and packaging method for frozen storage.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>enclosed</td>
<td>Review and give clarification</td>
<td>To ask</td>
<td></td>
</tr>
</tbody>
</table>

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

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:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>supervision</td>
<td>To do test</td>
<td></td>
</tr>
<tr>
<td>Naration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>enclosed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E. evaluation:

F. literature:
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 :

<table>
<thead>
<tr>
<th>stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>introduction</td>
<td>To explain definition, and variety of cheese</td>
<td>To attend, write and listen</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>To explain principles and object of making cheese</td>
<td>To attend, write and listen Discussion</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Enclosed</td>
<td>review</td>
<td>To ask</td>
<td></td>
</tr>
</tbody>
</table>
E. Evaluation

To Ask about procedure of making cheese

F. Literatures

Session Unity of learning

Subject : The science and technology of Dairy Processing
Code of Subject : PTH 302 Pl/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 :

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>introduction</td>
<td>To explain quality of cheese</td>
<td>To attend, write and listen</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>To explain defect and factors that effect to defect</td>
<td>To attend, write and listen</td>
<td>OHP and white board</td>
</tr>
<tr>
<td></td>
<td>To explain packaging and storage</td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td>enclosed</td>
<td>review</td>
<td>Bertanya</td>
<td></td>
</tr>
</tbody>
</table>

E. Evaluation :
Give duty to review about scientific journal related to processing of cheese.
F. Literatures:

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 :

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To explain sub subject and it’s relevancy with others sub subject</td>
<td>To attent, write and listen</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Introduction</td>
<td>To make many group according number of sub subject</td>
<td>Discussion</td>
<td>Paper, plastic of transparancy, pen,</td>
</tr>
<tr>
<td>Naration</td>
<td>Supervise to the discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Review</td>
<td>To ask</td>
<td></td>
</tr>
</tbody>
</table>

E. Evaluation :
To Make conclusion from result of discussion and to compare with literatures
F. Literatures

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 :

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>To explain about method of tuition in this session and review duty last week</td>
<td>To attent, write and listen</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>Give clarification disscussion result to compare in literatures</td>
<td>Discussion</td>
<td>OHP</td>
</tr>
</tbody>
</table>

enclosed

Review

To ask

E. evaluation :

To make Condensed milk Plant.
F. Literatures


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:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>To explain sub subject and it’s relevancy with others sub subject</td>
<td>To attend, write and listen</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>To make many group according number of sub subject</td>
<td>Discussion</td>
<td>Paper, plastic of transparent, pen,</td>
</tr>
<tr>
<td></td>
<td>Supervise to the discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enclosed</td>
<td>Review</td>
<td>To ask</td>
<td></td>
</tr>
</tbody>
</table>
E. Evaluation

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

F. literatures

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. Principle of subject : Milk Powder
C. Sub Subject :
   • Definition, variety and composition
   • processing
   • Quality and defect
   • Packaging and storage

D. Learning activity :

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>To explain about method of tuition in this session and review duty last week</td>
<td>To attent, write and listen</td>
<td>OHP and white board</td>
</tr>
<tr>
<td>Naration</td>
<td>Give clarification discussion result to compare in literatures</td>
<td>Discussion</td>
<td>OHP</td>
</tr>
<tr>
<td>enclosed</td>
<td>Review</td>
<td>To ask</td>
<td></td>
</tr>
</tbody>
</table>
E. evaluation

To make milk Powder Plant

F. literatures

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:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer Activity</th>
<th>Student activity</th>
<th>Media and tool of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Supervision</td>
<td>Doing test</td>
<td></td>
</tr>
<tr>
<td>Naration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>enclosed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E. Evaluation:

F. Literatures:
<table>
<thead>
<tr>
<th>No.</th>
<th>Subject of Subject</th>
<th>Principle of Subject</th>
<th>General Instruction Object</th>
<th>Description of Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td>General Instruction Object</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td>Description of Subject</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**GARIS BEASAR PROGRAM PENGARANAN**

**FAKULTAS PETERNAKAN UNIVERSITAS DIPONEGORO**
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 tuition method and evaluation of this subject.

B. Principal of subject : Introduction

C. Sub subject :
   - Description of subject
   - Relation inter subject
   - Lecture contract
   - Tuition method and evaluation

D. Education activity :

<table>
<thead>
<tr>
<th>Stage</th>
<th>Lecturer activity</th>
<th>Students activity</th>
<th>Tool and media of education</th>
</tr>
</thead>
<tbody>
<tr>
<td>introduction</td>
<td>to explain all of matter will give at this session.</td>
<td>To attend and write</td>
<td>OHP and white board</td>
</tr>
<tr>
<td></td>
<td>To introduce the lecturer of this subject.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naration</td>
<td>To explain background of this subject why give at this study programme</td>
<td>To attend and write</td>
<td>OHP and white board</td>
</tr>
<tr>
<td></td>
<td>To explain description of this</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description of this subject</td>
<td>To do making permanent group based on lecturer instruction.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To give actual examples</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To make structure of relation inter subject</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To explain lecture contract of this subject</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To explain of method education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To make small group discussion (5-7 students/group)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inclosed</th>
<th>To ask anything that need clarification or explanation to much more detail.</th>
</tr>
</thead>
<tbody>
<tr>
<td>To ask many things for actual examples to 2-3 students</td>
<td></td>
</tr>
<tr>
<td>To give review about subject were discussed at this session</td>
<td></td>
</tr>
<tr>
<td>To ask</td>
<td>To answer</td>
</tr>
<tr>
<td>To answer</td>
<td>To attend and write</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>COURSE</th>
<th>Eggs Science and Technology Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>COURSE CODE</td>
<td>PTH 303 P</td>
</tr>
<tr>
<td>CREDIT</td>
<td>(2-1)3</td>
</tr>
</tbody>
</table>
# ANIMAL AGRICULTURE OF DIPONEGORO UNIVERSITY

## MAIN ROLE OF TEACHING PROCESS

**Name of Course**: Eggs Science and Technology Processing  
**Code/ks**: PTH 303 P / 3 (2 – 1)  
**Short Description**: Egg, besides created as poultry propagation, it serves to the human food. As a food it needs good handling so it still in a fresh condition until be fresh up processing during.  
**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**:  

<table>
<thead>
<tr>
<th>No.</th>
<th>Course Specific Goal</th>
<th>Main Subject</th>
<th>Sub Subject</th>
<th>Time Estimation</th>
<th>References</th>
</tr>
</thead>
</table>
| 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:

<table>
<thead>
<tr>
<th>Teaching Step</th>
<th>Teacher Activity</th>
<th>Student Activity</th>
<th>Teaching Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductions</td>
<td>Introduction, Course Information</td>
<td>Note down, Listening, Discussion</td>
<td>OHP Blackboard</td>
</tr>
<tr>
<td>Presentation</td>
<td>Explaining relationship this course with others</td>
<td>Note down, Listening, Discussion</td>
<td>OHP Blackboard</td>
</tr>
<tr>
<td>Conclusion</td>
<td>Giving substance for the next meeting</td>
<td>Discussion</td>
<td>Blackboard</td>
</tr>
</tbody>
</table>

E. Evaluation: Quiz

F. References:
SET OF TEACHING INSTRUCTION

Name of Course: Egg 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:

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

E. Evaluation: Quiz

F. References:
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:

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

E. Evaluation: Quiz

F. References:
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:

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

E. Evaluation: Quiz
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 :

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

E. Evaluation: Quiz

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 "pinang"  
                  3. Egg Pickling
                  4. Omelets, mayonnaise, soufflés and pastry

D. Teaching Activity:

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

E. Evaluation: Quiz

SET OF TEACHING INSTRUCTION

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

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

E. Evaluation: Quiz

F. References:
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 :

<table>
<thead>
<tr>
<th>No.</th>
<th>Specific Instruction</th>
<th>Topics</th>
<th>Subtopics</th>
<th>Duration</th>
</tr>
</thead>
</table>
| 1.  | Students be able to understand and explain the meaning of agricultural extension | The meaning of agricultural extension | - Agricultural development, especially in animal husbandry  
- The relation of extension and other sciences  
- Purpose, Objectives, function, principles, philosopy 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 | - Education and behavioral change process  
- Types of education and their processes  
- Behavioral domain and the phase of change | 100 minutes t |
| 3.  | Students be able to understand and explain about communication, adoption, diffusion of innovation in the agricultural extension | Communication, adoption and diffusion of innovation | - 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 | - Meaning of extension method  
- Types of extension metod and its practices  
- Strategy of the use of the methods in behavioral change | 200 minutes |
|   | Students be able to understand and explain about extension media | Extension Media | | |   | Students be able to understand and explain about material, tools and education kits | Material, tools and extension kits | Definition of extension media | Various media and their applicationa | Strategy of the use of media | 200 minutes |   | Students be able to understand and explain about extension program planning | Extension program planning | Definition of extension program | The formation of program planning | Steps in program planning | 200 minutes |   | Students be able to understand and explain extension program evaluation | Evaluation in extension program | Definition of extension program evaluation | Formation of extension program evaluation | 200 minutes |   | Students be able to understand and explain government policy in extension, agriculture and food security | Extension program evaluation | Identifying the work’s place | Physical, infrastructure, institutional and human resources | Organisation and Administration | Facilities and work system | 100 minutes |   | 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

<table>
<thead>
<tr>
<th>No.</th>
<th>Phases</th>
<th>Lecturer Activities</th>
<th>Students activities</th>
<th>Media education kits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Introduction</td>
<td>Explaining: The meaning of development and agricultural development The meaning of education (Formal, Non-formal dan Informal) The meaning of behavioral change</td>
<td>Listening and responding</td>
<td>Whiteboard OHP LCD</td>
</tr>
<tr>
<td>2.</td>
<td>Presentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WEEK</td>
<td>TOPIC</td>
<td>SUBTOPIC</td>
<td>LECTURER</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>----------</td>
<td>----------</td>
<td></td>
</tr>
</tbody>
</table>
| I    | The meaning of extension, especially in the field of animal husbandry | - 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 | - 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 | The definition of communication, adoption and diffusion of innovation  
- Communication functions  
- Adoption and diffusion of innovation processes | ISB |
| IV dan V | Extension method | - Meaning of extension method  
- Types of extension metod and its practices  
- Strategy of the use of the methods in behavioral change | ISB |
| VI dan VII | Extension Media | - Definition of extension media  
- Various media and their applicationa  
- Strategy of the use of media | ISB |
| VIII | MID SEMESTER | | |
| IX dan X | Material, and educational kit in extension | - 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 | - Definition of extension program  
- The formation of program planning  
- Steps in program planning | TSE |
| XIII dan XIV | Extension program evaluation | - Definition of extension program evaluation  
- Formation of extension program evaluation | TSE |
| XV | Government policy in agricultural extension | - Identifying the work’s place  
- Physical, infrastructure, institutional and human resources  
- Organisation and Administration | TSE |
KRITERIA PENILAIAN:
1. Ujian MID Semester : 30 %
2. Ujian Akhir Semester : 30 %
3. Tugas : 10 %
4. Praktikum : 30%
Jumlah : 100%

BUKU PUSTAKA:

New York : David McKay Co., Inc.
Dirjen peternakan, Deptan. Jakarta.
The University of Michigan, Ann Arbor, Michigan.
The extension process. Canberra. AUUDP.
Isbandi. 1992. Pendidikan, komunikasi dan perencanaan program penyuluhan peternakan. FP
UNDIP. Semarang.
Lionberger, H. F. 1960. Adoption of new ideas and practices. Iowa : The Iowa State University
Press.
Bandung.
Bogor.
COURSE : ENTERPRENEURSHIP
COURSE CODE : 
CREDIT : 2(2-0)
COURSE OUTLINE:

SUBJECT STUDIED: ENTERPRENEURSHIP
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:
2. Djamiko, D. wirausaha dan Pembangunan. CV Alfabet, Bandung

<table>
<thead>
<tr>
<th>NO.</th>
<th>SPECIFIC INSTRUCTION GOALS</th>
<th>TOPICS</th>
<th>SUB-TOPICS</th>
<th>TIME ESTIMATION</th>
<th>REFERENCES</th>
</tr>
</thead>
</table>
| 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 | 2x100 minutes (2 times of meeting) | 5, 6, 7 |
|   | At the end of lectures, students know and can explain the role and goals of entrepreneurship | Role and goals of entrepreneurship | 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 | 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 | 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 | 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 | 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 | 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 | 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:

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

Evaluation:

References:
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:

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

Evaluation:

References:
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:

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

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

References:
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:

<table>
<thead>
<tr>
<th>STEPS</th>
<th>TEACHING ACTIVITY</th>
<th>STUDENT ACTIVITY</th>
<th>MEDIA AND TEACHING TOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Explain about Competency GIG and SIG</td>
<td>Pay attention Writing</td>
<td>White Board, OHP/LCD, felt-tip marker</td>
</tr>
</tbody>
</table>
| 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:
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:

<table>
<thead>
<tr>
<th>STEPS</th>
<th>TEACHING ACTIVITY</th>
<th>STUDENT ACTIVITY</th>
<th>MEDIA AND TEACHING TOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Explain about Competency GIG and SIG</td>
<td>Pay attention Writing</td>
<td>White Board, OHP/LCD, felt-tip marker</td>
</tr>
</tbody>
</table>
| 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:
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:

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

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

References:
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:

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

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

References:
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:

<table>
<thead>
<tr>
<th>STEPS</th>
<th>TEACHING ACTIVITY</th>
<th>STUDENT ACTIVITY</th>
<th>MEDIA AND TEACHING TOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Explain about Competency GIG and SIG</td>
<td>Pay attention Writing</td>
<td>White Board, OHP/LCD, felt-tip marker</td>
</tr>
<tr>
<td>Closing</td>
<td>Opportunities to student make question and answering the question from course</td>
<td>Asking &amp; Answering question Discussing</td>
<td>Notes</td>
</tr>
</tbody>
</table>

Evaluation:
Instrument used: student ability to asking and answering question from materials
References:
CONTRACT STUDY

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

SHORT DESCRIPTION:
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

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Topics</th>
<th>Sub-topics</th>
<th>Lecturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>1. Sense and term of entrepreneurship</td>
<td>WSM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Scope based pattern of entrepreneurship</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Entrepreneurship as culture</td>
<td></td>
</tr>
<tr>
<td>3 &amp; 4</td>
<td>Role and goals of entrepreneurship</td>
<td>1. be interested in to entrepreneurship</td>
<td>WSM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Crisis factors to start to business</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. measuring for interested business person</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Personalities of business person</td>
<td>1. Characters of business person</td>
<td>WSM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Attitude, temperament and personalities of business person</td>
<td></td>
</tr>
<tr>
<td>6 &amp; 7</td>
<td>To move of motivate</td>
<td>1. Social motivate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. achievement</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. to rise power of motivation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. to motivate other person</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>identification of business share</td>
<td>1. Change as innovation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Sources of innovation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Failure of business share</td>
<td></td>
</tr>
</tbody>
</table>
| 9 & 10 | The concepts and challenge of business | 1. Opportunities to business  
2. Reward and Challenge  
3. Livestock enterprises Model |
|--------|---------------------------------------|--------------------------------------------------------------------------------------------------|
| 13 & 14 | Build farm enterprise | 1. New farm business  
2. Family business  
3. Buy farm business |
| 15 & 16 | Build consumer loyalty | 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:
2. Djatmiko, D. wirausaha dan Pembangunan. CV Alfabela, Bandung
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.

<table>
<thead>
<tr>
<th>No</th>
<th>Aim of Specific Instruction</th>
<th>Topic</th>
<th>Sub topic</th>
<th>Time Estimation</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Student understand to production process, production factors, cost of production, supply and supply elasticity</td>
<td>Production, production process and supply</td>
<td>1. production concept and production factors 2. Cost of production, supply and supply elasticity</td>
<td>2 x 100 munite</td>
<td></td>
</tr>
</tbody>
</table>
## 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.

<table>
<thead>
<tr>
<th>No</th>
<th>Aim of Specific Instruction</th>
<th>Topic</th>
<th>Sub topic</th>
<th>Time Estimation</th>
<th>References</th>
</tr>
</thead>
</table>
| 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. | 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  
| 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  
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Relevant Theory/Concept</th>
<th>Topics</th>
<th>Duration</th>
<th>Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Student understand to determine market price, market functions, market classification and farm business equilibrium</td>
<td>Marketing theory</td>
<td>1. market price determination \2. market functions \3. market classification \4. farm business equilibrium</td>
<td>2 x 100 munite</td>
<td>Ekonomi Mikro. Erlangga. Jakarta.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic and Sub Topic</th>
<th>Lecturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>Economic Scope&lt;br&gt;1. Introduction and economic history&lt;br&gt;2. Economic problems and aim of economy</td>
<td>MKS</td>
</tr>
<tr>
<td>3-4</td>
<td>Consumption and demand&lt;br&gt;1. utility concept and demand utility&lt;br&gt;2. factors of demand influencing&lt;br&gt;3. demand elasticity</td>
<td>MKS</td>
</tr>
<tr>
<td>5-6</td>
<td>Production, production process and supply&lt;br&gt;1. production concept and production factors&lt;br&gt;2. Cost of production, supply and supply elasticity</td>
<td>MKS</td>
</tr>
<tr>
<td>7</td>
<td>Consumer utility theory</td>
<td>MKS</td>
</tr>
<tr>
<td>8</td>
<td>Market Theory&lt;br&gt;1. market price determination&lt;br&gt;2. market functions&lt;br&gt;3. market classification&lt;br&gt;4. farm business equilibrium</td>
<td>MKS</td>
</tr>
<tr>
<td>9</td>
<td>MID – TEST SEMESTER</td>
<td>TIM</td>
</tr>
<tr>
<td>10-11</td>
<td>Economics Welfare&lt;br&gt;1. indicators of economic growth and economic development&lt;br&gt;2. welfare indicators&lt;br&gt;3. factors of economic growth determination</td>
<td>BMS</td>
</tr>
<tr>
<td>12-14</td>
<td>Economic cycle and economic policy&lt;br&gt;1. the economic system of 2, 3 and 4 sectors.&lt;br&gt;2. fiscal and monetary policy.</td>
<td>BMS</td>
</tr>
<tr>
<td>15-16</td>
<td>Banking and Financing</td>
<td>BMS</td>
</tr>
</tbody>
</table>
4. REFERENCES:


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 minute
Schedule of meeting : 1 and 2

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 to the economic introduction and economic history, economic problems and aim of economy

B. Topic : Introduction and Economic scope

C. Sub Topic : 1. Introduction and economic history
                 2. Economic problems, aim and scope of economy

D. Teaching and Learning Activities

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Describe and explain the subject material:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Introduction economics</td>
<td>• Take note of</td>
<td>White board, OHP / LCD, board maker.</td>
</tr>
<tr>
<td></td>
<td>• to explain the competence of topic and sub topic</td>
<td>• written</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• explain the lectured contract</td>
<td>• Take note of</td>
<td></td>
</tr>
<tr>
<td>Presentation</td>
<td>1. explain the introduction and economic history</td>
<td>• give suggestion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. describe and clarify the scope of economy, economic problems and aim of economy</td>
<td>• discussion</td>
<td>White board, OHP / LCD, board maker.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• written</td>
<td></td>
</tr>
<tr>
<td>The closing of the session</td>
<td>a. closing of session</td>
<td>• presentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. randomly point toward the student to present the group discussion report</td>
<td>• give comment or question related</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. the comment from other student</td>
<td>to introduction and scope of economy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. give an assignment to revise the group discussion report completed by textbook</td>
<td>• doing an assignment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. describe the next subject lectured</td>
<td>• take not eol</td>
<td></td>
</tr>
</tbody>
</table>

1
E. Evaluation:
   The Instrument usage: checklist for evaluating an assignment student capability

F. References:

LECTURING AGENDA UNIT II

Subject Studied: Introduction Economic
Code of Subject: PTF 108
System of Credit Semester: 2 SCS
Time Schedule: 2 x 100 minute
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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. to explain the competence of topic and sub topic</td>
<td>• take note of</td>
<td>White board, OHP / LCD, board maker.</td>
</tr>
<tr>
<td></td>
<td>2. to explain the production and process</td>
<td>• take note of</td>
<td></td>
</tr>
<tr>
<td>Introduction</td>
<td></td>
<td>• give suggestion</td>
<td>White board, OHP / LCD, board maker.</td>
</tr>
<tr>
<td></td>
<td>Describe and explain:</td>
<td>• discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. production factors</td>
<td>• written</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. cost of production and product</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. optimizing and supply function</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. closing of session</td>
<td>• presentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. randomly point toward the student to present the group discussion report</td>
<td>• give comment or question related to production, optimizing and supply</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. the comment from other student</td>
<td>• doing an assignment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. give an assignment to revise the group discussion report completed by textbook or journal</td>
<td>• take note of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. describe the next subject lectured</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The closing of the session</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• group report</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• written the comment and question</td>
<td></td>
</tr>
</tbody>
</table>

3
E. Evaluation:

The Instrument usage: check list for evaluating an assignment student capability

F. References:

LECTURING AGENDA UNIT III

Subject Studied : Introduction Economic
Code of Subject : PTF 108
System of Credit Semester : 2 SCS
Time Schedule : 2 x 100 minute
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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction</td>
<td>1. describe the competence of topic and sub topic&lt;br&gt;2. describe utility, consumption and demand</td>
<td>• take note of&lt;br&gt;• take note of</td>
<td>White board. OHP / LCD. board maker.</td>
</tr>
<tr>
<td>Presentation</td>
<td>Explain the subject lectured, such as :&lt;br&gt;1. utility concept and demand utility&lt;br&gt;2. Value and price of goods and services&lt;br&gt;3. demand function</td>
<td>• give suggestion&lt;br&gt;• discussion for observing student capability&lt;br&gt;• written</td>
<td>White board. OHP / LCD. board maker. Form of student self evaluation</td>
</tr>
<tr>
<td>The closing of the session</td>
<td>1. closing of session&lt;br&gt;2. randomly point toward the student to present the group discussion report&lt;br&gt;3. the comment from other student&lt;br&gt;4. give an assignment to revise the group discussion report</td>
<td>• presentation&lt;br&gt;• give comment or question related to utility, consumption and demand&lt;br&gt;• doing an assignment&lt;br&gt;• take note of</td>
<td>• group report&lt;br&gt;• written the comment and question</td>
</tr>
</tbody>
</table>
E. Evaluation:
The Instrument usage: check list for evaluating an assignment student capability

F. References:

LECTURING AGENDA UNIT IV

Subject Studied: Introduction Economic
Code of Subject: PTF 108
System of Credit Semester: 2 SCS
Time schedule: 2 x 100 minute
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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>White board, OHP / LCD, board maker.</td>
</tr>
<tr>
<td>Introduction</td>
<td>1. describe the competence of topic and sub topic</td>
<td>• take note of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. describe market concept and classification of market</td>
<td>• take note of</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presentation</td>
<td>Explain the subject lectured, such:</td>
<td>• give suggestion</td>
<td>White board, OHP / LCD, board maker. Form of student self evaluation</td>
</tr>
<tr>
<td></td>
<td>1. market price determination</td>
<td>• discussion for observing student capability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. market functions</td>
<td>• written</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. market classifications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The closing of the session</td>
<td>1. closing of session</td>
<td>• presentation</td>
<td>group report</td>
</tr>
<tr>
<td></td>
<td>2. randomly point toward the student to present the group discussion report</td>
<td>• give comment or question related to marketing concept</td>
<td>written the comment and question</td>
</tr>
<tr>
<td></td>
<td>3. the comment from other student</td>
<td>• doing an assignment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. give an assignment to revise the group discussion report completed by textbook or</td>
<td>• take note of</td>
<td></td>
</tr>
</tbody>
</table>
E. Evaluation:
The Instrument usage: check list for evaluating an assignment student capability

F. References:
LECTURING AGENDA UNIT V

Subject Studied : Introduction Economic
Code of Subject : PTF 108
System of Credit Semester : 2 SCS
Time Schedule : 4 x 50 minute
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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1. describe the competence of topic and sub topic</td>
<td>▪ take note of</td>
<td>White board, OHP / LCD, board maker.</td>
</tr>
<tr>
<td></td>
<td>2. describe the national economic welfare</td>
<td>▪ take note of</td>
<td></td>
</tr>
<tr>
<td>Introduction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presentation</td>
<td>1. describe and explain the indicators of economic growth and economic development</td>
<td>▪ give suggestion for observing student capability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ give an indicators of economic growth question</td>
<td>▪ written and summary up of the economic growth and welfare and economic growth determination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ discussion and give an answer of the economic growth indicators</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. describe and explain the economic welfare indicators</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ give an indicators of economic welfare question</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ discussion and give an answer of the economic welfare indicators</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| The closing of the session | 1. closing of session | ▪ presentation  
2. randomly point toward the student to present the group discussion report | ▪ give comment or question related to marketing concept  
3. the comment from other student | ▪ doing an assignment  
4. give an assignment to revise the group discussion report completed by textbook or journal | ▪ take note of  
5. describe the next subject lectured | ▪ group report  
▪ written the comment and question |

E. Evaluation:
The Instrument usage: check list for evaluating an assignment student capability

F. References:
LECTURING AGENDA UNIT VI

Subject Studied : Introduction Economic
Code of Subject : PTF 108
System of Credit Semester : 2 SCS
Time Schedule : 6 x 50 minute
Schedule of meeting : 11, 12 and 13

A. AIM:
  1. Aim of General Instruction : At the end of study, student can understand 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 monetary policy.

B. Topic : Economic cycle and economic policy

C. Sub Topic : 1. Economy system of the 2, 3 and 4 sectors
  2. Fiscal and monetary policy.

D. Teaching and Learning Activities

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1. describe the competence of topic and sub topic</td>
<td>• take note of</td>
<td>White board, OHP / LCD, board maker.</td>
</tr>
<tr>
<td></td>
<td>2. describe the economic cycle and economic policy</td>
<td>• take note of</td>
<td></td>
</tr>
<tr>
<td>Presentation</td>
<td>1. describe and explain the 2, 3, and 4 sectors of economic</td>
<td>• give suggestion</td>
<td>White board, OHP / LCD, board maker.</td>
</tr>
<tr>
<td></td>
<td>• give a question of the 2, 3 and 4 economic sectors</td>
<td>• discussion an simulation for observing student capability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• discussion, give an aswere and conclusion of the 2, 3 and 4 economic sectors</td>
<td>• written and summary up of the 2, 3 and 4 economic sector and fiscal and monetary policy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. describe and explain the fiscal and monetary policy</td>
<td>• give a question of the fiscal and monetary policy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• give a question of the fiscal and monetary policy</td>
<td>• discussion and give an aswere and conclusion of the fiscal and monetary policy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• give a question of the fiscal and monetary policy</td>
<td>• discussion and give an aswere and conclusion of the fiscal and monetary policy</td>
<td></td>
</tr>
</tbody>
</table>

11
| 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 journal  
5. describe the next subject lectured | • presentation  
• give comment or question related to marketing concept  
• doing an assignment  
• take note of | • group report  
• written the comment and question |

E. Evaluation:
The Instrument usage: check list for evaluating an assignment student capability

F. References:
LECTURING AGENDA UNIT VII

Subject Studied : Introduction Economic
Code of Subject  : PTF 108
System of Credit Semester : 2 SCS
Time Schedule  : 6 x 50 minute
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 deflation

D. Teaching and Learning Activities

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. describe the competence of topic and sub topic</td>
<td></td>
<td>White board, OHP / LCD, board maker.</td>
</tr>
<tr>
<td></td>
<td>2. describe the banking economic financing policy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introduction</td>
<td>1. describe and explain of the concept of money, kinds and money functions</td>
<td>give suggestion</td>
<td>White board, OHP / LCD, board maker.</td>
</tr>
<tr>
<td></td>
<td>• give a question of the concept, kinds and functions of money</td>
<td>discussion an simulation for observing student capability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• discussion, give an aswere and conclusion of the concept, kinds and functions of money</td>
<td>written and summary up of subject lectured such money concept, banking and financing, inflation and deflation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. describe and explain the banking and financing institution</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• give a question of the banking and financing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• discussion and give an aswere and conclusion of the banking and financing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. describe and explain the</td>
<td>presentation of</td>
<td></td>
</tr>
</tbody>
</table>

13
| The closing of the session | 1. closing of session | presentation | 1. group report |
| | 2. randomly point toward the student to present the group discussion report | give comment or question related to marketing concept | 2. written the comment and question |
| | 3. the comment from other student | doing an assignment | |
| | 4. give an assignment to revise the group discussion report completed by textbook or journal | take note of | |
| | 5. describe the exam material | | |

E. Evaluation:
The Instrument usage: check list for evaluating an assignment student capability

F. References:

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.

<table>
<thead>
<tr>
<th>NO.</th>
<th>AIM OF SPECIFIC INSTRUCTION</th>
<th>TOPIC</th>
<th>SUB TOPIC</th>
<th>TIME (MNT)</th>
</tr>
</thead>
</table>
| 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 | • Introduction  
• The principle of farm business  
• The scope 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 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 | • 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 | 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 | • Management aspects  
• Farm business functions | Farm management functions:  
• 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) | • Cost of production  
• The method of price determination | 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 |
|   | The student can understand and explain the subject relation to budgeting, capital and analysis of financial ratios | · Budgeting  
· Analysis of financial ratios | 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 | · Farm development  
· The risks of farm | 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 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 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 business; and the application of farm business to livestock farmers in term of cashflow analysis.

LECTURING AGENDA UNIT

<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPIC</th>
<th>SUB TOPIC</th>
<th>LECTURER</th>
</tr>
</thead>
</table>
| 1, 2 | 1. Introduction  
2. The principle of farm business  
3. The scope 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 scope 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 | |
<table>
<thead>
<tr>
<th>5, 6, 7</th>
<th>Management aspects and the farm business functions have been done</th>
<th>Farm management functions, such as planning, producing, marketing, financing and organising</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>MID SEMESTER</td>
<td>TEAM</td>
</tr>
<tr>
<td>9, 10</td>
<td>• Cost of production</td>
<td>1. Definition of cost</td>
</tr>
<tr>
<td></td>
<td>• The method of price determination</td>
<td>2. Cost of production</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Determination of production and selling cost price and Break Even Point (BEP)</td>
</tr>
<tr>
<td>11, 12, 13, 14</td>
<td>budgeting, capital and analysis of financial ratios</td>
<td>1. Budgeting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Sources of capital</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Analysis of financial ratios, such as liquid assets, solvency, profit analysis</td>
</tr>
<tr>
<td>15 and 16</td>
<td>farm development and risks of farm</td>
<td>1. Farm development model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Risk factors and kinds of farm risk</td>
</tr>
</tbody>
</table>

REFERENCES:

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

<table>
<thead>
<tr>
<th>SUBJECT STUDIED</th>
<th>FEASIBILITY STUDY AND PROJECT EVALUATION (FSPE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CODE NUMBER/SYSTEM OF SEMESTER CREDIT</td>
<td>PTE 308/3(2-1)</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>Feasibility Study 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.</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th>Aim of Special Instruction</th>
<th>Topic</th>
<th>Sub Topic</th>
<th>Time Estimation</th>
<th>Bahan Pustaka</th>
</tr>
</thead>
</table>
| 1. Student can understand and explain the definition and meaning, benefit and scope of FSPE | Introduction | • 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 | • 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. | Financial and economic aspect for livestock farm business  
• Shadow prices | • 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 | • Compounding interest factor  
• Annuity and deferred annuity | .100 minute | Book no. 1, 3, 6 and 9 |
<table>
<thead>
<tr>
<th></th>
<th>Student can understand and explain the investment criteria concept consisting of NPV, IRR, Gross BC, Net BC and influencing inflation for investment</th>
<th>Investment criteria for livestock farm business</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>• Net Present Value (NPV)</td>
<td></td>
<td>Book no. 1, 3, 5, 6, 7, 8, 9, and 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Internal Rate of Return (IRR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Gross Benefit Cost Ratio (Gross BC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Net Benefit Cost Ratio (Net BC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Inflation focus on the investment</td>
<td>6 x 100 minute</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Student can understand and explain investment criteria utilizing for choosing livestock farm business investment possibility</td>
<td>Investment criteria utilizing for choosing livestock farm business investment possibility</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• IRR and Net BC comparison</td>
<td></td>
<td>100 minute</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cross over discount rate</td>
<td></td>
<td>Book no. 1, 3, 5, 6, 7, 8, 9, and 10</td>
</tr>
<tr>
<td>6.</td>
<td>Student can understand, explain and compose the Livestock farm business FSPE Proposal</td>
<td>Composing the FSPE Proposal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Composing the FSPE Proposal of livestock farm business</td>
<td>100 minute</td>
<td>Book no. 1 and 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Evaluating method of livestock Investment Criteria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SUBJECT STUDIED CONTRACT
FEASIBILITY STUDY AND PROJECT EVALUATION (3 SCS)

<table>
<thead>
<tr>
<th>STUDY PROGRAM</th>
<th>SOCIAL ECONOMIC ANIMAL AGRICULTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAY</td>
<td></td>
</tr>
<tr>
<td>TIME</td>
<td></td>
</tr>
<tr>
<td>CLASS</td>
<td></td>
</tr>
<tr>
<td>LECTURER</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPIC</th>
<th>SUB TOPIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>- Definition and meaning of Feasibility Study and Project Evaluation (FSPE) and its application for livestock farm business.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Benefit, scope and project cycle of FSPE</td>
</tr>
<tr>
<td>2, 3</td>
<td>Some aspects of FSPE</td>
<td>- Technical aspect,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Managerial and administration aspect,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Commercial aspect,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Financial and economic aspect,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Legal aspect</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Environmental aspect</td>
</tr>
<tr>
<td>4, 5, 6</td>
<td>Financial and economic aspect for livestock farm business</td>
<td>- Input – output livestock farm business</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Opportunity cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The concept, determination and evaluation of shadow price for livestock farm business</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- the differences between financial and economic analysis.</td>
</tr>
</tbody>
</table>
7 | Discounting and undiscouting analysis, time value of money | • Determination of financial and economic analysis

8 | • MID TEST | TEAM

10, 11, 12, 13, 14 | Investment criteria for livestock farm business | • Net Present Value (NPV)
• Internal Rate of Return (IRR)
• Gross Benefit Cost Ratio (Gross BC)
• Net Benefit Cost Ratio (Net BC)
• Inflation focus on the investment

14, 15 | Investment criteria utilizing for choosing livestock farm business investment possibility | • IRR and Net BC comparison
• Cross over discount rate

16 | Composing the FSPE Proposal | • Composing the FSPE Proposal of livestok 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 : 30%
Total : 100%

E. BIBLIOGRAPHY :
**LECTURING AGENDA UNIT I**

**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:** 1 x 100 minute  
**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, scoupe and project cycle of FSPE

**D. Teaching and Learning Activities**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Introduction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Describe and explain:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The competence of topic and sub topic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• the lectured contract and textbook for FSPE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Take note of</strong></td>
<td><strong>Written and discussion</strong></td>
<td><strong>White board, OHP / LCD, board maker.</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Take note of</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>give suggestion</strong></td>
<td><strong>White board, OHP / LCD, board maker.</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>discussion</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>written</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>presentation</strong></td>
<td><strong>give comment or question related to introduction and scoupe of FSPE</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>give the conclusion of topic, sub topic and discussion result</strong></td>
<td><strong>doing an assignment</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>give an assignment related to introduction material</strong></td>
<td><strong>take not cof</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>describe the next subject lectured</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
E. Evaluation:
The Instrument usage: check list for evaluating an assignment student capability and student class activity

F. BIBLIOGRAPHY
LECTURING AGENDA UNIT II

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 minute
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 aspect, 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 aspect,
   • Legal aspect
   • Environmental aspect

D. Teaching and Learning Activities

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Describe and explain:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The competence of topics and sub topic</td>
<td>• Take note of</td>
<td>White board, OHP / LCD. board maker.</td>
</tr>
<tr>
<td></td>
<td>• Some aspects of FSPE</td>
<td>• written and discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Take note of</td>
<td></td>
</tr>
<tr>
<td>Introduction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Describe and explain</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Technical aspect,</td>
<td>• give suggestion</td>
<td>White board, OHP / LCD. board maker.</td>
</tr>
<tr>
<td></td>
<td>• Managerial and administration aspect,</td>
<td>• discussion and presentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Commercial aspect,</td>
<td>• written and submit of group report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Financial and economic aspect,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Legal aspect</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Environmental aspect</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Group discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• randomly point toward the student to present the group discussion report</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• describe the next subject lectured</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The closing of 
the session

<table>
<thead>
<tr>
<th></th>
<th>a. closing of session</th>
<th>b. give the conclusion of topic, sub topic and discussion result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>c. give an assignment related to some aspects of FSPE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. describe the next subject lectured</td>
<td></td>
</tr>
<tr>
<td></td>
<td>presentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• give comment or question related to some aspects of FSPE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• doing an assignment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• take note of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• group report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• written the comment and question</td>
<td></td>
</tr>
</tbody>
</table>

E. EVALUATION :
The Instrument usage : check list for evaluating an assignment student capability and student class activity

F. BIBLIOGRAPHY :
### 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)  
**Time of Meeting**: 2 x 100 minute  
**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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
</table>
| 1 Introduction | Describe and explain:  
- The competence of topics and sub topic  
- Financial and economic analysis and shadow prices  
| - Take note of  
- written and discussion  
- Take note of | White board.  
OHP / LCD.  
board maker. |
| Presentation | Describe and explain:  
- 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 | - 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 | 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 |
| | | | presentation |
| | | | give comment or question related to financial and economic analysis of FSPE |
| | | | doing an assignment |
| | | | take note of |
| | | | 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:
LECTURING AGENDA UNIT IV

Subject Studied : FEASIBILITY STUDY AND PROJECT EVALUATION
Code of Subject : I*TE 308 / 2-1
System of Credit : 3 SCS (2-1)
Semester : 8
Time of Meeting : 1 x 100 minute
Schedule Meeting : 8

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 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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction • Describe and explain : The competence of topic and sub topic</td>
<td>• Take note of</td>
<td>White board, OHP / LCD, board maker.</td>
</tr>
<tr>
<td></td>
<td>• Discounting and undiscounting factor</td>
<td>• written and discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Take note of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presentation • Compounding interest factor</td>
<td>• Take note of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Annuity and deferred annuity</td>
<td>• give suggestion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Group discussion</td>
<td>• discussion and presentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Randomly point toward the student to present group discussion report</td>
<td>• written and submit of group report submit an assignment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Describe next subject lectured</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The closing of the session • closing of session</td>
<td>presentation</td>
<td>• group report</td>
</tr>
<tr>
<td></td>
<td>a. give the conclusion of topic, sub topic and discussion result</td>
<td>• give comment or question related to discounting, undiscounting</td>
<td>• written the comment and question</td>
</tr>
<tr>
<td></td>
<td>b. give an assignment related to discounting and undiscounting factor</td>
<td>• doing an assignment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. describe the next subject lectured</td>
<td>• take note of</td>
<td></td>
</tr>
</tbody>
</table>

E. EVALUATION :
The Instrument usage : check list for evaluating an assignment student capability and student class activity
F. BIBLIOGRAPHY:

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 minute
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 Rate of Return (IRR)
   - Gross Benefit Cost Ratio (Gross BC)
   - Net Benefit Cost Ratio (Net BC)
   - Inflation focus on the investment

D. Teaching and Learning Activities

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Describe and explain :</td>
<td>Take note of</td>
<td>White board, OHP / LCD, board maker.</td>
</tr>
<tr>
<td></td>
<td>- The competence of topic and sub topic</td>
<td>- written and discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Investment criteria</td>
<td>- Take note of</td>
<td></td>
</tr>
<tr>
<td>Presentation</td>
<td>Describe and explain relation to investment concept and</td>
<td>Take note of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Net Present Value (NPV)</td>
<td>- give suggestion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Internal Rate of Return (IRR)</td>
<td>- discussion and presentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Gross Benefit Cost Ratio (Gross BC)</td>
<td>- written and submit of group report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Net Benefit Cost Ratio (Net BC)</td>
<td>- submit an assignment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Inflation focus on the investment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Randomly point toward the student to present group</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>discussion report</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Describe next subject lectured</td>
<td>presentation</td>
<td>group report</td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------------</td>
<td>--------------</td>
<td></td>
</tr>
<tr>
<td>The closing of the session</td>
<td>give comment or question related to investment criteria</td>
<td>written the comment and question</td>
<td></td>
</tr>
<tr>
<td>a. closing of session</td>
<td>doing an assignment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. give the conclusion of topic, sub topic and discussion result</td>
<td>take note of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. give an assignment related to investment criteria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. describe the next subject lectured</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E. EVALUATION:
The instrument usage: check list for evaluating an assignment student capability and student class activity

F. BIBLIOGRAPHY:

10
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 minute
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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Introduction</td>
<td>Describe and explain :</td>
<td>Take note of</td>
<td>White board, OHP / LCD, board maker.</td>
</tr>
<tr>
<td></td>
<td>• The competence of topic and sub topic</td>
<td>written and discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Investment criteria utilizing for choosing investment possibility</td>
<td>Take note of</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presentation</td>
<td>Describe and explain :</td>
<td>Take note of</td>
<td>White board, OHP / LCD, board maker.</td>
</tr>
<tr>
<td></td>
<td>• IRR and Net BC comparison</td>
<td>give suggestion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cross over discount rate</td>
<td>discussion and presentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group discussion</td>
<td>written and submit of group report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Randomly point toward the student to present group discussion report</td>
<td>submit an assignment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Describe next subject lectured</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The closing of</td>
<td>a. closing of session</td>
<td>presentation</td>
<td>group report</td>
</tr>
<tr>
<td>the session</td>
<td>b. give the conclusion of topic, sub topic and discussion result</td>
<td>give comment or question related to investment criteria</td>
<td>written the comment</td>
</tr>
<tr>
<td></td>
<td>c. give an assignment related to utilizing investment possibility</td>
<td>possibility</td>
<td>and question</td>
</tr>
<tr>
<td></td>
<td>d. describe the next subject lectured</td>
<td>doing an assignment</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>take note of</td>
<td></td>
</tr>
</tbody>
</table>
E. EVALUATION:
The Instrument usage: check list for evaluating an assignment student capability and student class activity

F. BIBLIOGRAPHY:

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: 16
Time of Meeting: 1 x 100 minute
Schedule Meeting: 16

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 proposal
   • 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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Describe and explain:</td>
<td>2. Take note of</td>
<td>White board, OHP / LCD, board maker.</td>
</tr>
<tr>
<td>Introduction</td>
<td>• The competence of topics and sub topic</td>
<td>• written and discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Composing the FSPE Proposal</td>
<td>• Take note of</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• discussion and presentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• written and submit of group report submit an assignment</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• presentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• give comment or question related to composing FSPE Proposal</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• take note of</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• group report</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• written the comment and question</td>
<td></td>
</tr>
</tbody>
</table>

E. EVALUATION:
The Instrument usage: check list for evaluating an assignment student capability and student class activity
F. BIBLIOGRAPHY:

PRACTICAL AGENDA UNIT I

Subject Studied : FEASIBILITY STUDY AND PROJECT EVALUATION
Code of Subject : PTE 308 / 2-1
Time of Meeting : 1 x 100 munite
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 Analisys 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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Describe and give an example of present value, future value and interest rate calculation</td>
<td>• Take note of written and discussion</td>
<td>White board, OHP / LCD, board maker. Practical guidance</td>
</tr>
<tr>
<td>Presentation</td>
<td>Describe and give an example of present value, future value and interest rate calculation</td>
<td>• Take note of Give an answere Give suggestion</td>
<td>White board, OHP / LCD, board maker. Practical guidance</td>
</tr>
<tr>
<td>The closing of the practical</td>
<td>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</td>
<td>• give comment or question related to time value of money • doing an assignement • take note of</td>
<td>written the comment and question</td>
</tr>
</tbody>
</table>

E. EVALUATION : doing an assignment and give next an assignment

F. BIBLIOGRAPHY
Subject Studied: FEASIBILITY STUDY AND PROJECT EVALUATION
Code of Subject: PTE 308 / 2-1
Time of Meeting: 1 x 100 minute
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 Index, IRR, NPV, Financial and Economic Analysis, Ekonomi, and compose FSPE proposal.
2. Aim of Special Instruction: Student can understand, explain, and calculate the depreciation method.

B. Topic: Depreciation Method
C. Sub Topic: Depreciation Method

D. Teaching and Learning Activities

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>- Describe and explain depreciation method</td>
<td>- Take note of</td>
<td>White board, OHP / LCD, board maker. Practical guidance</td>
</tr>
<tr>
<td></td>
<td>- Calculation of depreciation method</td>
<td>written and discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presentation</td>
<td>Describe, explain, and calculate livestock farm business depreciation</td>
<td>calculate of livestock farm business depreciation</td>
<td>White board, OHP / LCD, board maker. Practical guidance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The closing</td>
<td>a. give the conclusion of topic, sub topic, and discussion</td>
<td>- give comment or question related to</td>
<td>written the comment and question</td>
</tr>
<tr>
<td>of the practical</td>
<td>b. give an assignment related to depreciation method</td>
<td>depreciation method</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. describe the next subject practical</td>
<td>- doing an assignment</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- take note of</td>
<td></td>
</tr>
</tbody>
</table>

E. EVALUATION: doing an assignment and give next an assignment

F. BIBLIOGRAPHY:
PRACTICAL AGENDA UNIT III

Subject Studied : FEASIBILITY STUDY AND PROJECT EVALUATION
Code of Subject : PTE 308 / 2-1
Time of Meeting  : 1 x 100 minute
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 Economis Analisys Ekonomi 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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Introduction</td>
<td></td>
<td></td>
<td>• Take note of</td>
</tr>
<tr>
<td></td>
<td>Describe and explain of regression analysis</td>
<td></td>
<td>• written and discussion</td>
</tr>
<tr>
<td>The closing of the practical</td>
<td>a. give the conclusion of topic, sub topic and discussion result</td>
<td>• give comment or question related to regression analysis</td>
<td>written the comment and question</td>
</tr>
<tr>
<td></td>
<td>b. give an assignment related to depreciation method</td>
<td>• doing an assignment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. describe the next subject practical</td>
<td>• take note of</td>
<td></td>
</tr>
</tbody>
</table>

E. EVALUATION  : doing an assignment and give next an assignment

F. BIBLIOGRAPHY :
PRACTICAL AGENDA UNIT IV

Subject Studied: FEASIBILITY STUDY AND PROJECT EVALUATION
Code of Subject: PTE 308 / 2-1
Time of Meeting: 1 x 100 minute
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 Economics Analysis / 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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
</table>
| Introduction                 | Describe, explain and give an example of some aspects of FSPE | • 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 | • take note of and compose some aspects related to FSPE                           | Board                                       |
| The closing of the practical | 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 | • give comment or question related to some aspects of FSPE
• doing an assignment
• take note of                                                             | OHP/LCD
• Petunjuk Praktikum                                                      |

E. EVALUATION: doing an assignment and give next an assignment

F. BIBLIOGRAPHY:
PRACTICAL AGENDA UNIT V

Subject Studied: FEASIBILITY STUDY AND PROJECT EVALUATION
Code of Subject: PTE 308 / 2-1
Time of Meeting: 1 x 100 munite
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 Economics Analisys 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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Describe, explain and give an example of investment calculation</td>
<td>Take note of and written and discussion</td>
<td>White board, OHP / LCD, board maker. Pracical guidance</td>
</tr>
<tr>
<td>Presentation</td>
<td>Describe, explain and give an example of ROI, NPV, IRR, BC ratios calculation and influencing of inflation to FSPE</td>
<td>take note of and calculate the investment criteria</td>
<td>Board, OHP/LCD, Petunjuk Praktikum</td>
</tr>
<tr>
<td>The closing of the practical</td>
<td>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</td>
<td>give comment or question related investment criteria doing an assignment take note of</td>
<td>written the comment and question</td>
</tr>
</tbody>
</table>

E. EVALUATION: doing an assignment and give next an assignment

F. BIBLIOGRAPHY:

9
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
1. Aim of General Instruction:
   - At the end of practical, the student can compute interest rate, Payback Period, BC ratio, Profitability Index, IRR, NPV, Financial and Economic Analysis Ekonomi and compose FSPE proposal.

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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Lecturer Activities</th>
<th>Student Activities</th>
<th>Media and teaching equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Describe, explain and give an example of FSPE usage for farm business livestock</td>
<td>- Take note of written and discussion</td>
<td>White board, OHP / LCD, board maker. Practical guidance</td>
</tr>
<tr>
<td>Presentation</td>
<td>Student visitation to livestock farm business or livestock small farm scale</td>
<td>- visitation and practical to farm</td>
<td>- Board - OHP/LCD - Petunjuk Praktikum</td>
</tr>
</tbody>
</table>

The closing of the practical:
- a. give the conclusion of topic, sub topic and discussion result
- d. the result of FSPE proposal composing description
- presentation of FSPE Report

E. EVALUATION: doing an assignment and give next an assignment

F. BIBLIOGRAPHY: