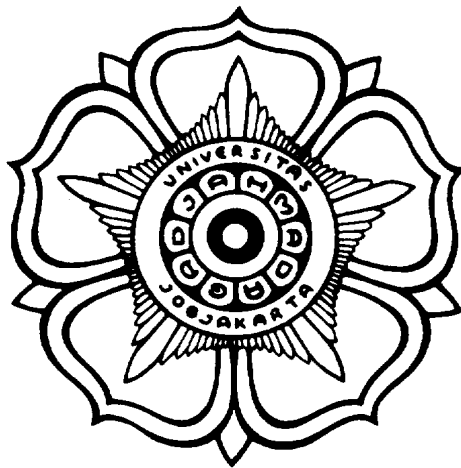# COURSE OUTLINE

Egg Science and Technology
(PTH 2115306, SKS 1/1)

Arranged by:
Prof. Dr. Ir. Nurliyani., M.S., IPM
Prof. Dr. Widodo,SP.,M.Sc
Endang Wahyuni, SPt., M.Biotech.
Ari Surya Sukarno, S.Pt., M.Biotech.
Ir. Satyaguna Rakhmatulloh, S.Pt., M.Sc.

Laboratory of Milk and Egg Technology
Faculty of Animal Science
Universitas Gadjah Mada
2022

Approval Sheet

Course Name   : Egg Science and Technology

Code/Credit   : PTH 2115306, SKS 1/1

Coordinator   :

    Name   : Prof. Dr. Ir. Nurliyani, MS.,IPM.

    Staff Number   : 196008171986032003

    Academic Rank   : Professor / IV c

    Current Position   : Head of Laboratory of Milk and Egg Technology

Yogyakarta, June 17 2022

Approved by   Course Coordinator

Head of Laboratory

(Endang Wahyuni, S.Pt., M. Biotech)   (Prof.Dr. Ir. Nurliyani, MS.,IPM)
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Certified by:

Vice Dean for Academic and Student Affairs

Ir. R. Ahmad Romadhoni Surya Putra, S.Pt., M.Sc., Ph.D., IPM., ASEAN Eng.
NIP. 198107092005011003

1. **BACKGROUND**

A subject of eggs science and technology is compulsory course for students of faculty of animal science. The material provided and discussed include the physical structure and the quality of the eggs, egg physicochemical properties, nutrients and chemicals of eggs, functional properties of egg, technology of egg preservation and processing, quality standards of eggs and egg products, and the benefits of eggs for the industry. The purpose of this course is to provide insight for students about egg products, which include raw materials, products and manufacturing processes as well as the benefits for consumers. Assessment course is through quizzes, midterms, final exams and laboratory work. Thus expected that students are able to understand and implement the knowledge that has been gained.

2. **COURSE OUTLINE**

    a. Course   : Egg Science and Technology
    b. Code/Credit   : PTH 2115306, /(1/1)
    c. Pre-requisite   : -
    d. Classification   : Compulsory
    e. Semester   : IV

3. **COURSE OUTCOME:**

The students know and understand the science of livestock of eggs products, and also the process of preservation and processing of eggs. They are able to apply knowledge and innovate to develop the processing of eggs products. They have the practical ability to preserve and process the eggs.

Table 1. Correlation between course outcomes and learning outcomes

Course Outcomes (CO)	Learning Outcomes
CO1: Knowledge and Understanding	A6: Basic concepts of egg quality and its products as well as egg preservation and processing technology. A7:Basic theories and instruments for preserving and processing egg for conducting scientific research related to egg science and technology

Course Outcomes (CO)	Learning Outcomes
CO2: Intellectual Ability	B1: Planning and implementation of research results on the quality and functional properties of egg.
CO3: Practical skills	C1: Plan and implement research on egg and its products appropriately C2: Use laboratory equipment when practice to get valid data

a. WORK LOAD

    a. Lecture class   : 14 x 1 x 50 minutes

    b. Assignment   :   7 x 50 minutes

    c. Practical Class   : 8 x 2 x 60 minutes

    d. Self study   : 14 x 1 x 50 minutes

b. STUDY/EXAM ACHIEVEMENT

Assessment Methods include formative assessment (Midterm and Final exam) and summative assessment (quizzes, task), and practical class, with the following assessment:

Table 2. Assesment of each component

No	Component	Percentage (%)*	Score (N)* (0-100)	Total* (% x N)
1	Formatif (*Knowledge and Understanding*)			
	Mid-term Exam	35		
	Final Exam	35		
2	Sumatif (*Managerial Skill)*			
	Quiz	5		
	Task	5		
3	Practical class (*Practical Skill*)	20		
Total Score		100		

Note*: To be completed by Team Teaching, and the total value is filled in after the learning process was completed.

Table3. Final Assessment

Total value in number	Total value in letter	Criteria assessment
81-100	A	Students were able to answer and explain the problem
76-80	A-	
71-75	A/B	
66-70	B+	Students were able to answer the questions but they were less able to explain the problem
61-65	B	
56-60	B-	
51-55	B/C	
46-50	C+	Students were able to answer the questions but they were not able to explain the problem
41-45	C	
36-40	C-	
31-35	C/D	
26-30	D+	Students try to answer and explain the problem but it were not related with the problem
21-25	D	
0-20	E	Student were not response the question

c. WEEKLY LEARNING ACTIVITY

a. Course

Week	Topic	Sub topic	Learning Method**	Lecturer
1.	Introduction of egg science and Technology	1. Definition of egg 2. Physical structure of egg 3. Quality and Grading of egg	lectures, discussions, quizzes	Prof.Dr.Ir.Nurliyani, MS.,IPM.
2.	Physicochemical of egg	1. Viscosity of egg 2. Surface activity of egg 3. pH value of egg	lectures, discussions, quizzes	Prof.Dr.Ir.Nurliyani, MS.,IPM.
3.	Nutrition and chemical of egg	1. Protein 2. Lipid	lectures, discussions, quizzes	Prof.Dr.Ir.Nurliyani, MS.,IPM.
4.	Nutrition and chemical of egg	3. Carbohydrates 4. Pigment, vitamin and mineral	lectures, discussions, quizzes	Prof.Dr.Ir.Nurliyani, MS.,IPM.
5.	Functional characteristic of egg	1. Coagulation 2. Foaming	lectures, discussions, quizzes	Prof.Dr.Ir.Nurliyani, MS.,IPM.

Week	Topic	Sub topic	Learning Method**	Lecturer
6.	Functional characteristic of egg	3. Emulsification	lectures, discussions, quizzes	Ari Surya Sukarno, SPt.,M.Biotech.
7.	Egg Microbiology	1. Microorganism Exterior	lectures, discussions, quizzes	Dr. Ir. Widodo, M.Sc.
MID-TERM EXAM				
8.	Egg Microbiology	2. Microorganism Interior	lectures, discussions, quizzes	Dr. Ir. Widodo, M.Sc.
9.	Preservation of egg	1. Basic of egg preservation 2. Chilling and Freezing Egg	lectures, discussions, quizzes	Endang Wahyuni, S.Pt.,M.Biotech.
10.	Preservation of egg	3. Salted egg 4. immersion	lectures, discussions, quizzes	Endang Wahyuni, S.Pt.,M.Biotech.
11.	Preservation of egg	5. Egg powder 6. Quality standard	lectures, discussions, quizzes	Endang Wahyuni, S.Pt.,M.Biotech.
12.	Processing of egg	1. Basic of egg processing 2. Boiling, poaching, frying, scramble, soufflé 3. Eggnog, advocaat, egghurt 4. Mayonnaise, egg sausage 5. Quality standard	lectures, discussions, quizzes	Endang Wahyuni, S.Pt.,M.Biotech.
13.	Processing of egg	3. Eggnog, advocaat, egghurt 4. Mayonnaise, egg sausage	lectures, discussions, quizzes	Endang Wahyuni, S.Pt.,M.Biotech.
14.	The benefits of eggs for industry	1. Benefits of eggs for the food industry 2. Benefits of eggs for the non-food industry	lectures, discussions, quizzes	Endang Wahyuni, S.Pt.,M.Biotech.
FINAL EXAM				

b.Practical Class

Week	Activity	Method	Time
1	General assistance of practice	Lectures, discussions, quizzes General Pre Test	1 x 2 x 60
2	Testing of egg quality	Section Test and Practice	1 x 2 x 60
3	Making and testing of egg powder	Section Test and Practice	2 x 2 x 60
4	Mayonnaise processing and Testing	Section Test and Practice	1 x 2 x 60
5	Final report and Test	Report, General Post Test	2 x 2 x 60

d.   Learning Activities and Assignments

The learning activities of the Egg Science and Technology course technically include face-to-face lectures, structured assignments, exercises/practicums and independent study. The number of hours in class lectures in 1 semester was 14 meetings for 50 minutes. The structured tasks given are 7 tasks with a duration of about 25 minutes for each task. The exercise/practicum given is 14 x 1 x 50 minutes. Student self-study as much as 14 x 1 x 50 minutes.

e.   Learning methods

Lectures are filled with theoretical explanations, class discussions related to the topics described. Independent learning by students, namely providing several references that must be studied.

Giving lectures by lecturers is using an LCD projector with power point and orally and in writing using the available whiteboard media. Lecture materials are given in the form of a copy of a power point or a copy of the lecture material in printed form (hardfile).

The practicum was carried out in groups with 5 students in each group. Each group is accompanied by a student assistant. The series of practicum includes Assistance, General Pre-Tets, practicum, report collection, and Response. Practical activities in the laboratory consist of pre-test, hands-on student practicum, explanation, and discussion.

f.   Scoring system

The final score is based on the value of the Mid-Semester Examination (UTS), practicum, and the Final Semester Examination (UAS). The percentage system for the assessment of Dairy Science and Technology courses can be seen in the

following table:

Egg Science and Technology Course Assessment System

No	Komponen	Persentase (%)	Nilai (N) (0-100)	Jumlah (% x N)
1	Formatif (*Knowledge and Understanding*)			
	Middle exam	45		
	Final Exam (UAS)	40		
2	*Practical Skill*	15		
Total		100		

1. Final Score Evaluation
a. Course cumulative grades

No Mahasiswa	Nama Mahasiswa	Komponen Penilaian (Nilai dalam angka dari komponen evaluasi)				Nilai dalam Huruf *
		UTS	UAS	Praktikum	Total	
19/439367/PT/08002	DYAH AYU RINTOKO PUTRI	34,48	31,81	13,52	79,82	A/B
19/439370/PT/08005	FADELLA ROSYIDTA	31,33	35,92	13,05	80,30	A/B
19/439373/PT/08008	FARAH WAHYU AMALA SUGIHARTO	34,73	33,58	14,25	82,56	A-
19/439376/PT/08011	FINDRI NUR FELLA SARI	35,94	39,39	13,01	88,35	A
19/439377/PT/08012	GABRIELLA RESTI PRIMADITYA	29,39	31,60	13,76	74,75	B
19/442938/PT/08070	AFRIZAL SYIFA KURNIANTO	35,09	31,88	14,10	81,08	A/B
19/442941/PT/08073	AHMAD SALMAN AL FATHONI	29,14	26,57	12,97	68,68	B-
19/442944/PT/08076	ALFINA DIAH SRI HAPSARI	35,21	36,63	13,69	85,53	A-
19/442948/PT/08080	ANGGITA PRIHANDINI	31,09	28,84	13,25	73,17	B
19/442955/PT/08087	BAGAS CESAR BASTOMI	34,00	31,74	11,94	77,68	B+
19/446019/PT/08273	EVA WIDILESTARI	30,36	34,86	13,34	78,56	A/B
19/446023/PT/08277	FARID ABDILLAH	32,66	36,77	12,98	82,41	A-
19/446026/PT/08280	GANCANG ARIFIANTO	23,68	29,40	13,01	66,09	B/C
19/446032/PT/08286	ILYAS KIKI HANDAKA	31,45	28,41	13,21	73,07	B
19/446033/PT/08287	INAS WIBOWO	32,42	34,57	13,14	80,13	A/B
19/446042/PT/08296	MUHAMMAD WIENAAFI H. A	25,26	31,67	13,29	70,22	B-
19/446054/PT/08308	NOVIA RIZQI E.	34,48	37,90	14,22	86,61	A
19/446055/PT/08309	NUR'ALIM HIDAYATURROHMAN	27,56	30,47	13,09	71,12	B-
19/446058/PT/08312	PRISMA DEVVI SINTAWATI	33,63	32,31	13,35	79,29	A/B
19/439371/PT/08006	FADHILA RAHMA ALIFA	31,93	33,44	13,69	79,06	A/B
19/439375/PT/08010	FEBRIYANAH	30,84	31,17	14,18	76,19	B+
19/439379/PT/08014	ISMAIL MAHENDRA	31,08	29,40	12,54	73,03	B

19/440150/PT/08055	RAFLI VILANDYAN ARMAN	31,33	33,65	12,26	77,24	B+
19/440151/PT/08056	REZA DIAR ANGGARA	33,63	34,36	13,50	81,50	A/B
19/440153/PT/08058	SARAH SAVIERA NOORAZIZA	27,44	27,35	13,54	68,33	B-
19/442945/PT/08077	ALIF RAMA YOGIYANTARA	32,78	29,76	13,01	75,55	C
19/442951/PT/08083	ARIE SADEWA	30,84	32,10	12,73	75,66	B+

Keterangan nilai :

GRADE	Range
A	>85,91
A-	82,21
A/B	78,51
B+	74,81
B	71,12
B-	67,42
B/C	63,72
C+	60,02
C	56,32
C-	<52,62

The percentage of student scores for the 2021/2022 Academic Year can be seen in Figure 1
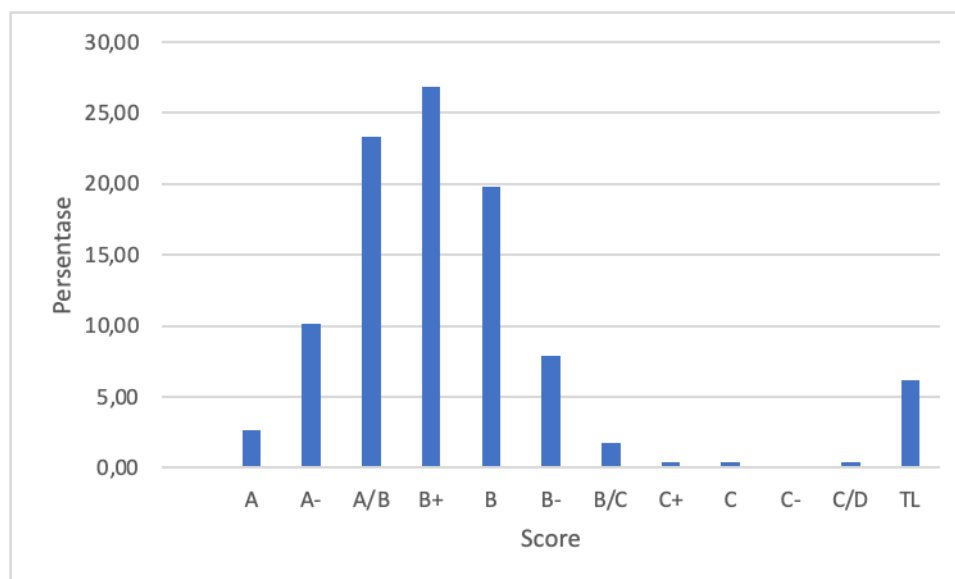

Figure 1. Graph of the percentage of student scores in the 2020/2021 Academic Year

Achievement of student scores by sampling 28 students in the 2020/2021 academic year, there were no students who scored below C/D. The assessment is based on three

components, namely UTS, UAS, and Practicum. The value with the highest percentage is the B+ value with a value range of 74.81 – 78.51. This means that the Egg Science and Technology lecture material given to students can be understood. The questions that are made both during UTS and UAS are questions that are appropriate and in line with the course outcome. The materials given during the practicum have also been harmonized with SAP and the course outcomes of this course.

b. Student Questionnaire Analysis

The results of the evaluation of student responses to teaching and learning activities carried out at the end of each UTS and UAS which include learning materials, conformity with RPKPS, preparation of lecturers in teaching, clarity of lecturers in giving lectures, assessment shows that lectures are going well, as evidenced by good scores.

The student assessment form is as presented in the table, with details of questions 1-10 for evaluating lecturers, while questions 11-12 are for evaluating students themselves.

Tabel Form penilaian mahasiswa

No.	Parameter	Penilaian				
		SS	S	TS	STS	TT
1	Dosen hadir sesuai jadwal					
2	Dosen menggunakan waktu perkuliahan secara penuh					
3	Mata kuliah mempunyai Rencana Topik Perkuliahan					
4	Perkuliahan sesuai dengan Rencana Topik Perkuliahan					
5	Sumber bahan perkuliahan mudah diperoleh					
6	Dosen menguasai bahan perkuliahan					
7	Dosen memberi kesempatan berdiskusi					
8	Tugas sesuai beban studi					
9	Kuis sesuai beban studi					
10	Soal ujian sesuai materi perkuliahan					
11	Saya dapat memahami materi kuliah yang disampaikan oleh dosen					
12	Setelah mengikuti kuliah, saya termotivasi untuk belajar lebih giat					

Keterangan :
SS = Sangat setuju
S = Setuju
TS = Tidak setuju
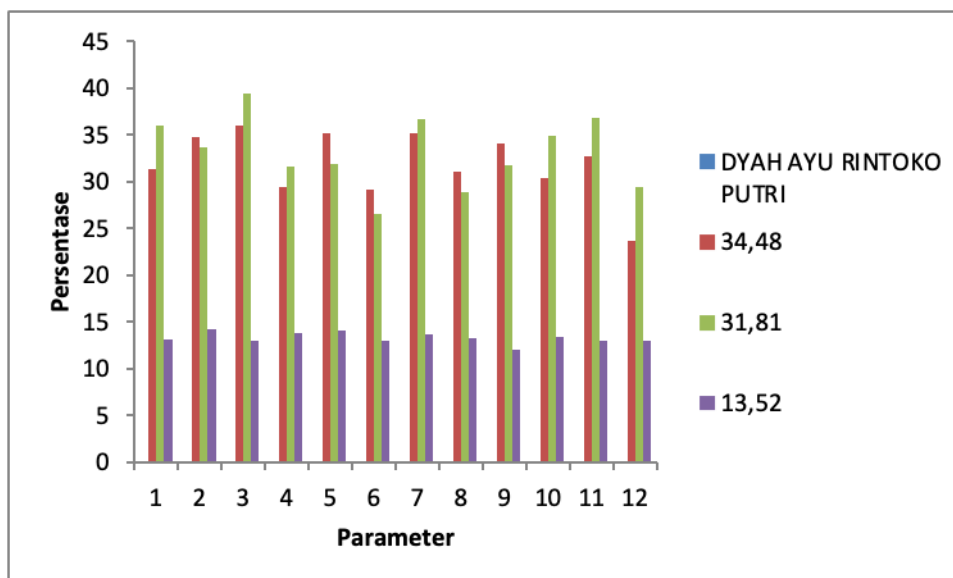STS = Sangat tidak setuju
TT = Tidak tahu

Figure 2. Graph of student evaluation of lectures for the 2020/2021 Academic Year

Based on 12 assessment parameters, student evaluations of the lecture system showed good results with a high percentage of more than 80%. The results of student evaluations of the 2021/20222 Academic Year lectures can be seen in Graph 2. This indicates that the learning system is in accordance with the Semester Learning Activity Program Plan (RPKPS) so that students can understand the entire series of lectures. Thus, it can be said that after attending lectures students are motivated to study harder.

c. The next plan

The next improvement effort is that lectures will optimize technology through E-learning, a combination of lectures, quizzes and structured assignments as an assessment component and encourage and motivate students to actively study independently. In addition, lecture materials will always be updated in accordance with the development of Dairy Science and Technology both nationally and internationally, especially through the development of science in the latest journals.

d. Practical guidence book

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