



Course Specification of Meat Hygiene

I. Course Identification and General Information:						
1	Course Title:	Meat Hygiene				
2	Course Number & Code:	PA577				
3	Credit hours:	C.H				Total
		Theoretical	Practical	Training	Seminar	
		2	1	0	0	3
4	Study level/ semester at which this course is offered:	Fifth Year: First Semester				
5	Pre –requisite (if any):	MI352, MI355, 3MI353, MI357				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor's degree (B. Sc.) Veterinary Medicine				
8	Language of teaching the course:	English				
9	Location of teaching the course:	Faculty of veterinary medicine				
10	Prepared by:	Dr. Faris Mohammed Ahmed Al-zailay				
11	Date of approval:					

II. Course description:

The course aimed at teaching the future veterinary professionals the responsibilities within the scope of public health protection through learning and training: macroscopic, bacteriological, serological,

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Dr. Fawzi Elsagheer

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parasitological, physicochemical and organoleptic tests of meat, methods of sanitary inspection of meat, responsibilities within veterinary inspection of animal markets, transport and slaughterhouses.

At the end of course, students should have acquired the principles of slaughterhouse planning, emergency slaughter and microbiology, preservation, and public health hazard of animal, poultry and fish meat. As well as, he/she should have gained the practical skills of inspecting and examining animal, poultry and fish carcasses and their meat products.

III. Intended learning outcomes (ILOs) of the course:			
(A) Knowledge and Understanding:			
Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Knowledge and Understanding.			
Program Intended Learning Outcomes (Sub-PILOs) in: Knowledge and Understanding		Course Intended Learning Outcomes (CILOs) in: Knowledge and Understanding	
After completing this program, students will be able to:		After completing this course, students will be able to:	
A1-	Demonstrate a sound knowledge and understanding of concepts and principles of general culture, basic science, and that support veterinary medicine.	a1-	Show knowledge and understanding the basics of slaughterhouse designs, methods of slaughter, emergency slaughter and pre-slaughter treatments.
A3-	Identifies various causes of animal diseases, animal epidemics and how they can be diagnosed; including common and life-threatening diseases of animals, poultry and fish.	a2-	Recall the judgment of abnormal changes and diseases found in meats and their products.
Teaching And Assessment Methods For Achieving Learning Outcomes:			
Alignment of Learning Outcomes of Knowledge and Understanding to Teaching and Assessment Methods:			

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Course Intended Learning Outcomes (CILOs) in Knowledge and Understanding		Teaching strategies/methods to be used	Methods of assessment
completing this course, students will be able to:			
a1-	Show knowledge and understanding the basics of slaughterhouse designs, methods of slaughter, emergency slaughter and pre-slaughter treatments.	<ul style="list-style-type: none"> ▪ Lecture ▪ Dialogue and discuss ▪ Practical practice ▪ Scientific visits 	<ul style="list-style-type: none"> ▪ Written examination ▪ Quiz ▪ Oral examination ▪ Practical examination
a2-	Recall the judgment of abnormal changes and diseases found in meats and their products.	<ul style="list-style-type: none"> ▪ Field clinical training ▪ brain storming ▪ self-learning 	<ul style="list-style-type: none"> ▪ Activities ▪ Reports evaluation

(B) Intellectual Skills:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: **Intellectual skills**

Program Intended Learning Outcomes (Sub-PILOs) in Intellectual skills		Course Intended Learning Outcomes (CILOs) of Intellectual Skills	
After completing this program, students will be able to:		After completing this course, students will be able to:	
B1-	Competently practices analytical and critical thinking skills in studying and assessing health problems and reading the results of animal medical examinations that is related to sciences.	b1-	Judge abattoir cases that either pass partially or totally condemned.
B3-	Design appropriate nursing and treatment care plans for different diseases that affect animals, prioritizing treatment.	b2-	Interpret laboratory and sensory findings correctly for the evaluation of the wholesomeness of meat and meat products.

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of Intellectual Skills to Teaching Methods and Assessment Methods:

Course Intended Learning Outcomes (CILOs) in Intellectual Skills.	Teaching strategies/methods to be used	Methods of assessment
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After completing this course, students will be able to:		<ul style="list-style-type: none"> ▪ Dialogue and discuss ▪ Lecture ▪ Practical practice ▪ Problem solving ▪ Working in groups ▪ Scientific visits ▪ Field clinical training ▪ Simulation and demos ▪ Researches and projects 	<ul style="list-style-type: none"> ▪ Written examination ▪ Oral examination ▪ Practical examination ▪ Performance notice ▪ Achievement file ▪ Reports evaluation ▪ Proposal evaluation
b1-	Judge abattoir cases that either pass partially or totally condemned.		
b2-	Interpret laboratory and sensory findings correctly for the evaluation of the wholesomeness of meat and meat products.		

(C) Professional and Practical Skills:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: **Professional and Practical Skills**

Program Intended Learning Outcomes (Sub-PILOs) in Professional and Practical Skills		Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills	
After completing this program, students will be able to:		After completing this course, students will be able to:	
C2-	Practices practical, diagnostic, clinical and research skills, including the collection of samples in various fields of veterinary medicine and related sciences, in a safe and effective manner, considering the ethics of the profession.	c1-	Prepare meat samples & examine organoleptically, chemically and microbiologically.
C3-	Reads the results of laboratory investigations and diagnostic scans and writes reports and prescriptions for all common cases in a proper way.	c2-	Apply good hygiene practices, e.g. based on HACCP principles, during slaughter and meat processing.

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of Professional and Practical Skills to Teaching and Assessment Methods:

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Course Intended Learning Outcomes (CILOs) in Professional and Practical Skills		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:		<ul style="list-style-type: none"> ▪ Practical practice ▪ Problem solving ▪ Working in groups ▪ Problem solving ▪ Scientific visits ▪ Case study ▪ Field clinical training ▪ Simulation & demos ▪ Researches and projects 	<ul style="list-style-type: none"> - Written examinations - Oral examinations - Practical examination - Performance notice - Achievement file - Reports evaluation - Proposal evaluation
c1-	Prepare meat samples & examine organoleptically, chemically and microbiologically.		
c2-	Apply good hygiene practices, e.g. based on HACCP principles, during slaughter and meat processing.		

(D) General / Transferable Skills:

Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: **General and Transferable skills**

Program Intended Learning Outcomes (PILOs) in General / Transferable skills		Course Intended Learning Outcomes (CILOs) in General / Transferable skills	
After completing this program, students will be able to:		After completing this course, students will be able to:	
D1-	Communicates effectively with other fellow professions and animal owners and expresses his ideas clearly and objectively.	d1-	Communicate with professional groups, colleagues, and food organizations.
D4-	Works in normal conditions, crises and epidemics, alone and effectively within a medical team.	d2-	Utilize computer and internet skills.

Teaching And Assessment Methods For Achieving Learning Outcomes:

Alignment of Learning Outcomes of General and Transferable skills to Teaching and Assessment Methods:

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Course Intended Learning Outcomes (CILOs) in General and Transferable Skills		Teaching strategies/methods to be used	Methods of assessment
After completing this course, students will be able to:		<ul style="list-style-type: none"> ▪ Dialogue and discuss ▪ Working in groups ▪ Scientific visits ▪ Researches and projects ▪ Self learning ▪ Simulation and demos ▪ Problem solving 	<ul style="list-style-type: none"> ▪ Achievement file ▪ Reports evaluation ▪ Proposal evaluation ▪ Performance notice ▪ Practical examinations
d1-	Communicate with professional groups, colleagues, and food organizations.		
d2-	Utilize computer and internet skills.		

IV. Course Content:					
1 – Course Topics/Items:					
a – Theoretical Aspect					
Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours
1	Introduction, Abattoir (types and essential requirement)	a1, a2, b1, b2 c1, c2	Construction and equipment of slaughter houses & meat plants	1	2
2	Management of abattoir operations	a1, a2, b1, b2 c1, c2	Sanitary requirements for the slaughterhouse	1	2
3	Transportation of animals to the slaughter	a1, a2, b1, b2 c1, c2	Transportation diseases	2	4
4	Hygienic care in lairage	a1, a2, b1, b2 c1, c2	Fasting and feeding of animals	1	2
5	Ante-mortem inspection	a1, a2, b1, b2 c1, c2	Diseases encountered on Ante-mortem inspection-slaughtering	1	2

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6	Post-mortem inspection-stamping	a1, a2, b1, b2 c1, c2	Imperfect bleeding	1	2
7	lymphatic system/ Rigor mortis	a1, a2, b1, b2 c1, c2	Rigor mortis	2	4
8	parasitic diseases	a1, a2, b1, b2 c1, c2	Judgment	1	2
9	Bacterial diseases	a1, a2, b1, b2 c1, c2	Judgment	1	2
10	Viral diseases	a1, a2, b1, b2 c1, c2	Judgment	1	2
11	Slaughtering of poultry	a1, a2, b1, b2 c1, c2	Judgment	1	2
12	HACCP and ISO in abattoir	a1, a2, b1, b2 c1, c2	Analysis of results collected during using of the HACCP	1	2
Number of Weeks /and Units Per Semester				14	28

b- Training Aspect:				
Order	Training Tasks	CILOs (symbols)	Number of weeks	Contact hours
1	Slaughtering and bleeding	a1, a2, b1, b2 c1, c2	1	2
2	Quality of meat (Examination of bleeding)	a1, a2, b1, b2 c1, c2	1	2
3	Abnormal colors examination	a1, a2, b1, b2 c1, c2	1	2
4	Abnormal flavor of meat examination	a1, a2, b1, b2 c1, c2	1	2
5	Testing of meat for freshness and spoilage	a1, a2, b1, b2 c1, c2	1	2
6	Measuring of pH	a1, a2, b1, b2 c1, c2	1	2
7	Bacteriological examination of meat and meat products	a3, b1, b3, c1, c3, d1	1	2
8	Detection of residues	a1, a2, b1, b2 c1, c2	1	2
9	Anatomical variations	a1, a2, b1, b2 c1, c2	1	2

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10	Examination of poultry meat	a1, a2, b1, b2 c1, c2	1	2
11	Examination of fish meat	a1, a2, b1, b2 c1, c2	1	2
12	Examination of canned food	a1, a2, b1, b2 c1, c2	1	2
13	Abattoir visit	a1, a2, b1, b2 c1, c2	1	2
14	Poultry abattoir visit	a1, a2, b1, b2 c1, c2	1	2
Number of Weeks /and Units Per Semester			14	28

V. Teaching strategies of the course:

- Lectures depending on the sharing efforts of the students and supported with macromedia and multimedia aids.
- Training visits to slaughter houses.
- Practical sections: Laboratory examination of meat, meat products, by chemical and microbiological methods.
- Self-learning (Electronic learning, Seminars, scientific search on related websites, international, national and local journals, related books in faculty library).
- Summer training course.
- Assays and reviews.
- Discussion groups.

3-Assessment Methods:

- Written examination: For assessment of knowledge, back calling and Intellectual skills.
- Practical examination: For assessment of practical and professional skill.
- Oral examination: For assessment of knowledge and Intellectual skills.
- Student activities: For assessment of knowledge and general and transferable skills.

I. Schedule of Assessment Tasks for Students During the Semester:

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No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes (CILOs symbols)
1	Participation, quizzes and assignments	2-14	10	10%	a1, a2, b1, b2 c1, c2,d1
2	Mid-Term Exam	8	10	10%	a1, a2, b1, b2 c1, c2
3	Mid-Term Practical Exam	8	10	10%	a1, a2, b1, b2 c1, c2
	Final Practical Exam	15	10	10%	a1, a2, b1, b2 c1, c2
5	Oral Exam	16	5	5%	a1, a2, b1, b2 c1, c2
6	Final Exam	16	55	55%	a1, a2, b1, b2 c1, c2
	Total		100	100%	

VI. Students' Support:

Office Hours/week	Other Procedures (if any)
From Saturday to Wednesday at 8:00 a.m. till 2 p.m.	Student can contact with me via e-mail

VII. Learning Resource (MLA style or APA style)S:

Required Textbook(s) (maximum two)

- El-Khateib, T., 2006. Atlas Meat Inspection. 1st Ed.
- Hutkins, R. W., 2006. Microbiology and Technology of Fermented Foods. 1st Ed., Blackwell Publ.

Recommended Readings and Reference Materials

- Bhuyan, M. 2007. Measurement and Control in Food Processing. 1st Ed., Taylor and Franis.
- Food science 2007: 4th ed. published by new age international (p) ltd. Publishers.
- James M. Jay. 2006. Modern Food Microbiology.
- Kowale, B. 2008. Methods in Meat Science.

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Essential References	
	<ul style="list-style-type: none"> - Alan H. Varnam 1995. Meat and Meat Products. - El-Khateib, T., 2006. Atlas Meat Inspection. 1st Ed. - Gracey, J. and Collins, D. 1992. Meat hygiene. - Grist A. 2008. Porcine Meat Inspection. Anatomy, physiology and disease conditions. Nottingham University Press. - Hui, Y.H. 2001. Meat science and applications. - Hutkins, R.W., 2006. Microbiology and Technology of Fermented Foods. 1st Ed., Blackwell Publ. - Mortimore, S. 1994. Haccp A Practical Approach. - Spanire, A.M., 2004. Quality of Fresh and Processed Foods. 1st Ed., Kluwer Academic - wames, P.D. 2000. Meat science. - Wilson W. G. 2005. Wilson's Practical Meat Inspection. VII Edition, Blackwell Publishing
Electronic Materials and Web Sites etc.	
	<ul style="list-style-type: none"> - WWW.PubMed.com - Intrnational of veterinary information services (IVIS) - www.Vet.net.com - journal of food protection - Science Direct web site
Other Learning Material:	
	<ul style="list-style-type: none"> - Department notes: available for students to purchase from the department. - White board, overhead projector and data show presentations used during teaching. - Laboratory , apparatus, Chemicals, glasses reagents and media, Kits.

X. Course Policies:	
1	Class Attendance: Mandatory to attend all course lectures
2	Tardiness: Not allowed at all. Students must be in class or in the practical session 10 minutes prior to the beginning of lectures or practical session
3	Exam Attendance/Punctuality: Attendance is mandatory; absence is accepted with valid excuse

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4	<p>Assignments & Projects: All assignments and projects are to be submitted on their due date. Any assignment turned in after the due date will not be accepted without valid and reasonable excuse</p>
5	<p>Cheating: Not tolerated and may lead to EXPELLING the student from the program</p>
6	<p>Plagiarism: Not tolerated AT ALL and may lead to EXPELLING the student from the program</p>
7	<p>Other policies:</p> <ol style="list-style-type: none"> 1.All devices must be on silent or at least on vibration during lectures/labs 2.Before any exam (written, oral) we must check student's identity (student's card, ID, passport). Without any of these documents, the student will not be allowed in the exam room. 3.Any of type/ form of cheating is not allowed no matter what. 4.Maintain silence during lectures/exam and disturbance is not allowed. For any questions students should raise their hand and wait for permission to talk.

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Course Plan of Meat Hygiene

X. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Faris M. A. Al-zailay	Office Hours					
Location & Telephone No.	770667223. Dhamar gov.	SAT	SUN	MON	TUE	WED	THU

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E-mail	Farisvet4@gmail.com	8am 2pm	8am 2pm	8am 2pm	8am 2pm	8am 2pm	-
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XI. Course Identification and General Information:

1	Course Title:	Meat Hygiene				
2	Course Number & Code:	PA577				
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2	-	1		3
4	Study level/year at which this course is offered:	Fifth Year: First Semester				
5	Pre –requisite (if any):	MI352, MI355, MI353, MI357				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered	Bachelor's degree (B. Sc.) Veterinary medicine				
8	Language of teaching the course:	English				
9	System of Study:	Regular / Semester				
10	Mode of delivery:	Lectures and Practical				
11	Location of teaching the course:	Faculty of veterinary medicine				

II. Course Description:

The course aimed at teaching the future veterinary professionals the responsibilities within the scope of public health protection through learning and training: macroscopic, bacteriological, serological, parasitological, physicochemical and organoleptic tests of meat, methods of sanitary inspection of meat, responsibilities within veterinary inspection of animal markets, transport and slaughterhouses.

II. Intended learning outcomes (ILOs) of the course:

At the end of course, students will be able to:

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- a1- Show knowledge and understanding the basics of slaughterhouse designs, methods of slaughter, emergency slaughter and pre-slaughter treatments.
 a2- Recall the judgment of abnormal changes and diseases found in meats and their products.
 b1- Judge abattoir cases that either pass partially or totally condemned.
 b2- Interpret laboratory and sensory findings correctly for the evaluation of the wholesomeness of meat and meat products.
 c1- Prepare meat samples & examine organoleptically, chemically and microbiologically.
 c2- Apply good hygiene practices, e.g. based on HACCP principles, during slaughter and meat processing.
 d1- Communicate with professional groups, colleagues, and food organizations.
 d2- Utilize computer and internet skills.

V. Course Content:

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Introduction, Abattoir (types and essential requirement)	1	2
2	Management of abattoir operations	2	2
3	Transportation of animals to the slaughter	3,4	4
4	Hygienic care in lairage	5	2
5	Ante-mortem inspection	6	2
6	Post-mortem inspection- stamping	7	2
7	Mid-Term Exam	8	2
8	lymphatic system/ Rigor mortis	9,10	4
9	parasitic diseases	11	2
10	Bacterial diseases	12	2
11	Viral diseases	13	2
12	Slaughtering of poultry	14	2

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13	HACCP and ISO in abattoir	15	2
14	Final Exam	16	2
Number of Weeks /and Units Per Semester		16	32

b- Training Aspect:			
Order	Training Tasks	Week Due	Contact hours
1	Slaughtering and bleeding	1	2
2	Quality of meat (Examination of bleeding)	2	2
3	Abnormal colors examination	3	2
4	Abnormal flavor of meat examination	4	2
5	Testing of meat for freshness and spoilage	5	2
6	Measuring of pH	6	2
7	Bacteriological examination of meat and meat products	7	2
8	Mid-Term Exam	8	2
9	Detection of residues	9	2
10	Anatomical variations	10	2
11	Examination of poultry meat	11	2
12	Examination of fish meat	12	2
13	Examination of canned food	13	2
14	Abattoir visit	14	2
15	Poultry abattoir visit	15	2

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16	Final Exam	16	2
Number of Weeks /and Units Per Semester		16	32

V. Teaching strategies of the course:

- Lectures depending on the sharing efforts of the students and supported with macromedia and multimedia aids.
- Training visits to the slaughterhouse.
- Practical sections: Laboratory examination of meat, meat products, by chemical and microbiological methods.
- Self-learning (Electronic learning, Seminars, scientific search on related websites, international, national and local journals, related books in faculty library).
- Summer training course.
- Assays and reviews.
- Discussion groups.

VI. Assessment Methods:

- Written examination: For assessment of knowledge, back calling and Intellectual skills.
- Practical examination: For assessment of practical and professional skill.
- Oral examination: For assessment of knowledge and Intellectual skills.
- Student activities: For assessment of knowledge and general and transferable skills.

No.	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Participation, quizzes and assignments	2-14	10	10%
2	Mid-Term Exam	8	10	10%
3	Mid-Term Practical Exam	8	10	10%
4	Final Practical Exam	15	10	10%
	Oral Exam	16	5	5%

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5	Final Exam	16	55	55%
	Total		100	100%

II. Learning Resources:

1- Required Textbook(s) (maximum two).

- El-Khateib, T., 2006. Atlas Meat Inspection. 1st Ed.
- Hutkins, R. W., 2006. Microbiology and Technology of Fermented Foods. 1st Ed., Blackwell Publ.

2- Essential References.

- Alan H. Varnam 1995. Meat and Meat Products.
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3- Electronic Materials and Web Sites etc.

- WWW.PubMed.com
- Intrnational of veterinary information services (IVIS)
- www.Vet.net.com
- journal of food protection
- Science Direct web site

Prepared by
 Dr. Faris Al-zailay

Vice Dean For Quality
 Affairs
 Dr. Abdulraqeb Alshami

Dean of the Faculty
 Ass. Prof. Dr. Abdu Alraoof
 Al-Shawkany

Dean of Development
 Center & Quality
 Assurance
 Ass. Prof. Dr. Huda Al-
 Emad

Rector of Sana'a University
 Prof. Dr. Al-Qassim Mohammed Abbas



XI. Course Policies:	
1	Class Attendance: Mandatory to attend all course lectures
2	Tardiness: Not allowed at all. Students must be in class or in the practical session 10 minutes prior to the beginning of lectures or practical session
3	Exam Attendance/Punctuality: Attendance is mandatory; absence is accepted with valid excuse
4	Assignments & Projects: All assignments and projects are to be submitted on their due date. Any assignment turned in after the due date will not be accepted without valid and reasonable excuse
5	Cheating: Not tolerated and may lead to EXPELLING the student from the program
6	Plagiarism: Not tolerated AT ALL and may lead to EXPELLING the student from the program
7	Other policies: 1.All devices must be on silent or at least on vibration during lectures/labs 2.Before any exam (written, oral) we must check student's identity (student's card, ID, passport). Without any of these documents, the student will not be allowed in the exam room. 3.Any of type/ form of cheating is not allowed no matter what. 4.Maintain silence during lectures/exam and disturbance is not allowed. For any questions students should raise their hand and wait for permission to talk.

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			محمد عباس