### ATTACHMENT 2 (e)

### Course Specifications

**Kingdom of Saudi Arabia**

**The National Commission for Academic Accreditation & Assessment**

**Course Specifications**

**(CS)**

**Meat Science and Technology (FSN 439)**

**Course Specifications**

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| Institution: King Saud University Date of Report: 10-02-2014 |
| College/Department: Food Science and Human Nutrition |

**A. Course Identification and General Information**

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| 1. Course title and code: Meat Science and Technology (FSN 439) |
| 2. Credit hours: 4 (2+2) |
| 3. Program(s) in which the course is offered.  (If general elective available in many programs indicate this rather than list programs)  Food Sciences and Human Nutrition |
| 4. Name of faculty member responsible for the course  Dr . Fahad Y. Al- Juhaimi |
| 5. Level/year at which this course is offered: Level 8/ Year 4 |
| 6. Pre-requisites for this course (if any)  Principles of Food Science (FSN-202) and Cooperative Learning (FSN-400) |
| 7. Co-requisites for this course (if any)  None |
| 8. Location if not on main campus |
| 9. Mode of Instruction (mark all that apply)  ✓  80  a. Traditional classroom What percentage?  ✓  10  b. Blended (traditional and online) What percentage?  10  c. e-learning What percentage?  ✓  d. Correspondence What percentage?  f. Other What percentage?  Comments: |

**B Objectives**

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| 1. What is the main purpose for this course?   * Understanding the principles of Meat Science and Other related fields. * Be familiar with different animal slaughter methods. * Understanding how muscles converted to meat * Be able to Identify standard meat cuts, and factors affecting meat quality and safety before and after slaughter. * Gain knowledge about poultry slaughtering, processing and packaging. * Understanding the application methods used in processing of meat, poultry and fish products. * Be familiar with methods apply to preserve and store meat, poultry, fish and their products. |
| 2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)   * Re- evaluating and updating course content according to recent science and technology related to the field of meat science and technology. * Use of new web sites related to meat science and technology. |

**C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)**

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| 1. Topics to be Covered | | |
| List of Topics | No. of  Weeks | Contact Hours |
| Introduction to Meat Science and its relation with other sciences | 0.5 | 1 |
| The importance of meat (economical and nutritional) and the Kingdom's efforts in making them available | 0.5 | 1 |
| Slaughter house, importance, requirements  Factors have to be taken into account before slaughtering | 0.5 | 1 |
| Different methods of slaughtering  Stamps and their importance | 1 | 1 |
| Structure and functions of meat muscle | 1 | 2 |
| Conversion of muscle to meat:  -Postmortem changes in meat muscle  -Electrical stimulation | 1.5 | 2 |
| Chemical composition of meat | 0.5 | 1 |
| Factors affecting meat palatability:  -Colour  -Tenderness  -Juiciness  -Flavour | 1 | 2 |
| First Midterm exam | 1 | 1 |
| Meat grading | 1 | 1 |
| Poultry slaughtering and preparation | 0.5 | 1 |
| Chemical composition and nutritional value of poultry and their sensory attributes | 0.5 | 2 |
| Fish (Introduction):  Classification of Fish  Body Structure of Fish  Weight Structure of Fish | 0.5 | 1 |
| Physical properties of Fish:  Shape, Size, specific area, specific weight, Bulk weight, Natural angle of repose, Angle of slip and Coefficient of friction | 1 | 1 |
| Changes in fish after death:  Release of mucus, Rigor mortis, Autolysis, Bacterial decomposition | 0.5 | 1 |
| Chemical composition and nutritional value of fish | 0.5 | 1 |
| Determination of fish quality:  TVBN, TMA, Thiobarbituric, FFA | 0.5 | 1 |
| Introduction to meat technology and the objectives of meat processing  -Types of meat processed products | 0.5 | 1 |
| Raw materials for processed meat | 0.5 | 1 |
| Smoking (meat and fish)  Drying (meat and fish) | 0.5 | 1 |
| Canning ( meat and fish ) | 0.5 | 1 |
| Sausages products | 0.5 | 1 |
| Calculation of principal ingredients used in processing of meat products | 0.5 | 1 |

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| 2. Course components (total contact hours and credits per semester): | | | | | | |
|  | Lecture | Tutorial | Laboratory | Practical | Other: | Total |
| Contact  Hours | 28 |  |  | 56 |  | 84 |
| Credit | 2 |  |  | 2 |  | 4 |

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| 3. Additional private study/learning hours expected for students per week.  3 |

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| 4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy |

Course Learning Outcomes, Assessment Methods, and Teaching Strategy work together and are aligned. They are joined together as one, coherent, unity that collectively articulate a consistent agreement between student learning, assessment, and teaching.

The ***National Qualification Framework*** provides five learning domains. Course learning outcomes are required. Normally a course has should not exceed eight learning outcomes which align with one or more of the five learning domains. Some courses have one or more program learning outcomes integrated into the course learning outcomes to demonstrate program learning outcome alignment. The program learning outcome matrix map identifies which program learning outcomes are incorporated into specific courses.

On the table below are the five NQF Learning Domains, numbered in the left column.

**First**, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. **Fourth**, if any program learning outcomes are included in the course learning outcomes, place the @ symbol next to it.

Every course is not required to include learning outcomes from each domain.

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|  | **NQF Learning Domains**  **And Course Learning Outcomes** | **Course Teaching**  **Strategies** | **Course Assessment**  **Methods** |
| **1.0** | **Knowledge** | | |
| 1.1 | Rationalizing the principles of meat science and technology | Lectures  Practicals | Homework and reports  Exams |
| 1.2 | Knowing national and international standards and specification related to meat and meat products quality and safety. | Lecture  Reports |
| 1.3 | Be able to understand the nutritional and economical/social importance of meat, poultry and fish. | Lecture  Essay |
| 1.4 | Be able to discuss the impact of the slaughter houses in providing wholesome safe meats for human consumption. | Lecture  Visit to slaughter house |
| 1.5 | Be able to differentiate between the different processed products (cured, dried, smoked, canned, etc) | Lecture  Practical session  Self observation |
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| **2.0** | **Cognitive Skills** | | |
| 2.1 | Students are able to understand skills required by a meat processing professional | Lectures, modules and | Quizzes  Mid-terms Exams  Practical exams  Homework and laboratory reports |
| 2.2 | Students know about the equipments and processing machines used in meat processing | Videos  Laboratory |
| 2.3 | Student become familiar with different standards related to meat products and their safety issue | practice  Field trips |
| 2.4 | Be able to identify standard meat cuts and factors affecting meat quality and safety before and after slaughter. | Lecture  Practical session |
| 2.5 | Be able to understand postmortem changes in meat muscles and their conversion to human food | Lecture  Essay |
| 2.6 | Be able to give decision on meat quality according to factors affecting their palatability. | Lecture and observations |
| 2.7 | Be able to explain the processes associated with poultry preparation. | Visit to poultry farm |  |
| 2.8 | Be able to apply skills and knowledge to give decision on freshness of fish. | Lecture  Practical session |
| 2. | Be able to explore the functions of raw materials for processed meat. | Lecture  Practical session |
| **3.0** | **Interpersonal Skills & Responsibility** | | |
| 3.1 | Students are able to illustrate and use a process in meat science and technology | Lectures, and practice | Practical exams  Theoretical exams  Homework and laboratory reports  Presentation |
| 3.2 | Participants can explain, predict and analyse meat products quality | Practical demonstration |
| 3.3 | Student can demonstrate and write about processing methods in meat technology | Practical and reports |
| 3.4 | Student can use different types of meats (chicken, animals and fish) food product development | Practicals |
| **4.0** | **Communication, Information Technology, Numerical** | | |
| 4.1 | Participant can carry out research in meat science and technology | Practical demonstration | Practical exams and reports |
| 4.2 | Participant can work for designing a process for meat products | Lecture and reports |
| **5.0** | **Psychomotor** | | |
| 5.1 | The participant can perform a certain experiment about meat technology | Practical demonstration | Practical exams and reports |
| 5.2 | Student can demonstrate a skill obtained in this course to others who are less familiar with the science of this field | Practicals |

**Suggested Guidelines for Learning Outcome Verb, Assessment, and Teaching**

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| **NQF Learning Domains** | **Suggested Verbs** |
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| **Knowledge** | list, name, record, define, label, outline, state, describe, recall, memorize, reproduce, recognize, record, tell, write |
| **Cognitive Skills** | estimate, explain, summarize, write, compare, contrast, diagram, subdivide, differentiate, criticize, calculate, analyze, compose, develop, create, prepare, reconstruct, reorganize, summarize, explain, predict, justify, rate, evaluate, plan, design, measure, judge, justify, interpret, appraise |
| **Interpersonal Skills & Responsibility** | demonstrate, judge, choose, illustrate, modify, show, use, appraise, evaluate, justify, analyze, question, and write |
| **Communication, Information**  **Technology, Numerical** | demonstrate, calculate, illustrate, interpret, research, question, operate, appraise, evaluate, assess, and criticize |
| **Psychomotor** | demonstrate, show, illustrate, perform, dramatize, employ, manipulate, operate, prepare, produce, draw, diagram, examine, construct, assemble, experiment, and reconstruct |

Suggested ***verbs not to use*** when writing measurable and assessable learning outcomes are as follows:

Consider Maximize Continue Review Ensure Enlarge Understand

Maintain Reflect Examine Strengthen Explore Encourage Deepen

Some of these verbs can be used if tied to specific actions or quantification.

**Suggested assessment methods and teaching strategies are:**

According to research and best practices, multiple and continuous assessment methods are required to verify student learning. Current trends incorporate a wide range of rubric assessment tools; including web-based student performance systems that apply rubrics, benchmarks, KPIs, and analysis. Rubrics are especially helpful for qualitative evaluation. Differentiated assessment strategies include: exams, portfolios, long and short essays, log books, analytical reports, individual and group presentations, posters, journals, case studies, lab manuals, video analysis, group reports, lab reports, debates, speeches, learning logs, peer evaluations, self-evaluations, videos, graphs, dramatic performances, tables, demonstrations, graphic organizers, discussion forums, interviews, learning contracts, antidotal notes, artwork, KWL charts, and concept mapping.

Differentiated teaching strategies should be selected to align with the curriculum taught, the needs of students, and the intended learning outcomes. Teaching methods include: lecture, debate, small group work, whole group and small group discussion, research activities, lab demonstrations, projects, debates, role playing, case studies, guest speakers, memorization, humor, individual presentation, brainstorming, and a wide variety of hands-on student learning activities.

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| 5. Schedule of Assessment Tasks for Students During the Semester | | | |
|  | Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.) | Week Due | Proportion of Total Assessment |
| 1 | Quizzes | Weekly | 5% |
| 2 | First theoretical exam | 6 | 12% |
| 3 | Seconded theoretical exam | 11 | 13% |
| 4 | First practical exam | 7 | 10% |
|  | Second practical exam | 12 | 10% |
| 5 | Practical reports | Periodically | 10% |
| 6 | Final exam | 14 | 40% |

**D. Student Academic Counseling and Support**

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| 1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)  Office hours : 3 hours/week |

**E. Learning Resources**

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| 1. List Required Textbooks  Hand book prepared by the instructor |
| 2. List Essential References Materials (Journals, Reports, etc.)  A- Arabic References   * أساسيات علم اللحوم- جون فورست- ترجمة محارب عبدالحميد طاهر. 1983م. كلية الزراعة –جامعة البصرة. * تكنلوجيا المنتجات السمكية- ترجمة مازن الهندي. 1983م . وزارة التعليم العالي و البحث العلمي- الجمهورية العراقية. * تكنولوجيا اللحوم – عصمت محمد الزلاقي. 2001م. مكتبة المعارف الحديثة. الأسكندرية. جمهورية مصر العربية. * تقنية اللحوم. يوسف الشريك. 2005. منشورات جامعة الفاتح. الجماهيرية الليبية. * تكنلوجيا اللحوم و الأسما***ك***- منير عبود جاسم الطائي. 1987م. كلية الزراعة –جامعة البصرة.   B- English References:   * Kisman, D., Kotula, A., Breidenstein, B.C. 1994. ***Muscle Foods*.** Chapman & Hall, Inc. New York.   Pearson, A.M and Tauber, F.M. 1984. ***Processed Meat***. Van Nostrand Reinhold Company. New York |
| 3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)   * Journal of Meat Science * Journal of Processed Meat * Poultry Science * Journal of Food Science |
| 4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)   * http://www.sciencedirect.com * Internet search engines * Smart boards |
| 5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.   * Microsoft Office, multimedia |

**F. Facilities Required**

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| Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.) |
| 1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)   * Lecture room for at least 30 students equipped with Lab top computer and projector and Net work connection * Laboratory for at least 30 students equipped with different meat processing equipments which include grinders, mixers, emulsifiers, ovens, sausage makers, smoke house etc. |
| 2. Computing resources (AV, data show, Smart Board, software, etc.)   * Smart board screen that is connected with computer and also can be connected to laptop pc. |
| 3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)   * Different basic equipments can be used such as, meat cutting tools, meat processing facilities, texture analyser, fish freshness meeter, proximate analysis equipments etc. |

**G Course Evaluation and Improvement Processes**

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| 1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching   * In Class feedback at mid semester time by asking questions on an anonymous form. Suggestions can be used to make up the deficiencies for the remaining period. * Students are requested to fill an anonymous online survey related to course contents, deficiencies and teaching methods etc., * End of the semester feedback teacher’s evaluation performance are used to get the students feedback. * Students can evaluate the teaching capabilities, contents delivered, and communication skills of the instructor. * Survey Feedback data is analyzed and used to upgrade the course contents, teaching skills of the instructor. |
| 2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor   * Small Group Analysis method of getting feedback from students by department representative other than instructor. Students are asked to suggest what is needed to improve the course. |
| 3 Processes for Improvement of Teaching   * Continuous improvements in the course contents according to the requirements of local job market and international scientific developments * Close collaboration with the other institutions offering the same course. * Consideration of the student’s interests and suggestions gathered through teacher's evaluation Performa. * Attend workshops, related to teaching skills improvement, offered by the Deanship of Quality at KSU. |
| 4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)   * Supervisors of students during industrial training are requested to evaluate their performance. * Students’ assignments and exams should be evaluated by eternal examiners from different institutions or from within the department. * Product development competition supervised by industrial expert can be used as an evaluation method to access the student’s capabilities. |
| 5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.   * The course contents are re-evaluated every five year * The new information from different sources is gathered on annual basis. * Changes and improvements in the course contents are made on the basis of new information in the field of meat science and technology |

**Faculty or Teaching Staff: Dr . Fahad Y. AL-Juhaimi**

**Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date Report Completed: 16-02-2104**

**Received by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dean/Department Head**

**Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**