



SULTAN QABOOS UNIVERSITY
COURSE OUTLINE
PROGRAM: Fall

1. Course Code	FSHN3102	
2. Course Title	Elements of Food Engineering	
3. Credits	3CR, 12 CP, 6 ECTS	
4. Pre-requisite Course(s)	PHYS(2101 or 2107)	
5. Co-requisite Course(s)		
6. Equivalent Course(s)		
7. Incompatible Course(s)		
8. Course Category	<input type="checkbox"/> University Requirement	<input type="checkbox"/> University Elective
	<input checked="" type="checkbox"/> College Requirement	<input type="checkbox"/> College Elective
	<input type="checkbox"/> Department Requirement	<input type="checkbox"/> Department Elective
	<input type="checkbox"/> Specialization Requirement	<input type="checkbox"/> Specialization Elective
	<input type="checkbox"/> Other (specify):	
9. Course Owner	College:	Department:
10. Course Type	<input type="checkbox"/> Lecture	<input checked="" type="checkbox"/> Lecture/Lab
	<input type="checkbox"/> Lecture/Seminar	<input type="checkbox"/> Lecture/Studio
	<input type="checkbox"/> Lecture/Tutorial	<input type="checkbox"/> Lecture/Lab/Tutorial or Seminar
	<input type="checkbox"/> Tutorial	<input type="checkbox"/> Laboratory (Practical)
	<input type="checkbox"/> Field or Work Placement	<input type="checkbox"/> Studio
	<input type="checkbox"/> Seminar	<input type="checkbox"/> Internship
	<input type="checkbox"/> Workshop	<input type="checkbox"/> Project
17. Language of Instruction	English	
18. Course Description		
This course deals with the basic concepts of engineering principles based on fundamental physics and its applications in food processing. The major areas are the introduction to food process engineering, material and energy balance, psychrometrics, fluid flow in food processing, heat and mass transfer in heating/cooling equipment, freezing, evaporation, refrigeration, and drying. The overall course objective is to provide the student with necessary conceptual ideas and applications in designing unit operations including equipment fabrication, selections, and operations.		
19. Teaching/Learning Strategies		
Essential contents will be introduced through lectures. Practical examples and problems will be used to illustrate the principles. After class, students will be assigned with homework exercises and problems. Learning outcomes will be assessed continually through written assignments, quizzes and tests. Laboratory experiments will be performed by students to improve their understanding of the principles and their problem-solving ability.		
20. Assessment Components and Weight [%]		
<input type="checkbox"/> Quizzes 10	<input type="checkbox"/> Practical 10	<input type="checkbox"/> Other (specify):
<input type="checkbox"/> Homework assignments 5	<input type="checkbox"/> Project	
<input type="checkbox"/> In-term examination(s) 25	<input type="checkbox"/> Final examination 50	
21. Grading Method		
<input checked="" type="checkbox"/> A-F Scale <input type="checkbox"/> Pass/Not passed		
22. Textbook(s) and Supplemental Material		
R. Paul Singh and Dennis R. Heldman. 2003. Introduction to food engineering "4th edition", Academic Press, London. Supplementary D. R. Heldman and R. P. Singh. 1992. Handbook of Food Engineering. M. Dekker, New York.		

23. Matching Course Objectives with Program Outcomes and SQU Graduate Attributes		
SQU Graduate Attributes		
A. SQU graduates should be able to: 1. apply the knowledge and skills relevant to the specialization 2. communicate effectively and use information and communication technologies 3. critically analyze complex information and present it in simple clear manner	B. SQU graduates possess 1. interpersonal communication skills and alignment with culture of international labour market to assist them in practical life and in living successfully 2. skills and motivation for independent learning and engagement in lifelong learning and research 3. work ethics and positive values, and intellectual independence and autonomy 4. teamwork skills and display potential leadership qualities	C. SQU graduates should relish good citizenship qualities, be conscious of their national identity and be socially responsible, engage in community affairs and be mindful of contemporary issues.

#	Intended Student Learning Outcome /Course Learning Objective	Relevant Program Outcome(s)	Applicable Attribute(s)
1.	understand and apply the basic engineering principles and concepts in food processing;	An ability to apply food processing and engineering	A1
2.	calculate material and energy balances in common food processes;	Acquisition of necessary success skills (communication	B2
3.	analyze and solve heat transfer problems in food processing;	critical thinking/problem solving, professionalism, life-long learning, interaction, information acquisition, and organizational	A3,B2
4.	demonstrate skills in analytical and logical thinking as well as problem-solving abilities.	critical thinking/problem solving, professionalism, life-long learning, interaction, information acquisition, and organizational	A3,B2
5.	understand the major characteristics of fluid flow and quantify the energy of fluid transportation in food processes.	An ability to apply food processing and engineering	A3
6.	Students will be able to understand equipment used in the food industry such as heat exchanger and dryer	An ability to apply food processing and engineering	A1
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16. Student Responsibilities
<p>It is the student's responsibility to know and comply with all University Academic Regulations relevant to participation in this course. These regulations specifically include attendance requirement and students' academic code of conduct.</p> <p>For attendance, it is the student's responsibility to be punctual and to attend all classes.</p> <p>Students are expected to perform their work with honesty and avoid any academic misconduct, which is defined as the use of any dishonest or deceitful means to gain some academic advantage or benefit. This can take many forms, including but</p>

not limited to, the following: copying, plagiarism, collusion and forging documents. For full details, please refer to the Undergraduate Academic Regulations and to the Student Academic Misconduct Policy.

Additionally, this course requires that you:

COURSE INFORMATION			
Course Code	FSHN3102	Course Title	Elements of Food Engineering
Semester/ Year	Fall 17	Section(s)	1
Day, Time, and Place	TUE, 10:00-11:50, AGR120R and THU, 8:00-9:50, CMT/A01		
Course Coordinator	Dr Nasser Al-Habsi		
Office Location	AGR/Food Science	Office Hours	Mon,10:00-10:50 TUE,12:00-12:50 WED,10:00-10:50 TUE,10:00-10:50
Office Tel. Ext.	3663	Email	habsin@squ.edu.om

Tentative Schedule			
Week	Lecture #	Topic/Material to be covered	Assessment
1	1	Introduction of Food Processing and Engineering	
2	2	Introduction of Food Processing and Engineering	
3	3	Engineering Units and Dimensions, Size and Shape	
4	4	Food Process Analysis and Flow Diagram	Quiz 1
5	5	Materials and Energy Balance	
6	6	Energy for Food Processing	
7	7		
8	8	Fluid Flow in Food Processing	midterm exam 31 st October
9	9	Heat Transfer in Food Processing	
10	10	Refrigeration and Cooling Systems	
11	11	Evaporation	
12	12	Freezing	
13	13	Drying	
14	14	Psychrometry	
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APPENDIX A: INSTRUCTORS OF MULTIPLE SECTIONS

[illegible]

APPENDIX B: ADDITIONAL INFORMATION