

SULTAN QABOOS UNIVERSITY **COURSE OUTLINE PROGRAM:** Agricultural Engineering

1.	Course Code	SWAE4204			
2.	Course Title	Advances in Postharvest Technology			
3.	Credits	3CR, 12 CP, 6 ECTS			
4.	Pre-requisite Course(s)	MATH 2193 or MATH 1106, SWAE 2001 or 3 2107	SWAE 3203 and PHYS 2101 or PHYS		
5.	Co-requisite Course(s)	NA			
6.	Equivalent Course(s)				
7.	Incompatible Course(s)				
8.	Course Category	University Requirement University Elective			
		College Requirement	College Elective		
		Department Requirement	Department Elective		
		Specialization Requirement Specialization Elective			
		Other (specify):			
9.	Course Owner	College: CAMS	Department: SWAE		
10.	Course Type		Lecture/Lab		
		Lecture/Seminar	Lecture/Studio		
		Lecture/Tutorial Lecture/Lab/Tutorial or Seminar			
		Tutorial Laboratory (Practical)			
		Field or Work Placement Studio			
		Seminar Seminar	Internship		
		Workshop	Project		
11.	Language of Instruction	English			
12	Course Description				

12. Course Description

This course will explain the advances in postharvest technology to reduce losses, enhance quality, extend shelf life, improve safety, and add value to food and other biological products. Emphasis will be given on new technologies in drying, processing and packaging.

13. Teaching/Learning Strategies

Apart from normal lectures, videos and 4-5 laboratory sessions are also part of this course. Students will have to do a review project which will enable each student to carry out in-depth examination of selected topic in advanced postharvest technology on food products. Review topic outcomes have to be presented in oral sessions to the class as well as through a written report. There will be 1 midterm test, 1 comprehensive final and 4 announced quizzes to assess student achievements.

14. Assessment Components and Weight [%]

Quizzes 20	Practical 10	Other (specify):
Homework assignments	Project 10	
\square In-term examination(s) 20	Final examination 40	

15. Grading Method

A-F Scale Pass/Not passed

16. Textbook(s) and Supplemental Material

1."Emerging Technologies for Food Processing," Da-Wen Sun (Ed.) Elsevier Academic Press, U.K., 2005.

2."Thermal Processing of Packaged Food," D. Holdsworth and R. Simpson, Springer, New York, 2008.

3."Non-Thermal Preservation of Foods," G.V. Barbosa-Canovas, U.R. Pothakumary, E. Palou, B.G. Swanson, Marcel Dekker, New York, 1998.

4."Preservation of Food with Pulsed Electric Field," G.V. Barbosa-Canovas, M.M. Gongora-Nieto, U.R. Pothakumary, and B.G. Swanson, Academic Press, San Diego, CA, 1999.

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

#	Intended Student Learning Outcome	Relevant Program Outcome(s)	Applicable
	/Course Learning Objective		Attribute(s)
1.	Understand the importance of advance technologies in posthavest and quality management	Demonstrate proficiency in application of advanced postharvest technologies in real world food problems	A1
2.	Learn advanced and emerging technologies used for postharvest processing	 Work independently and in team environments at national and international levels. Learn emerging technologies and implement them for personal and employer's success. Contribute to the welfare of the society at regional and global levels. Maintain the standards of health, safety, environment and professional ethics at work and society 	A1, A2
3.	Understand theory and principle applied to different thermal & non thermal processing operations	An ability to apply knowledge of mathematics, science, and engineering.	A1, A3
4.	The ability to work in teams and explain experimental data relevant to postharvest technology	Contribute to the team in a meaningful manner to achieve the team's output	B4
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16. Student Responsibilities

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.

For attendance, it is the student's responsibility to be punctual and to attend all classes.

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 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	SWAE4203	Course Title	Advances in Postharvest Technology			
Semester/Year	Fall2021	Section(s)	10/11			
Day, Time, and Place						
Course Coordinator	Dr Pankaj Pathare					
Office Location	245 Anx	Office Hours				
Office Tel. Ext.	1222	Email	pankaj@squ.edu.om			

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Tentative Schedule						
Week	Lecture #	Topic/Material to be covered	Assessment			
1	Topic 1	Introduction to trends in postharvest technology				
		Current trends & future challenges in posthavarvest technology				
2	Topic 2	Minimal Processing - Definition, concepts, methods, merits & challenges				
3	Topic 3	Advances in food drying	5%			
		Osmotic dehydration, fluidized bed drying, hybrid Drying				
		Quiz 1				
4	Topic 4	Advances in thermal processing				
		infrared heating - theory, working principle & application				
5	Topic 4	Microwave heating -theory, working principle & application				
6	Topic 4	Ohmic heating -theory, working principle & application	5%			
		Quiz 2				
7	Topic 5	Importance of non-thermal processing techniques, Theory & application of				
		Pulse electric field (PEF) processing				
8	Topic 5	High pressure processing- theory, working principle & application	20%			
		Mid term examination				
9	Topic 6	Cooling techniques & refrigerated storage design				
		Different cooling methods, refrigration load caculation				
10	Topic 7	Recent adavnces & improvement in packaging technology	5%			
		Usese of different packaging materials				
		Quiz 3				
11	Topic 7	Smart packaging & interactive packaging				
12	Topic 8	Advances in quality measurement techniques				
		Overview of different non-destructive methods used for quality measurement				
13	Topic 8	Computer vision, image acquisition & processing, and its application				
14	Topic 9	Mathematical modelling application in postharvest technology	5%			
		Postharvest and Modeling, case study on food drying, cooling & packaging				
		Quiz 4				
15		Project/review topics	Final exam			
		Oral presentation of the project				
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APPENDIX A: INSTRUCTORS OF MULTIPLE SECTIONS							
Section	Instructor	Day, Time, and Place	Office Location and Extension	Email	Office Hours		

APPENDIX B: ADDITIONAL INFORMATION