



SULTAN QABOOS UNIVERSITY

COURSE OUTLINE

PROGRAM: Soil Sciences and Water Technology

1. Course Code	SWAE3305	
2. Course Title	Agroclimatology	
3. Credits	3 CR, 12 CP, 6 ECTS	
4. Pre-requisite Course(s)	PHYS1091 or PHYS2101 or PHYS2107	
5. Co-requisite Course(s)	None	
6. Equivalent Course(s)	SOIL3305(2-way)	
7. Incompatible Course(s)	None	
8. Course Category	<input type="checkbox"/> University Requirement	<input type="checkbox"/> University Elective
	<input type="checkbox"/> College Requirement	<input type="checkbox"/> College Elective
	<input type="checkbox"/> Department Requirement	<input checked="" type="checkbox"/> Department Elective
	<input type="checkbox"/> Specialization Requirement	<input type="checkbox"/> Specialization Elective
	<input type="checkbox"/> Other (specify):	
9. Course Owner	College: CAMS	Department: SWAE
10. Course Type	<input type="checkbox"/> Lecture	<input type="checkbox"/> Lecture/Lab
	<input type="checkbox"/> Lecture/Seminar	<input type="checkbox"/> Lecture/Studio
	<input checked="" 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
11. Language of Instruction	English	
12. Course Description		
This basic course deals with the description and analysis of the environmental boundary layer and its interaction with animal and plant life. Impacts and effects of global climate changes on agriculture are studied. Adaptations, modifications and environmental controls for sustainable agricultures are investigated.		
13. Teaching/Learning Strategies		
In this course, topics are organized in a very systematic and knowledge-constructive manner such that general introduction is given in the first topic followed by a general topic talking about earth's atmosphere and then each climatic factor affecting plant growth is separated in one topic. Lastly, after gaining enough understanding about these factors, their link with agriculture is highlighted and the course concludes by giving available technologies used to control these factors when they are not conducive for plant and livestock growth. lectures normally start with a revision on what has been covered last time before starting new material. The instructor always encourages student interaction and discussions. at the end of each lecture, students are encouraged to ask questions.		
14. Assessment Components and Weight [%]		
<input checked="" type="checkbox"/> Quizzes [15%]	<input type="checkbox"/> Practical	<input type="checkbox"/> Other (specify):
<input type="checkbox"/> Homework assignments	<input type="checkbox"/> Project	
<input checked="" type="checkbox"/> In-term examination(s) [35%]	<input checked="" type="checkbox"/> Final examination [50%]	
15. Grading Method		
<input checked="" type="checkbox"/> A-F Scale <input type="checkbox"/> Pass/Not passed		
16. Textbook(s) and Supplemental Material		
Class presentation /seminar materials; soft copies of presentations, supplementary notes will be provided in advance.		

Textbooks:

- Global Climatic Changes and Agriculture
FAO, Rome. Italy
- Wellburn, Alan. 1994. Air Pollution and climatic change: The biological impact. Longman Scientific and Technical, Burnt Mill, Essex (2nd ed.).
- Straub, Conrad P. 1989. Practical handbook of environmental control. CRC Press, Boca Raton, FLA

17. Matching Course Objectives with Program Outcomes and SQU Graduate Attributes

SQU Graduate Attributes

A. SQU graduates should be able to: <ol style="list-style-type: none"> 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 <ol style="list-style-type: none"> 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 <p>relish good citizenship qualities, be conscious of their national identity and be socially responsible, engage in community affairs and be mindful of contemporary issues.</p>
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#	Intended Student Learning Outcome /Course Learning Objective	Relevant Program Outcome(s)	Applicable Attribute(s)
1.	The basics of environmental sciences	An understanding of the environmental boundary layer	ABET [a]
2.	The environmental boundary layer	An ability to estimate crop water requirements using different methods	ABET [a, b, e, k]
3.	Elements of climatology and their impacts on agriculture	An ability to describe climatic elements as to their occurrence and measurement	ABET [a, e, k]
4.	Animal and crop response to global climatic changes	An understanding of the impacts of global climatic changes on animal and plant life	ABET [a]
5.	Environmental impacts of air pollutants	An understanding of the global environmental issues such as acid rain, global warming and ozone layer depletion	ABET [a, e, k]
6.	Natural and artificial climatic adaptations and modifications	An ability to use the psychometric chart to determine air/vapor mixture characteristics	ABET [a, e, k]
7.		An ability to solve simple cooling/heating problems	ABET [a, e]
8.			
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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:

1. Attend all exams: No make-up exams will be given without a written medical excuse or prior permission from the instructor.
2. Students are responsible for all materials covered in the class whether presented orally during lectures or assigned from the text.
4. No class assignment of any student will be graded once the same assignment is corrected and returned to the class.
5. Examinations: As stated in section 13, all assessments are based on class material, homework assignments, and assigned readings.

COURSE INFORMATION			
Course Code	SWAE3305	Course Title	Agroclimatology
Semester/ Year	Spring 2017	Section(s)	10
Day, Time, and Place	TUE 10:00-11:20 am & THU 8:00-9:20 am, classroom A04		
Course Coordinator	Dr. Abdulrahim Al-Ismaili		
Office Location	CAMS 246	Office Hours	SUN & THU, 10:00-13:00
Office Tel. Ext.	1226	Email	abdrahim@squ.edu.om

Tentative Schedule			
Week	Lecture #	Topic/Material to be covered	Assessment
1	Introduction	Weather and Climate Meteorology and Climatology The Earth (Geometry) The Earth (Greenwich line & Equator) The Earth (Orientation) The Earth (Rotation and Orbit) The Earth (Plane of Ecliptic)	
2	The Earth Atmosphere	Composition of Atmosphere Mass of Atmosphere Structure of Atmosphere	
3	Solar Radiation	Insolation over the Globe Solar Radiation (SR) Budget	Quiz#1
4	Solar Radiation	Radiation Balance Measurement of Radiation	
5	Temperature	Temperature and its measurement Spatial, seasonal and diurnal variations Physiological temperature Soil temperature Effect of temperature on animal and plants	
6	Atmospheric Pressure and Motion	Atmospheric pressure Surface pressure belts Forces governing air movement	Quiz#2
7	Atmospheric Pressure and Motion	General circulation of the atmosphere Local winds Seasonal variation in atmospheric circulation Measurement of surface winds	
8	Moisture in the Atmosphere	The hydrologic cycle Humidity Formation of precipitation Forms and types of precipitation Rain gauges.	Midterm Exam
9	Moisture in the Atmosphere	Evaporation and evapotranspiration	
10	Climate and Agriculture	Climate-crop relations	
11	Climate	Solar radiation, temperature moisture and wind	Quiz#3

	and Agriculture		
12	Climate and Agriculture	Climate and animal husbandry Acclimatization Edaphic and biotic factors	
13	Environmental Control	Heat and mass transfer in greenhouses	
14	Environmental Control	Physics of temperature and enthalpy The psychrometric chart	Quiz#4
15	Environmental Control	Evaporative cooling in greenhouses Problem solving	
16	Final Exams		Final Exam
17	Final Exams		

APPENDIX A: INSTRUCTORS OF MULTIPLE SECTIONS

[illegible]

APPENDIX B: ADDITIONAL INFORMATION

ABET Program Outcomes and Assessment (a-k Criterion 3) is followed in this course

- a. An ability to apply knowledge of mathematics, science, and engineering.
- b. An ability to design and conduct experiments, as well as an ability to analyze and interpret data.
- c. An ability to design a system, component, or process to meet desired needs.
- d. An ability to function on multi-disciplinary teams.
- e. An ability to identify, formulate and solve engineering problems.
- f. An understanding of professional and ethical responsibility.
- g. An ability to communicate effectively.
- h. The broad education necessary to understand the impact of engineering solutions in a global and societal context.
- i. A recognition of the need for, and an ability to engage in life-long learning.
- j. The knowledge of contemporary issues.
- k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.