SULTAN QABOOS UNIVERSITY

COURSE OUTLINE

PROGRAM: soil sciences

1. Course Code	SWAE 3302	
2. Course Title	Environmental Soil Chemistry	
3. Credits	3CR, 12 CP, 6 ECTS	
4. Pre-requisite Course (s)	SWAE 2201	
5. Co-requisite Course (s)	NA	
6. Equivalent Course (s)	NA	
7. Course Category (*Specify either as* Elective *or* Requirement *and appropriate level: College, Department, etc.)*	☐ University Requirement	☐ University Elective
	☐ College Requirement	☐ College Elective
	☒ Department Requirement	☐ Department Elective
	☐ Other (specify):	
8. Course Owner	College: CAMS	Department: SWAE
9. Course Type	Lecture/Lab	
10. Language of Instruction	English	

11. Course Description

A basic course that covers chemical phenomena in the soil-water-plant continuum which have bearing on plant growth in arid climates. Topics discussed include structure, composition and properties of primary minerals, clays, and oxides, ion exchange, adsorption, weathering and buffering, soil colloidal behavior, acidic and basic soils, salinity, and models of solution and solid phase interactions

12. Teaching/Learning Strategies

Apart from normal lectures, practical sessions are also an integral part of this course. Students will learn how to work in groups in the practical sessions. There will be homework, 2 tests, 1 comprehensive final and lab reports to assess student achievements.

13. Evaluation Methods

2 Tests	30%
Final	45%
Homework	5%
Lab reports	20%
Total:	100%

14. Required Course Core Material

1) Soil Chemistry, Bohn, McNeal, and O'Connor, Wiley Interscience, 2nd edition, 1985.
2) Principles of Soil Chemistry, Kim H. Tan, CRC Press, 4th edition, 2011.

15. Matching Course Objectives with the Program Outcomes and with SQU Graduate Attributes

* ***Click here*** ***to view a list of action verbs use in developing objectives***

SQU Graduate Attributes

A. SQU graduates should be able to:	**B. SQU graduates possess**	**C. SQU graduates should relish** good citizenship qualities, conscious of their national identity and socially responsible, engage in community affairs and mindful of contemporary issues.
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 legible manner	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 enjoy intellectual independence and autonomy 4. teamwork skills and display potential leadership qualities	

#	Course Learning Objective	Relevant Program Outcome(s)	Applicable Attribute(s)
1.	To review and apply basic chemistry and soil chemistry concepts to soil environments	Identify the soil components and properties responsible for the chemical reactivity of soils Comprehend the fundamental chemical processes taking place in soils	A1/A2/A3
2.	To define weathering, structure, composition and properties of primary minerals, clays, and oxides	Comprehend funadmentals of soil formation and soil mineralogy	A1/A2
3.	To investigate the processes of dissolution and precipitation of minerals, ion exchange, and adsorption	Link soil chemical processes to the elemental composition and speciation in soils	A1/A3
4.	To review the chemistry of anthropogenic pollutants of environmental significance	Link theoretical concepts to practical environmental problems	A3/B2
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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 the Attendance and Student Academic Misconduct policies.

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	SWAE 3302	**Course Title**	Environmental Soil Chemistry
Year/Semester	Fall 2018	**Section**	10/11/12
Day, Time, and Place	Sunday 12-2pm (B14), Tuesday 12-2pm and Wednesday 12-2pm (AGR0012),		

Course Coordinator	Malik Al-Wardy		
Office Location	243	**Office Hours**	By Appointment
Office Ext.	1224	**Email**	mwardy@squ.edu.om

Tentative Schedule

Week	Lecture/Topic	Material to be Covered	Assignment /Exam	Weight (%)
1	Review of Chemical Principles	book 1/Pgs. 21-50 Handouts		
2	Review of Chemical Principles	book 1/Pgs. 21-50 Handouts	Lab 1	
3	Review of Soil Chemistry Principles	Handouts	Lab 2	2
4	Weathering and Soil Development	book 1/Pgs. 68-97 Handouts	Lab 3 HW 1	2 1
5	Weathering and Soil Development	book 1/Pgs. 68-97 Handouts	Lab 4	2
6	The Soil Solid Phase	book 1/Pgs. 104-128 Handouts	Lab 5 HW 2	2 1
7	Exam 1			15
8	The Soil Solid Phase	book 1/Pgs. 104-128 Handouts	Lab 6	2
9	The Soil Solid Phase	book 1/Pgs. 104-128 Handouts	Lab 7 HW 3	2 1
10	Charge Development in Soils	book 1/Pgs. 153-205 Handouts	Lab 8 HW 4	2 1
11	Cation & Anion Exchange Reactions	book 1/Pgs. 153-205 Handouts	Lab 9	2
12	Cation & Anion Exchange Reactions	book 1/Pgs. 153-205 Handouts	Lab10	2
13	Exam 2			15
14	Soil pollution	Handouts	Lab 11	2
15	Soil pollution	Handouts		

APPENDIX A: INSTRUCTORS OF MULIPLE SECTIONS

Section	Instructor	Day, Time, and Location	Office Location and Extension	Email	Office Hours

APPENDIX B: ADDITIONAL INFOMARION

Additional books available:

1. Environmental Soil Chemistry, Donald L. Sparks, Academic Press, 2nd Edition, 2003