



SULTAN QABOOS UNIVERSITY

COURSE OUTLINE

PROGRAM: Bachelor of Science in Plant Sciences

1. Course Code	PLNT4005	
2. Course Title	Plant Nutrition Management	
3. Credits	3 Cr Hrs , 12 Cr Points, 6 ECTS	
4. Pre-requisite Course(s)	PLNT3000 or BIOL3011, PLNT3211, PLNT3006, PLNT3512, PLNT3514: BIOL2101, CAMS2000, CAMS2003, CAMS3000, CAMS3001, CHEM2101	
5. Co-requisite Course(s)	-	
6. Equivalent Course(s)	PLNT4001, CROP4001, AGRN4001	
7. Incompatible Course(s)	-	
8. Course Category	<input type="checkbox"/> University Requirement	<input type="checkbox"/> University Elective
	<input type="checkbox"/> College Requirement	<input type="checkbox"/> College Elective
	<input checked="" 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: College of Agricultural and Marine Sciences	Department: Plant Sciences
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
11. Language of Instruction	English	
12. Course Description		
This course is designed to provide students with comprehensive exposure to the subject of plant nutrition. Topics include physiological functions and deficiency symptoms of different plant nutrients, physiological disorders due to nutrient deficiency and toxicities, mechanisms of uptake and translocation , mycorrhizae and their role in nutrient absorption, fertilizer application and soil amendments, fertilizer use in relation to environment, integrated plant nutrient management, and nutrient requirements of different crops and their management for economical crop yield.		
13. Teaching/Learning Strategies		
Lectures notes/powerpoint slides Laboratroy sessions Instructional videos		
14. Assessment Components and Weight [%]		
<input checked="" type="checkbox"/> Quizzes 10	<input type="checkbox"/> Practical 30	<input type="checkbox"/> Other (specify):
<input checked="" type="checkbox"/> Homework assignments 10	<input type="checkbox"/> Project	
<input type="checkbox"/> In-term examination(s) 10	<input type="checkbox"/> Final examination 40	
15. Grading Method		
<input checked="" type="checkbox"/> A-F Scale <input type="checkbox"/> Pass/Not passed		
16. Textbook(s) and Supplemental Material		
Epstein, E. and A. J. Bloom. 2005. Mineral Nutrition of Plants: Principles and Perspectives. 2nd Ed. Sinauer Associates Inc. USA Mengel, K. and E.A. Kirkby. 2001. Principles of Plant Nutrition. 5th Ed. International Potash Inst., Bern, Switzerland.		

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.	Understanding basic concepts and principles of plant nutrition.	Graduates will have knowledge and skills in plant sciences. Graduates will be motivated to engage in independent life-long learning.	A1, B2
2.	Explaining physiological functions and deficiency symptoms of different nutrients	Graduates will have knowledge and skills in plant sciences. Graduates will have ability to effectively communicate orally and in writing. Graduates will have analysed the literature and present in simple and clear manner. Graduates will be motivated to engage in independent life-long learning.	A1, A2, A3, B2
3.	Understanding mechanisms of uptake and translocation	Graduates will have knowledge and skills in plant sciences. Graduates will be motivated to engage in independent life-long learning. Graduates will have the ability to build teams and work in team for target oriented tasks. Graduates will have knowledge of relevant Omani laws, and understanding and motivation for environmental protection, resource conservation and social service.	A1, B2, B4, C
4.	Explaining mycorrhizae and their role in nutrient absorption	Graduates will have knowledge and skills in plant sciences. Graduates will have ability to effectively communicate orally and in writing. Graduates will be motivated to engage in independent life-long learning.	A1, A2, B2
5.	Understanding fertilizer application and soil amendments, and fertilizer use in relation to environment	Graduates will have knowledge and skills in plant sciences. Graduates will have ability to effectively communicate orally and in writing. Graduates will be motivated to engage in independent life-long learning.	A1, A2, B2
6.	Understanding and applying the concept of integrated plant nutrient management in plant production.	Graduates will have knowledge and skills in plant sciences. Graduates will have ability to effectively communicate orally and in writing.	A1, A2, B2, B4

		Graduates will be motivated to engage in independent life-long learning. Graduates will have the ability to build teams and work in team for target oriented tasks	
7.	Calculating the nutrient requirements of different crops and planning their management for economical crop yield.	Graduates will have knowledge and skills in plant sciences. Graduates will have ability to effectively communicate orally and in writing. Graduates will be motivated to engage in independent life-long learning.	A1, A2, 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 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:

Class participation is based on each student's contribution to class throughout the semester.

Students are responsible for any announcements made in class, even in case of absence.

Attendance is mandatory skipping 3 classes will result in dropping the student from the class.

COURSE INFORMATION			
Course Code	PLNT4005	Course Title	Plant Nutrition Management
Semester/ Year	Fall	Section(s)	10, 11
Day, Time, and Place	As Assigned		
Course Coordinator	Muhammad Farooq		
Office Location	CAMS, 218	Office Hours	TBA
Office Tel. Ext.	1214	Email	farooqcp@squ.edu.om

Tentative Schedule			
Week	Lecture #	Topic/Material to be covered	Assessment
1	Lec 1	Course outline, Basic concept and principles of plant nutrition	
	Lab 1	Introduction to lab and lab safety	
2	Lec 2	Physiological functions and deficiency symptoms of primary nutrients	
	Lab 2	Techniques of growing plants for nutritional studies (aeroponics, hydroponics, sand and gravel etc.)-I	
3	Lec 3	Physiological functions and deficiency symptoms of secondary and micro nutrients	
	Lab 3	Techniques of growing plants for nutritional studies (aeroponics, hydroponics, sand and gravel etc.)-II	
4	Lec 4	Physiological disorders due to nutrient deficiency and toxicities	Quiz-1 (5%)
	Lab 4	Identification of deficiency and toxicity symptoms of secondary and micro nutrients-I	
5	Lec 5	Mechanisms of nutrient uptake and translocation	
	Lab 5	Identification of deficiency and toxicity symptoms of secondary and micro nutrients-II	
6	Lec 6	Mycorrhizae and their role in nutrient absorption	
	Lab 6	Preparation of nutrient media (Hoagland, Yoshida and Johnson etc.) for water culture	
7	Lec 7	Fertilizer application and soil amendments	Mid-test (10%)
	Lab 7	Mid-test	
8	Lec 8	Fertilizer use in relation to environment	
	Lab 8	Soil and plant analysis for NPK -I	
9	Lec 9	Integrated plant nutrient management-I	
	Lab 9	Soil and plant analysis for NPK-II	
10	Lec 10	Integrated plant nutrient management-II	Quiz-2 (5%)
	Lab 10	Interpretation of soil and plant analysis results-I	
11	Lec 11	Nutrient requirements of different crops and their management for economical crop yield	
	Lab 11	Interpretation of soil and plant analysis results-II	
12	Lec 12	Nutrient requirements of different crops and their management for economical crop yield	
	Lab 12	Fertilizer requirement calculation	
13	Lec 13	Nutrient management on problem soils	
	Lab 13	Fertilizer requirement calculation	
14	Lec 14	Modern trends in plant nutrient management	
	Lab 14	Fertilizers, manures, composts and manures	
15	Lec 15	Course overview	Final lab test (20%)
	Lab 15	Final lab test	
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APPENDIX A: INSTRUCTORS OF MULTIPLE SECTIONS

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APPENDIX B: ADDITIONAL INFORMATION