



Course Specification

(Bachelor)

Course Title: **Water and fertilizer mangement**

Course Code: **APSA1606**

Program: **Sustainable Agriculture Techniques**

Department: *Enter Department Name .*

College: **Applied College**

Institution: : **Umm Al-Qura University**

Version: **Vesrion 1**

Last Revision Date: **15 June 2025**

Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods	4
C. Course Content	5
D. Students Assessment Activities	5
E. Learning Resources and Facilities	5
F. Assessment of Course Quality	6
G. Specification Approval	7





A. General information about the course:

1. Course Identification

1. Credit hours: (2 credit hours)				
2 credit hours				
2. Course type				
A.	<input type="checkbox"/> University	<input type="checkbox"/> College	<input checked="" type="checkbox"/> Department	<input type="checkbox"/> Track
B.	<input checked="" type="checkbox"/> Required		<input type="checkbox"/> Elective	
3. Level/year at which this course is offered: 1st Semester				
4. Course General Description:				
This course introduces students to fundamental concepts of managing water and fertilizers in agricultural systems. It covers the hydrological cycle, types and application methods of fertilizers, irrigation systems, and sustainable practices to enhance water and nutrient use efficiency.				
5. Pre-requirements for this course (if any):				
None				
6. Co-requisites for this course (if any):				
None				
7. Course Main Objective(s):				
<ul style="list-style-type: none"> Understand the interaction between water and fertilizers in plant growth Learn integrated management techniques for sustainable agriculture Enhance resource use efficiency to reduce environmental impact 				

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom		100
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning 		
4	Distance learning		

3. Contact Hours (based on the academic semester)





No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		30

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Describe the basic concepts of water and fertilizer management	K1	Lectures	- quizzes
1.2	Identify the relationship between irrigation and fertilizer use.	K2	Lectures case studies	-Quizzes -Assignments -Final exam
1.3	Recognize the types and sources of fertilizers	K3	Lectures, Case Studies	Quizzes Final exam
2.0	Skills			
2.1	Analyze the interaction between water and nutrient use efficiency.	S4	Case studies group discussions	Oral presentations -Assignments -Final exam
2.2	Apply integrated management techniques for optimal crop production.	S1	-Lectures -Discussions -Presentations	-Oral presentations -Quizzes -Assignments
3.0	Values, autonomy, and responsibility			
3.1	Collaborate in a multidisciplinary team to solve problem related to sustainability.	V2	-Discussions -Presentations	-Oral presentations Assignments
3.2	Demonstrate ethical and environmentally responsible practices in agricultural activities.	V3	-Discussions -Presentations	-Oral presentations Assignments



C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to water and fertilizer resources	2
2.	Water cycle and water availability for agriculture	2
3.	Types and sources of fertilizers	2
4.	Water quality and its impact on fertilizer efficiency	2
5.	Fertilizer application methods	2
6.	Irrigation systems and their relation to fertilizer use	2
7.	Soil fertility and nutrient management	2
8.	Integrated water and nutrient management	2
9.	Water and fertilizer management in different crops	2
10.	Environmental concerns and pollution control	2
11.	Climate change and its impact on water and fertilizer use	2
12.	Smart agriculture technologies	2
13.	Policies and regulations related to water and fertilizer use	2
14.	Case studies in integrated resource management	2
15.	Final review and assessment	2
Total		30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Mid Term Exam	6	20%
2.	Applied case studies	10	20%
3.	Reports and essay	12	10%
4.	Final Exam	16	50%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References

- Drechsel, P., Heffer, P., Magen, H., Mikkelsen, R., & Wichelns, D. (Eds.). (2015). *Managing water and fertilizer for sustainable agricultural intensification*.



	- Pereira, L. S., Oweis, T., & Zairi, A. (2002). *Irrigation management under water scarcity*. Agricultural Water Management, 57(3), 175–206. Elsevier.
Supportive References	- Steduto, P., Hoogeveen, J., Winpenny, J., & Burke, J. (2012). *Water and the rural poor: Interventions for improving livelihoods in sub-Saharan Africa*. - Chartzoulakis, K., & Bertaki, M. (2015). *Sustainable water management in agriculture*. Agriculture and Agricultural Science Procedia, 4, 88–98. Elsevier.
Electronic Materials	https://www.sare.org
Other Learning Materials	Molden, D. (Ed.). (2007). *Water for food, water for life: A comprehensive assessment of water management in agriculture*. Earthscan/IWMI.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms
Technology equipment (projector, smart board, software)	Projector and Smart board
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Direct: CLO's assessment Indirect: regular surveys to evaluate teaching effectiveness and course relevance
Effectiveness of Students assessment	Peer review	Direct: Annual review of course content by faculty members and external experts
Quality of learning resources	Students	Indirect: regular surveys to evaluate quality of learning resources





Assessment Areas/Issues	Assessor	Assessment Methods
The extent to which CLOs have been achieved	Peer review	Direct: Annual review of course content by faculty members and external experts
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Umm Al-Qura University Council
REFERENCE NO.	851110214476/195626
DATE	18/2/1447

