Course Specifications

Course Title:	**Plant Physiology 2**
Course Code:	**23073357-3**
Program:	**BSc Biology**
Department:	**Biology**
College:	**Aljumum Collage**
Institution:	**Umm Al-Qura University**

Table of Contents

A. Course Identification

1. Credit hours: **3 hours**
2. Course type **a.** University ☐ College ☐ Department ☐ Others ☐ **b.** Required ☐ Elective ☐
3. Level/year at which this course is offered: **6th level / 3rd year**
4. Pre-requisites for this course (if any)**:** **Plant Physiology 1 (23073351-3)**
5. Co-requisites for this course (if any)**:** **None**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3 hrs per weeks	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	42
2	Laboratory/Studio	3
3	Tutorial	
4	Others (specify)	
	Total	
Other Learning Hours*		
1	Study	
2	Assignments	
3	Library	
4	Projects/Research Essays/Theses	
5	Others (specify)	
	Total	

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

The course aims to give the student an idea of the basics of the various processes within the plant in terms of metabolic activity as well as a brief picture of the chemistry of organic compounds and manufactured within the plant.

2. Course Main Objective

Increase the use of web-based material and online teaching resources and updating the content continuously with new research in the field of plant improvement.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge:**	
1.1	Recognize the importance of enzymes in biological processes within the various plant cells, including plant metabolism.	
1.2	Identify the growth rate of the plant, through the growth and accumulation of nutrients analysed sugars and starches and fatty acids, and other organic	
1.3	To identify the presence of fatty acids and amino acids and proteins within the plant by plant metabolic processes.	
1...		
2	**Skills :**	
2.1	Skills to identify the processes metabolism that take place within the plant.	
2.2	Skills to identify the plants adapted to external conditions, such as unwanted heat, drought, salinity and other	
2.3	Skills the ability to analysed information and access to the right solution.	
2...		
3	**Competence:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No. of Weeks	Topics	Contact Hours
1	• Introduction to bioenergy • Thermodynamics law, "the first and second" • Definition of Heat content • Definition of Inotropes • Definition of the free energy	2
2-3	• Enzymes ○ Definition of the enzyme - The synthesis of the enzyme ○ The existence of the enzyme and its distribution in plant cells ○ General properties of the enzyme ○ The structural composition of the molecule protein "enzyme" 1- First structure of enzymes 2- secondary structure of the three forms (spiral - plate folded - random). 3- The third structure of the protein 4- fourth structure of the protein	4

	○ The structural composition of the enzymes ○ Split the organization Enzymes ○ Mechanical action of the enzyme ○ Activation energy ○ Enzymatic reaction kinetics ○ Michal's constant Km ○ Factors affecting the enzyme interaction • Classification's Enzymes	
4-5	• Carbohydrate metabolism • Monosaccharide's • Disaccharides sugars • Tri-saccharides sugars • Tetra-saccharides sugars • Polysaccharides pentose carbon atoms • Polysaccharides hexose carbon atoms • Cellulose "combination" • Starch "composition and synthesized" • Amylose – Amylopectin • Economic importance of carbohydrates in the plant • General properties of sugars • Sugar shifts in plant • Sucrose synthesized and installed in the plant	4
6-7	• Nitrogen Metabolism • Proteins Structure and Classification. • Stages of protein construction 1. Nitrate Reductase 2. The composition of amino acids and amides 3. The composition of proteins	4
8-9	• The importance and fat distribution • Fat metabolism First :- • The fat synthesis is divided into: - 1. Synthesis of fatty acids 2. Synthesis of glycerol 3. Esterification between them to be the fat Second: - • The Destroy of the fat "fat oxidation by beta" β" and Alpha" α "oxidation. • Converting the fat into sugars • Plant protection covers "Cuticle, waxes…	4
10	• Some biological processes related to sulfur • Sulfur metabolism - the symptoms of sulfur deficiency	2
11	Some organic ingredients in plant study economic value (plant pigments).	2
12	Some organic ingredients in plant study economic value	2

	"vitamins"	
13	The growth and Development, and Differentiation and Plant Hormones	2
14	Plant Tissue Culture	2

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		
1.1	Recognize the importance of enzymes in biological processes within the various plant cells, including plant metabolism.	• Lectures • Interactive presentations • Scientific discussion • Video Shows (Educational Videos) • Web-based study	• Exams (Oral test - Periodic tests) Group discussions
1.2	Identify the growth rate of the plant, through the growth and accumulation of nutrients analysed sugars and starches and fatty acids, and other organic		
1.3	To identify the presence of fatty acids and amino acids and proteins within the plant by plant metabolic processes.		
2.0	**Skills**		
2.1	Skills to identify the processes metabolism that take place within the plant	• Lectures • Scientific discussion. • Presentation skills and throw through the activities and duties required to be displayed to the students in seminars	- Laboratory lessons through practical tests to asses research related to the course are viewing on students in the evaluation discussion groups
2.2	Skills to identify the plants adapted to external conditions, such as unwanted heat, drought, salinity and other		
1.3	Skills the ability to analysed information and access to the right solution		
3.0	**Competence**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	periodic Exam	8th	20%
2	Practical Exam	14th	20%
3	Assignments (Homework + Activities+ Attendance)	weekly	20%
4	Final exam	16th	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

3 hours of office and guidance in the week.

F. Learning Resources and Facilities

1.Learning Resources

Required Text(s):	- فسيولوجيا النبات العام – الجز الثاني – باصلاح، محمد عمر، علي الهلال، محمد حمد الوهيبي – مطبعة جامعة الملك سعود للنشر العلمي والمطابع – الرياض (٢٠٠٢م) - علم النبات العام – د أحمد محمد مجاهد – ١٩٨٦م- مكتبة الأنجلو المصرية - أساسيات فسيولوجيا النيات – دكتور /محمد جمال الدين حسونة – دار المطبوعات الجديدة القاهرة – ج.م.ع. - أسس الكمياء الحيوية - عماد فسيولوجيا النيات – دكتور/ عماد الدين وصفي - المكتبية الأكاديمية – الدقي – القاهرة – ج.م.ع. - فسيولوجيا النيات – دكتور/ أحمد مصطفى حمد – نيوأوفست للطباعة – ت ٠٠٢٠٢٥٧٣٠٥٢٦ - القاهرة – ج.م.ع. - كتاب مترجم عن فسيولوجيا النبات للأستاذ الدكتور / روبرت دفلن – القاهرة - ج.م.ع - أسس الكمياء الحيوية – للدكتور محمد عبد المنعم الأعسر – المكتبة الأكاديمي - القاهرة ج.م.ع - فسيولوجيا النبات العملية – عبد الجواد – هشام, محمد علي الوهيبي - الناشر – عمادة شؤون المكتبات , جامعة الملك سعود - الرياض (١٤٠٩هـ) - الكمياء الحيوية (كمياء حيوية تركيبية وكمياء حيوية فسيولوجية – عبد الرحمن أحمد الحملاوي) الطبعة الثالثة – دار القلم – الكويت – ١٩٨٤م - فسيولوجيا النبات العام - الجزء الثاني – باصلاح محمد عمر – على الهلالي – محمد حمد الوهيبي – مطبعة جامعة الملك سعود للنشر العلمي والمطابع – ٢٠٠٢م ▪ Growth and Organization in Plant , Stewart, F.C. Adison - Wesley Co. Reading Wareing (1987) ▪ Dr. Imad Physiology / Imad Eddin descriptive – Dokki. Cairo – Egypt. ▪ The vital foundations of Chemistry - Dr. Mohamed Abdel Moneim southpaw-academic library - Cairo – ARE ▪ Growth and Organization in Plant, Stewart, FC Adison - Wesley Co. Reading Wareing (1987) ▪ Plant Physiology process - Abdel Gawad - Hisham, Mohammed Ali Al Wahaibi - publisher - Deanship of Library Affairs, King Saud University - Riyadh (1409) ▪ General Plant Physiology - Part II - reform, Mohammad Omar, Ali Crescent, Mohammed Hamad Al Wahaibi - King Saud University Press for publishing scientific and presses - Riyadh (2002 m) ▪ General Plant - Science Dr. Ahmed Mohammed Mujahid --1 986 m- Anglo-Egyptian library

	▪ The basics of the physiology of intentions - Dr. / Mohammed Jamal al-Din Hassouna - House new publications Cairo - J.m.a. ▪ Chemistry vital (vital chemistry and synthetic chemistry vital physiological - Ahmed Abdel-Rahman el-Hamalawy) Third Edition - Pen House - Kuwait – 1984 ▪ Plant Physiology year - the second part - the reform of Mohammad Omar - the Hilali - Mohammed Hamad Al Wahaibi - King Saud University Press for publishing scientific and presses - 2002
Essential References Materials	▪ Dr. Imad Physiology / Imad Eddin descriptive – Dokki. Cairo - Egypt. ▪ The vital foundations of Chemistry - Dr. Mohamed Abdel Moneim southpaw-academic library - Cairo – ARE ▪ Growth and Organization in Plant, Stewart, FC Adison - Wesley Co. Reading Wareing (1987) ▪ Plant Physiology process - Abdel Gawad - Hisham, Mohammed Ali Al Wahaibi - publisher - Deanship of Library Affairs, King Saud University - Riyadh (1409) ▪ General Plant Physiology - Part II - reform, Mohammad Omar, Ali Crescent, Mohammed Hamad Al Wahaibi - King Saud University Press for publishing scientific and presses - Riyadh (2002 m) ▪ General Plant - Science Dr. Ahmed Mohammed Mujahid --1 986 m- Anglo-Egyptian library ▪ The basics of the physiology of intentions - Dr. / Mohammed Jamal al-Din Hassouna - House new publications Cairo - J.m.a. ▪ Chemistry vital (vital chemistry and synthetic chemistry vital physiological - Ahmed Abdel-Rahman el-Hamalawy) Third Edition - Pen House - Kuwait – 1984 ▪ Plant Physiology year - the second part - the reform of Mohammad Omar - the Hilali - Mohammed Hamad Al Wahaibi- King Saud University Press for publishing scientific and presses – 2002
Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)	▪ Dr. Imad Physiology / Imad Eddin descriptive – Dokki. Cairo – Egypt. ▪ The vital foundations of Chemistry - Dr. Mohamed Abdel Moneim southpaw-academic library - Cairo - ARE

	▪ Growth and Organization in Plant, Stewart, FC Adison - Wesley Co. Reading Wareing (1987) ▪ Plant Physiology process - Abdel Gawad - Hisham, Mohammed Ali Al Wahaibi - publisher - Deanship of Library Affairs, King Saud University - Riyadh (1409) ▪ General Plant Physiology - Part II - reform, Mohammad Omar, Ali Crescent, Mohammed Hamad Al Wahaibi - King Saud University Press for publishing scientific and presses - Riyadh (2002 m) ▪ General Plant - Science Dr. Ahmed Mohammed Mujahid --1 986 m- Anglo-Egyptian library ▪ The basics of the physiology of intentions - Dr. / Mohammed Jamal al-Din Hassouna - House new publications Cairo - J.m.a. ▪ Chemistry vital (vital chemistry and synthetic chemistry vital physiological - Ahmed Abdel-Rahman el-Hamalawy) Third Edition - Pen House - Kuwait – 1984 ▪ Plant Physiology year - the second part - the reform of Mohammad Omar - the Hilali - Mohammed Hamad Al Wahaibi - King Saud University Press for publishing scientific and presses - 2002
Electronic Materials	There are too many websites and are searched using the more than one method to enter on Google for sites that have to do with rule the required of scientific study
Other Learning Materials	Using the Microsoft software in writing tables and graphs and PowerPoint presentation using the Power Point

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	**Classrooms, laboratories,**
Technology Resources (AV, data show, Smart Board, software, etc.)	**Smart Board**
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	**laboratory**

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
University used to measure students feedback about the course every few years. In addition, a special form was designed by the department and are given at the end of term to measure the student's feedback about the quality of teaching and course contents. Information in this feedback form are treated confidentially and students are not asked to write their names in it.	Any complain from students about quality of teaching and/ or course contents are always treated confidentially and considered and discussed well to find the solutions for it. In addition, as mentioned previously the department form for students feedback are also seen and analysed to improve any shortage in any aspects or matters	Department teaching staff are always encourage to update their knowledge in the field of work by attending national and international conferences and self-developments courses held inside or outside the university campus and a record of that is kept for each academic staff.

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

Head of Department

Dr. Wessam M. Filfilan

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