جامعة أم القرى

كلية العلوم التطبيقية

الدكتوراه في علم النبات

٤. Learning and Teaching

٤/١ Learning Outcomes and Graduate Specifications

٤/١/١ Main tracks or specializations covered by the program:

(١)- Plant Physiology
(٢)- Plant Ecology
(٣)- Plant Taxonomy
(٤)- Plant Genetics and Molecular Biology
(٥)- Phycology
(٦)- Plant Tissue Culture
(٧)-Plant Flora and Geography

٤/١/٢ Curriculum Study Plan Table

Year	Course Code	Course Title	Required or Elective	* Pre-Requisite Courses	Credit Hours	College or Department
١st Year (Semester ١) ٣ Compulsory courses (٨ credit hours) Semester total = ٨ credit hours	٤٠١٢٧١١-٣	Advanced Molecular Biology	R	N/A	٣	
	٤٠١٢٧١٢-٣	Environmental Pollution	R	N/A	٣	
	٤٠١٢٧١٣-٢	Phytochemistry	R	N/A	٢	
١st Year (Semester ٢) ١ Subject-Specific Elective Course (٤ credit hours) Semester total = ٤ credit hours	٤٠١٢٧٧٠-٤	Emerging topics in Plant Physiology	R	N/A	٤	
	٤٠١٢٧٧١-٤	Emerging Topics in Plant Taxonomy	R	N/A	٤	
	٤٠١٢٧٧٢-٤	Emerging Topics in Plant Ecology	R	N/A	٤	
	٤٠١٢٧٧٣-٤	Emerging Topics in Plant Tissue Culture	R	N/A	٤	
	٤٠١٢٧٧٤-٤	Emerging Topics in Phycology	R	N/A	٤	
	٤٠١٢٧٧٥-٤	Emerging Topics in Plant Biotechnology	R	N/A	٤	
	٤٠١٢٧٧٦-٤	Emerging Topics in Plant Genetics	R	N/A	٤	
	٤٠١٢٧٧٧-٤	Emerging Topics in Flora and Plant Geography	R	N/A	٤	
٢nd and ٣rd Year (first and second semesters)	**٤٠١٢٧٩٩-١٠ / Research Project leading to PhD thesis / Dissertation**					

٤/١/٤. Course Specification:

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications

Advanced Molecular Biology

٤٠١٢٦١١-٤

Course Specifications

Institution: **Umm Al-Qura University**
College/Department: **Faculty of Applied Science / Department of Biology**

A. Course Identification and General Information

١. Course title and code: **٤٠١٢٦١١-٤**
٢. Credit hours: **٢ Credit hours**
٣. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) **MSc in Botany**
٤. Name of faculty member responsible for the course **Dr. Mostafa Koutb**
٥. Level/year at which this course is offered
٦. Pre-requisites for this course (if any)
٧. Co-requisites for this course (if any)
٨. Location if not on main campus
٩. Mode of Instruction (mark all that apply) a. traditional classroom ✓ What percentage? **١٠٠ %** b. blended (traditional and online) ☐ What percentage? ☐

c. e-learning	☐ What percentage?	☐
d. correspondence	☐ What percentage?	☐
f. other	☐ What percentage?	☐

Comments:

B Objectives

١. What is the main purpose for this course?
٢. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description:
The course structure aims to discuss in details the following items including; isolation of plasmid DNA from bacteria; cloning of a plant gene into a bacterial vector; transformation and selection of recombinant clones; restriction analysis and gel electrophoresis of DNA; DNA sequencing; PCR analysis; Computer analysis of DNA; data bank search; molecular markers and their use in plant breeding; protein electrophoresis and staining; isoelectric focussing of proteins; Blue-native polyacrylamide gel electrophoresis.

١. Topics to be Covered

List of Topics	No. of Weeks	Contact hours

Introduction to molecular biology	١	٢
DNA manipulation techniques	٢	٤
Vectors	١	٢
DNA sequencing and computer analysis	١	٢
Gene expression and regulation	١	٢
Mutations	١	٢
Epigentics	١	٢
Protein electrophoresis, blue native, isoelectric focusing	١	٢
Protein blotting	١	٢
Protein sequencing	١	٢
Molecular marker and their use in plant breeding	١	٢
Recombinant DNA and transgenic organisms	١	٢

٢. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	٢٦					٢٦
Credit	٢					٢

٣. Additional private study/learning hours expected for students per week. ☐

٤. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

The students will gain fundamental knowledge of molecular biology: Practical aspects of molecular genetics and protein analysis: Design and execution of experiments in the field of molecular biology.

They learn to prepare a detailed protocol of all experiments including a section on materials and methods, a clear presentation of the results and a discussion on the expected and the real outcome of the experiments.

Students will gain fundamental knowledge about the structure and function of the genetic material, about the possibility of analysing DNA and about applications of DNA technology as well as basic knowledge of proteins and analytical methods for protein characterization.

In this course the students learn the fundamentals of experimental scientific work in the field of molecular biology. Starting with a hypothesis they learn to perform molecular genetic experiments. They evaluate the results of their experiments and test their hypothesis.

٥. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
١	**Activities**		٣٠٪
٣	**Essays**		٣٠٪
٤	**Final written exam**		٤٠٪
٥	**TOTAL**		١٠٠٪

D. Student Academic Counseling and Support

١. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Academic teaching staff will be available to meet students for consultation and academic advice at their private offices at the times advised.

Office hours: ١٠ hours per week; each semester. Time will varies each semester based on academic schedule for each teaching staff.

E Learning Resources

١. List Required Textbooks

Alberts, B., Bray, D., Lewis, J., Raff, M., Roberts, K. and Watson, J.D. ١٩٩٤: Molecular Biology of The Cell, ٣rd Edition. Garland, New York, London.

Clark, D.P. ٢٠٠٥: Molecular Biology. Elsevier Academic Press, Burlington, London.

Sambrook, J., Fritsch, E.F. and Maniatis, T. ٢٠٠١: Molecular cloning: a labaratory manual. ٣rd Edition. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York. **Simpson, R.J., Adams, P.D. and Golemis, E.A. ٢٠٠٨: Basic Methods in Protein Purification and Analysis: A Laboratory Manual. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York.**
٢. List Essential References Materials (Journals, Reports, etc.) High Impact Journals:
٣. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
٤. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
٥. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
١. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **(١)- Class room is already provided with data show** **(٢)- The area of class room is suitable concerning the number of enrolled students**
٢. Computing resources (AV, data show, Smart Board, software, etc.) **(١)- Class rooms are equipped with data show.** **(٢)- Library is required and connected to the network for students to study materials**
٣. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

١ Strategies for Obtaining Student Feedback on Effectiveness of Teaching **(١)- Questionnaires / students opinion survey** **(٢)- Open discussion in the class room at the end of the lectures or during individual student/staff**

meeting
٢ Other Strategies for Evaluation of Teaching by the Instructor or by the Department **(١)- Revision of student answer papers .** **(٢)- Analysis the grades of students.**
٣ Processes for Improvement of Teaching **(١)- Preparing the course as PPT.** **(٢)- Using scientific movies.** **(٣)- Coupling the theoretical part with laboratory part** **(٤)- Periodical revision of course content.**
٤. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) **After the agreement of Department and Faculty administrations; it might include:** **(١)- Random check of students exam papers / assignments by external examiner** **(٢)- Random check of students exam papers / assignments by internal examiner**
٥ Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. **A departmental review committee will look after the arrangement periodically after taking feedback from students and in the light of new development in the subject.**

Name of Instructor: _____

Signature: _____ Date Report Completed: _____

Name of Course Instructor _____

Program Coordinator:_____

Signature: _____ Date Received: _____

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications

Environmental Pollution

٤٠١٢٦١٢-٤

Course Specifications

Institution: **Umm Al-Qura University**
College/Department: **Faculty of Applied Science / Department of Biology**

A. Course Identification and General Information

١. Course title and code: **Environmental Pollution (٤٠١٢٦١٢-٤)**
٢. Credit hours: **٤ C. H.**
٣. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) **MSc Biology**
٤. Name of faculty member responsible for the course **Dr. Hanan E. Osman (heosman@uqu.edu.sa)**
٥. Level/year at which this course is offered
٦. Pre-requisites for this course (if any)
٧. Co-requisites for this course (if any)
٨. Location if not on main campus
٩. Mode of Instruction (mark all that apply) a. traditional classroom ✓ What percentage? **١٠٠ %** b. blended (traditional and online) ☐ What percentage? ☐ c. e-learning ☐ What percentage? ☐ d. correspondence ☐ What percentage? ☐ f. other ☐ What percentage? ☐ Comments:

B Objectives

١. What is the main purpose for this course? **The major objective of the course is to list various kinds of pollution; describe types of pollution, sources, harmful effects on human health and control of air pollution, indoor air pollution, noise pollution; describe water pollution, its causes and control; describe soil pollution, and its causes and control.**
٢. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: **This course deals with major problems of pollution of the atmosphere, water, the land surface and the food chain. It covers processes responsible for the occurrence and release of pollutants in the environment, dispersion mechanisms, the hazards associated with different types of pollutant, problems of accumulation of toxic substances, and procedures for the reduction of emissions and remediation of contaminated environments.**

١. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Introduction to Environmental Pollution	١	٤
Environmental management and pollution control strategies Environmental indicators; Pollution prevention methodologies; methods for waste minimization; types of recycling; recycling of waste material; recovery effort index	٣	١٢

Air pollution and control **Introduction to air pollution and atmospheric diffusion (Gaussian plume modeling); General ideas in air pollution control: Alternative control measures, Improving dispersion, Building tall stacks, Intermittent control schemes, Relocation of plant, Process change, Use of downstream control device. Control of particulate Contaminants: Nature of particulate contaminants; Behavior of particles in the atmosphere; Particulate Control Methods and Devices: Wall collection devices-Gravity settlers, Centrifugal separators, Electrostatic precipitators; Dividing collection devices -surface filters, Depth filters, Scrubbers; Selection of particulate collection device. Control of Gaseous Contaminants: Gaseous control methods and devices-Absorption, Adsorption, Combustion and Condensation. Major air pollutants in Middle East.**	٤	١٦
Methods of waste reduction such as volume and strength reduction, segregation, reuse, recycle, neutralization, equalization, proportioning. Fundamentals of urban water supply and sanitation infrastructure. Physical processes: sedimentation, coagulation and flocculation, filtration, sludge dewatering. Chemical processes: disinfection, removal of hardness, fluoride, arsenic, chromium, iron and manganese, removal of Nitrogen and Phosphorus. Biochemical processes: aerobic and anaerobic treatment methods. Low Cost Treatment Technologies: Septic tank; Imhoff tank; Oxidation ponds; Aerobic lagoons.	٤	١٦

Soil and control **Soil contamination by chemical pollutants: sources and fate.** **Remediation by plants, bioremediation by microorganisms;** **contamination by inorganic (including heavy metals) and** **organic pollutants; factors affecting uptake of contaminants,** **prevention and elimination of contamination; landfills.** **Effects of atmospheric deposition on various types of soils,** **cation exchange capacity (CEC) of soils**	٣	١٢
Noise pollution **Basics of Sound, Sound Propagation, Directionality,** **Noise Control at source, Noise Control along the source-receiver pathway, Noise Control at Receiver, Assessing and Predicting Noise.**	١	٤

٢. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	٦٤					٦٤
Credit	٤					٤

٣. Additional private study/learning hours expected for students per week. ☐

٤. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On completion of this course students will have or be able to:

- **By the end of the course, students will have a broad, integrated understanding of the major problems associated with pollution of the atmosphere, water, the land surface and the food chain.**

- **Students will be expected to be familiar with and have an understanding of:**
- **The causes of global warming, ozone depletion, enhanced N and S emissions and urban air pollution;**
- **Problems of pollution of the food chain by potentially toxic elements and persistent organic pollutions;**
- **The difference between persistent and biodegradable pesticides and how pesticides residues may be quantified;**
- **Procedures and prospects for reducing unwanted emissions to the environment and remediation of already polluted systems**
- **Synthesize primary literature and develop skills in writing based on background review, and writing to provide evidence for a hypothesis/point of view based on literature.**
- **Explain topics in through oral presentation and interpret through modern lens**
- **Report on synthesis of newly acquired data with published data**
- **Develop leadership in discussion of primary literature and in experimental settings.**
- **Critically evaluate their personal performance both as an individual and within a team**

٥. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
١	**Paper presentation (seminar)**		٣٠٪
٢	**Short essay**		٢٠٪
٣	**Written exam**		٣٠٪
٤	**Literature review**		٢٠٪
٥	**TOTAL**		١٠٠٪

D. Student Academic Counseling and Support

١. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) **Academic teaching staff will be available to meet individual students for consultation and academic advice at their private offices at the times advised.** **Office hours: ١٠ hrs per week; each semester. Time will varies each semester based on academic schedule for each teaching staff.**

E Learning Resources

١. List Required Textbooks **١) M.K. Hill. Understanding Environmental Pollution. Cambridge University Press, ٣rd Edition, ٢٠١٠.** **٢) C. Baird and M. Cann. Environmental Chemistry. W.H. Freeman, ٤th Edition, ٢٠٠٨.** **٣) - M.Z. Jacobson. Atmospheric Pollution, History, Science and Regulation. Cambridge University Press, ٢٠٠٢.** **٤) - J. Houghton. Global Warming, the Complete Briefing. Cambridge University Press, ٣rd Edition, ٢٠٠٤.** **٥) A book covering relevant basic chemical concepts:** **٦) C.V.A. Duke and C.D. Williams, Chemistry for Environmental and Earth Sciences. Cambridge University Press, ٢٠٠٨.**
٢. List Essential References Materials (Journals, Reports, etc.) High Impact Journals: **١. Atmospheric Environment** **٢. Environmental Pollution** **٣. Environmental Management** **٤. Journal of Air and Water Management Association** **٥. Journal of the Air Pollution Control Association**
٣. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
٤. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
٥. Other learning material such as computer-based programs/CD, professional standards or regulations and

software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
١. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **(١)- Class room is already provided with data show** **(٢)- The area of class room is suitable concerning the number of enrolled students and air conditioned.**
٢. Computing resources (AV, data show, Smart Board, software, etc.) **(١)- Class rooms are equipped with data show.** **(٢)- A computer lab is required and connected to the network for students to gather their data and study materials**
٣. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

١ Strategies for Obtaining Student Feedback on Effectiveness of Teaching **(١)- Questionnaires / students opinion survey** **(٢)- Open discussion in the class room at the end of the lectures or during individual student/staff meeting**
٢ Other Strategies for Evaluation of Teaching by the Instructor or by the Department **١)- Revision of student answer papers / assignments by another staff member.** **(٢)- Analysis the grades of students.**
٣ Processes for Improvement of Teaching

(١)- Preparing the course as PPT. **(٢)- Using scientific movies.** **(٣)- Coupling the theoretical part with laboratory part** **(٤)- Periodical revision of course content.**
٤. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) **After the agreement of Department and Faculty administrations; it might include:** **(١)- Random check of students exam papers / assignments by external examiner** **(٢)- Random check of students exam papers / assignments by internal examiner**
٥ Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. **A departmental review committee will look after the arrangement periodically after taking feedback from students and in the light of new development in the subject.**

Name of Instructor: _____

Signature: _____ Date Report Completed: _____

Name of Course Instructor _____

Program Coordinator:_____

Signature: _____ Date Received: _____

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications

Phytochemistry

٤٠١٢٦٤١-٤

Course Specifications

Institution: **Umm Al-Qura University**
College/Department: **Faculty of Applied Science / Department of Biology**

A. Course Identification and General Information

١. Course title and code: **Phytochemistry (٤٠١٢٦٤١-٤)**
٢. Credit hours: **٤ C. H.**
٣. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) **MSc Botany**
٤. Name of faculty member responsible for the course **Dr.Fatimah Mohammad Alshehrei**
٥. Level/year at which this course is offered
٦. Pre-requisites for this course (if any)
٧. Co-requisites for this course (if any)
٨. Location if not on main campus
٩. Mode of Instruction (mark all that apply) a. traditional classroom ✓ What percentage? ١٠٠٠ % b. blended (traditional and online) ☐ What percentage? ☐ c. e-learning ☐ What percentage? ☐ d. correspondence ☐ What percentage? ☐ f. other What percentage? Comments:

B Objectives

١. What is the main purpose for this course? **The course aims to provide students with the necessary skills for separation of the active constituents obtained from natural sources (Carbohydrates, classification and examples , alkaloids: examples on some alkaloidal compounds of various classes- plant phenolics: examples(flavonoids and coumarins), biosynthesis – glycosides – Terpenes study: classification, Chemistry of terpenes, biosynthesis- Steroids study: classification, examples on some Steroid compound) , in addition to the different methods of separation (chromatography) and then identify these active ingredients either in pure form of a mixture- as well as the different methods (TLC, HPLC, GC-MS).**
٢. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: **Introduction and definition of natural products resulting from secondary metabolites- Isolation and separation- Terpenes study: classification, Chemistry of terpenes, biosynthesis- Steroids study: classification, examples on some Steroid compounds, biological importance, biosynthesis- Alkaloids: Isolation from plants, classification, examples on some alkaloidal compounds of various classes- plant phenolics: examples(flavonoids and coumarins), biosynthesis.**

١. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Introduction to Phytochemisty	١	٤
Carbohydrates (classification of carbohydrates, monosaccharide, disaccharide, oligo sachaccharid, starch….	٢	٨
Alkaloids: Isolation from plants, classification, examples on some alkaloidal compounds of various classes- plant phenolics: examples(flavonoids and coumarins), biosynthesis.	٢	٨

Terpenes study: classification, Chemistry of terpenes, biosynthesis-	١	٤
Steroids study: classification, examples on some Steroid compounds, biological importance, biosynthesis-	١	٤
-Introduction to glycosides **- Simple phenolic glycosides**	٢	٨
Resins – tannins- essential oils- pigments.	٢	٨
Practical : **-Introduction to chromatography** **-Adsorption and column chromatography** **-Paper chromatography** **-Thin layer chromatography** **-Gas chromatography (GC)** **-High performance liquid chromatography (HPLC)** **- Gas Chromatography mass spectrum.**	٥	٢٠

٢. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	٦٤			٢٠		٦٤
Credit	٤			٤		٤

٣. Additional private study/learning hours expected for students per week.

٤. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

The student after completing the course, should be able to:

١- Acquire the principle of phytochemistry.

٢- Define the physicochemical properties of natural products.

٣- Illustrate, how to separate, identify and estimate the different active

chemical constituents (carbohydrate - alkaloids – glycosides and other natural products) of the plants.

٥- Acquire good knowledge about the uses of the different active constituents (essential oils – carbohydrates – resins – tannins) of the plants.

٦-Demonstrate effective communication skills in the form of student led group presentations.

٧- Demonstrate skills in working collegiately and effectively with others as a member of a team.

٥. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
١	**Paper presentation (seminar)**		٣٠٪
٢	**Short essay**		٢٠٪
٣	**Short written exam**		١٠٪
٤	**Long literature review**		٤٠٪
٥	**TOTAL**		١٠٠٪

D. Student Academic Counseling and Support

١. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) **Academic teaching staff will be available to meet individual students for consultation and academic advice at their private offices at the times advised.** **Office hours: ١٠ hrs per week; each semester. Time will varies each semester based on academic schedule for each teaching staff.**

E Learning Resources

١. List Required Textbooks: **١- "The alkaloids: Chemistry and Biology" (٢٠٠٢) Volume ٥٩ by Cordell** **G.A., Elsevier, New York.** **٢- "Column Chromatography, Gas Chromatography and Liquid** **Chromatography" (١٩٨٨) ١st ed. by: Karaway M.S., Pharmacognosy** **Dept., Faculty of Pharmacy, Cairo University.** **٣- "The Systemic Identification of Flavonoids" (١٩٧٠) by Mabry T.J.,** **Markham K.R. & Thomas M.B., Springer-Verlag, Berlin–Heidelberg–New York** **٤-"Textbook of Pharmacognosy and Phytochemistry" (٢٠٠٩) by Jarald E.E. and Jarald S. E., CBS Publishers & Distributors, New Delhi**
٢. List Essential References Materials (Journals, Reports, etc.) **Different web sites related to the subject including:** **١- http:/www.ansci.cornell.edu/plants/medicinal/** **٢- http:/www.botanical.com**
٣. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
٤. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

٥. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
١. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **(١)- Class room is already provided with data show** **(٢)- The area of class room is suitable concerning the number of enrolled students (could accommodate up to ١٠٠ students) and air conditioned.**
٢. Computing resources (AV, data show, Smart Board, software, etc.) **(١)- Class rooms are equipped with data show.** **(٢)- A computer lab is required and connected to the network for students to gather their data and study materials**
٣. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

١ Strategies for Obtaining Student Feedback on Effectiveness of Teaching **(١) - Questionnaires / students opinion survey** **(٢) - Open discussion in the class room at the end of the lectures or during individual student/staff meeting**
٢ Other Strategies for Evaluation of Teaching by the Instructor or by the Department **(١)- Revision of student answer papers / assignments by another staff member.** **(٢)- Analysis the grades of students.**
٣ Processes for Improvement of Teaching

(١)- Preparing the course as PPT. **(٢)- Using scientific movies.** **(٣)- Coupling the theoretical part with laboratory part** **(٤)- Periodical revision of course content.**
٤. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) **After the agreement of Department and Faculty administrations; it might include:** **(١)- Random check of students exam papers / assignments by external examiner** **(٢)- Random check of students exam papers / assignments by internal examiner**
٥ Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. **A departmental review committee will look after the arrangement periodically after taking feedback from students and in the light of new development in the subject.**

Name of Instructor: _____

Signature: _____ Date Report Completed: _____

Name of Course Instructor _____

Program Coordinator:_____

Signature: _____ Date Received: _____

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications

Emerging Topics in Plant Physiology

(٤٠١٢٧٧٠ - ٤)

Course Specifications

Institution: Umm Al-Qura University
College/Department: Faculty of Applied Science / Department of Biology

A. Course Identification and General Information

١. Course title and code: Emerging Topics in Plant Physiology ٤٠١٢٧٧٠ - ٤
٢. Credit hours: ٤ C. H.
٣. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) PhD. Botany
٤. Name of faculty member responsible for the course Prof. Dr. Hameda El Sayed Ahmed El Sayed (heelsayed@uqu.edu.sa).
٥. Level/year at which this course is offered
٦. Pre-requisites for this course (if any)
٧. Co-requisites for this course (if any)
٨. Location if not on main campus
٩. Mode of Instruction (mark all that apply) a. traditional classroom ✓ What percentage? ١٠٠٠ % b. blended (traditional and online) ☐ What percentage? ☐ ☐ ☐

c. e-learning What percentage?

d. correspondence What percentage?

f. other What percentage?

Comments:

B Objectives

١. What is the main purpose for this course? At the end of the course, students will: • Identify and describe metabolic pathways which are unique to plants and those shared with other eukaryotes. • identify plant metabolic pathways evolved from and shared with prokaryotes. • identify unique cellular structures peculiar to plants such as the plastids, as well as the differential properties of alternation of generations in gymnosperms and angiosperms. • be able to use basic bioinformatics tools in the investigation of broad gene structure in higher plants through biological databases mining.
٢. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: This topical course consists of two components: an exposition of a topic by the instructors followed by discussion by students. The subjects are selected from current, ongoing research in the field of experimental plant biology with a general subtext of the evolution of the physiological processes peculiar to higher plants. There Is No Required Text: Original articles in the scientific literature will be discusses. Materials for in-class discussions will be posted on Blackboard. Suggested reference books and review articles will also be posted on Blackboard.

١. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Teaching And Learning Models: ١. The topical nature of the course allows flexibility in choosing current topics that relevant to science as well as having practical applications and that may carry some societal concerns. ٢. At the same time, the variety of emerging topics in plant biology lends itself to inviting specialists in the fields to talk about new discoveries in their laboratories and their areas of expertise. ٣. Faculty, from within the university or outside, will be invited to present ongoing work in their field or their laboratories; their presentations will be preceded by discussion of their own papers or suggested literature. ٤. Rather than entirely depending on expository traditional lectures, and given the abundance of information available through printed and online scientific literature, the course will emphasize self-learning through discussion of available information among students and instructors, as well as critical thinking and analysis of scientific papers.	١	٤
Introductory session: Presentation of the course Teaching and learning models. Grading mechanism and attendance policies. Academic honesty	٣	١٦
Unit I Plant genomes		
Structure of plant genomes: Variability and tolerance to polyploidy Comparative genomics (genes and gene organization in chloroplasts vs. cyanobacteria) Gene lateral transfer: Transformation methods in plant biotechnology Chloroplast biogenesis, interactions with the nuclear genome, and organelle inheritance in higher plants	٤	١٦
Unit II Plant hormones and metabolism		
Biosynthesis of plant hormones Plant secondary metabolites Amino acid biosynthesis and assimilation of mineral nutrients in plants	٤	١٦
Unit III Integration of plant physiological processes		

Plant innate immunity Plant systems biology	٤	١٦

٢. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	٦٤					٦٤
Credit	٤					٤

٣. Additional private study/learning hours expected for students per week.	

٢. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

At the end of the course, students will:

- Identify and describe metabolic pathways which are unique to plants and those shared with other eukaryotes.
- Identify plant metabolic pathways evolved from and shared with prokaryotes.
- Identify unique cellular structures peculiar to plants such as the plastids, as well as the differential properties of alternation of generations in gymnosperms and angiosperms.
- Be able to use basic bioinformatics tools in the investigation of broad gene structure in higher plants through biological databases mining
- Describe molecular, cellular or organismal processes involved in plant defense against pathogens, including innate defense mechanisms.
- Familiarize him/herself with systems biology approaches in contemporary plant studies.

٥. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
١	Activities (Individual discussion; papers presentation; seminar)		٧٥٪

٢	Group projects		٢٥٪
٣	TOTAL		١٠٠٪

D. Student Academic Counseling and Support

١. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) Academic teaching staff will be available to meet individual students for consultation and academic advice at their private offices at the times advised. Office hours: ١٠ hrs. per week; each semester. Time will varies each semester based on academic schedule for each teaching staff.

E Learning Resources

٢. List Required Textbooks: Reference texts: • These are not required textbooks, but they may serve as background material. • Russell Jones, Helen Ougham, Howard Thomas, and Susan Waaland (٢٠١٢) Molecular Life of Plants, Wiley, ISBN: ٩٧٨-٠-٤٧٠-٨٧٠١٢-٩. • Christopher M. Gillen (٢٠٠٥) Reading Primary Literature: A Practical Guide to Evaluating Research Articles in Biology. Pearson, ISBN: ٩٧٨-٠٨٠٥٣-٤٥٩٩-٥.
٢. List Essential References Materials (Journals, Reports, etc.) Different Journals and web sites related to the subject including: ١. Journal of Plant Physiology. ٢. Journal of Agriculture and Food Science. ٣. Journal of Molecular Biology ٤. Journal of Biochemistry. ٥. Journal of Agricultures and Plant Science ٦. http:/www.ansci.cornell.edu/plants/medicinal/ ٧. http:/www.botanical.com
٣. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
٤. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

٥. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
١. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) (١)- Class room is already provided with data show (٢)- The area of class room is suitable concerning the number of enrolled students (could accommodate up to ١٠٠ students) and air conditioned.
٢. Computing resources (AV, data show, Smart Board, software, etc.) (١)- Class rooms are equipped with data show. (٢)- A computer lab is required and connected to the network for students to gather their data and study materials
٣. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

١ Strategies for Obtaining Student Feedback on Effectiveness of Teaching (١) - Questionnaires / students opinion survey (٢) - Open discussion in the class room at the end of the lectures or during individual student/staff meeting
٢ Other Strategies for Evaluation of Teaching by the Instructor or by the Department (١)- Revision of student answer papers / assignments by another staff member. (٢)- Analysis the grades of students.
٣ Processes for Improvement of Teaching

(١)- Preparing the course as PPT.

(٢)- Using scientific movies.

(٣)- Coupling the theoretical part with laboratory part

(٤)- Periodical revision of course content.

٤. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

After the agreement of Department and Faculty administrations; it might include:

(١)- Random check of students exam papers / assignments by external examiner

(٢)- Random check of students exam papers / assignments by internal examiner

٥ Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

A departmental review committee will look after the arrangement periodically after taking feedback from students and in the light of new development in the subject.

Name of Instructor: _____

Signature: _____ Date Report Completed: _____

Name of Course Instructor _____

Program Coordinator:_____

Signature: _____ Date Received: _____

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications

Emerging Topics in Plant Taxonomy

٤٠١٢٧٧١-٤

Course Specifications

Institution: **Umm Al-Qura University**
College/Department: **Faculty of Applied Science / Department of Biology**

A. Course Identification and General Information

١. Course title and code: **Emerging Topics in Plant Taxonomy (٤٠١٢٦٩١-٢)**
٢. Credit hours: **٢ C. H.**
٣. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) **MSc Plant Taxonomy**
٤. Name of faculty member responsible for the course **Dr. Widad Saleem Al-Juhani (wsjuhani@uqu.edu.sa)**
٥. Level/year at which this course is offered
٦. Pre-requisites for this course (if any)
٧. Co-requisites for this course (if any)
٨. Location if not on main campus
٩. Mode of Instruction (mark all that apply) a. traditional classroom ✓ What percentage? **١٠٠ %** b. blended (traditional and online) ☐ What percentage? ☐ c. e-learning ☐ What percentage? ☐ d. correspondence ☐ What percentage? ☐ f. other ☐ What percentage? ☐

B Objectives

١. What is the main purpose for this course? **This course aim to provide a depth understanding to important issues in field of plant taxonomy and shed a light on current trends and emerging problems in this area draws the attention of students to critical gaps in taxonomy researches.**
٢. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: **The course includes the recent trends and emerging topics in plant taxonomy. The content of the course will be flexible to be changed to cover any emerging topics that arise in the future. Thus, the course is not limited to the list of topics presented below, but will also cover future relevant issues. In addition, there will be focus on the topics that have applied significance.**

١. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Species Identification; ▪ **Plant Identification in the wild and challenges** ▪ **Plant species identification using leaf images** ▪ **Plant identification using the Convolutional Neural Networks** ▪ **Plant identification using Smartphones** ▪ **Use Android and iPhone mobile application as tools for species identification** ▪ **Examples of Smartphones applications in plant identification; LeafSnap, Plant-O-Matic, FlowerChecker, Pl@ntNet and Lucidmobile**	٣	١٢
Genome approach ▪ **Phylogeny based in whole genome** ▪ **Whole genome in eukaryotic phylogeny** ▪ **Whole genome to resolving incongruence in molecular phylogenies**	٢	٨

DNA Barcoding ▪ **Use DNA barcodes in species identification** ▪ **Use DNA barcodes in taxonomic and phylogenetic purposes**	١	٤
Current development in molecular phylogeny methods ▪ **Use Next-Generation sequences data (NGS)** ▪ **Use Third-generation sequencing data** ▪ **Use current genomic information for develop an integrative systematics and a global biodiversity Cyberbank**	٢	٨
Multi-locus DNA methods ▪ **Genotypes** ▪ **Use Microsatellite fragment lengths for species identification, taxonomy, genetic diversity & population studies**	١	٤
The Phylogeography (Geographic taxonomy) ▪ **Principle of Phylogeography** ▪ **Use Phylogeography to understand taxonomy and geographic distributions of plant species** ▪ **Use Phylogeography to understand genetic population structure** ▪ **Comparative phylogeography**	٢	٨
Critical discussion to latest taxonomic work **Positives, negatives, gaps and suggestion**	٣	١٢

٢. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	٥٦					٥٦
Credit	٢					٢

٣. Additional private study/learning hours expected for students per week.

٤. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On completion of this course students will have or be able to:

- **Recognize the recent developments in plant identification keys**
- **Awareness of recent developments in phylogenetic methods**
- **The role of Phylogeography to understand geographic taxonomy and distributions of plant species**
- **Determine the best methods for plant identification, phylogeny, study the genetic diversity and population structure**
- **Present information clearly in the form of verbal reports**
- **Communicate complex ideas and arguments in a clear, concise and effective manner.**
- **Work effectively as an individual or part of a team**
- **Use conventional and electronic resources to collect, select and organize complex scientific information**
- **Be able to assimilate and synthesize data from multiple sources**
- **Demonstrate capacity for self-learning and independent thinking and to utilize problem solving skills**
- **Demonstrate effective communication skills in the form of student led group presentations**
- **Demonstrate skills in working collegiately and effectively with others as a member of a team**
- **Set priorities and link these with effective time management**
- **Critically evaluate their personal performance both as an individual and within a team.**

٥. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
١	**Presentation and critical discussion to taxonomic papers (group seminar)**		٣٠٪
٢	**Literature review**		٤٠٪
٣	**Written exam**		٣٠٪
٥	**TOTAL**		١٠٠٪

D. Student Academic Counseling and Support

١. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Academic teaching staff will be available to meet individual students for consultation and academic advice at their private offices at the times advised.

Office hours: ١٠ hrs per week; each semester. Time will varies each semester based on academic schedule for each teaching staff.

E Learning Resources

١. List Required Textbooks

(١)- Soltis, Pamela, Doyle, J.J.(٢٠١٧) Molecular Systematics of Plants II: DNA Sequencing (v. ٢). Published by Springer.

(٢)- Pascale Besse (٢٠١٤) Molecular plant taxonomy: methods and protocols. Humana Press, New York.

٢. List Essential References Materials (Journals, Reports, etc.)

(١)- American Journal of Botany (Am J Bot)

(٢)- Botanical Journal of the Linnean Society

(٣)- Taxon

(٤)- *AoB PLANTS*

(٥)- Journal of Systematics and Evolution

(٦)- Plant Systematics and Evolution

٣. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

(١)-Johanne Ahrenfeldt (٢٠١٧) A Probabilistic Approach to Whole Genome based Phylogeny. DTU Bioinformatics, Technical University of Denmark (pdf).

(٢)-Wen, J., Harris, AJ., Ickert-Bond, SM., Dikow, R., Wurdack, K., and Zimmer, EA. (٢٠١٧) Developing integrative systematics in the informatics and genomic era, and calling for a global Biodiversity Cyberbank. Journal of Systematics and Evolution, ٥٥ (٤): ٣٠٨–٣٢١.

(٣)-Germain-Aubrey, C.C., Nelson, C., Soltis, D.E., Soltis, P.S., and Gitzendanner, M.A.(٢٠١٦) Are Microsatellite Fragment Lengths Useful for Population-Level Studies? The Case of Polygala lewtonii (Polygalaceae). Applications in Plant Sciences, ٤(٢): ١٥٠٠١١٥. doi:١٠,٣٧٣٢/apps.١٥٠٠١١٥.

(٤)-Yang, S., Fresnedo-Ramírez, J., Wang, Linda Cote, M., Schweitzer, P., Barba, P., Takacs,

E.M, Clark, M., Luby, J., Manns, D.C., Sacks, G., Mansfield, A.K. Londo, J., Fennell, A. Gadoury, D., Reisch, B., Cadle-Davidson, L., and Sun, Q. (٢٠١٦) A next-generation marker genotyping platform (AmpSeq) in heterozygous crops: a case study for marker-assisted selection in grapevine. Horticulture Research, ٣, ١٦٠٠٢; doi:١٠,١٠٣٨/hortres.٢٠١٦,٢.
٤. List Electronic Materials, Web Sites, Facebook, Twitter, etc. http://leafsnap.com/ http://www.flowerchecker.com/ https://www.mygarden.org/plants/plantifier http://www.makaques.com/example.html http://www.mynatureapps.com/mynature-tree-guide/
٥. Other learning material such as computer-based programs/CD, professional standards or regulations and software. **Lucid software (**http://www.lucidcentral.com)

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
١. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **(١)- Class room is already provided with data show** **(٢)- The area of class room is suitable concerning the number of enrolled students (could accommodate up to ٥٠ students) and air conditioned.**
٢. Computing resources (AV, data show, Smart Board, software, etc.) **(١)- Class rooms are equipped with data show.** **(٢)- A computer lab is required and connected to the network for students to gather their data and**

study materials
٣. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list) **Lucid software (**http://www.lucidcentral.com)

G Course Evaluation and Improvement Processes

١ Strategies for Obtaining Student Feedback on Effectiveness of Teaching **(١)- Questionnaires / students opinion survey** **(٢)- Open discussion in the class room at the end of the lectures or during individual student/staff meeting**
٢ Other Strategies for Evaluation of Teaching by the Instructor or by the Department **(١)- Revision of student answer papers / assignments by another staff member.** **(٢)- Analysis the grades of students.**
٣ Processes for Improvement of Teaching **(١)- Preparing the course as PPT.** **(٢)- Using scientific movies.** **(٣)- Coupling the theoretical part with laboratory part** **(٤)- Periodical revision of course content.**
٤. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) **After the agreement of Department and Faculty administrations; it might include:** **(١)- Random check of students exam papers / assignments by external examiner** **(٢)- Random check of students exam papers / assignments by internal examiner**
٥ Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. **A departmental review committee will look after the arrangement periodically after taking feedback from students and in the light of new development in the subject.**

Name of Instructor: _____

Signature: _____ Date Report Completed: _____

Name of Course Instructor _____

Program Coordinator:_____

Signature: _____ Date Received: _____

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications

Emerging Topics in Plant Ecology

٤٠١٢٧٧٢-٤

Course Specifications

Institution: **Umm Al-Qura University**
College/Department: **Faculty of Applied Science / Department of Biology**

A. Course Identification and General Information

١. Course title and code: **Emerging Topics in Plant Ecology (٤٠١٢٧٧٢-٤)**
٢. Credit hours: **٤ C. H.**
٣. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) **Ph.D. Biology**
٤. Name of faculty member responsible for the course **Dr. Hanan Osman (heosman@uqu.edu.sa)**
٥. Level/year at which this course is offered
٦. Pre-requisites for this course (if any)
٧. Co-requisites for this course (if any)
٨. Location if not on main campus
٩. Mode of Instruction (mark all that apply) a. traditional classroom ✓ What percentage? ١٠٠ % b. blended (traditional and online) ☐ What percentage? ☐ c. e-learning ☐ What percentage? ☐ d. correspondence ☐ What percentage? ☐ f. other ☐ What percentage? ☐

B Objectives

١. What is the main purpose for this course? **The course aimed to provide in depth understanding and exposure to the current trends and emerging problem in plant ecology and to make student familiar with the critical gap and emerging issues relevant to plant ecology researches.**
٢. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: **The course includes the recent trends and emerging topics in plant ecology. The content of the course will be flexible to be changed to cover any emerging topics that arise in the future. Thus, the course is not limited to the list of topics presented below, but will also cover future relevant issues. Some of the topics may have been covered briefly in the Advanced Plant Ecology course, but here will be covered in more depth. Also there will be focus on the topics that have applied significance. There will be no repetition of topics that has been covered in details in the Advanced Plant Ecology course.**

١. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Causes of climate change	١	٤
Greenhouse effect and greenhouse gases , Sulfate aerosol and black carbon , Land-use change, Emissions from freight transport	٣	١٢

Impacts of climate change **Temperature rise and global warming** **Increased freshwater flow** **Marine ecology** **Health impact** **Risk of lower production in agriculture sector.**	٤	١٦
Greenhouse gas remediation and carbon sequestration **Bio-energy with carbon capture and** **Carbon capture and** **Eliminating waste methane** **Energy efficiency and conservation**	٤	١٦
Impact of livestock on climate change **GHG emissions.**	٢	٨
Adaptation and mitigation practices **Adaptation measures** **Mitigation measures**	٢	٨

٢. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	٦٤					٦٤
Credit	٤					٤

٣. Additional private study/learning hours expected for students per week.

٤. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On completion of this course students will have or be able to:

- **Identify the natural and anthropogenic drivers of climate change.**
- **Summarise the direct observations of climate change.**
- **Describe the impacts of climate change for agriculture, forestry, ecosystems, water resources and human health**
- **Compare different climate change mitigation strategies and climate change policy options**
- **Discuss the ecological, social and economic aspects of climate change impacts, adaptation and mitigation on a global, sectoral and local scale**
- **Cooperate and work independently to devise strategies for climate change adaptation and mitigation on a global, sectoral and local scale**
- **Evaluate climate change policies and reflect on the need for social change**
- **Work effectively as an individual or part of a team.**
- **Use conventional and electronic resources to collect, select and organize complex scientific information.**
- **Be able to assimilate and synthesize data from multiple sources.**
- **Demonstrate capacity for self-learning and independent thinking and to utilize problem solving skills.**
- **Demonstrate effective communication skills in the form of student led group presentations.**
- **Demonstrate skills in working collegiately and effectively with others as a member of a team.**
- **Set priorities and link these with effective time management.**
- **Critically evaluate their personal performance both as an individual and within a team.**

٥. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
١	**Paper presentation (seminar)**		٣٠٪
٢	**Short essay**		٢٠٪
٣	**Short written exam**		١٠٪
٤	**Long literature review**		٤٠٪

٥	**TOTAL**		١٠٠٪

D. Student Academic Counseling and Support

١. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) **Academic teaching staff will be available to meet individual students for consultation and academic advice at their private offices at the times advised.** **Office hours: ١٠ hrs per week; each semester. Time will varies each semester based on academic schedule for each teaching staff.**

E Learning Resources

١. List Required Textbooks **١- Adger, W. N., S. Agrawala, M. M. Q. Mirza, C. Conde, K. L. O'Brien, J. Pulhin, R. Pulwarty, B. Smit, and K. Takahashi. ٢٠٠٧. Assessment of adaptation practices, options, constraints and capacity. In Climate Change ٢٠٠٧: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. M. L. Parry, O. F. Canziani, J. P. Palutikof, C. E. Hanson, and P. J. Van Der Linden, eds. Cambridge:M. L. Parry, O. F. Canziani, J. P. Palutikof, C. E. Hanson, and P. J. Van Der Linden, eds. Cambridge:Cambridge: Cambridge University Press.** **٢- Adger, W. N., I. Lorenzoni, and K. O'Brien. ٢٠٠٩. Adaptation now. In Adapting to Climate Change: Thresholds, Values, Governance. W. N. Adger, I. Lorenzoni, and K. L. O'Brien, eds. Cambridge: Cambridge University Press.** **٣- Roberta Farina, Claudia Di Bene, Chiara Piccini, Alessandro Marchetti, Antonio Troccoli, Rosa Francaviglia, ٢٠١٧, Do Crop Rotations Improve the Adaptation of Agricultural Systems to Climate Change? A Modeling Approach to Predict the Effect of Durum Wheat-Based Rotations on Soil Organic Carbon and Nitrogen.**
٢. List Essential References Materials (Journals, Reports, etc.)

Climate Risk Management **Global Food Security** **Environmental Impact Assessment Review**
٣. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
٤. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
٥. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
١. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **(١)- Class room is already provided with data show** **(٢)- The area of class room is suitable concerning the number of enrolled students (could accommodate up to ١٠٠ students) and air conditioned.**
٢. Computing resources (AV, data show, Smart Board, software, etc.) **(١)- Class rooms are equipped with data show.** **(٢)- A computer lab is required and connected to the network for students to gather their data and study materials**
٣. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

١ Strategies for Obtaining Student Feedback on Effectiveness of Teaching **(١)- Questionnaires / students opinion survey**

(٢)- Open discussion in the class room at the end of the lectures or during individual student/staff meeting
٢ Other Strategies for Evaluation of Teaching by the Instructor or by the Department **(١)- Revision of student answer papers / assignments by another staff member.** **(٢)- Analysis the grades of students.**
٣ Processes for Improvement of Teaching **(١)- Preparing the course as PPT.** **(٢)- Using scientific movies.** **(٣)- Coupling the theoretical part with laboratory part** **(٤)- Periodical revision of course content.**
٤. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) **After the agreement of Department and Faculty administrations; it might include:** **(١)- Random check of students exam papers / assignments by external examiner** **(٢)- Random check of students exam papers / assignments by internal examiner**
٥ Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. **A departmental review committee will look after the arrangement periodically after taking feedback from students and in the light of new development in the subject.**

Name of Instructor: _____Dr. Hanan Osman

Signature: _____ Date Report Completed: _____

Name of Course Instructor _____

Program Coordinator:_____

Signature: _____ Date Received: _____

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications

Emerging Topics in Plant Tissue Culture

(٤٠١٢٧٧٣-٤)

Course Specifications

Institution: Umm Al-Qura University
College/Department: Faculty of Applied Science / Department of Biology

A. Course Identification and General Information

١. Course title and code: Emerging Topics in Plant Tissue Culture (٤٠١٢٧٧٣ -٤)
٢. Credit hours: ٤ C. H.
٣. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) PhD. Botany
٤. Name of faculty member responsible for the course Prof. Dr. Hameda El Sayed Ahmed El Sayed (heelsayed@uqu.edu.sa).
٥. Level/year at which this course is offered
٦. Pre-requisites for this course (if any)
٧. Co-requisites for this course (if any)
٨. Location if not on main campus
٩. Mode of Instruction (mark all that apply) a. traditional classroom ✓ What percentage? ١٠٠ % b. blended (traditional and online) What percentage? c. e-learning What percentage? d. correspondence What percentage? f. other What percentage? Comments:

B Objectives

٣. What is the main purpose for this course? The aim of this course includes the recent trends and emerging topics in plant tissue culture. The content of the course will be flexible to be changed to cover any emerging topics that arise in the future. Thus, the course is not limited to the list of topics presented below, but will also cover future relevant issues. In addition, there will be focus on the topics that have applied significance The course is to provide a thorough understanding of theoretical and practical aspects of plant cell and tissue culture.
٢. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field) Tissue culture involves growing plants from very small sections (sometimes microscopic) in a laboratory. It is a propagation method which is being increasingly used. Tissue culture is not appropriate for many plants, but for others such as orchids, some indoor plants and in particular, many new plant varieties, it is a very popular propagation method. • Grow Ferns, Orchids, Cut Flowers or Other Plants. • Learn to produce large quantities of new varieties fast and at low cost. • Online or Correspondence • Payment Plans available • Unlimited tutor support by email.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: Topics include: Plant regeneration, genetic modification, cellular and physiological aspects of differentiation, somatic embryogenesis, secondary metabolism, hormonal regulation of differentiation. Students for whom this course is compulsory will have priority, but nevertheless they are advised to register as early as possible. • Explain the nature of plant growth processes, in the tissue culture environment. • Determine growing media to use for tissue culture. • Specify appropriate micro-propagation procedures for different purposes. • Explain the management of environmental control equipment used in tissue culture. • Design a layout for a commercial tissue culture facility. • Determine appropriate commercial applications for tissue culture.

١. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
How can the student use the computer to search recent topics in the field of study	١	٤
This topical course consists of two components: An exposition of a topic by the instructors followed by discussion by students.	١	٤
The subjects are selected from current, ongoing research in the field of experimental plant biology with a general subtext of the evolution of the physiological processes peculiar to higher plants.	٢	٨
There Is No Required Text: Original articles in the scientific literature will be discusses. Materials for in-class discussions will be posted on Blackboard. Suggested reference books and review articles will also be posted on Blackboard.	٢	٨
Teaching And Learning Models: ٥. Explain the nature of plant growth processes, in the tissue culture environment. ٦. Determine growing media to use for tissue culture. ٧. Specify appropriate micro-propagation procedures for different purposes. ٨. Explain the management of environmental control equipment used in tissue culture. ٩. Design a layout for a commercial tissue culture facility. ١٠. Determine appropriate commercial applications for tissue culture.	٢	٨
Plant tissue Culture is the aseptic and controlled culture of plant parts such as isolated organs, tissues, embryos, ovaries, on an artificial medium in a closed recipient. During the classical plant breeding process or during the vegetative propagation of a large number of crops, there is an “in vitro” phase. Also for genetic modification of a crop, knowledge about tissue culture is essential.	٢	٨

Do we want the in vitro plant or plant tissue to produce roots, callus or new shoots? Should the plant stay short or should it grow elongated? How can we influence its senescence? This course wants to provide insight in how we control a plant or its tissue in vitro, what's the meaning for practice and what are the problems? A number of basic skills are gained in a well-equipped laboratory. Making complex media, initiation in vitro, in vitro multiplication, and acclimatization.	٢	٨
A Plant Tissue Culture Technician is responsible for preparing culture media, labeling tubes/specimen containers, inoculating, sub culturing, incubating tissue cultures, hardening plants, maintaining laboratory supplies, cleaning of laboratory equipment utilizing proper cleaning protocols and procedures and maintaining records, under limited supervision	١	٤
A Plant Tissue Culture Technician must possess good eyesight and good hand-eye coordination. S/he must know how to work specifically as per the lab's protocol. S/he must have clarity in thought and should be detail oriented. The individual should possess the ability to learn, perform multiple tasks simultaneously, keep accurate records, follow instructions, and comply with company policies.	١	٤
Protoplast culture; Micropropagation ١. Introduction to plant hormones ٢. Biosynthesis and catabolism ٣. Hormone transport ٤. Signal transduction ٥. Plant hormones and biostimulants in horticulture and agriculture ٦. Plant hormones in tissue culture ٧. Doubled haploid production ٨. Protoplast fusion technology	٢	٨
Writing up a proposal for the work	١	٤

٢. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	٦٨					٦٨
Credit	٤					٤

٣. Additional private study/learning hours expected for students per week.	

٤. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

After successful completion of this course students are expected to be able to:

- Explain and discuss the general theoretical backgrounds and practical techniques of plant cell and tissue culture, comprising regeneration, plant genetic modification, cellular and physiological aspects of differentiation of plant tissue cultures (including hormonal cues and morphological impact) and somatic embryogenesis;

- Find, read, understand and integrate literature in the field of plant cell and tissue culture, comprising the aspects mentioned under the previous point;

- Devise, carry out and interpret experiments in plant cell and tissue culture, comprising a.o. handling various forms of plant tissue culture (including somatic embryogenesis and anther/microspore cultures), plant sample preparations for microscopy and interpreting histological to subcellular stainings, Agrobacterium transformation and induction of mutants, using general protocols;

- Devise, carry out, interpret and present a non-standard experiment in the field of plant cell and tissue culture, based on own literature search and own ideas.

٥. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination,	Week Due	Proportion of Total

	speech, oral presentation, etc.)		Assessment
١	Activities (Individual discussion; papers presentation; seminar)		٧٥٪
٢	Group projects		٢٥٪
٣	TOTAL		١٠٠٪

D. Student Academic Counseling and Support

١. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Academic teaching staff will be available to meet individual students for consultation and academic advice at their private offices at the times advised.

Office hours: ١٠ hrs. Per week; each semester. Time will varies each semester based on academic schedule for each teaching staff.

E Learning Resources

- List Required Textbooks:

Reference texts:

- These are not required textbooks, but they may serve as background material.
- Russell Jones, Helen Ougham, Howard Thomas, and Susan Waaland (٢٠١٢) Molecular Life of Plants, Wiley, ISBN: ٩٧٨-٠-٤٧٠-٨٧٠١٢-٩.
- Christopher M. Gillen (٢٠٠٥) Reading Primary Literature: A Practical Guide to Evaluating Research Articles in Biology. Pearson, ISBN: ٩٧٨-٠٨٠٥٣-٤٥٩٩-٥.
- Campbell, N. A. and Jane B. Reece. Biology. ٦th Edition. USA. Pearson Education, Inc. ٢٠٠٢.
- Freshney, R.I. Culture of Animal Cells: A Manual of basic techniques. ٥th Edition. USA. Wiley-Liss Inc. ٢٠٠٥.
- Gamborg, O. L. and G. C. Phillips. Plant cell, tissue, and organ culture: fundamental methods. Germany. Springer-Verlag. ١٩٩٥.
- Plant Propagation by Tissue Culture (٢٠٠٨). Online Resource:
- http://www.springerlink.com/content/n٥tm٣٠/?p=b٩٣c٥ea٧cf٠٩٤٧٥٨ba٣٤٠e٣٢٩c٦dfa٩١&pi=١
- This is a useful reference book you might want to have.
- Other Useful References:
- Plant Cell and Tissue Culture –A Tool in Biotechnology (٢٠٠٩). Online Resource:
- http://www.springerlink.com/content/x٥٧٠٣٥/?p=b٩٣c٥ea٧cf٠٩٤٧٥٨ba٣٤٠e٣٢٩c٦dfa٩١&pi=٢

- Plant Tissue Culture Engineering: (٢٠٠٦). Online Resource:
- http://www.springerlink.com/content/p٣p٤٤٨/?p=b٩٣c٥ea٧cf٠٩٤٧٥٨ba٣٤٠e٣٢٩c٦dfa٩١&pi=٤
- Plant Cell and Tissue Culture (١٩٩٠). Online Resource:
- http://www.springerlink.com/content/w٨٨٥٠٧/?p=b٩٣c٥ea٧cf٠٩٤٧٥٨ba٣٤٠e٣٢٩c٦dfa٩١&pi=٣

٢. List Essential References Materials (Journals, Reports, etc.)

Different Journals and web sites related to the subject including:

٨. Journal of Plant Physiology.
٩. Journal of Agriculture and Food Science.
١٠. Journal of Molecular Biology
١١. Journal of Biochemistry.
١٢. Journal of Agricultures and Plant Science
١٣. http:/www.ansci.cornell.edu/plants/medicinal/
١٤. http:/www.botanical.com

٣. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

٤. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

٥. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

١. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

(١)- Class room is already provided with data show

(٢)- The area of class room is suitable concerning the number of enrolled students (could accommodate up to ١٠٠ students) and air conditioned.

٢. Computing resources (AV, data show, Smart Board, software, etc.)

(١)- Class rooms are equipped with data show.

(٢)- A computer lab is required and connected to the network for students to gather their data and study materials

٣. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

١ Strategies for Obtaining Student Feedback on Effectiveness of Teaching (١) - Questionnaires / students opinion survey (٢) - Open discussion in the class room at the end of the lectures or during individual student/staff meeting
٢ Other Strategies for Evaluation of Teaching by the Instructor or by the Department (١)- Revision of student answer papers / assignments by another staff member. (٢)- Analysis the grades of students.
٣ Processes for Improvement of Teaching (١)- Preparing the course as PPT. (٢)- Using scientific movies. (٣)- Coupling the theoretical part with laboratory part (٤)- Periodical revision of course content.
٤. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) After the agreement of Department and Faculty administrations; it might include: (١)- Random check of students exam papers / assignments by external examiner (٢)- Random check of students exam papers / assignments by internal examiner
٥ Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. A departmental review committee will look after the arrangement periodically after taking feedback from students and in the light of new development in the subject.

Name of Instructor: _____

Signature: _____ Date Report Completed: _____

Name of Course Instructor _____

Program Coordinator:_____

Signature: _____ Date Received: _____

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications

Emerging Topics in phycology

٤٠١٢٧٧٤-٤

Course Specifications

Institution: **Umm Al-Qura University**
College/Department: **Faculty of Applied Science / Department of Biology**

A. Course Identification and General Information

١. Course title and code: **Emerging topics in phycology (٤٠١٢٧٧٤)**
٢. Credit hours: **٤ C. H.**
٣. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) **Ph.D. in Phycology**
٤. Name of faculty member responsible for the course **Prof. Dr. Ali Gab-Alla (aagaballa@uqu.edu.com).**
٥. Level/year at which this course is offered
٦. Pre-requisites for this course (if any)
٧. Co-requisites for this course (if any)
٨. Location if not on main campus
٩. Mode of Instruction (mark all that apply) a. traditional classroom [ ] What percentage? [ ] b. blended (traditional and online) [✓] What percentage? ١٠٠ % [ ] [ ]

c. e-learning What percentage?

d. correspondence What percentage?

f. other What percentage?

Comments:

B Objectives

١. What is the main purpose for this course? **The main target of this course is to promote scientific thinking to the student through enhance and build up update knowledge about recent topics in his / her area of research (PhD degree). This knowledge will help in finishing his/her PhD and reconstruct his/her mind on scientific basis and how to think scientifically.**
٢. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description:

١. Topics to be Covered		
List of Topics	No. of Weeks	Credit hours
How can the student use the computer to search recent topics in the field of study	١	٤
Using SCIENCEDIRECT to do advanced search about recent topics in phycology for example bioactive substances, biofuel, nanotechnology, etc. (note that these topics are changeable according to the area of study in phycology)	٣	١٢
Reading collected topics and writing a review of literature for at least ٣ topics	٣	١٢
Comparing ٣ topics review, which more best in research, more recent and more sound, with open areas or gaps for research	٤	٢٠
Discussions with the student to weigh up which the best to work in terms of availability of equipment, student skills, finance	٢	٨
Writing up a proposal for the work	٢	٨

	١٥	٦٠

٢. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours						
Credit	٣٠	٣٠				٦٠

٣. Additional private study/learning hours expected for students per week. [ ]

٤. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On completion of this course students will have or be able to:

- **Using Science Direct to do search about recent sound topics in the area of study.**
- **Collect most relevant papers in up to date research areas in his or her branch.**
- **Student will be able to have a background on recent methodologies which will use in his/her research.**
- **Student will be able to write a review in his field of research.**
- **Student (with help of supervisor) will be able to know the gaps and open areas still available for research in his field.**
- **Student will be able to do critical discussion about research in his/ her field of research.**
- **Student will be able to understand his / her proposal of research and how can perform it.**

٥. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
١	**Activities**		٣٠٪

٣	**Essays and discussions**		٣٠٪
٤	**Final written exam**		٤٠٪
٥	**TOTAL**		١٠٠٪

D. Student Academic Counseling and Support

١. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) **Academic teaching staff will be available to meet individual students for consultation and academic advice at their private offices at the times advised.** **Office hours: ١٠ hrs per week; each semester. Time will varies each semester based on academic schedule for each teaching staff.**

E Learning Resources

١. List Required Textbooks
٢. List Essential References Materials (Journals, Reports, etc.) High Impact Journals:. **- Getting access to international journals of algal research in Science Direct.**
٣. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
٤. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

_ Science Direct, ReseachGate, Academia.
٥. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
١. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **(١)- Class room is already provided with data show** **(٢)- The area of class room is suitable concerning the number of enrolled students**
٢. Computing resources (AV, data show, Smart Board, software, etc.) **(١)- Class rooms are equipped with data show.** **(٢)- Access to research websites especially Science Direct.**
٣. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

١ Strategies for Obtaining Student Feedback on Effectiveness of Teaching **(١)- Questionnaires / students opinion survey** **(٢)- Open discussion in the class room at the end of the lectures or during individual student/staff meeting.**
٢ Other Strategies for Evaluation of Teaching by the Instructor or by the Department **(١)- Revision of questions papers and student answer papers.**

(٢)- Analysis the grades of students.
٣ Processes for Improvement of Teaching **(١)- Periodical revision of course content according to the study research areas of the students.**
٤. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) **After the agreement of Department and Faculty administrations; it might include:** **(١)- Random check of students exam papers / assignments by internal examiner** **(٢)- Random check of students exam papers / assignments by external examiner**
٥ Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. **A departmental review committee will look after the arrangement periodically after taking feedback from students and in the light of new development in the subject.**

Name of Instructor: Prof. Dr. Ali Gab-Alla
_____

Signature: _____ Date Report Completed: _____

Name of Course Instructor _____

Program Coordinator:_____

Signature: _____ Date Received: _____

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications

Emerging Topics in Plant Biotechnology

٤٠١٢٧٧٥ ـ٤

Course Specifications

Institution: **Umm Al-Qura University**
College/Department: **Faculty of Applied Science / Department of Biology**

A. Course Identification and General Information

١. Course title and code: **Emerging Topics in Plant Biotechnology (٤٠١٢٧٧٥ – ٤)**
٢. Credit hours: **٤ C. H.**
٣. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) **PhD in Botany**
٤. Name of faculty member responsible for the course **Dr. Doaa EL-Ghareeb Keshek (dekeshek@uqu.edu.sa)**
٥. Level/year at which this course is offered
٦. Pre-requisites for this course (if any)
٧. Co-requisites for this course (if any)
٨. Location if not on main campus
٩. Mode of Instruction (mark all that apply) a. traditional classroom ✓ What percentage? **١٠٠ %** b. blended (traditional and online) ☐ What percentage? ☐ ☐ ☐

c. e-learning What percentage? ☐

d. correspondence ☐ What percentage? ☐

f. other ☐ What percentage? ☐

Comments:

B Objectives

١. What is the main purpose for this course?

- ✓ To be familiar with the principles, practices and application of plant tissue culture and transformation techniques in plants.
- ✓ To understand the importance of transformed plants as tool to understand gene functions as well as to improve crop production.
- ✓ To be familiar with the different techniques of plant transformation and hands-on experience and training in representative plant tissue culture and genetic engineering techniques.
- ✓ To understand issues and challenges encountered in the area of plant biotechnology such as ethics of plant biotechnology, biosafety and risk assessment.

٢. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- ❖ Utilization of TV network laboratory for examination and comparison during the practical lesson.
- ❖ Utilization of electronic materials and computer based programs to support the lecture course material.
- ❖ Posting the course material on the website that could be accessed by the students enrolled only in the course.
- ❖ Allocation of tutorial labs containing a number of computer hardware and some educational media.
- ❖ Increased use of IT or web-based reference material.
- ❖ Planning and effective use of e-learning and online learning management system using JUSUR to create a culture of interaction between students and course instructor through connect the laboratories and lecture halls of learning and communicating via the internet.
- ❖ Increasing the interaction between staff member and the student and the application of what is known as an interactive teaching to help meet the immediate follow-up and sustained by a staff member to levels of students.
- ❖ Consistently assigning problems projects to students, as an application to theoretical contents.
- ❖ Working on updating the objectives of the course and the scientific content as required.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description:
This course presents an overview of the techniques used in plant biotechnology, and underlying theory of plant tissue culture and genetic engineering of plants. In addition, the importance of using this technology in research as well as in commercial applications will be studied. The course also will include issues and challenges that face plant biotechnology.

١. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
١- Introduction to plant Biotechnology	١	٤
٢- Binary Vectors design and construction	٢	٨
٣- *Agrobacterium*-mediated transformation	١	٤
٤- Direct GENE transfer methods	٢	٨
٥- Selection and regeneration of transgenic plants	٢	٨
٦- The genetic manipulation of herbicide resistance	١	٤
٧- The genetic manipulation of pest resistance	١	٤
٨- Strategies for engineering stress tolerance in plants	١	٤
٩- The use of plants as factories	٢	٨
١٠-The improvement of crop yield and quality	١	٤
١١- Plant Biotechnology Ethics and Regulations	١	٤

٢. Course components (total contact hours and credits per semester): ٦٠ hours per semester

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	٦٠					٦٠

Credit	٤					٤

٣. Additional private study/learning hours expected for students per week.

٤. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On completion of this course students will have or be able to:

١- Develop fundamental knowledge in Plant Molecular Biotechnology and its application in laboratory and industry settings. This course will provide students an opportunity to deal with some of the most basic, yet widely utilized techniques in micropropagation, plant molecular diagnostics, DNA structure and Gene/Genome organization.

٢- Be familiar with the following principles which are important in plant biotechnology:

- Sterile techniques, media preparation, DNA extraction methods, gene isolation and nucleotide sequence analysis.
- Principles, technical requirement, scientific and commercial applications in Plant Biotechnology.
- Support methodology in plant tissue/cell culture to plant improvement, as well as DNA handling with PCR-based detection diagnostic tools.
- Become motivated to set goals towards higher education and key scientist in plant biotechnological research or industries.
- Understanding the benefits and bio-safety of genetically modified plants.

٥. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
١	**Activities**		٣٠٪
٣	**Essays**		٣٠٪

٤	**Final written exam**		٤٠٪
٥	**TOTAL**		١٠٠٪

D. Student Academic Counseling and Support

١. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) **Academic teaching staff will be available to meet individual students for consultation and academic advice at their private offices at the times advised.** **Office hours: ١٠ hrs. per week; each semester. Time will vary each semester based on academic schedule for each teaching staff.**

E Learning Resources

١. List Required Textbooks: ١.Plant Biotechnology: The genetic manipulation of plants. Adrian Slater, Nigel Scott and Mark Fowler. ٢nd edition, Oxford University Press, ٢٠٠٨. ٢.Introduction to Plant Biotechnology. H S Chawla. ٣rd edition, Science Publishers, ٢٠٠٩.
٢. List Essential References Materials (Journals, Reports, etc.) High Impact Journals: Plant Tissue Culture, Development, and Biotechnology Robert N. Trigiano (Editor), Dennis J. Gray (Editor) CRC Press; ١st edition (November ١٩, ٢٠١٠)
٣. List Recommended Textbooks and Reference Material (Journals, Reports, etc) Plant Tissue Culture, Development, and Biotechnology Robert N. Trigiano (Editor), Dennis J. Gray

(Editor) CRC Press; ١st edition (November ١٩, ٢٠١٠)
٤. List Electronic Materials, Web Sites, Facebook, Twitter, etc. ١- Plant Biotechnology Journal: http://onlinelibrary.wiley.com/journal/١٠,١١١١/(ISSN)١٤٦٧-٧٦٥٢/issues?activeYear=٢٠١٢ ٢- Handbook of Plant Biotechnology online. John Wiley & Sons: http://onlinelibrary.wiley.com/book/١٠,١٠٠٢/٠٤٧٠٨٦٩١٤٣
٥. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
١. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **(١)- Class room is already provided with data show** **(٢)- The area of class room is suitable concerning the number of enrolled students**
٢. Computing resources (AV, data show, Smart Board, software, etc.) **(١)- Class rooms are equipped with data show.** **(٢)- Library is required and connected to the network for students to study materials**
٣. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

١ Strategies for Obtaining Student Feedback on Effectiveness of Teaching **(١)- Questionnaires / students opinion survey** **(٢)- Open discussion in the class room at the end of the lectures or during individual student/staff**

meeting
٢ Other Strategies for Evaluation of Teaching by the Instructor or by the Department **(١)- Revision of student answer papers .** **(٢)- Analysis the grades of students.**
٣ Processes for Improvement of Teaching **(١)- Preparing the course as PPT.** **(٢)- Using scientific movies.** **(٣)- Coupling the theoretical part with laboratory part** **(٤)- Periodical revision of course content.**
٤. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) **After the agreement of Department and Faculty administrations; it might include:** **(١)- Random check of student's exam papers / assignments by external examiner** **(٢)- Random check of student's exam papers / assignments by internal examiner**
٥ Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. **A departmental review committee will look after the arrangement periodically after taking feedback from students and in the light of new development in the subject.**

Name of Instructor: _____

Signature: _____ Date Report Completed: _____

Name of Course Instructor _____

Program Coordinator: **Dr/ Doaa EL-Ghareeb Keshek**

Signature: _____ Date Received: _____

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications

Emerging Topics in Plant Genetics

٤٠١٢٧٧٦ - ٤

Course Specifications

Institution: **Umm Al-Qura University**
College/Department: **Faculty of Applied Science / Department of Biology**

A. Course Identification and General Information

١. Course title and code: **Emerging Topics in Plant Genetics (٤٠١٢٧٧٦ - ٤)**
٢. Credit hours: **٤ C. H.**
٣. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) **PhD in Botany**
٤. Name of faculty member responsible for the course **Dr. Doaa ElGhareeb Keshek (dekeshek@uqu.edu.sa)**
٥. Level/year at which this course is offered
٦. Pre-requisites for this course (if any)
٧. Co-requisites for this course (if any)
٨. Location if not on main campus
٩. Mode of Instruction (mark all that apply) a. traditional classroom ✓ What percentage? **١٠٠ %** b. blended (traditional and online) ☐ What percentage? ☐ ☐ ☐

c. e-learning What percentage?

d. correspondence What percentage?

f. other What percentage?

Comments:

B Objectives

١. What is the main purpose for this course? The course is designed to describe the fundamental basis of plant genetics - Explain biotechnological approaches for plant improvement .
٢. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: Heritable variation, strategies, and consequences of sexual/asexual reproduction, inbreeding and outbreeding. Chromosome structure, behavior, and mapping. Uses of tissue culture and recombinant DNA techniques in plant genetic manipulation.

١. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
١-The genetics revolution in the life sciences	١	٤
٢ - DNA: structure and replication	١	٤
٣- RNA: transcription and processing	١	٤
٤- Proteins and their synthesis	١	٤
٥- Single-gene inheritance	١	٤
٦- Independent assortment of genes	١	٤
٧- Mapping eukaryote chromosomes by recombination	١	٤
٨- The genetics of bacteria and their viruses	١	٤
٩ - Gene isolation and manipulation	١	٤

١٠- Application of recombinant DNA	١	٤
١١- Genomics	١	٤
١٢-The dynamic genome - Population genetics	١	٤
١٣- DNA analysis – plant DNA restrictions and fingerprinting with RAPDs	١	٤
١٤- Regulation of eukaryotic gene expression	١	٤
١٥- Gene interaction	١	٤

٢. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	٦٠					٦٠
Credit	٤					٤

٣. Additional private study/learning hours expected for students per week.

٤. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On completion of this course students will have or be able to:

١. Describe the fundamental basis of plant genetics

٢. Explain biotechnological approaches for plant improvement

٣. Explain genetic variance within plant populations, specifically as it relates to inheritance

٤. Analyze inheritance as it relates to single or quantitative gene traits

٥. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
١	**Activities**		٣٠٪
٣	**Essays**		٣٠٪
٤	**Final written exam**		٤٠٪
٥	**TOTAL**		١٠٠٪

D. Student Academic Counseling and Support

١. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Academic teaching staff will be available to meet individual students for consultation and academic advice at their private offices at the times advised.

Office hours: ١٠ hrs per week; each semester. Time will varies each semester based on academic schedule for each teaching staff.

E Learning Resources

١. List Required Textbooks

(١)- Principles of Plant Genetics and Breeding ٢nd Edition (٢٠١٢) Copyright © ٢٠١٢ John Wiley & Sons, Ltd Author(s): George Acquaah. Published Online: ١٦ AUG ٢٠١٢ **(٢)- Genetic Engineering of Crop Plants Edited by:G. W. Lycett and D. Grierson(١٩٨٩).** **(٣) Advances in Molecular Genetics of Plant-Microbe Interactions by Daniels, M.J. (et al.) (Eds.) (١٩٩٤)** **(٤)- Advances in New Technology for Targeted Modification of Plant Genomes (٢٠١٥).** **Editors: Zhang, Feng, Puchta, Holger, Thomson, James G. (Eds.)**
٢. List Essential References Materials (Journals, Reports, etc.) High Impact Journals: - **Plant Genetics and Genomics** - **Journal of Plant Genetics and Genomics: Crops and Models** **- Developments in Plant Genetics and Breeding**
٣. List Recommended Textbooks and Reference Material (Journals, Reports, etc)
٤. List Electronic Materials, Web Sites, Facebook, Twitter, etc.
٥. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)
١. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **(١)- Class room is already provided with data show** **(٢)- The area of class room is suitable concerning the number of enrolled students**

٢. Computing resources (AV, data show, Smart Board, software, etc.) **(١)- Class rooms are equipped with data show.** **(٢)- Library is required and connected to the network for students to study materials**
٣. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

١ Strategies for Obtaining Student Feedback on Effectiveness of Teaching **(١)- Questionnaires / students opinion survey** **(٢)- Open discussion in the class room at the end of the lectures or during individual student/staff meeting**
٢ Other Strategies for Evaluation of Teaching by the Instructor or by the Department **(١)- Revision of student answer papers .** **(٢)- Analysis the grades of students.**
٣ Processes for Improvement of Teaching **(١)- Preparing the course as PPT.** **(٢)- Using scientific movies.** **(٣)- Coupling the theoretical part with laboratory part** **(٤)- Periodical revision of course content.**
٤. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) **After the agreement of Department and Faculty administrations; it might include:** **(١)- Random check of students exam papers / assignments by external examiner** **(٢)- Random check of students exam papers / assignments by internal examiner**
٥ Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. **A departmental review committee will look after the arrangement periodically after taking**

feedback from students and in the light of new development in the subject.

Name of Instructor: _____

Signature: _____ Date Report Completed: _____

Name of Course Instructor _____

Program Coordinator:_____

Signature: _____ Date Received: _____

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Course Specifications

Emerging Topics in Flora and Plant Geography

٤٠١٢٧٧٧-٤

Course Specifications

Institution: **Umm Al-Qura University**
College/Department: **Faculty of Applied Science / Department of Biology**

A. Course Identification and General Information

١. Course title and code: **Emerging Topics in Water Microbiology (٤٠١٤٦٩١-٢)**
٢. Credit hours: **٢ C. H.**
٣. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) **MSc in Biology**
٤. Name of faculty member responsible for the course **Prof. Dr. Momen M. Zareh**
٥. Level/year at which this course is offered
٦. Pre-requisites for this course (if any)
٧. Co-requisites for this course (if any)
٨. Location if not on main campus
٩. Mode of Instruction (mark all that apply) a. traditional classroom ✓ What percentage? **١٠٠ %** b. blended (traditional and online) ☐ What percentage? ☐ ☐ ☐

c. e-learning What percentage? ☐

d. correspondence ☐ What percentage? ☐

f. other ☐ What percentage? ☐

B Objectives

١. What is the main purpose for this course? **The course aimed to provide in depth understanding and exposure to the current trends and emerging problem in flora of Saudi Arabia and to make student familiar with the critical gap and emerging issues relevant to Plant geography.**
٢. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: **The course includes the recent trends and emerging topics in plant geography and flora of Saudi Arabia. The course content will be flexible to be changed to cover any emerging topics that arise in the future. Thus, the course is not limited to the list of topics presented below, but will also cover future relevant issues. Some of the topics may have been covered briefly in the Advanced flora and ecology courses, but here will be covered in more depth. Also there will be focus on the topics that have applied significance. There will be no repetition of topics that has been covered in details in the advanced geography course.**

١. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Origins of Biodiversity idea. Protection, conservation, management of natural resources, protected areas and local development	٢	٤
Modern concept of biological diversity **in saving nature's legacy**	١	٢
Culture and nature, the inextricable link **in Cultural and spiritual values of biodiversity**	٢	٤
Protected areas: visions and management	١	٢
Landscape concept, origin and geographical perspectives	١	٢
Landscape issues: conservation, management and intervention	١	٢

Sociocultural characterization of territories	١	٢
Social demand of landscape	١	٢
Reinterpreted landscapes, from patrimonial sites to contemporary places	١	٢
Tourism, territorial branding and city-marketing	١	٢
Landscape as a brand. City-marketing strategies	١	٢
Rural development focused in landscape values	١	٢
Biome, megaflora and horticultural flora	٢	٤

٢. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	٣٢					٣٢
Credit	٢					٢

٣. Additional private study/learning hours expected for students per week. ☐

٤. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On completion of this course students will have or be able to:

- **Understand the Biodiversity idea. Protection, conservation, management of natural resources, protected areas and local development.**
- **Describe the *modern concept of biological diversity* in saving nature's legacy**
- **An introduction the landscape concept, origin and geographical perspectives.**
- **Identify and differentiate Biome, megaflora and horticultural flora.**
- **Present information clearly in the form of verbal reports.**
- **Communicate complex ideas and arguments in a clear, concise and effective manner.**
- **Work effectively as an individual or part of a team.**
- **Use conventional and electronic resources to collect, select and organize complex scientific information.**
- **Be able to assimilate and synthesize data from multiple sources.**
- **Demonstrate capacity for self-learning and independent thinking and to utilize problem solving skills.**

- **Demonstrate effective communication skills in the form of student led group presentations.**
- **Demonstrate skills in working collegiately and effectively with others as a member of a team.**
- **Set priorities and link these with effective time management.**
- **Critically evaluate their personal performance both as an individual and within a team.**

٥. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
١	**Paper presentation (seminar)**		٣٠٪
٢	**Short essay**		٢٠٪
٣	**Short written exam**		١٠٪
٤	**Long literature review**		٤٠٪
٥	**TOTAL**		١٠٠٪

D. Student Academic Counseling and Support

١. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Academic teaching staff will be available to meet individual students for consultation and academic advice at their private offices at the times advised.

Office hours: ١٠ hrs per week; each semester. Time will varies each semester based on academic schedule for each teaching staff.

E Learning Resources

١. List Required Textbooks

- **Wu, J. ٢٠٠٨. Landscape ecology. In: S. E. Jorgensen (ed), Encyclopedia of Ecology. Elsevier, Oxford.**
- **Kirchhoff, T., Trepl, L. and V. Vicenzotti, V. ٢٠١٢: What is landscape ecology? An analysis and evaluation of six different conceptions.**
- **Cain, Michael; Bowman, William; Hacker, Sally (٢٠١٤). *Ecology* (Third ed.). Massachusetts: Sinauer.**
- **Cox, C. B., Moore, P.D. & Ladle, R. J. ٢٠١٦. *Biogeography: an ecological and evolutionary approach*. ٩th edition. John Wiley & Sons: Hoboken**
- **Box, E.O. & Fujiwara, K. (٢٠٠٥). Vegetation types and their broad-scale distribution. In: van der Maarel, E. (ed.). *Vegetation ecology*. Blackwell Scientific, Oxford.**
- **Cullen, James; Knees, Sabina; Cubey, H Suzanne, eds. (٢٠١١), *The European Garden Flora: A manual for the identification of plants cultivated in Europe, both out-of-doors and under glass. Vols 1–5*, Cambridge, UK: Cambridge University Press.**

٢. List Essential References Materials (Journals, Reports, etc.)

- **Troll, C. ٢٠٠٧: The geographic landscape and its investigation. In: Wiens, J.A., Moss, M.R., Turner, M.G. & Mladenoff, D.J. (eds): Foundation papers in landscape ecology. New York, Columbia University Press:٧١–١٠١ [First published as: Troll, C. ١٩٥٠: Die geographische Landschaft und ihre Erforschung. Studium Generale ٣(٤/٥):١٦٣–١٨١].**
- **Reed, J; Deakin, E; Sunderland, T (٢٠١٥). "What are 'Integrated Landscape Approaches' and how effectively have they been implemented in the tropics: a systematic map protocol". *Environmental Evidence*. ٤:٢. ISSN ٢٠٤٧-٢٣٨٢**
- **Olson, D. M. & E. Dinerstein (١٩٩٨). The Global ٢٠٠: A representation approach to conserving the Earth's most biologically valuable ecoregions. *Conservation Biol.* ١٢:٥٠٢–٥١٥,**

٣. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

٤. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

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١. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) **(١)- Class room is already provided with data show** **(٢)- The area of class room is suitable concerning the number of enrolled students (could accommodate up to ١٠٠ students) and air conditioned.**
٢. Computing resources (AV, data show, Smart Board, software, etc.) **(١)- Class rooms are equipped with data show.** **(٢)- A computer lab is required and connected to the network for students to gather their data and study materials**
٣. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

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