King Saud University

College Of Science

Department of Biochemistry

Syllabus for BCH 350 – : Plant Biochemistry

**Instructors**

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**When can you see me?**

(During office hours or by appointment)The best way to reach me for questions, appointments etc. is by email or talk to me after class or in lab to set up a time to meet.

**Course Description**

Pant Biochemistry is a course designed to introduce the students to biochemical processes that take place in plant such as plant metabolic processes, photosynthetic reactions, plant secondary metabolites and the metabolic pathways, plant hormones and the use of plant in medicine and industry. The goal of this course is the current view of the biochemistry of plants, based on the latest knowledge and the biochemical differences between plants and other organisms. This course can target students from different disciplines such as biochemistry, botany and anyone using plant products -in food and medicines

**Course Objectives and Outcomes**

I have developed the course to address several learning aims and outcomes. After successful completing this course, students should be able to

1-To Explain the interaction between the various biochemical processes within the plant cell

2-To Describe the transport mechanism of bio-chemicals through plant membrane

3-To know the molecular components and features of biochemical pathways in plants

4-To be familiar with the structures, properties, and functions of plant metabolites

5-To appreciate how plants differ from other organisms at the biochemical level

6-To understand and explain secondary metabolites and their potential therapeutic and nutritional uses

**Content**

|  |  |  |
| --- | --- | --- |
| Week | Topic |  |
| 1&2 | **Plant cell structure and compartments** | Introduction to plant Anatomy and physiology |
| 3&4 | **Polysaccharides** | Polysaccharides are storage and transport forms of carbohydrates  Polysaccharides: Starch structure, metabolism  Polysaccharides: Cell wall structure, metabolism  cell wall biosynthesis  Fibers |
| 5 | **plant metabolism** | protein, lipid and sugars transportation in plant |
| 6&7 | Biosynthesis of natural products  Plant secondary metabolites  alkaloids  Phenolic  Terpene  Carotenoids  Secondary metabolites as antioxidants |
| 8 | nitrogen fixation |
| 9&10 | **Photosynthesis** | Photosynthesis - Light absorbtion  Photosynthesis Electron Transport  Photosynthesis Q-cycle and ATP synthesis  Calvin Cycle  Rubisco; photorespiration |
| 9 | **Plant hormones and signaling pathways** | hormones and  structure function relationship of plant hormones  Metabolism of auxins, gibberellins and cytokinins |
| 11&12 | **Vitamins in plants:** | occurrence, biosynthesis and function |
| 13 | **plant genome structure and bioinformatics** |  |

**Assessment**

The final course grade will be determined based on the following point breakdown:

**Marking scheme**

|  |  |  |
| --- | --- | --- |
|  | **Weight** | **Due date** |
| 1st midterm Exam | 20 |  |
| 2nd midterm Exam | 20 |  |
| Class participation and quizes | 5 |  |
| Group assignment and presentation | 10+5 |  |
| The final exam is cumulative | 40 |  |
| **Total** | **100** |  |

**Exams**

There will be three exams comprised of a combination of multiple choice, true/ false, matching, gap filling, short answer. Exams will cover all material discussed in lecture, or any additional resources given to the student.

If you know in advance that you will miss an exam, please notify me at least one week ahead of time so that we can make alternate arrangements. If you miss an exam due to a documented health or family related emergency, you **MUST** contact me and submit medical report or any other document(s) to request alternative exam. It is the responsibility of the student, not me, to ask for the make-up exam.

**Class attendance and participation**

Class attendance is taken on a regular basis. A student must have not less than 75% attendance at lectures and practical to be qualified to take the final examinations.

Participation includes actively responses to questions in class, participation in discussions, and simply raising your hand from time to time to ask questions or make a comment (something I DO expect you to do).

**What resources are available to you to help you succeed in this course?**

1. **Lectures**

Course will be delivered by Lectures. The lecture notes (Power point slides) will be available prior to the lecture. The power point slides are NOT a good substitute for attending lecture. There will be additional important information or explanations covered in lectures that will not be on your copy of the slides. If you miss a lecture please make arrangements with a classmate to get their class notes.

**Textbook adopted and supporting references**

|  |  |  |  |
| --- | --- | --- | --- |
| **Title of the book** | **Author's name** | **Publisher's name** | **Date of publication** |
| Lehninger: Principles of Biochemistry, 6th edition | David L. Nelson, Michael M. Cox | W.H. Freeman | 2012 |
| Introduction to plant biochemistry , 2nd edition | Godwin & Mercer | Pergamon | 2000 |

**How do I ensure that everyone has an equal opportunity to succeed in the class?**

As your professor, I am responsible for ensuring that all students have the same advantages throughout the course. You are encouraged to work with your classmates to do the problem sets and discuss the taught topics on lecture notes—science is a collaborative affair.

1. Any student in this course who has a disability that may prevent them from fully demonstrating their abilities should contact me personally as soon as possible to discuss any accommodations needed to ensure maximal participation and facilitate equal educational opportunity.
2. Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Any type course-related academic dishonesty will be dealt harshly along with a report of the incident being sent to the University. Academic dishonesty includes, but is not limited to, cheating on exam, copying reports, plagiarism, will not be tolerated and may result in a grade of "0" or "F" on the particular assignment or (F) grade for the entire course.
3. Traditionally, Cell Biology has not been the easiest of courses. If you do not understand a topic please ask questions to improve your comprehension. Be proactive about seeking help: the material moves quickly, so if you don’t ask for help when needed, you risk falling even further behind. Make sure to ask questions during class or see me after class if you are having problems.  **Don’t wait until last minute to get help!** Seek help from your classmates. I feel that collaborative studying and discussion of the material is an excellent way to learn. During discussions remember to respect the opinions and questions of other students.

**Suggestions for doing well**

* Come to lectures and laboratory classes (and participate)
* Take good notes during classes.
* Read book chapters or notes before and after attending lectures (and take the time to read them well)! Seek help if needed – Collaborate with each other
* Be active throughout the semester and make sure you take advantage of every possible resource that will help you to successfully complete this course.