Date	Day	Topic
26-Aug	T	Course overview & Phytochemicals Introduction
28-Aug	R	Introduction to phytochemicals
2-Sep	T	Classification of phytochemicals
4-Sep	R	Free Radicals & Antioxidants
9-Sep	T	Free Radicals & Antioxidants
11-Sep	R	Fruits & Vegetables
16-Sep	T	Organosulfur compounds (OSC)
18-Sep	R	Organosulfur compounds (OSC)
23-Sep	T	OSC & Phytoestrogens
25-Sep	R	Phytoestrogens
30-Sep	T	Phytoestrogens
2-Oct	R	Review
7-Oct	T	**Exam # 1**
9-Oct	R	**Fall Recess/ No Class**
14-Oct	T	TBA
16-Oct	R	Glucosinolates and cancer chemoprevention
21-Oct	T	Glucosinolates
23-Oct	R	Flavonoids & Tea polyphenols
28-Oct	T	Flavanoids & Resveratrol
30-Oct	R	Flavanoids & Resveratrol
4-Nov	T	Carotenoids & Lycopene
6-Nov	R	Carotenoids & Lycopene
11-Nov	T	TBA
13-Nov	R	Curcumin
18-Nov	T	Curcumin/phytosterols
20-Nov	R	Student presentations
25-Nov	T	Student presentations
27-Nov	R	**Thanksgiving break/No Class**
2-Dec	T	Student presentations
4-Dec	R	Student presentations
9-Dec	T	**Final Exam (Exam # 2)**

Note: Classroom lectures may be adjusted according to the availability of time for each topic and may be continued for one or more class hours than specified in the above schedule.

Course Title: Phytochemicals role in health & Disease
Course Number: PHA 556

Course Credits: 2

Class Meeting Time: 9:30 – 10:20 AM Tuesday & Thursday

Course Description

As stated by Hippocrates "Let food be thy medicine and Medicine be thy food" - the Father of Medicine long back, this course primarily focuses on biochemical role of phytochemicals present in dietary foods on health and disease. The objective of this course is to review and learn the basic concepts and classification of phytochemicals present in our daily diet, followed by the study of specific phytochemicals and their relation to human health and disease. Basic mechanisms/ pathways through which phytochemicals act/alter will be discussed. Students will have an opportunity of gaining an in-depth understanding of a specific phytochemical of their choice or any other phytochemical designated by the instructor through a research review paper and an in-class presentation. Lectures and discussions will be based on review articles and the primary literature.

Prerequisites: Good standing P-1 year

Course Outcomes:

Upon completion of this course, students should:

1. Have an understanding of what constitutes a phytochemical and their classification.
2. Have an extensive understanding of selected phytochemicals covered in class; how they work and their relevance to human health and disease.
3. Demonstrate the knowledge of cellular and molecular mechanisms within which phytochemicals alter in improving health & disease conditions.
4. Have experienced the process of critically and thoroughly investigating, discussing and reporting on a specific area of a selected phytochemical(s) through an individual or group research paper.
5. Demonstrate advanced scientific writing and presentation skills.

Educational Outcomes:

Section 1 Pharmaceutical Care:
Knowledge of basic Science, Math, Economic and Regulatory Principles

1.1.3. Demonstrate knowledge of the functional groups of drugs (phytochemicals) and other aspects of medicinal chemistry important for their interactions
1.1.4. Demonstrate knowledge of drugs (phytochemical) mechanisms of action

Manage Medication Information

1.3.2. Evaluate and interpret literature

Section 2 Systems Management:

2.1. Describe how the medication distribution system supports the safe and effective use of medication

2.4. Describe the importance of policy and procedures to ensure safe and accurate medication use and general pharmacy operations including personnel, administrative, physical resources, information technology and/or informatics.

Section 3 Public Health

3.1. Identify and evaluate at risk population which may benefit from public health initiatives.

Section 4 General Abilities

4.2. Relay and respond to information effectively and appropriately using verbal, nonverbal, written and technological methods of communication. (Ability to communicate)

4.6. Actively, effectively and appropriately participate in group interactions to achieve a common goal. (Group collaboration)

Learning Objectives: See individual topic handouts for specific learning objectives for the course.

1. Identify the constitution and classification of phytochemicals
2. Explain cellular and molecular mechanisms within which phytochemicals act to improve health

Course Assessment:

1) Active participation in classroom discussions is required (50 points out of a 200 total).
2) In and out of class room activities are designed to help the student in the application of information relevant to the class. It is the responsibility of the student to complete the assignments satisfactorily and on time. Failure to do so will result in the **loss of 0.5 grade point** for each late or unsatisfactory assignment from the final course grade.

Participation in discussions	50 points
Written assignment	25 points
Classroom presentation	25 points
Exams (2 x 50)	100 points
TOTAL	**200 points**

Course Grade Scale:

92 – 100 =4.0	86 – 92 = 3.5	79 - 86 = 3.0
74 – 79 = 2.5	65 - 74 = 2.0	<65 = 0.0

** Final grade is strictly awarded at the discretion of the instructor

Research Review Paper; Important Facts:

- This is your opportunity to expand your knowledge in a specific area of phytochemicals through a topic of your choice within phytochemicals.
- You can do this individually or in a group of up to 3 or 4 people.
- For groups, all group members will receive the same grade for the research paper.
- You must have your topic approved by the instructor and are encouraged to consult with the instructor as you decide on a topic.
- Your research review paper should be an enjoyable process, so this means you should work on it throughout the semester. You may need time to gather information so give yourself plenty of time to learn and enjoy the process.
- Your research review paper is due by **Monday December 8th, 2014**. You can e-mail it to me or bring it to my office (SLC 319A).

You must comply with the following format requirements:

- 8-10 pages including references and cover page.
- Computer printout, double spaced, one-sided/two-sided, 12-point font.
- Reference style is your choice but must be consistent.
- Must include a minimum of 5 primary research articles from peer-reviewed scientific journals.
- Avoid internet references (use scientific articles instead).

Recommended Text/Readings:

There is no required text for this class. However you can use the following textbooks for your reference.

1) An evidence-based approach to dietary phytochemicals, edited by Jane Higdon

2) Phytochemicals in health and disease (2009), edited by Yongping Bao and Roger Fenwick.

Attendance Policy:

Attendance will not be taken but is strongly encouraged. There will be no makeup of exams for unexcused absences and a grade of **zero** will be given. In the case of an unusual circumstance in which the absence is excusable, the student must contact **the instructor** at least one-half hour before class. Make-up exams for these cases will be given at the discretion of the instructor.

Examination Policy

Prior to the test, no student may enter the examination room. Upon entry into the examination room there will be no talking. All personal items (i.e. book bags, pagers, cellular phones, personal calculators, etc.) must be kept at the front or side of the room. Students will not be allowed to wear any type of hats during the examination and will be given assigned seats. The examination paper should not be turned over until instructed to do so by the proctor(s). The student should check that the examination is complete and read all the instructions. After the first test is returned to the proctor, tardy students will **not** be allowed to enter the room and start the exam. That student will get a zero for the test. Only questions related to typos or

obvious errors in the examination that the student feels may require a general announcement to the entire class will by answered by the proctors.

- All exams **must be returned to the course instructor(s) in class on the day on which it is made available for review. Failure to do so will result in a grade of zero for the examination.**
- Students will have **5 school days to review an exam after grades are made available to identify problem areas, verify grading or contest answers to questions. Exams will not be available for student review after this time period.**
- There will be no makeup of exams or quizzes for unexcused absences. A grade of **zero** will be given.
- In the case of an unusual circumstance in which the absence is excusable (for example, illness), the student must contact **the instructor** at least one-half hour before the exam. Students who are too ill to take an exam must see student health or their private physician for a written excuse.
- Make-up exams or assignments will be given at the discretion of the instructor.
- Instructor has the right to give a different make-up exam at his sole discretion.

Academic Honesty:

Any student who violates the Intellectual Responsibility and Plagiarism Policy as stated in the most recent copy of the University Student Handbook will be subject to disciplinary action which may include failure of the course.

Professionalism *(adpated from Purkenson D. University of Washington)*

As consistent with expectations of the practice environment, professional behavior and attitudes are expected for all students enrolled in professional practice courses. Professionalism is demonstrated by a student who:

- uses appropriate use of verbal & non-verbal communication
- is punctual
- is reliable, dependable, accountable for one's actions
- behaves in an ethical manner produces quality work,
- accepts constructive criticism and modifies behavior if necessary
- is cooperative – i.e. non-argumentative; willing and helpful
- is non-judgmental – student demonstrates an attitude of open-mindedness towards others and situations; does not "stereotype" others or prejudge situations
- communicates assertively – actively and appropriately engages in dialogue or discussion
- is self-directed in undertaking tasks, self-motivated
- is respectful – demonstrates regard for self, standardized patients, peers, faculty, staff and university property
- is empathetic – demonstrates appreciation of others' positions; attempts to identify with other with others' perspectives; demonstrates consideration towards others
- handles stress – remains calm, levelheaded, and composed in critical, stress or difficult situations

- is an active learner – seeks knowledge; asks questions, searches for information, takes responsibility for own learning
- is confident – acts & communicates in a self-assured manner, yet with modesty and humility
- follows through with responsibilities – if task is left incomplete or problem is not resolved, student seeks aid
- is diplomatic – is fair and tactful in all dealings with patients, peers, faculty and staff.
- is appropriately attired
- demonstrates a desire to exceed expectations – goes "above and beyond the call of duty", attempts to exceed minimal standards and requirements for tasks/assignments/responsibilities
- utilizes time efficiently – allocates and utilizes appropriate amounts of time to fulfill responsibilities; utilizes others' time wisely

Lack of respect for other students, professors or staff as demonstrated by comments, tone of voice, or disruptive behavior will **not be tolerated**.

Everyone has a right to be heard and should be able to express their constructive comments without ridicule. When expressing opinions etc. "I" phrases should be used. Lack of respect for other students, professors or staff as demonstrated by comments, tone of voice, disruptive behavior or absenteeism will **not be tolerated**. Additionally, there is to be no disruptive eating in the classroom.

Students who violate the professionalism policy can be dismissed from class. Re-entry into the class (including taking exams) can only occur after the student writes an essay on professionalism and civility; the essay must be deemed acceptable by the instructor and the department chair.

Cell Phones, Pagers & Other Communication Devices

All cell phones, pagers etc. are to be on **silent mode** during class or **turned off!** Cell phones and pagers are **NOT** to be answered during class time.