PHA 5933 Clinical Applications of Pharmacogenomics

Fall A 2014 1 Semester Credit Hour

Course Purpose:

Pharmacogenomics is the study of genetic variation associated with drug response, adverse drug events, and disease outcomes related to drug treatment. This course will focus on how pharmacogenomics can be used in patient care. Students will be given the opportunity to have their personal DNA genotyped on a custom chip, and utilize this information for the class assignments. Alternatively students may work with a de-identified genotype dataset. This course will use a combination of interprofessional lectures, and case-based discussions of clinical pharmacogenetic guidelines and primary literature. The goal of this course is to provide health professional students with the knowledge and skills to use pharmacogenomic information in their future clinical practice in an interprofessional learning environment.

Course Faculty and Office Hours

Course Coordinator:
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Office Hours
By appointment only.

Place and Time of Class Sessions

Online course material:
On Monday of each week, approximately 1 hour of lecture content will be made available (located in the Resources section of the course website). This lecture must be viewed by students and associated readings and/or assignments completed prior to the live class session.

Live Class Sessions: Wednesday from 5:30pm to 6:20pm, via the live, webinar platform. Students will be required to log in to the live, synchronous, webinar platform from their personal laptops.

How This Course Relates to the Learning Outcomes You Will Achieve in the Pharm.D. Program:

This course prepares the Pharm.D. student to accomplish the following abilities and the related Student Learning Outcomes (SLOs) upon graduation:

- **2.1. Patient-centered care (Caregiver)** - Provide patient-centered care as the medication expert (collect and interpret evidence, prioritize patient needs, formulate assessments and recommendations, implement, monitor and adjust plans, and document activities).

- **3.1. Problem Solving (Problem Solver) –** Identify and assess problems; explore and prioritize potential strategies; and design, implement, and evaluate the most viable solution.

- **3.4. Interprofessional collaboration (Collaborator) –** Actively participate and engage as a healthcare team member by demonstrating mutual respect, understanding, and values to meet patient care needs.

Course Objectives

Upon completion of this course, the student will:

1. Explain risks involved with pharmacogenetic testing.
2. Interpret and apply evidence from the pharmacogenomics medical literature and CPIC guidelines.
3. Apply personal or de-identified genetic information to clinical decision-making for representative cases using the following pharmacogenomic drug-gene pairs:
    a. CYP2D6 and Codeine
    b. Clopidogrel & CYP2C19
    c. SLCO1B1 and Simvastatin
    d. CYP2C9, VKORC1 and Warfarin
    e. TPMP and Thiopurines
    f. IL28B (IFNL3) and PEG-IFN
4. Demonstrate the contributions and roles of other health care professionals in the clinical application of genomic information to patient care.
5. Summarize the challenges and opportunities of implementing pharmacogenomic testing.

Pre-Requisite Knowledge and Skills

For student pharmacists, successful completion of 1PD and 2PD coursework is required to take this course.

Course Structure & Outline

Course Structure. The course consists of weekly web-based lectures, readings, and/or assignments and lectures (1 hour per week), and weekly live, web-based interactions with instructors and students (via live webinar platform, 1 hour per week).

Students will be periodically assigned to present and discuss content during live sessions (e.g. answers to cases or questions). These assignments will occur in such a way as to give an equal number of opportunities for individual students to present and participate.

This course will be offered during the **first 8 weeks** of the Fall semester, and may be taken alone, or in conjunction with Clinical Applications of Genomic Medicine (offered during the second 8 weeks of the Fall semester).

Course Outline/Activities. The outline of course activities is listed in **Appendix A**.

Textbooks

There is no required text. The instructor will provide any required reading.

Active Learning Requirements

For all learning experiences in this course, including lectures, reading assignments, cases and discussions, students are expected to actively engage in the learning process, striving to comprehend the meaning and relevance of all transmitted concepts and facts. Students should strive to discover deficiencies in their understanding, and attempt to resolve those deficiencies by any of several means, including through their own research (a recommended first step) and through consultation with fellow students and course instructors.

1. Lectures: Lectures will require completion of integrated quizzes, questions, reflection, feedback, and/or other assignments to ensure that students are actively engaging in the material and integrating it with their existing knowledge base.
2. Cases and Discussions: Attending and participating in cases and discussions are active learning processes in this course. Students are expected to actively participate in discussions and case-based learning, and communicate the concepts and ideas that they have learned in the lectures and are applying in this class.
3. Reading Assignments: Reading assignments will require completion of integrated quizzes, questions, reflection, feedback, and/or other assignments to ensure students are actively engaging in the reading assignments, and understand the objectives and concepts that are in the reading assignments.

Feedback to Students

Feedback will be provided through written comments and grading on patient cases, assignments, two quizzes, and through online and live class participation assessments.

Student Evaluation & Grading

Evaluation Methods

Each student's grade will be based on their individual performance; assessment will also be done individually by each faculty member participating in the course.

There will be two quizzes during the course, which will be administered online. Quizzes will cover material reviewed in the case discussions and assigned readings/lectures.

The course grade will be determined as follows:

Attendance (see attendance policy)	10%
Assignments and Patient Cases* (see below)	30%
Quizzes (see quiz policy)	30%
Participation (see below)	20%
Final Project	10%
Total	100%

Grading Scale

95-100 = A	90-94 = A-
86-89 = B+	83-85 = B
80-82 = B-	76-79 = C+
73-75 = C	70-72 = C-
66-69 = D+	63-68 = D
60-62 = D-	<60 = E

Assignments and Patient Cases:
Students will complete a short assignment or a patient case each week. Assignments will require completion of the lecture content and will be due prior to the live course session. There are a total of 6 assignments (1 per week for Week 2 through Week 7), so each one comprises 5% of your final grade.

Participation:
Students' participation grade will be derived from a number of interactive course activities, which include but are not limited to the following:

- Survey(s) or alternate assignments: Students will be given the option to complete a pre- and post-course survey as part of a study being conducted in conjunction with the course. Students preferring not to complete the survey will be required to complete an alternate assignment for this portion of the participation grade, which will be posted to Sakai. Additional details about this portion of the course will be provided during the first live class session, at which time students will also have the opportunity to ask any questions.
- Completion of webinar software training/installation of software
- Return of genotyping test kit (more information will be provided by the genotyping study coordinator)
- Participation in live, web-based sessions
- Other activities to be assigned throughout the course

Class Attendance Policy

Attendance for live, web-based sessions is required. Students will learn more from this course by attending these sessions and participating in the discussions. A student may have one unexcused absence with no penalty in the course. If a student has two to four unexcused absences, he/she will receive a reduction in the attendance portion of the grade: two unexcused absences = 20% reduction (2% reduction in the final grade), three unexcused absences = 30% reduction (3% reduction in the final grade), and four unexcused absences = 50% reduction (5% reduction in the final grade). If a student has five or more unexcused absences, he/she will receive zero points for attendance, resulting in a 10% reduction in the final grade.

Requests for excused absences should be directed to the course coordinator by email as early as possible in the course and will be handled on an individual basis. Examples of excused absences include: illness, death in the family, religious holiday. These should be made BEFORE the session that will be missed, if possible. Attendance will be monitored at live, web-based sessions via participation and log-in confirmation on the webinar platform. Students with excused absences will be required to watch a recording of the live, web-based session they missed, and provide a written summary of it to the course coordinator.

Quiz Policy

The two quizzes will be a take-home quizzes and will be 30% of the overall grade. The quizzes will be very similar to the in-class cases and discussion questions and will be "open book." Further description of the quiz can be found in **Appendix B**.

Make-up Quiz Policy

Students who miss a quiz due to unforeseeable circumstances, such as illness, family emergency, or death in the family should personally report this to the course coordinator PRIOR to the administration of the quiz. Appropriate and verifiable documentation of the need to miss the quiz will be required. Please note that circumstances other than these will be evaluated on an individual basis but notification PRIOR to the quiz is still required. A make-up quiz (essay format) will be provided to the student at a reasonable time, as established by the course coordinator. Only in extreme circumstances will the make-up quiz be administered more than two weeks after the scheduled quiz.

Policy on Old Assignments and Quizzes

Students are not provided old assignments or quizzes.

Assignment Deadlines

Assignments will be due each week prior to the live class session (specific details will be provided on the course website).

General College of Pharmacy Course Policies

The College of Pharmacy has a website that lists course policies that are common to all courses. This website covers the following:

1. University Grading Policies
2. Academic Integrity Policy
3. How to request learning accommodations
4. Faculty and course evaluations
5. Student expectations in class
6. Discussion board policy
7. Email communications
8. Religious holidays
9. Counseling & student health
10. How to access services for student success
11. Faculty Lectures/Presentations Download Policy

Please see the following URL for this information:
http://www.cop.ufl.edu/wp-content/uploads/dept/studaff/policies/General%20COP%20Course%20Policies.pdf

Complaints

Should you have any complaints with your experience in this course please contact your course coordinator. If unresolved, contact the COP Senior Associate Dean-Professional Affairs. For unresolved issues, see:
http://www.distancelearning.ufl.edu/student-complaints to submit a complaint.

Other Course Information

Appendix A: Schedule of course activities/topics
Appendix B: Description of cases and quizzes
Appendix C: Grading Rubrics

Appendix A: *Schedule of Course Activities/Topics*

Week	Instructor(s)	Lecture Topic
1	Solberg Brown	Bioethics and Informed Consent
2	McDonough	Pharmacogenomics and Pharmacogenomic Studies
3	Weitzel	Evidence-Based Approach to Clinical Pharmacogenetics
4	Cooper-Dehoff Cavallari	Cardiovascular Pharmacogenomics I
5	Cavallari	Cardiovascular Pharmacogenomics II
6	Lamba	Oncology Pharmacogenomics
7	Hamadeh Markowitz	Pain Management
8	Weitzel	Clinical Implementation

Appendix B. Description of cases and quizzes

Cases: Pharmacogenomic patient cases will be used throughout the course as assignments and to facilitate application of knowledge. Each case will include 3-5 questions. Students will be periodically assigned to present answers to the case during the live, web-based sessions. Students will also submit written answers for each case. For most of the cases, students will have the opportunity to use their own genetic information or de-identified information.

Quizzes: Students will be given a pharmacogenetic data set. Using this information and the information covered in the course, students will answer case-based questions covering pharmacogenomics, and make the best recommendations based on patients' genetic information.

Clinical Applications of Pharmacogenomics Grading Rubric

DATE: _____

Student Name: _____

Grading Scale: 5 (strongly agree) 4 (agree) 3 (neutral) 2 (disagree) 1 (strongly disagree)

Criteria:	**Score**	**Notes**
PATIENT PRESENTATION/ASSESSMENT		
Included appropriate discussion of the patient's disease states		
Included appropriate discussion of the patient's current drug therapy		
Included appropriate interpretation of patient's genotype results		
Summarized clinical implications of patient's genotype results		
Assessment demonstrated student's understanding of the subject matter		
Assessment was clearly communicated		
PATIENT PLAN		
Plan reflects patient's genotype results		
Plan considers patient's other disease states and/or drug therapy		
Plan includes appropriate suggestions for drug therapy/other changes		
Plan is supported by evidence-based reasoning		
Score	/50	