Essentials of Pharmacogenomics
SHENANDOAH UNIVERSITY
Bernard J. Dunn School of Pharmacy
REMEDIATION COURSE SYLLABUS

534: Essentials of Pharmacogenomics

COURSE DESCRIPTION:
This course provides students with the knowledge to interpret a patient's genetic data and prescribe medications and dosages based on their unique genetic make-up. The course will also introduce students to topics in Genetics, Cell Biology, Molecular Biology, and Biochemistry as relevant to the field of Pharmacogenomics. Additionally, students will be introduced to some common laboratory techniques currently in use in Pharmacogenomic research labs and will research and interpret pharmacogenomic literature and databases along with quickly evolving topics such as economics, informatics, and policy. This course is 2 credit hours for Shenandoah University visiting students.

COURSE FORMAT:
The course consists of a series of lectures and article discussions to develop the students' skills to assess, evaluate and apply information in order to make better informed, rational, responsible and ethical therapeutic decisions in patient care. Three exams will be given during the course, which are equally weighted to determine the course grade for Shenandoah University visiting students. The question types will vary. *Note: The number of exams may vary based on the academic year in which the course is offered.*

COURSE OBJECTIVES:
At the completion of this course, the student will be able to:

1. Describe the basic principles of genetics, such as single gene inheritance, independent assortment, linkage, and genetic variation.
2. Explain how the genome conveys information to the rest of the body (the central dogma of molecular biology).
3. Relate genetic polymorphisms to the function of various types of proteins, their role in disease development and therapeutics.
4. Identify economic and policy considerations relevant to pharmacogenomics.
5. Explain scientific procedures and techniques frequently performed in Pharmacogenomic research.
6. Apply genetic, cell, molecular, and biochemical concepts presented in the course to analyze and interpret genomic data.
7. Research and interpret scientific literature and online databases to obtain and provide pertinent pharmacogenomics information.

In addition to the global course objectives noted above, individual lecture objectives and outcomes will be provided prior to each lecture or lecture series.

OPTIONAL TEXTS AND MATERIALS:
- Griffiths, et al. Introduction to Genetic Analysis. Freeman/Worth. *(most recent edition)*
- Alberts, et al. Molecular Biology of the Cell**,** 6th edition. Garland Science. *(most recent edition)*
- Bertino, et al. Pharmacogenomics: An Introduction and Clinical Perspective. McGraw-Hill Education LLC. *(most recent edition)*

Note: Texts are primarily for background information and clarification, therefore, <u>not</u> required. Editions may vary due to availability. Course content may be subject to copyright.

GRADING SCALE *(for students completing the course as a Shenandoah University visiting student)*

A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	< 60%

TOPICS:
- Single Gene Inheritance
- Pedigree Analysis
- Independent Assortment
- Linkage and Genetic Interactions
- Genomes, Variation and Population Genetics
- Structural Genetic Variation
- Elements of Drug Disposition
- Pharmacogenetics of Receptors
- Pharmacogenetics of Enzymes
- Pharmacogenetics of Signaling
- Pharmacogenetics of Channels
- Genomics of Cancer
- Pharmacogenetics of Transporters
- Pharmacogenetics Haplotype Identification
- Genetics and Disease
- Personalized Medicine and Genetic Testing
- Genome Wide Association Studies
- Pharmacogenomics in Drug Development

Note: Topics may vary based on the academic year in which the course is offered.