

## **Drug Discovery Research Techniques PHAR 7299.002**

### **Course Description**

Laboratory-based course in research methods used in drug discovery research.

### **Additional Information on the Course**

This course introduces the students to different research methods used in the drug discovery field. Several techniques may be covered including cell culture, molecular biology, protein expression in different biological systems, protein purification, and biochemical enzyme assays.

### **Course Credit**

2 credit hours

**Pre-Requisites:** None

**Co-Requisites:** None

**Class Meeting Days, Time & Location:** TBD

### **Course Coordinator**

May H. Abdelaziz, BPharm, MS, PhD

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Office hours: Friday 10:30 am - 1:30 pm and by appointment

Preferred method of contact: Email

### **Fisch College of Pharmacy (FCOP) and UT Tyler Policies**

This is part 1 of the syllabus. Part 2 contains UT Tyler and the FCOP course policies and procedures and Part 3 contains policies specific to Fall 2020. These are available as a PDF at <https://www.uttyler.edu/pharmacy/academic-affairs/>. For experiential courses (i.e., IPPE and/or APPE), the Experiential Manual contains additional policies and instructions that supplement the Syllabus Part 1 and 2. Please note, the experiential manual may contain policies with different deadlines and/or instructions. The manual should be followed in these cases.

### **Required Materials**

Course required materials are available through the Robert R. Muntz Library. These materials are available either online (<http://library.uttyler.edu/>) or on reserve. Other required materials will be posted on the classes' Canvas site. The site address is: [uttyler.edu/canvas](http://uttyler.edu/canvas).

**Recommended Materials:** None

### Course Format

The course may include, but are not limited to, the following activities:

1. Independent study of selected readings
2. Term project: Project includes designing, expressing and purifying a protein construct and testing for activity/functionality. This includes designing a new gene construct for an oncogenic protein, testing expression in several systems (E. Coli, insect cells, yeast, etc...), protein purification and biological assays to determine activity/functionality.

### Course Learning Outcomes (CLOs)

1. Investigate some research techniques related to pharmacy and drug discovery research
2. Compare different expression systems for protein production
3. Assess suitable mechanisms for protein purification
4. Investigate appropriate biochemical assays to assess protein activity/functionality

### Course Assessment Methods

	Assessment Method	Description
1	Six assignments	<i>Execution of small related lab-based protocols or research assignments</i>
2	Final project overall results	<i>One reporting method will be used: Short written final report, oral presentation, poster presented in Lyceum or other research conference, written manuscript, etc...</i>

### Grading Policy & Grade Calculation

Grades will be determined based on evaluation of performance and results in executing small related lab-based protocols that form a multistep protocol for designing a construct, expressing the protein of interest, purifying it and testing for activity/functionality.

#### Standard Grade Calculation\*

<b>Assignment</b>	<b>75%</b>
Cell culture techniques	15%
Molecular Biology exercises	10%
Literature evaluation and design of lab protocol	10%
Test expression levels	10%
Purify target protein	15%
Test for activity/functionality	15%
<b>Final Project</b>	<b>25%</b>
Performance assessment	15%
Project Results	10%
<b>Total</b>	<b>100%</b>

**\*The final course letter grade will be determined according to the following grading scheme:**

A	90 - 100 %
B	80 - 89.999 %
C	70 - 79.999 %
D	65.0 - 69.999 %
F	< 65.0 %

### PHAR 72XX Course Schedule

<b>W</b>	<b>TOPIC</b>	<b>Instructor</b>	<b>CLO</b>
1/2	Introduction to project and construct design	Abdelaziz	1
3/4	Introduction to molecular biology and biotechnology	Abdelaziz	1,2
5/6	Expression of target protein	Abdelaziz	1,2
7/8	Purification of target protein	Abdelaziz	1,3
9/10	Activity/functionality of target protein	Abdelaziz	1,4
11/12	Variability of activity/functionality under different conditions	Abdelaziz	1,3,4
13/14	Project conclusion and reporting	Abdelaziz	1-4
15	Project results presentation		