|  |
| --- |
| **Course Outline** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Department & Number** | BioSc 184 | **Number of Weeks** | 18 |
| **Course Title** | ELISA Methodology and Assay Development | **Lecture Hours** | 15 |
| **Prerequisite** | BioSc159 or BioSc 172L or BioSc 148 | **Lab Hours** | 9 |
| **Challenge Policy** | Skill demonstration: accurate micropipetor use, standard curve generation and interpretation, dilution mathematics | **\*Hours By Arrangement** |  |
| **Co-requisite** |  | **Units** | 1 |
| **Challenge Policy** |  |  |  |
| **Advisory** |  |

|  |
| --- |
| **COURSE/CATALOG DESCRIPTION** |

|  |
| --- |
| This course introduces students to Enzyme-Linked ImmunoSorbant Assays (ELISA), a highly versatile method used to identify and quantify proteins, both in the biotechnology industry and in medical diagnosis. Students will gain extensive hands-on experience with instruments, method development and optimization, and data analysis. |

|  |  |
| --- | --- |
| **COURSE OBJECTIVES** | |
| At the completion of the course the student will be able to: | |

|  |
| --- |
| 1. Demonstrate understanding of the fundamental principles of ELISA methodology by selecting appropriate reagents for use in Quantitative, Sandwich, and Competitive ELISA assays. |
| 2. Optimize reagent concentrations for a given ELISA assay. |
| 3. Produce reliable data by correct use of instrumentation, including multichannel micropipetors, an electronic microtiter plate washer, and an electronic microtiter plate reader. |
| 4. Critically analyze data generated by ELISA assays. |

**COURSE CONTENT:** (In detail; attach additional information as needed and include percentage breakdown)

|  |
| --- |
| Structure and function of antibodies, antibody-antigen interactions, polyclonal vs. monoclonal antibodies, affinity vs. avidity of different antibody-antigen populations. |
| Direct vs. sandwich, competitive, and quantitative ELISA assays. |
| Use of programmable microtiter plate washer and reader, use of multichannel micropipetors |
| Laboratory calculations and data analysis |

|  |
| --- |
| **METHODS OF INSTRUCTION** |

|  |
| --- |
| Lecture |
| Laboratory experimentation |
| Instruction on instrumentation, and supervised experience with instrumentation |
| Small group work |

|  |
| --- |
| **INSTRUCTIONAL MATERIALS** |

|  |  |
| --- | --- |
| **Textbook Title:** | ELISA Course Materials (BioSc 184) |
| **Author:** | Katherine Krolikowski, PhD |
| **Publisher:** | Note: this is not a textbook, but an instructional materials packet written by the instructor |
| **Edition/Date:** | Spring 2011 |

|  |
| --- |
| **COURSE EXPECTATIONS** (Use applicable expectations) |

|  |  |
| --- | --- |
| **Outside of Class Weekly Assignments** | **Hours per week** |

|  |  |
| --- | --- |
| Weekly Reading Assignments | 1 |
| Weekly Writing Assignments |  |
| Weekly Math Problems | 1 |
| Lab or Software Application Assignments |  |
| Other Performance Assignments |  |

**STUDENT EVALUATION**: **(Show percentage breakdown for evaluation instruments)**

|  |  |  |
| --- | --- | --- |
| 70 | **%** | Analyses of data generated by ELISA experiments (lab write ups) |
| 30 | **%** | Homework and in-class worksheet assignments |
|  | **%** |  |
|  | **%** |  |

|  |
| --- |
| **GRADING POLICY (Choose LG, CR/NC, or SC)** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| X | **Letter Grade** |  | **Pass / No Pass** |  | **Student Choice** |
| 90% - 100% = A | | 70% and above = Pass | | 90% - 100% = A |
| 80% - 89% = B | | Below 70% = No Pass | | 80% - 89% = B |
| 70% - 79% = C | |  | | 70% - 79% = C |
| 60% - 69% = D | |  | | 60% - 69% = D |
| Below 60% = F | |  | | Below 60% = F |
| *or* |
| 70% and above = Pass |
| Below 70% = No Pass |

|  |  |
| --- | --- |
| **Prepared by:** | Katherine Krolikowski, PhD |

|  |  |
| --- | --- |
| **Content Review Date:** | October, 2013 |

Revised 04/13