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| **Course Outline** |

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| **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** |  |

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| **COURSE/CATALOG DESCRIPTION** |

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| 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. |

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

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| 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)

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| 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 |

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| **METHODS OF INSTRUCTION** |

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

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| **INSTRUCTIONAL MATERIALS** |

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| **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 |

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

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

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| 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)**

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

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

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| 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 |

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

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

Revised 04/13