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| **Course Outline** |

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| **Department & Number** | BioSc 186 | **Number of Weeks** | 18 |
| **Course Title** | Protein Purification and Analysis | **Lecture Hours** | 15 |
| **Prerequisite** | Biosc 159 or 172L or 148 (may be taken concurrently) | **Lab Hours** | 9 |
| **Challenge Policy**  | Successful completion of a college level course in Microbiology or Cell and Molecular Biology | **\*Hours By Arrangement** |  |
| **Co-requisite** |  | **Units**  | 1 |
| **Challenge Policy**  |  |  |  |
| **Advisory** |  |

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| **COURSE/CATALOG DESCRIPTION** |

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| This course will teach students how to isolate a specific protein from a complex cell lysate using affinity chromatography. The isolated protein will be analyzed by qualitative and quantitative protein assays. The size and purity of the isolated protein will be analyzed by SDS-Polyacrylamide Gel Electrophoresis (SDS-PAGE). |

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

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| Demonstrate facility with laboratory calculations |
| Demonstrate correct usage of precision measuring devices (micropipetors, analytical balance, microtiter plate reader) |
| Demonstrate an understanding of the principles of commonly used protein assays and SDS-PAGE analysis |
| Demonstrate understanding of the use of an affinity resin for protein purification |

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

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| Protein structure, oncogenes, cloning strategy for inducible protein overproduction |
| Concentration and dilution calculations, standard curve generation, preparation of buffers resins, and reagents used in protein purification |
| Use of micropipetors, pH meter, centrifuge, microtiter plate reader, polyacrylamide electrophoresis apparatus |
| Quantitative analysis of chromatographic fractions and purified protein with the Bradford assay. |

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| **METHODS OF INSTRUCTION** |

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| Lecture |
| Laboratory Experimentation |
| Instruction on and supervised practice with instrumentations |
| Working with a partner and in small groups |

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| **INSTRUCTIONAL MATERIALS** |

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| **Textbook Title:** | “Protein Purification and Analysis” (Version 3) |
|  **Author:** | Christopher Bell, Ph.D. |
|  **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 | .5 |
| Lab or Software Application Assignments | .5 |
| Other Performance Assignments |  |

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

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| 50 | **%** | Completion of all laboratory experiments and exercises |
| 30 | **%** | Laboratory Notebook kept according to Good Laboratory Practices |
| 20 | **%** | Problem sets |
|  | **%** |  |

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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:**  | Fall 2013 |

Revised 04/13