**STA 546 – Foundations of Bioinformatics**

**Semester**

**Professor**: \_ **Phone**: 610-436-\_

**Email**: \_@wcupa.edu **Office**: Building Room

**Office Hours**: Day 1

Day 2

Day 3

**Required Materials**:

* **Bioinformatics for Beginners: Genes, Genomes, Molecular Evolution. Databases and Analytical Tools**. Choudhuri, S. First Edition.

**Computing:** This course will rely heavily on computing. Therefore, it is expected that all students bring their laptops (with either Windows, OS X, or Linus operating systems) to every class.

**Course Description:** Bioinformatics is an interdisciplinary field involving molecular biology, computer science, mathematics, and statistics. Most data sets are very large and so require computationally intensive algorithms. This course intends to introduce students to many areas of biological data, along with algorithms and software to help model biological processes.

**Prerequisites:**

**Course Student Learning Outcomes:**

1. Students will be able to identify different biological structures using appropriate data sets.
2. Students will apply their knowledge of algorithmic tools through the use of statistical software.
3. Students will summarize their findings through weekly homework assignments.

**Applicable Programmatic Student Learning Outcomes:**

1. Demonstrate the ability to apply the elementary methods of statistical analysis, namely those based on classical linear models, categorical methods, and non-parametric ideas to perform data analysis for the purposes of statistical inference.
2. Demonstrate proficiency in the effective use of computers for research data management and for analysis of data with standard statistical software packages.
3. Learn to develop and critically assess design of experimental studies and the collection of data.
4. Apply one or more methods of statistical inference to a particular area of interest, particularly the program in the elective concentration.

**Meeting & Assessing Student Learning Outcomes:** Course grade will depend on three things:

1. Weekly homework assignments (30%). Students will be asked to analyze a data set using the material covered that week (SLO 1, 2, 3)
2. One In-Class Exam (30%). This exam will take place on xx-xx-xxxx. It will be an open notes, open book exam on any statistical software covered in class (SLO 2)
3. Project (40%). Students will choose from a pre-determined list of topics not covered in class and apply this topic to one of the data sets presented during the semester (SLO 1, 2, 3).

**Attendance Policy:** There is no attendance policy for this course. However, you are expected to make up any material from a missed course. All material can be found on the D2L website.

**Tentative Course Outline:**

* Basics of molecular biology structures (2 weeks)
* Introduction to software (2 weeks)
* Sequence alignment and assembly (3 weeks)
* Gene and protein expression analysis (3 weeks)
* Genome-wide association studies (3 weeks)
* Evolutionary Models (2 weeks)

**Evaluation & Grading:**

A letter grade will be assigned based on performance in the course, according to the following scale:

|  |  |  |  |
| --- | --- | --- | --- |
| **Grade** | **Quality Points** | **Percentage Equivalents** | **Interpretation** |
| A | 4.00 |  | Superior graduate attainment |
| A- | 3.67 |  |  |
| B+ | 3.33 |  | Satisfactory graduate attainment |
| B | 3.00 |  |  |
| B- | 2.67 |  |  |
| C+ | 2.33 |  | Attainment below graduate expectations |
| C | 2.00 |  |  |
| C- | 1.67 |  |  |
| F | 0 | < 70% | Failure |

D grades are not used. Refer to the Graduate Catalog for description of NG (No Grade), W, & other grades.

**Statements Common to All WCU Graduate Syllabi:**



**ACADEMIC & PERSONAL INTEGRITY**

It is the responsibility of each student to adhere to the university’s standards for academic integrity. Violations of academic integrity include any act that violates the rights of another student in academic work, that involves misrepresentation of your own work, or that disrupts the instruction of the course. Other violations include (but are not limited to): cheating on assignments or examinations; plagiarizing, which means copying any part of another’s work and/or using ideas of another and presenting them as one’s own without giving proper credit to the source; selling, purchasing, or exchanging of term papers; falsifying of information; and using your own work from one class to fulfill the assignment for another class without significant modification. Proof of academic misconduct can result in the automatic failure and removal from this course. For questions regarding Academic Integrity, the No-Grade Policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to the Department Graduate Handbook, the Graduate Catalog, the *Ram’s Eye View*, and the University website at www.wcupa.edu.

**STUDENTS WITH DISABILITIES**

If you have a disability that requires accommodations under the Americans with Disabilities Act (ADA), please present your letter of accommodations and meet with me as soon as possible so that I can support your success in an informed manner. Accommodations cannot be granted retroactively. If you would like to know more about West Chester University’s Services for Students with Disabilities (OSSD), please visit them at 223 Lawrence Center. The OSSD hours of Operation are Monday – Friday, 8:30 a.m. – 4:30 p.m. Their phone number is 610-436-2564, their fax number is 610-436-2600, their email address is ossd@wcupa.edu, and their website is at www.wcupa.edu/ussss/ossd.

**REPORTING INCIDENTS OF SEXUAL VIOLENCE**

West Chester University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator, Ms. Lynn Klingensmith. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the University protection of minors policy.  Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at the webpage for the Office of Social Equity at <http://www.wcupa.edu/_admin/social.equity/>.

**EXCUSED ABSENCES POLICY**

Students are advised to carefully read and comply with the excused absences policy, including absences for university-sanctioned events, contained in the WCU Graduate Catalog. In particular, please note that the “responsibility for meeting academic requirements rests with the student,” that this policy does not excuse students from completing required academic work, and that professors can require a “fair alternative” to attendance on those days that students must be absent from class in order to participate in a University-Sanctioned Event.

**EMERGENCY PREPAREDNESS**

All students are encouraged to sign up for the University’s free WCU ALERT service, which delivers official WCU emergency text messages directly to your cell phone. For more information, visit www.wcupa.edu/wcualert. To report an emergency, call the Department of Public Safety at 610-436-3311.

**ELECTRONIC MAIL POLICY**

It is expected that faculty, staff, and students activate and maintain regular access to University provided e-mail accounts. Official university communications, including those from your instructor, will be sent through your university e-mail account. You are responsible for accessing that mail to be sure to obtain official University communications. Failure to access will not exempt individuals from the responsibilities associated with this course.