Syllabus
EPP 531-004 Bioinformatics Applications, Summer 2017
University of Tennessee, Knoxville

Course sections:	EPP 531-004
Meeting Time:	MTWThF 9:00am - 11:30am (June 12th-June 16th Only)
Meeting Place:	Plant Biotechnology Building, Room 113
Course Credit Hours:	1
Course website:	https://github.com/statonlab/rnaseq_workshop/wiki

Primary Instructor:
Meg Staton — Email: mstaton1@utk.edu
Assistant Professor — Office: PBB 154
Entomology and Plant Pathology

Co-instructors:
Bobby Whitten, Group Leader of the User Assistance Group, National Institute for Computational Sciences (NICS)
Abdullah Almsaeed, Research Associate in Bioinformatics, Entomology and Plant Pathology
Ming Chen, PhD student in Genome Science and Technology
Fang Liu, PhD student in Entomology and Plant Pathology
Miriam Payá Milans, Post Doctoral Associate in Bioinformatics, Entomology and Plant Pathology
Jiali Yu, PhD student in Genome Science and Technology

The instructor reserves the right to revise, alter or amend this syllabus as necessary. Students will be notified by email of any such changes.

I. Course Description

This one-credit course meets for ONE WEEK, June 12-June16. This section will cover computational analysis of RNASeq data. Students will learn the basics of using a command line interface on UT's Linux-based computational resources to analyze RNASeq data. Basic steps such as quality assessment, read mapping and differential gene expression statistical analysis will be covered. This class meets in PBB 113.

II. Value Proposition

The discipline of bioinformatics is one of the most effective and promising tools for generating biological research discoveries, but it requires robust training in order to apply the principles correctly. This course will provide students with an introduction to key bioinformatic skills, including familiarity with UNIX command line, the R programing language and software for processing large transcriptome (RNA) datasets.

III. Student Learning Outcomes/Objectives

A. Students will be able to apply basic bioinformatic theory and tools to analyze transcriptome datasets
B. Students will be able to effectively communicate and critically assess the application of bioinformatic tools to transcriptome data
C. Students will have basic competence in the UNIX shell, R scripting, and usage of bioinformatic tools from the command line

IV. Learning Environment
Class meets MTWThF, 9:00am to 11:30am for one week (June 12th-16th). Class will consist of an hour of lecture/discussion followed by computer laboratory exercises.

A classroom is a collaborative environment, and both the instructor and the students have a shared responsibility to ensure a successful learning experience. Students should be prepared for all classes, be respectful of others, actively contribute to the learning activities in class and abide by the UT Honor Code. All instructors will be prepared for all classes, evaluate learners fairly and equally, be respectful of all students, create and facilitate meaningful learning activities and follow University codes of conduct.

V. Course Communication
Outside of class and the website, the instructors will utilize email to communicate course information, such as changes to the syllabus, answering questions relevant to all students, etc. All students are responsible for checking their university email accounts and reading all emails regarding the class.

VI. Texts/Resources/Materials
The course website will be used to distribute reading materials, links to references, lecture slides, and laboratory exercises (https://github.com/statonlab/rnaseq_workshop/wiki).There is not a required textbook to purchase.

VII. Required Equipment
Students are required to bring their own laptops (and power cord if needed) to class.

VIII. Course Evaluation
The final grade for each student will be on an A-F scale:

A	93-100 points
B+	88-92 points
B	80-87 points
C+	77-79
C	70-76
F	below 70

Points will be accrued from three assignments, with the following weight:

- Attendance (up to 25 points)
- Daily email of output files from lab (i.e. command line) exercises (up to 25 points)
- Journal article review and summary (up to 50 points)

Grading details:

Attendance Grading – Each day of attendance will accrue 5 points.
Output files - At the end of each day, you will need to send a file via email to mstaton1 at utk dot edu to get credit for completing the lab exercises. That file will be specified through the course website.
Journal Article Writing Assignment – Each student will select a peer-reviewed journal article about RNASeq analysis in their field and write a two page summary and review of the software methodology, due the following Friday, June 23rd. The document should cover the following topics:

- What is the study's hypothesis? (10 points)

- Why was RNASeq selected as an experimental method? (ie how does it relate to the biology of the hypothesis?) Is this technology appropriate for addressing the hypothesis? (10 points)
- What is the experimental design? Is it statistically robust? What software was used? (10 points)
- What are the results? How were the data interpreted? (10 points)
- What do you think are the strengths and weaknesses of the paper? What sort of follow up studies could be conducted to further this work? (10 points)

IX. Attendance

Attendance is the responsibility of each student, and presence during lecture and lab is essential for students to develop understanding of the material presented in the class. Absences due to special circumstances should be discussed with the instructor prior to the absence via email or in person.

X. How to Be Successful in This Course

- Do the readings and exercises during the class period. The concepts and practical exercises build on the material covered in prior lessons, so it is essential to try to attend all classes and to keep up with the subject matter.
- Get help early with problems. The instructors are there to help and want you to be successful. If something is not making sense or you are unable to complete a lab exercise, seek help immediately through email and/or in-person meetings. This will prevent you from falling behind during this fast-paced class.
- Select a journal article that is of a proper scope for the writing assignment. The scope of the article methodology should primarily be RNASeq. If you select an article regarding RNASeq of a biological system you are familiar with, this may help with answering the questions about the hypothesis and interpretation. **It is recommended that you email the article to the instructor to see if it is of proper scope.**

XI. Course Feedback

A final course evaluation will be provided to each student at the end of the course through the Student Assessment of Instruction System (SAIS). Each student will receive an email toward the end of the semester providing a link to the survey.

Course Schedule

The course schedule is posted on the course website, provided above.

UNIVERSITY POLICIES

Dear Student,

The purpose of this Campus Syllabus is to provide you with important information that is common across courses at UT. Please observe the following policies and familiarize yourself with the university resources listed below. At UT, we are committed to providing you with a high quality learning experience.

I wish you the best for a successful and productive semester.

Provost Susan Martin

Academic Integrity:
"An essential feature of the University of Tennessee, Knoxville is a commitment to maintaining an atmosphere of intellectual integrity and academic honesty. As a student of the university, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity."

University Civility Statement:
Civility is genuine respect and regard for others: politeness, consideration, tact, good manners, graciousness, cordiality, affability, amiability and courteousness. Civility enhances academic freedom and integrity, and is a prerequisite to the free exchange of ideas and knowledge in the learning community. Our community consists of students, faculty, staff, alumni, and campus visitors. Community members affect each other's well-being and have a shared interest in creating and sustaining an environment where all community members and their points of view are valued and respected. Affirming the value of each member of the university community, the campus asks that all its members adhere to the principles of civility and community adopted by the campus: http://civility.utk.edu/.

Disability Services:
"Any student who feels he or she may need an accommodation based on the impact of a disability should contact the Office of Disability Services (ODS) at 865-974-6087 in 2227 Dunford Hall to document their eligibility for services. ODS will work with students and faculty to coordinate reasonable accommodations for students with documented disabilities."

Your Role in Improving Teaching and Learning Through Course Assessment:
At UT, it is our collective responsibility to improve the state of teaching and learning. During the semester, you may be requested to assess aspects of this course either during class or at the completion of the class. You are encouraged to respond to these various forms of assessment as a means of continuing to improve the quality of the UT learning experience.

Key Campus Resources For Students:
- Undergraduate Catalog: (Listing of academic programs, courses, and policies)
- Graduate Catalog
- Hilltopics: (Campus and academic policies, procedures and standards of conduct)
- Course Timetable: (Schedule of classes)
- Academic Planning: (Advising resources, course requirements, and major guides)
- Student Success Center: (Academic support resources)
- Library: (Access to library resources, databases, course reserves, and services)
- Career Services: (Career counseling and resources; HIRE-A-VOL job search system)