**BINF 1101/1101L Course Syllabus Spring 2016**

(Dr. Mays, Bioinformatics Room 311)

**Course philosophy**

We are at the beginning of a *Genomic Revolution* that will touch nearly every aspect of our lives. To take advantage of this revolution (or at least not be disadvantaged by it) everyone needs to understand a few basic principles of bioinformatics and genomics. As you may already know, DNA provides the building plan for every living thing: people, carrots, germs, mushrooms, trees, slime mold, etc. DNA is a polymeric molecule made up of nucleotides. The order of these nucleotides determines whether you developed into a sophomore named Eric or a head of cabbage. DNA is the means by which the instructions for our humanity are encoded. DNA gives form and mechanism to evolution. DNA contains individual and highly personal information about identity and susceptibility to disease. Understanding DNA will provide us with an opportunity to feed the world, cure disease, and save the planet (from ourselves). Bioinformatics provides the computational toolkit to help you read the book of life.

BINF 1101 and BINF 1101L start from the basics to introduce students to DNA – what it is made of, how it is structured to contain and transmit information, how it is analyzed using the tools of bioinformatics, and the impact of its discovery on technology and society. No knowledge of genetics, cell biology, or computer programming and bioinformatics is presumed, but students will learn a little bit of each in this introductory course. This year, there is no textbook. All reading materials, videos, etc. will be provided via Moodle.

You will need to bring your UNCC Clicker to class for various “low stakes” quizzes. Clickers can be purchased (new or used) at the Bookstore and used for any UNCC class requiring a clicker. Be sure to register your clicker using Moodle (just register once and it will be valid for all UNCC courses). If your clicker is old or used, stop by the Information Desk in the Student Union (or Library) to see if it needs any firmware updates. The Center for Teaching and Learning warns against buying used clickers from Amazon or other sources. Sometimes these are stolen and the internal code ID doesn’t match the printed code, causing all sorts of problems. Also, the bookstore guarantees the clickers will work.

A week-by-week description of the course, assignments, and necessary materials is available on Moodle. It is critical that you watch the videos, do the readings, and take the PrepWork quiz on this homework BEFORE class (deadlines on shown on the syllabus). It will also be necessary for you to attend ALL classes and assigned labs.

The required Lab allows students taking BINF 1101 a chance to get some “hands on” experience with the basic tools of bioinformatics and genomics – sequence databases, genome browsers,
phylogenetic tree construction, a little genetic data analysis – using exercises that illustrate the concepts covered in the lectures.

**Learning Objectives - The goals are to learn about:**
1. Structure and function of DNA
2. Mechanisms of molecular evolution
3. The scientific process
4. How to use computer databases and tools to study biology
5. Algorithms used in bioinformatics
6. Developments in biotechnology and genomic medicine
7. How genomics will change your life
8. The meaning of life (if you really want to know)

**Basic Course Information:**

1. **University Integrity**

   All students are required to read and abide by the Code of Student Academic Integrity. Violations of the Code of Student Academic Integrity, including plagiarism, will result in disciplinary action as provided in the Code. Definitions and examples of plagiarism are set forth in the Code. The Code is available from the Dean of Students Office or online at: [http://www.legal.uncc.edu/policies/ps-105.html](http://www.legal.uncc.edu/policies/ps-105.html). A set of links to various resources on plagiarism and how to avoid it is available at the UNCC Library website: [http://library.uncc.edu/display/?dept=instruction&format=open&page=920](http://library.uncc.edu/display/?dept=instruction&format=open&page=920).

2. **Attendance**

   Consistent attendance at lecture is required, although exceptions will be made for reasons such as illness or family emergency with appropriate documentation.

3. **Grading Policy**

   Grades will be based on PrepWork (at home) quizzes on the assignments (15%), regular in-class Clicker quizzes (10%), a short proctored quiz at week 4 (5%), a midterm exam (20%), a final exam (25%), and laboratory quizzes and assignments (25%). **You will get a single grade for both the lecture and lab combined.** Grades will be assigned on the following scale:

   - A=90-100%
   - B=80-89%
   - C=70-79%
   - D=60-69%
   - F=<60%

   I do not enforce a bell curve or limit the number of good grades that can be given. If everyone in the class learns the material and does well, then everyone will get a good grade.
4. **Course Mechanics.**

- Unlike most classes you have taken, we will use an “active learner” or flipped class approach. You will get MOST of the information you need for this course from your readings and from watching videos at home, as well as from discussions in class. This approach is based on observations that most lectures, especially those using large numbers of PowerPoint slides, appear to cause brain damage. Therefore, we will reduce the number of PowerPoint slides to under the EPA safety limits.

- Check the Moodle site for your class assignment. Read/watch the assignment. You will then open a Moodle quiz on the assignment. The quiz is open book/open notes, and must be completed before the noon on the first class of the week (due times are listed for each quiz on Moodle). The quiz is timed, so you do not have forever to do it. You should then review your answers. If you want, you can take the same quiz again, after a 20-minute wait. The grade for the quiz will be the higher of the two attempts. You can use any aids you wish, except the help of another person. Over the semester, these quizzes will comprise 15% of your final grade.

- In class, you will be formed into teams of about 5 students each. During class, we will discuss what you have read or viewed, and we will have periodic clicker quizzes. You may consult your team members before you answer, but in the end, everyone answers for him or her self. You will get 2 points for a correct answer, 1 point for an incorrect answer, and zero for not taking the quiz. If the class is divided on the answers, then the groups may consult (or argue with) each other, and re-take the question (answer both attempts correctly and you will get even more points!). If you think that the idea is to actively think about the questions and talk about them to each other, you are right. The total value of these clicker quizzes is 10%, but many of the questions you deal with will reappear in a similar form in the mid-term and final.

- Since this is a TOP40 class, I am required to assess your performance in the first week of February. There will be a short proctored in-class Moodle quiz to see how you do when you can’t look up the answers or ask a friend (also, so you won’t be surprised by the mid-term and final exam experience). This will count 5% of your grade.

- A mid-term exam will be given just before mid-semester grade reports are due. It will be worth 20% of the course grade. It will be closed notes and you cannot consult your classmates.

- A final exam will be given on the official exam date for this course (check Moodle). It will be closed notes and you cannot consult your classmates. It is worth 25% of your total grade.

- Every week on either Monday or Wednesday (depending on your lab section), you will have a lab exercise to be completed during your scheduled lab session. You can consult the people around you when doing the exercises, but answer the quiz questions on your own. The total value of the exercises/quizzes for the lab is 25%.

- Communication Policy: Questions about course content should only be posted to the Moodle [Discussion Forum](#), not sent via email. This ensures everyone else sees your question and the answer and so everyone in the class has the same information. You
should only email the TA (Conor, cndozak@uncc.edu) or instructor (Dr. Mays, lemays@uncc.edu) if you have a personal issue you need to discuss, or an issue with a grade.

• If you need to miss a quiz or lab for a legitimate reason, contact the TA before the absence to make arrangements for a make-up. Documentation will be required for the absence to be excused and make-ups to be allowed.

5. **Additional policies.**

The use of cell phones, beepers, or other communication devices is disruptive, and is therefore prohibited during class. Except in emergencies, those using such devices must leave the classroom for the remainder of the class period. Students are permitted to use computers during class for note-taking and other class-related work only. Actually, (and this is no joke) a recent study has shown that taking notes with a computer is far less effective than taking notes by longhand\(^2\), so if you take notes using a computer, you are probably not learning much.

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1 PowerPoint was released by Microsoft in 1990 as a way to euthanize cattle using a method less cruel than hitting them over the head with iron mallets. After PETA successfully argued in court that PowerPoint actually was crueler than iron mallets, the program was adopted by corporations, universities, and the military for slide show presentations.