

GENETICS 564: Genomics & Proteomics CAPSTONE**Spring 2017****Instructor/Mentor:** Dr. Ahna Skop (skop@wisc.edu)**3 Credits-CAPSTONE****Tues: 3:30-4:20, Genetics Rm 1408****Thurs: 3:00pm-5:00pm, 150 Animal Sciences**

Papers: The list of papers will be posted on the course web site (<http://genetics564.weebly.com>) and you can obtain them via PubMed.

Course Learning Goals: Over the course of the semester, students will learn and be able to:

- 1). Learn to read and evaluate papers from the primary literature in the areas of genomics and proteomics
- 2). Gain confidence in modern experimental methods used to ask fundamental biological questions
- 3). Learn to probe current genetic data repositories, such as bioinformatics databases for useful information
- 4). Learn to synthesize, present, and critique original research in the selected areas of genomics and proteomics
- 5). Effectively communicate work to the public in written form by publishing own research in a website format
- 6). Effectively communicate work to peers/public in spoken form through practice making and giving presentations
- 7). Effectively communicating work through the visual: image and slide layout
- 8). Address ethical, scientific and societal issues relating to their project by researching information from various sources, including researchers, individuals with the disease/trait, family members, YouTube videos and various popular press articles related to semester-long project on a human disease gene
- 9). To learn the scientific peer review process by experiencing several in-class peer reviews of student presentations, Specific aims, visuals and web-based projects.
- 10). To learn how diversity (social and intellectual) makes you more creative and harder-working in science.

Capstone Class Structure:

Each **Tuesday class** will be conducted as a “journal club” (*except where noted on the syllabus). Two students will present one paper and one review on a particular selected topic on genomics or proteomics. Each presentation should last approximately one hour (30min background/30min paper) and give background information needed to understand each paper (using review paper(s) supplied and your research you found on the internet), present the data figure-by-figure, and include a discussion of the results. An overview of the genomic or proteomic technique(s) that was used by the researchers in the primary paper should be given so that everyone will understand the primary paper. Everyone is expected to read the reviews and original papers assigned so that they can participate in the discussion, of which you will be graded. One question should be submitted to the course blog (<http://genetics564.weebly.com/blog-2017>) no later than 12:00pm each presentation day from each student (except the speaker(s)). This question **should** be asked in class. Participation points are determined based on YOU asking your question(s) you posted on the blog or one that comes to your mind while listening to the discussion. Most students who get an ‘A’ in the course are active participants in the class.

Thursday Lab:

Each lab class on Thursday will be conducted in **150 Animal Sciences** (Computer Lab). Throughout the semester you will be working on one aspect of your semester-long project each week during lab class time. I encourage you to work in a group both in class and outside of class. It will be beneficial to your research and ideas you come up with.

Grading:

The total points possible is 800. **Everyone starts with an “A” (800pts) on day one** and then you lose points over the course of the semester. The grade breakdown is as follows: Specific Aims (300pts), Tuesday group presentations (100pts), Final presentations (200pts), Website deadlines #1-4 (40pts), Final website (60pts) and Class participation/Blog questions (100pts). Everyone has the potential to get an “A” in this course. It is impossible to fail unless you don’t do any work or participate. Grade Range: 756-800 (A) 721-752 (AB) 680-720 (B) 640-679 (BC) 600-639 (C) 0-599 (D/F). Percentages: 95-100% is an A, 91-94% is an AB, 85-90% is a B, 80-84% is a BC, 75-79% is a C, 70-74% is a C/D, 60-69% is a D, 0-59% is an F. There will be no curve.

Computer:

I will have my MAC computer available so that you may load your Powerpoint or Keynote talks on my computer. If you want to use your own computer, make sure that everyone in your group’s visual aids are loaded as one presentation to make things go more smoothly in class. Please contact me if you need my computer a day before class so I can bring my computer in.

Meeting with Ahna:

Each student/group has the option to meet with Ahna prior to their Tuesday or Final presentations to clear up any questions. You should have read all papers and have an outline of your presentation prepared before this meeting. After your talk, I will meet with you after the class has left to give feedback on your performance and suggestions for improving your talk. You will receive your grade using a rubric that Ahna & the entire class will have filled out. Your final grade for your presentations will be determined by adding 75% of Ahna's grade + 25% of the Class' grade.

Teaching a "GREEN" course:

I am trying to make this course as "GREEN" as I can. I will try to use very little paper throughout the semester; hopefully you will do the same. Of course, the computers use electricity to work, but I am trying to keep the paper waste to a minimum. Shut off your computers if when you are done! Please recycle paper when are done with it!

Being Creative:

You were born with a tremendous amount of creative possibilities! I encourage you to be as creative and innovative as you can be in this course, both with your project and in your class presentations. Don't be afraid to take risks! Each one of you is unique and this alone brings a lot to class, your project and science.

Diversity:

Diversity is a source of strength, creativity, and innovation at UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals. The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background— people who as students, faculty, and staff serve Wisconsin and the world.

10 things that require ZERO talent:

1. Being on time
2. Work ethic
3. Effort
4. Body language
5. Energy
6. Attitude
7. Passion
8. Being coachable
9. Doing extra
10. Being prepared

Guidelines & Grading:

1. **Tuesday Presentations (100pts):** Usually the groups of two split the talk into the review/background section and then the primary paper, with one student doing each. Presenting a primary paper involves three aspects: **First**, you should give some background that will help the other students understand the paper and put the paper in the context of other research in this area (1st speaker). *You should focus on introducing background that relates to the paper as well as to the genomic or proteomic technique you are presenting. You should give the basic overview of the technique, how it is used and some examples of how it can be used to tackle questions someone might have about their genes, proteins or genomes, etc. **Second**, you should go through the paper figure by figure (2nd speaker). Your role here is to point out what the purpose of each experiment is and to assist the class in evaluating the data. To properly evaluate the data you must understand how the experiment was done and look up any techniques you are unfamiliar with. **Third**, you should facilitate a discussion with your fellow students (both Speakers). Ideally, other students will interject their opinions of the experiments as you present each one. You can encourage participation by pausing to ask specific questions ("I thought that a control was needed in this experiment, does anyone agree, and if so what control is needed?"). You should also summarize the author's conclusions and encourage a discussion of these conclusions and future lines of inquiry suggested by these studies. Please feel free to interject your own thoughts on the paper! Blog questions: Your classmates will each be submitting a question to ask you in class to facilitate discussion. You should try to figure out the answers prior to your presentation. Ahna can surely help you too (just ask). Peer reviews: Peer feedback is important in science. Ahna and your peers will evaluate your presentations throughout the semester. The grades will be a **weighted grade** from Ahna's grade and the class grade (75%/25%). Grading

of Tuesday Presentations (100pts): Organization: 15%, Content: 50%, and Presentation: 35% (see Tuesday Presentation Rubric on website under the Projects tab for details).

- 2. Website #1-4 (40pts), Final website (60pts) and Final Presentations (200pts) & Specific Aims (300pts)**: Web-based resources are heavily used in genomics and proteomics analysis. Therefore, it is good to learn how to create web pages. Websites will be created using <http://www.weebly.com>. Your assignments will be submitted online only. You will present and defend your ideas in a 15-minute final talk at the end of the semester. Specific aims grade breakdown is on the back of the schedule and also below. See deadlines and details for particular sections on the project schedule and project directions online under the Project tab.

Website #1-4 (40pts): Your website will be graded using the following criteria (for the labs we have done by the due date): Quality of background and intro (homepage and all data and conclusion) pages: 30%, Quality & presentation of the results, methods & references (i.e. your data): 30%, All labs done to date: 35% and Originality & aesthetics of overall website: 5%.

Grading of Final Presentations (100pts): Your final presentation will be graded using the following criteria:
Organization: 10%, Content: 50% and Presentation: 40% (see Final Presentation Rubric on website under the Projects tab for details). Final Presentation (140pts) Rough draft of talks (Rough Draft#1: 20pts) (Rough Draft #2: 20pts), Final talk uploaded to website: (20pts). The Final presentation grade will receive a **weighted grade** from Ahna's grade and the class grade (75%/25%).

Grading of Websites (100pts): Your final website will be graded using the following criteria: Quality of background and intro (homepage and all data and conclusion) pages: 30%, Quality & presentation of the results, methods & references (i.e. your data): 30%, Conclusion and discussion of future directions: 35% and Originality & aesthetics of overall website: 5%.

Specific Aims (300pts): Your specific aims grading: **Homework #1*: Peer review previous Gen564 students' specific aims (20pts), *Specific Aims Day 2*: Class discussion (20pts), *Specific Aims 1st Draft*: (3 copies to class + Website upload) (50pts). **Homework#2*: Peer review (20pts), *Specific Aims Day 3*: Peer review (20pts), *Specific Aims 2nd Draft*: (3 copies to class + Website upload) (50pts), *Specific Aims Day 4*: Peer review of students' 2nd draft IN CLASS (20pts), *Specific Aims Final Draft*: Students hand in final draft to be graded using FINAL Specific Aims Rubric (100pts). See website for details & deadlines.

3. Class Participation, Attendance and Blog Questions (100pts):

Class participation (50pts): Learning to participate in a meaningful discussion of scientific data is a major goal of this course. You can only participate if you have read all assigned papers and come to class and lab prepared. Don't be surprised if you experience a quiz or two over the course of the semester from your readings. During the Tuesday presentations, it is OK to interrupt to ask a question or make a comment. You should not save all your questions/comments until the end. Active participation by everyone makes for a lively and interesting discussion. Your opinion is important, and you are encouraged to express it. ***Attendance NOTE**: **You are exempt from 2 classes throughout the semester, any more you lose a letter grade.** If you are sick or have a family emergency, **please email ahead of time** that you will not be able to make it to class that day. You are given 50pts at the beginning of the semester and you will lose points here if you don't participate. Every class you don't ask a question you lose 5pts (-5pts). If you ask a lot of questions you maintain your 50pts class participation grade.

Blog Questions (50pts at 5pts each): For each class presentation, everyone will be expected to post 1 question prior to class (about the paper, technique or topic) on our class blog. This should be one or more questions about what you are unclear or interested hearing more about from reading that you want to ask in class. If you are presenting, you do not need to submit a question. ***NOTE**: **You are exempt from submitting 2 questions during the semester.** Any more than that you **lose a letter grade**. Each week you don't submit a question over the 2 you are exempt from, you lose 5pts each time. The question should be submitted no later than 12:00pm the day of the presentation. ***NOTE**: The speaker(s) should read the questions on the blog after 12 noon and be ready to answer them in class. I will surely help you out if you don't know.

Academic Misconduct:

Throughout the course of the semester you will be obtaining the majority of your research from web-based sites and material. I know how easy it might seem to take what is on a website. But think twice, I am quite computer savvy and I will catch you. **Definition of Academic Misconduct:** Academic honesty requires that the course work (drafts, reports, examinations, papers) a student presents to an instructor honestly and accurately indicates the student's own academic efforts. (UW-Madison Guidelines)

Academic misconduct is an act in which a student:

- * seeks to claim credit for the work or efforts of another without authorization or citation;
- * uses unauthorized materials or fabricated data in any academic exercise;
- * forges or falsifies academic documents or records;
- * intentionally impedes or damages the academic work of others;
- * engages in conduct aimed at making false representation of a student's academic performance;
- * assists other students in any of these acts.

Examples include but are not limited to: cutting and pasting text from the web without quotation marks or proper citation; paraphrasing from the web without crediting the source; using notes or a programmable calculator in an exam when such use is not allowed; using another person's ideas, words, or research and presenting it as one's own by not properly crediting the originator; stealing examinations or course materials; changing or creating data in a lab experiment; altering a transcript; signing another person's name to an attendance sheet; hiding a book knowing that another student needs it to prepare an assignment; collaboration that is contrary to the stated rules of the course, or tampering with a lab experiment or computer program of another student.

UW-Madison's Guidelines for Academic Misconduct:

<http://www.students.wisc.edu/doso/academic-integrity/>

How to avoid plagiarizing (UW-Madison Writing Center):

http://writing.wisc.edu/Handbook/QPA_plagiarism.html

Plagiarism (UW-Madison Guidelines)

Plagiarism means presenting the words or ideas of others without giving credit. You should know the principles of plagiarism and the correct rules for citing sources. In general, if your paper implies that you are the originator of words or ideas, they must in fact be your own. If you use someone else's exact words, they should be enclosed in quotation marks with the exact source listed. If you take ideas please reference where you got them from (ex. Skop, 2004).

Genetics 564 Honor Code

In order to participate in Genetics 564 you must agree to the following standards by signing your name below:

I will research and report data taken from web-based databases and resources honestly and accurately.

Under no circumstances will I fabricate data or change data to fit what I think it should be.

All work that I will submit under my name will be my own. I will not copy or paraphrase from any website or student in the course (including previous students or other students in other courses online). I will list the names of students with whom I worked with (if applicable for certain parts of your project).

I will not allow another student to submit assignments for me.

I will strive to produce a first author web-based project that is honest and true to my own semester research.

I will be proud to publish my work on our course website as my own.

Name: _____

Date: _____

Please sign and give back to me at the end of class.