BL 308 Genetics Syllabus Spring 2010
Department of Natural Sciences/Biology

Professor: Nighat P. Kokan, Ph.D.
Office: RB 218
Contact: Office 414-410-4138 (Voice Mail); Mail Box # 371; e-mail npkolan@stritch.edu Best way to contact me is via e-mail!
Office Hours: Mondays & Wednesdays 11:30-12:00; Tuesdays & Thursdays 11:00 – 12:00
Walk-ins are welcome as well. You can also meet with me at other times by consultation and/or appointment.
Lecture: Tuesdays & Thursdays 9:30 – 11:50 RB 202
Lab: Wednesdays 1:10 - 4:00 RB 212
Supplementary readings, original research papers published by nature journal can be obtained from http://www.nature.com/scitable/
The online textbook of Molecular Biology from http://www.web-books.com/MoBio/ Additional textbook readings will be assigned as we proceed in the semester
GEP Annotation Research Package, available at the bookstore. Annotation Research Project information and supplementary materials from Genomic Education Partnership site at Washington University in St. Louis accessed at http://gep.wustl.edu/
Additional protocols provided by the Instructor on Educator. Students should provide a 3-ring binder for filing lab protocols and a bound composition notebook for data collection and recording (lab log book). A 2-4 GB flash key for data storage.
Course Website: http://educator.stritch.edu for class announcements, syllabus, course materials, assignments, problem sets and solutions, external links, grades, Internet resources and supplemental information.
E-mail: Please have your emergency contact information included in your personal data form on Educator in case of an emergency.

BL 308 (4 Cr.) Overall Course Objectives: Considers the principles, theories and current concepts of heredity. Included are modern technologies, ethical issues, genetic manipulation and engineering that impact society. Three class hours and three laboratory hours.
Course Outcome # 1: Demonstrate an understanding of the basic principles of inheritance as applied to individuals and populations.

Measurable Course Objectives:

1. Be able to identify the reasons for Mendel’s success with pea plants.
2. Distinguish between dominant, recessive, codominant and incompletely dominant traits.
3. Recognize pleitropy and epistasis with examples.
4. Distinguish between sex-linked, sex-limited and sex-influenced traits.
5. Be able to transpose genetic word problems into genetic symbols and logically solve monohybrid, dihybrid and extensions to Mendelian genetics problems.
6. Be able to use Punnett square, product and sum rules of probability in solving genetic problems.
7. Be able to calculate the number and ratios of genotypes, phenotypes from a given cross and determine the significance of deviations from predicted ones using Chi-square analysis.
8. Distinguish between the reciprocal cross and testcross and be able to determine when to use them.
9. Identify autosomal versus sex-linked and recessive versus dominant traits in pedigrees.
10. Identify factors in changing allelic frequencies in populations.
11. Calculate allelic frequencies using Hardy-Weinberg equilibrium.

Course Outcome # 2: Understand the chromosome theory of inheritance and recognize linkage, recombination and the mapping of genes on chromosomes.

Measurable Course Objectives:

1. Describe mitosis and meiosis and the ploidy status of each stage.
2. Be able to recognize and diagram the various stages of mitosis and meiosis.
3. Identify when recombination and crossing over occur during meiosis.
4. Distinguish between sister chromatids and non-sister chromatids, between homologous and non-homologous chromosomes.
5. Be able to map genes using two point, three point crosses or tetrad analysis.
6. Be able to determine the significance of deviations from predicted ones using Chi-square analysis.

Course Outcome # 3: Demonstrate an understanding of the Central Dogma in Molecular Genetics, including DNA replication, transcription, translation and the mechanisms involved in mutations.

Measurable Course Objectives:

1. Describe the general differences between replication, transcription and translation processes between the prokaryotes and eukaryotes.
2. Be able to replicate, transcribe and translate a piece of DNA, and conversely, be able to deduce the sequence of DNA from a given peptide sequence.
3. Be able to analyze DNA and protein sequences using computational and bioinformatic tools and programs.
4. Be able to distinguish the various mechanisms involved in DNA recombination.
5. Identify the purpose of the various experiments and the contributions of the following scientists in the elucidation of the various molecular mechanisms in DNA: Griffith, Avery, Hershey and Chase, Meselson and Stahl, Lauria-Delbruk, Ames, Beadle and Tatum, Crick and Brenner, and Benzer.
6. Be able to distinguish between silent, missense, nonsense and frameshift mutations.
Course Outcome # 4: Demonstrate an understanding of the current tools and techniques used in genetic engineering including the major techniques related to deconstructing and reconstructing the genome through genetic and molecular analysis. Develop an understanding of the debates and social issues related to the impact of this “new” genetics to humans and society.

Measurable Course Objectives:

1. Identify the use and function of each of the following “molecular/genetic toolkit”: restriction enzymes, vectors, genomic versus cDNA libraries, selectable marker genes, probes, DNA fingerprinting, hybridization, and Southern blots.
2. Describe the various techniques used in the study of the structure, activity and the products of genes.
3. Distinguish between Southern, Northern and Western blotting techniques in the identification of genotypes and phenotypes.
4. Describe the procedure and use of DNA cloning, DNA sequencing, RFLP mapping and PCR in the detection and analysis of a gene.
5. Discuss the social and ethical issues related to the use of genetic testing.

Course Outcome # 5: Understand the levels of eukaryotic chromosome organization, chromosomal rearrangements and gene regulation including the genetics of cancer.

Measurable Course Objectives:

1. Compare and contrast the structure of prokaryotic and eukaryotic DNA and chromosomes.
2. Differentiate mechanisms of gene regulation in prokaryotes and eukaryotes.
3. Differentiate between euchromatin and heterochromatin and the relationship to gene regulation.
4. Recognize and give examples of X-inactivation and Barr body.
5. Differentiate between the various chromosomal rearrangements and associated implications on the individual.
6. Differentiate between the various changes in chromosomal number and the associated implications on the individual.
7. Distinguish between meiotic and mitotic nondisjunction and its consequences.
8. Describe the main features of gene regulation in the prokaryotes and eukaryotes.
9. Describe the relationship between oncogenes, tumor suppressor genes and cancer.

Course Outcome # 6: Demonstrate basic competency in the use of bioinformatic tools for research and analysis for genes and genetic diseases in some depth using the various available online databases.

Measurable Course Objectives:

1. Recognize and utilize NCBI and the various sequence and structural databases that are publicly available for researching and analyzing a given DNA sequence, gene or genetic disease.
2. Work with bioinformatics tools to identify and analyze a given DNA sequences to determine the gene and the protein encoded by that gene.
3. Determine and visualize the three-dimensional structure of a protein encoded by the gene from databases.
4. Determine the chromosome for the gene and show how the defects in the gene manifest in disease and/or impacts society.
5. Use current scientific literature to write a research paper using Internet research tools.
6. Collect, analyze, interpret and report scientific research findings and data in a logical manner.
Course Outcome # 7: Demonstrate an understanding of the scientific method in conducting genetics related experiments in the laboratory.

Measurable Course Objectives:

1. Be able to design, conduct and test hypotheses in experiments related to genetic principles.
2. Be able to analyze, interpret and draw conclusions from data collected from experiments.
3. Be able to communicate the findings in writing in a scientific report format.

Assessment: The course outcomes # 1-7 above, will be evaluated by the following criteria

1. Assignments and Problem sets
2. Written Examinations
3. Laboratory Exam Work/Reports
4. Laboratory Assessments
5. Web-based Tutorials
6. Written Reports
7. Oral Reports

Writing and Speaking Across the Curriculum: You will be writing several short reports and oral presentations of topics of current interest in the form of ‘Genetics Communiqué.” Topics for this can include genetic conditions, genetics and society, biotechnology and bioinformatics. This would begin after the first class exam or week five and continue during the semester. The genome annotation research report presentations will take place towards the end of the semester. Genetics Communiqué reports would involve the textbooks, library, Internet, and computers for your literature search. Details for these reports will be given to you in class, below are a few general guidelines for the research report:

Research and Oral Presentation Guidelines
The annotation research report should be written in the scientific paper format. It should be followed by an oral PPT presentation of the findings to the class. The research oral presentations will take place during the last two weeks of classes. The guidelines and details for the paper will be provided on Educator and in class. The research oral presentation will be a 15-20 minute PPT presentation to the class; you will be evaluated on your platform performance, knowledge of subject matter as a whole, knowledge of specific technical details, proper use of visual aids, and ability to answer questions from the audience. Oral presentations will take place during the last two weeks of classes. The due date for the oral reports is indicated on the lecture schedule, no late submissions! Late reports will be assessed a penalty of 5 points per day!

Genomic Education Partnership (GEP) Annotation Projects
Here is a brief description of the current project from the GEP WashU site “The scientific problem we will tackle during spring 2010 is a question of comparative genomics: can we distinguish heterochromatic and euchromatic domains based on sequence organization and/or characteristics of the genes in these different environments? What insight can we gain concerning the evolution of the fourth chromosome, and the genes it contains? In Drosophila (the fruit fly), the small fourth chromosome (sometimes called the "dot" chromosome) is unusual in that it appears to be essentially heterochromatic-packaged in a relatively condensed form, replicated late in S phase, exhibiting no meiotic recombination, etc. An examination of the DNA sequence indicates that the 1.2 Mb arm has a normal gene density (~80 genes), but a ten-fold higher frequency of repeated
sequences (generally remnants of transposable elements) than the other chromosome arms, which are euchromatic. Many of the genes on the fourth chromosome are associated with silencing marks, but can be expressed in this heterochromatic environment. Recent studies have suggested that heterochromatin formation is targeted by the presence of repetitious sequence elements, although it appears that not all repetitious elements can trigger heterochromatin formation.”

You will be working on the annotations during the lab period of genetics class. As part of this project you will be a contributing member of the GEP consortium. The GEP requirements for authorship are a minimum of one gene annotation per student and a valid e-mail by which you can be reached to proof read, and okay any submissions for publication. At the end of the semester all annotation projects need to be submitted in the proper GFF format to Washington University. Please be aware that as a real research project there are sometimes unforeseeable roadblocks. In addition, for program assessment purposes you will be asked to take pre-course and post course surveys and quizzes from the GEP Wash U site: http://gep.wustl.edu/ The assessments are done with WU IRB and CSU IRB approval and the surveys and quizzes are anonymous.

Policy on Attendance: It is in your best interest to attend all lectures and labs. For missed lecture, it is expected that you inform me via e-mail or in person, it is your responsibility to get the class notes, and handouts. For group activity work there is no makeup Lab attendance is very important as it is factored in your grade, and group work activities since make-up of group activity is not an option. If you are to miss any labs due to an emergency, it is expected that you inform me via e-mail or voice mail, the nature of the problem. For missed labs that are unexcused, you will receive a failing grade for the missed lab portion which constitutes 30% of your course grade. Since labs are an integral part of the course, a failing grade in lab could result in a failing grade for the course.

Policy on Homework and Assignments: Each week you will be able to download and print from the course website course materials, handouts, assignments and problem sets related to the material under study. It is highly recommended that you develop problem-solving skills in genetics by systematically working through the “Solved Problems” section of the chapter under study. You are required to hand in the Problem Sets given to you in class or in the Assignment section of the course web site for grading. Any work handed in late may be assessed a penalty for handing in work past the due date. In some instances, these problem sets and assignments can be submitted on-line under the Assignment section of Educator. It is preferred that assignments be neat and complete, with information presented in a logical manner. If you have questions about the assignments, lecture or lab materials feel free to discuss these issues with me. It is recommended that you utilize the online quiz feature under each chapter from the textbook website for gaining experience in problem solving and honing your analytical and test taking skills. It is your responsibility to seek the help of the instructor for any problems or questions that you have with on-line quizzes, lectures or lab materials.

Policy on Exams and Quizzes: There will be three written class exams and one open notes/book lab exam and a comprehensive final. Exams will cover both lecture material and some concepts from labs. The format of the exams will consist of multiple choice questions, short answer questions, matching, label diagrams, genetic problem solving and critical thinking questions. There are no make-up exams for any missed exams; in the event of an emergency contact the instructor.

<table>
<thead>
<tr>
<th>Grade Weights</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Exams</td>
<td>40%</td>
</tr>
<tr>
<td>Class Assignments and Reports</td>
<td>10%</td>
</tr>
<tr>
<td>Lab Assignments and Research Reports</td>
<td>30%</td>
</tr>
<tr>
<td>Final Exam, Comprehensive</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
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Grades:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93-100%</td>
</tr>
<tr>
<td>A-</td>
<td>90-92%</td>
</tr>
<tr>
<td>B+</td>
<td>87-89%</td>
</tr>
<tr>
<td>B</td>
<td>83-86%</td>
</tr>
<tr>
<td>B-</td>
<td>80-82%</td>
</tr>
<tr>
<td>C+</td>
<td>77-79%</td>
</tr>
<tr>
<td>C</td>
<td>73-76%</td>
</tr>
<tr>
<td>C-</td>
<td>70-72%</td>
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<tr>
<td>D+</td>
<td>67-69%</td>
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<tr>
<td>D</td>
<td>63-66%</td>
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<tr>
<td>D-</td>
<td>60-62%</td>
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<td>F</td>
<td>0-59%</td>
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</tbody>
</table>

Policy on Cheating and Plagiarism: In accordance with the mission of Cardinal Stritch University and my own strong belief in the principle of academic integrity, it is expected that all students enrolled in this class will abide by the Academic Integrity policy as laid out on pages 53-54 of 2008-2009 Undergraduate Student Handbook. Using someone’s work without proper credit or citation is a violation of this policy. Anyone who does not abide by these rules gets an automatic zero in their work in this class.

Special Needs Disability Statement: Cardinal Stritch University and this instructor are in compliance with Section 504 of the Rehabilitation Act and the Americans with Disability Act. Any person enrolling in this course who may require alternative instruction and/or evaluation procedures due to a handicapping condition including learning disabilities may disclose the presence of a disabling condition and request accommodations by contacting the Academic Support Center for appropriate arrangements. See 2008-2009 Undergraduate Student Handbook page 56-58

Important Dates to Remember Spring 2010

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Day of Classes</td>
<td>January 19</td>
</tr>
<tr>
<td>Last Day to Drop/Add</td>
<td>January 26</td>
</tr>
<tr>
<td>Graduation Application Deadline</td>
<td>March 1</td>
</tr>
<tr>
<td>Midterm</td>
<td>March 12</td>
</tr>
<tr>
<td>Last Day to Withdraw</td>
<td>March 26</td>
</tr>
<tr>
<td>Spring Break/Easter Break</td>
<td>March 27- April 6</td>
</tr>
<tr>
<td>Honors Day</td>
<td>April 21</td>
</tr>
<tr>
<td>Last Day of Classes</td>
<td>May 10</td>
</tr>
<tr>
<td>Final Exams</td>
<td>May 11-14</td>
</tr>
<tr>
<td>Graduation/Commencement</td>
<td>May 16</td>
</tr>
<tr>
<td>Incomplete Make up Deadline</td>
<td>June 4</td>
</tr>
</tbody>
</table>

Note: The preceding Policies and Grade Weights are subject to change at the sole discretion of the instructor if at any time during the semester it is deemed appropriate.
Writing Assignment Rubric

A paper:
- Demonstrates conceptual understanding
- Is complete and goes beyond what is expected
- Presents clear rationale
- Presents specific, relevant details as evidence
- Draws conclusions that follow logically from the arguments presented
- Uses excellent style and grammar
- Represents exemplary achievement

B paper:
- Demonstrates understanding
- Is complete
- Presents rationale
- Presents supporting evidence with some detail
- Draws conclusions that mostly follow from the arguments presented
- Has good style and grammar
- Represents commendable achievement

C paper:
- Demonstrates some understanding, but is unclear
- Is fairly complete
- Presents somewhat flawed rationale
- Presents supporting evidence that lacks detail
- Does not establish strong connections between arguments and conclusions.
- Uses adequate style and grammar.
- Represents adequate achievement

D paper:
- Demonstrates obvious misconceptions
- Is sorely incomplete
- Presents flawed rationale
- Presents no examples
- Makes no connection between arguments and conclusions
- Fails to use acceptable style and grammar
- Represents little evidence of achievement

F paper:
- Demonstrates no understanding
- Shows no real attempt
- Presents a restatement of the question
- Represents no evidence of achievement
Oral Presentation Rubric

A presentation:
Subject is addressed very thoroughly
Presentation is very well organized
Presenter communicates complete understanding of topic
Presents many specific, relevant details as evidence
Visual aids are used very effectively
Delivery style thoroughly engages the audience
Has no or very few vocal fillers; can be heard; makes good eye contact
Represents exemplary achievement

B presentation:
Subject is addressed thoroughly
Presentation is well organized
Presenter communicates good understanding of topic
Presents some specific, relevant details as evidence
Visual aids are used effectively
Delivery style engages the audience
Has few vocal fillers; can be heard; makes good eye contact
Represents good achievement

C presentation:
Subject is adequately addressed
Presentation is adequately organized, occasionally gets off track
Presenter demonstrates some understanding of topic
Presents few specific, relevant details as evidence
Visual aids minimally help presentation
Delivery style is somewhat distracting, doesn’t always engage the audience
Has some vocal fillers; at times difficult to hear; eye contact is intermittent
Represents adequate achievement

D presentation:
Subject is poorly addressed
Presentation gets off track and is poorly organized
Presenter attempts to show understanding but is unclear
Presents very few specific, relevant details as evidence
Visual aids do little to enhance presentation
Delivery style is distracting and minimally engages the audience
Has many vocal fillers; is difficult to hear; student reads mainly from notes
Represents poor achievement

F presentation:
Subject needs more explanation
Presentation lacks organization
Presenter demonstrates no real understanding of topic
Presents no examples
No visual aids
Delivery style does not engage the audience
Has many vocal fillers; cannot be heard; reads only from notes—no eye contact
Represents no evidence of achievement
<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Topics, Chapters &amp; Readings</th>
<th>Assignments, Notes, Exams &amp; URLs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>January 19, 21</td>
<td>Study of Biological Information and Mendelian Genetics (1-2)</td>
<td><a href="http://www.mendelweb.org">http://www.mendelweb.org</a></td>
</tr>
<tr>
<td>2</td>
<td>January 26, 28</td>
<td>Extensions and Exceptions to Mendelian Genetics (3)</td>
<td><a href="http://morgan.rutgers.edu/MorganWebFrames/htmldocs/contents.php">http://morgan.rutgers.edu/MorganWebFrames/htmldocs/contents.php</a></td>
</tr>
<tr>
<td>3</td>
<td>February 2, 4</td>
<td>Chromosome Theory of Inheritance Mitosis and Meiosis (4)</td>
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</tr>
<tr>
<td>4</td>
<td>February 9, 11</td>
<td>Linkage, Recombination and Mapping (5)</td>
<td>Exam 1</td>
</tr>
<tr>
<td>5</td>
<td>February 16, 18</td>
<td>DNA Replication and Recombination (6)</td>
<td>Genetics Communiqué Begin</td>
</tr>
<tr>
<td>6</td>
<td>February 23, 25</td>
<td>Gene Anatomy and Function (7)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>March 2, 4</td>
<td>Gene Expression (8)</td>
<td><a href="http://www.biology.arizona.edu/default.html">http://www.biology.arizona.edu/default.html</a></td>
</tr>
<tr>
<td>8</td>
<td>March 9, 11</td>
<td>Deconstructing the Genome (9)</td>
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</tr>
<tr>
<td>9</td>
<td>March 16, 18</td>
<td>Reconstructing the Genome through Genetic and Molecular Analysis (10)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>March 23, 25</td>
<td>DNA Variation and Genotyping (11)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>March 30, 1</td>
<td>---------------Spring Break-------------</td>
<td><a href="http://www.biology.arizona.edu/default.html">http://www.biology.arizona.edu/default.html</a></td>
</tr>
<tr>
<td>12</td>
<td>April 6, 8</td>
<td>---------------Spring Break------------- Chromosomal Changes and Chromosomal Rearrangements (12, 13)</td>
<td></td>
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<tr>
<td>13</td>
<td>April 13, 15</td>
<td>Genetic Analysis in Bacteria (14)</td>
<td>Exam 3</td>
</tr>
<tr>
<td>14</td>
<td>April 20, 22</td>
<td>Gene Regulation Prokaryotes versus Eukaryotes (16, 17)</td>
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<tr>
<td>15</td>
<td>April 27, 29</td>
<td>Genomic Technologies 2</td>
<td></td>
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<tr>
<td>16</td>
<td>May 4, 6</td>
<td>Genetic Analysis of Populations (20)</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>May 12</td>
<td><strong>Final Comprehensive Exam @ 8:00 am</strong></td>
<td>Final Exam</td>
</tr>
</tbody>
</table>
### BL 308 Genetics Tentative Laboratory Schedule Spring 2010

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Experiment Design Set-Up</th>
<th>Experiments, Follow-Up Activities, &amp; URLs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>January 20</td>
<td>Introduction, Safety Contract, <strong>Take the Online IRB (Institutional Review Board) Training.</strong> (Print Certificate to hand in by next week)</td>
<td><strong><a href="http://www.stritch.edu/irb.aspx">http://www.stritch.edu/irb.aspx</a></strong></td>
</tr>
<tr>
<td>2</td>
<td>January 27</td>
<td>Mendelian Genetics: Monohybrid &amp; Dihybrid Crosses Use of Model Organisms for Huntington Disease <strong>Subscription to FlyLab</strong></td>
<td><strong><a href="http://morgan.rutgers.edu/MorganWebFrames/htdocs/contents.php">http://morgan.rutgers.edu/MorganWebFrames/htdocs/contents.php</a></strong></td>
</tr>
<tr>
<td>3</td>
<td>February 3</td>
<td>Introduction to FlyLab, Determining Patterns of Inheritance, Sex Chromosomes</td>
<td><strong>Take GEP Pre-course survey and Pre-course quiz</strong></td>
</tr>
<tr>
<td>4</td>
<td>February 10</td>
<td>FlyLab continued…. Probability and Chi Square Test</td>
<td>FlyLab Report 1 Due</td>
</tr>
<tr>
<td>5</td>
<td>February 17</td>
<td>FlyLab continued…. Two Point Crosses and Linkage</td>
<td>FlyLab Report 2 Due</td>
</tr>
<tr>
<td>6</td>
<td>February 24</td>
<td>A Simple Introduction to NCBI BLAST</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>March 3</td>
<td>GEP Exercise #1: Detecting and Interpreting Genetic Homology</td>
<td>FlyLab Report 3</td>
</tr>
<tr>
<td>8</td>
<td>March 10</td>
<td>GEP BLAST Exercise #2: Using mRNA and EST Evidence in Annotation</td>
<td><strong>Worksheet: Chimp BAC Analysis: Genes and Pseudogenes</strong></td>
</tr>
<tr>
<td>9</td>
<td>March 17</td>
<td>GEP Genome Annotation Research Project Assignments</td>
<td><strong>Lab Exam</strong></td>
</tr>
<tr>
<td>10</td>
<td>March 24</td>
<td>Genome Annotation Research Project</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>March 31</td>
<td>**<strong><strong><strong><strong><strong>Spring Break</strong></strong></strong></strong></strong></td>
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<tr>
<td>12</td>
<td>April 7</td>
<td>Genome Annotation Research Project Cont…</td>
<td>Annotation Progress Report 1</td>
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<tr>
<td>13</td>
<td>April 14</td>
<td>Genome Annotation Research Project Cont…</td>
<td>Annotation Progress Report 2</td>
</tr>
<tr>
<td>14</td>
<td>April 21</td>
<td>Genome Annotation Research Project Cont…</td>
<td>Annotation Progress Report 3</td>
</tr>
<tr>
<td>15</td>
<td>April 28</td>
<td>Genome Annotation Research Project Cont…</td>
<td><strong>GEP Annotation Report Due</strong></td>
</tr>
<tr>
<td>16</td>
<td>May 5</td>
<td><strong>Annotation Research Report Presentations Submit Genome Annotation Files WashU</strong></td>
<td><strong>Take GEP Post-course survey and GEP Post-course quiz</strong></td>
</tr>
<tr>
<td>17</td>
<td>May 12</td>
<td><strong>Final Comprehensive Exam @ 8:00 am</strong></td>
<td></td>
</tr>
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