PBIO4_5280_Laboratory in Genomics Techniques
(Spring 2017)

Lecture 100 (Class Number 12469_12471)
Labs 101 (Class # 12470_12472)

Instructor: Dr. Zhihua Hua
Office: 500 Porter Hall
Email: hua@ohio.edu

Lab: M: 3:05 – 6:05 PM & W: 3:05– 5:05 PM, Porter Hall 304
Final Exam: Monday, 4/25/2016, 2:20 PM, Porter Hall 304

Text: Data Oriented Genomic Techniques by Zhihua Hua and Emily Keil - PBIO4/5280 Manual

Course Description:
Since the invention of next generation sequencing technology, Biology has become the No. 1 scientific field that rapidly produces data information in an exponential growth pace. Using a project-oriented design, this class begins with a comparative genomic study of a gene superfamily among 10 genomes through an in silico deep sequence data analysis, which will help you learn how to develop biological hypothesis from big data mining. To tackle the newly developed hypothesis, you will experience a series of hands on wet-bench genomic techniques, including molecular cloning, genomic DNA analysis, protein biochemistry, and RNA expression analysis at both single gene and transcriptome levels, to produce data for testing your hypothesis. At the end of the class, you will acquire a comprehensive skill in genomics for tackling gene functions in a genome.

Learning Outcomes
1. To take detailed lab notes and make good lab reports
2. To be able to manipulate large biological sequence databases
3. To demonstrate skills in molecular biology experimental design and data analysis
4. To be able to perform essential genomic lab experiments and evaluate the results
5. To catch up the advanced technologies in genomics
6. To show comprehensive thinking skills in science

Grading (Total Points: 400)
1. Home work projects (100 points, Bioinformatics Section)
2. Exam 1 (100 points, Molecular Biology Lab)
3. Exam 2 (100 points, Protein Biochemistry Lab)
4. Exam 3 (100 points, RNA Biology Lab)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tr>
<td>A-</td>
<td>90&lt;94&lt;100%</td>
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<td>B-</td>
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<tr>
<td>C-</td>
<td>70&lt;74&lt;77&lt;80%</td>
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<td>D-</td>
<td>60&lt;64&lt;67&lt;70%</td>
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<td>F</td>
<td>&lt;60%</td>
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Office Hours:
By appointment, Porter 500, phone 740-593-1123
Email: hua@ohio.edu

NOTE: According to university policy
(http://www.catalogs.ohio.edu/content.php?catoid=39&navoid=2332#grad_info), grades
cannot be changed except in the case of an error or formal grade appeal. If a student
has not completed missed work/assignments/exams for absences that are "excused", s/he
should receive an “I” (incomplete) or “PR” (progress) as appropriate for the class and
circumstances.

Accommodations: Any student who suspects s/he may need an accommodation based
on the impact of a disability should contact the class instructor privately to discuss the
student’s specific needs and provide written documentation from the Office of Student
Accessibility Services. If the student is not yet registered as a student with a disability,
s/he should contact the Office of Student Accessibility Services.

Policies on Attendance/Absence: Attendance for laboratory is mandatory and any lab
experiment missed cannot be “made-up”. Late assignments will not be accepted, and
work missed cannot be “made-up” without adequate proof of legitimate absence as per
University policy as indicated in the Undergraduate catalog (see
http://www.catalogs.ohio.edu/content.php?catoid=39&navoid=2332#enro_info) (in brief,
hospitalization, documented illness, death of an immediate family member, or an
authorized university activity). It is the responsibility of the student to contact me
immediately to arrange for make-up assignments. Missed work must be completed within
one (1) week of the missed class. In the event of extended excused absences, I will try to
work with the student to make a reasonable schedule for making up the missed work,
depending on the amount of work missed, which may not be possible. In the event of a
major campus emergency, course requirements, deadlines and grading percentages are
subject to changes that may be necessitated by a revised spring calendar or other
circumstances beyond the instructor’s control. Any changes in this course will be posted
on Blackboard as announcements.

Academic Dishonesty: The Ohio University Student Code of Conduct prohibits all forms
of academic dishonesty, including cheating, plagiarism, forgery, furnishing false
information and alteration or misuse of university documents, records or identification
(http://www.ohio.edu/communitystandards/academic/students.cfm). Any evidence of
academic dishonesty in lecture or lab, as defined above and including falsification or
misrepresentation of data and plagiarism (copying material directly or not properly giving
credit for ideas from others) will cause a grade of ZERO (0) for the corresponding activity
and may be reported to the Office of Community Standards and Student Responsibility
University Judiciaries for further action. A student may appeal academic sanctions
through the grade appeal process (the appeal-of-grade procedure), and in reported to the
Judiciaries, a student will have the right to a full hearing. For additional information about
Academic Misconduct or the Ohio University Student Code of Conduct, consult
http://www.ohio.edu/communitystandards/#students.

Intellectual Property: The lectures, classroom activities, and all materials associated
with this class and developed by the instructor are copyrighted in the name of Zhihua Hua
on 01/01/2017 and cannot be used by others without expressed written permission.
PBIO 4/5280_Laboratory in Genomics Techniques (Spring 2017)

Course Calendar (M: 3:05-6:05 pm; W: 3:05-5:05 PM) and Assignments

Instructor: Dr. Zhihua Hua
TAs:
(Schedule may change as necessary, class attendance is mandatory)

<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Topic</th>
<th>Assignment</th>
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<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>Lecture 1</td>
<td>Introduction</td>
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<td>W</td>
<td>Lecture 2</td>
<td>Superfamily Evolution</td>
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<td>2</td>
<td>M</td>
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<tr>
<td></td>
<td>W</td>
<td>Lab 1</td>
<td>Open Source Programming</td>
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<td>Lab 2</td>
<td>BLAST</td>
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<td>3</td>
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<td>Lab 3</td>
<td>Bioperl 1</td>
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<td>Lab 4</td>
<td>Bioperl 2</td>
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<td>Lab 6 &amp; Lab 7</td>
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<td>W</td>
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<td>Ligation</td>
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<td>Lab 8 &amp; Lab 9</td>
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<td>Genomic DNA Extraction</td>
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<td>Lab 10</td>
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<td>W</td>
<td>Lab 11</td>
<td>Plasmid Isolation</td>
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<td>8</td>
<td>M</td>
<td>Lab 12</td>
<td>Restriction Fragment Length Polymorphism + Review 1</td>
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<td>W</td>
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Molecular Biology Lab Exam
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<td>M</td>
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<td>Lecture 4 &amp; Lab 13 Biochem Lab</td>
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Data Oriented Genomic Techniques

Zhihua Hua and Emily Keil

A Project-Based Laboratory Manual for PBIO4/5280

Spring 2017
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