<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture #: Topic(s)</th>
<th>Reading: Albers et al. 6th Edition Approximate pages.</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 Jan</td>
<td>1. Introduction: Overview Genetics and Genomes</td>
<td>Chapter 1: Review</td>
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<tr>
<td>11 Jan</td>
<td>2. Chemistry/Protein Review</td>
<td>Skim Chapters 2 and 3</td>
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<tr>
<td>13 Jan</td>
<td>3. DNA Structure and Chromosomes</td>
<td>Chapter 4: Watson and Crick 175-80</td>
</tr>
<tr>
<td>16 Jan</td>
<td>Holiday – Martin Luther King Day</td>
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<tr>
<td>18 Jan</td>
<td>4. Nucleosomes</td>
<td>Chapter 4: 187-193</td>
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<td>20 Jan</td>
<td>5. Supranucleosomal Structure</td>
<td>Chapter 4: 194-207</td>
</tr>
<tr>
<td>23 Jan</td>
<td>6. Chromatin Remodeling/Genomes</td>
<td>Chapter 4: 207-232</td>
</tr>
<tr>
<td>25 Jan</td>
<td>7. DNA Replication I</td>
<td>Chapter 5: 237-253</td>
</tr>
<tr>
<td>27 Jan</td>
<td>8. DNA Replication II</td>
<td>Chapter 5: 254-265</td>
</tr>
<tr>
<td>30 Jan</td>
<td>Review 1</td>
<td>Chapters 1-4, 5: DNA Replication</td>
</tr>
<tr>
<td>1 Feb</td>
<td><strong>Midterm 1</strong></td>
<td>Lectures 1-8</td>
</tr>
<tr>
<td>3 Feb</td>
<td>9. DNA Damage and Repair</td>
<td>Chapter 5: 266-276</td>
</tr>
<tr>
<td>6 Feb</td>
<td>10. Recombination and Transposition</td>
<td>Chapter 5: 276-295</td>
</tr>
<tr>
<td>8 Feb</td>
<td>11. Bacterial Transcription</td>
<td>Chapter 6: 301-309</td>
</tr>
<tr>
<td>10 Feb</td>
<td>12. Eukaryotic/Archaeal Transcription</td>
<td>Chapter 6: 310-314</td>
</tr>
<tr>
<td>13 Feb</td>
<td>13. mRNA processing – I</td>
<td>Chapter 6: 315-323</td>
</tr>
<tr>
<td>15 Feb</td>
<td>14. mRNA processing – I</td>
<td>Chapter 6: 323-333</td>
</tr>
<tr>
<td>17 Feb</td>
<td>15. Translation I</td>
<td>Chapter 6: 333-349</td>
</tr>
<tr>
<td>20 Feb</td>
<td>16. Translation II / RNA world</td>
<td>Chapter 6: 350-369</td>
</tr>
<tr>
<td>22 Feb</td>
<td>Review</td>
<td>Part of Chapter 5 and Chapter 6</td>
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<tr>
<td>24 Feb</td>
<td><strong>Midterm 2</strong></td>
<td>Lectures 9-16</td>
</tr>
<tr>
<td>27 Feb</td>
<td>17. Transcriptional Regulation I</td>
<td>Chapter 7: 369-380</td>
</tr>
<tr>
<td>1 Mar</td>
<td><strong>Transcriptional Regulation II</strong></td>
<td>Chapter 7: 380-392</td>
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<tr>
<td>3 Mar</td>
<td>18. Transcriptional Regulation III</td>
<td>Chapter 7: 392-404</td>
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<tr>
<td>6 Mar</td>
<td>19. Transcriptional Regulation IV</td>
<td>Chapter 7: 404-413</td>
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<tr>
<td>8 Mar</td>
<td>20. Transcriptional Regulation IV</td>
<td>Chapter 7: 413-428</td>
</tr>
<tr>
<td>10 Mar</td>
<td>21. Post Transcriptional Regulation</td>
<td>Chapter 7: 429-436</td>
</tr>
<tr>
<td>13 Mar</td>
<td>22. Non-coding RNAs</td>
<td>Chapter 7: 440-462</td>
</tr>
<tr>
<td>15 Mar</td>
<td>23. Methods I - Proteins</td>
<td>Chapter 8: 463-507</td>
</tr>
<tr>
<td>17 Mar</td>
<td>24. Methods II – Nucleic Acids</td>
<td></td>
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<tr>
<td>22 Mar</td>
<td><strong>Final Examination 10:15-12:05pm</strong></td>
<td>Lectures 17-24</td>
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</tbody>
</table>

**Instructor/Office Hours:** Ken Stedman, Ph.D.
- Professor, Biology Department, PSU
- Center for Life in Extreme Environments
- Office 466, SRTC (aka Science Building 2)
- Office Hours M, W, F 11:20-12:15 (after class) and by appointment
- E-mail: kstedman@pdx.edu (preferred)
- [http://web.pdx.edu/~kstedman](http://web.pdx.edu/~kstedman)
Prerequisites:
• Principles of Biology and General Chemistry, preferably at PSU.
• Organic Chemistry recommended but not required.
• Biochemistry helpful but not required.

Textbook, etc.:
• **I-clicker** device. **REQUIRED**
  o Used for quizzes and in class questions
  o Can use iclicker, iclicker + or iclicker 2 – NO App/iclicker go, NO REEF polling
  o **10% of final grade**
  o ~$20 on Amazon
  o *Register Clicker with ODIN ID on iclicker.com, by 1 Feb 2016 at the latest.*

d2l:
• Lecture presentations old and new, hopefully by 10pm the night before the lecture
• Old examinations
• Supplemental materials
• Grade sheets
• Discussion Forum?

Lecture Recordings
• Lecture recordings, audio and screen capture will be made available on YouTube after each lecture:
  • [https://www.youtube.com/channel/UCDDso1eQqAPgKFEeRm_D6gA](https://www.youtube.com/channel/UCDDso1eQqAPgKFEeRm_D6gA)
  • Or search for Kenneth Stedman on YouTube.

Examinations:
• Two Midterms, 50 questions, multiple choice, SCANTRON. (30% of Grade each). 1 Feb. and 24 Feb. from 10:15-11:20 am.
• One (non-cumulative) Final, 50 questions, multiple choice, SCANTRON. (30% of Grade). 16 March. 10:15am-12:05pm

Examination policy:
• Examinations are closed book.
• Once started there is no time limit on taking the examinations. However, once the first person has finished with their examination and turned it in, no one will be allowed to start an examination. **BE ON TIME!**

Grading: Minimally the top score in the class will be set to 100%.
• 90% of this score or higher will be an A.
• 85% or higher an A-.
• 80% or higher a B+.
• 70% or higher a B,
• etc.
Makeup/Cheating Policy:
• Makeup exams are only given under extreme circumstances, e.g. birth/death in family or personal illness that requires immediate medical attention (signed letter from medical professional on letterhead required). The format and date of the makeup examination will be determined by the instructor.
• Any cheating on any examination will be rewarded with a zero for that examination.

Regrade Policy:
Must be requested in writing within a week of return of examination. Scantrons may be copied.

Statement regarding students with disabilities: Accommodations are collaborative efforts between students, faculty and the Disability Resource Center (DRC). Students with accommodations approved through the DRC are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through the DRC should contact the DRC immediately at 503-725-4150.

Incompletes: University policies: http://www.pdx.edu/registration/online-grading#psu_grading_system will be followed. Please review these before approaching me about an incomplete.

Important Dates:
• Last day to drop classes without a W (dropped classes not recorded on transcripts): 22 Jan. 2016
• Midterm 1: 1 Feb. 2017
• Last day to withdraw from classes (course is recorded on transcript as W): 26 Feb. 2017
• Last day to change grading option: 26 Feb. 2017
• Midterm 2: 24 Feb. 2017
• Final Exam: Wednesday! 22 Mar. 2017

Title IX Reporting Obligations:
Portland State University is committed to providing an environment free of all forms of prohibited discrimination and sexual harassment (sexual assault, domestic and dating violence, and gender or sex-based harassment and stalking). If you have experienced any form of gender or sex-based discrimination or sexual harassment, know that help and support are available. PSU has staff members trained to support survivors in navigating campus life, accessing health and counseling services, providing academic and on-housing accommodations, helping with legal protective orders, and more. Information about PSU’s support services on campus, including confidential services and reporting options, can be found on PSU’s Sexual Misconduct Prevention and Response website at: http://www.pdx.edu/sexual-assault/get-help or you may call a confidential IPV Advocate at 503-725-5672. You may report any incident of discrimination or discriminatory harassment, including sexual harassment, to either the Office of Equity and Compliance or the Office of the Dean of Student Life.

Please be aware that all PSU faculty members and instructors are required to report information of an incident that may constitute prohibited discrimination, including sexual harassment and sexual violence. This means that if you tell me about a situation of sexual harassment or sexual violence that may have violated university policy or student code of conduct, I must share the information with my supervisor, the University’s Title IX Coordinator or the Office of the Dean of Student Life. For more information about Title IX please complete the required student module Creating a Safe Campus in your D2L.
Learning Objectives:

Protein structure
- Recognize and describe the basic structure of Alpha helix hydrogen bonds and side chain orientation
- Recognize and describe the basic structure of Beta strand/sheet hydrogen bonds and side chain orientation
- List all the basic, acidic and OH-containing amino acids

DNA structure
- Identify a Watson-Crick base pair
- Recognize polarity and explain its significance in intramolecular and intermolecular interactions.
- Identify 2’ and 3’ positions on ribose
- Identify Major and minor grooves and explain the significance for DNA binding
- Describe the cause and significance of hydrogen bonding
- Describe the basics of chromosome structure and the role of histone modification
- Recognize gene and repeat content of human genome
- Compare and contrast Twist and Writhe and positive and negative supercoils

Replication
- List the steps in the mechanism of elongation and proofreading by DNA polymerases
- Describe reasons and mechanisms for high fidelity replication
- List the proteins present at replication forks in both bacteria and eukarya
- Describe the functions of origins of replication in bacteria and eukarya and the proteins that bind them
- Diagram the mechanism of licensing of replication origins

Transcription
- Diagram and describe the significant steps and components of the transcription cycle
- Identify the components and describe the function of a promoter
- Explain the meaning of “Consensus sequence” and give an example of one
- Describe the role and function of sigma factors
- Describe the role and function of General Transcription Factors TF2D, B, and H

Regulation
- Contrast positive and negative regulation and provide examples of each
- Describe the role and function of enhancers and enhancer binding proteins and provide examples of each.
- Diagram and explain the operon model
- Describe the structure and role of eukaryotic enhancer binding proteins and their modularity
- Describe HTH, Homeodomain, and Zn finger DNA binding domains and know that others exist
- Identify the targets, both direct and indirect of eukaryotic enhancer binding proteins
- Identify the targets, both direct and indirect of eukaryotic repressors
- Compare and contrast combinatorial control, master regulators, and cell-type specific transcriptional regulators
- Identify the molecules involved and explain the processes of post-transcriptional control, translational initiation regulation, alternative splicing, and mRNA editing.
- Compare and contrast small regulatory RNAs of the siRNA and miRNAs classes and basic aspects of their mechanisms of silencing/repression.

Last Updated: 14 November 2016