**BIO441: Cancer Biology**  
**Fall 2018 syllabus**

Instructor: Leslie Saucedo  
Office: TH 257F  
phone: 879-2788  
Email: lsaucedo@pugetsound.edu

**Class sessions:** T, Th 11-12:20pm  
**Office hours:** Mon 12-1, Tue 1-2  
--or by appointment

---

**Course Description:**  
This course will examine genetic alterations that contribute to cancer and how they disrupt normal regulation of cell growth. Several specific mechanisms that promote cancer progression will be examined in detail, providing a platform for thoughtful consideration of current therapeutic approaches. Prerequisite courses are BIO212 and BIO311. Registration requires instructor permission.

**Course Readings:** *Molecular Biology of Cancer*, 4th ed. by Lauren Pecorino is the recommended text for this course and will serve as a primer for numerous primary articles and reviews from leading scientific journals. Additionally, texts used previously in BIO212 and BIO311 (various) are highly recommended to serve as references to fundamentals of cell biology and genetics.

**Course Objectives:**  
- To understand the multistep, genetic alterations which enable the transformation of a normal cell to a cancer.  
- To focus in on the numerous mechanisms in place to guard against cancer and how they are subverted.  
- To appreciate the complexity of cancer, such as the unique evolution of every tumor, heterogeneity between tumors and within tumors.  
- To become very comfortable reading and evaluating primary literature and approaching it as the most valuable source of current knowledge.  
- To effectively and accurately communicate current research in molecular cell biology.

**Assessment of Learning:**  
- Exams (35%): Two open notes exams will be administered on weeks 5 and 12 (17.5% each).  
- Take home reading questions (10%): a few questions will be included with each primary/secondary article to be discussed in class.  
- Primary paper presentation (15%): Small groups will be assigned a leading role in class discussion of articles (weeks 6-11).  
- Research paper (25%): This independent project is designed to allow each student to identify a particular cancer-related topic that they wish to explore deeply. Students will present a short (5-7 minutes) presentation outlining their topic the last two days of class. Recommended length is 10-15 pages, should include at least five primary references, and a final, novel model figure.  
- Course participation (15%). Includes attendance, reading responses and contributing to class discussions.
**BIO 441 Course Schedule:**
*Tentative (may be adjusted as needed)*

**Week 1:** Introduction: cancer as a group of diseases with shared phenotypes but personal trajectories
- 8/28: Pecorino Ch. 1
- 8/30: Pecorino Ch. 2

**Week 2:** Overview of gene expression & chromosome structure
- 9/6: Pecorino Ch. 3, *reading response*

**Week 3:** Overview of cell division, differentiation and death
- 9/11: Pecorino Ch. 8
- 9/13: Pecorino Ch. 5, Ch. 7, *reading response*

**Week 4:** Oncogenes and tumor suppressors
- 9/18: Pecorino Ch. 6
- 9/20: Pecorino Ch. 4, *reading response*

**Week 5:** Conversion of normal cells into cancer cells
- 9/27: *Exam I*

**Week 6:** Hallmarks of Cancer I: Self-sufficiency in growth signals
- 10/2: background lecture/discussion

**Week 7:** Hallmarks of Cancer II: Insensitivity to growth inhibitory signals
- 10/9: background lecture/discussion

**Week 8:** Hallmarks of Cancer IV: Limitless replicative potential
- 10/16: Fall Break, no class
- 10/18: Truly immortal (and contagious!) cancer
  - [https://harpers.org/archive/2008/04/contagious-cancer/](https://harpers.org/archive/2008/04/contagious-cancer/)
  - [https://www.sciencedaily.com/releases/2014/01/140123141742.htm](https://www.sciencedaily.com/releases/2014/01/140123141742.htm), *reading response*
Week 9: Hallmarks of Cancer III: Evasion of programmed cell death
10/23: background lecture/discussion

Week 10: Hallmarks of Cancer V: Sustained angiogenesis
10/30: background lecture/discussion
   Pecorino Chapter 10, reading response

Week 11: Hallmarks of Cancer VI: Tissue invasion & metastasis
11/6: Pecorino 205-223, reading response

Week 12: Emerging Hallmark: Reprogramming Metabolism
11/13: background lecture/discussion
   Pecorino 258-262
11/15: Exam II

Week 13: Prevention, Treatment, and Harm
11/20: background lecture/discussion
11/22: Thanksgiving, no class

Week 14: Emerging & Enabling Hallmarks: Avoiding and Co-Opting the Immune System, Student Research Presentations
11/27: Pecorino Ch. 12, pp. 310-317, reading response
11/29: Each student will give a brief overview of their chosen research topic.

Week 15: Student Research Presentations continued…
12/4: Each student will give a brief overview of their chosen research topic.