

“Epigenetics and Systems Biology”

Spring 2019 (Odd Years) – Course Syllabus

Biol 476/576 Undergraduate/Graduate Course (3 Credit)

SLN: (476) – 11978, (576) – 11979

Time - Tuesday and Thursday 10:35 am – 11:50 am

(Course Lectures on Blackboard/Panopto and Discussion Sessions on WSU Zoom for all campuses)

Room – CUE 418

Course Director - Michael Skinner, Abelson Hall 507, 335-1524, skinner@wsu.edu

Objective – The objective of the course is to learn the concept and critical role of systems to understand molecular, cell, development, physiology and evolutionary aspects of biology with a focus on the role of epigenetics in systems biology.

Schedule/Lecture Outline -

| | | |
|----------------|----------------|---|
| January 8 & 10 | Week 1 | Systems Biology (History/ Definitions/ Theory) |
| 15 & 17 | Week 2 | Systems Biology (Networks & Emergence) |
| 22 & 24 | Week 3 | Systems Biology (Components: DNA to Phenotype) |
| 29 & 31 | Week 4 | Systems Biology (Genomics / Technology) |
| February 5 & 7 | Week 5 | Epigenetics (History / Molecular Processes) |
| 12 & 14 | Week 6 | Epigenetics (Molecular Processes & Integration) |
| 19 & 21 | Week 7 | Epigenetics (Genomics and Technology) |
| 26 & 28 | Week 8 | Cell & Developmental Biology |
| March 5 & 7 | Week 9 | Epigenetics of Cell & Developmental Biology |
| 11-15 | Week 10 | Spring Break |
| 19 & 21 | Week 11 | Environmental Impact on Biology |
| 26 & 28 | Week 12 | Environmental Epigenetics |
| April 2 & 4 | Week 13 | Disease Etiology |
| 9 & 11 | Week 14 | Epigenetics & Disease Etiology |
| 16 & 18 | Week 15 | Evolutionary Biology & Genetics |
| 23 & 25 | Week 16 | Epigenetics & Evolutionary Biology |
| Apr/May 30 & 2 | Week 17 | Grant Review/ Study Section Meeting |

Instruction Format -

- One 1.5 hour overview/lecture per week
- One 1.5 hour literature review/discussion session per week

Course Requirements -

1. Attendance
2. Participation in literature and discussion sessions

Graduate Students:

3. Grant proposal (6 page limit) due week of April 23
4. Student Grant Review session on week of April 30

Undergraduate Students:

3. Two exams

Grading and Evaluation-

- Both in class attendance (10%) and discussion participation (25%) and (graduate students) the proposal (65%) or (undergraduate students) exams (65%) will be factors considered.
- Grading scale A(90%), B(80%), C(70%), D(60%), F(<60%)

References and Textbook-

- Reading literature and references provided one week prior to session
- No required textbook (suggested reading provided from selected textbooks such as The Cell or Genes and review articles).

Conjoint Course Requirements –

1) Undergraduate –

- 1) Attendance (10%)
- 2) Participation and presentation in literature and discussion session (25%)
- 3) 2 exams (Midterm and Final), tested on lectured material (65%)

2) Graduate –

- 1) Attendance (10%)
- 2) Participation and presentation in literature and discussion session (25%)
- 3) Grant proposal (6 page limit) and review (65%)

3) Same lecture and literature discussion session for both 476 and 576 level students.

4) Same discussion session for both 476 and 576 level students.

The 576 & 476 students orally presenting and discussing specific literature (provided by instructor) overviews and leading discussion on that literature with questions provided by instructor to facilitate.

The 476 students orally presenting and participating in discussion and provided selected questions regarding the literature to answer during class and hand back after class for P/F grade of answers.

5) Students may receive credit in only one component of the conjoint listed course.

Catalog Entry –

SBS 476 level Epigenetics and Systems Biology 3 (Spring odd Years). Pre req Biol 301. Current literature based course on epigenetics and systems biology with topics in environmental epigenetics, disease etiology, and role epigenetics in evolutionary biology. Credit not granted for both 476 and 576.

SBS 576 level Epigenetics and Systems Biology 3 (Spring odd Years) Current literature based course on epigenetics and systems biology with topics in environmental epigenetics, disease etiology, and role epigenetics in evolutionary biology. Credit not granted for both 476 and 576.

Graduate Students

Grant Proposal

Outline:

- Title
- Abstract
- Specific Aims / Hypothesis
- Background
- Preliminary Results
- Experimental Design and Methods
- References

(6-10 pp. single spaced typed limit)

Key Points:

- Specific aims should be focused and concise and clarify hypothesis
- Be as concise and direct as possible
- Work significance of proposal into grant when appropriate
- Use only critical preliminary results

Additional Information:

- Propose short-range studies to address long-range goals
- Write grant for 3 to 4 year period to complete studies
- Feasibility of success is critical, ask right type of question
- Experimental design needs to address hypothesis

Score/Rating:

Factors involved: Type question addressed, organization of thoughts, preliminary results, feasibility, reasonable completion expectations, focus of aims and proposed studies.

| | | |
|-----------|---------------------|--------------------------|
| Score | | |
| 1.0 - 1.5 | Outstanding | Funded |
| 1.5 - 2.0 | Excellent | Probably Funded |
| 2.0 - 2.5 | Good | Accepted, but not Funded |
| 2.5 - 3.0 | Satisfactory | |
| 3.0 - 3.5 | Adequate | |
| 3.5 - 4.0 | Fair | |
| 4.0 - 5.0 | Acceptable | |

Review:

NIH Study Section style review with all students/fellows participating in the review. Primary and secondary reviewers will be selected and all grants will be critiqued.

Note:

Welcome to use opportunity to prepare grants for student orals or fellowship applications.

SBS Student Learning Outcomes

The School of Biological Sciences has adopted a standardized set of learning outcomes for our courses. We expect each undergraduate student who has a major in Biology or Zoology to have achieved the following outcomes at the time they graduate with a B.S. from our program:

1. Understand and explain major biological concepts.
2. Use critical thinking and scientific skills to analyze and solve problems.
3. Effectively communicate biological problems and solutions to both the scientific community and the public at large in writing and in discussion.
4. Formulate logical hypotheses and test them by designing and running appropriate experiments or observational studies and analyses.
5. Identify the central body of knowledge in biology or zoology (including knowledge from molecular biology, genetics, evolution, ecology and organismal biology.).
6. Use scientific literacy and knowledge of biology or zoology to analyze contemporary social, cultural, and environmental issues and contribute to informed opinion.

Students with Disabilities

Reasonable accommodations are available for students with documented disabilities or chronic medical conditions. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center at Washington Building 217; Phone: 509-335-3417 to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center. For more information contact a Disability Specialist on your home campus.

Pullman or WSU Online: 509-335-3417 <http://accesscenter.wsu.edu>, Access.Center@wsu.edu

Academic integrity

Academic integrity is the cornerstone of higher education. As such, all members of the university community share responsibility for maintaining and promoting the principles of integrity in all activities, including academic integrity and honest scholarship. Academic integrity will be strongly enforced in this course. Students who violate WSU's Academic Integrity Policy (identified in Washington Administrative Code (WAC) 504-26-010(3) and -404) will receive [**insert academic sanction (e.g., fail the course, fail the assignment, etc.)**], will not have the option to withdraw from the course pending an appeal, and will be reported to the Office of Student Conduct.

Cheating includes, but is not limited to, plagiarism and unauthorized collaboration as defined in the Standards of Conduct for Students, WAC 504-26-010(3). You need to read and understand all of [the definitions of cheating](#). If you have any questions about what is and is not allowed in this course, you should ask course instructors before proceeding.

If you wish to appeal a faculty member's decision relating to academic integrity, please use the form available at conduct.wsu.edu.

Campus safety and Emergency Notification

Classroom and campus safety are of paramount importance at Washington State University, and are the shared responsibility of the entire campus population. WSU urges students to follow the "Alert, Assess, Act," protocol for all types of emergencies and the "[Run, Hide, Fight](#)" response for an active shooter incident. Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT in the most appropriate way to assure your own safety (and the safety of others if you are able).

Please sign up for emergency alerts on your account at MyWSU. For more information on this subject, campus safety, and related topics, please view the FBI's [Run, Hide, Fight video](#) and visit the [WSU safety portal](#).