BIOL 472

The Organismal Form and Function Lab

**Syllabus – SEMESTER/YEAR**

**Instructor:**  **Phone:**

**Office:**  **Email:**

**Office Hours:** \*\*\*\*\*\*

**Text:** *No text, readings will be* ***posted on blackboard***

**Graduate student:** *TBD*

**Undergraduate learning assistant:** *TBD*

**Course website:** wp.towson.edu/off-lab

**Twitter**: @off\_lab

**Course Topic:** This course will focus on investigating how animals move. We will learn about animal form, function and performance, and apply those topics to develop hypotheses, collect, analyze and present data. The goal of the course is to give student’s authentic research experiences focused on organismal form, function and performance. Student’s will develop their own hypotheses related to biomechanics and whole-organismal performance and use high speed cameras to collect their data and test their hypotheses. The first half of the course will have lectures based on animal performance, muscle physiology, kinematics and biomechanics, while the labs will focus on high speed cinematography, digitization and obtaining kinematics. We will also have field trips to collect local invertebrates to use as our subjects. In the second half of the course, the lecture portion will be replaced with more “lab meeting” exercises, including paper presentations and discussion, while the lab portion will be time for students to collect and analyze their data.

**Objectives:**

* Students will comprehend animal movement based on their knowledge of animal form, function and performance, from the physiology of muscles to ecological and evolutionary patterns
* Students will acquire the skills and techniques necessary to quantify animal movement, integrating math, physics and computer programming using high-speed videography and kinematic analyses.
* Students will  gain authentic research experience in whole-organismal physiology through active participation in the scientific method.
* Students will comprehend the skills and techniques necessary to collect, analyze, and present data in relation to a hypothesis or question

**Grading:**

  **Points Possible**

 Midterm …………………… 75

 Individual Assignments…………… 80

 Group Assignments..……………… 245

 Final Paper ………........................... 100

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 **Total points possible 500**

**Grade Scale:**

**A** …….(92-100%) **C+** ……. (78-79.9%)

**A-** ……. (90-91.9%) **C** ……. (70-77.9%)

**B+** …… (88-89.9%) **D+**……. (68-69.9%)

**B** …… (82-88.9%) **D** ……. (60-67.9%)

**B-** ……. (80-81.9%) **F** …….(Below 60%)

At the conclusion of the semester, each student’s total point accumulation will be determined and converted to a percentage by comparison with the maximum total points possible (**500**). There *may* be opportunities for bonus points through extra questions on exams. *These bonus points will be added on to your final class total and constitute your “curve” for the semester.* ***There will be no additional curving of grades****. If you end up with an 89.9% you will get a B+.*

**Makeup exams and assignments:** Because the nature of this class is a research based lab course, there will be **No makeups or late assignments**.

**Cheating policy:** Cheating of any kind is not acceptable. Anyone caught cheating will be dismissed from the room and will receive a zero for the exam. In addition, the incident will be reported to Academic Affairs and a letter noting the incident will be placed in your permanent academic records.

***Written assignments:*** There will be several written assignments throughout the course submitted through blackboard. Do not plagiarize other’s work (either in the class, from the actual paper or elsewhere). To ensure you are not plagiarizing, each written assignment will be submitted and checked with SafeAssign. If you are more than 20% match on Safe Assign, you will lose points (For example, 25% will be taken off if Safe Assign suggests a 25% match). If you are more than 50% match you will receive a 0 for the assignment. To ensure you are aware of your score, you will have multiple attempts to submit the assignment.

Don’t risk it…it’s not worth it! Please visit <https://www.towson.edu/about/administration/policies/academicaffairs.html>

for additional informational.

Student conduct: In fairness to everyone enrolled in this course, it is critical that the best possible learning atmosphere be maintained at all times in the classroom and the laboratory. Free discussion, inquiry, and expression are encouraged in this class. Classroom behavior that interferes with either (a) the instructor's ability to conduct the class or (b) the ability of students to benefit from the instruction is not acceptable. Examples may include routinely entering class late or departing early; use of cell phones, or other electronic devices; repeatedly talking in class without being recognized; talking while others are speaking; or arguing in a way that is perceived as "crossing the civility line." Classroom behavior that is determined to be inappropriate and cannot be resolved by the student and the faculty member may be referred for administrative or disciplinary review and the student will be barred from attending class.

* Talking and other disruptive behavior of any kind will not be tolerated.
* Late arrivals and early departures from class are disruptive; please arrive on time for class.
* Cell phones must be turned off prior to the start of lecture and remain off the entire period. DO NOT TEXT DURING LECTURE OR RECITATION as it is distracting to you and others around you. Don’t be rude. I can see you texting under the table. If you are not here to listen and learn, please stay home. Your friends and family can wait. Don’t even consider answering your phone or making a call during lecture or recitation.
* Food and Drink ARE NOT ALLOWED IN THE CLASSROOM
* We will be working with live animals, please be respectful of them and treat them ethically.

Attendance: Attendance is essential to your success and is mandatory throughout the course.

Group Work: A large portion of this class is focused on group work, including several assignments. Please be respectful of others in your group, work as a team and contribute equally. Throughout the course I will meet with groups to ensure there are no issues. If you have a concern please contact me so we can discuss privately before approaching the group. To ensure everyone in the group is participating and contributing, 20 points from your group assignments will be based on peer evaluation. Each student in the group will evaluate themselves and the other students in the group (see peer evaluation at the end of the syllabus). I will average those scores and combine them with the group’s score (out of 30) based on the assignments rubric.

Americans with disabilities act: If you are a qualified student with a disability seeking accommodations under the Americans with Disabilities Act, you are required to self-identify with Accessibility & Disability Services in the Administration Building and present a letter to me from ADS. This should be done during the first week of class.

**Diversity Statement.**Towson University values diversity and fosters a climate that is grounded in respect and inclusion, enriches the educational experience of students, supports positive classroom and workplace environments, promotes excellence, and cultivates the intellectual and personal growth of the entire university community. Should you feel that you are experiencing a negative environment related to diversity issues or cultural sensitivity, we encourage you to contact the Department's Assistant Chair, [Dr. Colleen Winters cwinters@towson.edu ]. For more information go to <https://www.towson.edu/fcsm/departments/biology/diversity.html>

**Participation in HHMI grant:**

The Howard Hughes Medical Institute (HHMI) has awarded a grant to Towson University to expand diversity and inclusion in course-based research laboratory classes (CUREs) in the sciences. One goal of this grant is to develop and improve these CUREs, including BIOL410-Molecular Biology. The evaluation of the program will be conducted by Dr. Ghent (cghent@towson.edu), who will come to class to explain the details. The evaluation is completely separate from your grade in this course. This research will ask you to take three surveys, volunteer for interviews, and agree to allow two class sessions to be recorded with audio and video equipment. The plan has been approved by the Towson University Institutional Review Board (#1710024728). More information about the grant project is available [here](http://www.hhmi.org/news/24-institutions-commit-diversity-and-inclusion-through-2017-hhmi-inclusive-excellence).

**Note:** Syllabus and schedules may be changed at any time based on the progress of the class. You will be notified if changes occur.

You must attend class to be informed of updates. Be sure to print any materials required and bring to class. There will be assignments and reports Below is an outline when material is due, but this is subject to change. **Late assignments will not be accepted.**

**Bibliography**

Select chapters will be provided on blackboard, with a copy on hold in the library, from:

Biewener, A., and S. Patek. Animal locomotion. Oxford University Press, 2018.

Irschick, D. J., and T. E. Higham. Animal athletes: an ecological and evolutionary approach. Oxford University Press, 2016.

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| --- | --- | --- | --- | --- |
| Week | Day | Topic | Reading | Assignment |
| 1 | \*\*\*\*\*\*\*\* | Introduction: class, camera setupForm, function and performance | Irschick and Higham Ch. 1 | **Due at end of lab**: video test (5 pts) Discuss reading |
| 2 | \*\*\*\* | **Labor Day NO CLASS** |  |  |
|  | \*\*\*\* | What affects performance?(paper discussion) | Irschick and Higham Ch. 2 | **DUE \*\*\***: Paper summary (10 pts) Paper: Winchell et al. 2018 |
| 3 | \*\*\*\*\*\*\*\* | Introduction: kinematic and performance analysesMuscle Physiology and Energetics | Biewener and Patek Ch. 2 | **DUE \*\*\***: Two observations from nature (5 pts.) |
| 4 | \*\*\*\* | Collection field trip (Oregon Ridge) |  | **DUE \*\*\***: Digitizing test (10 pts.)  |
|  | \*\*\*\* | Terrestrial locomotion | Biewener and Patek Ch. 4 | Paper discussion: Full & Tullis 1990 |
| 5 | \*\*\*\*\*\*\*\* | Collection Field trip (TU Field Station)Jumping, climbing, clinging | Biewener and Patek Ch. 7 | **DUE \*\*\***: Kinematic test (10 pts.)Paper discussion:  |
| 6 | \*\*\*\*\*\*\*\* | Collection field trip/animal training(Oregon Ridge)Flying | Biewener and Patek Ch. 6 | **DUE \*\*\***: Initial hypothesis/question draft (5 pts.) Paper discussion:  |
| 7 | \*\*\*\* | Lab work |  |  |
|  | **\*\*\*\*** | **Midterm** |  | **DUE \*\*\*:** research proposal abstract (30 points) |
| 8 | \*\*\*\*\*\*\*\* | Lab work Lab work | **TBD** |  |
| 9 | \*\*\*\*\*\*\*\* | Lab workPresentation and paper discussion | **TBD** | **DUE \*\*\***: Video, digitized point, kinematic assignment (40 pts) **group****DUE \*\*\***: 3 student paper presentations (20 points) |
| 10 | \*\*\*\*\*\*\*\* | Lab workLab meeting and paper discussion | **TBD** | **DUE \*\*\***: 3 student’s paper presentations (20 pts.)**DUE \*\*\***: Initial **group** presentation of research (50 pts.) |
| 11 | \*\*\*\* | Lab work |  |  |
|  | \*\*\*\* | Lab meeting and paper discussions | **TBD** | **DUE \*\*\***: 3 student’s paper presentations (20 pts.) |
| 12 | \*\*\*\*\*\*\*\* | Lab workData analysis & Data presentation |  |  |
| 13 | \*\*\*\* | Lab work |  | **DUE \*\*\***: **Group** Teaser trailer (50 pts.) |
|  | **\*\*\*\*** | **Thanksgiving NO CLASS** |  |  |
| 14 | \*\*\*\*\*\*\*\* | Lab WorkLab meeting and paper discussion |  | **DUE \*\*\***: 3 student’s paper presentations (20 pts.) |
| 15 | \*\*\*\* | Lab work & poster prep |  | Department of Biology **Group** poster presentation (50 points) 12/7/18 |
|  | \*\*\*\* | Lab meeting |  |  |
| 16 | \*\*\*\*\*\*\*\* | Final presentation due |  | **DUE \*\*\***: **Group** final presentation (50 points)**DUE \*\*\*: Group** final paper due (100 points) |

**Assignment Schedule**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Week** | **Assignment** | **Points** | **Due** | **Individual or Group** |
| **1** | Video test | 5 |  | Individual |
| **2** | Paper summary | 10 |  | Individual |
| **3** | Field observations | 5 |  | Individual |
| **4** | Digitizing test | 10 |  | Individual |
| **5** | Kinematic test | 10 |  | Individual |
| **6** | Initial hypotheses/questions | 5 |  | Individual |
| **7** | Video, digitized, kinematic | 40 |  | Group |
|  | **Midterm** | **75** |  | **Individual** |
| **8** | Presentation of project | 50 |  | Group |
| **9** | Paper summary**3** student paper presentations | 2020 |  | IndividualIndividual |
| **10** | **3** student paper presentations | 20 |  | Individual |
| **11** | **3** student paper presentations | 20 |  | Individual |
| **12** | Teaser Trailer | 50 |  | Group |
| **13** |  |  |  |  |
| **14** | **3** student paper presentations | 20 |  | Individual |
| **15** | Dept. poster presentation | 50 |   | Group |
| **16** | Final presentationFinal Paper | 50100 |  | GroupGroup |

**Peer Evaluation Form for Group Work**

Your name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Write the name of each of your group members in a separate column. For each person, indicate the extent to which you agree with the statement on the left, using a scale of 1-4 (1=strongly disagree; 2=disagree; 3=agree; 4=strongly agree). Total the numbers in each column.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Evaluation Criteria | Group member: | Group member: | Group member: | Group member: |
| Attends group meetings regularly and arrives on time. |  |  |  |  |
| Contributes meaningfully to group discussions and demonstrates a cooperative and supportive attitude. |  |  |  |  |
| Completes group assignments on time. |  |  |  |  |
| Prepares work in a quality manner. |  |  |  |  |
| Contributes significantly to the success of the project. |  |  |  |  |
| TOTALS |  |  |  |  |

Feedback on team dynamics:

1. How effectively did your group work?
2. Were the behaviors of any of your team members particularly valuable or detrimental to the team? Explain.
3. What did you learn about working in a group from this project that you will carry into your next group experience?

Adapted from a peer evaluation form developed at Johns Hopkins University (October, 2006)