Laboratory Methods 

in Hormones & Behavior

BIOA 455 AU 2021

Lab Sections A/B: WED 9:30 AM – 12:20 PM/

1:00 PM – 3:50 PM (in RAI 230)

\*Must be taken concurrently with BIOA 454 Seminar

**Teaching team** (Zoom office hours by appointment)**:**

**Instructor:** Dr. Melanie Martin **TA**: Alene Chang [martinm7@uw.edu](mailto:martinm7@uw.edu) [archang@uw.edu](mailto:archang@uw.edu)

## DESCRIPTION AND LEARNING OBJECTIVES

This laboratory course provides an introduction to wet lab methods, hormonal biomarker collection, and enzyme immunoassay analysis. Students will also gain appreciation for research study design and interpretation through adherence to data collection protocols, statistical analysis of assay results and behavioral data, and reflection on practical and ethical considerations for human behavioral and hormonal research. No previous laboratory experience is required. This course fulfills UW Natural World (NW) General Education Requirements and is part of the Medical Anthropology and Global Health (MAGH) and Human Evolutionary Biology (HEB) Options in Anthropology. A lab fee is assessed to cover costs of data collection materials and assays. *Registration is by add code only*: students must take the course concurrently with BIOA 454 and review schedule commitment and lab expectations in order to register.

*By the end of this course you should be able to:*

* Demonstrate competency in lab & biomarker collection protocols
* Understand the principles and mechanisms of enzyme immunoassays to measure hormonal concentrations
* Execute enzyme immunoassays on salivary cortisol
* Process raw data from cortisol assays for use in statistical analysis
* Analyze relationships between hormonal profiles and measures of sleep quality, mood, and stress

## ORGANIZATION AND ASSESSMENTS

### Course structure

1. This is a 3-credit course, [which according to the UW represents a time commitment of 9 hours/week](https://www.washington.edu/students/reg/credit.html#:~:text=The%20basic%20rule%20for%20determining,30%20hours%20in%20a%20quarter.) (including 3 hours in-person lab time)
2. All lab sections will meet in-person. Students will select lab patterns to work with all quarter long. During Week 4 and Week 6, we will be conducting 3-day cortisol assays; Tuesday & Thursday seminars during these weeks will be cancelled and lab partners will sign-up for times on those days to perform Day 1 and Day 3 protocols. *There is no lab Thanksgiving week*.
3. **HOWEVER…**..it is 2021 and we are still in a global pandemic. Despite all precautions we may take, any one of us, at any time, may be exposed or infected with COVID-19 and will need to quarantine and recover. Unfortunately due to time constraints, it is not feasible to hold make-up lab sessions. We will work with students on a case-by-case basis to assess alternatives for temporary absences due to illness/quarantine.
   1. In the event that you need to quarantine: You will be excused from in-person lab assignments during your quarantine. Depending on when this happens, you may have to work with your lab partner and teaching team to ensure your collected samples are processed and assayed. If you miss the EIA practice lab, you should expect to shadow and assist your lab partner when assaying your collected samples, rather than perform the assay yourself.
   2. In the event that your instructor needs to quarantine: wet labs will be taught by a TA or a substitute; data analysis workshops will move to remote synchronous meetings
   3. In the event that the university moves to fully remote instruction: students will continue biomarker collection and training in laboratory principles through remote tutorials. We will arrange to safely collect biomarker samples and instruments from students for processing. Results will be returned to students for analysis, with all analysis training and workshopping moved to synchronous remote meetings.

### Assessments

Assignments are grouped into three categories (summarized below) and weighted accordingly: Lab assignments 30%; Lab Quizzes 30%; Final project 40%. Lab assignments and quizzes are due by Sunday 11:59 pm of the week assigned (e.g. Week 1 assignments/quizzes are due by Sunday Oct 10). See Canvas for complete and detailed descriptions of all assignments, assessments, & due dates.

1. **Lab Assignments: 30% of final grade**
   1. Weekly assignments corresponding to lab trainings and exercises
2. **Lab Quizzes: 30% of final grade**
   1. 1-2 quizzes per week covering lab skills and concepts (Weeks 1 - 7)
   2. The lowest quiz score will be dropped
3. **Final project: 40% of final grade**
   1. 10 pts Completion of one-time and daily online surveys (individual points)
   2. 10 pts Contribution to class-designed survey & experimental design (with lab partner)
   3. 10 pts Actiwatch protocol compliance (individual points)
   4. 10 pts Saliva collection protocol compliance (individual points)
   5. 40 pts Final report: data analysis of selected survey question & class cortisol and sleep data (with lab partner)
   6. 10 pts Final presentation: 3-5 minute pre-recorded presentation (with lab partner)

### Grading system

There are no curves or extra credit opportunities. Final percentage scores are converted to grade points using the scales below. These are the MINIMUM percentages for each grade point. Percentages are automatically converted to grade points and are NOT ROUNDED (e.g. 94.89 = 3.9)

Minimum percent = Grade point

95 = 4.0 88 = 3.3 81 = 2.6 74 = 1.9 67 = 1.2

94 = 3.9 87 = 3.2 80 = 2.5 73 = 1.8 66 = 1.1

93 = 3.8 86 = 3.1 79 = 2.4 72 = 1.7 65 = 1.0

92 = 3.7 85 = 3.0 78 = 2.3 71 = 1.6 64 = 0.9

91 = 3.6 84 = 2.9 77 = 2.2 70 = 1.5 63 = 0.8

90 = 3.5 83 = 2.8 76 = 2.1 69 = 1.4 60-62 = 0.7

89 = 3.4 82 = 2.7 75 = 2.0 68 = 1.3 <60 = 0.0

## COURSE CALENDAR

(Subject to change. See Canvas for updates and detailed descriptions of course assignments, due dates, and assessments)

|  |  |  |
| --- | --- | --- |
| Week | Lab | Canvas assignments |
| Wk 0  9/29 | Course introduction **(RAITT 114)**  Lab tour and safety | Onboarding Assignments |
| Wk 1  10/6 | Basic lab skills 1 (Pipetting) | The Scientific Method: behavioral observation & survey design |
| Wk 2  10/13 | Basic lab skills 2 (Dilutions & Measurement) | Biomarker collection: methods & interpretations/  Crowd source class survey questions |
| Wk 3  10/20 | Urinary cortisol EIA demo  Saliva sample collection prep | Principles of enzyme immunoassays  Finalize class survey |
| Wk 4  10/27 | Urinary cortisol EIA practice (**IN LAB ALL WEEK**: TUES 10/26 LAB A 10:30 - 11:00/ LAB B 11:30 - 12:00; THURS 10/28 SIGN UP FOR SLOTS  At home: saliva sample collection (Thurs - Sun) | |
| Wk 5  11/3 | Saliva sample lab prep | Measurement & interpretation of diurnal hormone patterns |
| Wk 6  11/10 | Salivary cortisol EIA (**IN LAB ALL WEEK**: TUES 11/9 LAB A 10:30 - 11:00/ LAB B 11:30 - 12:00; THURS 10/28 SIGN UP FOR SLOTS | |
| Wk 7  11/17 | EIA quality control & interpretations (**RAITT 114)** | Quantitative vs. qualitative assays; false positives/negatives |
| WK 8 | **THANKSGIVING NO LAB** | Due: Lab assay reports |
| WK 9  12/1 | Data analysis (**RAITT 114)** | Due: Final project Draft 1 |
| WK 10  12/8 | Data analysis (**RAITT 114)** |  |
| FINALS  WEEK | **FINAL PROJECTS DUE**  FLASH PRESENTATIONS: Monday Dec 13 10:30 - 12:20 in RAITT 116 | |

## COURSE POLICIES

1. **Academic misconduct:** The university’s policy on plagiarism and academic misconduct is a part of the Student Conduct Code, which cites the definition of academic misconduct in the WAC 478-121. (WAC is an abbreviation for the Washington Administrative Code, the set of state regulations for the university. The entire chapter of the WAC on the student conduct code is here.) According to this section of the WAC, academic misconduct includes: “Cheating”—such as “unauthorized assistance in taking quizzes”, “Falsification” “which is the intentional use or submission of falsified data, records, or other information including, but not limited to, records of internship or practicum experiences or attendance at any required event(s), or scholarly research”; and “Plagiarism” which includes “[t]he use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgment.” [The UW Libraries have a useful guide for students](http://www.lib.washington.edu/teaching/plagiarism).
2. **Accommodation:** Your experience in this class is important to me. If you have already established accommodations with Disability Resources for Students (DRS), please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course. Contact the [Disability Services Office](http://hr.uw.edu/dso/) (206-543-6450 or dso@uw.edu ) to request accommodations. Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW’s policy, including information on how to request an accommodation, is available at [Religious Accommodations Policy](https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/). Accommodations must be requested within the first two weeks of this course using the [Religious Accommodations Request form](https://registrar.washington.edu/students/religious-accommodations-request/)
3. **Communication**: Please post questions about assignments, quizzes, and concepts that the whole class would benefit from to the Canvas discussion board. For any other individual communication with your teaching team, please use email (not Canvas messaging). Practice [professional communication in your correspondence:](https://www.insidehighered.com/views/2015/04/16/advice-students-so-they-dont-sound-silly-emails-essay) use your uw.edu email address and employ proper salutations (Dr. Martin). I will respond to emails within 48 hours. \*If you are struggling for any reason with assignments or course pacing, please do not hesitate to reach out or request a one-on-one zoom meeting\*. If you need to urgently communicate with, please add \*urgent\* to the subject line.
4. **Technological problems:** Technological problems are not a sufficient excuse for not turning in any assignments by grading deadlines. Back up your work physically and using cloud storage.
5. **Inclusivity:** Among the core values of the university are inclusivity and diversity, regardless of race, gender, income, ability, beliefs, and other ways that people distinguish themselves and others. If any assignments and activities are not accessible to you, please contact me so we can make arrangements to make an alternative assignment available. Learning often involves the exchange of ideas. To include everyone in the learning process, we expect you will demonstrate respect, politeness, reasonableness, and willingness to listen to others at all times – even when passions run high. Behaviors must support learning, understanding, and scholarship. Preventing violence is a shared responsibility in which everyone at the UW plays apart. If you experience harassment during your studies, please report it to the [SafeCampus website](http://washington.edu/safecampus/) (anonymous reports are possible). SafeCampus provides information on counseling and safety resources, University policies, and violence reporting requirements help us maintain a safe personal, work and learning environment.