SYLLABUS

BIMM194 - Circadian Rhythms: physiological and molecular aspects.

Winter 2022 (2 units)

This is an in-person course, however it will be taught fully online during weeks 1 & 2
Note that (due to the recent increase in COVID-19 cases) the instruction mode may be further adjusted according to University guidelines

Instructor: JOSE PRUNEDA-PAZ

Office: Muir Biology Building #3214.

E-mail: jprunedapaz@ucsd.edu (please use the subject line: 'BIMM194'). Note that emails will be generally answered by 8PM every day.

Phone: 858-534-8323 (please identify yourself as a student in BIMM194).

Course website: https://canvas.ucsd.edu

Class hours: Thursdays, 2:00 - 3:20 PM (US Pacific Time)

Weeks 1-2: in Zoom (meeting link in the course website "Zoom LTI PRO" folder) [1]

Weeks 3-10: in CENTR #217A

Office hours: Tuesdays 2:00 - 3:00 PM (US Pacific Time)

Week 2: in Zoom (meeting link in the course website "Zoom LTI PRO" folder) [1]

Weeks 3-10: in BIOLOGY BUILDING #1102

[1]*Campus spaces for Zoom classes: https://vcsa.ucsd.edu/news/covid-19/#Campus-Zoom-Spaces*

Rules for in person classes and office hours:

1) **Everyone must complete a daily symptom and exposure screening** (student symptom screener). Remember that if you develop symptoms, the quickest way to get a test is through the screener tool.
2) **Everyone must wear a mask.** The campus recommends the use of N-95 and KN-95 masks (a face covering/face mask DOES NOT include a scarf, ski mask, balaclava, bandana, gaiter, turtleneck, collar, plastic face shield, or single layer of fabric).
3) **Everyone must be fully vaccinated and boosted against COVID-19**, or have an approved exception or deferral, per University of California policy. Requests for exceptions or deferral should be submitted as soon as possible so you do not risk non-compliance with the policy. Make a free vaccination appointment.
4) These University guidelines may be updated during the quarter. You can find up to date regulations as well as additional information and resources at: https://returntolearn.ucsd.edu/return-to-campus/campus-repopulation/index.html

Presentation manuscripts: provided in separate files in the class website.

Important dates:

Must check at: https://blink.ucsd.edu/instructors/courses/enrollment/calendars/2021.html.

- January 11: Professor office hours start.
- January 12: deadline to sign up to for week 3 presentation (first student led presentation) (3 students). Students interested in presenting should submit a request directly to the professor at jprunedapaz@ucsd.edu (students will be assigned on a first come first serve basis)
- January 14: manuscripts for Week 4-10 presentations will be posted in the class website.
- January 18 (8AM) - January 21 (2PM): deadline to sign up for Week 4-10 presentations (up to 3 students each group).

  How do you do this?. Go to the "People" folder in the course website and select the "Presentation Groups" tab. Add yourself to one of the presentation groups (note that each group cannot have more than 3 students).

  After January 21, students will be assigned to a presentation roster by the professor (in alphabetical order according to the last name).
- January 20: first student group will present the assigned manuscript (#2).

For other important dates, see the Course Schedule below.

COURSE STRUCTURE:

Course Prerequisites:
BIMM100 (Molecular Biology)**.**
If you feel rusty on the material of the prerequisites, it is strongly recommended that you carefully read Chapters 4-8, of the *Lodish* textbook (7th ed), which cover material that is considered prerequisite and will only be mentioned in passing during class.

Purpose of the course:
Biological clocks are common to most life forms in the planet. Most organisms have evolved to perform biological functions in a time-of-day specific manner. Biological clocks allow an organism to coordinate its physiology with daily environmental and endogenous. In this course you will learn how biological clocks function at the molecular level, and how clock control of physiological processes ultimately regulates optimal organismal functions. The chronobiology field has rapidly extended to many areas of biology. The goal of the course is not only to provide an overall view of this field, but also to learn how to interpret and present the primary literature that has shaped our current knowledge in it.

Classes:
In the first class the professor will review the general principles of biological clocks. In subsequent classes (weeks 2-10) manuscripts that illustrate key aspects of the clock function will be presented and discussed. The selected manuscripts will be available to download from the class website by January 14 and must be read before class. A group of up to 3 students will be assigned to each manuscript. Presenters will identify the major question/s addressed by the manuscript, describe each figure (or part of them) and the corresponding conclusion and come up with a simple take-home message for the paper. **EACH presenter must be able to clearly explain ANY part of the assigned paper.**

On the week of your presentation (at the very latest) the group will present their presentation slides to the professor during office hours, so you will need to start working on your manuscript at least 7-10 days before the presentation date.

The presentation should contain:
1) Brief introduction and general question
2) Specific question, experiment and result (for each figure or part of figure)
3) Review of conclusions from each figure
4) TAKE-HOME MESSAGE or main conclusion/s

Presentation of the first manuscript (week 2) will be by the professor in Zoom at the scheduled class day/time (meeting link in the course website “Zoom LTI PRO” folder).
Student led presentations (weeks 3-10) will be in person.

You are encouraged to search for an alternative manuscript for your presentation (http://www.ncbi.nlm.nih.gov/pubmed).
If you decide to do so, you must provide the manuscript to the professor at least 2 weeks prior to your assigned presentation date (by e-mail at jprunedapaz@ucsd.edu) and get the professor’s written approval.

Attendance:
Attendance to class is required and will be considered for your final grade (tardy tolerance: 5 minutes for up to 2 classes).

'In class' participation:
Your participation in class is very important and will be considered for your final grade.

During remote classes, all students will have video and microphone disabled. To ask a question, you will need to use **the "raise hand" tool in Zoom** (under the "participants" tab) to call instructor's attention. During questions and answers, all student's microphones will be enabled, as anyone in the class will be welcome to provide an answer.

Quizzes:
There will be nine online (open book) quizzes, one every week (except the first week) at the end of each manuscript presentation (total time for each quiz will be 10 minutes).
Quizzes will consist of 4-5 multiple choice or short answer questions in relation to the paper presented. Questions will be related to conclusions or concepts emphasized during the paper presentation.
Each quiz will account for 5% of your grade.

There will be up to ONE scheduled make-up quiz for students that are absent to any class. Students will take the make-up quiz during office hours (students will have the opportunity to clarify with the professor any point about the missed presentation prior to taking the quiz).

Academic integrity:
Students are expected to do their own work, as outlined in the UCSD Policy on Academic Integrity ("Academic integrity" folder in the class website). **Academic misconduct** is broadly defined as any prohibited and dishonest means to receive course credit, a higher grade, or avoid a lower grade. Academic misconduct misrepresents your knowledge and abilities, which undermines the instructor's ability to determine how well you're doing in the course. Please do not risk your future by cheating.

Disabilities:
Students requesting accommodations and services due to a disability for this course need to provide a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD), prior to eligibility for requests. Receipt of AFAs in advance is necessary for appropriate planning for the provision of reasonable accommodations. **Please note that instructors are unable to provide accommodations unless they are first authorized by OSD**. For more information, contact the OSD at (858) 534-4382 (voice), **osd@ucsd.edu**, or visit **osd.ucsd.edu**.

COURSE GRADING:

Your grade in BIMM194 is based entirely on the cumulative score of the following:

1) in class presentation of the assigned manuscript (40%)

- Preparation (manuscript and slide revision with professor) (10%)
- Slide organization/clarity (5%)
- Presentation (20%)
- Q/A (5%)

2) quizzes (45%)

- 5% per quiz

3) in class participation (15%)

- attendance (10%) (each class=1%)
- participation in class (5%) (each question asked=1%)

Letter grades will be assigned as follows:

97-100%: A+
90-97%: A
87-90%: B+
80-87%: B
77-80%: C+
70-77%: C
60-70%: D
Below 60%: F

COURSE SCHEDULE:

Lecture day	*Week*	*Manuscript #*	*Manuscript title, authors & citation (PDF in TED)*	*Presenters*
1/6/22	1	N/A	**Introductory Lecture: Circadian clock overview**	J Pruneda-Paz
1/13/22	2	#1	**Resonating circadian clocks enhance fitness in cyanobacteria** Ouyang et al. PNAS 1998, 95:8660–8664.	J Pruneda-Paz
1/20/22	3	#2	**Positional Cloning of the Mouse Circadian *Clock* Gene** King et al. Cell 1997, 89:641–653.	Roster in Canvas
1/27/22	4	#3	**Feedback repression is required for mammalian circadian clock function** Sato et al. Nature genetics 2006, 38(3):312-319.	Roster in Canvas
2/3/22	5	#4	**Rhythmic Oxygen Levels Reset Circadian Clocks through HIF1a** Adamovich & Ladeuix et al. Cell Metabolism 2017, 25, 93-101	Roster in Canvas
2/10/22	6	#5	**Sleeping sickness is a circadian disorder** Rijo-Ferreira et al. Nat. Communications 2018, 9(62): 1-13	Roster in Canvas
2/17/22	7	#6	**Disruption of the clock components CLOCK and BMAL1 leads to hypoinsulinaemia and diabetes** Marcheva et al. Nature 2010, 466:627-631	Roster in Canvas
2/24/22	8	#7	**Control of skin cancer by the circadian rhythm** Gaddameedhi et al. PNAS 2011, 108(46):18790-18795	Roster in Canvas
3/3/22	9	#8	**Optimized Dosing Schedule Based on Circadian Dynamics of Mouse Breast Cancer Stem Cells Improves the Antitumor Effects of Aldehyde Dehydrogenase Inhibitor** Matsunaga et al Cancer Res 2018, 78(13):3698-3708	Roster in Canvas
3/10/22	10	#9	**A large-scale study reveals 24-h operational rhythms in hospital treatment** Ruben et al. PNAS 2019, 116(42): 20953–20958	Roster in Canvas