

## SYLLABUS

BIMM194 - Circadian Rhythms: physiological and molecular aspects.  
Spring 2021 (online course), 2 units

**Professor: JOSE PRUNEDA-PAZ**

Office: Muir Biology Building #3214.

E-mail: [jprunedapaz@ucsd.edu](mailto: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).

**Class website:** <https://canvas.ucsd.edu>

**Class hours:** Thursdays, 3:30 - 4:50 PM, (US Pacific Time) via Zoom.  
(Zoom meeting link in the class website "Zoom LTI PRO" folder).

**Office hours: Tuesdays 4:00 - 5:00 PM (US Pacific Time),** online.  
(Zoom meeting link in the class website "Zoom LTI PRO" folder).

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

**Important dates:**

Must confirm at: <https://blink.ucsd.edu/instructors/courses/enrollment/calendars/2020.html>.

April 6: Professor and IA office hours start.

April 7: deadline to sign up to for week 3 presentation (first student led presentation) (4 students). Students interested in presenting should submit a request directly to the professor at [jprunedapaz@ucsd.edu](mailto:jprunedapaz@ucsd.edu) (students will be assigned on a first come first serve basis)

April 9: manuscripts for Week 4-10 presentations will be posted in the class website.

April 13 (8AM) – April 16 (4PM): deadline to sign up for Week 4-10 presentations (up to 4 students each group).

How do you do this?.

In the class website go to the "People" folder and select the "Presentation Groups" tab. Add yourself to one of the presentation groups (note that each group cannot have more than 4 students).

After April 16, students will be assigned to a presentation roster by the professor (in alphabetical order according to the last name).

April 15: first student group will present the assigned manuscript (#2).

For other important dates, see the Course Schedule below.

**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 (7<sup>th</sup> 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.

**COURSE STRUCTURE:**

**Classes:**

In the first 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 April 9 and must be read before class. A group of up to 4 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 slide 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 will be through Zoom (meeting link in the class website “Zoom LTI PRO” folder). The professor and students in the presentation group will co-host these sessions.

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](mailto:jprunedapaz@ucsd.edu)) and get professor's written approval.

**Attendance:** Attendance to class is required (tardy tolerance: 5 minutes for up to 2 classes).

**'In class' participation:** during synchronous classes, all students will have video disabled but

microphone enabled (if background noise is too distracting student microphones will be disabled by the host/s).

Your participation in class is very important and will be considered for your final grade. For that 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 paper 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](mailto:osd@ucsd.edu), or visit [osd.ucsd.edu](http://osd.ucsd.edu).

**COURSE GRADING:**

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

**1) presentation of the assigned manuscript (40%)**

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

**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:**

<b>Lecture day</b>	<b>Week</b>	<b>Manuscript #</b>	<b>Manuscript title, authors &amp; citation (PDF in TED)</b>	<b>Presenters</b>
4/2/20	1	N/A	<b>Introductory Lecture: Circadian clock overview</b>	J Pruneda-Paz
4/9/20	2	#1	<b>Resonating circadian clocks enhance fitness in cyanobacteria</b> Ouyang et al. PNAS 1998, 95:8660–8664.	J Pruneda-Paz
4/16/20	3	#2	<b>Positional Cloning of the Mouse Circadian Clock Gene</b> King et al. Cell 1997, 89:641–653.	Roster in Canvas
4/23/20	4	#3	<b>Feedback repression is required for mammalian circadian clock function</b> Sato et al. Nature genetics 2006, 38(3):312-319.	Roster in Canvas
4/30/20	5	#4	<b>Rhythmic Oxygen Levels Reset Circadian Clocks through HIF1a</b> Adamovich & Ladeux et al. Cell Metabolism 2017, 25, 93-101	Roster in Canvas
5/7/20	6	#5	<b>Sleeping sickness is a circadian disorder</b> Rijo-Ferreira et al. Nat. Communications 2018, 9(62): 1-13	Roster in Canvas
5/14/20	7	#6	<b>Disruption of the clock components CLOCK and BMAL1 leads to hypoinsulinaemia and diabetes</b> Marcheva et al. Nature 2010, 466:627-631	Roster in Canvas
5/21/20	8	#7	<b>Control of skin cancer by the circadian rhythm</b> Gaddameedhi et al. PNAS 2011, 108(46):18790-18795	Roster in Canvas
5/28/20	9	#8	<b>Optimized Dosing Schedule Based on Circadian Dynamics of Mouse Breast Cancer Stem Cells Improves the Antitumor Effects of Aldehyde Dehydrogenase Inhibitor</b> Matsunaga et al Cancer Res 2018, 78(13):3698-3708	Roster in Canvas
6/4/20	10	#9	<b>A large-scale study reveals 24-h operational rhythms in hospital treatment</b> Ruben et al. PNAS 2019, 116(42): 20953–20958	Roster in Canvas