BIMM194 – Circadian Rhythms: physiological and molecular aspects.
Spring 2019, 2 units

Professor: Jose Pruneda-Paz, Biology Building #3214.
E-mail: jprunedapaz@ucsd.edu (please use the subject line: 'BIMM194'). E-mails sent before 8 AM Mon-Fri will generally be answered on the same day. E-mails sent later than 8 AM will generally be answered the following (business) day.
Phone: 858-534-8323 (please identify yourself as a student in BIMM194).

Class website: In TritonEd: http://ted.ucsd.edu.

Class hours: Wednesday, 3:00 - 4:20 PM, in YORK 3010.

Office hours: Mondays 10:00 - 11:00 AM, Biology building room 3214, starting Apr 8.

Important dates:

April 8: deadline to sign up to for presentation #2 (first student leaded presentation) (4 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)

April 9: manuscripts for presentations #3-10 will be posted in 'TritonED' (http://ted.ucsd.edu).

April 12: deadline to drop class

April 15 (7AM) – April 17 (4PM): deadline to sign up for presentations #3-10 (up to 4 students each group). In TritonED (http://ted.ucsd.edu), go to 'groups' and sign up on one of the 8 presentation rosters.
After April 17, students will be assigned to a presentation roster by the professor (in alphabetical order according to last name).

April 17: first 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 (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.

COURSE STRUCTURE:

Lectures:
In the first lecture we will review the general principles of biological clocks. In subsequent lectures (9 in all) 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.**

I suggest the following template for the presentation:

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

Before your presentation you should use Office Hours to discuss manuscript and slide content with professor.

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 (either in person at the Biology Building #3214 or by e-mail at jprunedapaz@ucsd.edu) and get professor's written approval.

Quizzes:
There will be nine quizzes, one every week (except the first week) at the end of each paper presentation. They 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 any point about the missed presentation prior to taking the quiz).

Participation in class:
1) Attendance (tardy tolerance: 5 minutes for up to 2 classes)
2) Questions and discussion during presentations.

COURSE GRADING:

- presentation of the assigned manuscript (40%)

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

- quizzes (45%)

- 5% per quiz

- participation (15%)

- attendance (10%) (tolerance 5 minutes)
- participation in class (5%)

Letter grades will be assigned as follows:
90-100: A
80-90: B
70-80: C
60-70: D
Below 60: F

COURSE SCHEDULE:

Lecture day	*Manuscript #*	*Manuscript title, authors & citation (PDF in TED)*	*Presenters*
4/3/19	N/A	**Introductory Lecture: Circadian clock overview**	J Pruneda-Paz
4/10/19	#1	**Resonating circadian clocks enhance fitness in cyanobacteria** Ouyang et al. PNAS 1998, 95:8660–8664.	J Pruneda-Paz
4/17/19	#2	**Positional Cloning of the Mouse Circadian *Clock* Gene** King et al. Cell 1997, 89:641–653.	Roster in TED
4/24/19	#3	**Feedback repression is required for mammalian circadian clock function** Sato et al. Nature genetics 2006, 38(3):312-319.	Roster in TED
5/1/19	#4	**Rhythmic Oxygen Levels Reset Circadiasn Clocks through HIF1a** Adamovich & Ladeuix et al. Cell Metabolism 2017, 25, 93-101	Roster in TED
5/8/19	#5	**Disruption of the clock components CLOCK and BMAL1 leads to hypoinsulinaemia and diabetes** Marcheva et al. Nature 2010, 466:627-631.	Roster in TED
5/15/19	#6	**TBA**	Roster in TED
5/22/19	#7	**Control of skin cancer by the circadian rhythm** Gaddameedhi et al. PNAS 2011, 108(46):18790-18795.	Roster in TED
5/29/19	#8	**Administering xCT Inhibitors Based on Circadian Clock Improves Antitumor Effects** Okasaki et al Cancer Res 2017, 77(23):6603-6613	Roster in TED
6/5/19	#9	**Aligning work and circadian time in shift workers improves sleep and reduces circadian disruption.** Vetter et al. Curr Biol. 2015, 25(7):907-911.	Roster in TED