



**Department of Psychology**

**Psychology 631.03 – Neural Regulation of Sleep & Circadian Rhythms  
Winter Session 2006**

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<b>Instructor:</b>	<b>Michael Antle, PhD</b>	<b>Lecture Location:</b>	<b>ED154</b>
<b>Phone:</b>	220-2574	<b>Lecture Days/Time:</b>	M 14:00-16:45
<b>Email:</b>	<a href="mailto:antlem@ucalgary.ca">antlem@ucalgary.ca</a>		
<b>Office:</b>	Admin 018		
<b>Office Hours:</b>	By Appointment		

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**Course Description and Goals**

Our behaviour and physiology are organized with particular daily patterns called circadian rhythms. This course will examine research on the neural regulation of these rhythms. Topics covered will include the neural basics, resetting the circadian clock, neuroanatomy. Additionally, this course will examine the neural regulation of sleep and application of circadian rhythms research to human sleep disorder.

**Required Text**

Readings will be provided.

The following supplementary texts are recommended if students require more background. These texts are not specifically stocked at the bookstore, but can be purchased directly from the publisher, or through online vendors such as “amazon.ca” and “chapters.indego.ca”

Refinetti, R. (2006) *Circadian Physiology* 2<sup>nd</sup> Ed. Taylor Francis Group, CRC Press: New York, NY. (ISBN: 0849322332)

Dunlap JC, Loros JJ, DeCoursey PJ, Eds. (2004) *Chronobiology: Biological Timekeeping*. Sinauer Associates, Inc.: Sunderland, MA. (ISBN: 087893149X)

**Evaluation**

Weekly thought papers on readings (7 papers, 1-2 pages each)	20%	Due at the start of class each week (Jan 16 <sup>th</sup> – March 6 <sup>th</sup> )
Weekly presentations	10%	Jan 16 <sup>th</sup> – March 6 <sup>th</sup>
Term presentation	20%	March 13 <sup>th</sup> – April 10 <sup>th</sup>
Term paper	50%	Due April 10 <sup>th</sup> , 2006

Term papers are due at the start of the last class on the 10<sup>th</sup> of April. Late papers will be penalized 10% per day weekends inclusive.

The term paper should focus either on circadian rhythms or sleep, but besides this requirement, the topic is completely up to the student. Topics for the term paper must be approved by the instructor. Students will give a 1 hour presentation on their topic in class.

**Suggested term paper topics:**

The following list is not exhaustive, and is provided to aid students in selecting a topic of interest to them.

### Entrainment

- Feeding rhythms
- Social entrainment
- Exercise and circadian rhythms

### Physiology

- Peripheral oscillators
- Circadian inputs and outputs
- Circadian photoreceptors
- Anatomy of the SCN
- Aging and the circadian system
- Hormone and circadian rhythms
- Molecular biology of the circadian clock

### Other Species

- Drosophila
- Birds
- Photoperiodism and seasonality

### Human Aspects

- Shift work environments
- Jet lag treatments
- Sleep deprivation and accidents
- Circadian aspects of disease (e.g., cancer, heart disease)
- Human sleep disorders (narcolepsy / sleep phase insomnias / fatal familial insomnia)
- Evolutionary function of sleep
- Chronopharmacology
- Human performance / learning / cognition and circadian rhythms
- Circadian rhythms and depression

## **How to write a thought paper:**

1. Should be ideally 1 (and at the very most 2) pages in length.
2. Can cover both the research paper you read and the review paper, although you should focus on the research paper.
3. Present your thoughts on what you have read.
  - a. What did you find interesting?
  - b. What problems can you see with the experiment?
  - c. Are there any other interpretations?
  - d. What future experiments would you suggest?
4. Do not simply summarize the paper you read.

## **How to give a 10-15 minute presentation on the paper you read:**

Each week (from Weeks 2-8), every person will read a different research paper and will present this paper to the rest of the class. Powerpoint slides are already prepared for you, and include all the figures in the paper that you read. You need only give us the details of the paper that you've read.

We want to learn something from your presentation, therefore you need to be able to pull out the big points of the paper you read, and convey the content in a clear and efficient manner.

You should try and address the following points in your presentation:

1. What was the research question? (hypothesis)
2. Why was this question important? (rationale)
3. What did the scientists do to examine this question? (methods)
4. What did the scientists find? (results)
5. What do their findings mean? (discussion)

In your presentation, you should emphasize the last 2 points, but you'll need to briefly cover the first 3 points in order for the last 2 points to make sense.

Keep in mind that everyone has read the same review paper, which covers many of the overarching themes, so you won't need to spend a lot of time introducing the area.

Method sections are often written in such a way so that other scientists can replicate the experiment and confirm the findings presented. We do not need this level of detail. Simply summarize the big points (they injected a drug to an area of the brain, they recorded field activity of neurons, they exposed the animal to light, etc...).

### **Grading Scale**

A+	96-100%	B+	80-84%	C+	67-71%	D+	54-58%
A	90-95%	B	76-79%	C	63-66%	D	50-53%
A-	85-89%	B-	72-75%	C-	59-62%	F	0-49%

As stated in the University Calendar, it is at the instructor's discretion to round off either upward or downward to determine a final grade when the average of term work and final examinations is between two letter grades. To determine final letter grades, final percentage grades will be rounded up or down to the nearest whole percentage (i.e., 89.5% will be rounded up to 90%; 89.4% will be rounded down to 89%, etc.).

## Lecture Schedule

DATE	
Jan. 9	Rhythms Background Lecture
Jan. 16	Suprachiasmatic Nucleus as a Clock
Jan. 23	Photic entrainment – Behaviour and Physiology
Jan 30	Photic entrainment – Molecular Biology
Feb. 6	Photic entrainment – Pharmacology and Anatomy
Feb. 13	Non-Photic Entrainment
Feb. 27	Human Sleep Disorders / Narcolepsy
March 6	Jet Lag / Shift Work
March 13	Student Presentations
March 20	Student Presentations
March 27	Student Presentations
April 3	Student Presentations
April 10	Student Presentations

## University of Calgary Curriculum Objectives

This course addresses the following core competencies:

- Critical and creative thinking
- Analysis of problems
- Effective oral and written communication
- Gathering and organizing information
- Interpretive and assessment skills

With the following course characteristics:

- Considerable class discussion; students are prompted to think critically about course material
- All readings are published research articles
- Class discussions centering on methodological and conceptual issues in research studies
- Inquiry based approach to individual term projects

## Reappraisal of Grades

A student who feels that a piece of graded term work (term paper, essay, test, etc.) has been unfairly graded, may have the work re-graded as follows. The student shall discuss the work with the instructor within fifteen days of being notified about the mark or of the item's return to the class. If not satisfied, the student shall immediately take the matter to the Head of the department offering the course, who will arrange for a reassessment of the work within the next fifteen days. The reappraisal of term work may cause the grade to be raised, lowered, or to remain the same.

If the student is not satisfied with the decision and wishes to appeal, the student shall address a letter of appeal to the Dean of the faculty offering the course within fifteen days of the unfavourable decision. In the letter, the student must clearly and fully state the decision being appealed, the grounds for appeal, and the remedies being sought, along with any special circumstances that warrant an appeal of the reappraisal. The student should include as much written documentation as possible.

## Plagiarism and Other Academic Misconduct

Intellectual honesty is the cornerstone of the development and acquisition of knowledge and requires that the contribution of others be acknowledged. Consequently, plagiarism or cheating on any assignment is regarded as an extremely serious academic offense. Plagiarism involves submitting or presenting work in a course as if it were the student's own work done

expressly for that particular course when, in fact, it is not. Students should examine sections of the University Calendar that present a Statement of Intellectual honesty and definitions and penalties associated with Plagiarism/Cheating/Other Academic Misconduct.

### **Academic Accommodation**

*It is a student's responsibility to request academic accommodation.* If you are a student with a disability who may require academic accommodation and **have not** registered with the Disability Resource Centre, please contact their office at 220-8237. If you are seeking academic accommodation, please notify your instructor no later than fourteen (14) days after the commencement of the course. Note that the lecturer must approve any tape recordings of lectures.

### **Absence From A Test / Late Submission of Term Paper**

There are no exams in this course, however, a completed Physician/Counselor Statement will be required if a term paper is late due to health reasons. The student will be required to pay any cost associated with the Physician Counselor Statement.

### **Bonus Course Credits for Research Participation**

There will be no bonus course credits for research participation in this course

### **Student Organizations**

Psychology students may wish to join the Psychology Undergraduate Students' Association (PSYCHS). They are located in the Administration building, room 170 or may be contacted at 220-5567.

**Student Union VP Academic:** Phone: 220-3911 [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca)  
**Student Union Faculty Rep.:** Phone: 220-3913 [socialscirep@su.ucalgary.ca](mailto:socialscirep@su.ucalgary.ca)

### **Important Dates**

The last day to drop this course and **still receive a fee refund** is January 20, 2006. The last day to withdraw from this course is April 13, 2006.