PSYC 360:
The Psychology and Neurobiology of Sleep
Winter Term 2026

General Course Information

Course: PSYC-360
Course Title: The Psychology and Neurobiology of Sleep
Semester and Year: W 2026
Number of Credits: 3.00 Units
Learning Hours: 124.5 (18 Lecture, 26.5 Lab, 80 Private Study)
Modality: On Campus
Lectures:
Classroom Accessibility: Wheelchair Accessible

Land Acknowledgement

Queen's University is situated on the territory of the Haudenosaunee and Anishinaabek.

Ne Queen's University e'tho nón:we nikanónhsote tsi nón:we ne Haudenosaunee táhnon Anishinaabek tehatihsnonhsáhere ne onhwéntsya.

Gimaakwe Gchi-gkinoomaagegamig atemagad Naadowe miinwaa Anishinaabe aking

Course Description: The course will introduce students to: the physiology and neurobiology of sleep; methodology of sleep research; evolution and comparative aspects of sleep; discussion of potential functions of sleep; and an overview of sleep disorders. The course will also teach students to apply their knowledge of sleep mechanisms and sleep disorders in conceptualizations of real-world case histories of individuals with sleep problems.

Date	**Topic**
SECTON I:	INTRODUCTION TO SLEEP
Jan. 7	Course Introduction
Jan. 14	Sleep, Insomnia, and Insomnia Treatment
SECTION II:	THE NEUROBIOLOGICAL BASIS OF SLEEP
Jan. 21	The timing of sleep: Process S and Process C
Jan. 28	Neurobiology of waking and slow wave sleep

Feb. 4	The phenomenon of REM sleep I: Neurobiology
Feb. 11	The phenomenon of REM sleep II: Dreaming
Feb. 18	**READING WEEK**

SECTION III:	FUNCTION OF SLEEP
Feb. 25	Evolution and comparative aspects of sleep
Mar. 4	Sleep and learning/memory
Mar. 11	Sleep and synaptic plasticity

SECTION IV:	SLEEP LOSS AND SLEEP DISORDERS
Mar. 18	Sleep for health, emotion, and cognition I
Mar. 25	Sleep for health, emotion, and cognition II
Apr. 4	Concluding thoughts and Exam Review

Course Learning Outcomes:

After successful completion of PSYC 360, students should be able to

a) summarize the biological (neurobiological, physiological), psychological, and social characteristics and mechanisms of sleep in various species and be able to apply this knowledge to a clinical case in humans

b) summarize the evolution of sleep and critically discuss the potential functions of sleep

c) identify factors that affect sleep quality

d) apply methods to quantify sleep parameters and quality in humans

e) describe and discuss the nature of sleep disorders and apply this knowledge to conceptualize clinical presentations related to sleep, including considerations of their treatments and ethics**.**

Text: The required readings for the course consist of review articles and book chapters selected to complement the topics covered in the lectures. They are available on the Psyc 360 onQ web site with no associated material cost.

Assessments:

Lab projects:	45%
Lab Participation	5%
Open Book Sleep Case Conceptualization:	20%
Final exam:	30%

Assessment	Allignment with Course Learning Outcome	Weighting
Sleep Diary + Lab Report	Course Learning Outcomes: a), c), d)	20%
Overnight Sleep Lab + Hypnogram Assignment	Course Learning Outcomes: a), c), d)	10%
Sleep Myth Proposal and Presentation	Course Learning Outcomes: c), d)	15%
Open-Book Case Conceptualization	Course Learning Outcomes: a), c), e)	20%
Final Exam	Course Learning Outcomes: a), b), c), d), e)	30%
Lab Participation	Course Learning Outcomes: a), b), c), d), e).	5%

Laboratory Projects (45%):

1. Completion of sleep diary and written laboratory report: *"Factors influencing sleep quality in adults"* (20%).
2. Overnight sleep EEG recordings in the lab (attendance mandatory) and submission of a sleep hypnogram and one page report (10%).

3, *Sleep Myths: Are current and popular conceptions about sleep more fact or fiction?*

Independent research project to critically evaluate a common idea, hypothesis, or widely accepted notion regarding sleep. You and your partner will present the results of your research to your lab section (15%).

Details regarding the laboratories will be provided in the lab manual (see below) for each project. Note that attendance in all scheduled labs is mandatory and will contribute to the participation mark.

Lab Participation (5%):

Attendance will be taken at each lab section. If you are unable to attend a lab section, please email your TA and this will be taken into account for your mark.

Open Book Sleep Case Conceptualization (20%): Final Lab Section

Throughout the course and lab sections, we will practice case conceptualizations from case histories related to sleep. You will be presented with a case that discusses etiology, symptomology, and context of a specific client with a sleep disorder. The task will be to comment on the neurobiological, psycho-behavioural, and sociocultural factors that influence the case.

In your first lab section, you will see a detailed example of this, done from start to finish. In subsequent lab sections, you will collaboratively work through cases.

In your final lab section, you will be presented with a case describing a sleep disorder. You will then identify the relevant neuro-biological, psycho-behavioural, and sociocultural factors of the case and fit them into a case conceptualization model. You will be asked to form hypotheses (informed by course content) about how these factors interact within the context of the disorder (e.g., predispose, precipitate, perpetuate, and/or protect). After forming individual hypotheses (in point form), you will write a detailed paragraph which highlights the most important aspects of the case and describes how they interrelate to create the experience of the disorder described in the case study. Finally, you will briefly discuss treatment considerations.

This test will be open book. You will be allowed to use a laptop to search through your notes, but you will not be allowed to use the internet.

Final exam (30%): The final exam will be scheduled during the final exam period.

Queen's Policy Statement on Academic Integrity

Queen's University is dedicated to creating a scholarly community free to explore a range of ideas, to build and advance knowledge and to share the ideas and knowledge that emerge from a range of intellectual pursuits. Each core value of academic integrity, as defined in the Senate Academic Integrity Policy, gives rise to and supports the next.

Honesty appears in presenting one's own academic work, whether in the context of an examination, written assignment, laboratory or seminar presentation. It is in researching one's own work for course assignments, acknowledging dependence on the ideas or words of another and in distinguishing one's own ideas and thoughts from other sources. It is also present in faithfully reporting laboratory results even when they do not conform to an original hypothesis. Further, honesty is present in truthfully communicating in written and/or oral exchanges with instructors, peers and other individuals (e.g. teaching assistants, proctors, university staff and/or university administrators).

Trust exists in an environment in which one's own ideas can be expressed without fear of ridicule or fear that someone else will take credit for them.

Fairness appears in the proper and full acknowledgement of the contributions of collaborators in group projects and in the full participation of partners in collaborative projects.

Respect, in a general sense, is part of an intellectual community that recognizes the participatory nature of the learning process and honours and respects a wide range of opinions and ideas. However, "respect" appears in a very particular sense when students attend class, pay attention, contribute to discussion and submit papers on time; instructors "show respect by taking students' ideas seriously, by recognizing them as individuals, helping them develop their ideas, providing full and honest feedback on their work, and valuing their perspectives and their goals" ("The Fundamental Values of Academic Integrity", 3rd Edition, p. 8).

Ultimately, responsibility is both personal and collective and engages students, administrators, faculty and staff in creating and maintaining a learning environment supported by and supporting academic integrity.

Courage differs from the preceding values by being more a quality or capacity of character – "the capacity to act in accordance with one's values despite fear" ("The Fundamental Values of Academic Integrity", 3rd edition, p. 10). Courage is displayed by students who make choices and integrous decisions that are followed by action, even in the face of peer pressure to cheat, copy another's material, provide their own work to others to facilitate cheating, or otherwise represent themselves dishonestly. Students also display courage by acknowledging prior wrongdoing and taking proactive measures to rectify any associated negative impact.

All of these values are not merely abstract but are expressed in and reinforced by the University's policies and practices.

Use of Generative Artificial Intelligence (GenAI) Tools

Use of GenAI tools is not allowed in any part of student work for this course. Submitting AI-generated content constitutes a departure from academic integrity as defined by university Academic Integrity procedures.

Assignment Submission Late Policy

To build in flexibility and promote accessibility and inclusion for all students, this course has been designed with built-in grace periods where possible. All written submissions have a built-in three-day grace period. You can use this grace period without applying for formal academic accommodations. If you require more than this three day grace period, you can use the Academic Considerations Portal.

Accommodations for Disabilities

Queen's University is committed to working with students with disabilities to remove barriers to their academic goals. Queen's Student Accessibility Services (QSAS), students with disabilities, instructors, and faculty staff work together to provide and implement academic accommodations designed to allow students with disabilities equitable access to all course material (including in-class as well as exams). If you are a student currently experiencing barriers to your academics due to disability related reasons, and you would like to understand

whether academic accommodations could support the removal of those barriers, please visit the QSAS website to learn more about academic accommodations or start the registration process with QSAS by clicking Access Ventus button at Ventus | Accessibility Services | Queen's (queensu.ca)

VENTUS is an online portal that connects students, instructors, Queen's Student Accessibility Services, the Exam's Office and other support services in the process to request, assess, and implement academic accommodations.

To learn more go to: https://www.queensu.ca/ventus-support/students/visual-guide-ventus-students

You can also contact the psychology accommodations office directly at psyc.accom@queensu.ca

Academic Consideration for Students in Extenuating Circumstances

Academic Consideration is a process for the University community to provide a compassionate response to assist students experiencing unforeseen, short-term extenuating circumstances that may impact or impede a student's ability to complete their academics. This may include but is not limited to any extenuating circumstance (illness, bereavement, traumatic event, injury, family emergency, etc.) which is short-lived, begins within the term, and will not last longer than 12 weeks - see Academic Consideration webpage for details (https://www.queensu.ca/artsci/undergraduate/student-services/academic-consideration).

Each Faculty has developed a protocol to provide a consistent and equitable approach in dealing with requests for academic consideration for students facing extenuating circumstances. For more information, undergraduate students in the Faculty of Arts and Sciences should consult the Faculty's webpage on Academic Consideration in Extenuating Circumstances and submit a request via the Academic Consideration Request Portal. Students in other Faculties and Schools who are enrolled in this course should refer to the protocol for their home Faculty.

Students are encouraged to submit requests as soon as the need becomes apparent and to contact their instructor and/or course coordinator as soon as possible once academic consideration has been granted. Any delay in contact may limit the options available for academic consideration. While we encourage instructors to accommodate, each instructor has discretion in deciding whether or how to apply the Academic Consideration. For more information on the Academic Consideration process, what is and is not an extenuating circumstance, and to submit an Academic Consideration request, please see the Faculty of Arts and Science's Academic Consideration website. ASO courses include links to information on Academic Consideration on your Course Homepage in onQ.

Please see the Teaching Team page for contact information for your instructor and TA(s), where relevant. For more information, please see the Senate Policy on Academic Consideration for Students in Extenuating Circumstances.

Discussion Guidelines

University is a place to share, question and challenge ideas. Each student brings a different lived experience from which to draw upon. To help one another learn the most we can from this experience please consider the following guidelines.

1. Make a personal commitment to learn about, understand, and support your peers.
2. Assume the best of others and expect the best of them.
3. Acknowledge the impact of oppression on the lives of other people and make sure your writing is respectful and inclusive.
4. Recognize and value the experiences, abilities, and knowledge each person brings.
5. Pay close attention to what your peers write before you respond. Think through and re-read your writings before you post or send them to others.
6. It's ok to disagree with ideas, but do not make personal attacks.
7. Be open to being challenged or confronted on your ideas and to challenging others with the intent of facilitating growth. Do not demean or embarrass others.
8. Encourage others to develop and share their ideas.

Copyright of Course Materials

Grading Scheme and Grading Method

All components of this course will receive numerical percentage marks. The final grade you receive for the course will be derived by converting your numerical course average to a letter grade according to Queen's Official Grade Conversion Scale:

Queen's Official Grade Conversion Scale

Grade	Numerical Course Average (Range)
A+	90-100
A	85-89
A-	80-84
B+	77-79
B	73-76
B-	70-72
C+	67-69
C	63-66
C-	60-62
D+	57-59
D	53-56
D-	50-52
F	49 and below

PSYCHOLOGY 360:

The Psychology and Neuroscience of Sleep

LAB MANUAL

Winter Term 2026

Lab Attendance:

Attendance in all scheduled labs is mandatory and will contribute to the participation mark.

Schedule of Labs and Lab Assignments

Week 1 (January 8th)	No Lab
Week 2 (January 15th)	Lab Introduction: Handout and Discuss Sleep Diary + Case Conceptualization Demonstration
Week 3 (January 22nd)	Lab Session: Case Conceptualization Practice - Due date to submit sleep diary, Thursday January 22nd, 11:59pm
Week 4 (January 29th)	Lab Session: Hand out sleep diary data; discuss lab report - Due date to sign up for EEG overnight lab, Thursday, January 29th, 11:59pm.
Week 5 (February 5th)	Lab Session: The EEG: A Short Introduction - Due date for Sleep Myth Proposal, Thursday, February 5th, 11:59pm - Overnight EEG Lab Sessions Begin
Week 6 (February 12th)	Lab Session: Lab Report Writing Strategies - Overnight EEG Lab Sessions
Week 7 (February 19th)	Reading Week
Week 8 (February 26th)	Lab Session: Effective Presentation Techniques - Due date for lab reports, Thursday, February 26th 11:59pm
Week 9 (March 5th)	Sleep Myth #1 presentations during lab sessions
Week 10 (March 12th)	Sleep Myth #2 presentations during lab sessions

Week 11 (March 19th)	Sleep Myth #3 presentations during lab sessions
Week 12 (March 26th)	Sleep Myth #4 (make up session) and Exam Review
Week 13 (April 2nd)	Open-Book Case Conceptualization

Lab #1: Sleep Diary and Lab Report

Goal:

The first goal of this lab is to demonstrate the use of a common self-report technique (the sleep diary) to track sleep quality over a 7-day period, and to identify the influence of various life-style factor on sleep. The second goal is to summarize, analyze, and present the data collected in the sleep diaries in a written APA-style lab report.

Lab Report Writing: in Psychology 360

There are several approaches to organizing the content and style of reports of scientific data. The following are some suggestions that you may want to pay special attention to, seeing as they have been written by your TAs who will be marking your assignments.

Structural Requirements

The report **should not exceed 10 double-spaced typed pages in length**, but this page limit does not include the abstract, figures, tables, and references. All citations and references must be written in **APA format (7th edition)**. Please include a running head and short title along with the page number. Figures and tables, if required, should be located at the end of the paper after the references.

Content Organization

Your paper should include the following sections in the following order: Title Page, Abstract, Introduction, Method, Results, Discussion, References, Tables and Figures. Label the sections as such. Subheadings may be used in the Methods sections covering information such as Animals, Surgery, Testing Procedure, Statistics, or anything else you deem appropriate. Subheadings may also be used for the Results and Discussion sections, though much more sparingly. We encourage you to refer to the methods sections of published journals to determine what information should be included in your paper.

Style Suggestions

Be concise. Superfluous information will be frowned upon with **haughty derision**.

For your reading audience, assume a general knowledge of the brain, behaviour, cognition, and sleep, as well as the basic methodologies used to investigate them. Terms such as “standard procedures” are insufficient to describe your experimental methods, while excessive detail (e.g., repeating every question of the sleep diary) are too detailed for this report.

The Introduction should be constructed such that general issues and problems relating to the experiment lead into more specific ones, ending into the scientific questions that require attention. This should be followed by a clear statement of purpose for the present study. The introduction should end with experimental hypotheses addressing the questions raised in the preceding paragraphs.

When stating “facts” in the introduction, **always** reference your sources. You do not need to cite very general statement. If you are unsure about whether or not a citation is needed, it probably is (feel free to ask your TAs). Try to avoid quoting directly from a published source, but rather paraphrase the ideas and findings in your own words. Similarly, avoid verbatim extraction of anything in this booklet, such as descriptions of experimental methods.

The methods section should be an entirely fact-based description of the procedure you followed, the subjects and materials you used, and the analysis of the data you carried out. By convention, the methods are written in the **past tense.** Be sure to take notes of all procedure details in labs.

The results section is purely factual, consisting of the findings (and statistical significance) from every experimental procedure and/or analysis described in the methods. This section **should not** include any interpretations of the results. Illustration through figures can make the results more meaningful for the reader, and figures are almost invariably preferable to tables. At the end of the results section, the reader should be able to interpret your findings, without referencing your discussion section.

The discussion section is the section in which you demonstrate your understanding of the purpose for the study, the results obtained, how they relate to the hypotheses, and the possible implications your results have to other studies or to the field in general. This section will be scrutinised most heavily by your reader. Statements of interpretation of your results should always be worded tentatively (e.g., “These

results **suggest/imply** that sleep duration is decreased by…." **not** "These results **prove/claim/show…**."). Alternative explanations of the results and limitations of the study can also be provided in this section. You should also include future directions for research throughout the discussion, especially near the final paragraphs. The paper should conclude with a summary of your findings and a reiteration of your "take-home message".

All figures and tables should include brief captions describing their content. Figures should be simple and illustrate no more than one or a few major points. The figures and tables should be placed at the end of the report, after the references section.

Some Resources: **http://www.sleepfoundation.org/primary-links/how-sleep-worksMethods**
http://www.mayoclinic.org/sleep/art-20048379
http://www.nature.com/nature/journal/v498/n7455/pdf/498427a.pdf
http://news.discovery.com/human/health/could-we-get-by-without-sleep-130703.htm
http://news.discovery.com/human/health/sleep-loss-deprivation-health-effect-20130624.htm
http://sleep.stanford.edu **http://www.newscientist.com/article/dn24002-poor-sleep-makes-food-more-appealing.html**

You are also expected to find other, current articles or resources related to this topic.

Written Assignment Marking Scheme

Sleep Diary Handed in on Time **/5**

Abstract: **/5**

Is the abstract the correct length (maximal 250 words; 1 point)?

Does it summarize the basic methods, purpose, results, and conclusions (1 point each) effectively?

Introduction: **/15**

Is the background literature reviewed thoroughly (with *at least 10* different citations that are well utilized and integrated into the report) (10 points)?

Is there a good rationale for why you are doing the current experiment? (3 points)

Are the hypotheses and predictions clearly outlined? (2 points)

Methods: **/20**

Are the subjects (2 points), materials (2 points), and procedures (8 points) and data analyses (8 points) clearly and completely described?

Results: **/15**

Did you use an appropriate statistical test describe the statistics clearly? (5 points)

Are the results presented clearly, and do they follow logically from your figures? (10 points)

Discussion: **/20**

Did you link your findings with the current research and with your predictions?

Did you include interpretations of the results?

Did you suggest limitations of the current study and future directions?

Did you discuss the implications of the results? (5 points each)

References: **/5**

Are all references in the list in the text and vice versa?

Are all references and citations in APA (7th edition) format?

(-0.5 point for each unique error)

Figures and Tables:

/5 Are all figures clearly constructed and do they show the effects found in the study?

Are all figures and tables in APA (7th edition) format (including captions, titles, etc.)?

Handed in on time? **Yes/No**

APA (7th edition) Style:

/10

Title, running head, page #s, subtitles, citations.

Extra comments:

Total /100

Lab #2: Overnight Sleep-EEG Lab

Overview:

The goal of the lab is to demonstrate to students the procedures involved in a typical overnight polysomnography sleep experiment in real time. Groups of 5-6 students, together with one TA, will spent one night in the Sleep Laboratory at Queen's. One student will be the "sleeper", who will be connected to EEG, EOG, and EMG electrodes and is allowed to sleep in a private sleep room. The other students and the TA will be in an adjacent room, where they will monitor brain, eye, and muscle activity and score the sleep stages of the sleeper throughout the night (hint: bring a supply of treats and goodies to keep your energy levels up; coffee and tea will be provided in the lab).

At the end of the night, your TA will provide you with a summary of the sleep profile of the sleep. Every student is responsible to graph out and submit a hypnogram (can be computer-generated or hand-drawn) of the sleep profile to your TA. In addition, you are required to submit a one-page analysis of the hypnogram (12-point font, double spaced; the hypnograms themselves do not count towards the one-page limit, but need to be submitted together with the one-page report in the same document). The analysis should compare the overnight hypnogram to a "textbook" hypnogram that describes a typical night of normal, healthy sleep. The lecture notes and readings contain many examples of such a "standard hypnograms". You are responsible for finding one of these and using it as a standard to which you will compare the hypnogram that we will generate from the sleep experiment.

As a guide for your written analysis, use and answer the following questions:

1. Are there any clear differences/abnormalities between the standard healthy-sleep hypnogram and the one that we generated in the lab?
2. If yes, what are these differences?
3. How do these differences affect sleep quality? In other words, do they indicate improved or reduced sleep quality? Explain.
4. What might be one potential reason for why our overnight sleep differed from the standard healthy sleep hypnogram?

Please submit your hypnogram, the “standard” hypnogram, and the one-page written analysis as one Word document on onQ. The deadline for this submission is one week after the end of the overnight sleep session (for example: overnight sleep lab from Tuesday evening to Wednesday morning; the hypnogram is due on the following Wednesday by 23:59 hours).*

Assessment:

a) sign up for the sleep lab with your TA by the deadline indicated in the course schedule (see above)

b) attendance and active participation in the in the overnight sleep session (60% of this lab)

c) evaluation of the hypnogram and written analysis (40%)*

Lab #3: Sleep Myth Presentation

Goal:
The goal of this lab is to critically examine a common assumption or belief (“myth”) about sleep, factors that influence sleep, or the functions of sleep. The validity of the “myth” is critically assessed by identifying and presenting one or two empirical studies/research articles that test the hypothesis contained in the myth.

Background:
There are numerous ideas and believes about sleep and its functions. We are familiar with many of them (e.g., “warm milk makes you sleepy”; “a power-nap improves performance at the workplace”; “screen time before bed interferes with sleep”; "we only need 2-3 hours of sleep"). Identify one sleep myth that is of interest to you (use books, movies, news outlets, your friends, other sources) for ideas. Be creative and try to find something a bit unusual if you can!

The Sleep Myth and Relevant Research:
The background research and presentations are done in pairs of students. It is your responsibility to coordinate with your partner to agree on a topic/myth, conduct the background research, and prepare and deliver the presentation.

Formalize the myth that you will investigate in a brief statement (see examples above) and find at two (2) research articles that describe experiments to assess the hypothesis contained in the sleep myth. Submit the proposal of your sleep myth topic and citations to the article(s) to your TA by the stated deadline (posted in the Schedule above) ***see Policy on deadlines and late submissions**. Read the articles and familiarize yourself with the general background, specific methodology used in these studies, the results, and the implications and conclusions. Do the results of the study support or contradict the "sleep myth"? What conclusions can we draw from the study about the specific sleep myth, and perhaps sleep more generally?

The In-Class Presentation: Finally, you and your partner will present the myth and the studies you have reviewed to your lab section. A slideshow presentation (e.g., PowerPoint, Keynote) is expected; however other multimedia can be used as well (if you wish to use something else or additional media, please contact your TA at least one week prior to your presentation date). The presentation should provide a clear statement of the sleep myth and a brief introduction/background of the myth. Then present the relevant studies, with an emphasis on the methodology and results. Finally, present your conclusions drawn from the studies; does the experimental evidence support or contradict the sleep myth. Are there any important implications and recommendations that you can make? Do not just repeated what the authors' of your studies conclude and recommend; come up with some of your own ideas and conclusions!

The presentation/slide show should be no longer than 15 min.

Some things to consider for effective talks:

- longer is not always better: keep the talk short and concise
- more is not always better: cramming too much information into a talk will overwhelm and confuse your audience
- ask yourself: what information is important and necessary for my audience to understand the studies; leave out information that is not of primary importance

- how do I get my audience interested in my talk? how can I engage my audience?
- for slides, text is often less effective than graphs and images
- have fun with your talk; your audience will enjoy your talk a lot more if they feel that you enjoy giving it!

Attendance and Participation: Attendance during all presentation sessions is mandatory. Participate in the labs by asking questions, voicing your opinion, or providing ideas and insights into the various topics. Attendance and participation both contribute to the overall mark for this lab (see below) and enhance the learning experience by facilitating active discussions of course material.

Marking Breakdown:

Initial Proposal

- Proposal was complete and submitted in time /5

Presentation

Presentation Style /5

- Was the presenter easy to understand, clear and engaging?

Content /15

- Background review/review of myth
- Review of studies chosen
  (explain the rationale, methods, results)
- Discuss results and what they mean for your myth, critical evaluation (demonstrate your own understanding of the literature)

Use of Audio/Video Materials /5

- Were presentation materials used effectively and clearly?

Integration/Critical Analysis /5

- Was the student able to demonstrate knowledge, understanding, and critical thinking related to the research area and specific studies discussed?

Question/Answer /5

- Was the student able to answer questions?
  (demonstrate some knowledge and critical thinking)

LAB MARK /40