The Science of Sleep Course Syllabus

Department of Psychology & Neuroscience

PSYO/NESC 3264 Fall 2026

Dalhousie University operates in the unceded territories of the Mi'kmaw, Wolastoqey, and Peskotomuhkati Peoples. These sovereign nations hold inherent rights as the original peoples of these lands, and we each carry collective obligations under the Peace and Friendship Treaties. Section 35 of the Constitution Act, 1982, recognizes and affirms Aboriginal and Treaty rights in Canada.

We recognize that African Nova Scotians are a distinct people whose histories, legacies, and contributions have enriched the part of Mi'kma'ki known as Nova Scotia for over 400 years.

Course Instructor(s)

	Name	Email	Office Hours
Instructor	Dr. Elena Koning	elena.koning@dal.ca	By appointment
Teaching Assistant	Celia Glenham	celia.glenham@dal.ca	By appointment

Course Description

Sleep is a universal biological necessity and occupies roughly one third of human life, but its mechanisms, functions, and determinants remain active areas of scientific inquiry. In this online course, students will learn about the science of sleep, including: the history of sleep science, common methods used to measure sleep, regulatory mechanisms, how sleep changes across the human lifespan and across species, developmental and cultural determinants, the implications for human health, models of the functions of sleep, and the role of sleep in memory, among other topics. Students will read primary and secondary literature, engage in peer learning, as well as conduct, interpret, and communicate their own sleep science study to achieve the course learning objectives.

Course Prerequisites: PSYO 2000.03 or NESC 2000.03 and NESC 2470.03/PSYO 2470.03 or BIOL 2020.03.

Course Structure & Materials

Course Delivery: This course will be delivered in an online, synchronous manner. This course will be delivered primarily through the Brightspace online learning management system and Microsoft Teams. Students must monitor both Brightspace and their Dalhousie email accounts regularly. The final exam will require on-campus attendance. If students are connecting to any course resources from outside of Canada, they are responsible for ensuring awareness and

compliance with any applicable laws in the country from which they are connecting. Students must also be aware that not all software is available and functional in all countries, and that this may impede course progression. Students are solely responsible for ensuring they have ongoing access to required course resources.

Lectures: Online lectures will occur through Microsoft Teams on Mondays and Wednesdays from 2:35 to 3:55pm ADT/AST. Online lectures will include didactic and interactive components and provide an opportunity for students to ask broader questions about the course content and assignment requirements. Some lectures will include group-based active learning activities (see SOLAR assessment description below).

Textbook (optional but recommended): The optional textbook for this course is Rusak, B. (2025). The Science of Sleep, *Oxford University Press*, which can be purchased at the Dal Bookstore or directly via the Oxford University Press website: https://global.oup.com/academic/product/the-science-of-sleep-9781605352978?cc=ca&lang=en&

Minimum Technology Requirements: To participate in this course, students are required to have access to a laptop, microphone, camera, and reliable internet connection.

Learning Objectives

After completing this course, students should be able to:

1. Describe major milestones in the history of sleep science and their significance
2. Critically appraise and apply common sleep and circadian research methods, including measuring their own sleep and circadian patterns
3. Explain how homeostatic and circadian mechanisms interact to regulate the timing, duration, and architecture of sleep across the 24-hour cycle
4. Compare sleep patterns across the human lifespan and across species, and evaluate what this variation reveals about the biological, ecological, and evolutionary bases of sleep
5. Analyze how cultural, socioeconomic, and environmental factors impact sleep behaviour and contribute to sleep inequities in human populations
6. Explain the neural mechanisms that regulate sleep and wakefulness, including the roles of brainstem arousal systems, thalamocortical, and forebrain structures
7. Appraise the evidence linking sleep to human health outcomes and evaluate the methodological challenges involved in establishing causation in this literature
8. Evaluate competing hypotheses about the functions of sleep, using evidence from both behavioural and neurophysiological research
9. Communicate evidence-based findings clearly and accurately in accordance with the conventions of the sleep science literature
10. Demonstrate self-directed and social learning by managing time and peer engagement across the online course format

Course Content & Schedule

Week	Topic	Assessments & Activities
1 (Sept 8-11)	Sept 9: Introduction to Sleep Research	Syllabus Quiz
2 (Sept 14-18)	Sept 14 & 16: Methods for Sleep Research	SOLAR 1
3 (Sept 21-25)	Sept 21 & 23: History & Methods of Circadian Rhythms Research	SOLAR 2
4 (Sept 28-Oct 2)	Sept 28 & 30: Homeostatic & Circadian Regulation of Sleep	SOLAR 3
5 (Oct 5-9)	Oct 5: Sleep Across the Human Lifespan Oct 7: Sleep in Other Species	SOLAR 4 NAPS Proposal Due: Oct 5th
6 (Oct 12-16)	Oct 12: Thanksgiving (No Class) Oct 14: Cultural & Environmental Effects on Sleep	SOLAR 5
7 (Oct 19-23)	Oct 19: Midterm Exam Oct 21: Suprachiasmatic Nuclei, Pineal Gland & Melatonin	SOLAR 6 Midterm Exam: Oct 19th
8 (Oct 26-30)	Oct 26: Neural Regulation of Sleep & Waking Oct 28: Behavioural Effects of Inadequate Sleep	SOLAR 7
9 (Nov 2-6)	Nov 2: Sleep & Human Health A Nov 4: Sleep & Human Health B	SOLAR 8
(Nov 9-13)	*Fall Break (No Class)*	
10 (Nov 16-20)	Nov 16: Models of The Functions of Sleep Nov 18: Neuroplasticity and the Functions of Sleep	NAPS Presentation Due: Nov 16th SOLAR 9
11 (Nov 23-27)	Nov 23 & 27: The Effects of Sleep on Memory	SOLAR 10
12 (Nov 30-Dec 4)	Nov 30 & Dec 2: Putting It All Together	
Exam Period (Dec 11-20)	Final Exam (TBD)	

Course Assessments

Note: Students must complete the syllabus quiz in order to have access to the remainder of the course materials (unlimited attempts, score not included in final grade). Completing the syllabus quiz late may result in students missing deadlines for other course assignments; in this case, no make-ups will be provided.

Assessment	Weight (% of final grade)	Date
SOcial Learning Activity & Reflections (SOLAR; Best 8 of 10)	20% (8 x 2.5% each)	Weekly
Midterm Exam (Online)	20%	Oct 19th
N-of-1 Applied Personal Sleep Study (NAPS)	30% (10% proposal, 20% presentation)	Proposal: Oct 5th Presentation: Nov 16th
Final Exam (In-person)	30%	TBD

SOcial Learning Activity & Reflections (SOLAR)

- This is a structured peer learning activity and/or reflection conducted during scheduled lecture times. The objective is to reinforce key concepts through active, collaborative engagement with the course material and to build a shared learning community across the term
- Activities vary from week to week (e.g., case study analysis, journal club, think-pair-share, concept mapping, and other collaborative formats) and are design to test and apply that week's course content. As such, students are expected to complete assigned readings before SOLAR sessions in order to participate and receive full marks.
- Students will typically work in small groups to complete each activity, with some aspect of the group's work being documented/submitted (e.g., a group worksheet, shared document) in Brightspace so that participation can be assessed
- Submissions will be accepted up until 11:59pm on the day of the scheduled SOLAR
- Grading will be based on both participation/completeness (50%) and scientific accuracy/quality (50%)
- Ten SOLAR activities will be scheduled across the term; the best eight of ten scores will count toward the final grade. Due to the built-in drop policy, no make-ups will be provided for missed or incomplete SOLARs

Midterm Exam

- The midterm exam is completed online through Brightspace during the scheduled lecture timeslot (~90-minute window)
- The midterm exam is individual, open-book and assesses knowledge of the course content from weeks 1 to 6 (inclusive), including lecture material, readings, in-class discussion, and SOLAR activities

- The midterm exam includes a variety of questions, including multiple choice, multi-select, and short-answer questions that require students to apply, analyze, and evaluate course concepts

N-of-1 Applied Personal Sleep Study (NAPS)

- This assignment asks students to act as scientists and conduct a structured self-experiment on their own sleep or circadian rhythms. Students will select and administer validated sleep measures at two timepoints, choose and implement an evidence-based intervention, and communicate their findings as a recorded scientific presentation
- The assignment is assessed in two components: 1) a research proposal in which students will establish their scientific rationale, measures, and hypotheses; and 2) a recorded presentation in which students present their methods, results, and discussion (including proposed neurobiological mechanisms and critical limitations) in the format of a scientific talk
- Full instructions, recommended timeline, and the marking rubric will be made available on Brightspace

Final Exam

- The final exam is completed in-person during the scheduled exam period
- The exam is individual and includes a variety of questions to assess knowledge of the course content, including multiple choice, multi-select, and written response questions.
- The exam is designed to reward students who have engaged consistently with the course materials and is not designed to be completed by consulting the textbook alone
- Students should use their lecture notes, readings, and SOLARs throughout the term, as well as self-directed study, to prepare for the final exam

Conversion of numerical grades to final letter grades follows the Undergraduate Dalhousie Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (0-49)
A- (80-84)	B- (70-72)	C- (55-59)	

Course-Specific Policies

Extensions: There are no make-ups for missed SOLARs. If a student requires an extension on a component of the NAPS assignment, they must email the course instructor. These will be considered on a case-by-case basis. A missed exam or final assignment submission due to unusual circumstances must be communicated immediately by 1) submitting a Student Declaration of Absence (SDA) uploaded to the relevant folder in the "Assessments" tab on Brightspace and 2) emailing the course instructor; both actions must occur within 48 hours of the assessment due date. In no cases will extensions for any assignments or exam make-ups be allowed to extend past the end of course completion date. A grade of 'zero' will be applied for any assessment not completed, where no SDA was submitted and the student did not discuss lack of submission with the course instructor.

Artificial Intelligence (AI) Policy: AI tools (e.g., Claude, Copilot, ChatGPT) may be used as supportive tools in the learning process, but all submitted work must reflect the students' own critical thinking and analysis. Any AI assistance must be used transparently and responsibly. All AI use must be disclosed according to the Artificial Intelligence Disclosure (AID) Framework. The following provides specific guidance on appropriate and inappropriate AI use in this course:

- Appropriate uses of AI include:
  - Clarifying unfamiliar concepts or terminology from lectures and readings, though course materials and your instructor should be your first resource
  - Checking grammar, spelling, and sentence clarity in your own written work after you have drafted it
  - Generating a first outline or brainstorm that you then substantially revise, develop, and make your own
- Inappropriate uses of AI include:
  - Generating any part of your NAPS assignment without substantial original thought and rewriting; these sections are assessed on your ability to connect course content to your own data and scientific reasoning, which AI cannot do on your behalf
  - Using AI to interpret your Time 1 of Time 2 measurement scores or to generate your hypotheses; these must reflect your own scientific thinking
  - Using AI to produce your SOLAR posts or peer responses. The value of this activity depends entirely on authentic peer-to-peer exchange; AI-generated posts undermine both your own learning and your classmates' experience
  - Using AI to answer any quiz or exam questions during the quiz/exam window
  - Submitting any AI-generated text as your own without disclosure, regardless of how much it has been edited. This constitutes academic dishonesty under Dalhousie's Academic Integrity Policy
- Most importantly, the skills you will build in this course (i.e., reading primary literature, connecting mechanistic understanding to real observations, evaluating evidence) are important for future success in university, research, clinical, and other professional settings. Inappropriate use of AI jeopardizes the learning processes that the assessments in this course were designed to create, and it is you (the student) who will carry that gap forward.

Academic Integrity: Should there be a question of academic integrity with respect to completion of assessments or the inappropriate use of AI, students may receive a 'zero' grade on the assessment in question and/or be subject to Dalhousie academic integrity proceedings.

Course Accessibility: You are eligible for accommodations based on protected characteristics such as religion. If you have religious, cultural, or community-significant observances that conflict with course requirements, reach out to me to collaboratively find alternatives for completing the course requirements. To begin the process of requesting a formal academic accommodation, contact the Student Accessibility Centre

Syllabus Appendix

(Formerly University Policies and Statements)

Syllabus Appendix: Student Supports & University Statements, Policies, and Guidelines