

 FLORIDA ATLANTIC UNIVERSITY	NEW COURSE PROPOSAL Undergraduate Programs		UUPC Approval <u>3/27/23</u> UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner Posted _____ Catalog _____
	Department Psychology College Science (To obtain a course number, contact erudolph@fau.edu)		
Prefix PSB Number 4842	(L = Lab Course; C = Combined Lecture/Lab; add if appropriate) Lab Code	Type of Course <input type="text" value="Lecture"/>	Course Title Neuroscience of Sleep
Credits (See Definition of a Credit Hour) 3 Effective Date (TERM & YEAR) Summer 23	Grading (Select One Option) Regular <input checked="" type="radio"/> Sat/UnSat <input type="radio"/>	Course Description (Syllabus must be attached; see Template and Guidelines) This course introduces the field of sleep science. Topics addressed include the neurochemistry of sleep, circadian biology, normal sleep physiology, sleep across the lifespan, diagnostic sleep testing, sleep deprivation, sleep disorders, and dreams.	
Prerequisites, with minimum grade* PSB 3002 Biological Bases of Behavior, C-	Corequisites	Registration Controls (Major, College, Level)	
*Default minimum passing grade is D-. Prereqs., Coreqs. & Reg. Controls are enforced for all sections of course			
WAC/Gordon Rule Course <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to proposal. See WAC Guidelines .	Intellectual Foundations Program (General Education) Requirement (Select One Option) None General Education criteria must be indicated in the syllabus and approval attached to the proposal. See Intellectual Foundations Guidelines .		
Minimum qualifications to teach course Ph.D. in Psychology, or related field			
Faculty Contact/Email/Phone Lauren Mavica, lkogelsc@fau.edu; 6-3364	List/Attach comments from departments affected by new course		
Approved by Department Chair <u>Robin Vallacher</u> College Curriculum Chair <u>[Signature]</u> College Dean <u>[Signature]</u> UUPC Chair <u>Ethlyn Williams</u> Undergraduate Studies Dean <u>Dan Meeroff</u> UFS President _____ Provost _____		Date 02/16/23 <u>3-16-23</u> <u>3/27/23</u> <u>3/27/23</u>	

Email this form and syllabus to mianning@fau.edu seven business days before the UUPC meeting.

PSB 4842-001

Neuroscience of Sleep

M 2:00pm – 4:50pm

3 credits

Spring, 2023

Dr. Robert Vertes, Ph.D.

Office: BS 521

Office hours: TR 11-1:00pm

Classroom: TBA

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Course Description

This course introduces the field of sleep science. Topics addressed include the neurochemistry of sleep, circadian biology, normal sleep physiology, sleep across the lifespan, diagnostic sleep testing, sleep deprivation, sleep disorders and dreams.

The course will cover the basic mechanisms of sleep-wake control, circadian rhythms, sleep disorders, and the nature and function of sleep and dreams. The readings for the course will primarily consist of materials (journal articles and book chapters) on the topics of the course. These will be provided to the students.

The course will consist of a combination of lectures and discussions on the topics to be covered. Students will be expected to complete the assigned readings for each class period. The Professor will introduce and discuss each of the topic(s) of the course but will expect the students to join in the discussion of the topics.

Instructional Method

This course instructional method is Online Live Lecture. 100% of the course is delivered online, with synchronous meeting times. The course will meet live online at specified meeting days and times.

Prerequisites/Corequisites

PSY 3002 Biological Bases of Behavior

Course Objectives/Student Learning Outcomes

After successful completion of this course, students should be able to:

1. summarize the behavioral, physiological, neurobiological characteristics and mechanisms of sleep in various species
2. summarize the evolution of sleep and critically discuss the potential functions of sleep
3. identify factors that affect sleep quality
4. apply methods to quantify sleep parameters and quality in humans
5. describe and discuss the nature of sleep disorders and their treatments.

Course Evaluation Method

The students will be given three objective exams (mainly multiple choice questions) – at the times listed on the syllabus. The three exams will be equally weighted and will cover the material presented prior to each exam – i.e., they will not be cumulative exams.

Course Grading Scale

Grade	%
A	100 – 93.00
A-	92.99 – 90.00
B+	89.99 – 87.00
B	86.99 – 83.00
B-	82.99 – 80.00
C+	79.99 – 77.00
C	76.99 – 73.00
C-	72.99 – 70.00
D+	69.99 – 67.00
D	66.99 – 63.00
D-	62.99 – 60.00
F	< 59.00

Reasonable Accommodation Statement for Makeups

Reasonable accommodation will be made for students participating in a religious observance or in University-approved activities, including athletic or scholastics teams, musical and theatrical performances and debate activities.

Policy on Makeup Tests

You will be allowed to take a make-up exam, in-person, only for documented, University-sanctioned reasons and only if you have received approval. For foreseeable instances in which you will miss the exam period, you must provide acceptable documentation and get approval to make-up the exam prior to the absence. When an exam is missed due to an unforeseeable emergency, you must contact me and provide acceptable documentation no later than 24 hours from the time of the missed exam to get approval to take a make-up exam. You must take your exam within 7 days of your return after the absence.

Credit Hour Definition

This course involves 50 minutes of in class instruction for each credit hour per week, and a minimum of two hours of out of class assignments each week for 15 weeks. To master the

material covered in this course it is expected that you will spend a minimum of two hours per week per credit hour on the out of class assignments.

Policy on the Recording of Lectures

Because of a new Florida Statute in 2021, the following model language is suggested for inclusion in course syllabi, at the discretion of individual faculty:

Students enrolled in this course may record video or audio of class lectures for their own personal educational use. A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach students about a particular subject. Recording class activities other than class lectures, including but not limited to student presentations (whether individually or as part of a group), class discussion (except when incidental to and incorporated within a class lecture), labs, clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, and private conversations between students in the class or between a student and the lecturer, is prohibited. Recordings may not be used as a substitute for class participation or class attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of the University's Student Code of Conduct and/or the Code of Academic Integrity.

Attendance Policy

Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

Counseling and Psychological Services (CAPS) Center

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>

Disability Policy

In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at www.fau.edu/sas/.

Code of Academic Integrity

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see [University Regulation 4.001](#).

Mandatory Course Entry Quiz (MCEQ)

The MCEQ is the mechanism for you to provide confirmation of attendance. This is the final authorization needed to disburse federal aid, and without it we are unable to apply federal aid to the your account balance. Do not forget to complete the quiz.

Required Text

The Science of Sleep: What It Is, How It Works, and Why It Matters by Wallace B. Mendelson, University of Chicago Press, 2017.

In addition: Understanding Sleep and Dreaming, 2nd ed., by William H. Moorcroft, Springer, 2013. (copy provided).

Course Topical Outline

Dates and readings for the lectures (subject to modifications or additions as we proceed, but with advanced notice)

1-9 Organizational meeting and overview of the course

1-16 No class, school holiday

1-23 Basic mechanisms of sleep-wake control

Purves et al, Chapter 28, Cortical States (copy provided)

McCormick and Westbrook, Sleep and dreaming, chapter 51, in Principles of Neural Science, by Kandel et al. 5th ed. (copy provided)

Chapter 46 (The modulatory functions of the brain stem) in Principles of Neural Science,

by Kandel et al. 5th ed. (copy provided). The first part of this chapter for reference or reading. (copy provided).

Brown et al., Control of sleep and wakefulness, *Physiological Reviews*, 2012. (for reference only) (copy provided)

1-30 Basic mechanisms of sleep-wake control, continued

Arrigoni E and Fuller PM. The circuit, cellular, and synaptic basis of sleep-wake regulation. In: *Handbook of Sleep Research* (Ed, HC Dringenberg), Vol. 30, 2019. (copy provided).

Vertes RP. Brainstem control of the events of REM sleep. *Prog Neurobiol.* 22:241-288, 1984. (copy provided).

Datta S, Maclean RR Neurobiological mechanisms for the regulation of mammalian sleep-wake behavior: reinterpretation of historical evidence and inclusion of contemporary cellular and molecular evidence. *Neurosci Biobehav Rev.* 31:775-824, 2007. (for reference only) (copy provided).

2-6 Basic mechanisms of sleep-wake control, continued

Saper CB, Fuller PM. Wake-sleep circuitry: an overview. *Curr Opin Neurobiol.* 44:186-192, 2017. (copy provided).

Vertes, R.P. Hippocampal theta rhythm of REM sleep. In: *Rapid Eye Movement Sleep: Mechanism of Regulation and Dysregulation*, Mallick B.M., Pandi-Perumal S.R., McCarley R.W. and Morrison, A. (Eds), Cambridge University Press, Cambridge, UK, pp. 151-163, 2011. (copy provided)

Linley, S.B. and Vertes, R.P. Serotonergic systems in sleep and waking. In: *Handbook of Sleep Research*, Vol. 30, Dringenberg, H.C. (Ed.), Elsevier, New York, 2019, pp. 101-124. (copy provided)

2-13 **First exam**

2-20 Circadian rhythms and circadian modulation of sleep and phylogeny of sleep;

Sollars PJ, Pickard GE. The Neurobiology of Circadian Rhythms. *Psychiatr Clin North Am* 38: 645-665, 2015. (copy provided).

Lesku JA, Aulsebrook AE, Kelly ML, Tisdale RK. Evolution of sleep and adaptive sleepiness. In: *Handbook of Sleep Research*, Vol. 30, Dringenberg, H.C. (Ed.), Elsevier, New York, 2019. (copy provided)

- Lyamin OI, Siegel JM. Sleep in aquatic mammals. In: Handbook of Sleep Research, Vol. 30, Dringenberg, H.C. (Ed.), Elsevier, New York, 2019. (copy provided)
- 2-27 Disorders of sleep
- Schwartz MD, Kilduff TS. The Neurobiology of Sleep and Wakefulness, Psychiatr Clin North Am 38:615-644, 2015. (copy provided).
- Khoury J, Doghramji K. Primary Sleep Disorders. Psychiatr Clin North Am 38: 683-704, 2015. (copy provided)
- 3-6 Spring break
- 3-13 **Second exam**
- 3-20 Function of sleep and dreams
- Feld GB, Born J. Sculpting memory during sleep: concurrent consolidation and forgetting. Curr Opin Neurobiol. 44:20-27, 2017. (copy provided).
- Boyce R, Williams S, Adamantidis A. REM sleep and memory. (copy provided).
- Sara SJ. Sleep to remember. J Neurosci. 37:457-463, 2017. (copy provided).
- Poe GR. Sleep is for forgetting. J Neurosci. 37:464-473, 2017. (copy provided).
- 3-27 Function of sleep and dreams, continued
- Vertes, A life sustaining function for REM sleep: A theory. Neurosci. Biobehav. Rev. 10:371-376, 1986. (copy provided).
- Siegel, The REM sleep-memory consolidation hypothesis. Science 294:1058-63, 2001. (copy provided).
- Vertes RP Memory consolidation in sleep: Dream or reality, Neuron 44:135-148, 2004. (copy provided).
- Vertes RP, Linley SB. No cognitive processing in the unconscious, anesthetic-like, state of sleep. J. Comp. Neurol. 529:524-538, 2021. (copy provided)
- 4-3 Function of sleep and dreams, continued
- Dringenberg HC. Sleep and memory consolidation: conceptual and methodological challenges. In: Handbook of Sleep Research, Vol. 30, Dringenberg, H.C. (Ed.), Elsevier, New York, 2019. (copy provided)
- Siegel, Sleep in animals: a state of adaptive inactivity. In: Principles and Practice of Sleep

Medicine, 6th ed., pp. 103-114, 2017. (copy provided).

Hobson JA, Friston KJ. Waking and dreaming consciousness: neurobiological and functional considerations. Prog Neurobiol. 98:82-98, 2012. (copy provided)

4-10 Discussion of articles – to be decided

4-17 Discussion of articles – to be decided

4-24 Discussion of articles – to be decided

5-1 **Final exam**

***Note: I reserve the right to make changes to the syllabus schedule due to a variety of circumstances (e.g., unforeseen absences).**