Course Change Request

New Course Proposal

Date Submitted: 09/09/21 4:44 pm

Viewing: NEUR 424 : Sleep and Circadian Rhythms

Last edit: 09/09/21 4:44 pm

Changes proposed by: gscott21

In Workflow

1. **NEUR Chair**
2. **SC Curriculum Committee**
3. SC Associate Dean
4. Assoc Provost-Undergraduate
5. Registrar-Courses
6. Banner

Approval Path

1. 09/14/21 9:17 am Saleet Jafri (sjafri): Approved for NEUR Chair

Are you completing this form on someone else's behalf?

Yes

Requestor:

Name	Extension	Email
Lauren Guerriero	3-5901	lguerrie@gmu.edu

Effective Term: Spring 2022

Subject Code: NEUR - Neuroscience

Course Number: 424

Bundled Courses:

Is this course replacing another course? No

Equivalent Courses:

Catalog Title: Sleep and Circadian Rhythms

Banner Title: Sleep and Circadian Rhythms

Will section titles vary by semester? No

Credits: 3

Schedule Type: Lecture

Hours of Lecture or Seminar per week: 3

Repeatable: May be only taken once for credit, limited to 3 attempts (N3)

Max Allowable Credits: 3

Default Grade Mode: Undergraduate Regular

Recommended Prerequisite(s):
NEUR 335

Recommended Corequisite(s):

Required Prerequisite(s) / Corequisite(s) (Updates only):
BIOL 213, PSYC 376

Registrar's Office Use Only - Required Prerequisite(s)/Corequisite(s):

And/Or	(	Course/Test Code	Min Grade/Score	Academic Level	)	Concurrency?

Registration Restrictions (Updates only):

Registrar's Office Use Only - Registration Restrictions:

Field(s) of Study:

Class(es):

Level(s):

Degree(s):

School(s):

Catalog Description:
This course introduces the fields of circadian rhythms with emphasis on sleep including the underlying molecular and genetic machinery, neuroanatomy, and neurophysiology. The impact of sleep and lack thereof will be explored on diseases and modern society. Considerable time will be spent reading and analyzing the primary literature in human and animal models.

Justification:

Our bodies run on a 24-hour clock controlling our sleep/wake, vigilance, metabolism, and much more. These circadian rhythms are critical for our survival as a human species as well as the proper functioning in our bodies. This elective course will cover the field of circadian rhythms and sleep, which is a growing field that incorporates neuroscience and psychology to understand how our rhythms work and what happens when they are disrupted. Every student knows the impact of a poor nights' sleep and will draw on their own experiences to help understand the underlying neuroscience behind these processes. We are creating this course as an elective for Neuroscience majors, but also Psychology students, and it will be taught regularly by Ren Guerriero. This course is of great interest to students in neuroscience and pre-health care.

Does this course cover material which crosses into another department? No

Learning Outcomes:

(1) display knowledge of the systems underlying sleep and circadian biology
(2) identify and explain the causes and consequences of insufficient sleep and
(3) recognize the importance of sleep hygiene for health and optimal performance.

Attach Syllabus

461 Syllabus - Fall 2021, blank Code of Conduct.pdf

Additional Attachments

Staffing:

(1) faculty member: Lauren Guerriero (lguerrie@gmu.edu)

Relationship to Existing Programs:

May be an elective for PSYC, BIOL.

IPN will offer a crosslisted grad section for MS and PHD students as well.

Relationship to Existing Courses:

N/A

Additional Comments:

Reviewer Comments

Key: 17297

NEUR 424 – Sleep and Circadian Rhythms Fall 2021

Instructor: Dr. L. Ren Guerriero (they/them)
Their email: lguerrie@gmu.edu
Their phone #: 703-993-5901
Meeting times: Fridays 10:30 am – 1:10 pm
Meeting location: Krasnow Building 229
Office Hours: Monday 10:00-11:00 am
Office Location: Krasnow 253 and Zoom

What is this class?

This course introduces the fields of circadian rhythms with emphasis on sleep including the underlying molecular and genetic machinery, neuroanatomy, and neurophysiology. The impact of sleep and lack thereof will be explored on diseases and modern society. Considerable time will be spent reading and analyzing the primary literature in human and animal models.

What will I get out of this class?

Learning Outcomes:

(1) display knowledge of the systems underlying sleep and circadian biology
(2) identify and explain the causes and consequences of insufficient sleep and
(3) recognize the importance of sleep hygiene for health and optimal performance.

How do I do well in this class?

This class relies heavily on discussion and readings. To do well you need to do your readings before coming to class and be ready to discuss. I recommend taking notes when reading and coming prepared for discussion. Also, communication is key to doing well in this course. You will be graded on your written and oral communication, but communication is necessary when you are confused in class. To make sure we all know how to act in class, our first day we will write and vote on a code of conduct, which will them be added to the syllabus. This will include both instructor and student responsibilities. It is then our job to uphold ourselves and other to the code of conduct.

What are our responsibilities? (Code of Conduct)

These will be written and voted on in our first class meeting
Student responsibilities:
Instructor responsibilities:

- COVID Policies: All students, instructors, and TAs are required to follow the university's public health and safety precautions and procedures outlined on the university Safe Return to Campus webpage (https://www2.gmu.edu/safe-return-campus). Similarly, all students, instructors, and TAs in face-to-face and hybrid courses must also complete the Mason COVID Health Check daily, seven days a week. The COVID Health Check system uses a color code system and students will receive either a Green, Yellow, or Red email response. Only students, instructors, and TAs who receive a "green" notification are

permitted to attend courses with a face-to-face component. If you suspect that you are sick or have been directed to self-isolate, please quarantine or get testing. Faculty are allowed to ask you to show them that you have received a Green email and are thereby permitted to be in class.

- All class members are required to follow Mason's current policy about facemask-wearing. As of August 11, 2021, all community members are required to wear a facemask in all indoor settings, including classrooms. An appropriate facemask must cover your nose and mouth at all times in our classroom.

How will I be graded in this class?

Grading Scale:

A+	97-100%	B+	87-89%	C+	77-79%	D 60-69%	F 0-59%
A	90-96%	B	80-86%	C	70-76%		

Exams (2, 50 points) – You will have one midterm and a non-cumulative final exam in this course.

Sleep assessment paper: You will be writing a research-style paper over an intervention on your own sleep patterns. This will be broken into a few sections to keep you on track throughout the semester. This intervention can be a number of things lasting a very short time or a much longer intervention. You will track how this intervention impacts your sleep quality and/or quantity or your waking quantity/quality or both. The type of intervention must be justified in your paper with a review of the literature (the annotated bibliography below will be helpful on this). The intervention could be as simple as a new behavioral technique to improve your sleep or waking state across a school week or weekend. Could be diet or drinking changes, etc. Charts, graphs, tables, or other form of visual aids are expected along with the APA style report. Quantitative data analyses are strongly encouraged (let me know if you need help with statistics).

- Sleep journals (10, 10 points each) – Each week you will submit a standardized journal including your sleep times and wake times. You can do this manually using the provided sleep journal (on Blackboard) or using a Fitbit / other app that tracks sleep/wake. Additions to the standardized journal can be made to meet your research question. Tracking your sleep daily will take some discipline, but once it becomes a habit it will be an easy part of your daily routine. Each journal entry will be included in your final research paper as supplemental data.
- Topic approval (15 points) – Write a short paragraph (no more than 300 words) describing your rational, methods, and expected results for you sleep experiment. Upon approval of your topic by Dr. G you can proceed with your project. If you want to start the project earlier, topics can be turned in early.
- Annotated bibliography (50 points)– The annotated bibliography will include 10 primary research articles that you found to support your choice in sleep intervention. For each primary article, write a short paragraph describing the purpose of the research, methods used, main findings, limitations, and why or why not you will use this for your intervention.
- Draft of paper (+5 points to your final research paper or final exam, whichever is lower)– If you so choose, you can turn in a draft of your paper for revision by Dr. G.

- Final research paper (80 points)– The final research paper will describe the project you completed throughout the semester with you as the subject. It will be 10 pages in APA style. This will include an introduction, methods, results (include statistical analysis), discussion, and references. A full rubric and description is posted on Blackboard.

News in sleep presentations (30 points) – Every week, we will have one student present a 10-minute talk about a recent breakthrough in the sleep field. This will be based off a primary literature article that was written in 2015 or more recent. Using visual aids such as slides is recommended, but not required. Weeks of assignments will be determined during the first day of class. The week before you must send your journal article to the entire class (email to Dr. G and they can distribute) for discussion.

Participation and Assignments (6 points/day) – Attending class is an essential component of the learning process for the majority of students. The instructor will be monitoring your attendance and participation in the class. In order to receive credit for a discussion session, you must make a meaningful contribution to the discussion. You must talk and your question or comment must represent that you have read the article being discussed. If you do not talk or are absent, you will not receive credit for the day.

I missed class or an assignment, what do I do?

Life is unpredictable and illness (both physical and mental) should be taken seriously. If you know you will not be in class, email Dr. Guerriero. Holidays, illnesses, and university sanctioned events likely count as an excused absence, but only if you notify Dr. Guerriero either before the event or as soon as you decide you're too ill to come to class. Next, if you miss class, look at Blackboard for the information covered in class. If the article doesn't make sense to you, email Dr. Guerriero. If the slides are confusing, email Dr. Guerriero.

Missed Assignments

- "Life Happens Pass" – For one written assignment this semester you can get an automatic 48-hour extension on the due date, no questions asked. You must inform Dr. Guerriero in writing (email) to get this pass.
- All other missed assignments will get a 10% deduction per day of being late. It is to your benefit to turn in assignments late. Most of the points are better than no points!

I'm struggling in this class. How do I get help?

I don't understand the class material, assignments, my grades – email Dr. Guerriero. When emailing us, you have to use your gmu.edu email account or we cannot verify that the email came directly from you.

I'm stressed, anxious, angry, or mentally unwell – Counseling and Psychological Services have drop-in hours or virtual services, including a text line, online chat, and video chats. If its outside business hours, they have an after-hours crisis counselor (call 703-993-2380 and selection option 1).

I need help with time management, note taking, or other study skills – Talk to Dr. Guerriero or reach out to Learning Services for a personalized appointment and online tools.

I'm struggling with social issues that impact my identity, my culture, or me personally – College and higher education is inherently exclusionary, racist, sexist, and classist, and I'm committed to helping change that. Mason is also committed to this, with lots of resources:

Center for Culture, Equity, and Empowerment (includes bias incident reporting form)
First-Gen+ Center (resources for first-generation, undocumented, refugee, and limited income students)
LGBTQ+ Resources Center (including crisis, community, and gender transition resources)
Student Support and Advocacy Center (resources for financial help, sexual and interpersonal violence support, and drug/eating disorder recovery)

I need class accommodations for a disability, illness, or other reason – First talk to Disability Services office. They will meet with you virtually and help you with your individual needs. We can only activate your accommodations after you talk with Disability Services. Then talk to Dr. Guerriero about this class; they are happy to help you with what you need.

Tentative Schedule – Fall 2021

Subject to change (check Blackboard for the most recent version)

Date	What we are discussing	How to prepare for class	When is homework due?
August 27	- Syllabus - What do you know about sleep already?		- Pre-Class Survey due Sept 2 at 11:59 pm
September 3	- Diversity of sleep - Measuring sleep in humans: PSQI, ESS, Sleep journals	- Read: Hobson, 2005 Sleep is by the brain for the brain - Read: Seigel, 2008 Do all animals sleep? - Review: Sleep journal 1 on Blackboard	- Sleep journals start: Sleep journal 1 due Sept 10 at 11:59 pm
September 10	- Intro to circadian rhythms: Phase, phase shifts, zeitgeber, - Molecular basis of circadian rhythms	- Read: Vitaterna *et al.,* 1994 Mutagenesis and mapping of a mouse gene, *Clock,* Essential for Circadian Behavior	- Sleep journal 2 due Sept 16 at 11:59 pm - Topic approval for Sleep assessment paper: due Sept 16 at 11:59 pm
September 17	- Neurological and hormonal control of sleep and circadian rhythms	- Read: Buxton *et al.,* 2003, Exercise elicits phase shifts and acute alterations of melatonin that vary with circadian phase - Skim: Ko and Takahashi, 2006, Molecular component of the mammalian circadian clock	- Sleep journal 3 due Sept 23 at 11:59 pm
September 24	- Neurological and hormonal control of sleep and circadian rhythms	- Read: Maret *et al.,* 2007, Homer1a is a core brain molecular correlate of sleep loss	- Annotated bibliography due Oct 29 at 11:59 pm - Sleep journal 4 due Sept 30 at 11:59 pm
October 1	- Sleep across the lifespan - Development and aging	- Read: Aurora *et al.,* 2016, Habitual sleep duration and all-cause mortality in a general community sample	- Find an app marketed to improve your sleep and be ready to discuss on Oct 8 - Sleep journal 5 due Oct

			7 at 11:59 pm
October 8	- Sleep technology: EEG, PSG, actigraphy - Exam review	- Read: Yetish *et al*., Natural sleep and its seasonal variations in pre-industrial societies	- Sleep journal 6 due Oct 14 at 11:59 pm
October 15	Exam 1	- Come to office hours if you have questions	- Sleep journal 7 due Oct 21 at 11:59 pm
October 22	- Why do we sleep? - Glymphatic system	- Read: Xie *et al.,* 2013, Sleep drives metabolite clearance from the brain	- Sleep journal 8 due Oct 28 at 11:59 pm
October 29	- Dreaming - Sleep rocking	- Read: Kompotis *et al.,* 2019 Rocking in Mice	- Sleep journal 9 due Nov 4 at 11:59 pm
November 5	- Sleep disorders	- Read: Joiner, The Neurobiological Basis of Sleep and Sleep Disorders	- Sleep journal 10 due Nov 11 at 11:59 pm
November 12	- Health outcomes of disrupted rhythms	- Read: Hahn *et al*., 2014, A change in sleep pattern may predict Alzheimer Disease	- Optional: Draft of sleep assessment paper for feedback due Nov 18 at 11:59 pm
November 19	- Racial disparities in sleep	- Read: Letzen *et al.,* 2021 Racial disparities in sleep-related cardiac function in young, healthy adults: implications for cardiovascular-related health	- Post-class survey due Dec 2 at 11:59 pm
November 26	Nothing. Get some rest (Thanksgiving Recess)		
December 3	- Unknowns of sleep - Future directions		- Sleep assessment paper due Dec 2 at 11:59 pm
December 10	Exam Week		Final exam