

# Biological Clocks in Neural Health and Disease

## Course Handbook

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**COURSE NUMBER** GMS6712

**CREDIT HOURS** 3 credit hours

### **COURSE DESCRIPTION**

Biological Clocks in Neural Health and Disease (GMS6712) covers general concepts in the field of circadian biology, the molecular nature of the circadian clocks, the locations of these clocks in the body, and how these clocks control physiology and brain function. We will also explore current research findings on the roles that circadian clocks play in sleep, psychiatric, and neurodegenerative disorders and how the benefits of therapeutic treatments for many disorders may be maximized if their delivery is synchronized to the patient's circadian clocks.

## **COURSE FORMAT**

This is a 3-credit, online course. It is divided into 8 modules, each of which you will complete in 1-3 weeks. Each module is broken down into 1-4 subunits to improve your ability to master the information covered in each module. Each unit contains a video lecture in VoiceThread format and assigned readings from the primary literature. The VoiceThread lectures are ~10-15 min in duration and can easily be viewed one slide at a time. In some cases, additional short videos explaining key concepts have been included in specific units. Each unit is accompanied by a self-check quiz that will allow you to assess your understanding of the material presented in the unit.

The eight modules have been designed to be completed in the order that they are presented. Each module will be considered complete when you have completed all assignments associated with the module. In addition to the self-check quizzes, modules include either Module Tests or Essay Assignments. Module 8, the final module consists of a circadian project that will allow students to focus on a specific interest they have in the field of biological clocks. Detailed instructions for completing the various types of assignments in this course are associated with the first occurrence of the assignment type in the course.

## **TARGET AUDIENCE**

The target audience for this online course is post-baccalaureate students, graduate students, and working professionals who are interested in improving their understanding of how biological clocks impact normal and diseased brain function. Post-baccalaureate students include students enrolled in UF graduate certificate programs, UF MSc programs, and UF PhD programs. Interested advanced undergraduate students are encouraged to inquire about registration.

## **PREREQUISITES**

Completion of GMS 6007 or consent of instructor. Designed for graduate students in MSc or PhD programs and Biomedical Graduate Certificate students.

## **COURSE DIRECTOR AND INSTRUCTOR**

Sue Semple-Rowland, PhD. Professor of Neuroscience and Director of the Biomedical Neuroscience Certificate Program

Email – [rowland@ufl.edu](mailto:rowland@ufl.edu) (see directions below in the section How to email your instructor)

Office phone: 352-273-5095

Office hours: Students can request and schedule online Zoom meetings



## COURSE GOALS / LEARNING OBJECTIVES

Biological clocks affect all aspects of our lives and disruptions of their function can manifest in many ways, all of which compromise health. The significance of the circadian system is only now garnering the attention of research scientists and health care providers. At the end of this course you will be able to discuss and answer the following questions:

- What are the defining characteristics of circadian rhythms?
- What is our current understanding of the underlying molecular mechanisms that drive circadian oscillators?
- What is the role of the circadian clock in regulating sleep behavior?
- What is the relationship between the circadian clock and affective and degenerative disorders?
- Explain chronotherapeutics and whether this approach should be a central feature of future efforts to develop therapies for neural diseases.
- Explain how circadian biology affects the research you are carrying out or the research in your chosen research field.

## COURSE SCHEDULE AND TOPICS

This is a 14-week course is offered during the Fall and Spring terms. The course is divided into 8 modules that will be completed every 1-3 weeks depending on the content of the module. The following table shows the module topics that we will cover in this course and the number of weeks that will be spent on each module.

Week(s)	Topics
1	Mod 1 - Course Introduction
2	Mod 2 - Biological Rhythms
3-4	Mod 3 - Circadian Clocks
5-6	Mod 4 - Circadian Clocks and Sleep
7-8	Mod 5 - Circadian Clocks and Affective Disorders
9-10	Mod 6 - Circadian Clocks and Neurodegenerative Diseases
11-12	Mod 7 - Circadian Clocks and Chronotherapeutics
13-15	Mod 8 - Circadian Project

All lectures are given by the Course Director, Dr. Sue Semple-Rowland.

## COURSE ASSIGNMENTS

Modules consist of assigned readings that come from the primary research literature, Voice Thread lectures, and self-check quizzes. Each module concludes with a final assignment that consists of either two module tests (fact and essay), a Beyond-the-Basics discussion, or a short essay. During the final three weeks of the course students will complete a circadian project. This 3-week period includes Thanksgiving break.



Students should carefully examine the auto-generated Canvas course syllabus that lists the specific assignments associated with each module and the dates/times that these assignments are due. **It is important to make a note of due dates for the various quizzes, tests, and assignments since they vary across modules.**

Assignment type	Weighted % Final Grade
Self-check quizzes (12)	10%
Module Tests (4)	30%
Beyond the Basics Assignment (1)	10%
Short Essay (3)	30%
Final Student Project (1)	20%

## ASSIGNMENT DETAILS

### SELF-CHECK QUIZZES

**All modules include self-check quizzes. You will take each self-check quiz using LockDown browser.** The quizzes are designed to expose you to the types of questions that will appear on module tests and to help you identify the materials that you may not understand. The self-check quizzes consist of T/F, multiple choice, matching, fill-in-the-blank, and multiple answer questions. These quizzes are timed. The time allotted for each quiz is indicated in the quiz instructions and starts when you start the exam. *If you begin a 10 min quiz 5 minutes before it is due, you will have only 5 min to complete the quiz because it will automatically submit and close when it is due.* In order to receive credit for the self-check quizzes, you must complete them before the deadlines. You will not be able to take them after the deadline passes unless you have made arrangements with the instructor to extend your deadline.

When you submit your quiz, **you will be immediately given ONE opportunity to see your quiz score and the questions you answered incorrectly. Correct answers will not be provided.** In some cases, I have included an explanation of the question that you will see if you answered the question incorrectly. It is important that you take time to go through your graded quiz after you submit it since you will not be able to view your graded quiz. When you check your quiz, if you believe that you did not receive credit for a question that you think you answered correctly, please post the question # you are concerned about in the assignment comments bar on the right side of the quiz. Include in your comments an explanation of why you think you should receive credit for your answer. I will then evaluate your quiz and adjust your score if appropriate.

I review all of the submitted quizzes within 24 hours of the due date and give credit for answers that were marked incorrect because of misspelling.



## MODULE TESTS

**Modules 2 and 3 conclude with module tests that will be taken using LockDown browser.** The Module tests consist of two separately timed parts: the Module test and the Module Essay test. The Module tests consist of T/F, multiple choice, matching, fill-in-the-blank, and multiple answer questions. The Module Essay tests consist of short essay questions.

Both of these tests will be timed and the questions will be randomized. Importantly, the time limit for completing the exam starts when you start the exam. *If you begin a 40 min exam 20 minutes before it is due (e.g. 11:59 pm), you will have only 20 min to complete the exam because Lockdown browser will automatically submit your exam when it is due.*

You will receive your score for the **module test** when you submit it but you will not be able to view the graded questions until I release the test results to the class. You will not receive a score for the **module essay test** until I grade them. I will post the corrected test results within 24 hours of the due date/time. You will then be given 24 hours to view each test and you will be able to see correct/incorrect answers and the comments I post on your tests.

**I strongly recommend that you take the ALL online quizzes and tests well before the time they are due which is 11:59 pm. The speed of the internet can significantly decrease between 10 pm and midnight. Thus, to avoid time delays during testing, you should try to complete exams during non-peak hours and of course avoid using Wifi connections.**

## BEYOND THE BASICS ASSIGNMENT

The final assignment in Module 4 – Circadian Clocks and Sleep is a Beyond-the-Basics assignment. For this assignment, you will write an essay in which you address a question related to a TedTalk given by Dr. Russell Foster. The Beyond the Basics essay will be graded using a rubric that is posted with the assignment. If you have questions about this rubric, please do not hesitate to ask them.

## ESSAYS

Student will write and submit three essays. Students will choose their essay topic from 2-3 possible topics provided by the course director related to the information provided in Modules 5-7. A detailed rubric accompanies each essay assignment so that students know how their essays will be evaluated.

## FINAL STUDENT PROJECT

The purpose of this assignment is to provide you with an opportunity to review and take a deep dive into the primary scientific literature to research a topic that you found of interest that is either related to or is an extension of one of the topics presented in this course. The project is



comprised of four steps. You will complete each of these steps and then summarize your work in a succinct and cohesive 800-1000 word essay.

## GRADING

The scores from the self-check quizzes, module tests, the Beyond-the-Basics assignment, the short essays, and the final circadian project will be weighted as follows when determining your course grade. You can track your progress in the course by selecting the Grades tab in the course menu.

Self-check quizzes (15 total)	10%
Module Tests (4 total)	30%
Beyond the Basics assignment (1)	10%
Short essays (3 total)	30%
Final student project (1)	20%

Grading rubrics that I will use to evaluate your Beyond-the-Basics assignment, short essays, and your final project will be provided to you so that you will understand what is required to successfully complete these assignments and how they will be evaluated.

### ***Late assignments, quizzes and tests***

We recognize that personal circumstances arise that may interfere with your ability to meet a deadline. If you anticipate missing a deadline, please let the instructor know as soon as possible and they will work with you to resolve the issue. Your emails will be responded to within 24 hours (typically sooner). Please see the [UF Attendance Policies](#) concerning absences, religious holidays, and illness. In general, late assignments, quizzes, and tests will not be accepted unless you have obtained a deadline extension from the instructor.

If you encounter technical difficulties with assignments (e.g. LockDown browser malfunction), be sure to include a UF helpdesk ticket number in your request for a deadline extension if you plan to request one. The extension request MUST be submitted within 24 hours of the technical difficulty.

## GRADING SCALE

A numerical grade will be assigned at the end of the course based on the total percent of weighted points earned in all assignments using the grading scale shown below. It is possible, though not guaranteed, that this scale could be adjusted slightly (1-2%) at the end of the course to better reflect the efforts of the class.

93-100% = A  
90-92% = A-  
87-89% = B+



83-86% = B  
80-82% = B-  
77-79% = C+  
73-76% = C  
70-72% = C-  
67-69% = D+  
63-66% = D  
60-62% = D-  
<60% = E

## GRADING POLICY

Students will be expected to complete all requirements for each module. There will be no deadline extensions for completion of modules unless granted by the course. Failure to submit a module assignment or complete a module test by the course deadline without making an effort to remedy the situation (obtain assignment extension) will be recorded as a zero.

## LEARNING RESOURCES

- Readings are assigned from the primary literature.
- Recorded VoiceThread lectures that are accessible through the course website. Students are encouraged to post any questions they have about the lecture material directly within the lectures using the text, audio, or video + audio commenting features of VoiceThread. These questions will only be visible to the instructor. All questions will be answered by the instructor. The answers to questions that would benefit all students taking the course will be posted in the lecture so all students can view them.
- Several units contain a self-check quiz that has been designed to reinforce the lecture and reading assignments. Directions for these quizzes accompany each quiz. Pay particular attention to when the results of your quiz submission will be visible to you.
- Discussion boards are available for posting questions about the readings and general questions about the course and course materials. In addition, I have set up a discussion board containing links to stories about some of the newest developments in the field of circadian biology. I hope that you find these stories interesting and encourage you to post questions/comments about them.
- Online, scheduled synchronous meetings between students and the instructor will be available by request throughout the semester using Zoom Conferences.

## REQUIRED TECHNOLOGY

- Laptop or desktop computer equipped with microphone and video camera. The microphone and video camera can be used to post comments/questions to VoiceThread and will be used to create the final Circadian Project. There are VoiceThread apps that are available for free for iOS and Android devices that can be used to view the VT and



comment on them. I strongly recommend that you use a laptop or desktop computer when working on your VT projects for this course.

- High speed, broad band internet connection such as DSL or cable. A broadband Internet connection is strongly recommended. Slower connections may affect your ability to interact with materials in the course. It is also recommended that you try to submit all course exams and assignments well ahead of the deadline since I have found that network speeds can significantly slow as the deadlines approach due to increased use by students.

SPECIAL NOTE: Some users with satellite Internet service may find their online courses do not load quickly or consistently due to satellite network design issues.

- Installation of LockDown Browser on computer that you will use for this course. The computer you use to take exams should be “hard wired” to the internet. WiFi is not stable enough to support a reliable connection while taking quizzes or exams.
- Canvas courses are best viewed using Chrome or Firefox. For specific questions about browser compatibilities and general questions about e-learning at UF please go to <https://wiki.helpdesk.ufl.edu/FAQs/E-Learning>.

## **COURSE EVALUATION**

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at the end of the course. You will receive an email from UF when your evaluation is ready to be completed. These evaluations are very important to instructors since they help instructors to identify areas of a course that are working well and those that might require improvement. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of student evaluations are available to students at <https://evaluations.ufl.edu/results/>.

## **PLAGIARISM**

Students must understand what plagiarism is and must not engage in this behavior when completing assignments and tests in this course. The University of Florida Student Honor Code states that plagiarism includes but is not limited to:

1. Quoting oral or written materials including but not limited to those found on the internet, whether published or unpublished, without proper attribution.
2. Submitting a document or assignment that in whole or in part is identical or substantially identical to a document or assignment not authored by the student.

Student whose assignments/tests exhibit evidence of plagiarism will receive zeros for those assignments and tests for the first offense and will receive a warning. Students who continue to engage in this behavior after the warning will be reported to the UF Dean of Students Office.



## **PROHIBITED COLLABORATION OR CONSULTATION**

Student found to be involved in sharing answers and/or collaborating on exams or assignments will receive zeros for those exams and assignments. Students who continue to engage in this behavior after the warning will be reported to the UF Dean of Students Office.

## **HOW TO SUCCEED IN ONLINE COURSES**

First, you need to be aware that online learning poses its own unique challenges. Because the online classroom is available to you 24 hours a day it is easy to delay work on course material, forget deadlines, and not put enough time in to prepare for exams. These challenges are exacerbated when a student is not a 'self-starter' or if does not possess good time management skills including use of reminders.

Unlike traditional instructional settings in which each student goes to the same class, the online setting enables every student to “create” the class of his or her choosing. In theory, this type of instruction should be more adaptable to a variety of learning styles; however, the reality is that some students have not yet determined what their optimal learning style is. Poor performance in online courses often can be directly linked to procrastination and poor time management (trying to do a week’s worth of work just before the deadline). Rushing to complete assignments before the 11:59 pm deadlines on Sundays is NOT a good strategy because you forfeit your opportunity to ask questions about material you do not understand. Completing the self-check quizzes during the work week can help you to pinpoint topic areas you are finding difficult. In general, I answer questions you have about course content within 12-24 hrs of your posting of your question. Oftentimes, I answer much more quickly. Questions posted Sunday afternoon/evening may not be answered before you take tests that are due at 11:59 pm on Sunday.

You are expected to adhere to the posted assignment deadlines but you may submit assignments before the deadlines. There are two things you can do to insure that you are informed of deadlines. **First**, it is important that you take advantage of the notification features of Canvas so that you receive reminders when assignments are due and can receive notices when new information is posted in the course. You should take a moment to modify your notification preferences so that you can take advantage of what Canvas offers. Your preference settings can be accessed by clicking on your account icon in the left menu panel on the Canvas page (your photo or icon on top of icon listing) and by selecting Notifications from the list. **Second**, it is important that you check your ufl.edu email on a daily basis which is the email address that Canvas and I will use to communicate with you.

## **ACADEMIC HONESTY**

As a result of completing the registration form at the University of Florida, every student has signed the following statement: "I understand that the University of Florida expects its students to be honest in all their academic work. I agree to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University."



We fully support the intent of the above statement and will not tolerate academic dishonesty. All students enrolled in GMS 6021 are expected to follow the University of Florida Honor Code (excerpt above). The full text can be found at: <http://regulations.ufl.edu/chapter4/4041-2008.pdf>

Student guidelines for ethical behavior can be found at:  
<http://www.registrar.ufl.edu/catalog/policies/students.html>.

Please also review the use of copyrighted materials, which can be found on the Health Science Center Library's web page:  
<http://www.library.health.ufl.edu/services/copyright.htm>

### **WHEN DO I CONTACT THE UF HELPDESK?**

In the event that you have **technical difficulties with E-learning (CANVAS)**, please contact the UF helpdesk at [learning-support@ufl.edu](mailto:learning-support@ufl.edu), or (352) 392-4357 - select option 2. If your technical difficulties will cause you to miss a due date, you **MUST** report the problem to E-learning. Include the ticket number that you are given in an e-mail to the instructor to explain the late assignment/quiz/test.

Types of questions that should be directed to the Help Desk:

1. I can't log into E-learning
2. I have clicked on the "submit" button for my quiz and nothing is happening
3. I can't upload an assignment (be sure that you have reviewed the tutorial on how to do this **BEFORE** you contact the Help Desk)
4. E-learning has given me an error message and I can't submit my assignment.

***NOTE:*** Late work that involves technical difficulties with E-learning **MUST** be accompanied by a ticket number from the Help Desk.

***ALSO*** - Be sure to be familiar with the hours of operation for the UF help desk since they are oftentimes not available after 10:30pm on workdays and after 8:00 pm on weekends. There hours are posted at <http://helpdesk.ufl.edu/about/business-hours/>

### **WHEN DO I POST QUESTIONS TO THE COURSE QUESTIONS DISCUSSION BOARD?**

Questions that deal with the course itself should be submitted to the Course Questions board. Posted questions should **NOT** be about grades or a private matter. Do not post personal grade questions on the Course Questions discussion board.



Before posting a question, check those already posted to be sure that you are not duplicating a question. These should be things that other students in the class might have trouble with. For example:

1. I am unable to post comments to VoiceThread.
2. The link to a specific VoiceThread is not working.
3. One of the quiz questions did not display properly.

Posting on the Course questions board is the fastest way to get an answer to your question. Be sure to give it a meaningful heading!

Questions of a private nature should be e-mailed to the course instructor (see below on how to e-mail within E-learning). In all cases, please allow 24 hours for a response. Every effort will be made to answer questions posted over the weekend with 24 hours. If not addressed, they will be addressed on the following Monday.

## **WHEN DO I EMAIL MY INSTRUCTOR?**

Questions about the course should be e-mailed to the instructor through the e-mail tool in E-learning.

Examples of e-mail questions for the instructor to get clear, concise responses:

1. I think there is an error in my grade for the assignment in module 3 (be sure to explain exactly why you think there is an error and provide documentation)
2. I am behind in the course and I would like to know how I may catch up (in such a case, your instructor may ask you to set up a Skype meeting or a time to call on the telephone)

If you have questions about the course itself, please reread the syllabus before asking a question. If the answer is not in the syllabus, check the Course Questions discussion board (this discussion board can be located by clicking on the discussions menu tab on the left of the course home page). If the answer to your question is not there, please post the question on the Course Questions discussion board.

DO NOT e-mail the instructor with general course questions. If your question is of a personal nature, e-mail your instructor from within e-learning system using the instructions below. Late work that involves technical difficulties with E-learning MUST be accompanied by a ticket number from the Help Desk.

## **HOW TO EMAIL YOUR INSTRUCTOR**

When emailing your instructor, please do so through Canvas.

To send an e-mail from the course:

1. Click on the mail icon that is located the left side of your screen.
2. Click the "Compose Message" button.



3. "To: window" will display.
4. Locate your instructor's name.
5. Always include a description in your subject line
6. Type your message and add any necessary attachments. Be sure that your subject line is meaningful.
7. Click "send."

## **STUDENT SUPPORT SERVICES**

As a student in a distance learning course or program you have access to the same student support services that on campus students have. For course content questions contact your instructor.

For any technical issues you encounter with your course please contact the UF computing Help Desk at 352-392-4357. For Help Desk hours visit: <http://helpdesk.ufl.edu/>.

For a list of additional student support services links and information please visit: <http://www.distance.ufl.edu/student-services>

### **Special Accommodations**

Students requesting disability-related academic accommodations must first register with the Disability Resource Center (<http://www.dso.ufl.edu/drc/>). This should be done as early in the semester as possible.

### **\*\*All audio lectures in this course are accompanied by written transcripts\*\***

The Disability Resource Center will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation. The Disability Resource Center is located in 001 Building 0020 (Reid Hall). Their phone number is 352-392-8565.

