

## Course Syllabus



# GMS 6848: Ensuring Rigor and Reproducibility in Clinical and Translational Research

**SEMESTER:** Spring 2024

Classes Begin: January 8<sup>th</sup>, 2024

Classes End: April 24<sup>th</sup>, 2024

Final project: due before May 2nd, 2024

**FORMAT:** Online: asynchronous (through Canvas)

**CREDITS:** 1

**COURSE WEBSITE:** CANVAS GMS 6848

**INSTRUCTOR:** Todd Manini, PhD

**Professor**

**College of Medicine**

**Department Health Outcomes & Biomedical Informatics**

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**COURSE PREREQUISITES:** None

## COURSE OVERVIEW:



This course introduces the principles and practices required to conduct rigorous and reproducible research across the translational spectrum. Rigor and reproducibility are quite appropriately receiving greater emphasis across all levels of research, and are receiving greater attention from scientific journals and funders of research alike. At the National Institutes for Health (NIH), rigor and reproducibility are being promoted in their guidance to grant applicants as well as grant reviewers

(<https://grants.nih.gov/reproducibility/index.htm> )

(<https://grants.nih.gov/reproducibility/index.htm>). The NIH is in fact implementing policies “requiring formal instruction in scientific rigor and transparency to enhance reproducibility for all individuals supported by institutional training grants, institutional career development awards, or individual fellowships.”

(<https://grants.nih.gov/grants/guide/notice-files/NOT-OD-16-034.html> )

(<https://grants.nih.gov/grants/guide/notice-files/NOT-OD-16-034.html>). Thus, it is essential that researchers understand best practices in research to ensure rigor and reproducibility of their research. In this course, students learn these best practices, including sound study planning and design, consideration of all relevant biomedical variables, sound data management practices, statistical considerations and techniques, and transparency in reporting research results.

## COURSE OBJECTIVES:

Teaching methods include readings, recorded lecture (including audio and slides), online forum discussion, and assessment.

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

- Understand the importance of rigor and reproducibility in research across the translational spectrum
- Identify key characteristics, strengths, and weaknesses of various study designs necessary to ensure scientific rigor
- Recognize key biomedical variables necessary for a given research question
- Implement best practices in data collection and management
- Understand the importance of selecting appropriate data analysis techniques to ensure reproducible results
- Report and present results from a research study in a fully transparent manner

## COURSE SCHEDULE:



<b>Week/ Module</b>	<b>Start date</b>	<b>Topic</b>
<b>1</b>	1/8	Introduction and overview: The foundational premise of this course
<b>2</b>	1/15	The scientific method and reasoning
<b>3</b>	1/22	Why all the fuss – a history of scientific misconduct
<b>4</b>	1/29	Rigor, reproducibility, replicability, and transparency
<b>5</b>	2/5	Reproducibility vs replicability
<b>6</b>	2/12	Improving reproducibility and replicability
<b>7</b>	2/19	Study design considerations
<b>8</b>	2/26	Study design considerations: A case for pilot (early phase) studies
<b>9</b>	3/4	Bias and confounding
<b>10</b>	3/11	Spring break 3/9 – 3/16
<b>11</b>	3/18	Data collection and management: best practices I
<b>12</b>	3/25	Data collection and management: best practices II
<b>13</b>	4/1	Analyzing data to ensure reproducibility
<b>14</b>	4/8	Transparency in research reporting

<b>15</b>	4/15	Transparency in research reporting: The FAIR Guiding Principles
<b>16</b>	4/22	Final project: Data Management and sharing plan Classes officially end on 4/24
<b>Reading days &amp; final exams</b>	4/22-5/3	Final project

### **COURSE LOGISTICS:**

Weekly module materials will be available to you on the Canvas site. Students are able to access the next module on Sunday at 10 PM.

Weekly assignments are due on Sunday at 11:59pm. **Note: The Final project will have a different schedule to allow sufficient time to complete the work.**

### **COURSE REQUIREMENTS:**

Students are expected to actively engage in weekly discussions, complete readings posted to Canvas, view videos, complete weekly assessments and do a final project. A computer with high-speed Internet connectivity, ability to read/review/edit Microsoft files, ability to read/review pdf files, and a working webcam and microphone are required to effectively complete all course components.

### **READING and VIDEO MATERIALS:**

Each module has different requirements. In general, a selected publication(s) or video that highlights the content of that particular module will be used to generate assignments. Students are responsible for any content from the assigned readings posted in the weekly module folder. Assignments may cover any course content covered in assigned readings and virtual lectures.

### **COURSE COMMUNICATIONS:**

Most course communications will occur through the discussion boards in Canvas.



Private or grade related questions should be sent to me via the email function in Canvas. The e-learning canvas site follows the rules and regulations of FERPA. Using the email function in Canvas, select the instructors as recipients, and include the course mnemonic, GMS6848, in the subject line (to facilitate a more timely response).

### USE OF AI TOOLS

New AI tools like ChatGPT, DALL-E, Stable Diffusion, and Midjourney, to name a few, are powerful tools that we will all use for the foreseeable future. You are permitted to use these tools, but like any tool you should be in control of its function. I would like students to have an open dialogue about their use of ChatGPT. Reveal to the instructor and class when you use an AI tool to facilitate your learning. Pre-approved uses include idea generation, rephrasing text, grammar checking, conversating to build general knowledge about a topic, and computer code generation. Although the instructor is unable to “prove” plagiarism, cutting and pasting exact text will be frowned upon and ridiculed.

### ATTENDANCE:

This course is being held online in an asynchronous manner that doesn't require attendance to specific day and time. However, success in this course is dependent on your active participation and engagement throughout the course. As such, students are required to complete all assignments by the due date, and to actively participate in class discussions posts.

### INSTRUCTOR AVAILABILITY:

This is an asynchronous class that is not amenable to a set day and time as with traditional office hours. Depending on the student pool, hybrid (in-person+virtual) "Ask me" meetings may occur. I will make myself available for individual meetings when requested. Please email me through Canvas to schedule an individual time to meet.

### GRADE COMPOSITION:

Students' final grades will be determined via a variety of assessments, specifically: weekly assignments and the final project.

### **Assessment Description**

### **% of Grade**



## Weekly assignments

Assignments include discussions, quizzes, presentations etc. Assignments are worth 20 pts unless otherwise specified. 80%

## Final project

20%

## Total

100%

### WEEKLY assignments:

Each week, students will be asked to read or view material that highlights the content for that particular module/week. Assignments could be discussions, quizzes, giving presentations, creating timelines, writing short focus papers etc.

Discussions: Some modules have a discussion forum which draws on lecture content and course reading material for that week's module. Students are expected to provide a meaningful contribution to the discussion (in the form of providing at least one meaningful comment on various aspects of the articles, asking a is highly encouraged to engage every week if you are able! Discussions will 'close' at the end of the week, Sunday 11:59pm EST. You may not go back and contribute to a previous discussion in subsequent weeks to receive credit.

Quizzes: Quizzes will be posted to the module on Mondays; students will need to complete the quiz by the following Sunday (**the quiz must be completed by Sunday at 11:59pm EST**). Quizzes will consist of focus on the course content covered in that particular module. Quizzes are administered via Canvas and students should take the quiz in an environment with a dependable internet connection. **Quizzes cannot be retaken** and unanswered questions will receive a score of zero points.

FINAL project: Details of the final project are found in the module material.

**ATTENDANCE POLICY:**

This course is being held online in an asynchronous manner. Anytime that attendance is required, all faculty are bound by the UF policy for excused absences. For information regarding the UF Attendance Policy, see the Registrar website for additional details:

**<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>**.

**GMS 6848 GRADING SCALE:**

<b>Total Points Earned</b>	<b>% of Total Points Earned</b>	<b>Letter Grade</b>	<b>Grade Point Equivalent</b>
186 +	> 93	A	4.0
180-185	90-92	A-	3.67
174-179	87-89	B+	3.33
164-173	83-86	B	3.00
160-163	80-82	B-	2.67
154-159	77-79	C+	2.33
146-153	73-76	C	2.00
140-145	70-72	C-	1.67
134-139	67-69	D+	1.33

126-133	63-66	D	1.00
120-125	60-62	D-	0.67
< 120	< 60	E	0.00






For more detail on letter grades and related University of Florida policies, please see the Grades and Grading Policies at <https://gradcatalog.ufl.edu/graduate/regulations/#text>.

#### MAKE-UP POLICY:


Students are allowed to make up work only as the result of substantial illness or other unanticipated circumstances. In the event of such emergency, documentation will be required in conformance with University policy. Work missed for any other reason will earn a grade of zero.

#### UNIVERSITY OF FLORIDA POLICIES


STUDENTS REQUIRING ACCOMODATIONS: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the [Disability Resource Center](https://disability.ufl.edu/get-started/)  [\(https://disability.ufl.edu/get-started/\)](https://disability.ufl.edu/get-started/). It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.


COURSE EVALUATION: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. [Click here for guidance on how to give feedback in a professional and respectful manner.](https://gatorevals.aa.ufl.edu/students/)  [\(https://gatorevals.aa.ufl.edu/students/\)](https://gatorevals.aa.ufl.edu/students/) Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via [ufl.bluera.com/ufl/](https://ufl.bluera.com/ufl/). [Summaries of course evaluation results are available to students here](https://gatorevals.aa.ufl.edu/public-results/)  [\(https://gatorevals.aa.ufl.edu/public-results/\)](https://gatorevals.aa.ufl.edu/public-results/).



UNIVERSITY HONESTY POLICY: UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” [The Honor Code](#)  (<https://sccr.dso.ufl.edu/process/student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

SOFTWARE USE: All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

STUDENT PRIVACY: There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see the [FERPA Rights](#)  (<https://registrar.ufl.edu/ferpa/>).

NETIQUETTE – Communication Courtesy: Be kind, Be considerate, Be respectful. All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions, and chats. The first instance of clearly rude and/or inappropriate behavior will result in a warning. The second instance will result in a deduction of five percentage points from your overall grade. The third instance will result in a drop of a letter grade (A to B, A- to B-, and so on). Learn more about netiquette [here](#)  ([https://www.cise.ufl.edu/wp-content/uploads/2019/08/CISE\\_Netiquette\\_Guide.pdf](https://www.cise.ufl.edu/wp-content/uploads/2019/08/CISE_Netiquette_Guide.pdf))

GETTING HELP: For issues with technical difficulties for E-learning in Canvas, please contact the UF Help Desk at:


[learning-support@ufl.edu](mailto:learning-support@ufl.edu) (<mailto:learning-support@ufl.edu>)

(352) 392-HELP

<https://lss.at.ufl.edu/help.shtml>



Any requests for make-ups due to technical issues must be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date of the problem. You must e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up/extension.


Other resources are available at <http://www.distance.ufl.edu/getting-help>  (<http://www.distance.ufl.edu/getting-help>) for:

Counseling and Wellness resources

Disability resources

Resources for handling student concerns and complaints

Library Help Desk support

Should you have any complaints with your experience in this course please visit the [Distance Learning website](https://distance.ufl.edu/)  (<https://distance.ufl.edu/>) to submit a complaint.