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

University of Florida
College of Medicine
Department of Health Outcomes & Biomedical Informatics

INSTRUCTOR:
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COURSE PREREQUISITES: GMS 6861 (Applied Biostatistics I), or equivalent

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.htmhttps://grants.nih.gov/grants/guide/notice-files/NOT-OD-16-034.html). 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." (). 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, 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
- Select appropriate data analysis techniques to ensure reproducible results
- Report and present results from a research study in a fully transparent manner

COURSE SCHEDULE (TENTATIVE)	Topic	Readings	Quiz	Assignment
Week				
1	Introduction; General overview/motivation on rigor and reproducibility in research	TBD	1	Initial Assignment
2	Study design considerations across the translational spectrum	TBD	2	
3	Selecting all relevant biomedical variables	TBD	3	
4	Data collection and management: best practices	TBD	4	
5	Analyzing data to ensure reproducibility	TBD	5	Final Assignment
6	Transparency in research reporting	TBD	6	