GMS 6836: Foundations of Learning Health System Research

**Department of Health Outcomes and Biomedical Informatics**

**College of Medicine**

**University of Florida**

Semester: Fall 2020

Format: Online, Asynchronous (through Canvas)

Credits: 1

Course director:

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# COURSE DESCRIPTION

This course provides an overview of the foundational principles required to conduct research in a learning health system environment. Students will gain introductory knowledge in the relevance and application of various topics to the learning health system, including systems science, research and standards of scientific evidence, research methods, informatics, ethics, improvement and implementation science, and stakeholder engagement

# COURSE OVERVIEW

In 2007, the Institute of Medicine (IOM) proposed the Learning Health System (LHS) concept as an integrated clinical, operational, and research health system environment focused on improving quality and outcomes of care. The LHS integrates improvement science strategies and an array of other scientific methodologies at the point of care not only to improve quality, but to accelerate the translation of scientific discovery into practice. Forrest et al. (2018) identified seven core competencies for LHS researchers: 1) systems science; 2) research questions and standards of scientific evidence; 3) research methods; 4) informatics; 5) ethics of research and implementation in health systems; 6) improvement and implementation science; and 7) engagement, leadership, and research management.

# COURSE OBJECTIVES

The primary goals of this course are to provide students with introductory knowledge of the seven core competencies for LHS researchers, and more importantly, to demonstrate the principles and practices of these foundational areas in learning health systems here at UF and elsewhere. Upon successful completion of this course, students will be able to:

1. Understand the importance of sound research within a learning health system environment.

2. Identify the seven core competencies of LHS research.

3. Describe best practices in LHS research.

4. Identify additional resources to gain further knowledge in each of the seven core competencies.

# COURSE FORMAT

This course will operate as a 12-week advanced graduate seminar, adapted to an asynchronous, online format. Each week, students will be asked to read one scientific publication that highlights the content for that week’s topic. A discussion forum on Canvas will be made available each week, moderated by the course director. Students will provide meaningful discussion to the forum during the week that focuses on the week’s topic. No reading is assigned for the final week, as discussion will focus on applying the LHS core competencies.

## Quizzes

Every two weeks an online quiz associated with the week’s module will be posted on Canvas. Quizzes will be posted to the module on Monday of the assigned week. Students will need to complete the quiz before being able to access the discussion forum for that week. Each module’s quiz will focus on the course content covered in that particular module. Each quiz will consist of 10 multiple choice questions intended to assess understanding of the material. Students will have 30 minutes once they begin the quiz to complete it. Students are strongly encouraged to find a time to complete the quiz without interruption, as there will not be an opportunity to pause the quiz once the student begins taking it.

## Learning Health System Research Study Proposal - Outline

During the course, students will be asked to generate an idea for a potential LHS research study. The initial milestone for this assignment will be an outline of the associated protocol, including bulleted points regarding background, need for the study, basic study design, and research questions to be answered. Students will not be expected to provide great detail on any given aspect of the study; rather, this outline will generate a dialogue between the student and the course director, allowing the director to provide constructive feedback to enhance the proposal. Detailed instructions and a grading rubric will be provided with the assignment.

## Final Learning Health System Research Study Proposal

Based on feedback from the course director, the student will draft a 2-3 page proposal for a LHS research study that incorporates the competencies introduced in the class. Detailed instructions and a grading rubric will be provided.

# EVALUATION AND GRADING

Grades will be based on:

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| --- | --- |
| Meaningful contribution to the weekly forum | 60 points / 30% of final grade(5 points / 2.5% of final grade each week) |
| Biweekly quizzes | 60 points / 30% of final grade(10 points / 5% of final grade each quiz) |
| LHS study proposal outline (1-2 pages) | 40 points / 20% of final grade |
| Final LHS study proposal (2-3 pages) | 40 points / 20% of final grade |

## Final Grade

Satisfactory / Unsatisfactory

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| --- | --- | --- |
| **Total Points Earned** | **% of Total Points Earned** | **Grade** |
| 150 – 200 | 75% to 100% | S (Satisfactory) |
| < 150 | < 75% | U (Unsatisfactory) |

For additional grading policy information, you may visit the graduate catalog web page at

https://catalog.ufl.edu/graduate/regulations/.

# COURSE POLICIES

Students are expected to adhere to the following course policies.

## Participation

Success in this course is dependent on your active participation and engagement. Weekly participation in the discussion forum is required, and failure to participate in a weekly discussion forum is considered an absence. University of Florida rules require attendance during one of the first two course sessions. Missing more than three weekly discussion forums without prior notification to the instructor will result in a failure. Excused absences follow the criteria of the UF Graduate Catalog (e.g., illness, serious family emergency, military obligations, religious holidays), and should be communicated to the course director prior to the end of the week for the module when possible (i.e., before 11:59 pm on Sunday).

For more information, please visit:

https://catalog.ufl.edu/graduate/regulations/.

## Assignments

Regardless of participation, students are responsible for meeting the scheduled due dates for class assignments.

* Your assignment must be submitted no later than 11:59 pm EST on the day that it is due.
* Late assignments will NOT be accepted, unless you have a formal proof of the exception (e.g,. a written doctor’s note, a police ticket, etc.).
* All assignments must be submitted electronically via Canvas. No handwritten assignments are permitted.
* DO NOT COPY OTHERS’ ASSIGNMENTS. There is zero tolerance for academic dishonesty. The one who copies the assignment will receive 0 points. The one who is copied will get only 50% of the points that he/she should have received.
* Searching for a solution on the web – and then submitting it as your answer for an assignment – will be considered a violation.

## Returned Assignments

Keep copies of all assignments that you submit and of all grades until you receive official notification of your final course grade.

## Policy on Make-Up Work

Students are allowed to make up work only as the result of 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.

Any requests for make-up work 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 the course director within 24 hours of the technical difficulty if you wish to request a make-up or extension.

## Netiquette – Communication Courtesy

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 deduction of five percentage points from your overall grade. The third instance will result in a final grade of Unsatisfactory.

For more information, see:

<http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf>

# RESOURCES

## CANVAS

Course information, readings, lectures, and grades are available on Canvas at http://lss.at.ufl.edu/. You must have a Gatorlink account to log on. *You will access the web site on a weekly basis to access all course material, participate in discussions, and submit assignments.*

**Getting Help**

For issues with technical difficulties for E-learning in Canvas, please contact the UF Help Desk at: learning-support@ufl.edu or by calling (352) 392-HELP - select option 2. Additional information is available at: <https://lss.at.ufl.edu/help.shtml>

## Accommodations for Students with Disabilities

Students requiring accommodations must first register with the Dean of Students' Office. The Dean of Students' Office will provide documentation to the student who must then provide this documentation to the faculty member when requesting accommodation. The College is committed to providing reasonable accommodations to assist students in their coursework.

## Counseling and Mental Health Services

Please visit the UF counseling center website for information regarding appointments: <https://counseling.ufl.edu/> or call (352)392-1575

## UF Police Department

For Campus Police, please call the UF Police Department at (352) 392-1111.

For **all** emergencies and medical assistance, please call 911.

# 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.

Guidance on how to give feedback in a professional and respectful manner is available at <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 <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

## SCHEDULE OF TOPICS AND READINGS

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| **Week** | **Discussion forum open (2020)** | **Topic, readings, and assignments** |
| **From (Mon.)** | **To (Sun.)** |
| 1 | Aug. 31 | Sept. 6 | Topic: Introduction to the Learning Health SystemReading: Forrest et al. *Health Services Research*, 2018: 53(4).Assignments: * Quiz 1 (must be completed to access forum discussion)
* Forum discussion (due 9/6, 11:59 EST)
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| 2 | Sept. 7 | Sept. 13 | Topic: Research Questions in Learning Health SystemsReading: Stoto et al. *eGEMs*, 2017a: 5(1).Assignments: * Forum discussion (due 9/13, 11:59 EST)
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| 3 | Sept. 14 | Sept. 20 | Topic: Research Methods in Learning Health Systems (Part 1)Reading: Stoto et al. *eGEMs*, 2017b: 5(1).Assignments: * Quiz 2 (must be completed to access forum discussion)
* Forum discussion (due 9/20, 11:59 EST)
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| 4 | Sept. 21 | Sept. 27 | Topic: Research Methods in Learning Health Systems (Part 2)Reading: Stoto et al. *eGEMs*, 2017c: 5(1).Assignments:* Forum discussion (due 9/27, 11:59 EST)
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| 5 | Sept. 28 | Oct. 4 | Topic: Systems Theory and ScienceReading: Stoto et al. *eGEMs*, 2017d: 5(1).Assignments: * Quiz 3 (must be completed to access forum discussion)
* Forum discussion (due 10/4, 11:59 EST)
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| 6 | Oct. 5 | Oct. 11 | Topic: Biomedical Informatics (Part 1)Reading: Carney & Yong. *J. Biomed. Inform.*, 2017: 68.Assignments: * Forum discussion (due 10/11, 11:59 EST)
* LHS Proposal Outline (due 10/11, 11:59 EST)
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| 7 | Oct. 12 | Oct. 18 | Topic: Biomedical Informatics (Part 2)Reading: Noorbakhsh-Sabet et al. *Am. J. Med.*, 132(7).Assignments: * Quiz 4 (must be completed to access forum discussion)
* Forum discussion (due 10/18, 11:59 EST)
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| 8 | Oct. 19 | Oct. 25 | Topic: Ethics of Research in Learning Health SystemsReading: Morain & Kass. *eGEMs*, 2016: 4(2).Assignments: * Forum discussion (due 10/25, 11:59 EST)
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| 9 | Oct. 26 | Nov. 1 | Topic: Improvement and Implementation Science (Part 1)Reading: Kilbourne et al. *Medical Care*, 2019: 57(10).Assignments: * Quiz 5 (must be completed to access forum discussion)
* Forum discussion (due 11/1, 11:59 EST)
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| 10 | Nov. 2 | Nov. 8 | Topic: Improvement and Implementation Science (Part 2)Reading: Safaeinili et al. *Learning Health Systems*, 2019: 4(1).Assignments: * Forum discussion (due 11/8, 11:59 EST)
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| 11 | Nov. 9 | Nov. 15 | Topic: Engagement in Learning Health SystemsReading: Key & Lewis. *Learning Health Systems*, 2017: 2(3).Assignments: * Quiz 6 (must be completed to access forum discussion)
* Forum discussion (due 11/15, 11:59 EST)
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| 12 | Nov. 16 | Nov. 22 | Topic: Applying Learning Health Systems Core CompetenciesAssignments:* Forum discussion (due 11/22, 11:59 EST)
* Final LHS Proposal (due 11/22, 11:59 EST)
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## LIST OF ASSIGNED READINGS

Carney TJ, Yong AY. (2017). Leveraging health informatics to foster a smart systems response to health disparities and health equity challenges. *Journal of Biomedical Informatics*, 68: 184-189.

Forrest CB, Chesley Jr. FD, Tregear ML, Mistry KB. (2018). Development of the Learning Health System Researcher Core Competencies. *Health Services Research*, 53(4) Part 1: 2615-2632.

Key KD, Lewis EY. (2017). Sustainable community engagement in a constantly changing health system. *Learning Health Systems*, 2(3): e10053.

Kilbourne AM, Goodrich DE, Miake-Lye I, Braganza MZ, Bowersox NW. (2019). Quality Enhancement Research Initiative Implementation Roadmap: Toward Sustainability of Evidence-based Practices in a Learning Health System. *Medical Care*, 57(10)-Suppl 3: S286-S293.

Morain SR, Kass NE. (2016). Ethics Issues Arising in the Transition to Learning Health Care Systems: Results from Interviews with Leaders from 25 Health Systems. *eGEMs*, 4(2): 3.

Noorbakhsh-Sebet N, Zand R, Zhang Y, Abedi V. (2019). Artificial Intelligence Transforms the Future of Health Care. *American Journal of Medicine*, 132(7): 795-801.

Safaeinili N, Brown-Johnson C, Shaw JG, Mahoney M, Winget M. (2019). CFIR simplified: Pragmatic application of and adaptations to the Consolidated Framework for Implementation Research (CFIR) for evaluation of a patient-centered care transformation within a learning health system. *Learning Health Systems*, 4(1): e10201.

Stoto M, Oakes M, Stuart E, Savitz L, Priest EL, Zurovak J. (2017a). Analytical Methods for a Learning Health System: 1. Framing the Research Question. *eGEMs*, 5(1): 28.

Stoto M, Oakes M, Stuart E, Priest EL, Savitz L. (2017b). Analytical Methods for a Learning Health System: 2. Design of Observational Studies. *eGEMs*, 5(1): 29.

Stoto M, Oakes M, Stuart E, Brown R, Zurovak J, Priest EL. (2017c). Analytical Methods for a Learning Health System: 3. Analysis of Observational Studies. *eGEMs*, 5(1): 30.

Stoto M, Parry G, Savitz L. (2017d). Analytical Methods for a Learning Health System: 4. Delivery System Science. *eGEMs*, 5(1): 31.