OBJECTIVES
This course builds skills in applying methods for achieving change in health care and public health systems. Students will learn how to use management science to diagnose and address the sources of problems in reliability and productivity. This course will equip students to design an improvement project, including how to design changes that will produce consistent results at the desired scale of implementation, with particular attention to designing changes that work in complex systems and for populations, and that spread through an organization or system and sustain over time. This course is the first quarter of a two-quarter sequence, with 215B focusing on effective methods for improvement and 225A (Research Methods for Improvement and Implementation Science) focusing on how to design, carry out and publish improvement and implementation science.

Course objectives are to:
1. Prepare students to plan and manage improvement projects in their current work and future roles as change agents and leaders of health care systems;
2. Provide training in skills and analytic methods for applying improvement science in clinical settings, health systems, and other population-focused systems (including public health, education, and social services);
3. Enable students to design an improvement project and apply improvement methods to real problems or opportunities for innovation.

COURSE METHODOLOGY
This course provides students with the theory underlying improvement science and with quality improvement fundamentals. The course emphasizes application of the methods so that students gain skills in improvement project design and implementation. The course includes lectures, discussion, exercises, team activities, organizational examples, and individual projects. The best way to master the concepts and methods is hands-on application so most of the class time will be dedicated to discussion, group activities, and direct application of methods to student projects. The course builds upon the Advanced Improvement Methods course
developed by the James M. Anderson Center for Health System Excellence, Cincinnati Children’s Hospital Medical Center (CCHMC), and Associates in Process Improvement (API). The syllabus and selection of readings draw heavily on materials developed by CCHMC and API and are used with their permission.

This course reflects the principle of learning by doing. Each student will identify an improvement project in which the theory and methods acquired in this course can be applied throughout the quarter. Course instructors will link students with an appropriate setting and improvement project if they do not have an improvement project underway. Because of the importance of communication and teamwork in effective quality improvement, students will gain experience in multiple presentation methods, including preparation of storyboards.

PREREQUISITES:
HPM Improvement Methods Boot Camp, or equivalent, or by permission of instructor.

GRADING
Grades will be based on class participation and performance on the following assignments:
1. Class discussion of methods and case studies (20%)
2. Leading discussion of a selected book (10%)
3. Preparation of an improvement project, including completion of project milestones (50%)
4. Presentation of improvement project design and milestones, using a storyboard (20%)

A separate document distributed in class will provide instructions regarding the improvement project preparation and presentation, and how these will be graded.

READINGS
The required text is:

A recommended but not required text is:

Useful reference texts include:
Diffusion of Innovations. Everett Rogers
The New Economics for Industry, Government, and Education. W. Edwards Deming

BOOK DISCUSSIONS
Each student will read one of the following books and lead a class discussion of about 30 minutes. Please cover the main principles and what you found most intriguing, and prepare some discussion questions. These discussions will take place weekly beginning in Week 3.
• Democratizing Innovation. *Eric Von Hippel*
• Serious Creativity. *Edward DeBono*
• The Design of Everyday Things. *Donald Norman*
• The Inmates Are Running the Asylum: Why High Tech Products Drive Us Crazy and How to Restore the Sanity. *Alan Cooper*
• Where Good Ideas Come From: The Natural History of Innovation. *Steven Johnson.*
• The High-Velocity Edge: How Market Leaders Leverage Operational Excellence to Beat the Competition. *Steven Spear.*
• The Fifth Discipline: The Art & Practice of The Learning Organization. *Peter Senge*
• The Heart of Change: Real Life Stories of How People Change Their Organizations. *John Kotter*
• The Toyota Way. *Jeffrey Liker*
• Thinking, Fast and Slow. *Daniel Kahnemann*
• First, Break All the Rules: What the World’s Greatest Managers Do Differently. *Marcus Buckingham and Curt Coffman*
• Influencer: The Power to Change Anything. *Joseph Grenny and Kerry Patterson.* (2013 or earlier edition)
• Good to Great and the Social Sectors: A Monograph to Accompany Good to Great. *Jim Collins*
• Managing the Unexpected: Assuring High Performance in an Age of Complexity. *Karl Weick and Kathleen Sutcliffe.*
• The Visual Display of Quantitative Information. *Edward Tufte*
• Swarm Creativity. *Peter Gloor*
• Making Social Science Matter, Why Social Inquiry Fails and How it Can Succeed Again. *Bent Flyvbjerg*

**IMPROVEMENT PROJECT (PRACTICUM)**

Students will apply improvement methods to a current project or will be linked with a improvement project at the UCLA Health System, the Los Angeles County Department of Public Health, or another population health system. Students are encouraged to use their own project or practice for this practicum experience if the project is conducive to the requirements of the class. For the improvement project, each student will:

• Identify a problem that needs to be fixed and that is in an area where you have control (or, is under the control of the improvement team that you’re working with). The ideal project is one in which you are likely to be able to achieve a measurable change within several months. You can identify a part of a project where you can take personal accountability for a diagnostic or analytic component.

• Identify the people who will need to be involved.
• Meet with the improvement project sponsor to ensure that they approve and will support your choice for a project.
• Apply coaching and peer advice in the design, measures and/or methods of your improvement project.
• Identify where to get the information for your measures. If data are not available, you will develop a plan to collect data and begin collecting it.

Students will prepare and present their work in storyboards, which will be presented during the final class sessions. The trifolds for the storyboard presentations (36” by 48”) will be provided. The oral presentations of the storyboards integrate what was done in the improvement project with the principles that are covered in the courses. The storyboard presentations should display clear connection between the readings, the learning, and the practice. The storyboard includes the improvement project overview and rationale, specific aim, project plan, design, driver diagram, measures, description of changes, results, and lessons learned and implications. A template and further guidance for the storyboards will be provided early in the quarter.

SESSIONS

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<thead>
<tr>
<th>Week 1 – The Science of Improvement</th>
<th>Wednesday, January 11</th>
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Overview of course, syllabus and assignments
Introduction to improvement science as a theory of managing change
Book sign-ups
Introduction to improvement project practicum and opportunities

Topics include:
• Deming’s System of Profound Knowledge (understanding variation, appreciation of the system, theory of knowledge/action-learning, and psychology/change management;
• The cultural transformation associated with improvement;
• Distinguishing the approaches, and the potential for alignment, of implementation and measurement for purposes of improvement, accountability and clinical research;
• Relationship of Model for Improvement, LEAN, Six Sigma

Readings:
• The Improvement Guide. (Chapter 1 – Changes that result in improvement, Chapter 2 – Skills to support improvement)

Recommended resources:
http://www.ihi.org/resources/Pages/IHIWhitePapers/ComparingLeanandQualityImprovement.aspx

• The Bell Curve. Atul Gawande. The New Yorker. December 6, 2004

Week 2 – Measurement for Management and Improvement
Wednesday, January 18

Topics include:
• Measurement for improvement
• Types of measures (including outcome, process and balancing measures)
• Judgment sampling and qualitative measurement
• Interpreting and annotating run charts
• Special cause and common cause
• Attribute and continuous control charts
• Pareto charts
• Visual display of data (family of measures, dashboarding)

Readings:
• The Data Guide, Learning from Data to Improve Health Care. Provost L & Murray S. 2010. (Chapter 2, Chapter 3 (pages 67-84), Chapter 4)

Recommended resources:

Week 3 – Diagnostic Methods for Understanding Causes
Wednesday, January 25

Guest: Robert Martin PsyD, Performance Excellence, UCLA Health

Topics include:
• Root cause analysis (fishbone diagram, 5 whys)
• Process flow/mapping
• Project selection/opportunities within UCLA Health

Readings:
• The Improvement Guide (Appendix B)
Week 4 – Developing Changes  
Wednesday, February 1

Topics include:
• Designing and using key driver diagrams
• Change concepts
• Methods for prioritizing changes

Readings:
• The Improvement Guide. (Chapter 6, Developing a Change; Appendix A, A Resource Guide to Change Concepts)

Week 5 – Plan-Do-Study-Act Cycles, and Experience-Based Design  
Wednesday, February 8

Topics include:
• Use of PDSA cycles
• Experimentation in daily practice
• Involving patients/clients in care design

Readings:
• The Improvement Guide (Chapter 5, Using the Model for Improvement; Chapter 8, Implementing a Change)
• Bate P & Robert G. 2006. Experience-based design: From redesigning the system around the patient to co-designing services with the patient. Quality and Safety in Health Care. 15:307-310.

Week 6 – Building and Sustaining Reliable Care Processes  
Wednesday, February 15

Topics include:
• Highly adoptable improvement
• Reliability principles
• Changes for achieving levels of reliability
• Holding the gains (sustainability)

Readings:
• Improving the Reliability of Health Care. (2004). Thomas Nolan, PhD, Roger Resar, MD, Carol Haraden, PhD, Frances A. Griffin, RRT, MPA, Institute for Healthcare Improvement.
• The Improvement Guide. (Chapter 7, Testing a change; Chapter 8, Implementing a change)

**Week 7 – Implementing Improvement**  
**Wednesday, February 22**

Topics include:
• Improvement projects (A3)
• Effective teams
• Running an improvement project
• Engaging the organization infrastructure (e.g. policy)
• Mitigating resistance to change

Readings:
• The Improvement Guide. (Chapter 14 – Developing improvement capability)
• Case Study: Cincinnati Children’s Hospital Medical Center

**Week 8 – Scaling and Spread of Improvement**  
**Wednesday, March 1**

Topics include:
• Scaling, spread and dissemination

Readings:
• The Improvement Guide. (Chapter 9, Spreading Improvements)
**Week 9 – Improvement for Populations and Complex Systems**
**Wednesday, March 8**

Topics include:
- Improvement in complex systems
- Applications in population health
- Learning networks and collaborative science

Readings:
- *The Improvement Guide*. (Chapter 11, Improving Large or Complex Systems)

**Week 10 – Improvement Project Presentations (Part 1)**
**Wednesday, March 15**

Oral presentation of improvement project storyboards, which will be posted on trifold displays. The presentations will integrate what was done in the improvement project (the practice) with the principles that are covered in the courses. The storyboard presentations should display clear connection between the readings, the learning, and the practice.

**Week 11 - FINALS WEEK – Improvement Project Presentations (Part 2)**
**Wednesday, March 16**

Continued from Week 10
**Learning Objectives for the Course and Relationship to PhD and MSHS Competencies:**

Under the sponsorship of AcademyHealth and ARHQ, a list of core competencies for PhD training in health services research was developed and published (Forrest CB, Martin DP, Holve E, Millman A, Health services research doctoral core competencies, BMC Health Serv Res. 2009 Jun 25;9:107). A modification of this list, regrouping the competencies from 14 areas to 11 was subsequently published on the AHRQ website (*Health Services Research Core Competencies. Final Report. Agency for Healthcare Research and Quality, Rockville, MD. http://www.ahrq.gov/fund/training/hsrc08.htm*).

The table below lists the learning objectives for the course and the related PhD/MSHS Competency.

<table>
<thead>
<tr>
<th>Learning Objectives</th>
<th>PhD/MSHS Competency</th>
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<tbody>
<tr>
<td>At the end of the course, a student should:</td>
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<tr>
<td>Be able to explicate what implementation science is, and its relationship to the various social sciences.</td>
<td><strong>Theoretical knowledge</strong> Applying or developing theoretical and conceptual models relevant to health services research <strong>Professional development</strong> Working collaboratively in teams within disciplines, across disciplines, and/or with stakeholders</td>
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<tr>
<td>Be able to conceptualize an implementation science research problem in terms of questions, conceptual model, overall analytic approach, measures and data.</td>
<td><strong>Theoretical knowledge</strong> Applying or developing theoretical and conceptual models relevant to health services research <strong>Relevant and important HSR question development</strong> Posing relevant and important research questions, evaluating them, and formulating solutions to health problems, practice and policy <strong>Conceptual models and operational methods</strong> Using or developing a conceptual model to specify study constructs for a health services research question and developing variables that reliably and validly measure these constructs <strong>Study designs</strong> Describing the strengths and weaknesses of study designs to appropriately address specific health services research questions <strong>Professional development</strong> Working collaboratively in teams within disciplines, across disciplines, and/or with stakeholders</td>
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<tr>
<td>Understand how to design an improvement/implementation</td>
<td><strong>Theoretical knowledge</strong> Applying or developing theoretical and conceptual models relevant to health services research</td>
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<td>science intervention and how to conduct literature searches and critically review the literature.</td>
<td>services research</td>
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<tr>
<td>Relevant and important HSR question development</td>
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<tr>
<td>Posing relevant and important research questions, evaluating them, and formulating solutions to health problems, practice and policy</td>
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<td>Be able to identify existing measures in the field, and to assess measures for validity and reliability</td>
<td>Conceptual models and operational methods</td>
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<td>Using or developing a conceptual model to specify study constructs for a health services research question and developing variables that reliably and validly measure these constructs</td>
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<td>Understand the basic elements of direct data collection:</td>
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<td>• Basic survey methods and design</td>
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<td>• Questionnaire development</td>
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<tr>
<td>• Sampling strategies</td>
<td>Data collection and management methods</td>
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<tr>
<td>Sampling and collecting primary health and health care data and/or assembling and managing existing data from public and private sources</td>
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<tr>
<td>Understand the major ethical issues in conducting improvement and implementation science, and begin to formulate one’s own ethical research standards</td>
<td>Research conduct management</td>
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<tr>
<td>Executing and documenting procedures that ensure the reproducibility of the science, the responsible use of resources, the ethical treatment of research subjects, with particular focus on ethics and human subject considerations in research</td>
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<tr>
<td>Understand the process of developing an improvement project/protocol</td>
<td>Relevant and important HSR question development</td>
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<td>Posing relevant and important research questions, evaluating them, and formulating solutions to health problems, practice and policy</td>
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<td>Study designs</td>
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<tr>
<td>Describing the strengths and weaknesses of study designs to appropriately address specific health services research questions</td>
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<tr>
<td>Communication</td>
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<tr>
<td>Effectively communicating the process, findings, and implications of health services research through multiple modalities with stakeholders, focusing in this course on protocol development.</td>
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