PREREQUISITES:
(BMI 540 or 565) AND (PHPM 524 or BSTA 511 or MATH 530). Experience with R (or other scripted statistical language), SQL, and spreadsheets a positive. Students must bring a laptop to class.
Signature required.

COURSE DESCRIPTION:
Data Analytics will explore the role of analysts, and analytics, in healthcare organizations. The course will consist of six weeks of directed readings with online discussions, hands-on use of analytical tools for data extraction and analysis, one week on campus, and individual completion of a term project. The on-campus portion will consist of lectures, guest speakers, and hands-on lab sessions. This will be an applied course that introduces the concepts of the data analytics lifecycle, including:

- Data Analysis and its use in healthcare organizations
- The analytics consulting life cycle
- Framing an analytical problem
- Requirements and metric definition
- Data extraction
- Metadata and its importance within an organization
- Creating, validating, interpreting, and presenting analysis
- Current and emerging tools in data analysis
- Emerging topics in healthcare data analysis

INSTRUCTORS:
Shannon McWeeney, PhD  
Head, Division of Bioinformatics and Computational Biology  
Dept. of Medical Informatics & Clinical Epidemiology (DMICE)  
OHSU  
Email: mcweeney@ohsu.edu

Brian Sikora, MHA  
Senior Director, Data & Information Management Enhancement  
Kaiser Permanente  
Email: brian.p.sikora@kp.org

Delilah Moore, PhD  
Lead Information Analyst, Data & Information Management Enhancement
TEXTBOOKS:
Required

Optional/Recommended:

COURSE OBJECTIVES:
1. Understand the field of data analytics, the use of analytics within organizations, and the role of analysts within organizations.
2. Learn the skills to fully define problem and learn to assemble a team with the right components and approach to solve the problem. Ability to work through an operational problem end to end.
3. Understand where data comes from and how to extract the data (structure, unstructured and abstract data).
4. Learn how to effectively communicate the results of an analysis (interpreting data, how to tell if one is successful, analytical maturity, define the problem, presenting the analysis).
5. Learn about the common tools utilized to access and manipulate data.
6. Be able to design a new metric.

COURSE SCHEDULE & LOGISTICS

Note: Sakai will be available June 27


Participate in online discussions of the following topics in Sakai. There are also optional, but recommended assignments in R/SQL each week to prepare you for the prework assignment that
is due before the on-campus portion. If you do these in order, the task of doing the prework will be easier and spread out, and you will be well-prepared for the on-campus problem sets.

1. Install R, practice with the software, read in a dataset, and complete an R tutorial before the first day of on-campus instruction.
5. Best Practice and Case Studies in Healthcare Analytics. Read Strome: Chapter 12, McNeill: Part 4 (Read your choice of two case studies, and scan the remaining chapters)
6. R/SQL
   Load SQLite and R onto a local laptop / computer
   Learn to load a table into SQLite
   Access that table from R and run basic statistics
   Learn about a basic analytic problem: predicting readmissions
7. Data Presentation Tools and Techniques. Read Strome: Chapters 10 and 11, read the LACE article and Amarasingham.

**On-Campus Session**

Aug. 21-25, 2017, Monday – Thursday 9:00 to 4:00 and Friday 9:00 to 12:00, BICC 124

The week will be a combination of lecture and R workshops. Guest lecturers will include analysts and executives from Kaiser Permanente. Possible topics may include:
   Analyst roles in healthcare organizations
   Components of analytic work—consulting, requirements analysis, creating metrics
   Executive sponsorship of analytic projects
   Case study of implementing a readmission risk score
   Metadata
   Bioinformatics

**COURSE GRADING POLICY:**
This is a graded course. Points will be assigned for the following items as follows:
<table>
<thead>
<tr>
<th>Item</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>R/SQL Prework</td>
<td>15</td>
</tr>
<tr>
<td>Final Presentation</td>
<td>20</td>
</tr>
<tr>
<td>In Class Participation</td>
<td>10</td>
</tr>
<tr>
<td>Problem Set 1</td>
<td>20</td>
</tr>
<tr>
<td>Problem Set 2</td>
<td>15</td>
</tr>
<tr>
<td>Problem Set 3</td>
<td>15</td>
</tr>
<tr>
<td>Online Participation</td>
<td>12</td>
</tr>
<tr>
<td>Total Points</td>
<td>107</td>
</tr>
</tbody>
</table>

The course is graded on a curve, but usually adheres to the following distribution:
A 93-100 %
A- 90-92.99 %
B+ 87-89.99 %
B 83-86.99 %
B- 80-82.99 %
C+ 77-79.99 %
C 73-76.99 %
C- 70-72.99 %
F <70 %

Graduate Studies in the OHSU School of Medicine is committed to providing grades to students in a timely manner. Course instructors will provide students with information in writing at the beginning of each course that describes the grading policies and procedures including but not limited to evaluation criteria, expected time needed to grade individual student examinations and type of feedback they will provide.

Class grades are due to the Registrar by the Friday following the week of finals. However, on those occasions when a grade has not been submitted by the deadline, the following procedure shall be followed:

1) The Department\(^1\)/Program Coordinator\(^2\) will immediately contact the Instructor requesting the missing grade, with a copy to the Program Director and Registrar.
2) If the grade is still overdue by the end of next week, the Department\(^1\)/Program Coordinator\(^2\) will email the Department Chair directly, with a copy to the Instructor and Program Director requesting resolution of the missing grade.
3) If, after an additional week the grade is still outstanding, the student or Department\(^1\)/Program Coordinator\(^2\) may petition the Office of Graduate students for final resolution.

\(^1\) For courses that are run by a specific department.
\(^2\) For the conjoined courses (course number is preceded by CON_ that are run by Graduate Studies

ACADEMIC HONESTY:
Course participants are expected to maintain academic honesty in their course work. Participants should refrain from seeking published solutions to any assignments. Literature and resources (including Internet resources) employed in fulfilling assignments must be cited. See http://www.ohsu.edu/xd/education/schools/school-of-medicine/departments/clinical-
departments/dmice/students/current-students.cfm for details (click on “Professional Conduct Policy”).

See http://www.ohsu.edu/xd/education/library/research-assistance/plagiarism.cfm?WT_rank=1# for information on code of conduct for OHSU and http://www.ohsu.edu/xd/education/teaching-and-learning-center/for-students/index.cfm for more information on citing sources and recognizing plagiarism.

In an effort to uphold the principles and practice of academic honesty, faculty members at OHSU may use originality checking systems such as Turnitin to compare a student’s submitted work against multiple sources.

To protect student privacy in this process, it will be necessary to remove all personal information, i.e. student name, email address, student u-number, or any other personal information, from documents BEFORE submission.

**COMMITTMENT TO EQUITY AND INCLUSION**

Oregon Health & Science University is committed to creating and fostering a learning and working environment based on open communication and mutual respect. If you encounter sexual harassment, sexual misconduct, sexual assault, or discrimination based on race, color, religion, age, national origin or ancestry, veteran or military status, sex, marital status, pregnancy or parenting status, sexual orientation, gender identity, disability or any other protected status please contact the Affirmative Action and Equal Opportunity Department at 503-494-5148 or aaeo@ohsu.edu. Inquiries about Title IX compliance or sex/gender discrimination and harassment may be directed to the OHSU Title IX Coordinator at 503-494-0258 or titleix@ohsu.edu

**STUDENT ACCESS**

OHSU is committed to providing equal access to qualified students who experience a disability in compliance with Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act (ADA) of 1990, and the ADA Amendments Act (ADA-AA) of 2008. If you have a disability or think you may have a disability (physical, sensory, chronic health, psychological or learning) please contact the Office for Student Access at (503) 494-0082 or studentaccess@ohsu.edu to discuss eligibility for academic accommodations. Information is also available at www.ohsu.edu/student-access. Because accommodations may take time to implement and cannot be applied retroactively, it is important to have this discussion as soon as possible. All information regarding a student’s disability is kept in accordance with relevant state and federal laws.

**NOTE:**

This syllabus and class schedule is subject to change by the instructors. Changes will be made with as much advance notice as possible.

**USE OF SAKAI**
This course will have an online component, which can be accessed through Sakai, OHSU’s online course management system. For any technical questions or if you need help logging in, please contact the Sakai Help Desk.

Students having difficulties with Sakai should contact the Sakai Help Desk. Do not contact the instructor. Similarly, if you have questions about content, contact your instructor or TA.

The Sakai Help Desk is available:
Mon – Fri, 8 am – 9 pm
Weekends, 12 pm – 5 pm
Closed on OHSU-Observed holidays
Contact Information:
(Toll-free) 877-972-5249
(Web) http://atech.ohsu.edu/help
(Email) sakai@ohsu.edu

DMICE COMMUNICATION POLICY

1. If the syllabus directs the student to contact the TA before contacting the instructor, the student should do so. Otherwise, the student should contact the instructor and allow 2 business days (not including weekends) for a response.
2. If the student does not receive a response from the instructor within 2 business days, s/he should contact the TA (if there is one). When contacting the TA s/he should cc the instructor and Diane Doctor at doctord@ohsu.edu.
3. If a student does not receive a response from the TA within 1 business day (not including weekends), s/he should contact Diane Doctor at doctord@ohsu.edu and cc the instructor and the TA.
4. If Diane does not reply within 1 business day (not including weekends), the student should contact Andrea Ilg at ilgan@ohsu.edu.
5. Students having difficulties with Sakai should contact the Sakai Help Desk at sakai@ohsu.edu or at (877) 972-5249. Sakai help is available M-F from 8am to 10-pm and weekends from Noon to 5pm. Do not contact the instructor.
6. Please use professional etiquette when communicating with peers and the instructor. This means avoiding aggressive or offensive language, showing respect for others’ opinions and positions, and conducting yourself as if you were face to face with them. Please pay special attention to etiquette in class forums and when using email. If you notice someone violating this policy, please make the instructor and TA aware of the problem.

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To comply with the fair use doctrine of the US copyright law, Sakai course sites close three weeks after grades are posted with the Registrar. Please be sure to download all course material you wish to keep before this time as you will have no further access to your courses.