Data Analytics  
BMI 569/669  
June 27-September 9, 2016  
Summer 2016 Hybrid  
3 credit hours

PREREQUISITES:  
BMI 540 or 565, BMI 544, and PHPM 524 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  
Kaiser Permanente  
Email: delilah.s.moore@kp.org
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:

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. 22-26, 2016, Monday – Thursday 9:00 to 4:00 and Friday 9:00 to 12:00, BICC 124

<table>
<thead>
<tr>
<th>Day</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Monday AM</td>
<td>Introductions/Background/Review Week</td>
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<td>Recap from pre-work, Applications to the KP world</td>
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<td></td>
<td>Analyst Roles in Healthcare Organizations</td>
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<td>Consulting Life Cycle</td>
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<tr>
<td>PM</td>
<td>R Workshop</td>
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<td></td>
<td>• Problem set 1</td>
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<tr>
<td>Tuesday AM</td>
<td>Framing an analytical problem</td>
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<td>• Guest Speakers: Karen Schartman, KPNW Chief Financial Officer and Dr.</td>
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<td>Rahul Rastogi, Medical Director of RTMC, Transportation Services, and</td>
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<td>Continuing Care Services</td>
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<td>• LACE and 30-Day Readmissions will be used as the focal point of this</td>
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<tr>
<td>PM</td>
<td>A Structured Approach to Requirements Definition</td>
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<td></td>
<td>R Workshop</td>
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<td></td>
<td>• Complete problem sets 1, 2</td>
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<tr>
<td>Wednesday AM</td>
<td>Creating Metrics</td>
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<td>Implementation and Interpretation</td>
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<td>PM</td>
<td>R Workshop</td>
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<td>• Problem sets 1, 2</td>
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<tr>
<td>Thursday AM</td>
<td>Bioinformatics data needs / translational components</td>
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<td>Metadata</td>
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PM | R Workshop
---|---
| Complete problem sets 1, 2, 3, 4

Friday

| AM | Group Presentations |
---|---
| Emerging Trends (Optional)

**COURSE GRADING POLICY:**
This is a graded course.

The course is graded on a curve, but usually adheres to the following distribution:

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<tr>
<th>Grade</th>
<th>Range</th>
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<tbody>
<tr>
<td>A</td>
<td>90-100</td>
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<td>A-</td>
<td>85-89</td>
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<tr>
<td>B+</td>
<td>80-84</td>
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<tr>
<td>B</td>
<td>75-79</td>
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<tr>
<td>B-</td>
<td>70-74</td>
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<tr>
<td>C+</td>
<td>65-69</td>
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<tr>
<td>C</td>
<td>60-64</td>
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<tr>
<td>D/F</td>
<td>&lt;60</td>
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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 Department¹ /Program Coordinator² 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 Department¹ /Program Coordinator² 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 Department¹ /Program Coordinator² 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 pat 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”).

*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.*

**STUDENT ACCESS**

OHSU is committed to providing equal access to qualified students with disabilities. Student Access determines and facilitates reasonable accommodations, including academic adjustments and auxiliary aids, for students with documented disabilities. A qualified student with a disability is a person who meets the academic and technical standards requisite to admission or participation in a particular program of study. As defined by the Americans with Disability Act (ADA), a person with a disability has a physical or mental impairment that substantially limits one or more major life activities of the individual. This may include, but is not limited to, physical conditions, chronic health issues, sensory impairments, mental health conditions, learning disabilities and ADHD. Student Access works with students with disabilities from all of OHSU’s educational programs and at each campus.

Each school has an assigned Program Accommodation Liaison (PAL), who acts as an “in-house” resource for students and faculty concerning access issues for students with disabilities. The PAL works in collaboration with Student Access to implement recommended accommodations for students with disabilities.

It is recommended that you contact Student Access to consult about possible accommodations if you a) received disability accommodations in the past, b) begin experiencing academic difficulties, and/or c) are given a new diagnosis from your healthcare provider.

Learn more about Student Access:
Phone: 503 494-0082
Email: studentaccess@ohsu.edu
Website: [www.ohsu.edu/student-access](http://www.ohsu.edu/student-access)

**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](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 8 am to 10 pm and weekends from Noon to 5 pm. Do not contact the instructor.

**COPYRIGHT INFORMATION**

Every reasonable effort has been made to protect the copyright requirements of materials used in this course. Class participants are warned not to copy, audio, or videotape in violation of copyright laws. Journal articles will be kept on reserve at the library or online for student access. Copyright law does allow for making one personal copy of each article from the original article. This limit also applies to electronic sources.

To comply with the fair use 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.