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:

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TEXTBOOKS:

Required
- Strome, Trevor L. *Healthcare Analytics for Quality and Performance Improvement*. Wiley, Hoboken, NJ: 2013. ISBN 978-1-118-5196901.
- McNeill, Dwight, ed. *Analytics in Healthcare and the Life Sciences*. International Institute for Analytics, Upper Saddle River, NJ: 2014. ISBN 978-0-13-340733-4.

Optional/Recommended:
- Few, Stephen. *Information Dashboard Design: Displaying Data for At-a-Glance Monitoring*. Analytics Press: 2013. ISBN: 978-1-938277-00-6
- Gensinger, Raymond A, ed. *Analytics in Healthcare: An Introduction*. HIMSS, Chicago: 2014. ISBN 978-1-938904-64-6.

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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

Online: June 27 – August 21. **On-campus:** August 22-26. **Online:** August 27-September 9.

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.

2. Topic: Strategy and Organizational Structures, Part 1. Read Strome: Chapters 1 – 3, McNeill: Part 1 (Chapters 1 – 4)
3. Topic: Strategy and Organizational Structures, Part 2. Read Strome: Chapter 4-9, McNeill: Part 2
4. Implementation and Advanced Analytics. Read Strome: Chapter 11 (187-193), McNeill: Part 3
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

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

	PM	R Workshop • Complete problem sets 1, 2, 3, 4
Friday		Group Presentations
	AM	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:
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 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").

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.

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.

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.