Addictions and Addictive Behaviors
M19-562 / MPHS: PSYCHIATRIC AND BEHAVIORAL HEALTH SCIENCES CONCENTRATION

Spring 2019
Preliminary Syllabus

Dates: 1/17/2019-5/2/2019

Time: Thursday, 1-4 pm

Location: Room 2133, Taylor Avenue Building

Instructors:
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Lecturers: Arpana Agrawal, Ph. D., Kathy Bucholz, Ph. D

Guest Lecturers: Alex Ramsey, Ph. D.; Ned Presnall, M.S.W., Rachel Winograd, Ph.D.

Office Hours: By Appointment

Prerequisites: M21-560 Biostatistics I or equivalent, or coursemaster approval.

Course Credits: 3

Grading: Letter for MPHS Psychiatric and Behavioral Health Sciences Concentration students.
Choice of Letter or Pass/Fail for others.

Course description: The objective of this course is to help students develop skills required to design research projects in the area of addiction science. This is accomplished by fostering a broad understanding of addiction and addictive behavior in the population, spanning all levels of science, from molecular genetics to drug policy. Students will be introduced to the epidemiology of substance use disorders and methods for surveying substance use and associated disorder. Diagnostic criteria and their assessment in the general population will be introduced. Reviews and/or overviews of basic science will be presented, including discussions of basic pharmacology, heritability and genetics These concepts will then be related to more specialized topics, including drug policy, treatment, and recovery.

Format: The class format will be broadly divided into one-hour formal lectures that cover the core topics followed by a lab and discussion period during which students will work on a group project that will be developed into a publishable manuscript. Depending on enrollment size, this will be a single project that the entire class participates in.

Students will be expected to participate in class discussions, informally present material related to the class project and contribute to the final project product through writing, data analysis, presentation of results, or a combination of these.

As**signments:** The primary assignment is the class project. Periodic assignments will be given as the project progresses and will involve reading, summarizing and criticizing extant literature.

Student Requirements for the course:

1. **Attendance** is required for all classes. We understand that professional conferences, illness, and family situations arise. If you are unable to attend class, please e-mail the coursemaster as far in advance as possible.

2. **Readings** or other media assignments should be completed before each lecture. Articles or links to articles will be posted on blackboard in advance of each lecture. Some citations to assigned readings are provided in the syllabus <u>but these are subject to change.</u>

3. **Participation** is expected of each student. This will consist of either informal discussions or semi-formal student presentations. Students will need to prepare as directed by the lecturer during the prior week's lecture and/or by e-mail.

4. **Assignments:** See above.

Objectives: At the end of this course, the student will be able to:

1. Define addiction and identify its core features and diagnostic criteria; describe the evolution of diagnostic criteria, differentiate between problematic use and dependence.
2. Identify sources of data for describing the contemporary and historical epidemiology of alcohol, drug and tobacco use; evaluate the methods used to obtain such data, their strengths and limitations.
3. Describe the role of genetics in addiction and the relations between heritability and molecular genetics.
4. Describe key environmental influences on addiction and recovery, including social and policy factors.
5. Develop hypotheses that utilize the above competencies and specify methods and data sources to test such hypotheses.

Text: There is NO required text. It is strongly recommended that you read one of the supplemental texts at your own pace as you take the course. This is a project-oriented course with limited lecture time. Therefore, self-directed readings of material in your areas of interest are important. Supplemental texts are listed at the end of the syllabus.

COURSE OUTLINE. Note that lecture and lab Schedules are presented separately. These schedules are preliminary and subject to change.

Lectures

Readings may be assigned for some lectures and it is expected that students will read these prior to the lecture and be prepared to discuss.

WEEK 1: 1/17/2019. Agrawal. *Neurobiology of addictions*

WEEK 2: 1/24/2019**.** Bucholz. *Diagnostic Criteria for Substance Use Disorder*

WEEK 3: 1/31/2019**.** Grucza. *Analytical Methods for Studying Drug Policy (Causal Inference)*

WEEK 4: 2/7/2019. Grucza**.** *Epidemiological Studies, Survey Methods, Assessments, Data Sources*

WEEK 5: 2/14/2019. Agrawal. *Genetic studies of addiction*

WEEK 6: 2/21/2019. Grucza. *Multivariate methods.*

WEEK 7: 2/28/2019. Chen. *Candidate genes and genomics*

WEEK 8: 3/7/2019. Rachel Winograd. *Harm Reduction.*

WEEK 9: 3/14/2019. Lab Only (Note: This is Spring Break for Main Campus).

WEEK 10: 3/21/2019. Plunk. *Community-Engaged Research*

WEEK 11: 3/28/2019. TBD. *Internet/Social media research.*
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WEEK 12: 4/4/2019. Chen. *Gene-Environment Interations.*

WEEK 13: 4/11/2019. Chen. *Pharmacologic treatment of substance use disorders.*

WEEK 14: 4/18/2019. Ramsey. *Implementation Research.*

WEEK 15: 4/25/2019. Presnall. *Treatment and Recovery.*

WEEK 16: 5/2/2019. Lab Only

Version 1/7/2019

Addictions and Addictive Behaviors
LAB Syllabus

Spring 2019

Overview:
Faculty will work with students to review literature, generate hypothesis, conduct data analyses, and complete a group manuscript. The goal is to complete a manuscript on Addiction for submission to a scientific journal (e.g. Drug and Alcohol Dependence) in 5/2019.

Learning Objectives:
1) Students will gain state of the art knowledge on critical reviews of literature, generating testable hypotheses, data analyses, and scientific manuscript writing.
2) Students will gain knowledge and experience on addiction research and journal submission.

Manuscript Topic Examples: To be distributed prior to first week of class.

Available Research Databases: To be distributed prior to first week of class.

Literature Searches:
1. Each student will conduct literature searches and present 2-3 relevant papers on a selected topic on addiction. Discuss knowledge gaps in important public health topics based on the literature review.
2. The class will select a central hypothesis for the group manuscript and write an introduction to summarize relevant literatures for the central hypothesis.

Manuscript Outlines
1. Introduction
    a. Describe an important public health topic
    b. Review existing literatures on this topic
    c. Define knowledge gaps
    d. Describe central and specific hypotheses and data which will be used for research

2. Methods
    a. Sample
    b. Assessment
    c. Analysis
3. Results
    a. Sample characteristics (Table 1)
    b. Finding 1
    c. Finding 2
    d. Finding 3

4. Discussion
    a. Summarize the major findings
    b. Integrate findings with existing evidence
    c. Discuss additional findings

d. Discuss limitations
e. Describe implications and future directions

Target Journal for Submission
Drug and Alcohol Dependence or other journals in addiction sciences

Authorship Guidelines
First Author(s): 1 -3 volunteers
Primary responsibility; organize references, submission(s). Be available for revision, resubmission.

Middle authors (alphabetized)

Last Authors: Course Faculty

Timeline and Milestones

1/17/19 **Week 1: Addiction: The Scientific Process and Planning**
Faculty and the class will discuss the manuscript plan, required tasks, and timeline.

1/24/19 **Week 2: Addiction: Where is the knowledge gap in the Literature?**
Students will present their literature review results, identified knowledge gaps, and potential testable hypotheses.

1/31/19 **Week 3: Addiction: The impact and feasibility of research questions**
Faculty and students will discuss and select a testable central hypothesis and appropriate database for research.

2/7/19 **Week 4: Addiction: Writing the introduction and hypotheses**
Synthesize the literature and present the Introduction section

2/14/19 **Week 5: Addiction: Methods and Analyses I**
Students present analyses results and methods.

2/21/19 **Week 6: Addiction: Methods and Analyses II**
Students present analyses results and methods

2/28/19 **Week 7: Addiction: Methods and Analyses III**
Students present analyses results and methods

3/7/19 **Week 8: Addiction: Methods and Analyses IV**
Students finalize analyses results and present the Methods section

3/14/19 **Week 9: Addiction: Present the primary finding**
Students will present the primary findings in tables and figures for feedbacks

3/21/19 **Week 10: Addiction: Present secondary findings**
Students will present secondary findings in tables and figures for feedbacks

3/28/19 **Week 11: Addiction: Present additional findings**

Students will present additional findings in tables and figures for feedbacks

4/4/19 **Week 12: Addiction: Finalize Results**
Students will present the complete Results section with tables and figures for feedbacks

4/11/19 **Week 13: Addiction: Research finding implications**
Students will present key findings and implications.

4/18/19 **Week 14: Addiction: How does the finding fill the knowledge gap**
Students will present how these findings extend knowledge in the addiction field.

4/25/19 **Week 15: TBD**

5/2/19 **Week 16: Addiction: Manuscript Finalizing and Submission**
Students present the Discussion section including limitations and future directions
Faculty and students review the final manuscript draft and prepare for journal submission.

Supplemental Text Recommendations

Erickson, Carlton K. 2007. The Science of Addiction: From Neurobiology to Treatment. WW Norton & Company. Focus is on basic science, genetics and treatment. Easy to read.

Goldstein, Avram. 2001. Addiction: From Biology to Drug Policy. Oxford University Press. Very broad focus, somewhat out of date, but information still relevant. Also fairly easy to read.

Levinthal, Charles F. Various editions. Drugs, Behavior, and Modern Society. Pearson Education New Zealand. Haven't read this one, but looks relevant. Like McKim, (below) this is a standard textbook for Addiction courses.

McKim, William A, and Stephanie D Hancock. Drugs and Behavior: An Introduction to Behavioral Pharmacology. Prentice Hall Upper Saddle River, NJ. Various editions. New versions are available, but material is but older (less expensive) versions are sufifceitn. The 6th edition (Mckim only) was published in 2006 and can be found on Amazon for under $30. Highly recommended for those without a basic science background. (For those interested in advanced behavioral pharmacology, search for Meyer and Quenzer).

West, Robert, and Jamie Brown. 2013. Theory of Addiction. John Wiley & Sons. Theory oriented with more of a psychology focus.

Class Project: Potential topics

Cannabis legalization and its effects on alcohol or tobacco use

One of the most important public health questions surrounding cannabis legalization is related to its potential impact on alcohol or tobacco use. While economists believe that legalization will save billions in enforcement and incarceration costs, any increase in alcohol or tobacco use accompanying this would likely eliminate the net economic benefit. By linking legalization policy to state alcohol or tobacco use data, can we address this question in a way that builds on the extant literature?

Adolescent depression and substance abuse

The prevalence of adolescent substance use disorders has undergone marked reductions over the past 10-20 years. Yet recently – and paradoxically, sharp increases in depression and suicidal behavior have been observed. This is paradoxical because these disorders often accompany one another. Has the association between substance misuse and depression changed over time?

Opioids and Polydrug use

The rate of opioid overdose has increased sharply in the last few years, more so than the prevalence of opioid use disorder. One reason for this is the increased availability of fentanyl. But the use of opioids with other drugs also increases risk for overdose. What are the trends – overall and within certain demographics – for alcohol and other drug misuse among opioid misusers. Is this related to the "deaths of despair" phenomenon? (See Case & Deaton, PNAS, 2015).

Demographic slowdowns in the decline of smoking

As alluded to above, death rates for non-Hispanic Whites, particularly those without a college degree began increasing in the early 2000s. Opioids and alcohol are a significant contributor to this phenomenon, but declines in rates of other causes of death have declined, including from COPD. Have smoking rates in this demographic followed those for other groups? Or might smoking be a significant contributor to "deaths of despair"?

Heavy Drinking

Rates of heavy drinking have increased sharply among certain demographic groups, particularly middle-aged and older adults. A number of public use data sets measure "binge" or heavy drinking episodes, defined as drinking 5 or more drinks at a time for men, 4 or more for women, and data series are available covering most years since 2000. What can we learn about the "new" heavy drinkers? Are they more or less educated? Likely to smoke? Report better or worse physical or mental health?