PHA5244
Principles of Evidence-Based Practice
Spring, 2024
3 Credit Hours – [A-E Grading]

The goal of the course is to familiarize students with methods and tools to evaluate biomedical literature to inform evidence-based patient care. The course spans across three main areas: formulating and addressing patient care questions, searching and evaluating available resources, and critically appraising published biomedical literature.

Teaching Partnership Leaders
Richard Segal, RPh, PhD
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- Phone: 352-273-6265

Office Hours: Please see Canvas course site for posted office hours.

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Jingchun "Serena" Guo, MD, PhD
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Office Hours: Please see Canvas course site for posted office hours.

Entrustable Professional Activities
This course will prepare you to perform the following activities which the public entrusts a Pharmacist to perform:
Information Master Domain
12. Use evidence-based information to advance patient care.
      ST12.1 Retrieve and analyze scientific literature to make a patient-specific recommendation.
      ST12.2. Retrieve and analyze scientific literature to answer a drug information question.

Course-Level Objectives
Upon completion of this course, the student will be able to:
1. Define the best practices required to address drug information questions.
2. Identify appropriate resources and search strategies to answer a specific patient care question.
3. Describe the principles of study design and measurement in the evaluation of published research studies.

4. Summarize and apply the principles of biostatistics to interpret study results of published biomedical literature.
5. Explain how clinical findings are summarized in published biomedical literature.
6. Appraise the literature to formulate an evidence-based recommendation in clinical decision-making.

Course Pre-requisites

1. Successful completion of Block 1, 2, and 3 courses.

Course Co-requisites

1. PHA 5781 Patient Care

Required Textbooks/Readings

Available via HSC Library – Access Pharmacy (https://accesspharmacy.mhmedical.com/)

1. Malone PM, Malone MJ, Park SK. eds. **Drug Information: A Guide for Pharmacists, 7e** New York, NY: McGraw-Hill; 2022. ISBN-10: 1260460304
2. White S. eds. **Basic & Clinical Biostatistics, 5e** New York, NY: McGraw-Hill; 2020. ISBN-10: 126045536X

Use UF VPN to access UF Libraries Resources when off-campus.
The UF HSC library staff can assist you with questions or issues related to accessing online library materials. For assistance contact your College of Pharmacy librarian or visit the HSC Library Website at this URL:http://www.library.health.ufl.edu/

Suggested Textbooks/Readings

Available via HSC Library – Access Pharmacy (https://accesspharmacy.mhmedical.com/)

1. Yang Y, West-Strum D. eds. **Understanding Pharmacoepidemiology** New York, NY: McGraw-Hill; 2011.
2. Greenberg RS. eds. **Medical Epidemiology: Population Health and Effective Health Care, 5e** New York, NY: McGraw-Hill; 2015. ISBN 978-0-07-182272-5
3. Aparasu RR, Bentley JP, Pate AN. eds. **Student Handbook for Pharmacy Practice Research: A Companion Book to Conduct Practice-Based Research in Pharmacy**. McGraw Hill; 2022. ISBN 978-1-260-47425-1

Other Required Learning Resources

None

Materials & Supplies Fees

None

Student Evaluation & Grading

Evaluation Methods and How Grades are calculated.

[The Canvas© gradebook will be set-up using the percentages below to compute the grade.]

Assessment Item	Grade Percentage
iRATs [5]: the lowest grade among 6 iRATs will be dropped (5 at 3% each)	15%
tRATs (6 at 1.67% each)	10%
Assignment – Drug Information Form**	20%
Midterm Exam	25%
Final Exam	30%
Total	**100%**

Table 1.1 Evaluation and Grading Above
**Late assignment policy: Late assignments will NOT be accepted.

Table 1.2 grading scale

Percentage	Letter Grade
92.50-100%	A
89.50-92.49%	A-
86.50-89.49%	B+
82.50-86.49%	B
79.50-82.49%	B-
76.50-79.49%	C+
72.50-76.49%	C
69.50-72.49%	C-
66.50-69.49%	D+
62.50-66.49%	D
59.50-62.49%	D-
< 59.50%	E

Rounding of grades:
Final grades in Canvas will be rounded to the 2nd decimal place. If the decimal is X.495 or higher, Canvas will round the grade to X.50. The above scale depicts this policy and grades are determined accordingly. Grade assignment is made using this policy and NO EXCEPTIONS will be made in situations where a student's grade is "close."

Grade adjustments for RATs and Exams:
Grades for readiness assessment tests (iRAT/tRATs) and exams (midterm and final) will be evaluated by the course coordinators using item analyses statistics provided by Canvas™ and ExamSoft™.
Coordinators will only give credit back for those questions deemed to perform poorly based on objective criteria (i.e. Percent of students who answered the question correctly, the Discrimination Index, and the Point Biserial).

Educational Technology Use

The following technology below will be used during the course and the student must have the appropriate technology and software.
1. ExamSoft™ Testing Platform
2. Canvas™ Learning Management System

For technical support, navigate to [Educational Technology and IT Support Contact Information](http://curriculum.pharmacy.ufl.edu/current-students/technical-help/) at this URL: http://curriculum.pharmacy.ufl.edu/current-students/technical-help/

Artificial Intelligence Use

The use of artificial intelligence (AI) text generators such as ChatGPT on assignments, projects, quizzes, and exams is prohibited in this course. Use of AI text generators is considered evidence of academic dishonesty. If a student is uncertain about the use of AI technology, it is the student's responsibility to ask the instructor prior to beginning the assignment or assessment.

Pharm.D. Course Policies

The Policies in the following link apply to this course. Review the General [Pharm.D. Course Policies](http://curriculum.pharmacy.ufl.edu/current-students/course-policies/) carefully, at this URL: http://curriculum.pharmacy.ufl.edu/current-students/course-policies/.

Attendance Policy

Attendance is mandatory for active learning sessions such as team-based learning sessions, case discussions, laboratory sessions, and other activities that the instructor designates as required. This course has 6 required sessions. A student who misses more than 1 session for this course (greater than 25% of the required active learning sessions) will receive an incomplete in the course and will retake the course during the next offering, resulting in delayed graduation.

Late Assignment Policy

Late assignments will NOT be accepted.

Makeup Assignments

N/A

Accessibility and Belonging Statement

The University of Florida College of Pharmacy strives to stimulate a culture that promotes diversity and inclusion within an exceptional community of students, faculty, and staff. It is our intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength, and benefit.

We intend to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let us know ways to improve the course's effectiveness for you personally or for other students or student groups.

If any of our class meetings conflict with any of your religious events, an excused absence will be provided when requested using the standard UF COP process as detailed in the UF COP Course policies.

If you feel that you have experienced or witnessed any bias/treatment that falls short of these expectations, you may submit a report through the UF COP Student Mistreatment Report.

Course Evaluation Process

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Appendix A. Course Directory

Teaching Partnership Leader/Course Director:

Richard Segal, RPh, PhD
- Email: segal@cop.ufl.edu
- Office: 6304 Malachowsky Hall/GNV
- Phone: 352-273-6265

Office Hours: Please see Canvas course site for posted office hours.

Weihsuan 'Jenny' Lo-Ciganic, MSPharmD, MS, PhD
- Email: wlociganic@cop.ufl.edu
- Phone: 412-383-2171

Jingchun "Serena" Guo, MD, PhD
- Email: guoj1@cop.ufl.edu
- Office: 6004 Malachowsky Hall/GNV
- Phone: 352-273-6533

Office Hours: Please see Canvas course site for posted office hours.

Questions to Ask:
- Concerns about performance
- Guidance when there are performance problems (failing grades)
- General questions about content

Other Teaching Partnership Faculty Members:

Lauren Adkins, MLIS
- Email: lauren.adkins@ufl.edu
- Office: GNV Health Science Center Libraries
- Phone: (352)273-8444

Office Hours: Please see Canvas course site for posted office hours.

Instructional Designer:

Name: Holly Fremen
- Email: holly.fremen@cop.ufl.edu
- Office: HPNP 4309
- Phone: 352-273-5558

Academic Coordinator Gainesville Campus:

Name: Ashley Williams
- Email: acwilliams@ufl.edu

Absence/Tardy Email: (Visit the course policy site for further instructions)

Educational Coordinators

Name: Katie Orben
- Email: korben06@ufl.edu
- Office: Jacksonville Campus

Name: Jessica Linares
- Email: jnoriegalinares@ufl.edu
- Office: Orlando Campus

Questions to Ask:
- Issues related to course policies (absences, make up exams, missed attendance)
- Absence/tardy requests (Only the Academic Coordinator handles absence requests)
- Questions about dates, deadlines, meeting place
- Availability of handouts and other course materials
- Assignment directions
- Questions about grade entries in gradebook (missing grades, incorrect grade)
- Assistance with ExamSoft® (Distance campus students may contact the Educational
- Coordinator for use of Examplify and assistance during exams. The Academic Coordinator is the contact person for issues related to grading and posting of ExamSoft grades.

Appendix B: Learning Objectives

Mod#	Unit Topic	Course Objectives	Learning Objectives
	Watch: Course Introduction Video		− Discuss the course's policies and procedures outlined in the syllabus.
1	**Module 1: Evidence-Based Medicine and Principles of Drug Information**	**1-2**	**1. Define the best practices required to address drug information questions.** **2. Identify appropriate resources and search strategies to answer a specific patient care question.**
1.1	Watch: Principles of Evidence-Based Medicine		− Define evidence-based medicine. − Describe the history of evidence-based medicine. − Discuss barriers to implementing evidence-based practices.
1.2	Watch: Formulating an Effective Response		− Summarize the elements of an answerable clinical question. − Outline the steps that are necessary to identify the actual drug information needs of the requestor. − List and describe the four critical factors that should be considered and systematically addressed when formulating a response. − Define analysis and synthesis, and describe their applications in the process of formulating responses and recommendations. − List the elements and characteristics of effective responses to medication-related queries.
1.3	Read: Chapter 3. Drug Information Resources		− Differentiate among primary, secondary, and tertiary sources of biomedical information. − Select appropriate resources for a specific information request. − Describe the role of Internet- and mobile-based resources in the provision of drug information. − Explain the advantages and disadvantages of print- versus Internet- or mobile-based resources for drug information. − Identify tertiary resources to determine appropriateness of information. − Describe appropriate search strategy for identification of drug information. − Recognize alternative resources for provision of drug information. − Describe reliable health information resources for patients and consumers. − Explain the role and progress of drug information resource retrieved from mobile applications and their potential impact on patient care.
1.4	Watch: Searching the Literature		− Describe the systematic approach to answer drug information questions. − Explain the differences between primary, secondary, and tertiary resources. − Describe the general principles in narrowing the scope of a search. − Discuss resources available at the UF Health Science Center Library.
1.5	Watch: PubMed Tutorial		− Describe PubMed's scope and content. − Explain the use of medical subject headings (MeSH) in PubMed. − Explain the use of Pharmacological Action (PA) headings in PubMed. − Discuss common pitfalls in a PubMed search strategy. − Discuss how to manage results in PubMed.

Mod#	Unit Topic	Course Objectives	Learning Objectives
1.6	Watch: Embase Tutorial		- Describe Embase's scope and content. - Explain how to search pharmacy literature in Embase. - Explain the use of Emtree terms in Embase. - Discuss common pitfalls in an Embase search strategy. - Discuss how to manage results in Embase
1.7	Watch: Drug Labeling		- List the elements and purpose of sections in a drug label for prescription drugs. - Recognize the differences in drug labels between prescription and over-the-counter drugs. - List the elements and discuss the limitations of labeling for dietary supplements. - Discuss references to answer drug-related questions pertaining to drug labeling.
1.8	Complete: Evaluating Internet Health Information Tutorial		- Summarize the steps involved in evaluating the health information found on the Internet. - Distinguish the quality of online health information resources.
1.9	Read: Chapter 25. Drug Information and Contemporary Community Pharmacy Practice (ALS prep)		- Discuss limitations of the current approaches pharmacists use to deliver drug information to their patients. - Compare and contrast patient education and consumer health information (CHI) as drug information sources for patients. - Define social networking and describe how patients use this tool as a drug information source. - Discuss mobile health information technology and its impact on how consumers are obtaining information. - Describe the model for drug information services delivered by pharmacists. - Design three strategies using electronic media to assist patients in receiving and applying high-quality drug information. - List 13 characteristics of a high-quality health literate Internet site. - Define participatory medicine and describe how this model changes the dynamic of the patient and the health care professional.
1	**Active Learning Session 1: Applied Drug Information**	**1-2**	
2	**Module 2: Uncontrolled Studies and Adverse Drug Reactions**	**2-3**	**2. Identify appropriate resources and search strategies to answer a specific patient care question.** **3. Describe the principles of study design and measurement in the evaluation of published research studies.**
2.1	Watch: Principles of Causal Inference		- Define and state the important characteristics of a cause. - Describe the differences between causation and correlation. - Discuss the principles of scientific inquiry. - Define and explain the role of counterfactuals in causal inference.

Mod#	Unit Topic	Course Objectives	Learning Objectives
2.2	Watch: Hierarchy of Evidence		– Discuss the major types of studies used in biomedical research. – Describe the effect that study design has on the level of evidence. – Distinguish between experimental and observational studies.
2.3	Watch: Case Reports and Case Series		– Describe the components of a clinical case report. – Discuss the features of a case series. – Describe the systems for reporting adverse drug events. –
2.4	Watch: Determining Causality		– Distinguish between a risk factor and a cause. – List the elements used to determine a causal association. – Describe and apply the elements of the Bradford Hill Criteria and the Naranjo Algorithm. – Explain the difference between an explicit and implicit method of determining a casual association.
2.5	Watch: Internal Validity		– Define internal validity. – Describe and explain the threats to internal validity applied to biomedical studies.
2.6	Read: Example of Case Report (ALS prep)		– Apply concepts of causality and causal inference to a published case report.
2.7	Read: Example of Case Report (ALS prep)		– Apply concepts of causality and causal inference to a published case report.
2.8	Read: Consistency of psychotropic drug-drug interactions listed in drug monographs (ALS prep)		– Apply concepts of drug information and causal inference to describe drug-drug interactions.
2	**Active Learning Session 2: Case Report and Drug Interactions**	**2-3**	
3	**Module 3: Applying Biostatistics for Study Appraisal**	**3-5**	**3. Describe the principles of study design and measurement in the evaluation of published research studies.** **4. Summarize and apply the principles of biostatistics to interpret study results of published biomedical literature.** **5. Explain how clinical findings are summarized in published biomedical literature.**
3.1	Watch: Anatomy of a Research Paper and Evaluation Template		– Describe the elements of a research article. – Define critical appraisal. – Describe how to do an initial assessment of an article. – Identify whether there is conflict of interest in an article. – Compare metrics of impact for a journal.
3.2	Read: Drug Literature Evaluation Template		– Describe the information required to critically evaluate the published literature.
3.3	Read: Chapter 3. Summarizing data & presenting data in tables and graphs		– Define scales of measurement. – Explain how to summarize and display numerical and nominal data. – List types of charts and graphs used in reporting biomedical literature.

Mod#	Unit Topic	Course Objectives	Learning Objectives
3.4	Watch: Levels of Measurement and Hypothesis testing		– Identify descriptive statistics. – Differentiate between nominal, ordinal, interval, and ratio values – Differentiate between independent and dependent variables – Identify a measure of central tendency based on type of the data – Define random error. – Describe the process of hypothesis testing. – List the elements of a good hypothesis.
3.5	Watch: P-values, 95% confidence intervals, and power in study design		– Define alpha and differentiate between Type I and Type II error – Differentiate between a null & alternative hypothesis – Define p value. – Describe the advantages of using 95% Confidence Intervals in reporting study results. – Explain the elements of sample size and power calculations. – Discuss methods to reduce the possibility of either of the type I and type 2 errors occurring.
3.6	Watch: Absolute and Relative Measures		– Define and distinguish between incidence and prevalence. – Describe and calculate absolute and relative measures of comparison. – Calculate and interpret relative risk (RR), relative risk reduction (RRR), absolute risk reduction (ARR), and number needed to treat (NNT) or number needed to harm (NNH).
3.7	Watch: Overview of Statistical Tests		– Describe the different basic statistical tests that can be used in biomedical research. – List statistical software programs that can be used to conduct statistical tests.
3.8	Watch: Basic Concepts of Confounding and Adjustment		– Define and provide examples of confounding. – Describe the methods for assessing presence of confounding. – Describe the methods for controlling confounding including restriction, randomization, matching, and stratified and multivariable or multivariate analyses.
3	**Active Learning Session 3: Biostatistics in Practice**	**3-5**	
4	**Module 4: Experimental Studies**	**3-6**	**3. Describe the principles of study design and measurement in the evaluation of published research studies.** **4. Summarize and apply the principles of biostatistics to interpret study results of published biomedical literature.** **5. Explain how clinical findings are summarized in published biomedical literature.** **6. Appraise the literature to formulate an evidence-based recommendation in clinical decision-making.**
4.1	Watch: Randomized Clinical Controlled Trials		– Define randomized control trials. – Describe key characteristics of randomized controlled trials. – Discuss the role of RCT in the drug development cycle. – List the different types of RCTs.

Mod#	Unit Topic	Course Objectives	Learning Objectives
4.2	Watch: Sampling and Randomization		– Define and differentiate sample and population. – Explain sampling and methods to conduct sampling. – Define randomization applied to RCTs. – List the different types of randomization techniques commonly used in biomedical research.
4.3	Watch: Attrition in RCTs		– Define attrition in the context of randomized controlled trials. – Differentiate between attrition vs. attrition bias – List and explain methods used to control for attrition bias – Differentiate between per-protocol and intention-to-treat analyses.
4.4	Watch: Clinical Outcomes		– Define clinical endpoints and surrogate outcomes and list examples. – Discuss the role of patient reported outcomes in biomedical research. – Describe the advantages and limitations of objective and subjective clinical outcomes.
4.5	Watch: Statistical and Clinical Significance		– Differentiate between clinical and statistical significance. – Discuss the misconceptions regarding P values.
4.6	Watch: External Validity		– Define generalizability of a study. – Describe the effect of inclusion and exclusion criteria in studies.
4.7	Watch: Limitations of RCTs		– – List some key limitations of RCTs. – Explain how to interpret the results of RCTs with flaws. – State potential advantages of observational studies.
4.8	Read: RCT example article (ALS prep)		– Apply the drug literature evaluation template to critique a published RCT.
4	**Active Learning Session 4: Journal Club RCT**	**3-6**	
5	**Module 5: Observational Studies**	**4-6**	**4. Summarize and apply the principles of biostatistics to interpret study results of published biomedical literature.** **5. Explain how clinical findings are summarized in published biomedical literature.** **6. Appraise the literature to formulate an evidence-based recommendation in clinical decision-making.**
5.1	Watch: Observational Studies		– List and distinguish different type of basic observational studies. – Explain why an observational study can generally only be used to describe associations rather than causation
5.2	Watch: Cross-Sectional Studies		– Describe key characteristics of cross-sectional studies. – Discuss the strengths and limitations of cross-sectional studies.
5.3	Watch: Cohort Studies		– Describe key characteristics of cohort studies. – Discuss the strengths and limitations of cohort studies. – Differentiate between prospective and retrospective cohort studies. – Define selection bias and its effect on cohort studies.

Mod#	Unit Topic	Course Objectives	Learning Objectives
5.4	Watch: Survey Research		– List types of commonly used survey instruments and approaches in biomedical research. – Discuss the strengths and limitations of survey research. – Describe the types of survey instruments and delivery methods – Discuss commonly used publicly-available surveys for research.
5.5	Watch: Reliability		– Define reliability. – Describe the different types of reliability. – Discuss the role of reliability in the evaluation of biomedical literature.
5.6	Watch: Sensitivity and Specificity		– Define and calculate sensitivity, specificity, positive predictive value, and negative predictive value – Define and interpret ROC curves
5.7	Read: Chapter 12 Methods of Evidence-Based Medicine and Decision Analyses (Not entire chapter)		– Discuss the threshold model in clinical decision making. – Describes steps in evaluating the accuracy of diagnostic procedures. – Define and interpret ROC curves
5.8	Read: Cohort Study Example Article (ALS prep)		– Apply the drug literature evaluation template to critique a published cohort study.
5	**Active Learning Session 5: Journal Club Cohort study**	**3**	
6	**Module 6: Summarizing the Evidence**	**4-6**	**4. Summarize and apply the principles of biostatistics to interpret study results of published biomedical literature.** **5. Explain how clinical findings are summarized in published biomedical literature.** **6. Appraise the literature to formulate an evidence-based recommendation in clinical decision-making.**
6.1	Watch: Systematic Reviews		– Differentiate between narrative (nonsystematic) reviews vs. systematic reviews – Describe the key elements and the process to conduct a systematic review. – Describe the commonly used guidelines and the Cochrane Collaboration resources for systematic review.
6.2	Watch: Meta-Analyses		– Define meta-analysis. – Explain how to interpret a forest plot. – Explain the sources and effect of heterogeneity on a meta-analysis. – Describe the difference between random and fixed effects models. – Describe how to assess for publication bias in a meta-analysis. – Explain subgroup and sensitivity analyses. – Describe indirect comparisons and define network meta-analysis.

Mod#	Unit Topic	Course Objectives	Learning Objectives
6.3	Watch: Guidelines and Evidence		− Define clinical practice guideline. − Describe the process of development of evidence-based clinical practice guidelines. − Discuss appropriate use of the GRADE system for grading the quality of evidence and the strength of recommendations. − Identify sources of published clinical practice guidelines. − Discuss implementation and evaluation of adaptation of clinical practice guidelines.
6.4	Read: Systematic review/meta-analysis example article (ALS prep)		− Apply appraisal principles and concepts of evidence-based practice to critique a published systematic review.
6.5	Read: Guidelines example article (ALS prep)		− Apply appraisal principles and concepts of evidence-based practice to critique a published clinical guideline.
6.6	Read: Chapter 14. Drug Evaluation Monographs		− Describe and perform an evaluation of a drug product for a drug formulary. − List the sections included in a drug evaluation monograph. − Describe the overall highlights included in a monograph summary. − Describe the recommendations and restrictions that are made in a monograph. − Describe the purpose and format of a drug class review. − Describe and perform an evaluation of a therapeutic interchange.
6.7	Watch: From a PharmD to a research career		− Describe research opportunities for pharmacists in practice. − Discuss career pathways in biomedical research across the continuum of drug development.
6	Active Learning Session 6: Meta-analysis and Guidelines	4-6	

Course Outline

Please routinely check your campus calendar and the Canvas course site for any messages about changes in the schedule including meeting dates/times, deadlines, and room changes.

Date / Time [Recommended for Independent Study]	Mod #	Activity	Activity Title	Objectives	Contact Time (hr)	Responsible
03/04/2024	3	Quiz Online Graded	Pre-test quiz of Module 3's knowledge			Weihsuan 'Jenny' Lo-Ciganic
03/04/2024	1	Module	Module 1: Evidence-Based Medicine and Drug Information	1-2		
03/04/2024	1	Video Lecture	Watch: Course Introduction Video		0.25	Weihsuan 'Jenny' Lo-Ciganic
03/04/2024	1.1	Video Lecture	Watch: Principles of Evidence-Based Medicine		1	Richard Segal
03/04/2024	1.2	Video Lecture	Watch: Formulating an Effective Response		0.5	Richard Segal
03/04/2024	1.3	Reading	Read: Chapter 3. Drug Information Resources		0.5	Richard Segal
03/04/2024	1.4	Video Lecture	Watch: Searching the Literature		1	Lauren Adkins
03/04/2024	1.5	Video Lecture	Watch: PubMed Tutorial		0.5	Lauren Adkins
03/04/2024	1.6	Video Lecture	Watch: Embase Tutorial		0.5	Lauren Adkins
03/04/2024	1.7	Video Lecture	Watch: Finding Primary Sources		0.25	Lauren Adkins

03/05/2024	1.8	Video Lecture	Watch: AI and Drug Information		0.13	Lauren Adkins
03/05/2024	1.9	Video Lecture	Watch: Drug Labeling		0.5	Richard Segal
03/05/2024	1.1O	Reading	Read: Evaluating Internet Health Information Tutorial		0.5	Richard Segal
03/05/2024	1.11	Reading	Read: Chapter 25. Drug Information and Contemporary Community Pharmacy Practice (ALS prep)		0.5	Richard Segal
03/06/2024 at 8:00am – 09:50am	1	Active Learning Session-- VC	Active Learning Session 1: Applied Drug Information	1-2	2	Richard Segal
03/06/2024		Quiz In-class Graded	iRAT 1			Richard Segal
03/06/2024		Quiz In-class Graded	tRat 01			Richard Segal
03/07/2024	2	Module	Module 2: Adverse Drug Reactions and Uncontrolled Studies	2-3		Richard Segal
03/07/2024	2.1	Video Lecture	Watch: Principles of Causal Inference		0.25	Richard Segal
03/07/2024	2.2	Video Lecture	Watch: Hierarchy of Evidence		0.5	Richard Segal
03/08/2024	2.3	Video Lecture	Watch: Case Reports and Case Series		0.5	Richard Segal
03/11/2024	2.4	Video Lecture	Watch: Determining Causality		0.5	Richard Segal
03/11/2024	2.5	Video Lecture	Watch: Internal Validity		0.75	Richard Segal

03/18/2024	2.6	Reading	Read: Example of Case Report (ALS prep)		0.5	Richard Segal
03/19/2024	2.7	Reading	Read: Example of Case Report (ALS prep)		0.5	Richard Segal
03/19/2024	2.8	Reading	Read: Consistency of psychotropic drug-drug interactions listed in drug monographs (ALS prep)		0.5	Richard Segal
03/22/2024 at 10:00am - 11:50am	1	Active Learning Session-- VC	Active Learning Session 2: Case Report and Drug Interactions	2-3	2	Richard Segal
03/22/2024		Quiz In-class Graded	iRAT 02			Richard Segal
03/22/2024		Quiz In-class Graded	tRat 02			Richard Segal
03/23/2024	3	Module	Module 3: Applying Biostatistics for Study Appraisal	3-5		Weihsuan 'Jenny' Lo-Ciganic
03/25/2024	3.1	Video Lecture	Watch: Anatomy of a Research Paper and Evaluation Template		0.5	Weihsuan 'Jenny' Lo-Ciganic
03/26/2024	3.2	Reading	Read: Drug Literature Evaluation Template		0.25	Weihsuan 'Jenny' Lo-Ciganic
03/27/2024	3.3	Reading	Read: Chapter 3. Summarizing data & presenting data in tables and graphs		0.5	Weihsuan 'Jenny' Lo-Ciganic
03/29/2024	3.4	Video Lecture	Watch: Levels of Measurement		0.5	Weihsuan 'Jenny' Lo-Ciganic

Date	Module	Type	Title/Topic	Chapters	Hours	Instructor
			and Hypothesis testing			
04/1/2024 5pm		Assignment Graded	Assignment: Drug Information Form			Richard Segal
04/01/2024	3.5	Video Lecture	Watch: P-values, 95% confidence intervals, and power in study design		1	Weihsuan 'Jenny' Lo-Ciganic
04/02/2024	3.6	Video Lecture	Watch: Absolute and Relative Measures		1	Weihsuan 'Jenny' Lo-Ciganic
04/05/2024	3.7	Video Lecture	Watch: Overview of Statistical Tests		1	Weihsuan 'Jenny' Lo-Ciganic
04/05/2024	3.8	Video Lecture	Watch: Basic Concepts of Confounding and adjustment		0.25	Weihsuan 'Jenny' Lo-Ciganic
04/10/2024 at 1:00pm-2:50pm	3	Active Learning Session--VC	Active Learning Session 3: Biostatistics in Practice	3-5	2	Weihsuan 'Jenny' Lo-Ciganic
04/10/2024		Quiz In-class Graded	iRAT 03			Weihsuan 'Jenny' Lo-Ciganic
04/10/2024		Quiz In-class Graded	tRat 03			Weihsuan 'Jenny' Lo-Ciganic
04/16/2024 at 10:00am-12:00pm	1-3	Exam	Midterm Exam	1-5	2	Richard Segal, Serena Jingchuan Guo, Weihsuan 'Jenny' Lo-Ciganic
04/11/2024	4	Module	Module 4: Experimental Studies	3-6		Serena Jingchuan Guo
04/11/2024	4.1	Video Lecture	Watch: Randomized Clinical Controlled Trials		0.5	Serena Jingchuan Guo
04/12/2024	4.2	Video Lecture	Watch: Sampling and		0.5	Serena Jingchuan Guo

Date	Module	Type	Title		Hours	Instructor
			Randomization			
04/12/2024	4.3	Video Lecture	Watch: Attrition in RCTs		0.5	Serena Jingchuan Guo
04/12/2024	4.4	Video Lecture	Watch: Clinical Outcomes		0.5	Serena Jingchuan Guo
04/15/2024	4.5	Video Lecture	Watch: Statistical and Clinical Significance		0.25	Serena Jingchuan Guo
04/15/2024	4.6	Video Lecture	Watch: External Validity		0.75	Serena Jingchuan Guo
04/15/2024	4.7	Video Lecture	Watch: Limitations of RCTs		0.5	Serena Jingchuan Guo
04/16/2024	4.8	Reading	Read: RCT example article (ALS prep)		1	Serena Jingchuan Guo
04/18/2024 at 1:00pm-2:50pm	4	Active Learning Session--VC	Active Learning Session 4: Journal Club RCT	3-6	2	Serena Jingchuan Guo
04/18/2024		Quiz In-class Graded	iRAT 04			Serena Jingchuan Guo
04/18/2024		Quiz In-class Graded	tRat 04			Serena Jingchuan Guo
4/25/2024 at 8:00am		Exam Review	Midterm Exam Review			
04/18/2024	5	Module	Module 5: Observational Studies	4-6		Weihsuan 'Jenny' Lo-Ciganic
04/18/2024	5.1	Video Lecture	Watch: Observational Studies		0.75	Weihsuan 'Jenny' Lo-Ciganic
04/18/2024	5.2	Video Lecture	Watch: Cross-Sectional Studies		0.5	Weihsuan 'Jenny' Lo-Ciganic
04/18/2024	5.3	Video Lecture	Watch: Cohort Studies		0.75	Weihsuan 'Jenny' Lo-Ciganic
04/19/2024	5.4	Video Lecture	Watch: Survey Research		0.5	Weihsuan 'Jenny' Lo-Ciganic
04/19/2024	5.5	Video Lecture	Watch: Reliability		0.5	Weihsuan 'Jenny' Lo-Ciganic

04/22/2024	5.6	Video Lecture	Watch: Sensitivity and Specificity		0.5	Weihsuan 'Jenny' Lo-Ciganic
04/22/2024	5.7	Reading	Read: Chapter 12 Methods of Evidence-Based Medicine and Decision Analyses (Not entire chapter)		0.25	Weihsuan 'Jenny' Lo-Ciganic
04/23/2024	5.8	Reading	Read: Cohort Study Example Article (ALS prep)		1	Weihsuan 'Jenny' Lo-Ciganic
04/24/2024 at 8:00am-9:50am	5	Active Learning Session-- VC	Active Learning Session 5: Journal Club Cohort study	3	2	Weihsuan 'Jenny' Lo-Ciganic
04/24/2024		Quiz In-class Graded	iRAT 05			Weihsuan 'Jenny' Lo-Ciganic
04/24/2024		Quiz In-class Graded	tRat 05			Weihsuan 'Jenny' Lo-Ciganic
4/24/2024	6	Module	Module 6: Summarizing the Evidence	4-6		Weihsuan 'Jenny' Lo-Ciganic
4/24/2024	6.1	Video Lecture	Watch: Systematic Reviews		0.5	Weihsuan 'Jenny' Lo-Ciganic
4/24/2024	6.2	Video Lecture	Watch: Meta-Analyses		1	Weihsuan 'Jenny' Lo-Ciganic
4/25/2024	6.3	Video Lecture	Watch: Guidelines and Evidence		0.5	Weihsuan 'Jenny' Lo-Ciganic
4/25/2024 at 8:00am		Exam Review	Exam Review			
4/26/2024	6.4	Reading	Read: Systematic review/meta-analysis example article		0.75	Weihsuan 'Jenny' Lo-Ciganic
4/29/2024	6.5	Reading	Read: Guidelines example article		0.5	Weihsuan 'Jenny' Lo-Ciganic

4/29/2024	6.6	Reading	Read: Chapter 14. Drug Evaluation Monographs		0.5	Weihsuan 'Jenny' Lo-Ciganic
4/30/2024	6.7	Video Lecture	Watch: From a PharmD to a research career		0.25	Richard Segal
05/01/2024 at 8:00am-9:50am	6	Active Learning Session--VC	Active Learning Session 6: Meta-analysis and Guidelines, Case #7	4-6	2	Weihsuan 'Jenny' Lo-Ciganic
05/01/2024		Quiz In-class Graded	iRAT 06			Weihsuan 'Jenny' Lo-Ciganic
05/01/2024		Quiz In-class Graded	tRat 06			Weihsuan 'Jenny' Lo-Ciganic
5/2/2024 at 8:30am		Course Eval	Course Eval Due			
05/06/2024 at 10:00am-12:00pm	1-6	Exam	Final Exam	All		Richard Segal, Serena Jingchuan Guo, Weihsuan 'Jenny' Lo-Ciganic
					42.38	