



**Chaminade**  
**University**  
OF HONOLULU

HAWAI'I SCHOOL OF PROFESSIONAL PSYCHOLOGY  
AT CHAMINADE UNIVERSITY OF HONOLULU

**Course Syllabus**

[Chaminade University Honolulu](http://www.chaminade.edu)

3140 Wai'ālae Avenue - Honolulu, HI 96816

[www.chaminade.edu](http://www.chaminade.edu)

**Course Number:** PP7041

**Course Title:** Quantitative Inquiry

**Department Name:** Hawai'i School of Professional Psychology

**College/School/Division Name:** College of Education and Behavioral Sciences

**Term:** Spring 2024

**Course Credits:** 3

**Class Meeting Days:** Tuesday (section I) or Thursday (section II)

**Class Meeting Hours:** 1:00 p.m. – 4:00 p.m.

**Class Location:** Section I – Keiffer 6; Section II – Keiffer 10

**Instructor Name:** Jeffrey D. Stern, Ph.D.

**Email:** jeffrey.stern@chaminade.edu

**Phone:** 808.739-7427

**Office Location:** Behavioral Sciences 109

**Office Hours:** Tuesdays & Thursdays: 9:00-11:00; Wednesdays by appointment

**University Course Catalog Description and Overview**

This course surveys the major methodologies for completing psychological research, with an emphasis on the design of quantitative strategies for answering clinical questions. Students develop critical thinking skills to evaluate and review published research. Diversity issues in measurement are explored.

**Instructional Contact and Credit Hours**

Students can expect 15 hours of instructional engagement for every 1 semester credit hour of a course.

Instructional engagement activities include lectures, presentations, discussions, group-work, and other activities that would normally occur during class time. Instructional engagement activities may occur in a face-to-face meeting, or in the classroom.

In addition to instructional engagement, students can expect to complete 30 hours of outside work for every 1 semester credit hour of a course. Outside work includes preparing for and completing readings and assignments. Such outside work includes, but is not limited to, all research associated with completing assignments, work with others to complete a group project, participation in tutorials, labs, simulations and other electronic activities that are not a part of the instructional engagement, as well as any activities related to preparation for instructional engagement.

At least an equivalent amount of work specified in the paragraph above shall be applied for other academic activities as established by the institution, including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

## **Marianist Values**

This class represents one component of your education at Chaminade University of Honolulu. An education in the Marianist Tradition is marked by five principles and you should take every opportunity possible to reflect upon the role of these characteristics in your education and development:

- Education for formation in faith
- Provide an integral, quality education
- Educate in family spirit
- Educate for service, justice and peace
- Educate for adaptation and change

## **Native Hawaiian Values**

Education is an integral value in both Marianist and Native Hawaiian culture. Both recognize the transformative effect of a well-rounded, value-centered education on society, particularly in seeking justice for the marginalized, the forgotten, and the oppressed, always with an eye toward God (Ke Akua). This is reflected in the 'Ōlelo No'eau (Hawai'ian proverbs) and Marianist core beliefs:

1. Educate for Formation in Faith (Mana) E ola au i ke akua ('Ōlelo No'eau 364) May I live by God
2. Provide an Integral, Quality Education (Na'auao) Lawe i ka ma'alea a kū'ono'ono ('Ōlelo No'eau 1957) Acquire skill and make it deep
3. Educate in Family Spirit ('Ohana) 'Ike aku, 'ike mai, kōkua aku kōkua mai; pela iho la ka nohana 'ohana ('Ōlelo No'eau 1200) Recognize others, be recognized, help others, be helped; such is a family relationship
4. Educate for Service, Justice and Peace (Aloha) Ka lama kū o ka no'eau ('Ōlelo No'eau 1430) Education is the standing torch of wisdom
5. Educate for Adaptation and Change (Aina) 'A'ohe pau ka 'ike i ka hālau ho'okahi ('Ōlelo No'eau 203) All knowledge is not taught in the same school

## **Program Learning Outcomes: HSPP Aims and Competencies**

The Hawai'i School of Professional Psychology at Chaminade University of Honolulu's clinical psychology doctoral program's aim is to educate and train students employing a practitioner-scholar model so that they will be able to function effectively as clinical psychologists. To ensure that students are adequately prepared, the curriculum is designed to provide for the meaningful integration of psychological science, theory, and clinical practice. The clinical psychology program at the Hawai'i School of Professional Psychology is designed to emphasize the development of knowledge, skills, and attitudes essential in the training of health service psychologists who are committed to the ethical provision of quality, evidence based services to diverse populations and who are able to apply multiple theoretical perspectives to clinical issues.

The Hawai'i School of Professional Psychology at Chaminade University of Honolulu's clinical psychology doctoral program subscribes to the American Psychological Association (APA) Standards of Accreditation. As such, students are expected to establish an identity in and orientation to health service psychology by acquiring the necessary discipline-specific knowledge and profession-wide competencies. Upon completion of the PSYD degree in clinical psychology, students will be able to:

1. Apply ethical and legal standards relevant to the practice of clinical psychology, including professional ethics that guide professional behavior.
2. Apply professional communication and interpersonal skills, to include the utilization of clear, informed, and well-integrated communication, as well as effective interpersonal skills across settings.
3. Apply professional values and attitudes across settings, including self-reflective practice and openness to supervision and feedback.
4. Apply awareness of individual and cultural diversity, including knowledge of theoretical models and diversity research that serve to guide the application of diversity competence.

5. Articulate and integrate the history and systems of psychology as well as the basic areas in scientific psychology, including affective, biological, cognitive, developmental, psychopharmacological, and sociocultural aspects of behavior.
6. Conduct science in psychology, applying psychometrics, statistical analyses, and quantitative and qualitative research methods.
7. Competently perform psychological assessments, including the ability to administer, interpret, integrate, and convey results of psychological tests.
8. Competently perform clinical interventions, including case formulation, theoretical conceptualization, developing and applying evidence-based treatment plans, and evaluating treatment effectiveness in work with clients.
9. Apply knowledge of consultation models and practices, including interprofessional and interdisciplinary skills in consultative services.
10. Articulate supervision models and practices, including areas of ethics and potential conflicts.
11. Apply the Marianist values, through acts of community service, justice, and peace.

### Course Learning Outcomes

1. Students will identify, analyze, and evaluate quantitative research methods and constructs through course assignments (e.g., single-subject design posters/presentations, research proposals and critique) and the final examination. (Competency 6)
2. Students will articulate key psychometric and statistical constructs (e.g., validity and reliability, statistical power) as evidenced by course assignments (operationalization, single-subject design posters/presentations, research proposals, an article critique) and the final examination (Competency 6)
3. Students will demonstrate understanding of the ethical principles that are designed to ensure the protection of participants in human research as demonstrated by their completion of the CITI online ethics training and research proposals, including generating a consent form. (Competency 1, 2)
4. Students will demonstrate their understanding of fundamental statistical strategies that are used to analyze data gathered in psychology research as evidenced by their single subject design posters/presentations, class discussions, research proposals, and final exam. (Competency 6)
5. Students will learn single subject research design methodology and how to apply it to clinical cases as evidenced by class discussions and their single subject design posters/presentations. (Competency 6, 8)

### Required Learning Materials

#### Required Textbooks

Bordens, K.S., & Abbott, B.B. (2018). *Research design and methods: A process approach* (10<sup>th</sup> ed.). New York: McGraw Hill. (B&A)

#### Required Readings

American Psychological Association. (2010). *Ethical principles of psychologists and code of conduct*. Washington, DC: Author.

American Psychological Association (2019). *Publication manual of the American Psychological Association, 7<sup>th</sup> edition*, Washington DC: Author.

Applebaum, M., Cooper, H., Kline, R. B., Mayo-Wilson, E., Nezu, A. M., and Rao, S. M. (2018). Journal article reporting standards for quantitative research in psychology: The APA publications and communications board task force report. *American Psychologist*, 73(1), 3-25.

Eigsti, I., Zayas, V., Mischel, W., Shoda, Y., Ayduk, O., Dadlani, M. B., Davidson, M. C., Aber, J. L., and Casey, B. J. (2006). Predicting cognitive control from preschool to late adolescence and young adulthood. *Psychological Science*, 17(6), 478-484.

Kazdin, A. E. (2017). *Research design in clinical psychology* (5<sup>th</sup> ed.). Pearson. (selected content handouts)

Lilienfeld, S. O., Ritschel, L. A., Lynn, S. J., Rautin, R. L., and Latzman, R. D. (2014). Why ineffective psychotherapies appear to work: A taxonomy of causes of spurious therapeutic effectiveness. *Perspectives on Psychological Science*, 9(4), 355-387.

- Tate, R. L., McDonald, S., Perdices, M., Togher, L., Schultz, R., and Savage, S. (2008). Rating the methodological quality of the single-subject designs and n-of-1 trials: Introducing the single-case experimental design (SCED) scale. *Neuropsychological Rehabilitation, 18*(4), 385-401.
- Tate, R. L., Perdices, M., Rosenkoetter, U., Shadish, W., Vohra, S., Barlow, D. H., Horner, R., Kazdin, A., Kratochwill, T., McDonald, S., Sampson, M., Shamseer, L., Togher, L., Albin, R., Backman, C., Douglas, J., Evans, J. J., Gast, D., Manolov, R., Mitchell, G., Nickels, L., Nikles, J., Ownsworth, T., Rose, M., Schmid, C. H., and Wilson, B. (2017). The Single-Case Reporting guideline In behavioural interventions (SCRIBE) 2016 statement. *Neuropsychological Rehabilitation, 27*(1), 1-15.
- Tate, R. L., Perdices, M., Rosenkoetter, U., Wakim, D., Godbee, K., Togher, L., and McDonald, S. (2013). Revision of a method quality rating scale for single-case experimental designs and n-of-1 trials: The 15-item Risk of Bias in N-of-1 Trials (RoBiNT) scale. *Neuropsychological Rehabilitation, 23*(5), 619-638.
- Torquati, L., Mielke, G. I., Brown, W. J., Burton, N. W., and Kolbe-Alexander, T. L. (2019). Shift work and poor mental health: A meta-analysis of longitudinal studies. *American Journal of Public Health, 109*(11), e13-e20.
- Watts, T. W., Duncan, G. J., & Quan, H. (2018). Revisiting the marshmallow test: A conceptual replication investigating links between early delay of gratification and later outcomes. *Psychological Science, 29*(7), 1159-1177.

## Course Requirements

**Attendance and Participation:** Students are expected to attend every class, arrive on time, complete all assigned readings, actively participate in class discussions, and behave appropriately and professionally at all times. More than two unexcused absences will result in being withdrawn from the class or a failing grade. Student attendance and participation will be one measure of students' understanding of the theoretical, empirical, and applied foundations within the clinical practice of psychology.

Students are expected to familiarize themselves with all assigned materials ahead of time and to come prepared to discuss and/or apply them in class. The readings listed for a particular class date are the readings that will be discussed on that date, so please read them ahead and come prepared to discuss them or do activities based on the readings. **(20 points)**

**Operational Definition:** You will be assigned a "construct" or "behavior" for which you will be required to create an operational definition. You will also be required to give a hypothetical example of its use in a research study. In so doing, you will describe how your construct will be measured, very specifically! For example, if your construct is "road rage," you will have to define this term, operationally (i.e., measurable, observable; i.e., what are and what are not Road Rage behaviors?), and give an example of how you would measure it in a study designed to, for example, reduce road rage behaviors. This will be covered the first week, with in-class presentations (5 minutes only) and write up due week 2. **(20 points)**.

**Article Critique:** Students are to critique an article. The critique will include a summary, critical analysis, and conclusion (three paragraphs). The critical analysis must include no fewer than 5 separate points of methodological criticism. Critiques are not to be longer than 1 page, double-spaced, with 1-inch margins, and no less than 10-point font. One point will be deducted for every line over one page on the critique. This will be difficult for all of you and very difficult for some-however, it is an important exercise in organization and parsimony. The article to be critiqued will be provided. **(20 points)**.

**Single-subject research study and poster presentation:** A detailed description of the specifics of this assignment is forthcoming and should be referred to, often, during the completion of this assignment. It consists of sub-assignments including selection of the behavior (and operational definition); baseline monitoring of the behavior; development of a single subject design methodology; review of relevant

literature to complete the design; implementation of the design and gathering of data; and presentation, including graph(s). APA formatting and style are required. (40 points)

**Research Proposal Presentation:** Students are expected to give a 15-minute presentation. Presentations should include a detailed description of a quantitative research proposal. The presentation should include a brief background of the research, the purpose and significance of the proposed research, the research question, the hypotheses, the design, the method (sample, instrumentation, procedures), and statistical tests proposed. (20 points)

**Research Proposal:** Students are to submit a quantitative research proposal between 10-15 pages that demonstrates understanding of the concepts covered in class. No fewer than 8 peer-reviewed journal articles are to be included in the proposal, which could be used as the basis for the CRP. Be sure to reference all source material properly. (60 points)

**CITI online ethics in research with human participants:** This training is accessible for free through Chaminade IRB. Access the online ethics CITI training <https://chaminade.edu/irb/irb-training/>. Then follow the instructions for “2.1 Registering and Enrolling for CITI.” When you have completed the required courses:

Social and Behavioral Research – Basic/Refresher (10 modules)

Information Privacy Security IPS (4 modules)

Social and Behavioral Responsible Conduct of Research - RCR (8 modules)

Print up the certificates of completion (3) and email them to me at [jeffrey.stern@chaminade.edu](mailto:jeffrey.stern@chaminade.edu) by 11:59pm on Friday night, 4/26/24. (20 points)

**Final Exam:** This will be an in-class, closed book final exam. Content will be based upon readings, lecture material, class discussions and activities and was developed using the EPPP test prep materials. (50 points)

## Grading

Project/Assignment	Point Value (% of grade)
Attendance and Participation	20 points (8%)
Operational Definition	20 points (8%)
Article Critique	20 points (8%)
Single Subject study presentation and poster	40 points (16%)
Research Proposal Presentation	20 points (8%)
Research Proposal (manuscript)	60 points (24%)
CITI research ethics online training	20 points (8%)
Final Exam	50 points (20%)
Total	250 points (100%)

**Grading Scale** designed from

Grade point equivalents (and grading scale values) are presented below. Final scores > .5 will be rounded up.

A = 4.00 (93-100)	A- = 3.67 (90-92)	
B+ = 3.33 (88-89)	B = 3.00 (83-87)	B- = 2.67 (80-82)
C = 2.00 (70-79); Failed - No credit given		F = 0.00 ( $\leq$ 69); Failed - No credit given

### **Instructional Contact and Credit Hours**

The unit of semester credit is defined as university-level credit that is awarded for the completion of coursework. One credit hour reflects the amount of work represented in the intended learning outcomes and verified by evidence of student achievement for those learning outcomes. Each credit hour earned at Chaminade University should result in a minimum of 45 hours of engagement, regardless of varying credits, duration, modality, or degree level. This equates to one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester. Terms that have alternative lengths, such as 10 week terms, should have an equivalent amount of faculty instruction and out-of-class student work to meet each credit hour. Direct instructor engagement and out-of-class work result in total student engagement time of 45 hours for one credit. The number of engagement hours may be higher, as needed to meet specific learning outcomes.

#### *Specific Credit Situations*

The minimum 45 hours of engagement per credit hour can be satisfied in fully online, internship, or other specialized courses through several means, including (a) regular online instruction or interaction with the faculty member and fellow students and (b) academic engagement through extensive reading, research, online discussion, online quizzes or exams; instruction, collaborative group work, internships, laboratory work, practica, studio work, and preparation of papers, presentations, or other forms of assessment. This policy is in accordance with federal regulations and regional accrediting agencies.

### **Course Policies**

***Instructor and Student Communication:*** Questions for this course can be emailed to the instructor. Online, in-person, and phone conferences can be arranged. Response time is up to 2 days.

***Cell phones, tablets, and laptops:*** Out of consideration for your classmates, please set your cell phone to silent mode during class. Students are encouraged to bring laptops or tablets to class as the instructor will assign online activities and readings that will require the use of a laptop or tablet. Laptops and tablets should not be misused, such as checking distracting websites. Use your best judgment and respect your classmates and instructor.

***Disability Access:*** If you need individual accommodations to meet course outcomes because of a documented disability, please speak with me to discuss your needs as soon as possible so that we can ensure your full participation in class and fair assessment of your work. Students with special needs who meet criteria for the Americans with Disabilities Act (ADA) provisions must provide written documentation of the need for accommodations from the Counseling Center by the end of week three of the class, in order for instructors to plan accordingly. If a student would like to determine if they meet the criteria for accommodations, they should contact the Kōkua 'Ike Coordinator at (808) 739-8305 for further information ([ada@chaminade.edu](mailto:ada@chaminade.edu)).

Failure to provide written documentation through the Counseling Center will prevent your instructor from making the necessary accommodations, instructors cannot provide accommodations unless they have been prescribed by the Counseling Center. Once you have received an official notice of accommodations from the Counseling Center, it is also very important to discuss these accommodations directly with your instructor so that they can better support your needs. If you have specific questions regarding your individualized accommodations, you may speak directly with your instructor and/or you may contact the Counseling Center.

**Title IX Compliance:** Chaminade University of Honolulu recognizes the inherent dignity of all individuals and promotes respect for all people. Sexual misconduct, physical and/or psychological abuse will NOT be tolerated at CUH. If you have been the victim of sexual misconduct, physical and/or psychological abuse, you are encouraged to report this matter promptly. Faculty members promote safe and healthy environments, and any sexual, physical, and/or psychological misconduct or abuse will be reported to the Title IX Coordinator. If you or someone you know has been harassed or assaulted, you can find the appropriate resources by visiting Campus Ministry, the Dean of Students Office, the Counseling Center, or the Office for Compliance and Personnel Services.

**Attendance Policy:** Students are expected to attend regularly all courses for which they are registered. Student should notify their instructors when illness or other extenuating circumstances prevent them from attending class, and they should make arrangements to obtain missed information and complete missed assignments. Notification may be done by emailing the instructor's Chaminade email address, calling the instructor's campus extension, or by leaving a message with the instructor's division office. It is the instructor's prerogative to modify deadlines of course requirements accordingly. Any student who stops attending a course without officially withdrawing may receive a failing grade.

Students may be automatically withdrawn from the class or receive a failing grade if there are three or more absences in a 16-week term or two absences in a row in a 16-week term. With the condensed nature of the 8-week terms, missing class one day (e.g., 6-hours of class) would be equivalent to two absences in a row in a 16-week term.

Students with disabilities who have obtained accommodations from the Chaminade University of Honolulu ADA Coordinator may be considered for an exception when the accommodation does not materially alter the attainment of the learning outcomes. Federal regulations require continued attendance for continuing payment of financial aid. When illness or personal reasons necessitate continued absence, the student should communicate first with the instructor to review options. Anyone who stops attending a course without an official withdrawal may receive a failing grade or be withdrawn by the instructor at the instructor's discretion.

**Professionalism with Class Topics and Discussions:**

It is anticipated that in the course of students' graduate education in clinical psychology, they will have emotional reactions to class topics and discussions. Recognizing, understanding, and managing one's internal states is an integral part of one's professional responsibility. In the event that affective reactions become overwhelming, students are expected to manage their reactivity as they would as a practicing professional, subsequently discussing it with professors/supervisors and seeking informal and/or formal support. Similarly, it is the student's responsibility to notify the professor of potential issues, so they can address them (e.g., using the correct pronouns, pronouncing names/words correctly, awareness of triggering content).

Self-disclosure is considered voluntary and at the discretion of the student. Additionally, it is expected that peers be mindful and respectful of disclosures of others, keeping shared information confidential.

**Academic Conduct Policy:** Any community must have a set of rules and standards of conduct by which it operates. At Chaminade, these standards are outlined to reflect both the Catholic, Marianist values of the institution and to honor and respect students as responsible adults. All alleged violations of the community standards are handled through an established student conduct process, outlined in the Student Handbook and HSP Program Catalog, and operated within the guidelines set to honor both students' rights and campus values.

Students should conduct themselves in a manner that reflects the ideals of the University. This includes knowing and respecting the intent of rules, regulations, and/or policies presented in the Student Handbook and Program Catalog, and realizing that students are subject to the University's jurisdiction from the time of their admission

until their enrollment has been formally terminated. Please refer to the Student Handbook and HSPP Program Catalog for more details. A copy of the Student Handbook is available on the Chaminade website.

Unless expressed in writing via a university accommodation, all course information, content, and materials in any medium (including but not limited to notes, slides, recordings, electronic files, and verbal discussions and presentations) are prohibited from being intentionally or unintentionally shared (or allowed to be accessed), distributed, published, uploaded, or reproduced in any form, as they are reserved for the private use by the student registered for the course. Any audio and/or visual recordings (including pictures) are prohibited unless prior written permission from the instructor is granted, and permission is limited to individual and temporary use (i.e., recordings are not to be shared/reproduced, recordings must be deleted at the end of the term).

Unless otherwise instructed, all course submissions should follow the Publication Manual of the American Psychological Association, 7th Edition format. The faculty at the Hawai'i School of Professional Psychology at Chaminade University of Honolulu is dedicated to providing a learning environment that supports scholarly and ethical writing, free from academic dishonesty and plagiarism. This includes the proper and appropriate referencing of all sources. Your course assignments may be submitted to an online authenticity resource (e.g., Turnitin), which helps students and instructors detect potential cases of academic dishonesty.

Similarly, the program needs to evaluate a student's *competency* in all academic and practice areas (including writing skills and critical thinking). Therefore, using artificial intelligence (AI) and automated writing tools is *not permitted* for program submissions and will be considered academic dishonesty.

**Technology:** A laptop with the following technology may be required in order to complete courses in the Clinical Psychology program: at least Windows 10 (for PCs), at least Mac OS X 10.5.8 (for Macs); a current antivirus program; the current Microsoft Office (PowerPoint and Word) and Adobe Acrobat; a standard web browser; and an internet or broadband connection with speed and connectivity to support internet searches and video conferencing. Most courses are paperless, but a printer/scanner may also be required.

**Course Schedule:**

Week	Topic	Required Reading	Assignment(s) due
1	1/9 or 1/11 Syllabus; Scientific method; Developing a research design; Operationalization	Syllabus; APA Pub Manual, B&A Ch. 1	Operationalization
2	1/16 or 1/18 Operationalization presentations; Theories, Hypotheses, models; SS design	B&A Ch. 2 & 3; Tate (08)	<b>Operationalization write-up</b> Select SS design behavior to measure
3	1/23 or 1/25 Single Subject Design cont'd; Peer/Lit Review; Causal Inference; Experimental vs. correlational Research; Validity & reliability	B&A Ch. 4 & 12 Tate (13)	
4	1/30 or 2/1 Validity & reliability II; Bias, science, and pseudoscience, systematic observations, critiquing research	B&A Ch. 5, Lillienfeld	Read article TBA for In-class critique
5	2/6 or 2/8 Scientific Method II; validity and reliability III;	B&A Ch. 6; Eigsti	
6	2/13 or 2/15 Ethics; Observational Research; validity of non-experimental research methods; review critique #1	B&A Ch. 7 & 8 APA Ethics in Research Guidelines	<b>Critique #1</b>
7	2/20 or 2/22 Present SS posters, recruitment, assignment, intro. to group designs	Tate (17)	<b>SS Research Presentation and Poster due</b>
8	2/27 or 2/29 Survey and Questionnaire Research; validity and reliability of survey research	B&A Ch. 9	



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9	3/5 or 3/7	Between and Within Subjects Experimental Designs	B&A Ch. 10 Watts	
10	3/12 or 3/14	Mixed Designs; covariation and Interaction, descriptive stats, measures of association	B&A Ch. 11, 13	
11	3/19 or 3/21	Inferential statistics, statistical power, parametric and non-parametric statistics	B&A Ch. 14	<b>First draft of Research Proposal</b> <i>Don't forget CITI training!!</i>
12	3/26 or 3/28	Make Edits to Proposal as suggested, work on ppt	B&A Ch. 15	
13	4/2 or 4/4	No class this week.		
14	4/9 or 4/11	Meta-analysis; Reporting Research Results; Finishing up.	B&A Ch. 16; Applebaum; Torquati	<i>Don't forget CITI training!</i>
15	4/16 or 4/18	Research Proposal Presentations; review for final exam		<b>Final Research Proposal</b> <i>Don't forget CITI training!</i>
16	4/23 or 4/25	<b>Final Exam</b>		<b>Ethics CITI training Certificate</b> <b>Final Exam</b>

Bordens & Abbott (2018)

\* Note: Additional and/or alternate readings/chapters may be assigned and will be provided prior to the date the material is covered. Additionally, this course syllabus and schedule are subject to change based upon the needs of students, progress, availability of resources, and the capricious whim of the professor.