

Course Syllabus

PSY (7964).(001) | (Dynamical Systems in Social Psychology)

Spring 2018

The University of Utah - Department of Psychology

3 Credit Hours

Class Meets (T: 1:00-4:00) in room (801 BEHS)

This syllabus is not a binding legal contract. With reasonable notice to students, the instructor may modify the syllabus and course schedule at any time, to accommodate the needs of the class. Should you have any questions or concerns, it is your responsibility to contact the instructor for clarification.

Instructor: (Jonathan Butner)

Office	(714) BEHS
Phone	(801/581-3206)
Email	(jonathan.butner@psych.utah.edu)
Office hours	(by appointment)

Required Materials

We will utilize selected readings including articles and chapters from books, approximately 100 pages a week. Some of these will be quite technical and will only truly be understood after extended discussion (much of the systems literature is quite difficult).

Course Format

This will be a driven discussion format. The instructor will guide the discussion using comments provided by the students from earlier in the week. Some weeks will contain mini lecturettes for when the materials are particularly difficult to understand without further instructions.

Course Description

Dynamical systems (the study of changing systems) is a mathematical approach for characterizing change in multi-component phenomena. In this class, we explore psychological phenomena as a dynamic system. This involves incorporating interdisciplinary ideas that can be extrapolated from calculus and applied to any phenomena over time. It stresses the idea that psychology is about studying temporal patterns that have stable properties nested into a much

larger hierarchy of relationships. The end result is a completely different epistemology of psychology that brings theory, methods, and statistics much closer together.

Course Overview

At its simplest, we can think of dynamical systems theory as a series of tools that can be used to understand how a group of individuals form group behavior, how a series of attributes can combine to make decisions, or how two people can coordinate a conversation. Its central focus is on processes as a whole over time and how those processes can change qualitatively in the way they function. For instance, central and peripheral processing are two well-documented modes by which people attempt to make educated decisions. As social psychologists, we normally think of it as a switch in which the decision making process takes into account very different information. From a dynamical systems approach the aim is to be able to describe both modes as states within the system, depict the stability of each state, their transitory nature, and key variables that can make one state less stable or even become impossible all together. This should not sound all that different from what has already been done. However, a systems approach is unique in that it attempts to quantify these qualitative features.

Several theories have derived features from dynamical systems that tend to appear across many phenomena – chaos theory, complexity theory, catastrophe theory, and self-organization theory are just a few. Dynamical systems can then be thought of as the mathematics behind all of these other theories. In truth, there are lots of grey areas between which theory is which and the distinctions I make are arbitrary, at best. In this spirit, we will not limit our study to any one these.

A systems approach is relatively new to psychology. Ironically, the parents of social psychology argued for models that are very consistent with a systems approach. However, over the years, the field has been limited by methodology, statistics, and fear of making phenomena too complicated. For example, most phenomena in social psychology have been described in a “snapshot in time” where change – a key feature in any systems approach – has been largely ignored. Many limitations still remain in psychology, but there have also been recent advances for bringing this meta-theoretical approach to the field.

In this course, we will review some features and terminology of a systems approach. Our initial focus will examine well-documented systems from physics, chemistry, and biology. This will help us establish what a dynamic system is and is not. Next we will translate this logic into psychology, though we will rely on the concepts proposed by systems theory rather than any particular phenomena in psychology. These concepts will then be translated into mathematics through a combination of visualizations and equation forms. We will then enter into some of the more esoteric areas of systems theory that has had little coverage in psychology thus far. Finally, we will sample from the breadth of psychology that has taken a systems approach or is consistent with a systems approach.

Course Objectives

- At the end of the course, students will be able to describe dynamical systems terminology and ideas as they apply to the social sciences in language accessible to non-systems scientists. This will include canonical examples as well as conceptual integrations of the complex ideas.
- At the end of the course, students will be able to depict changing phenomena through time understanding the relationship between emergence/self-organization, temporal patterning, and stability.
- At the end of the course, students will have some skills in regards to examining social science phenomena as a dynamic system using a barrage of analytic techniques. This will not exist in any specific analytic package though some examples will be provided in R.
- At the end of the course, students will have applied systems ideas to their own line of research considering their own phenomena as a dynamic system.

Evaluation Methods/Assignments

Learning objectives will be assessed through four primary mechanisms.

- *Comments on Weekly Readings.* At least twenty four hours prior to class time students are required to post at least three comments on the Canvas Discussion Board in regards to the articles. These comments can entail summaries, questions, thoughts, research ideas, and other commentaries that are relevant to the readings. In total, this should be equivalent to approximately one double-spaced page in 12 point font per person (that is, a single sentence for each comment will not suffice). These comments will be used by the instructor to facilitate discussion, pulling questions and comments to guide class time. Therefore it is important for students to use these as an opportunity to highlight what they understand, help other understand, and also allow for creative directions to be brought into the class time discussions. *In addition, students must respond to at least two other people's comments.* These responses can take place in the 24 hours prior to class. Commenting on others' comments is to ensure that each person has read each other's comments. All in attendance (including those who sit in the class) are expected to complete the readings and provide comments.
- *Discussion Participation.* All students are expected to participate in the discussion exploring the complex ideas covered in the readings. On some weeks, assignments will be given wherein individuals must present. These presentations may be simple data presentations, or other ideas to help cement the materials for all classmates. All in attendance (including those who sit in the class) are expected to participate.
- *Midterm Project.* To assess the ability to explain systems ideas to non-systems scientists one of two mechanisms will be employed half way through the semester. Either students will be given an exam testing terminology or students will be asked to generate web material that will be posted on the university website (systems.psych.utah.edu). *In either case, the focus will be on being able to explain systems concepts to non-systems scientists.* If a midterm exam is used, the exam will be in computer written format during the class period requiring the student to provide definitions and examples for various terminology without the aid of notes or discussion. If web materials are generated instead, each student will also have their web materials evaluated by at least two other

students in the class, providing comments and corrections. Again, it will involve providing terminology and examples but for the much larger internet community.

- *Final Project.* To enforce mastery within one's own field, students will generate a research paper applying systems theory to their own area of interest. This can be a study proposal, theory generation, or complete application. The instructor may choose to include an in class presentation and may adapt a poster presentation version for both the written and in class formats (to be decided after the midterm).

Grading Policy

Evaluation Method	Weight
Participation	30%
Reading Comments/Assignments	30%
Midterm	20%
Final	20%

Over the entire semester students may be late twice for providing reading comments and not have it count against the student's grade. Late involves providing comments within the 24 hours prior to class. For these late comments to be accepted, the student is responsible for providing printed copies of their comments for everyone in the class and the student still must have commented on at least two other people's comments prior to the class (showing that they are still prepared for class, just not 24 hours in advance). Lateness on midterms and finals will not be accepted.

Class participation will be recorded for each class.

Grades will be determined using a straight percentage system.

Lower limit for grades: A (93%), A- (90%), B+ (87%), B (83%), B- (80%), C+ (77%), C (73%), C- (70%), D+ (67%), D (63%), D- (60%), E (<60%)

Student Rights and Responsibilities

All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, detailed in the Student Handbook. Students have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible

classroom behaviors. Students have the right to appeal such action to the Student Behavior Committee. For Student Rights and Responsibilities, see <http://www.regulations.utah.edu/academics/6-400.html> (Links to an external site.)

Department of Psychology Undergraduate Academic Misconduct Policy

The Department of Psychology has a zero tolerance policy for academic misconduct. Academic misconduct includes cheating, plagiarizing, research misconduct, misrepresenting one's work, and inappropriately collaborating. This applies to any work students turn in for evaluation or course credit. Definitions can be found in the Student Code at <http://www.regulations.utah.edu/academics/6-400.html> (Links to an external site.)

If you are suspected of academic misconduct, the process proceeds according to the rules found in the

Student Code, University Policy 6-400(V). **If you are found responsible for misconduct, consequences range from failure on the assignment to dismissal from the program,** consistent with both University and Psychology Department Policy.

Minor offenses (plagiarism in written work) include failure to use citations correctly, because of lack of understanding of proper procedures for crediting ideas, rather than intention to cheat (with no evidence of lifted/stolen text. Major Offenses include:

1. Cheating on a test, quiz, problem set, or other independent work
2. Plagiarism in written work: Copying any quantity of text from another source or another student without quoting and citing the copied text.
3. Plagiarism in written work: Flagrant misuse of citations, such that a student clearly attempted to represent ideas that were not his/hers as if they were, even if the ideas were presented in the student's own words.

Both minor and major offenses will have consequences, as outlined in the full Psychology Department Policy (which you can find [here \(Links to an external site.\)](#) in PDF format).

[Optional:] Assignments turned in on Canvas will be screened using Turnitin, and the above policy will be followed when misconduct is found.

Course Policies

- Class will start on time. Up to two breaks will be taken during class on the hour or halfway through the class (if only a single break is given that day). Students are expected to show on time.
- Students are allowed to bring food and drink to class.
- Students are welcome to use computers in class. Recordings are not allowed without everyone's permission. Further any approved recording can only be used for personal use and not placed on the internet.
- Grading, articles, and discussions outside of class will be maintained through the Canvas system.
- The room has a projector, but only has a VGA connection. If you will need to use it, keep this in mind that you might require an adapter.

University Attendance Requirements

The University expects regular attendance at all class meetings. Instructors must communicate any particular attendance requirements of the course to students in writing on or before the first class meeting. Students are responsible for acquainting themselves with and satisfying the entire range of academic objectives and requirements as defined by the instructor.

Students absent from class to participate in officially sanctioned University activities (e.g., band, debate, student government, intercollegiate athletics) or religious obligations, or with instructor's approval, shall be permitted to make up both assignments and examinations. The University expects its departments and programs that take students away from class meetings to schedule such events in a way that will minimize hindrance of the student's orderly completion of course requirements. Such units must provide a written statement to the students describing the activity and stating as precisely as possible the dates of the required absence. The involved students must deliver this documentation to their instructors, before the absence.

Except in cases of sudden illness or emergency, students shall in advance of the absence arrange with the instructor to make up assignments.

Unexpected University facility closures due to weather, emergency or disaster may occur from time to time. Students may be required to complete coursework missed due to these or other class cancellations; however, instructors requiring mandatory make-up sessions may not penalize students if they are unable to attend due to time conflicts, etc.

Student Support & Accommodations

Americans with Disabilities Act (ADA) Statement

The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for

accommodations. All information in this course can be made available in alternative format with prior notification to the Center for Disability Services.

More information can be found in the CDS Student Handbook:

<http://disability.utah.edu/documents/CDS-Student-Handbook.pdf> (Links to an external site.).

Scheduling Accommodations.

Consistent with Section Q of the University's Policy for Instruction and Evaluation, to be found at <http://regulations.utah.edu/academics/6-100.php> (Links to an external site.), I am willing to accommodate university activities as well as values-based obligations (including religious or other values-based activities) that conflict with course activities. No later than the end of the second week of the semester, please send me an e-mail with the nature and date of your anticipated absence (earlier if your conflict occurs before that deadline). That will give us time to work out a way for you to make up any missed work.

Content Accommodations.

There will be no content accommodations in this class. Please review the syllabus and topics carefully and be sure that you are able to engage all of the topics we will be covering this semester.

Wellness Statement

Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student's ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness - www.wellness.utah.edu (Links to an external site.) (801-581-7776). The Counseling Center is another excellent resource, offering services that include counseling and a mindfulness clinic (see <http://counselingcenter.utah.edu> (Links to an external site.)).

Veterans Center

If you are a **student veteran**, I want you to know that the U of Utah has a Veterans Support Center on campus. They are located in Room 161 in the Oplin Union Building. Hours: M-F 8-5pm. Please visit their website for more information about what support they offer, a list of ongoing events and links to outside resources: <http://veteranscenter.utah.edu> (Links to an external site.). Please also let me know if you need any additional support in this class for any reason.

LGBT Resource Center

If you are a member of the **LGBTQ community**, I want you to know that my classroom is a safe zone*. Additionally, please know that the U of Utah has an LGBT Resource Center on campus. They are located in Room 409 in the Oplin Union Building. Hours: M-F 8-5pm. You can visit their website to find more information about the support they can offer, a list of events through

the center and links to additional resources: <http://lgbt.utah.edu> (Links to an external site.). Please also let me know if there is any additional support you need in this class.

Learners of English as an Additional/Second Language

If you are an English language learner, please be aware of several resources on campus that will support you with your language development and writing. These resources include: the Department of Linguistics ESL Program (<http://linguistics.utah.edu/esl-program/> (Links to an external site.)); the Writing Center (<http://writingcenter.utah.edu/> (Links to an external site.)); the Writing Program (<http://writing-program.utah.edu/> (Links to an external site.)); the English Language Institute (<http://continue.utah.edu/eli/> (Links to an external site.)). Please let me know if there is any additional support you would like to discuss for this class.

Nondiscrimination: Discrimination is defined at the University of Utah as less than favorable treatment based on race, color, religion, national origin, gender identity/expression, sexual orientation, age, disability, or status as a protected veteran. The University of Utah expects members to treat one another with respect. Any behavior that results in sexual abuse, harassment, or intimidation of another person, or any unwanted objectionable sexual attention toward another person is considered to be sexual harassment and will not be tolerated. As a student of the University of Utah, you are entitled to participate in University programs and activities free of sexual harassment and other forms of discrimination. No verbal statements of discrimination or harassment will be tolerated in this class. This includes conversations and discussions that are held through the class website, as well. Please be respectful! If you feel that there has been a violation of these expectations, please let me know and/or contact the Director of the Office of Equal Opportunity and Affirmative Action (Park Bldg. Rm 135; (801) 581-8365).

Campus Safety: The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.

Academic Calendar

<http://www.sa.utah.edu/regist/calendar/datesDeadlines/deadlines.htm> (Links to an external site.)

Course Schedule

Date	Topic/Description
1/7/20	Syllabus Review and Introduction to Emergence

1/14/20	Introduction to Complexity
1/21/20	Emergence and Self-Organization
1/28/20	A Taxonomy of Patterns
2/4/20	Open Systems & Stability
2/11/20	Differences and Differentials
2/18/20	Catastrophic Change and Nonlinearity
2/25/20	Topology in Two Dimensions
3/4/20	Towards a Dynamical Psychology
3/10/20	Spring Break
3/17/20	Cycles and Cycles of Cycles
3/24/20	Systems Modeling
3/31/20	Flexible Systems Approaches
4/7/18	Coupling and Coordination
4/14/18	Symmetry and Super Symmetry
4/21/18	Chaos and Dimensionality

Course Summary:

Date	Details	Due
Mon Jan 15, 2018	Assignment Week 1	due by 1pm
Tue Jan 16, 2018	Assignment Week 1 Netlogo Assignment	due by 4pm
Mon Jan 22, 2018	Assignment Week 2	due by 1pm
Tue Jan 23, 2018	Assignment Week 2 Additional Assignment Assignment Week 1 Additional Assignment	due by 1pm due by 4pm
Mon Jan 29, 2018	Assignment Week 3	due by 1pm
Mon Feb 5, 2018	Assignment Week 4	due by 1pm
Tue Feb 6, 2018	Assignment Week 4 Additional Assignment	due by 1pm
Mon Feb 12, 2018	Assignment Week 5	due by 1pm
Tue Feb 13, 2018	Assignment Week 5 Additional Assignment	due by 11:59pm
Tue Mar 6, 2018	Assignment Additional Assignment Web Pages Due	due by 11:59pm
Fri Mar 6, 2020	Assignment Midterm Due Assignment Final Papers Here Assignment Final Week Assignment SKIP: Week 13 Assignment Week 10 Assignment Week 11	due by 11:59pm

Date

Details

Due

Assignment [Week 12](#)

Assignment [Week 6](#)

Assignment [Week 7](#)

Assignment [Week 8](#)

Assignment [Week 9](#)