COURSE INFORMATION

Course Title: Nonlinear Dynamic Systems

Course Number: ISC 5453-001 & 5453-002

Credit Hours: 3

Instructor: William E. Hahn, Ph.D.

PREREQUISITES, COREQUISITES, AND PROGRAM OF STUDY

Required: There are no required prerequisite courses.

COURSE LOGISTICS

Fall 2022

Instructional Method: In Person

Location and Time: Ly 103

CRN(s): ISC 5453-001, ISC 5453-002, ISC 5453-003

INSTRUCTOR CONTACT INFORMATION

✉ whahn@fau.edu

☎ +1 (561) 479–8123

Office Hours: Tuesday 12:00pm–3:00pm by appointment, txt 561-479-8123

COURSE DESCRIPTION

Introduction to nonlinear dynamical systems in an interdisciplinary setting. Topics covered include one-, two- and three-dimensional ordinary differential equations, bifurcations, one- and two-dimensional maps, iterated function systems, time scale separation and self-organization and elementary stochastic systems.

COURSE OBJECTIVES/STUDENT LEARNING OUTCOMES

Successful completion of this course will enable students to follow the literature on Complex Systems and apply methods of nonlinear dynamics to their own research.

COURSE EVALUATION METHOD

The requirements of the course and structure for evaluation are as follows:

1. Weekly Lab Reports Posted Online 80%
2. Final Project 20%

COURSE GRADING SCALE

A	A−	B+	B	B−	C+	C	D	F
$90-100$	$87-89$	$84-86$	$80-83$	$77-79$	$70-76$	$60-69$	$50-59$	$0-49$

POLICY ON MAKEUP TESTS, LATE WORK, AND IN-COMPLETES

Late work is not accepted except in extraordinary circumstances.

Exams and written assignments will be provided during lectures and must be handed in on their respective due dates.

To master the material covered in this course, it is expected that the student will spend a minimum of two hours per week per credit hour on the out-of-classroom assignments.

CREDIT HOUR DEFINITION

This course involves 50 minutes of instruction for each credit hour per week, and a minimum of two hours of out of class assignments each week for 15 weeks. To master the material covered in this course it is expected that the student will spend a minimum of two hours per week per credit hour on the out of classroom assignments.

REASONABLE ACCOMMODATION STATEMENT FOR MAKEUPS

Reasonable accommodation will be made for students participating in a religious observance or in University-approved activities, including athletic or scholastic teams, musical and theatrical performances and debate activities.

SPECIAL COURSE REQUIREMENTS

Students are expected to have Colab, GitHub, Overleaf accounts setup.

For more information visit https://education.github.com/.

https://www.overleaf.com/

COURSE ETIQUETTE POLICY

This course is conduced at the graduate level. Students are expected to attend and participate in all lectures.

ATTENDANCE POLICY STATEMENT

"*Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence*"

DISABILITY POLICY STATEMENT

In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at www.fau.edu/sas/.

COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS) CENTER

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to http://www.fau.edu/counseling/.

CODE OF ACADEMIC INTEGRITY POLICY STATEMENT

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001.

TEXTS/READINGS

Readings and notes will be provided on online.

SUPPLEMENTARY/RECOMMENDED RESOURCES

Posted Online

COURSE TOPICAL OUTLINE

Introduction to nonlinear dynamical systems in an interdisciplinary setting.

- Models
- Cellular Automata
- PDE
- ODE
- Systems
- Oscillator Networks
- Neural ODE
- Neural PDE