

CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

NEW COURSE PROPOSAL

PROGRAM AREAS MATH

1. **Catalog Description of the Course.** *[Include the course prefix, number, full title, and units. Provide a course narrative including prerequisites and corequisites. If any of the following apply, include in the description: Repeatability (May be repeated to a maximum of ___ units); time distribution (Lecture ___ hours, laboratory ___ hours); non-traditional grading system (Graded CR/NC, ABC/NC). Follow accepted catalog format.]*

MATH 350 DIFFERENTIAL EQUATIONS AND DYNAMICAL SYSTEMS (3)

Three hours of lecture per week.

Prerequisite or Corequisite: MATH 250.

Topics include: ordinary differential equations, existence and uniqueness of solutions. Linear equations. Laplace methods. Flows and diffeomorphisms, limit sets, iterations of maps. Positive entropy systems, chaotic behavior of trajectories.

2. **Mode of Instruction.**

	Units	Hours per Unit	Benchmark Enrollment
Lecture	<u> 3 </u>	<u> 1 </u>	<u> 24 </u>
Seminar	<u> </u>	<u> </u>	<u> </u>
Laboratory	<u> </u>	<u> </u>	<u> </u>
Activity	<u> </u>	<u> </u>	<u> </u>

3. **Justification and Learning Objectives for the Course.** (Indicate whether required or elective, and whether it meets University Writing, and/or Language requirements) *[Use as much space as necessary]*

The course is a required course for Mathematics majors.

Through this course, students will be able to

- Use criteria for the existence and uniqueness of solutions of ordinary differential equations
- Analyze linear differential equations
- Use Laplace methods
- Discuss the basic properties of flows and diffeomorphisms, limit sets and iterations of maps
- Analyze chaotic behavior of trajectories
- Present concepts and techniques of Differential Equations and Dynamical Systems in oral and written form.

This course is not designed to satisfy the University Writing or Language requirements.

4. **Is this a General Education Course** **YES** **NO**
If Yes, indicate GE category:

A (English Language, Communication, Critical Thinking)	
B (Mathematics & Sciences)	
C (Fine Arts, Literature, Languages & Cultures)	
D (Social Perspectives)	
E (Human Psychological and Physiological Perspectives)	

5. Course Content in Outline Form. *[Be as brief as possible, but use as much space as necessary]*

Ordinary differential equations: Existence and uniqueness of solutions
Linear equations
Laplace methods
Flows and diffeomorphisms
Limit sets, iterations of maps
Positive entropy systems, chaotic behavior of trajectories.

6. References. *[Provide 3 - 5 references on which this course is based and/or support it.]*

Dynamical Systems: Differential Equations, Maps and Chaotic Behaviour
by D.K. Arrowsmith, C.M. Place (Chapman & Hall Mathematics Series) 2000.

7. List Faculty Qualified to Teach This Course.

All Mathematics Faculty

8. Frequency.

a. Projected semesters to be offered: Fall X Spring X Summer

9. New Resources Required.

a. Computer (data processing), audio visual, broadcasting needs, other equipment

None

b. Library needs

None

c. Facility/space needs

None

10. Consultation.

Attach consultation sheet from all program areas, Library, and others (if necessary)

11. If this new course will alter any degree, credential, certificate, or minor in your program, attach a program modification.

Proposer of Course

Date