California State University Channel Islands New Course Proposal

Program Areas Math and Computer Science

1. Catalog Description of the Course.

Math 511 FUNCTIONAL ANALYSIS (3)

Three hours of lecture per week

Prerequisite: Admission to the Computer Science or Mathematics Graduate Program Topics include: metric spaces, function spaces, normed vector spaces, linear operators. Banach spaces, Hilbert space,. Spectral theory, and fundamental theorems in functional analysis. Applications in various fields including computer science, bioinformatics, statistical analysis.

2. Mode of Instruction.

<u>Units</u>	Hou	ırs per Unit	Benchmark Enrollment
Lecture 3	1	30	
Seminar *	*	*	
Laboratory	*	*	*
Activity *	*	*	

3. Justification and Learning Objectives.

Justification: This course is an elective for students in MS in Applied Mathematics and MS in Computer Science.

Learning Objectives:

Through this course, students will be able to

- Understand the theoretical basis of the function spaces and normed spaces
- Work with metric and function spaces, linear operators, and spectral theory
- Analyze properties of various function spaces
- Apply functional analysis to various fields
- Express concepts and techniques of in oral and written form by constructing various proofs.

4. Is this a General Education Course?

No.

5. Course Content in Outline Form.

Topics:

- a) metric spaces,
- b) function spaces,
- c) normed vector spaces,
- d) linear operators,
- e) Banach spaces,
- f) Hilbert spaces.
- g) Spectral theory,
- h) Fundamental theorems
- i) Applications in computer science, bioinformatics, statistical analysis.

6. References.

Texts:

- a) Functional Analysis, W. Rudin, McGraw-Hill (1997)
- b) History of Functional Analysis, Jean Dieudonné, North-Holland (1981)

7.	Li	st Faculty Qualified to Teach This Course.
	Al	l Mathematics faculty
8.		equency. Projected semesters to be offered: FallX_ Spring _X Summer
9.	Ne	ew Resources Required.
	a.	Computer (data processing), audio visual, broadcasting needs, other equipment
		none
	b.	Library needs
		none
	c.	Facility/space needs
		none
10.		onsultation. tach consultation sheet from all program areas, Library, and others (if necessary)
11.		this new course will alter any degree, credential, certificate, or minor in your ogram, attach a program modification.
Pro	pos	I. Grzegorczyk10/31/03 er of Course Date

c) Introduction to Fourier Analysis and Euclidean Spaces, Stein and Weiss (2000)

Approvals

Program Coordinator	Date
GE Committee Chair (If applicable)	Date
Curriculum Committee Chair	Date
Dean	Date
Effective Semester:	

California State University Channel Islands

Course prefix, number, title, and units: MATH 51	Course	prefix,	number,	title,	and units:	MA	TH 51	1
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2.	Program Areas:	<u>MATH</u>

Recommend Approval

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Art		
Business & Economics		
Education		
ESRM		
Humanities		
Liberal Studies		
Mathematics & CS		
Sciences		
Library*		
Information Technology*		
I echnology*		

^{*} If needed