

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 484. ALGEBRAIC GEOMETRY AND CODING THEORY (3)

Three hours of lecture per week.

Prerequisite: MATH 333

Study of algebraic varieties over algebraically closed fields. Modern application to coding theory.

2. Mode of Instruction.

	Units	Hours per Unit	Benchmark Enrollment
Lecture	3	1	24
Seminar	_____	_____	_____
Laboratory	_____	_____	_____
Activity	_____	_____	_____

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 an elective for Mathematics majors.

Through this course, students will be able to

- Discuss and apply the basic notion of algebraic variety over an algebraically closed field
- Apply elementary concepts from algebraic geometry to coding theory
- Present concepts and techniques of elementary Algebraic Geometry 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]*

Algebraic varieties over algebraically closed fields
Function fields
Local rings
Divisors
Homology and Cohomology groups
Modern application to coding theory.

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

Designs, Graphs, Codes and Their Links (London Math. Society Students Texts, No 22) , by J.H. Van Lint, P. J. Cameron (1992)

A First Course in Coding Theory (Oxford Applied Mathematics and Computer Science Series), by Raymond Hill (1990)

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