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 584 ALGEBRAIC GEOMETRY AND CODING THEORY (3)
Three hours lecture per week
Prerequisite: Admission to the Computer Science or Mathematics Graduate Program
Topics include: Algebraic varieties over algebraically closed fields and finite fields, Hamming codes, cyclic codes, BCH codes, alternant codes, Goppa codes, and codes on graphs.

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]*

This course is an elective for the proposed MS program in Mathematics. Students in the course will learn how to apply algebraic geometry to coding theory. Some of the topics covered will relate to current research questions. This course could stimulate further research in the area.

Through this course, students will be able to

- Discuss and apply the algebraic varieties over an algebraic field in various situations
- Apply 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**

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

Algebraic varieties over algebraically closed fields
Algebraic varieties over finite fields,
Hamming codes,
Cyclic codes,
BCH codes,

Alternant codes,
Goppa codes,
Codes on graphs.

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

Theory of Error-Correcting Codes MacWilliams and Sloane North Holland 1977
Designs, Graphs, Codes and Their Links (London Math. Soc. Stud. Texts, No 22) , 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.

_____JESSE ELLIOTT _____10/31/20002_____
Proposer of Course Date

Approvals

_____

Program Coordinator Date

_____

GE Committee Chair Date
(If applicable)

_____

Curriculum Committee Chair Date

_____

Dean Date

Effective Semester: _____

California State University Channel Islands
New Course Proposal Consultation Sheet

Course prefix, number, title, and units: _____ MATH 484. Algebraic Geometry and Coding Theory (3)

2. Program Areas: _____MATH

Recommend Approval

Program Area/Unit	**Program/Unit Coordinator**	**YES**	**NO** (attach objections)	**Date**
Art				
Business & Economics				
Education				
ESRM				
Humanities				
Liberal Studies				
Mathematics & CS				
Sciences				
Library*				
Information Technology*				

* If needed