CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

NEW COURSE PROPOSAL

PROGRAM AREAS _____BIOLOGICAL AND PHYSICAL SCIENCES, MATH AND COMPUTER SCIENCE

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.]*

PHYS 510 ADVANCED IMAGE ANALYSIS TECHNIQUES (3)

Three hours of lecture in the lab per week.

Prerequisite: Admission to the Computer Science or Mathematics Graduate Program

Image processing course in the fundamentals of 2-D digital signal processing with emphasis in image processing techniques, image filtering design and applications. Programming exercises in Matlab (or Octave) will be used to implement the various processes, and their performance on synthetic and real images will be studied. Applications in medicine, robotics, consumer electronics and communications.

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 a core course for MS in Computer Science and MS in Applied Mathematics.

Through this course, students will be able to

1. match, register, recognize, classify, and cluster, 2D data
2. analyze complex image configurations.
3. Demonstrate knowledge of image processing techniques
4. write original computer code for a image analysis .
5. use applications of 2D analysis in algorithms
6. analyze scientific visualization processes.
7. organize and express ideas clearly and convincingly in oral and written forms.

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]*

a) 2-D digital signal processing
b) image processing techniques,
c) image filtering design and applications.
d) programming to implement the various processes,
e) performance on synthetic and real images

f) applications in medicine, robotics, consumer electronics and communications.

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

Geometric Tools for Computer Graphics (The Morgan Kaufmann Series in Computer Graphics and Geometric Modeling) Philip J. Schneider, David H. Eberly , Morgan Kaufmann; 2002, ISBN: 1558605940

Beyond the Third Dimension: Geometry, Computer Graphics, and Higher Dimensions , Thomas F. Banchoff, Scientific American Library Series, W H Freeman & Co., 1996, ISBN: 0716760150

Advanced Animation and Rendering Techniques, Wall, Addison-Wesley, 1999, 0201544121

7. List Faculty Qualified to Teach This Course.

Physics 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

Use of existing computer labs.

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.

Geoff Dougherty 10/31/1003

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

1. Course prefix, number, title, and units: _____COMP 566 (3)

2. Program Areas: _____MATH AND COMPUTER SCIENCE

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