

## GE CRITERIA APPROVAL FORM

Course Number and Title: PHYS/COMP/MATH 445 Image Analysis and Pattern Recognition

Faculty Member(s) Proposing Course: Geoff Dougherty

**Indicate which of the following categories would be satisfied by this course by marking an "X" on the appropriate lines.**  
Courses may be placed in up to two GE categories as appropriate. Upper Division Interdisciplinary GE courses may be placed in two categories plus the UDIGE category.

	A1: Oral Communication
	A2: English Writing
	A3: Critical Thinking
X	B1: Physical Sciences
	B2: Life Sciences
	B3: Mathematics
X	B4: Computers and Technology
	C1: Fine Arts
	C2: Literature
	C3: Languages & Cultures
	D: Social Perspectives
	E: Human Psychological & Physiological Perspectives
X	Upper Division Interdisciplinary GE

Lab Included? Yes X No \_\_\_\_\_

Please provide a brief explanation of how the proposed course meets each of the criteria for the selected General Education categories.

This course is **GE** because of its breadth and applicability: students taking it will acquire the skills, experience and knowledge "appropriate to educated people within our society".

***All Category B courses shall:***

- Promote the understanding and appreciation of the methodologies of math or science as investigative tools and the limitations of mathematical or scientific endeavors.

→The course will present the scientific principles and concepts underpinning pattern recognition in an image, encouraging the student to recognize the limitations in extracting and quantifying such information.

- Present mathematical or scientific knowledge in a historical perspective and the influences of math or science on the development of world civilizations, both past and present.

→ The historical background, the utility of earlier methods, and the applications of pattern recognition to complex and diverse patterns will be addressed.

- Apply inductive and deductive reasoning processes and explore fallacies and misconceptions in the mathematical or scientific areas.

→Critical reasoning skills in the application of physical principles and choice of appropriate technique will be emphasized.

**Category B-1 Physical Sciences—Chemistry, Physics, Geology, and Earth Sciences courses shall:**

- Present the principles and concepts of the physical sciences and the physical universe.

→ Scientific principles and concepts, and their applications to pattern recognition, will be discussed.

**Category B-4 Computers and Information Technology courses shall:**

- Include use of computers or information technology to solve problems as appropriate.

→ Programming exercises will be used for image segmentation, feature extraction and classification. A wide variety of digital images will be used, and the performance of different approaches studied.

***In addition to meeting Category A-E criteria as appropriate all Upper Division Interdisciplinary GE courses shall:***

- Emphasize interdisciplinarity by integrating content, ideas, and approaches from two or more disciplines.

→ This course is an example of connecting the disciplines of physics, math and computer science in an explicit manner, and in a way that focuses on examples from these disciplines and beyond. The course encompasses B1, B3 and B4 but our rules only allow two of these to be listed. The course explicitly covers content from Computer Science (approaches, algorithms, ways of thinking) and does not merely use computers as tools.

- Include substantive written work consisting of in-class writing as well as outside class writing of revised prose.

→ Each student is required to provide a written report on a term project on particular image recognition strategies. The report will consist of both in-class writing and outside writing of revised prose on a topic, and each report will be discussed in the class.