

(2)

CURRICULUM PROPOSAL FORM 2000-2001

NON-GENERAL EDUCATION PROCESS A

***DEADLINES:** Deadline dates for 2000/2001 submissions: Regular proposals: October 20, 2000 to be implemented in Fall 2001; Short-Term proposals: December 8, 2000 to be implemented in Fall, 2001; Regular proposals February 16, 2001 to be implemented in Spring, 2002; March 23, 2000 for short-term courses to be implemented in Spring 2002.

PROPOSAL TITLE: Computer Vision

SPONSOR(S): Jianning Xu

DEPARTMENT: Computer Science

COLLEGE: LAS

IF LAS CHECK ONE: History/Humanities Math/Sciences Social/Behavioral Sciences

Check one: Undergraduate Graduate

0707 565

THE ATTACHED **NON-GEN-ED** PROPOSAL IS BEST DESCRIBED BY THE ITEM(S) CHECKED.

New non-gen-ed course

Short-term non-gen-ed course

Minor curricular changes (fewer than three) to:

- existing non-gen-ed course
- non-gen-ed degree requirements
- major
- minor, specialization, concentration, track, certificate program

DEPARTMENT
(Signature indicates approval)

Dept. Curriculum Chair / Date Jianning Xu 10/20/00

Dept. Chairperson / Date [Signature] 10/20/00

ACADEMIC DEAN

Approved Not Approved Comments:

Dean's Signature/Date [Signature] 10-27-00

RECEIVED

ROWAN UNIVERSITY SENATE

COLLEGE CURRICULUM COMMITTEE
 Date of open hearing (if necessary) 12/22/00 Approved Not Approved _____
 Comments:
 Signature of College Chair/Date: [Signature] 2/8/01

UNIVERSITY CURRICULUM COMMITTEE
 Date Received/Processed 5/30/01
 Comments:
 Curriculum Chair Signature [Signature] Date Announced At Senate 5/30/01

EXECUTIVE VICE PRESIDENT/PROVOST
 Approved Not Approved _____ If no, reasons are as follows:
 Student Credit Hours _____ Faculty Load Hours _____ Equalized Credit Hours _____
 Official Copy & Approval Sheet Filed (Date): _____ Executive VP/Provost Signature/Date [Signature] 6/5/01

REGISTRAR
 Date Approved Course Description Received _____ Hegis Taxonomy & Course Number Assigned _____
 Registrar Signature/Date [Signature] 6/5/01

NOTIFICATION FORWARD

<input checked="" type="checkbox"/> Senate Curriculum Committee Chairperson	<input checked="" type="checkbox"/> Academic Dean(s)	<i>Memo sent 8/13/01</i>
<input checked="" type="checkbox"/> Department Chairpersons	<input checked="" type="checkbox"/> Registrar	_____ Sponsor(s)

Rowan University
Department of Computer Science

Course Proposal

Computer Vision

1. Details

- a. Course Title: Computer Vision
- b. Sponsor: Jianning Xu, Computer Science Department
- c. Credit Hours: 3
- d. Course Level: Graduate
- e. Curricular Effect: This course will be an elective for students in the Master of Arts Higher Education program who are specializing in Computer Science.
- f. Prerequisites: Linear Algebra (1701.210), Probability & Statistics I (1702.360), and Data Structures and Algorithms (0704.103); or permission of instructor.
- g. Suggested Time: One section each year or based on demand.
- h. Resources: The course can be taught with existing faculty, equipment, and library resources.

2. Rationale

Computer vision is an area in computer science that is concerned with building computer systems that analyze images automatically and determine what the computer “sees” and “recognizes.” Visual information, transmitted in the form of digital images, is becoming a major method of communication in the age of the internet and world-wide-web. With breathtaking pace, computers are becoming more powerful and at the same time less expensive, so that widespread applications for computer vision and computer imaging emerge. The applications of computer vision include factory automation, military target tracking and identification, video surveillance, human-computer interaction, document processing, medical diagnosis imaging, remote sensing, space exploration imaging, and many others. This course will introduce the students to this fascinating and fast-developing field. It will convey both the fundamental issues in computer vision and major approaches that address them. Students will be introduced to methods, algorithms, and computer architectures for image analysis systems. This course will enable students to apply computer vision techniques to solve various image analysis problems.

Currently, there is no course in computer vision available to graduate students. This course will help to fill that gap. In practice, this course will frequently be offered concurrently with an undergraduate course Computer Vision, which is being proposed at the same time. Graduate students will be expected to do more work in the course than the

undergraduates. For example, graduates may be required to research a more advanced topic and present the results to the class. Such topics include camera calibration, stereopsis, dynamic vision, and computer architectures for vision. These topics will only receive an introductory coverage in the undergraduate version of the course.

3. Essence of the course

a. Objectives in relation to student outcomes

Students will be introduced to the fundamental issues and major approaches of building automatic vision systems. Students will be exposed to different techniques and algorithms for performing various computer vision tasks. Students will also gain hands-on experience of implementing various vision algorithms. Students will be able to apply the techniques and algorithms to solve various vision problems.

b. Topic outline

- Image formation
- Image filtering and transforms
- Image features
- Mathematical morphology
- Segmentation
- Camera calibration
- Stereopsis
- Dynamic vision
- Object recognition
- Computer architectures for vision

c. Evaluation and grading procedure of students

Students will be evaluated based on homework, projects, one or more in-term examinations, and a final examination.

d. Course evaluation

This course will be evaluated by the department curriculum committee.

e. Possible textbooks

D. Forsyth and J. Ponce, *Computer Vision: A Modern Approach*, Prentice-Hall, 2001.
George Stockman and Linda Shapiro, *Computer Vision*, Addison-Wesley, 2000.

4. Results of consultation

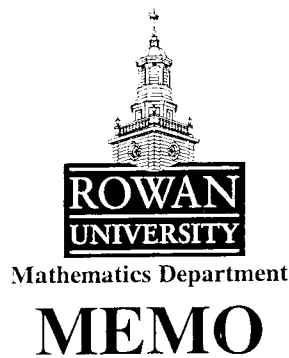
We consulted with the ECE Department.

5. Catalog Description:

0707.5## Computer vision 3 s.h.

(Prerequisites: 1701.210 Linear Algebra, 1702.360 Probability & Statistics I, and 0704.103 Data Structures and Algorithms; or permission of instructor)

This course examines the fundamental issues in computer vision and major approaches that address them. The topics include image formation, image filtering and transforms, image features, mathematical morphology, segmentation, and object recognition. More advanced topics such as camera calibration, stereopsis, dynamic vision, and computer architectures for vision will also be covered. Independent projects on these advanced topics will be required.



TO: Jennifer Kay
Computer Science Department

FROM: Ron Czocho, Chair
Mathematics Dept

DATE: December 20, 2000

RE: Consultation on proposed changes to CS major

Thank you for the opportunity to review the changes you have proposed in the Computer Science B.S. degree. I have carefully studied your proposal and I support the suggested changes. These changes will require your students to develop a more focussed set of electives and I think that is a good thing.

The inclusion of Calculus I in your core will have no effect on the Mathematics Department since the students already take the course. The only possible effect would be that it better describes the appropriate order for taking Calculus I with respect to Discrete Mathematics.

I am disappointed that Numerical Analysis will no longer be listed as a possible Restricted Elective. My disappointment stems from the fact that the field of numerical analysis was the place where computer science was born. Nevertheless, I understand the need for this change and recognize that students who are interested in this topic can take the course as an elective.

I have read the proposal for Specializations within the Computer Science major. While the numerical and scientific computation option could cause a marginal increase in enrollments in some Mathematics courses, the courses we are talking about could handle up to 10 students per year without the necessity of offering another section.

This proposal with 6 different specializations should not generate more than 10 students selecting the specialization that would have an impact on the Math Department. So I have no problem with this proposal and I support it.

Ron Czocho, Chairman
Mathematics Department
Rowan University
(856)-256-4845

My homepage: <http://www.rowan.edu/mars/depts/math/czocho/Homepage/homepage.html>

Dept. homepage: <http://www.rowan.edu/mars/depts/math/>

To: Math/Science Curriculum Committee
From: Jennifer Kay, Chair, Computer Science Curriculum Committee
Re: Course Consultations for Computer Science Proposals



Attached is a record of correspondence with

- John Schmalzel, Chair, Electrical & Computer Engineering, and
- Jooh Lee, Chair, MIS Department

Dr. Schmalzel & Dr. Lee were asked for consultations for computer science proposals on October 18th, 2000, and again on November 29th, 2000. Neither provided a consultation for any of the courses.

Dr. Martin Itzkowitz, chair, University Curriculum Committee, recommended that I provide you with a record of correspondence, which you will find attached.

To: schmalzel@rowan.edu, lee@rowan.edu
From: Jennifer Kay <kay@elvis.rowan.edu>
Subject: Course consultations
Cc: hartley@rowan.edu, hristesc@elvis.rowan.edu, baliga@rowan.edu
Bcc: kay@elvis.rowan.edu
Attached:

My apologies for sending this so late, we've been running to get everything organized.

We are going to be submitting 7 curriculum proposals this year, and we'd like your consultation on them.

The props are:

- 2 database programming proposals (one graduate, one undergraduate)
- A change to our major to reduce the number of credits to 120 from 123
- A proposal to add concentrations to our major (so students can get a degree in CS with a concentration in AI for example)
- 2 computer vision proposals (one grad, one undergrad)
- An undergraduate wireless networking course (the counterpart to the graduate course we already have on the books.

All of these proposals can be found at:
http://elvis.rowan.edu/~kay/course_props/

Again, sorry they're so late, and thanks for your help

-- Jennie Kay
CS Curriculum committee chair

X-Sender: kay@elvis.rowan.edu
X-Mailer: QUALCOMM Windows Eudora Version 4.3.1
Date: Wed, 18 Oct 2000 18:44:52 -0400
To: czocho@rowan.edu
From: Jennifer Kay <kay@elvis.rowan.edu>
Subject: Consultation request
Cc: hartley@rowan.edu, hristesc@elvis.rowan.edu, baliga@rowan.edu

Ron,

My apologies for getting this out to you so late. We were wondering if you could give us a consultation on our change of major proposal that you'll find at:

http://elvis.rowan.edu/~kay/course_props/major_change.pdf

Thanks!

-- Jennie

(CS curriculum committee chair)

Jennifer Kay
Rowan University
Computer Science Department

kay@elvis.rcwan.edu
<http://www.rowan.edu/~kay>

X-Mailer: Novell GroupWise Internet Agent 5.5.2.1
Date: Mon, 23 Oct 2000 13:45:06 -0400
From: "Jennifer S. Kay" <kay@rowan.edu>
To: <kay@elvis.rowan.edu>
Subject: Fwd: Course consultations-Delegated

>>> Schmalzel 10/23/00 13:44 >>>

ECE Team,

Please take a quick look at the slate (7) of CS course proposals. I would assume that you may have been contacted by the proposing faculty if they were seeking your opinion/input on certain topics...

jls



[TEXT27.htm](#)

Received: from cobain.rowan.edu
by groupwise.rowan.edu; Wed, 18 Oct 2000 18:49:30 -0400
Received: from elvis.rowan.edu (elvis.rowan.edu [150.250.64.69])
by cobain.rowan.edu (8.9.3/8.9.3) with ESMTP id SAA10065;
Wed, 18 Oct 2000 18:49:33 -0400
Received: from jkay.elvis.rowan.edu (dhcp-139-238.rowan.edu [150.250.139.238])
by elvis.rowan.edu (8.9.3/8.9.3) with ESMTP id SAA2854037;
Wed, 18 Oct 2000 18:49:06 -0400 (EDT)
Message-Id: <4.3.1.2.20001018183456.00b64480@elvis.rowan.edu>
X-Sender: kay@elvis.rowan.edu
X-Mailer: QUALCOMM Windows Eudora Version 4.3.1
Date: Wed, 18 Oct 2000 18:49:14 -0400
To: schmalzel@rowan.edu, lee@rowan.edu
From: Jennifer Kay <kay@elvis.rowan.edu>
Subject: Course consultations
Cc: hartley@rowan.edu, hristesc@elvis.rowan.edu, baliga@rowan.edu
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"; format=flowed

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CS with a concentration in AI for example)
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All of these proposals can be found at:
http://elvis.rowan.edu/~kay/course_props/

Again, sorry they're so late, and thanks for your help

-- Jennie Kay
CS Curriculum committee chair

Jennifer Kay
Rowan University
Computer Science Department

kay@elvis.rowan.edu
<http://www.rowan.edu/~kay>

To: schmalzel@rowan.edu, czochor@rowan.edu
From: Jennifer Kay <kay@elvis.rowan.edu>
Subject: Course consultations
Cc: hartley@rowan.edu, hristesc@elvis.rowan.edu, baliga@rowan.edu
Bcc:
Attached:

Hi,

I never heard back from you about our course consultation request. I assume this is because they're not terribly controversial. If you have comments, could you please get them to me asap.

Thanks,

-- Jennie

To: lee@rowan.edu
From: Jennifer Kay <kay@elvis.rowan.edu>
Subject: Course consultation request
Cc: hartley@rowan.edu, hristesc@elvis.rowan.edu, baliga@rowan.edu
Bcc:
Attached:

Hi,

I never heard back from you about our course consultation request. I assume this is because they're not terribly controversial. If you have comments, could you please get them to me asap.

Thanks,

-- Jennie

X-Mailer: Novell GroupWise Internet Agent 5.5.2.1
Date: Wed, 29 Nov 2000 17:40:26 -0500
From: "John L. Schmalzel" <Schmalzel@rowan.edu>
To: <kay@elvis.rowan.edu>
Cc: "Linda M. Head" <head@groupwise.rowan.edu>,
"Robert R. Krchnavek" <krchnavek@groupwise.rowan.edu>,
"Raul E. Ordonez" <ordonez@groupwise.rowan.edu>,
"Ravi Prakash Ramachandran" <ravi@groupwise.rowan.edu>,
"John L. Schmalzel" <Schmalzel@groupwise.rowan.edu>,
"Shreekanth A. Mandayam" <Shreek@groupwise.rowan.edu>,
"Xiao-Hua Yu" <xhyu@groupwise.rowan.edu>
Subject: Re: Course consultations



[TEXT75.htm](#)

Jennifer,

I fwd'd the list around to the faculty, but have yet to hear any/much feedback. I'll cc this to the ECE faculty for last-minute remarks.

Thanks!
jls

>>> Jennifer Kay <kay@elvis.rowan.edu> 11/29/00 12:56PM >>>

Hi,

I never heard back from you about our course consultation request. I assume this is because they're not terribly controversial. If you have comments, could you please get them to me asap.

Thanks,

-- Jennie

Jennifer Kay
Rowan University
Computer Science Department

kay@elvis.rowan.edu
<http://www.rowan.edu/~kay>

To: "John L. Schmalzel" <Schmalzel@rowan.edu>
From: Jennifer Kay <kay@elvis.rowan.edu>
Subject: Re: Course consultations
Cc:
Bcc:
Attached:

Thanks, John. Assuming they don't have any feedback, can you send me a quick "all ok" note.

-- Jennie

At 05:40 PM 11/29/00 -0500, you wrote:
Jennifer,

I fwd'd the list around to the faculty, but have yet to hear any/much feedback. I'll cc this to the ECE faculty for last-minute remarks.

Thanks!
jls