

CURRICULUM PROPOSAL FORM 1999-2000

RECEIVED

**NON-GENERAL EDUCATION PROCESS A**

**\*DEADLINES:** Deadline dates for 1999/2000 submissions: Regular proposals: October 22, 1999 to be implemented in Fall 2000; Short-Term proposals: December 10, 1999 to be implemented in Fall, 2000; Regular proposals February 18, 2000 to be implemented in Spring, 2001; March 24, 2000 for short-term courses to be implemented in Spring 2001.

0704225

PROPOSAL TITLE: New Course of Data Structures for Engineers

SPONSOR(S): Jennifer Kay

DEPARTMENT: Computer Science

COLLEGE: LAS

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

Check one:  Undergraduate  Graduate

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 Jennifer Kay 11/21/99

Dept. Chairperson / Date S. Bergman 10/21/99

**ACADEMIC DEAN**

Approved  Not Approved  Comments:

Dean's Signature/Date Joy King 11/2/99

**COLLEGE CURRICULUM COMMITTEE**

Date of open hearing (if necessary) 11/30/97 Approved \_\_\_\_\_ Not Approved \_\_\_\_\_

Comments: Faculty resources need to be provided

Signature of College Chair/Date: [Signature] 11/30/97

**UNIVERSITY CURRICULUM COMMITTEE**

Date Received/Processed 2/24/00

Comments:

Curriculum Chair Signature [Signature] Date Announced At Senate 5-12-00

**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] 9/18/00

**REGISTRAR**

Date Approved Course Description Received 4/20/00 Hegis Taxonomy & Course Number Assigned 0704-225

Registrar Signature/Date [Signature]

**NOTIFICATION FORWARD**

\_\_\_\_\_ Senate Curriculum Committee Chairperson \_\_\_\_\_ Academic Dean(s)

\_\_\_\_\_ Department Chairpersons \_\_\_\_\_ Registrar \_\_\_\_\_ Sponsor(s)

**Rowan University  
Department of Computer Science**

**Course Proposal**

**Data Structures for Engineers**

1. Details

A. Course Title	Data Structures for Engineers
B. Sponsor	Jennifer Kay, Department of Computer Science.
C. Credit Hours	3
D. Course Level	Undergraduate
E. Curricular Effect	Elective for Engineering Students
F. Prerequisites	Computer Science and Programming (0704.103) and Mathematics for Engineering Analysis II (1701.242)
G. Suggested Time	One section per year
H. Resources	Current resources are adequate

2. Rationale

The computer science department has proposed the addition of a laboratory component to our Data Structures course (1701.222) moving it from 3 to 4 s.h. Currently, many Electrical and Computer Engineering students take data structures. Furthermore, their expectation is that more students will be taking this course in the future. The Electrical and Computer Engineering department feels that their students can not add an additional s.h. to their load. This course will cover most of the material currently covered in the 3 s.h. Data structures course.

3. Essence of the course

a) Objectives in relation to student outcome

Students will be able to:

1. Define and implement Abstract Data Types
2. Use classes and objects
3. Evaluate the efficiency of algorithms
4. Write recursive functions
5. Use pointers and linked lists
6. Define and use a variety of common Abstract Data Types including:
  - Lists
  - Stacks
  - Queues

b) Topic outline

1. Designing Software
2. Software Reliability
3. Abstract Data Types, Classes, and Objects
4. Efficiency
5. Recursion
6. Lists
7. Stacks
8. Queues

c) Evaluation and grading procedure for students

Students will be evaluated based on homework, assignments and one or more tests.

d) Course Evaluation

The department curriculum committee will evaluate this course.

4. Results of consultation

The Mechanical and Electrical and Computer Engineering Departments were consulted for this proposal.

5. Catalog Description:

0704.2XX Data Structures for Engineers 3 s.h.

I. (Prerequisites: 0704.103 (Computer Science and Programming) and (1701.242) Mathematics for Engineering Analysis II)

The course features programs of realistic complexity. The programs utilize data structures (strings, lists, graphs, stacks) and algorithms (searching, sorting, etc.) for manipulating these data structures. The course emphasizes interactive design and includes the use of microcomputer systems and direct access data files.

**From:** John L. Schmalzel  
**To:** Kay, Jennifer S.  
**Date:** 10/21/99 11:41PM  
**Subject:** Re: Consultations

MEMORANDUM

Date: 21 OCT 1999

TO: Dr. Jennifer Kay, and CS Curriculum Committee  
FR: J. Schmalzel, Chair ECE (jls)

SUBJ: Course/Curriculum Review

I have had a chance to review your department's proposed course/curriculum changes. In an effort to get you some immediate feedback, I am providing the following comments. In the case of Embedded Systems, additional comments to follow.

A. Minor Changes:

1. Change Semester Hours of Data Structures and Algorithms.

ECE Response: We understand your desire for more lab contact with your students. We wish it would have been possible under the original 3-SCH version of the course in order to avoid necessitating a new version of Data Structures intended for ECE students only. However, we have a firm cap on our total SCH required for the degree (128 SCH).

2. Change Restricted Electives for CS Majors.

ECE Response: This is a CS-Department decision taken in response to self-assessment of curricular objectives.

3. Change Prereq's for CS Senior Project.

ECE Response: This is a CS-Department decision taken in response to self-assessment of curricular objectives.

4. Drop pre-calc minimum grade requirement for CS majors.

ECE Response: This is a CS-Department decision taken in response to self-assessment of curricular objectives.

B. Course Proposals

1. Data Structures For Engineers.

ECE Response: (Continuation of comment from A.1. above.) A desirable outcome of the course development/planning process would be to determine a way to teach a hybrid course that would allow both CS and ECE students to co-exist within a single Data Structures course framework. We believe that it is important for our students to be mixed with your majors to enhance multidisciplinary opportunities--an objective that is not served by separating them by course.

A possible approach may be suggested by an experiment we've performed with our electronics course (0909.311), which has both ECE and ME students required to take it. We were able to create a hybrid course by sharing a single common lecture time per week, and then splitting off into second lecture/lab sessions to handle the perceived need for somewhat different focus between the groups. In the case of Data Structures, this might mean 2 lectures a week + lab, shared by both ECE and CS students, and a 3d lecture per week for CS students only. Other variations could be tried.

We would welcome the opportunity to explore options with your faculty.

2. Grad Topics in CS.

ECE Response: This is a CS-Department decision taken in response to self-assessment of curricular objectives.

### 3. Embedded Systems Programming.

ECE Response: (A more detailed response needs to be developed. Embedded systems development is dependent on hardware vs. software trade-offs, which is an ECE core element.)

{end memo}

>>> Jennifer S. Kay 10/21/99 09:48PM >>>  
John,

Sorry for filling your mailbox tonight. We're still waiting for consultations from you on the following proposals:

#### Minor Changes:

- Change Semester Hours of Data Structures and Algorithms
- Change Restricted Electives for CS Majors
- Change Prereq's for CS Senior Project
- Drop pre-calc minimum grade requirement for CS majors

#### Course Props

- Data Structures For Engineers
- Grad Topics in CS
- Embedded Systems Programming

Any chance you could zap me an email with a copy of the above list of topics and "We support these" or any concerns that you have so that I can stick it on the back of our props? (In particular, let me know if you think the prereq's for the DS for Engineers makes sense)

I'm still waiting on some of our committee to finish looking over your two, My guess is that we'll have no problems with Adaptive Filters, but maybe some concerns over ANN's. I'm pushing people to finish reviewing so we can formally get back to you. I'll send you something or call you tomorrow morning.

Thanks!

-- Jennie

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Jennifer S. Kay  
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**CC:** Baliga, Ganesh; Bergmann, Seth; ECE\_Faculty; Tinkham, Nancy; Waksman, Adlai

**From:** Tirupathi R Chandrupatla  
**To:** Kay, Jennifer S.  
**Date:** 10/22/99 9:51AM  
**Subject:** Consultations

Jennifer:

We support the following minor changes and course proposals from Computer Science.

Minor Changes:

- Change Semester Hours of Data Structures and Algorithms
- Change Restricted Electives for CS Majors
- Change Prereq's for CS Senior Project
- Drop pre-calc minimum grade requirement for CS majors

Course Props

- Data Structures For Engineers
- Grad Topics in CS
- Embedded Systems Programming

T.R.

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