UNIVERSITY FACULTY SENATE FORMS

Academic Program Approval

This form is a routing document for the approval of new and revised academic programs. Proposing department should complete this form. For more information, call the Faculty Senate Office at 831-2921.

Submitted by: _____Keith Decker_____phone number__831-1959___

Department: _____CISC_____email address__decker@udel.edu____

Action: _____**revise major**_____
(Example: add major/minor/concentration, delete major/minor/concentration, revise major/minor/concentration, academic unit name change, request for permanent status, policy change, etc.)

Effective term_____**08F**_____
(use format 04F, 05W)

Current degree_____**BA**_____
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed change leads to the degree of: _____**BA**_____
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed name:_____**Computer Science**_____
Proposed new name for revised or new major / minor / concentration / academic unit (if applicable)

Revising or Deleting:

Undergraduate major / Concentration:_____
(Example: Applied Music – Instrumental degree BMAS)

Undergraduate minor:_____
(Example: African Studies, Business Administration, English, Leadership, etc.)

Graduate Program Policy statement change:_____
(**Must attach** your Graduate Program Policy Statement)

Graduate Program of Study:_____
(Example: Animal Science: MS Animal Science: PHD Economics: MA Economics: PHD)

Graduate minor / concentration:_____

Note: all graduate studies proposals must include an electronic copy of the Graduate Program Policy Document, highlighting the changes made to the original policy document.

List new courses required for the new or revised curriculum. How do they support the overall program objectives of the major/minor/concentrations)?
(Be aware that approval of the curriculum is dependent upon these courses successfully passing through the Course Challenge list. If there are no new courses enter "None")

There are two new courses:

- CISC 108 Introduction to Computer Science I: Introduction to the fundamental ideas of computing and principles of programming with an emphasis on systematic program design. Topics include functional programming, data abstraction, procedural abstraction, use of control and state, recursion, testing, and object-oriented programming concepts. Requires no prior programming experience, only high-school algebra, open to any major.

- CISC 275 Introduction to Software Engineering: Object oriented software design and development through use of the Java programming language. Topics include team programming, design patterns, graphical user interfaces, software engineering tools (e.g., integrated development environments, version control, build management, bug tracking, automated testing).

CISC 108 becomes the preferred first course for all majors and minors in Computer Science (we also will allow CISC 106, the first course for the School of Engineering, for students who change into the major after taking these courses). Material from CISC 280, about the nature of computation and functional programming, has/will be moved to CISC 108, and CISC 280 will be retired. The other function of CISC 280 was as an introduction to some software engineering principles; this will be accomplished by CISC 275, a renumbering and re-imagining of the current CISC 370. The new CISC 275 will introduce students to team programming, object-oriented design patterns, professional software engineering tools, and how to create modern graphical user interfaces.

Explain, when appropriate, how this new/revised curriculum supports the 10 goals of undergraduate education: http://www.ugs.udel.edu/gened/

The revised curriculum is very similar to the current curriculum. The two new courses primarily address goals 1,2,3 (Goal 3, collaboration, is a focus of 275 and will also be a part of 108).

Identify other units affected by the proposed changes:
(Attach permission from the affected units. If no other unit is affected, enter "None")

None. In particular, ELEG/CPEG students taking the CISC 106/181/220 sequence are not affected by this change.

We plan to retire CISC 105, the old intro course, in two years (2009), and will be contacting departments that mention 105 as to which of the modern intro courses (103, 106, or 108) would be most appropriate (by default, departments should use 108, which is the most general and the most complete).

Describe the rationale for the proposed program change(s):
(Explain your reasons for creating, revising, or deleting the curriculum or program.)

We first began discussing this change two years ago when Engineering requested that we create a new intro course for all engineering students [CISC 106] based on MATLAB programming, and when we formalized CISC 475 as the "capstone" course for the BS major. The CISC 280 course, which introduces "computational thinking" as opposed to programing comes too late in the major to be of much help to students. 475 was covering too much material to allow for the large capstone projects we wanted the students to undertake. Allowing students to choose, on their own, to take our second course, CISC 181, or start with CISC 105 resulted in many years of uneven student preparation for CISC 181. CISC 105, while offered to anyone without need for a background in programming, did not offer any specific help for beginners or non-majors other than starting at the beginning. In fact, it uses a language (C) that requires concepts that are important primarily for CISC majors, but that have been supplanted in modern languages that would be used by non-majors. The curriculum we propose here is designed to satisfy four

goals on which the current curriculum is falling short:

- It will emphasize program design (as opposed to just programming) from the outset. This will give students a stronger foundation in computational problem-solving, and ultimately more flexible long-term skills. Such a change is consistent with recent trends towards more design emphasis in our discipline as a whole.
- It will be more approachable for students with no prior programming experience. Computer Science is increasingly relevant for students across disciplines, and we want our introductory curriculum to teach novice students how to use programming and computation as both intellectual and practical tools. Evidence suggests that CISC 105 is not working well for students with no prior programming experience.
- It is designed to move certain difficult concepts (specifically, hardware memory management)further back in the sequence of courses in the CISC major. This will help reduce the learning curve for non-CISC majors in our early courses. CISC 108 will teach students an easy-to-follow methodology for designing programs from an understanding of the information that the program must process. Furthermore, we will teach the methodology in conjunction with a language with very simple syntax, and an integrated development environment. The combination of a methodology, simple syntax, and beginners environment allows us to cover more interesting and advanced concepts in the intro course. It also lets students focus on the information and design aspects of computing, rather than the specific language details. In other words, the computing material will get richer, while the language overhead lightens. Experience with this curriculum at other schools indicates that the curriculum is well-suited to novices and CS majors alike. Many students who have taken this curriculum report applying its lessons on information organization to other areas of study.
- It is designed to give an exposure to professional software engineering tools, team programming, and object oriented design patterns early enough that they can be used in the Junior and Senior years of the program.

Program Requirements:

(Show the new or revised curriculum as it should appear in the Course Catalog. If this is a revision, be sure to indicate the changes being made to the current curriculum and **include a side-by-side comparison** of the credit distribution before and after the proposed change.)

DEGREE: BACHELOR OF ARTS
MAJOR: COMPUTER SCIENCE
CURRICULUM CREDITS
See page 90 for University and College requirements.
MAJOR REQUIREMENTS
CISC 108 Introduction to Computer Science I. 3
CISC 181 Introduction to Computer Science II. 3
CISC 220 Data Structures 3
CISC 260 Machine Organization and Assembly Language 3
CISC 275 Introduction to Software Engineering 3
Eighteen credits of Computer Science numbered 301 or above, approved by the student's advisor 3
MATH 210 Discrete Mathematics I 3
MATH 241 Analytic Geometry and Calculus A 4
Minimum grade C- in the CISC courses. Minimum grad C- in MATH 210 for students who wish to take CISC 301.
ELECTIVES
After required courses are completed, sufficient elective credits must be taken to meet the minimum credit requirement for the degree.
CREDITS TO TOTAL A MINIMUM OF 124

	OLD	NEW
CISC requirements	30	33
MATH requirements	7	7
College/University Req.	46	46
General Electives	41	38

	OLD	NEW
Total	124	124

ROUTING AND AUTHORIZATION: (Please do not remove supporting documentation.)

Department Chairperson _____ Date _____

Dean of College _____ Date _____

Chairperson, College Curriculum Committee _____ Date _____

Chairperson, Senate Com. on UG or GR Studies _____ Date _____

Chairperson, Senate Coordinating Com. _____ Date _____

Secretary, Faculty Senate _____ Date _____

Date of Senate Resolution _____ Date to be Effective _____

Registrar _____ Program Code _____ Date _____

Vice Provost for Academic Affairs & International Programs _____ Date _____

Provost _____ Date _____

Board of Trustee Notification _____ Date _____

Revised 10/23/2007 /khs