SPECIAL REPORT

of the

PROVOST

concerning the

ESTABLISHMENT OF A
COLLEGE OF INFORMATION AND COMPUTER SCIENCES

Presented at the 745th Regular Meeting of the Faculty Senate
February 19, 2015

Katherine S. Newman
Senior Vice Chancellor for Academic Affairs and Provost
ACADEMIC MATTERS COUNCIL
Neal Abraham, Wesley Autio, Martha Baker, Carol Barr, Bryan Beck, Laura Briggs, Stephanie Chapko, Laura Francis, Daniel Gordon, Patrick Kelly, Nancy Lamb, Clare Lamontagne, John Lenzi, Meredith Lind, Linda Lowry, Pamela Marsh-Williams, Ernest May, MJ Peterson, Linda Shea (Chair), Kelly Smiaroski, Kregg Strehorn, Patrick Sullivan David Vacchi, Ruth Verock O’Loughlin, Tom Weston

At its meeting on January 21, 2015, the Academic Matters Council voted unanimously to approve the proposal to create a new college, submitted as proposal #1660 in the Course and Curriculum Management System.

ACADEMIC PRIORITIES COUNCIL
Richard Bogartz (Chair), Nicholas Bromell, Elizabeth Chilton, W. Curt Conner, Suzanne Daly, Kathleen Debevec, Piper Gaubatz, Bryan Harvey, Masoud Hashemi, A. Yemisi Jimoh, Nancy Lamb, Ernest May, Deborah Picking, Monroe Rabin, James Rinderle, Barbara Stanley, Peter Stern, Susan Sturgeon, Jerri Willett

The Academic Priorities Council voted 11 - 0 to endorse approval of establishing a College of Information and Computer Sciences. Following the vote, one member suggested that we include in our endorsement

"...some language that addresses the need for a well-planned transition to full college status. Such status would include management of incoming new students at NSO this summer as well as managing a cadre of "exploratory" (pre-majors) with the shift away from a general undeclared student population.

Although CS has been working with an autonomous budget, this unit has NOT been managing its incoming student population in such a manner, and it is unclear if they are as yet ready to do so because I do not believe that they have been sending any staff to the NSO planning sessions already underway for the coming summer. If we are to fully address "student success" as an academic priority, the NSO transition piece (and overall student management) should be addressed in advance of a full approval of new college level status."

Provost Newman responded to this with

"The School of CS has been completely integrated into the planning for exploratory tracks, advising of undeclared students, etc. We have treated it as if it was a College already for these purposes, mindful of the need to ensure students arriving in the Fall are provided for in exactly the same fashion as all other first year students."

These two statements are not contradictory. The planning may not yet have reached the action stage in Computer Science. The APC urges a speedy transition with respect to management of incoming students to the new college.

GRADUATE COUNCIL

The Academic Standards and Curriculum Committee (ASCC) of the Graduate Council met on February 4, 2015 and reviewed the proposal for the Establishment of a College of Information and Computer Sciences. The ASCC recommended this proposal for approval.

On Wednesday, February 4, 2015, the Graduate Council, through an email vote, approved the Establishment of the College of Information and Computer Sciences.
The Program and Budget Council (P&BC) held a special meeting on Wednesday, February 11, 2015 to deliberate the Special Report of the Provost entitled, Establishment of a College of Information and Computer Sciences. The report proposed changing the status of the School of Computer Science, currently in the administrative structure of the College of Natural Sciences (CNS), to a college with its own dean.

After an extensive discussion about issues pertaining to the budgetary implications of the proposed college, the Council approved the proposal with a unanimous vote.

The discussion centered on the lack of clear budget-related data in the report, especially the additional cost of hiring a dean for the proposed college. Also raised were issues pertaining to complexities inherent in separation from the College of Natural Sciences (CNS) and the set-up of an independent college. These concerns were laid to rest partly because several members of the Council agreed with the strategic importance of the proposed college, but primarily because of the strong letters of support from the administration, especially the one from Provost Katherine Newman, who explicitly recognized the need to “recruit a founding dean in short order.”

The Provost's proposal, as forwarded from the Faculty Senate office, was circulated to the members of the Council ahead of time, and there was a little back and forth by email about how best to proceed with the proposal. In the end, Prof. Lori Clarke, Chair of the School of Computer Science, kindly came to the meeting and gave a brief presentation explaining the current situation of the School of Computer Science, what would change with the move to a College, and what the benefits would be.

There were a number of questions from members of the Council. Issues that came up included: future plans for growth in organization and faculty of the proposed College, future research directions, sources of the new College's budget, and why the change to a College is important. Some members suggested that the new College create steering committees in areas of computing of broad interest to the campus, such as curriculum and high performance computing. The Secretary of the Faculty Senate observed how active and outward looking Computer Science has been in both research and governance. Various members of the Council indicated they are looking forward to even more collaboration with Computer Science, including the Libraries, Nursing, and Social and Behavioral Sciences.

The Council seemed fully satisfied with the answers to their questions and endorsed the proposal unanimously at its regularly scheduled meeting on January 23, 2015.

MOVED: That the Faculty Senate approve the Establishment of a College of Information and
The attached proposal for the establishment of a College of Information and Computer Sciences (CICS) results from many years of planning on the part of the faculty in first the Department of Computer Science and now the School of Computer Science. The faculty propose a fully autonomous College headed by a Dean, bringing to nine the number of such academic units on the Amherst campus. The campus administration fully endorses this proposal and presents it to the Faculty Senate for consideration.

The rationale for this change is detailed in the proposal, but several considerations deserve special note:

1. Computer Science is one of the consistently strongest programs on the campus in terms of both research and teaching at the graduate and undergraduate levels. The faculty have more than demonstrated the capacity to attract students, scholars and research support at a level consistent with an autonomous academic unit at a research university. The proposal identifies a number of similar units at other distinguished universities.

2. The field of Computer Science generally has become established as central to a broad and expanding range of other disciplines, and on this campus the School of Computer Science has demonstrated extraordinary effectiveness in engaging scholars in other fields. In fact, Computer Science has forged more research partnerships than any other unit on campus. Going forward, this capacity for collaboration will be strengthened by College status and the leadership of a Dean who can negotiate partnerships at many levels.

3. Computer Science has been an innovator in graduate and undergraduate education since its inception, and as a College will be a strong contributor to educational strength. Among other things, the new College will serve as home to the Information Technology minor in which it has long played a leading role.

4. The greater focus and identity deriving from College status will increase the campus’s capacity to respond to societal needs and expectations. Computer Science is central to the Commonwealth’s broad knowledge-based economy, and pivotal in such emerging areas as data science and cyber security that support the state’s finance and health care sectors. College status reflects both the increasing scope and complexity of the field and the campus’s leadership.

5. This proposal reflects the logical conclusion of a long and thoughtful evolutionary process. Strategic Planning in this direction began in the department around the time of the creation of the College of Natural Sciences in 2009; resulted in the successful proposal for a School of Computer Science within CNS in 2012; and profited from the experience School status provided. The important questions related to even greater autonomy have been fully explored, and a solid foundation for the new College has been constructed over time. In this regard it is important to note that the challenges of financial autonomy were fully addressed in 2012 via a Memorandum of Understanding with the Dean of CNS, and the School has been operating with the equivalent of a College fiscal structure since that time.

6. The creation of the College of Information and Computer Sciences is fully consonant with the goals of our strategic planning process campus wide. It will improve our standing as a “destination of choice” for students who recognize that this field is central to their goals as future engineers, social scientists, natural scientists, public health specialists, and, of course, computer scientists. From a “partner of choice” perspective, there can be no doubt: creating this College will encourage industry partnerships, advance regional economic development, and position our campus to reap significant benefits in philanthropy and competitiveness for national research awards.

It is important to note that this proposal affects only the administrative organization of Computer Science. All faculty appointments will continue unchanged, and all academic programs will continue as currently approved. The current College-level requirements of CNS will continue to apply to undergraduates within CICS.
I urge the Senate to join the Computer Science Faculty, Dean Goodwin of CNS, and the campus leadership in supporting this well-deserved and timely step forward.

Attachment: “A Proposal for a College of Information and Computer Sciences at the University of Massachusetts Amherst”

A Proposal for a College of Information and Computer Sciences
at the University of Massachusetts Amherst

1. Vision and Rationale

In establishing the School of Computer Science in 2012 as a unit within the College of Natural Sciences, the Computer Science faculty, campus administration and broader campus community continued the evolution of the organization of computing research and education on the UMass Amherst campus. That process began 50 years ago with the founding of a graduate program in Computer Science (CS), and continues here today with this proposal for a College of Information and Computer Sciences (CICS) at the University of Massachusetts Amherst.

This present proposal for a College of ICS follows naturally from the recent establishment of the School of Computer Science (SCS). The vision and rationale for establishing a School of Computer Science two years ago still ring true (and perhaps even louder) today:

- **Information and Computer Sciences play an increasingly central role in the 21st century university.** From an educational standpoint, undergraduate enrollments in Computer Science (both class enrollments and number of majors) are at an all-time-high, both on our campus and nationally. At some universities, Computer Science has become the most popular major (Stanford) or individual course (Harvard) on campus. Importantly, student interest in computing extends across campus, far beyond students majoring in CS, science or engineering. From a research standpoint, computation (including the evolving field of data science) has joined theory and experimentation as a third research paradigm, providing myriad opportunities for inter-disciplinary research collaborations involving CS across the campus. Similarly, information science is an interdisciplinary field that includes the analysis, collection, classification, manipulation, storage, retrieval, movement, dissemination, and protection of information. Information and computing sciences are complementary and overlapping education and research areas that touch every discipline.

- **Information and Computer Sciences play an increasingly important role within the Commonwealth, within the federal government, and more broadly in society.** Numerous initiatives speak to the importance of computing within the Commonwealth: the state’s Big Data Initiative, the multi-

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1. UMass Amherst Faculty Senate Document http://www.umass.edu/senate/fs_docs/2012-2013/722/SEN_DOC_NO_13-022.pdf
3. Indeed, CS has had more interdisciplinary (multi-unit) research awards than any other unit on campus.
Institutional Massachusetts Green High Performance Computing Center, and cyber-security initiatives such as the Business Higher Education Forum’s Massachusetts’ Cyber Network and Mass Insight’s Advanced Cyber Security Center. Larger federal activities mirror such state-level initiatives. ICS plays a crucial national economic role as well: a significant fraction of US economic growth since 2002 can be traced to ICS; the Bureau of Labor Statistics estimates that 57% of all STEM jobs in 2012-2022 will be in Information Technology.

- Creating a College of ICS positions UMass Amherst within the Commonwealth and nationally. The creation of a new organizational entity signals the importance, vitality and institutional commitment for that area. Forming a School of Computer Science was a visible first step emphasizing the campus’ leadership role – within the discipline, within the state, and nationally. The creation of a College of Information and Computer Sciences continues and accelerates that leadership, consistent with that of several forwarding-looking research universities with highly ranked computing programs, as well as at least two close-by universities (see Appendix A).

The 2012 SCS proposal promised that “The School will be the intellectual focal point for broad interdisciplinary activities in research, teaching and outreach that engage UMass community members across the campus in computational thinking, building upon the Department’s nationally prominent research activities and its already strong connections to other campus academic units in research, teaching and service.” SCS has realized, and even surpassed, this vision:

- In its education mission, SCS is exploring an exciting new undergraduate program in informatics, aimed broadly at the application of information and computing sciences across many disciplines. New courses have been developed and piloted, and several focus tracks (including a track in big data) have been defined. A terminal (professional) MS program has been implemented, admitting a larger number of MS students into the program with great success. SCS has continued its educational leadership role on campus through the IT minor, the Bay State Fellows program (an SCS-funded program that provides top CS undergrads from the Five Colleges with a stipend and free tuition for an MS CS degree), and developed and expanded placement activities. With the high quality of both its undergraduate and graduate students, UMass Amherst Computer Science is a “destination of choice” for undergraduate and graduate students alike.
- In research, SCS has played a leadership role in the new inter-disciplinary Computational Social Science Institute (CSSI), and remains a nationally recognized leader in research. SCS is developing new institutes in Data Science and in Cyber-security, involving numerous participants across campus. SCS’s long-standing tradition of funded, inter-disciplinary research collaboration has continued and accelerated. With combined directed and indirect annual research expenditures of more than $18M, UMass Amherst Computer Science is an investment of choice for federal and industry research partners.
- In service, SCS faculty have played a leadership role in numerous national, statewide and UMass system education and research activities with MassCAN, ECEP, CAITE, CITI, the MGHPC, UMass Data Science Workshops, Holyoke Gas and Electric, BHEF, and in the DESE/DHE. UMass Amherst Computer Science is a partner of choice for many state activities.

Why a College?

In many ways, the SCS is already performing the many critical functions undertaken by existing colleges, except that is does not have a dean or college-level committees. With approximately 350 individuals on payroll and a budget (including research expenditures) of approximately $21M, SCS is already an organization that is as large and complex as many UMass Amherst colleges. SCS has also taken on college-level activity involving communications (e.g., a long-standing newsletter aimed at alumni and peer CS departments, colleges and schools), alumni (e.g., a long-standing annual Outstanding Alumni Award dinner, annual east and west coast alumni gatherings), industry (e.g., an industrial affiliates program, an
annual research review) and student outreach (e.g., Women in Engineering and Computing Career Day, with industry and alumni representatives, and Community College Day).

But our experiences as a school have also helped us understand the additional value of becoming a college:

- **Being a catalyst for interdisciplinary campus activities.** The ability to interact college-to-college (dean-to-dean) will greatly facilitate developing interdisciplinary activities, particularly in undergraduate education.

- **Enabling strategic, long-term planning for a critical campus unit.** A degree of budgetary autonomy is needed for CICS to strategically plan and budget for the long term. A college can much better plan and budget strategically than a school.

- **Informing campus-level directions with respect to information and computer science.** With an ICS dean interacting directly with campus leadership through the dean’s council, campus- and unit-level decisions can be better informed.

- **Providing visible leadership.** As noted above, creating a new organizational entity signals the importance, vitality and institutional commitment for that area. Forming a College of Information and Computer Sciences will emphasize the campus’ leadership role in ICS within the UMass system, the Commonwealth, and nationally.

- **Enhanced fundraising.** Since fundraising is a decanal activity, a separate CICS dean will be able to spend more time on fundraising and development activities.

### 2. Initial College Organization, Personnel, Governance

The initial organization of the College of Information and Computer Sciences will be as a “single unit” college, with a dean, a faculty of ICS, a chair (who will also serve as Executive Associate Dean of the College), and several institutes and centers. This is similar to the initial configuration of Colleges of Computer Science at CMU, Georgia Tech, Cornell and Indiana, where selected institutes later evolved into departments. Northeastern University still has a College of Computer and Information Science with no departmental structure. The suite of existing degree programs at UMass Amherst (BA, BS, MS, PhD) will remain unchanged. The current BS degree program encompasses existing CNS requirements and we will explicitly include CNS’ foreign language requirement into our BA degree requirements, so there will be no change in requirements for current or incoming students. We will continue our on-going development of an undergraduate degree in informatics. New programs, e.g., in Data Science, may emerge in collaboration with other units where appropriate, as CICS grows and evolves.

Faculty personnel procedures will be developed to follow the “Academic Personnel Policy of the University of Massachusetts at Amherst, Boston, and Worcester” (a.k.a. the “Red Book”) and the MSP contract.

There are no facilities requirements associated with becoming a College beyond the need for a dean’s office in existing SCS space (although, we have immediate needs for more space, but this is true whether we become a college or not. There is minimal overall impact on personnel since, as noted above, the SCS is already performing the many critical functions already performed by existing UMass Amherst colleges.

### 3. Budget Considerations

The primary new expense for establishing the College of Information and Computer Sciences will be the Dean’s Office, including associated staff positions. We expect that selected college-level staff positions, e.g., advising and development staff currently provided through the College of Natural Sciences, will be moved from CNS to the College of Information and Computer Sciences. Other costs will be shared by the current School of Computer Science and the UMass Amherst campus. Additional budget considerations are addressed in Provost Newman’s letter, accompanying this proposal, as Appendix B.
4. Approvals
The concept of a College of ICS has been under discussion for years within the School of Computer Science. The formation of a College of Information and Computer Sciences, as envisioned in this document, was unanimously and enthusiastically supported by SCS faculty in their October 2014 retreat. CNS Dean Steve Goodwin, UMass Amherst Provost Katherine Newman, and UMass Amherst Vice Chancellor Michael Malone also support the formation of CICS. Letters of support are attached as Appendix B.
Appendix A: Colleges of Computer Science

Top-25 Colleges of Computing at R1 institutions:
- **CMU**, School of CS (1988), 7 units, 131 faculty. CMU’s graduate program in CS is ranked #1 by US News and World Reports; other rankings are shown parenthetically below. UMass Amherst CS is ranked #25.
- **Cornell**, Computing & Information Science (1999), 3 units (CS, IS, stats) 60 faculty. (#6)
- **Georgia Tech**, College of Computing (1988) 3 units (CS, Interactive computing, computational science), 93 faculty. (#9)
- **Indiana University**, School of Informatics and Computing (2000), 3 units (CS, Informatics, ILS), 89 faculty. (#52)
- **UC Irvine**, School of Information and CS (2002), 3 units (CS, Informatics, statistics), 61 faculty. (#29)

nearby:
- **SUNY Albany** College of Computing & Information (2005), 3 units (CS, informatics, info studies)
- **Northeastern U.** College of Computer and Information Sci. (1982), 1 unit (CS). Scheduled to add 15-20 faculty over the next 3-4 years.

In 2000, responding to the increasing number of colleges of computing, the Computing Research Association (http://www.cra.org, CRA) established the CRA Deans Group to provide leadership and community to emerging and established colleges of computing and interdisciplinary "IT" schools. The group is organized around schools of computing, schools of information, and/or schools of information technology with heads that report directly to their campus Provost or Chief Academic Officer. The Computing Research Association (CRA) is an association of more than 200 North American academic departments of computer science, computer engineering, and related fields; laboratories and centers in industry, government, and academia engaging in basic computing research; and affiliated professional societies.

For additional discussion of the evolving field of Computer Science, and the organizational placement of Computer Science units in academia, see Sen. Doc. No. 13-022: Appendix A (Computational Thinking); Appendix B (Computer Science Programs: Where are they organizationally?); Appendix C (The Contemporary View of Computer Science: Larger and Local Perspective). Sen. Doc. No. 13-022 was prepared and extensively discussed during the recent process of forming the School of Computer Science.
Appendix B: Letters of Support

To: Senate Rules Committee

From: Katherine S. Newman
Senior Vice Chancellor for Academic Affairs and Provost

Re: College of Information and Computer Sciences

I write to provide my strong endorsement for the proposal to establish a College of Information and Computer Sciences at the University of Massachusetts Amherst. In my view, it is not only timely but essential that we foreground publically the prominence of the work our colleagues do in this domain. The creation of this new college will telegraph to the Commonwealth, the nation, and to our international partners, the critical and foundational importance of our investment in the field.

As you know, this is the final step in an evolution that began some years ago within the College of Natural Sciences, with the creation of the School of Computer Science. Colleagues may wonder why that was not enough. The simple reason is that while the underpinnings of its internal coherence were assured by the emergence of SCS, its public visibility is not sufficient for our purposes today. The appointment of a Dean who can lead the College, speak for it to industry and the philanthropic world, and participate in national and international organizations on its behalf, is essential. We are investing heavily in faculty growth and new centers (especially in data science and cybersecurity), but will not reap the full benefits of these commitments unless the College is maximally visible to the outside world.

There are, of course, significant internal benefits to the creation of the College. The impact of computer science across the campus is enormous. In virtually all of the other colleges, aspects of information and computer science have become (or has long been) an integral part of their research mission. Increasingly, their students (at all levels) need training in the field. At the moment, however, there is no Dean to sit with the rest of the deans in planning for curricular initiatives that crisscross the campus. In the same vein, we need decanal representation in order to ensure that the several centers and institutes that are part of computer science (most notably, of late, an Institute for Cybersecurity, and the Center for Data Science) are capacious and reach across the campus.

When the School of Computer Science was launched, concern was raised about budgetary implications, particularly vis-a-vis administrative support. I do not foresee any problems along these lines now. The functions necessary to run the College are presently supported by CNS and will “move over” to become part of this independent entity. This includes advising and development. Other support structures that may be needed for the College, especially vis-a-vis industry relations, will grow in time and as revenue from sponsored research helps to make it feasible.

For all of these reasons, I offer my strongest possible endorsement for this proposal. It is my hope that we can conclude the necessary review in a timely fashion so that we can recruit a founding dean in short order. I am enthusiastic about what the new College for Information and Computer Sciences will mean for UMass and for the field itself.
Katherine S. Newman  
Provost/Sr. Vice Chancellor  
373 Whitmore Administration Building  
University of Massachusetts  
Amherst, MA 01003  

Provost Newman,  

I want to express in writing my strong support for the creation of a College of Information and Computer Sciences here at the University of Massachusetts Amherst. As you know from our prior conversations, I believe that the formation of this college is in the best interest of the university. I am confident that the College of Information and Computer Sciences will evolve into an entity that will significantly enhance the reputation of the university. We are already seeing productive interactions between the current School of Computer Science and many other academic units on campus. I anticipate that these interactions will continue to flourish. I look forward to working with as the proposal moves through the governance process.  

Respectfully,  

Steve Goodwin, Dean  
College of Natural Sciences
January 5, 2015

Provost Katherine S. Newman  
Torrey Little Professor of Sociology  
373 Whitmore Hall  
181 President’s Drive  
University of Massachusetts Amherst  
Amherst, MA 01003

Dear Provost Newman:

I am writing to support the request of the School of Computer Science to change its status from a school within a college to a freestanding college in its name to the College of Information and Computer Sciences. Based on the documents prepared by the School of Computer Science, “A Proposal for a College of Information and Computer Sciences” and others cited therein, there is a strong case for the request.

I note that there is an obvious connection to one of the “Suggested Areas of Intersection Between Campus Strengths and State, Regional or National Priorities,” developed in phase II of the campus strategic plan, namely “Data science, computing and analytics, computational social science (CSS).” Perhaps less obvious and more is the relationship of informatics and computing to many of the other suggested areas such as “Cognitive science,” “Applied life sciences,” “Advanced materials and manufacturing,” “Climate science,” and probably others. I am very pleased to see that this is clearly recognized in the SCS proposal.

There is great potential for growth in engagement, especially in Massachusetts with several state and private sector initiatives. I look forward to working with a new CICS dean to maximize the impact of the program development on engagement in these areas.

Sincerely,

Michael F. Malone

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1http://www.umass.edu/senate/sites/default/files/ITFSO-Phase-II-Report-Appendix-D-Subcommittee-on-Research-and-Graduate-Education_2.pdf