Science & Engineering Task Force

Report to Provost Gary Olson

Submitted February 1, 2010

This report was approved by the Science & Engineering Task Force on February 1, 2010 by a vote of 8-4
Science & Engineering Task Force Members

<table>
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<tr>
<th>Name</th>
<th>Department/Unit</th>
<th>Additional role(s)</th>
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<tr>
<td>Stephen Adkison</td>
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<td>Co-chair</td>
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<td>Pamela Crowell</td>
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<td>Co-chair Liaison to Pharmacy &amp; Health Professions task force</td>
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<td>Dan Ames</td>
<td>Geosciences</td>
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<td>Richard Brey</td>
<td>Physics</td>
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<td>Biological Sciences</td>
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<td>Arya Ebrahimpour</td>
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<td>Nancy Glenn</td>
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<td>Biological Sciences</td>
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Process

The Science & Engineering (S&E) Task Force co-chairs were appointed by Provost Gary Olson on November 4, 2009. The co-chairs appointed the task force members, with approval by Provost Olson and President Vailas. All S&E task force members are faculty with extensive experience in graduate and undergraduate teaching, and nationally-recognized research.

At the first S&E task force meeting on November 6, 2009, President Vailas and Provost Olson gave the task force its charge (see next section). The S&E task force met multiple times as delineated below. At the December 9, 2009 meeting, Professor Corey Schou shared his experiences with the ISU College of Business Executive Committee. All S&E faculty had opportunities to contribute their ideas and opinions to the work of the task force through open forums on January 19th and 20th, 2010, through numerous departmental meetings and discussions with task force members, and through unsolicited written communication to task force members. The ISU faculty as a whole had opportunities to discuss the work of the S&E task force in the Faculty Senate meeting on December 14, 2009, and in the ISU faculty meeting on January 6, 2010. In addition, S&E task force liaisons attended multiple meetings of the other two task forces, and Dr. Laura Woodworth-Ney attended several S&E task force meetings as the liaison from the Education, Arts, Social Sciences, & Humanities task force.
This report was drafted by a task force co-chair, and all task force members were asked to solicit S&E faculty feedback. Feedback from task force members and their departmental colleagues was provided to the task force co-chairs, who accordingly revised the report. The task force then voted on final approval of the revised report.

Science and Engineering Task Force Meetings

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<th>Date</th>
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<td>S&amp;E Task Force</td>
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<td>12/9/09</td>
<td>S&amp;E Task Force</td>
<td>Dr. Corey Schou, ISU College of Business</td>
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<td>12/14/09</td>
<td>ISU Faculty Senate</td>
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<td>ISU faculty meeting</td>
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<td>1/22/10</td>
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Task Force Charge

The Science & Engineering Task Force was asked to provide feedback on the President’s model (below) for reorganizing into a College of Science and Engineering. In so doing, the task force was asked to:

- Answer questions provided by President Vailas
- Address strengths and drawbacks of the model
- Make recommendations on ways to address identified drawbacks, including alternative reorganization models
- Make recommendations for the implementation of the reorganization model supported by the task force
President’s Model (not accepted in total by the S&E task force)

- Each college will have an Executive Committee, composed of senior faculty from the various disciplines, to assist the Dean with strategic planning, tenure and promotion reviews, etc.

- Each division/school (Science Programs, Engineering Programs) will have an Associate Dean

- Each program will have a Coordinator instead of a Department Chair. All Coordinators will be on 9-month contracts with the exception of some programs in the health professions and pharmacy that have 12-month contracts.

- Faculty in the Department of Biology will be reassigned to either the College of Science and Engineering or the College of Pharmacy and Health Professions.

S&E Task Force Feedback

Recommendations for implementation

The S&E task force recommends that the following steps be taken if a new College of Science & Engineering is to be formed.

1) First and foremost, thorough **academic program review** must take place as soon as possible, and, ideally, prior to the formation of the new college. In its most recent accreditation review in 1994, the Northwest Commission on Colleges and Universities (NWCCU) recommended that ISU reduce its academic program offerings. Since that time, ISU has not reduced programs; it has added programs. The S&E task force recommends review of all science and engineering programs in a data-driven process, using the same metrics for all programs. Multiple measures regarding student, faculty, and financial success should be considered. Then, any
underperforming programs should be eliminated or extensively revised so that healthy programs may remain intact and/or grow.

2) Implementation of the college reorganization plan should not be initiated until review of all college academic programs is completed, and college administrative structure, funding sources, goals, and performance measures are fully developed. Some task force members felt that the timeline given to the task force was too short to fully consider the structure of a new college. Other task force members felt that details would be fully considered and worked out during the implementation phase.

3) A nation-wide search for a Founding Dean should begin as soon as possible. The new dean should lead the formation, development, and long-term success of the new college. An interim dean, no matter how dedicated and talented, will by nature be in office only a short time, and often will not have the same level of authority and/or willingness to implement long-term change as a permanent dean. The task force believes that true change and reorganization can only happen with a new, permanent dean. The task force recommends a nation-wide search to attract a dean with the administrative, research, and teaching experience necessary to lead the new college.

4) The faculty Executive Committee should be formed as soon as possible. The Executive Committee members should be highly experienced in nationally-competitive research and teaching, be elected by the faculty, and have final approval from the dean. Executive Committee members should represent the various academic disciplines within the college, and representation should be proportional to faculty numbers in each discipline. The Executive Committee could constitute the Founding Dean Search Committee, would replace the college promotion and tenure committees, and would conduct the academic program review. With these responsibilities, especially in the first few years of the new college, the task force strongly recommends compensation for Executive Committee members in the form of teaching release.

5) The Dean, Executive Committee, and Chairs should consider a) sharing staff across the college, enabling college staff to specialize in key areas, including grant accounting, human resources, course scheduling, student advising, finance, purchasing, and travel; and b) providing additional training to staff in critical functions such as grant accounting (the major area of concern among task force members). Currently, the few staff in small departments must be adept at many functions, and do not have the opportunity to specialize as staff may do in large units. Additional staff training would benefit college staff, faculty, and the upper administration staff. Staff could learn additional skills, and, ultimately, be eligible for higher levels of promotion; faculty could spend less time on functions that would be carried out by staff, and would thus spend more time on research and teaching; and central administration staff would spend less time on college level functions and more on their primary duties. Two examples are undergraduate program coordinator and graduate program coordinator. These staff members would report to a faculty member (e.g. on the Executive Committee), and would be responsible for executing academic program functions created and approved by faculty, including student advising. (More than one of each may be necessary for the large number of students and programs in science and engineering). Whenever possible, staff members should stay with their current units to take advantage of their specific knowledge and experience in that
unit. Current S&E staff members are actively discussing ways to improve efficiency and will be ready to provide valuable input when reorganization of staff functions is discussed.

6) **Departments should be maintained** to enable local control of laboratory fees, department-specific donations, and program operating budgets. In addition, maintaining departments would make a transition to a new college less disruptive for faculty and staff.

7) **Chairs should receive some summer stipend** in proportion to their summer administrative duties.

8) **Initial promotion and tenure, and faculty annual reviews should be performed by peers in same discipline** (i.e. ecologists evaluate ecologists; civil engineers evaluate civil engineers, mathematicians evaluate mathematicians, etc.). While there are efficiencies to be gained in the new college structure, discipline-specific review should not be lost in larger units with multiple disciplines (e.g. engineering, physics and nuclear engineering, biological sciences). The recent College of Engineering external review emphasized the importance of discipline-specific promotion and tenure review. In fact, promotion and tenure could be a 4 step process within the college: discipline-specific faculty committee, Chair, Executive Committee, Dean. In some cases, additional steps currently take place at the departmental level.

9) Finally, the S&E task force recommends a **college-wide research colloquium** to promote interdisciplinary interactions and research projects.

**Values**

In all of its discussions, the S&E task force emphasized the following values. These values hold whether or not reorganization takes place.

- Data-driven decision making
- Commitment to research and teaching (graduate & undergraduate)
- Faculty review by peers in the same discipline
- Maintain accreditation of healthy academic programs (currently, Chemistry, Health Physics, and Engineering programs are accredited)

**S&E Task Force Votes**

*(100% of S&E faculty members on the task force voted; the task force co-chairs did not vote)*

Support for the concept of and further consideration for a College of Science & Engineering: 10 in favor, 0 against

Support for the concept of and further consideration for a College of Science and a separate College of Engineering: 9 in favor, 1 against
The new college should have an Executive Committee comprised of senior faculty experienced in teaching and nationally-recognized research, responsible for advising the Dean on academic program review, strategic planning, tenure & promotion, and college budget/resource allocation: 7 **in favor**, 3 **against**

There should be a nation-wide search for a college Founding Dean (i.e. not interim dean) as soon as possible. The Founding Dean would have the full authority and power of the office, and would work with college faculty and university administration to establish the new college. **10 in favor, 0 against**

Chair compensation should not be limited to 9 months: **10 in favor, 0 against**

Consideration should be given for one or two biological science departments: 7 **in favor, 3 against** (the latter 3 felt that consideration should only be given for two biological science departments)

Implementation of the college reorganization plan should not be initiated until review of all college academic programs is completed, and college administrative structure, funding sources, goals, and performance measures are fully considered: **10 in favor, 0 against**

*President’s model strengths*

- Many ongoing research and teaching collaborations between scientists & engineers, e.g.
  - DOD-funded prosthetic hand project – mechanical engineering, biological sciences, and others
  - NSF-funded climate change and water resources EPSCoR project – biological sciences, geosciences, civil engineering
  - DOE, NRC-funded projects – nuclear engineering and physics
  - Co-participation in the Ph.D. in Applied Science and Engineering program
  - Geoscience faculty teach in the civil & environmental engineering program
  - Nuclear engineering faculty teach in the physics program
- Common commitment to research among scientists and engineers
- A College of Science & Engineering could be a smaller, more efficient college than Arts & Sciences
• Executive committee
  – enables more faculty input at the college level (i.e. direct faculty input to the dean)
  – reduces administrative burden on chairs
  – provides greater transparency in college-level decisions
  – strategic, forward thinking

President’s model drawbacks

• Programs vs. departments: task force prefers departments
  • Students and faculty identify with departments, not programs
  • Appearance of loss of local fiscal control in programs
• Underperforming academic programs may draw resources away from healthy programs
• Department chair and program head duties extend beyond 9 months/year
• Biological sciences faculty do not wish to go to Health Sciences, but prefer to stay with other natural sciences
  • The nature of their work is primarily fundamental biological science rather than health science
  • Graduate programs in the current Department of Biomedical and Pharmaceutical Sciences in the College of Pharmacy are not able to provide financial support to very many students, despite the national norm for student stipends in biological and biomedical science graduate programs; biology faculty are very concerned about effects of such a move on current and future graduate students, and, consequently, their ability to maintain nationally-competitive research programs
  • There are no relevant graduate programs for biological science faculty in the current Kasiska College of Health Professions

• No need for Associate Deans
  • Unbalanced scope of oversight with 99 science and 24 engineering faculty (faculty numbers include tenured/tenure track, research, clinical, and instructors, based on departmental websites searched on 1/24/10)
  • Unnecessary layer of administration between chairs and dean; contrary to the goal of greater administrative efficiency
S&E task force recommendations to address drawbacks (see also the Recommendations for Implementation on pp. 4-6)

- Keep departments
- Combine or reorganize some departments/units to achieve greater efficiency
- Review academic programs; eliminate or extensively revise underperforming programs
- Keep Biological Sciences faculty in the College of Science & Engineering
- Give faculty the choice to pursue joint or affiliate appointments in other departments, units, or colleges

Alternative models

The S&E task force recommends the following organizational and management structure(s) should a new College of Science and Engineering be formed.

Dean
- Reports to Provost
- Areas of responsibility
  - Development/fundraising
  - Budget and other resources, e.g. space allocation
  - Strategic planning
  - New faculty hires
  - Tenure & promotion
  - Chair performance reviews

Executive Committee
- Advisory to the Dean
- Tenured/experienced faculty with track record of success in teaching and nationally-recognized research
- Elected by faculty
- Members from various disciplines within the College, with representation in proportion to faculty numbers in each discipline
- 3 year rotation, teaching release
- Replaces current college tenure & promotion committees
- Areas of responsibility
  - Academic program review
  - Budget and other resources
  - Strategic planning
  - New faculty hires
  - Tenure & promotion

Chairs
- Report to the Dean
- Periodic chairs meetings with the Dean
• Chair responsibilities
  • Management of academic program lab fees, operating expenses, and department/program-specific donations
  • Facilitate communication between Dean and faculty
  • Faculty performance review

Departments and academic programs

Engineering: The current College of Engineering has 24 faculty in the departments of Civil & Environmental Engineering; Electrical Engineering and Computer Science; and Nuclear and Mechanical Engineering, and offers ABET-accredited degree programs in these areas. The task force recommends that these units (with the possible exception of Nuclear Engineering – see below) be combined into one department/unit with a single chair/unit administrator within the College of Science & Engineering. Each degree program may also have a program coordinator. It is paramount to have an engineering organizational structure that will enable its healthy academic programs to maintain ABET accreditation.

Biological Sciences: The current Department of Biological Sciences has 33 tenured/tenure-track and research faculty, and a few instructors. Approximately half of them are in ecology and evolution, and half in anatomy and physiology, biochemistry, microbiology, and molecular biology. Among these areas, there are clear discipline-specific differences in scientific approach, resource needs, and benchmarks for productivity. Consequently, the task force considered the possibilities of one vs. two biological science departments. In the first model, the Department of Biological Sciences would remain in its current structure as one unit; in the second model, it would become two departments, e.g. one with emphasis on biochemistry, microbiology, and molecular biology and another with emphasis on ecology and evolution. Faculty would have the choice of joining one or both departments, and both departments would cooperate in delivering Biology degree programs. The advantages of the first model are increased efficiency and reduced administration with one large department. The advantages of the second model are that faculty would be evaluated by disciplinary peers, and all S&E departments would be similar in size. Most Biological Sciences faculty favor keeping one department, but some favor consideration of two departments based on the discipline-specific differences listed above. The task force suggests that Biological Sciences faculty, and, if needed, the Executive Committee and Dean review the department’s administrative structure, faculty interests and alignment, and resources.

Physical Sciences and Mathematics: The task force recommends that the current departments of Chemistry (16 faculty), Geosciences (11 faculty), and Mathematics (17 faculty) remain as is, and that consideration be given to combining the Departments of Physics (15 faculty) and Nuclear Engineering (5 faculty). There are multiple research collaborations and some teaching collaborations among physicists and nuclear engineers.

In summary, the proposed College of Science and Engineering would realize efficiency in one dean rather than two, and from reorganizing from 8 to 6 or 7 departments/units.
Task force responses to President’s questions

- Does reorganization facilitate research and instructional collaborations? Yes, with science and engineering in one college, collaborations among the disciplines are easier than ever. The college-wide research colloquium will foster research collaborations across disciplines.

- Does reorganization enhance faculty’s role in shared governance at the college and program levels? Yes, via the Executive Committee, where faculty would participate in more college level decisions.

- Does reorganization increase the scope of faculty shared governance at the college and program levels? Yes. ISU Faculty Senate enables faculty to engage in university-wide governance. The proposed Executive Committee will enable similar input at the college level.

- Does reorganization reduce demands on faculty time for committee and other service responsibilities? In many cases, yes. For very small departments, this is certainly the case. And, in the case of large departments, some processes, e.g. promotion and tenure, could be simplified and streamlined to reduce faculty time for departmental committee service.

- Does reorganization help distribute workload across disciplines, providing more opportunities for reduced workloads for research and other commitments? Yes, the Executive Committee can oversee and facilitate this.

- Does reorganization enable streamlining of programming by reducing redundant course offerings? N/A

- Does reorganization enhance patient care in the health professions (due to centralization of clinics)? N/A

- Does reorganization increase flow of communication between faculty and central administration by reducing cumbersome administrative layers? Communication from the dean to faculty could be improved via the Executive Committee.

- Does reorganization broaden use of available resources across larger units? Yes, particularly for Engineering.

- Does reorganization facilitate long-term strategic growth? Yes, via the recommended academic program review, Executive Committee functions, a smaller college more uniformly devoted to research, and, most likely, through a new Founding Dean.