Academic Program Review
Department of Statistics
University of Nebraska, Lincoln
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Executive Summary: The Department of Statistics is a relatively new unit (2003) that arose from the timely merger of the Division of Statistics (Department of Mathematics; College of Arts and Science (CAS)) and the Department of Biometry (Institute of Agriculture and Natural Resources (IANR)). The Department has research strengths in Statistical Genetics/Computational Biology; Survey Sampling; and Statistics Education; has deep research collaborative connections with programs in IANR; and has become a more integrated academic work environment since the last academic program review. As training and research needs/demands for Statistics increase worldwide, the Department of Statistics is uniquely positioned to meet the challenges associated with both data driven science and society (e.g., Big Data and Analytics), and educating the next generation of teachers, statisticians, and quantitative thinkers. Because the Department of Statistics is jointly administered by IANR and CAS, and because these two entities serve both the land grant and liberal arts missions of the University of Nebraska-Lincoln (UNL), respectively, the strengths and opportunities that reside with the Department of Statistics present enormous possibilities for transformative change in the academic culture, in undergraduate and graduate education, and in interdisciplinary research. With this in mind, four prioritized areas of focus are identified in anticipation of fluctuations in faculty and staff numbers (retirements and hiring), and the desire to guide UNL Statistics proactively toward greater University-wide visibility in research, consulting and education; national and international recognition for novel contributions to the discipline of Statistics; and greater efficiencies with current resources in anticipation of new/promised resources.

1. Graduate Program: Prioritization/Consolidation/Restructuring
    - Modified recruitment and admissions procedures, and enrollment reductions (no more than 5/1 ratio of students to faculty)
    - Masters/Service track; and Ph.D. track
    - Joint Ph.D. programs, 5th year MS, dual degree, and leveraged teaching
2. Undergraduate Program: Experiential-based
    - Professor of Practice (PoP)/Director of Undergraduate Studies, advising, instruction
    - Two tracks: students with the goal of attending graduate school, or those with the goal of joining the work force after graduation
    - Leverage learning/research experiences with research foci
3. Research: Paths to Excellence
    - Computational and Integrative Biology
    - Education Analytics
    - Foundations of Statistics
4. Departmental Environment: Unify faculty, staff, and students around Departmental vision and success
    - Morale and Value: staff, student, faculty
    - Clear leadership and vision forward
    - Proactive planning of initiatives with an eye on efficiencies

Given that the University of Nebraska-Lincoln is currently transitioning into the Big Ten Conference culture, and has new membership into the Committee on Institutional Cooperation (CIC), this is indeed a timely opportunity for the Department of Statistics and the administrations of IANR and CAS to unite in a joint venture to not only 'Think Big', but to build efficiencies, efforts, and vision toward unique transformative changes that address the Chancellor's goals for the University.

Each of the four prioritized areas of focus are discussed, and recommendations made, in anticipation of fluctuations in faculty and staff numbers (retirements and hiring), and the desire to guide UNL Statistics proactively toward greater University-wide visibility in research, consulting and education; national and international recognition for novel contributions to the discipline of Statistics; and greater efficiencies with current resources in anticipation of new/promised resources.

1. **Graduate Program: Prioritization/Consolidation/Restructuring**
   - **Modified recruitment and admissions procedures, and enrollment reductions (no more than 5/1 ratio of students to faculty)**
   - **Masters/Service track; and Ph.D. track**
   - **Joint Ph.D. programs, 5th year MS, dual degree, and leveraged teaching**

The majority of successful graduate programs in Statistics in the United States are the result of strong faculty with strong research programs who teach relevant, foundational, and current subjects, and who are able to attract top students with whom they work. Often building a strong graduate program is mistakenly considered more important than creating, developing, or maintaining service courses, undergraduate majors, or consulting. In reality the strongest graduate programs in Statistics exist because of large service teaching commitments to the University, successful undergraduate programs, and statistical consulting services. Undergraduate programs and graduate programs co-exist in that the teaching assistance and consultant support comes from graduate students working as teaching assistants (TAs) and statistical consultants, or graduate research assistants (RA or GA), in exchange for stipends and tuition waivers. With this cohesive vision in mind, recommendations are made for strengthening the graduate program, and in turn supporting both the service teaching and research missions of the Department while providing support for the proposed undergraduate program that will be discussed next.

Recommendations:

- An appropriate Faculty/Student ratio is vital to any successful graduate program. The number of graduate students (approximately 65 equally distributed Masters and Ph.D. students, currently) in the Department in recent years has been too large relative to the number of faculty. It is recommended that the Department reduce, through a more selective admissions process, its graduate study body to roughly 50 students within the next two years.
- Further, in subsequent years, as the number of faculty grows and as the proposed undergraduate program takes hold, the Department should maintain a student/faculty ratio not greater than 5.0. The impact of this adjustment is twofold. First, it will increase/focus the amount of time that faculty spend directing the projects/theses of each graduate students, and second it will increase the quality and reputation of the Department's research enterprise.
- It is strongly recommended that the Department revisit all of its Masters and Ph.D. curricula (including qualifying oral and written exams, etc.), course offerings, and opportunities with a view toward consolidation, course quality and consistency, and efficiencies. Compared with much larger departments (e.g., Iowa State University, Purdue University, Texas A&M, Ohio State University), UNL Statistics should not try to offer the same spectrum of courses over the same timeframe.
- It is recommended that the number of courses taught in any given semester be reduced. This will focus/update the graduate program, reduce the workload of the already burdened faculty/staff, and allow time for less reactive and more proactive changes to the Department.
- It is also suggested that the Department consider offering its elective courses less often (e.g., Ph.D. electives only once every 2-3 years), or consolidate some of them (e.g., combine the two experimental design courses into one course; combine the 2-credit matrix algebra course and current 3-credit linear models course; etc.). This will increase student enrollment in the elective courses, decrease the breadth of faculty teaching, and provide a restructured and focused graduate program.

- Further, it is suggested that collaborative and cross listed courses be explored with the Department of Mathematics and other departments (e.g., Computer Science, etc.) for the purpose of taking advantage of their course offerings, and thus preserving the time of the Statistics faculty for externally funded research activities. Efficiencies created by prioritization and consolidation provide the Department with the flexibility it needs to pursue new avenues (i.e., be proactive) that increase University visibility and value, as well as free up faculty/staff time to pursue new opportunities (e.g., an Undergraduate Program in Statistics, and a 5th year Masters).
- Although our message is consolidation of course offerings for the Masters and Ph.D. curricula, there are two areas to consider increases in course offerings, one should address the notable absence of modern computational training specifically in the Masters program, and the second should provide structured consulting experiences. The lack of a required statistical computing course for the Masters program puts graduates of this program at a distinct disadvantage when compared to graduates from other institutions that have aggressively incorporated computing into their curriculum. It is recommended that a modern statistical computing course be added to the curriculum. It should include use of a programming language (Java, C-Plus, etc.), an understanding of algorithms, optimization, dimension reduction, and an introduction to Bayesian computational methods. Finally, consulting experience is vital for any Masters or Ph.D. graduate. Incorporating required consulting experiences into the graduate program needs to be a priority that is supported by the Department/Colleges/University in terms of funding, commitment, and message. It is well known, from other departments (Iowa State, Purdue, Penn State) in the country that a successful consulting service increases collaborations across units, improves reputations and research, and provides graduate students with valuable interdisciplinary experience. The impact of these changes will make the graduate program more attractive to applicants while making graduates of the program more current, and thus more employable.
- The number of applicants to the Department's graduate program is very low in comparison to other Big Ten Departments of Statistics. For example, Purdue University Department of Statistics, while much larger, receives 500-600 applications for their Masters and Ph.D. graduate programs each year (they accept approximately 40-45 students per academic year). To improve the quantity, quality, and diversity of applicants, the Department needs to be more intentional in its marketing efforts. Professor Zhang's student recruitment visits to China (AY 2013-2014) are a great first step, and we recommend that the Department continue to invest in recruitment activities in the future (e.g., Field of Dreams Conference, Society for Advancement of Chicanos and Native Americans in Science **(**SACNAS**)** Conference, etc.).
- It is also suggested that the joint Ph.D. programs (with Economics, Agronomy, etc.) be advertised more aggressively to undergraduate students majoring in the affiliated departments. Acquiring joint quantitative training is uniquely marketable, available via the Department, and piggybacks on the strength of other University graduate programs.

Impact:

Focusing the Graduate Program in Statistics via efficiencies in coursework and research, and increasing the quality of applicants/admits supports the CAS Strategic Plan Objective 2. "Graduate programs of high quality are critical to the research enterprise."

2. **Undergraduate Program: Experiential-based**
   - **Professor of Practice (PoP)/Director of Undergraduate Studies, advising, instruction**
   - **Two tracks: students with the goal of attending graduate school, or those with the goal of joining the work force after graduation**
   - **Leverage learning/research experiences with research foci**

Undergraduate education is the cornerstone for every land-grant university in the United States. As today's society and world become more data driven, quantitative thinking, reasoning, and analytics are no longer optional –they are a necessity. The UNL Department of Statistics is well-positioned to provide undergraduate training in Statistics for the University (i.e., service courses), and to create and offer an undergraduate degree in Statistics. The formation of a new undergraduate program in Statistics is timely, supports the land-grant university mission, and reinforces the "Think Big" initiative to increase student enrollment.

Recommendations:

- Redesign the Statistics service courses using technology (e.g., online or blended delivery, flipped classroom, etc.) to improve learning and reduce costs, and to create a unique Statistics, or Data Science (or, Data Analytics) undergraduate major with an integrated curriculum that offers a variety of attractive end points for students; specifically, terminal degree (i.e., students entering the workforce), graduate school (students continuing their education), and/or 2+3 Masters (5 year BS/BA and Masters for students in the Undergraduate Statistics Program).

Importance and Justification:

Service Courses: There is a significant national need for training in quantitative literacy. As the world becomes more data-driven it is essential that every undergraduate from UNL be able to read (e.g., newspapers, reports, web-sites, etc.), process, consider, draw conclusions and form opinions that are quantitatively informed. The Department of Statistics is well-positioned to approach the majority of undergraduate programs on campus for the purpose of providing introductory service Statistics courses. By taking advantage of different instructional delivery styles (e.g., traditional lecture, flipped classroom, online/blended) University redundancies will be reduced, teaching efforts consolidated, and UNL Statistics will be positioned as a significant contributor to the overall undergraduate education and experience at UNL.

Undergraduate Major Courses: Worldwide, Statistics and/or Data Analytics is in very high demand as evidenced by the increasing number of Advanced Placement (AP) examinees (153,000 students in 2012). The popularity of the Statistics undergraduate major is a nationally growing trend that is currently being experienced by UNL peer institutions. A lean undergraduate major in Statistics coupled with already strong undergraduate degrees such as Mathematics and/or Actuarial Science lends itself to double-majors and multiple partners campus-wide.

Leveraging existing infrastructure:

Service Courses: UNL Statistics faculty have a proven record of pedagogical and teaching innovation including a teaching assistant (TA) mentoring/training program that is a national model, and (not mentioned during the site visit, but) as evidenced by Dr. Erin E. Blankenship receiving the 2013 Mu Sigma Rho William D. Warde Statistics Education Award for her 'work in developing and teaching Statistics courses for elementary, middle, and high school educators; for making important contributions to and for providing leadership in the Statistics education research community; for creating and implementing novel instructional approaches including the use of writing assignments to assess student understanding, to identify and address areas of student misunderstanding, and to encourage critical thinking; and for consistently achieving excellence in teaching'. Furthermore, there are also excellent resources available nationally (e.g., the GAISE assessment and pedagogical guidelines www.amstat.org/education/gaise ; multi-section course redesign models at the National Center for Academic Transformation www.thencat.org ; and pedagogical resources www.CAUSEweb.org); excellent instructional design support for developing blended courses at the UNL Office of Online and Distance Education; and campus partners such as the Program of Excellence at the Center for Science, Mathematics and Computer Education, and existing collaborations with Teaching Learning and Teacher Education group.

Undergraduate Major Courses: A skeletal framework of core courses necessary for creating an undergraduate degree in Statistics (or Data Analytics/Science) already exists in the Department of Statistics at UNL. Specifically, a probability/mathematical Statistics core; an applied Statistics core; and an advanced applied Statistics core all currently exist as part of a suite of 800-level level (service) courses available to students from other departments. Further, there are undergraduate courses that exist in other departments that can be utilized for an undergraduate Statistics curriculum. Specifically, a mathematics and computational core; advanced mathematics core (for undergraduate Statistics majors who are headed to graduate school); applied core courses in the computational sciences, or elsewhere on campus (for undergraduate Statistics majors who will work after graduation). Two pieces are needed for a successful undergraduate major in Statistics: First, an integrative theme that gives the major a unique UNL character (e.g., "discovery through data", "modeling the living world", "data analytics with geographic information services (GIS)," etc.). Second, a co-op (for the terminal, or 2+3 track undergraduate majors), or a research experience for undergraduates (REU; for the graduate school track undergraduate majors). Both a themed education, and tailored work/research experience that serves the three groups of undergraduate students (terminal degree, graduate school bound, and a 2+3 Master track), leverages the Department of Statistics' strengths and ties to industry and research centers.

Opportunities for intellectual, personnel, or capital investment:
While much of an undergraduate curriculum in Statistics can be leveraged by taking advantage of existing resources, there is one key faculty hire that is immediately necessary in order to avoid further overloading an already burdened faculty. Specifically, a Professor of Practice (PoP) with administrative (e.g., undergraduate advising; dealing with transfer credits); scholarship (course development in a culture of assessment); and teaching (course coordination and classroom instruction) duties is recommended to serve as the Director of Undergraduate Studies. This person will be responsible for launching the undergraduate major, and working with faculty on course (redesign) efforts. As the major takes hold and grows, a second Professor of Practice faculty hire is recommended to sustain efforts, and to move the program to a level of national prominence by using Statistics classrooms as a laboratory for continual teaching and learning innovation. In order to accomplish this, it is recommended that refreshing equipment in both the undergraduate and graduate teaching laboratories be a top priority and necessity; this should be done in conjunction with the planned use of technology over the next four years, and not just as a legacy refresh of existing desktop machines.

Tactics/Partners:
Undergraduate students in Actuarial Science, Mathematics, Biological Sciences, and a host of other highly quantitative IANR departments, have tremendous potential to rapidly fuel the rise of Statistics as a popular double-major. Support from the Center for Science, Mathematics and Computer Education for PoP and Discipline Based Education Research (DBER) positions, collaboration and support of new PoP/DBER faculty with recent PoP/DBER hires campus-wide; collaboration with Teaching Learning and Teacher Education in the pre-service teacher training component in conjunction with existing courses and resources all provide a great foundation upon which to build an undergraduate Statistics major.

Impact:
Service Courses: Service courses in undergraduate Statistics not only provide an efficient high-quality learning experience for students, they provide faculty with a classroom laboratory that allows for continual innovation, creativity, and novel research in Statistics Education.

Undergraduate Major: The expected trajectory of success for an undergraduate major in Statistics is at least 100 well-trained undergraduates within 5 years. This includes a large number of students competitive for graduate school; a significant number of 2+3 Masters students that enrich UNL Statistics' graduate program; and a pipeline of students prepared to enter the workforce as data analysts (including double majors). The impact of a Statistics undergraduate program will be mostly felt by the Department of Mathematics (cross listed courses, enrollment pressure, etc.). Discussions amongst the review team suggest that the impact would likely be small, yet a detailed analysis of the potential impact is suggested. An undergraduate major in Statistics is in full alignment with CAS Strategic Plan Objective 1, and an active coop program is in line with CAS Strategic Plan Objective 3.1.

3. Research: Paths to Excellence

- **Computational and Integrative Biology**
- **Education Analytics**
- **Foundations of Statistics**

The research path of any academic unit is set by the interest, focus, and collaborations of the faculty. Building on existing strengths, rather than venturing into new areas saves time and resources, and focuses the mission and vision of the Department. With this in mind, since its inception, the Department of Statistics has focused existing interest, new hires, and research programs in the areas of Computational and Integrative Biology (also considered Bioinformatics-type research), Statistics Teaching and Education Analytics Research, and Foundational Statistics (or core curriculum). The first and second foci will be discussed at length given that the Foundations of Statistics are included in every dimension of the departmental teaching and research missions.

Computational and Integrative Biology

Recommendations:

- Build on the collaborations and needs of other University units in Statistical Bioinformatics, Computational Biology, Big Data, Genetics, Genomics, Epigenomics and the like for the purpose of growing Departmental reputation in both research and communication, generating interest, and making the Department relevant both locally, domestically, and internationally.
- Provide support and standard statistical analyses for collaborators that in turn will lead to new research ideas, often theoretical, for Statistics faculty, graduate students looking for dissertation topics, and opportunities for undergraduate research experiences.
- Understand, and encourage (students/faculty), the difference between doing analyses for collaborators to move their science forward, and performing novel Statistics research that arises from collaborators' requests. Collaborators do not have time to wait 6 months or longer for a novel solution or method. Helping them quickly, then working on their research problem independently, and returning to them later with an improved solution is a good way to promote UNL Statistics' commitment and reputation to Computational and Integrative Biology. Further, this approach promotes value to the University.
- It is suggested that a faculty member with interest in Bioinformatics and/or Computational Biology host the mail list for all of UNL; announce all Departmental, Center, University, and Industry talks/workshops; again, this promotes goodwill and sends a positive message of commitment from UNL Statistics.
- Host a "University" Computational and Integrative Biology Seminar each semester by starting with UNL faculty presenting existing collaborations (i.e., PI of lab, or biology-type, presents problem/question for the first 20 minutes; statistician-type presents the methodological approach for the second 20 minutes; have 10 minutes of discussion with biologist-type and statistician together with the audience).
- Make other units on campus aware of UNL Statistics' new found direction by attending seminars, asking for 5 minutes during faculty meetings to pitch ideas, ask for suggestions, and inform direction of the Department.
- Suggest (i.e., contact Deans, Heads, Search Chairs) joint faculty appointments (major and minor departments) with new and existing faculty across the University; this will increase visibility, collaborations, and opportunities. There are huge opportunities for joint appointments with Mathematics (Mathematical Biology), Computer Science (big data, networks, dimension reduction), Biology (integrative 'omics, Epigenomics), Agronomy (Plant Genetics and Genomics), etc.

Importance and Justification:

Technology is driving advances in the biological sciences, and generating data. These data need to be cleaned, stored/databased, explored, and integrated. Understanding the specifics of the technology, how to design an experiment, how to explore, reduce dimension, and analyze the data, as well as interpret the results are collaborative efforts that often involves a team of people. In order for UNL to remain competitive in the overall scientific arena it is essential that Computational and Integrative Biology grow as both a discipline and service as there is an increasing need to train students, as well as supply expertise that advances science.

Leveraging existing infrastructure:
Via the Computational Science Initiative, and the positions for big data that have already been allocated in IANR, much of the workforce for Computational and Integrative Biology is being hired or will be hired in the near future. It is essential that Statistics faculty are represented on the search committees (Deans/Heads can make this happen), at the seminars and interview talks (introducing themselves (name/department) to the speaker and audience when they ask questions or voice opinions), and that joint faculty positions be considered and offered to candidates. The existence of joint faculty positions improves communication across units, increases co-advising of students, and lowers the academic walls between units; such faculty send a clear message that UNL proactively acknowledges interdisciplinary collaboration, education, and research both internally and externally.

Impact:
High-impact research is not only the cornerstone of any highly ranked academic department, it is a designated item of focus in the CAS Strategic Plan Objective 2. Given the University's investment in Computational Biology and Bioinformatics, the current direction of UNL Statistics in Computational Biology, and the need for Computational Biology/Bioinformatics support, research, and training, an active program within the Department will promote its message/direction, and will significantly impact the entire University.

Statistics Teaching and Education Analytics Research (STEAR)

Recommendation:
- Build on Departmental strengths in Statistics Education and Analytics.
- Leverage the strength in TA mentoring, and the recommended course and curriculum redesign activities mentioned previously, as opportunities to enhance the Department's research program in Statistics Education.

Importance and Justification:
National reports and standards in nearly every state recognize Statistics as being vital to the core curriculum at all levels. However, the expansive growth in Statistics courses, especially at K-12 levels, has put the burden on instructors with little or no training in statistical content. It is also widely recognized that the non-deterministic thinking and reasoning skills necessary to grasp statistical concepts are different from those in Mathematics, and difficult for students to grasp. Thus, there is need for research in both the teaching and learning of Statistics. The value added by pedagogical innovations are crucial, and well aligned with national priorities. Interestingly, since Education Analytics and Statistics Education Research are both small fields, UNL is nearly unique in having both in the same department – the calling card of an opportunity for ground-breaking work.

Leveraging existing infrastructure:
There are long-standing collaborative ties to the Department of Teaching Learning and Teacher Education; active participation of Statistics faculty in the Center for Science, Mathematics and Computer Education (a UNL Program of Excellence); unique research in Education Analytics focusing on value-added models; and an innovative TA mentoring system that are all hallmarks of the strength of the recent UNL Department of Statistics STEAR efforts. This successful focus has generated publications, research funding, and reputation for the Department.

Opportunities for intellectual, personnel, or capital investment:
With two active, and three more moderately involved faculty, the Department is able to keep their current level of STEAR efforts at a high quality. However, the addition of substantial efforts in research focusing on the Department's new curricular reforms, K-12 teacher training efforts, and course redesign creates the need for an additional DBER tenure-track position, and an opportunity for some sort of funding that is equivalent to a PoPs training grant. This will allow for the coordination of the service classes in a culture of assessment; meet the

needs of the Common Core and other state standards for teacher training in an effective research-based manner; and will foster the evaluation of the value-added to student learning arising from those actions.

Tactics/Partners:
It is important for the UNL Department of Statistics to enhance and sustain contacts with DBER faculty in other disciplines and to make greater use of existing UNL central course and research development seed funding. This will initiate STEAR activities and provide the pilot data that are important for national funding sources. Further, the active participation in the Center for Science, Mathematics and Computer Education should be extended and nurtured as part of enhanced STEAR activities. In addition, the value-added modeling using stochastic networks is cutting-edge work and should be leveraged as a reputation builder through broad dissemination. It should definitely be highlighted in UNL outreach publications and development efforts (e.g., contact both Development and Outreach offices in both the Colleges, and at higher levels with this information).

Impact:
An active STEAR program using Departmental service classes as a laboratory for scholarly work is at the core of CAS Strategic Plan Objective 1.1.

4. **Departmental Environment: Unify faculty, staff, and students around departmental vision and success**
    - **Morale and Value: staff, student, faculty**
    - **Clear leadership and vision forward**
    - **Proactive planning of initiatives with an eye on efficiencies**

A safe, productive, nurturing work and learning environment is the foundation of any successful team. As was mentioned previously, the Department of Statistics is a relatively new unit (2003) that arose from the merger of the Division of Statistics (Department of Mathematics; College of Arts and Science (CAS)) and the Department of Biometry (Institute of Agriculture and Natural Resources (IANR)). Along with this merger came different academic cultures, attitudes, and loyalties. Under temporary leadership the Department has made progress toward a unified vision and direction, but there are numerous issues that need to be addressed so that staff, students, and faculty feel valued, heard, important, and respected. Though the culture has improved since the last Program Review, conversations with staff, faculty, and students still revealed low morale, exhaustion from workload, confusion about the path forward/vision, lack of communication, and disregard for people's time. The results of these revelations are that faculty and staff are leaving/retiring, recruitment of quality graduate students is difficult, and fulfilling the teaching and research needs of the land grant university mission is next to impossible. Further, there is a distrust of the upper administration due to promised faculty positions and resources from both Colleges (CAS and IANR) not being delivered, and a general feeling of no support. Students in particular are oddly well informed about the inner workings of the Department, politics, and disputes, and they too are suffering from low morale and a general feeling of instability and no support. Despite these challenges, the faculty get along well and are unified in their desire to cultivate the Department of Statistics' enormous potential.

Recommendations:

- Communication, attitude, teamwork, and a feeling of personal value start from the top. Permanent leadership (i.e., hiring the Chair of Statistics) has already brought some level of stability and resolve for moving forward in a unified manner. This leadership needs to be mentored by both higher administration (Deans) and peers (fellow Department Chairs in the Colleges). It is suggested that the Chair form a mentoring committee (or one be formed for the Chair), that is met with regularly, of 2-4 more experienced Chairs from both CAS and IANR.
- With respect to the direction of the Department, it is suggested that the Chair of Statistics define, communicate (verbally and in writing), and delegate clear/doable initiatives that in turn formulate a five year Strategic Plan for the Department. The content of this external review team report is a very good starting point for an initial five year Strategic Plan (e.g., 1. Deploy faculty efficiencies; 2. Graduate Program and Admissions; 3. Undergraduate Program). It is recommended that the Chair provide to the faculty and upper administration Objectives, Strategies, Deliverables, and Metrics for assessment.
- Regular faculty/staff meetings should be established once a month with contributed agenda items from the faculty/staff that is circulated 24 hours in advance, and with a defined start and stop time (meetings should start/end on time, should be scheduled with the class schedule operating times in mind (not after 5pm), and be no longer than a class period). Meeting attendance and minutes should be taken by the Chair's Assistant and posted on an internal departmental website as a record of discussions.
- It is recommended that the Chair have a regular office schedule, as much as possible, so that the staff are able to have access to the Chair, and so they can be productive and helpful to the Department and University.
- Further, it is recommended that the Chair walk through the staff offices once a day to say hello, answer quick questions, and to acknowledge the important responsibilities that staff have in running the day-to-day operations of a successful department; doing this upon arrival to campus lets everyone know the Chair are in the building.
- While the Chair has responsibilities to the Department, the Chair also has a research program. It is suggested that the Chair work with his Assistant to block out time for research (e.g., 4 hours blocks twice a week); during this time the Chair's office door is closed, or he is working elsewhere.

- To increase communication and create a sense of value among the staff, the Chair should hold a monthly Staff meeting (agenda items contributed by staff, agenda circulated 24 hours in advance, start/stop on time, meeting no longer than one class period).
- Finally, staff and faculty should refrain from involving students in Departmental/University politics, and over-sharing Departmental activities (dirty laundry) that are not directly relevant to the students. Students need a clear path forward without the distractions of being involved in negativity.
- Communication from the Chair to the students can be accomplished via monthly (bulleted) emails, and/or meeting with them as a group once a semester (with an agenda and preset start/stop time).
- Further, it is recommended that the Department conduct a Climate Survey from the Women in Science and Engineering Leadership Institute (WISELI) at the University of Wisconsin for the purpose of uncovering/revealing any underlying issues that may be preventing a healthy and productive work environment.
- Discussions of international recruitment of students, increased diversity, and global research programs are essential among faculty, staff and students for the purpose of inclusion, transparency, and globalization.
- Lastly, it is suggested that the Department sponsor one social event each semester for staff, faculty, students and their families with food, open bar, games, awards, raffle, etc. in order to promote a positive teamwork environment. The Chair will have to rally the troops, and maybe even participate in some silly games, to increase attendance for the first couple events, but it will eventually make a big difference in Departmental morale.

Importance and Justification:
Research and national reports indicate that a safe, positive, inclusive work environment leads to increased morale, productivity, recruitment of new employees, retention of existing employees, and future success among employees. Open communication with, and access to, the leadership of the Department is essential to moving the Department into a place of efficiencies, stability, importance, value, and recognition.

Leveraging existing infrastructure:
UNL has in place a plan for growing and moving the University forward. All of UNL Statistics' future plans are extremely well aligned with the existing resources and direction of the University. Communicating UNL Statistics' plan forward to faculty, staff, students and administrators reinforces the objectives of the Department, leverages existing infrastructures, and sets the stage for future resource needs.

Opportunities for intellectual, personnel, or capital investment:

Strategic hiring of key faculty in both Computational Biology and Statistics Education supports the redesign of the Graduate Program that in turn will support the suggested creation of an Undergraduate Program which in turn supports an already successful PoP and teacher training program.

Tactics/Partners:
With the new leadership for UNL Statistics in place, it is essential that the Department make a conscious effort toward efficiencies, consolidation, teamwork, and mentoring. It is suggested that (and has been offered by) Rebecca Doerge (Head of Purdue Statistics) host the Chair of Statistics at UNL for the purpose of job shadowing, talking with faculty and staff about communication, direction, and strengths and weaknesses. Professor Doerge has also offered to return to UNL Statistics in the Fall of 2014 to discuss ongoing progress of the Department. Further, the UNL Department of Mathematics is already a strong partner; this partnership should be cultivated and enhanced.

Impact:
A positive and respectful work environment where everyone knows the plan forward is the key to proactive change and impact.