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To: Associate Dean Eric Wilcots
From: Chair Brian Yandell, Department of Statistics
Re: Teaching Load Reduction Request
Date: Fall 2011 (revised 14 Nov 2011)

The purpose of this memo is to formally request that the teaching load for Department of Statistics faculty be reduced from 4 to 3 courses per year. Our peer Statistics Departments have teaching loads of 3 courses per year. Therefore, we are at a serious, competitive disadvantage in our ability to recruit and retain the highest quality faculty. Below, we address major issues, including

1. Would reduced teaching load adversely affect the undergraduate program and student access to courses and faculty?
2. How would a change in teaching load affect student opportunities for involvement in research?
3. What is the impact on the L&S budget of our grant buyout rate?

Before addressing these questions, we review the teaching loads at peer institutions and the UW-Madison Statistics Department instructional portfolio.

Teaching Loads at Peer Statistics Departments

In 2010, as part of our 10-year review, Jun Shao and Zhengjun Zhang conducted a comparison of teaching loads at other peer institutions. All the Big 10 schools have 3 semester (U Illinois, Indiana U, U Iowa, Michigan State, U Michigan, U Minnesota, Penn State, and Purdue) or 4 quarter (Northwestern, Ohio State) course loads. Similarly for other public schools, semester systems have 3-course loads (UC Berkeley, UNC, NCSU, Iowa State, Texas A&M, U Florida, Florida State, Rutgers U) and quarter systems have 4-course loads (UCLA, UC Davis, U Washington). Finally, private schools have the same loads (U Penn, Harvard, Columbia, Duke on semesters; Stanford and Chicago on quarters). While some of these departments on semester systems still formally retain a 4-course load on paper, the *de facto* load is 3. Further, some departments with 3-course loads are even offering reductions to 2-course loads.

Statistics Instructional Portfolio

Statistics and L&S agreed on 17 February 2006 to base the number of lecture sections on a teaching FTE of 18. This yield 72 lectures, reduced by 4 for Chair and Associate Chair buyouts to 68, or 34 per semester. Through a long-standing internal arrangement, Biostatistics & Medical Informatics (BMI) covers one of these 34 courses per semester with their staff. Four introductory course lectures are combined with others (see below) to reduce the Statistics instructional portfolio to 30 lectures per semester. Thus, Statistics is expected to cover 58 lectures a year with L&S resources.

Statistics and L&S agreed to increase class sizes in two large introductory courses (Stat 301 and 371) up to 144 to save 4 lecture sections for internal reallocation as teaching load reductions. That is, these saved lectures could partially reduce teaching load for faculty on a rotating basis. Thus, Statistics reallocates these 4 lecture reductions, plus the one BMI-contributed each semester on average.

Recent increase in course demand has caused the permanent addition of a fourth lecture of Stat 371 (included above), and a possibly permanent increase in 311, 312 and 324 from 3, 2 and 2 lectures per year, respectively, to 4, 4 and 3. Finally, increased enrollment from SOAR this fall led to an additional Stat 301 lecture. The following table shows teaching responsibilities for the past two academic years, 2010-11 and 2011-12 (with only the conservative budget for Spring 2012), split between Statistics faculty, BMI faculty and Lecturers. Extra courses beyond the 60 per year traditional teaching portfolio are separated out; L&S paid for extra undergraduate courses, while graduate extras were donated by faculty.

two years	total	Stat	BMI	Lec
graduate	36	35	1	0
grad extra	2	1	1	0
undergrad	84	31	4	49
ug extra	10	1	0	9
total	132	68	6	58

Calculations in the next two tables itemize “debits” (faculty duties that reduce teaching FTE) for the academic years 2010-11 and 2011-12. Debits include chair and associate chair administrative buyouts, research grant buyouts, sabbaticals, L&S Dean retention deals, and L&S internal teaching load reductions. Note that there are no internal teaching load reductions under the 3-course plan.

2010-11	4-course		3-course		2011-12	4-course		3-course	
	FTE	Load	FTE	Load		FTE	Load	FTE	Load
Debits	5.25	21	3.17	9.5	Debits	6.75	27	4.67	14
L&S load reduction	2	8	0	0	L&S load reduction	2	8	0	0
Dean retention	0	0	0	0	Dean retention	1	4	1	3
research grant buyouts	1.75	7	1.67	5	research grant buyouts	1.25	5	1.17	3.5
chair,ac	1.5	6	1.5	4.5	chair,ac	1	4	1	3
sabbatical	0	0	0	0	sabbatical	1.5	6	1.5	4.5

The next two tables show debits and available faculty for the 4-course and 3-course plans using 2010-11 and 2011-12 data. We have 14.25 FTE teaching “assets” from 20 faculty, many with joint appointments. These 14.25 FTE can theoretically cover 57 lectures with the 4-course teaching load, or 42.75 courses with the 3-course plan. Now focus on 2010-11. For the 4-course teaching load, the debit is 5.25 FTE, or 21 lectures, netting available faculty of 9 FTE, or 36 faculty lectures. With a 3-course plan, the debits are 3.17 FTE, or 9.5 lectures, leaving 11.08 FTE, or 33.25 net available faculty lectures. The number of STS Lecturers needed for our instructional mission is 22 under the 4-course plan, and 24.75 under the 3-course plan. For 2011-12, we need 28 STS Lecturers under the 4-course plan, or 29.25 under the 3-course plan. Thus, Statistics would need an extra STS Lecturer per semester on average under the 3-course plan.

2010-11	4-course		3-course		2011-12	4-course		3-course	
	FTE	Load	FTE	Load		FTE	Load	FTE	Load
Teaching assets	14.25	57	14.25	42.75	Teaching assets	14.25	57	14.25	42.75
teaching debits	5.25	21	3.17	9.5	teaching debits	6.75	27	4.67	14
net avail	9	36	11.08	33.25	net avail	7.5	30	9.58	28.75
total to teach	14.5	58	19.33	58	total to teach	14.5	58	19.33	58
STS needed	--	22	--	24.75	STS needed	--	28	--	29.25

This extra STS “cost” for the 3-course plan might seem large, but it is only an 8% increase in base STS budget, and is actually less when considering the added STS demand to cover increased enrolment in undergraduate courses. The benefit to faculty recruitment and retention should outweigh this cost.

Undergraduate Program: Courses and Degrees

Changes to UG curriculum are in progress. These are in two primary areas: (1) modernizing introductory course instruction; and (2) improving the quality and quantity of offerings for the undergraduate major and other advanced undergraduates.

Many undergraduates, ~2000 per semester, take statistics courses to fulfill a requirement of their major. For most, this is a single introductory statistics course. We are providing more resources to introductory courses in several ways. We have instituted a “**head TA**” system in which two experienced TAs oversee the other TAs and coordinate with Lecturers to ensure high quality experience by students in the TA-led discussions. In addition, we hope to soon have a part-time academic staff to assist with instructional materials for data analysis. These materials will standardize presentations by TAs and provide a growing collection of resources to students, particularly those who show an interest in continuing to a second course.

We expect to offer a new course in Spring 2012, **Stat 327** (under the Stat 692 course number for now). This course is similar in spirit to CS 368, “Learning a Programming Language”. We will initially offer one or two modules of “Beginning Data Analysis with R”, with the express purpose of aiding undergraduates taking 300 and 400 level courses (notably Stat 333). These 5-week modules will provide the basics of data analysis with a widely used computer tool. In coming years we expect to offer intermediate and advanced modules for R and other statistical languages, depending on demand, much as is done with CS 368. An exciting aspect of this course is that we want to employ **undergraduate statistics majors as student hourlies** to assist in the computer work for this course.

Undergraduate Program: Research Opportunities

We are in the process of redesigning our undergraduate major, with the Stat 327 course a key player. This exercise will be continuing through this academic year. One aim of this redesign is to provide new opportunities for undergraduates to get **involved in research at an early point** in their program. This will likely include more extensive data analysis projects as well as opportunities to join interdisciplinary research teams. We would like to add an undergraduate research course, Stat 49x, once we have sufficient staff to offer it consistently.

Graduate Program: Courses and Degrees

Statistics is already offering a minimal graduate program, and has clearly established core sequences (609-610 and 709-710 math stat for MS and PhD; 849-850 linear models and 998 consulting for both MS and PhD). Graduate study in statistics, here or at other top institutions, is built on a strong mathematical foundation rather than on a statistics undergraduate degree experience. Thus, incoming graduate students need a common foundation to build the graduate expertise. This differs markedly from some other fields, such as chemistry or physics, where students are expected to have strong credentials in that field already. Thus our graduate program already has a strong, central foundation.

Over the coming year, we plan to review our graduate electives with the intent to combine several specialized courses into a smaller number of consistently offered courses. That is, these aggregated courses would be offered every year or two, but their detailed content would rotate.

Impact on L&S Budget of Faculty Buyouts

Statistics follows the L&S “80% rule”, that is, 80% of faculty effort is devoted to instruction. With a 4-course load, one course could be bought out for 20% academic year salary (4 courses = 4 * 20% = 80%). A 3-course load would then have a 26.7% academic year buyout rate (3 courses = 3 * 26.7% = 80%). We argue below that the impact on the L&S budget through grant buyouts is typically modest in Statistics, and would not be altered markedly by this change.

Current course buyout rate is 20% of academic year salary, with faculty required to teach one course per

year. Only a few faculty currently buy out of courses to reduce to one course per year: one 100% faculty member pays 60% of salary (3 courses) while 2-3 50% FTE faculty members each pay 20% salary (1 course) per year with grants. Other faculty use grants for summer salary, but only occasionally buy out courses. Thus 1.25-1.5 FTE on average are paid for by grants.

Joint (50%) faculty who currently buy down to 1 course per year would, over four years, pay the same rate ($4 \times 20\% = 3 * 26.7\% = 80\%$ salary over 4 years). If faculty were allowed to average the 3-course buyout cost over multiple years, there would be no net change in revenue or salary savings.

It must be noted that our “outlier” is a senior member of the National Academy of Sciences, and her excellence reflects strongly on the entire university. Further, she is unfortunately likely to retire in the not too distant future, and should not be a consideration for long term salary savings. Frankly, the college has had a sweet deal collecting 60% of her salary for many years, and a reduction to 53.3% seems a small price to pay if it allows her to continue with her highly productive research program.

Another important consideration is that recently hired **probationary faculty** were already given a 3-course teaching load, but with the expectation that the buyout rate for a course is 20%. It will be important to maintain this 20% buyout rate for probationary faculty, which adds no cost to L&S as it is already agreed. Further, it is important to honor these agreements in order to retain these promising new hires. Once tenured, these probationary buyout rates would change to that of other tenured faculty.

Faculty Recruiting and Retention

Our historical target FTE has been 18, while our actual FTE has declined over the past decade to 14.25. We make strong arguments in the 2011 strategic plan, “Data, Models and Statistics” for a target of 20 FTE, slightly below our 21 FTE target set in our 2002 strategic plan. The recent 10-year review strongly encouraged growing our department.

It is extremely awkward to explain our internal teaching course load reduction to potential new faculty during interviews, especially when they are looking at other institutions with 3- or 2-course load offers. Startup packages that reduce teaching load before tenure only postpone the problem to a later retention issue, as we have experienced in recent years. This teaching load reduction seems a no-cost (or at most low-cost) way to improve the climate and retain faculty in a pro-active manner.

As we add faculty in the coming years, it will be important to allow flexibility to develop new undergraduate *and* graduate offerings, in concert with our curriculum redesign process and to enable unanticipated innovation in the field of statistics. To that end, when hiring new faculty under the 3-course teaching load, we wish the flexibility to add 1 new course to our offerings per FTE. Anticipating that it might take ten years to achieve 20 FTE, we could then see an increase in course offerings of roughly 5 new courses, which would greatly extend our impact across campus, and deepen training of our undergraduate majors and graduate statistics students. This would drop our need for STS lecturers from the current 13-17 to around 4-8.

Summary

In summary, the Statistics Department requests to formally reduce its faculty teaching load to 3 courses per FTE. This will improve our ability to recruit and retain the best quality faculty. This request comes in conjunction with serious remodeling of our undergraduate and graduate curriculum, with the aim to involve more faculty in undergraduate instruction as our faculty size grows, and improve the quality of the student experience, particularly in the realm of research training. If in addition to the course load reduction there is flexibility to average buyouts over multiple years, there should be essentially no salary savings loss for L&S over the long term.