

**ACADEMIC COUNCIL**  
**Meeting of March 28, 2011**  
**McKenna Auditorium**  
**3:30 p.m. – 5:30 p.m.**

**Members present:** Panos Antsaklis, Robert Bernhard, M. Brian Blake, Seth Brown, Laura Carlson, Rev. John Coughlin, O.F.M., Greg Crawford, Darren Davis, Dennis Doordan, Nick Entrikin, William Evans, Stephen Fallon, Judy Fox, Mary Frandsen, John Gaski, Nasir Ghiaseddin, Robert Goulding, Stuart Greene, Dennis Jacobs, Rev. John Jenkins, C.S.C., Peter Kilpatrick, A. Graham Lappin, John LoSecco, Kelly Martin, Andrew McGauley, John McGreevy, Nell Newton, William Nichols, Susan Ohmer, Hugh Page, Cathy Pieronek, Donald Pope-Davis, Joseph Powers, Ava Preacher, John Robinson, Jim Seida, Greg Sterling, Ann Tenbrunsel, Carolyn Woo

**Members and Observers excused:** Thomas Burish, Rev. Tom Doyle, C.S.C., Umesh Garg, Michael Lykoudis, Dale Nees, Brian O’Conchubhair, Cheri Smith,

**Members and Observers absent:** John Affleck-Graves, Don Bishop, Megan Dillhoff, Austin Holler, Christine Maziar, Mike Oliver, Julianne Turner, Cynthia Weber

**Observers present:** Kevin Barry, Chuck Hurley, Harold Pace, Warren vonEschenbach

**Guests:** Brian Baker, Steven Buechler, Marianne Corr, Holly Goodson, Andrew Sommese

**1. Welcome and opening prayer:** Father Jenkins welcomed members and invited Dean Peter Kilpatrick to deliver the opening prayer.

**2. Approval of minutes:**

The minutes of the February 22, 2011 meeting were unanimously approved. It was noted that Judy Fox should be included in the ‘members present’ list and that the Advanced Studies committee was mistakenly identified as a subcommittee. These changes were incorporated into the minutes.

**3. Academic Articles Revisions:**

Father Jenkins began the presentation of revisions to the Academic Articles by noting that the changes presented today have arisen due to a decrease in the number of officers. This change keeps ND in line with a current trend in both public and private institutions to reduce the number of university officers. This decrease has then resulted in other changes and some ‘clean up’ to the Academic Articles. Father Jenkins invited

guest Ms. Marianne Corr, General Counsel, to speak about the kinds of changes made. Ms. Corr noted that the changes are merely administrative, serving the function of streamlining the Academic Articles, and have been essentially adopted already.

There was no discussion. A motion to approve the changes was made by Prof. Seth Brown and seconded by Dean Greg Sterling. The changes were approved unanimously.

#### **4. Amendment to Faculty Senate Bylaws:**

Father Jenkins invited Prof. John Robinson, president of the Faculty Senate, to present the proposed changes to the Faculty Senate Bylaws.

Prof. Robinson explained that a need to adjust faculty representation on the Faculty Senate arose when the Economics and Public Policy department was abolished in the last academic year. Some faculty were incorporated into the remaining Economics department; others become members of a number of other departments. And, finally, at least two to three remained unattached to a department. This last situation resulted in no representation of these unaffiliated faculty to the Faculty Senate. Noting that the faculty are not complaining of this situation; still, Prof. Robinson said that it is the goal of the Faculty Senate that all 'regular' faculty have representation. The proposed resolution to this situation is to create an 'at large' position in the College of Arts and Letters. This would increase faculty representation to 47. Prof. Robinson noted one constraint on this solution: would such a position outweigh the College of Arts & Letters representation in the Faculty Senate?

Prof. Robinson referred to a chart, previously distributed to members, in which the representation to the Faculty Senate has been broken down by 'faculty class.' The chart indicates clearly that the addition of an 'at large' position would not outweigh the College of Arts & Letters representation.

Prof. Robinson acknowledged that the chart also indicates 'wildly disproportionate' representation to the Faculty Senate across several faculty classes. He noted that the Faculty Senate will take up this issue downstream in the regular and periodic revision of the Faculty Senate bylaws; he added that the faculty do not express any particular concern about this disproportion.

Dean Nell Newton moved to approve the change; the motion was seconded by Prof. Seth Brown. The change was unanimously approved.

## **5. Proposal: Applied and Computational Mathematics and Statistics (ACMS) Professional Master of Science Degree Program Proposal**

Father Jenkins invited Dean Greg Crawford to introduce the proposal for a new master's program. Dean Crawford turned over the presentation to Prof. Steven Buechler, chairman of the department of Applied and Computational Mathematics and Statistics (ACMS).

Prof. Buechler noted that over the last couple of years, examples of professional masters degree programs have emerged in a number of institutions nationally. It is a successful paradigm because it seems to mesh well with what is needed in scientifically technical fields today.

The areas covered by the program cover a large number of potential application areas. Therefore, the proposed program has been divided into different tracks targeting particular careers and academic subjects. Initially, there will be tracks in mathematical biology and mathematical modeling. Applied statistics will be added as soon as the statistics faculty is hired. These tracks match seamlessly with other degree programs and research activities. The core ACMS courses in the program will be the same ones taken by the doctoral students, so few new classes will need to be created. Because of the high level of the doctoral courses, students in the program must be academically strong, and they will progress quickly. This allows the program to be structured as an accelerated 12 month, 30 credit program, whereas competing programs often have an initial semester of lower level background material and normally require 18 months for completion.

There are many professional masters programs in so-called 'industrial mathematics,' which focus on high-tech design, energy and materials, using traditional methods of applied math. The proposed math modeling track targets a sector that is updated with more modern numerical models and computational training. The math biology track has exciting possibilities because there are few competing programs and a huge potential market in medical devices, medical imaging, pharmaceuticals and emerging biotech industries. The high level of research in computational biology will enable the program to train students well while also keeping the program at the forefront of the field. The applied statistics track will begin, as mentioned, when the necessary courses have been created. The master's in statistics degree is highly respected in many sectors. This program will focus on biomedical applications, in which graduates can get jobs in pharmaceuticals, medical research, academic research centers and biotechnology. Other students may train for employment in government and social sciences. It is expected that this track will begin strong and attract many students.

The department is excited about adding this degree to the campus; it fits well with the mission of the university and with the department. Finally, it addresses the needs of current students in their relationships with potential employers.

Father Jenkins invited Prof. Panos Antsaklis, head of the Advanced Studies Committee, to speak.

Prof. Antsaklis reported that the proposal has been approved by the Graduate Council at its January 27, 2011 meeting. It was brought to the Advanced Studies Committee and the Faculty Senate, and then it was forwarded to the Executive Committee of the Academic Council. So it has passed through and been approved by each requisite stage.

The floor was opened for questions or comments.

Prof. Seth Brown inquired about the expected size of the program. Prof. Buechler said it is expected to be about 20 students; he noted that it might grow, and that the applied statistics track is expected to be about 20. Prof. Brown said that this is larger than the doctoral program enrollment. Prof. Buechler said the expected graduate population will be about 36 in all; the Ph.D. candidates thus will be about seven to eight per year. Prof. Brown noted that the shared graduate courses would be composed very predominantly of master's degree students. Prof. Buechler reported that this balance is not unusual in this area; in statistics graduate programs, the ratio is often 2:1 master's to doctoral students. He offered the example of the statistics program at Columbia University, which has 16 faculty, 40-50 doctoral students and about 200 master's students. Prof. Brown asked if this balance creates any problems in setting the level of courses in which the predominant student is a master's student. Prof. Buechler said difficulties are not anticipated, in part because the students to be admitted will be qualified to succeed in the basic courses.

Prof. Susan Ohmer asked about the procedures for a master's student who develops an interest in continuing on to the doctoral program. While an application would be required, Prof. Buechler stressed that the process should be a smooth one. The student would have taken the courses required to pass the exams, s/he would be likely to smoothly attach to an adviser and progress through the orals and have no difficulty progressing.

Prof. Graham Lappin noted that the program seems to be geared toward students who are well prepared, in ways similar to the preparation of Notre Dame students. Otherwise, for a weaker student, the time-to-degree is going to be extended. He asked

about the competition for the topnotch students: is it envisioned that most of them will be graduates of Notre Dame? Prof. Buechler said that over time, there should be change, as the undergraduate program grows. There may be an increase in the number of students who are interested in a five-year program. There are only a few private universities offering this type of degree; rather, a lot of available programs are at more regional universities. Therefore, this program will be very attractive to good students from across the nation. Prof. Buechler stated that he has no concern that the program might have to admit lesser students in order to fill the class.

Prof. Joe Powers noted that there are electives options, with an expectation of 6 credits in electives; he asked if the electives would be at the graduate or undergraduate level. Prof. Buechler said the course would mostly be designed to meet graduate level standards with a lot of cross listed courses, but that he would not proscribe the courses out of the box. Prof. Powers asked about the expected undergraduate background for incoming students. Prof. Buechler addressed this question in terms of the tracks and offered suggested courses that would be prerequisites to acceptance into the program.

Dean Carolyn Woo spoke about what she termed 'a significant implementation detail.' The students of the program are scheduled to go into the Esteem Business module; she noted that this module is provided by the Mendoza College of Business (MCOB). Further, she said the MCOB has not discussed this plan with ACMS. She expressed concern about capacity; the module might not be able to absorb a significant additional growth as it is currently situated. Secondly, she expressed concerns about budget data connected with the Esteem Business module. Dean Woo asked for clarification about these concerns.

Prof. Buechler said that he had talked with the director of Esteem, Bob Allworth, about cost sharing mechanisms, noting that the figures were suggested by Prof. Allworth about the cost and the way it could be shared. Prof. Buechler stated that if there is a mistake in the figures, it will be corrected. Dean Woo stressed that her concern is that capacity issues be addressed before finalizing the proposal. She noted that the synergy is potentially positive, if adequate accommodation can be assured.

Dean Greg Sterling offered a number of reasons why he believes the proposal is important. First, the American Council on Education reported an increase in degrees awarded in the decade 1995-2005: 35% increase in associate bachelor's degrees, 47% increase in master's degrees, and a 26% increase in doctoral degrees. The so-called 'growth industry' in higher education is largely in the master's degree. That is being driven by a good number of industries which are now saying that the bachelor's degree is no longer acceptable as a terminal degree. The NSF, for example, has stated quite

explicitly that the master's degree should be the terminal degree. This proposal, then, meets the demand of this national trend. Secondly, for Notre Dame, the program meshes nicely with the developing relationship between the university and some industries. He expressed a long term expectation—not merely blind optimism—that a number of industries will send students to get a master's degree in this program. Dean Sterling suggested that these factors might provide a broader framework within which to consider this proposal. Further, he noted that the Graduate School is not underwriting this program; this is a cost-bearing program. He assured faculty that the development of this new program would not have an adverse affect on other disciplines.

Prof. Antsaklis moved to approve the proposal; it was seconded by Dean Sterling. The proposal was approved with one nay vote. Dean Woo offered an explanation of her negative vote: she stressed that she supports the concept and the actuality of this degree program. She is unable to vote yes, however, until the MCOB is able to address the issue of its ability to deliver the Esteem Business module courses.

Father Jenkins noted that the proposal passed, and he thanked all concerned in the process of putting together the program and the proposal.

## **6. Proposal: Integrated Biomedical Sciences (IBmS) Doctoral Degree Program Proposal**

Father Jenkins invited Prof. Antsaklis to present the proposal for the Integrated Biomedical Sciences doctoral program. Prof. Antsaklis said that the motivation for this proposal is that today, research in biochemistry, molecular biology, biophysics and related cellular and molecular biomedical sciences transcends the boundaries of traditional academic departments. Many universities have addressed this by creating graduate 'umbrella programs' in which the various departments participate in joint recruitment and training of graduate students. This particular proposal, at its inception, will implement a graduate 'umbrella program' involving the departments of chemistry and biochemistry, biological sciences, physics, and ACMS. Prof. Antsaklis introduced two faculty guests, Prof. Brian Baker and Prof. Holly Goodson, to speak about the program.

Prof. Baker said that the impetus for this program came from the observation that all of Notre Dame's peers had implemented a similar umbrella program many years ago. Notre Dame faculty involved in recruitment repeatedly experienced the situation of a strong and interested applicant who was intrigued by what Notre Dame had to offer, but who was nonetheless wooed away by these larger umbrella programs at other

universities. Choice and opportunities in advisors, research projects, and advancements occurring across many different departments at other institutions were available to students through the umbrella programs. At Notre Dame, extraordinary effort was required to get permission to have access to similar kinds of opportunities. This atmosphere resulted in loss of these applicants. The committee endeavored to create a program which mimicked some of the ideas at other institutions and also included some unique Notre Dame features.

The proposed program will enroll applicants into the program for the first year of graduate study; the student will matriculate into the department in the second year while also remaining affiliated with the new graduate program. A key feature of the new program is the 'training clusters.' Faculty will be grouped by specialties—there are seven planned clusters—which are independent of department boundaries. Thus, students will be attracted to the program and to the training clusters rather than to the traditional departments. It is anticipated that this structure will provide students with a great opportunity to get past some of the departmental walls that have been in place. These clusters are also an effective way to organize faculty independent of departments, which will encourage communication and collaboration among faculty across departments. While this occurs already in an ad hoc way, this new design should catalyze this kind of effort.

For faculty in interdisciplinary areas, such as biophysics, who have had difficulty in the past with recruitment, these clusters should provide them with increased opportunity to make contact with students.

Administratively, when a student does choose a faculty advisor, then the student will become a member of that faculty member's department; however, the student will still be working toward this new IBmS degree. So, while such a student might be enrolled in the physics department, s/he will not be subject to the requirements of physics but rather to the requirements of IBmS.

The goal is to dismantle some of the walls that have been in place that have inhibited student recruitment and student progression, and also to catalyze faculty communication and promote interdisciplinary research.

Prof. Graham Lappin, stating that this is an admirable and important concept, asked about the potential for elitism. He stated that students will naturally apply to such a premier program. For instance, a student interested in biochemistry will apply to the program. But if that student is not accepted into this program, does the possibility exist that the student would be discouraged from attending Notre Dame and go elsewhere?

He asked if the program would have a negative impact on recruiting to the traditional departments, such as biology and chemistry.

Prof. Goodson noted that the committee has considered this possibility. The application deadline has been moved considerably forward of the deadline for application to the traditional departments to encourage application to both. This new deadline is consistent with peer institutions' deadlines. It is anticipated that the pools of applicants will be somewhat different due to this decision. In addition, Prof. Goodson noted that the GLOBES program, which is also an 'elitist' program, has not created this potential negative impact on the traditional biology program.

Dean Sterling responded to this question. He reported that from 1998-2008, the number of doctoral degrees awarded in the health sciences grew at an average of 9% per year; that was far and away the greatest increase. The second highest growth was in engineering Ph.D.s, which grew at a rate of 3.3% per year. These data indicate that there is a huge pool of people interested in the life sciences and in medicine. It is to be expected that this kind of program expands rather than decreases the pool; there is potential for Notre Dame to attract a larger proportion of that pool. Prof. Goodson noted that while there is a possibility of drawing away some applicants from the traditional programs, Notre Dame is currently not attracting a portion of the applicants for interdisciplinary programs, such as chemical biology or genomics, because these programs are not visible to applicants. Any loss in numbers should be balanced by these gains. The ability to say that a student can come to Notre Dame and focus on some of these specialized courses will be a benefit for recruitment.

Prof. Baker added that the proposal document indicates the committee's concern about this issue. Disparate application times have been planned, and all students will be encouraged to apply simultaneously to both. The programs will be co-advertised, to remind applicants of the multiple options available. These efforts will not remove the concern, but they do address it. Anecdotally, there is awareness that the students who have been missed because Notre Dame has not been able to offer this kind of program are strong students who will likely offset the potential risk of weakening or diminishing the programs.

Prof. Dennis Doordan asked how critical to the viability of the program is the financial participation of Indiana University; the document indicates that IU will provide two fellowships. Prof. Baker indicated that the document outlines the funding as provided by the IU School of Medicine, the departments of the Graduate School, and the College of Science; each contributes fellowships. The IU School of Medicine is down for two fellowships, and the budget currently has room for 13 students. He added that if IU

were not providing support, the program would be able to offer fewer positions. The participation of the IU School of Medicine is an element to highlight. It will be of benefit in advertising the program.

Noting that different disciplines maintain different credit requirements, Prof. Joe Powers asked how the required 24 credits compare to other departments in the College of Science. Prof. Baker compared the credits among several science programs, and noted that faculty should keep in mind the distinction between an instructional course credit and a thesis research course credit. The 24 credits for this program are for instructional coursework.

Prof. Lappin noted that the proposal should make clear that students who work through the IU School of Medicine and do research there will in fact be receiving Notre Dame degrees. In addition, he mentioned the issue of sustainability and growth. The program is set up for 15 students, and there are mechanisms for getting funding. What is the long term sustainability plan, to grow the program to 25 students, for instance, since a lot of the funding is up front? Students are coming in for a year to do a lot of rotations. Related to that, the time to degree in chemistry and biochemistry is very long; how is that going to be impacted by taking a full year of non-research-based study?

Prof. Goodson noted that, compared to other departments, biochemistry's time to degree is long, but compared to other institutions, it is actually not long. So the appropriate comparison is an unresolved issue. In comparison to other institutions, the year-long rotation is common. She added that the students in her lab are occupied in the second semester with TA responsibilities, etc, which keep them from focusing on their research. She said a lot of maturation occurs, allowing the hypothesis that the year-long rotation will not negatively impact the students' progress to degree, based on the practices of other institutions and on current student practice. However, she agreed that it is an issue to watch.

Prof. Baker said the program's goal is to recruit high quality students to this competitive program, so that they will be able to get out of the gate quickly and so that Notre Dame will retain them in the program longer. With regard to the funding question, he agreed that training grants, whether from NSF or NEH, have a finite lifetime. To address the funding issues, the program intends to continue fund raising, to help raise additional funds to provide further support. The future growth of the program will be dependent, in part, on how well the students do in it. The program will recruit outstanding students; if they do well, it may make sense to increase the contributions of the departments. That can only happen, of course, if the departments are able to do that, and if they see value in the program. Thus, the discussion of the future growth of the

program will be dependent on how well it develops. The program plans to apply for grants, but it is desirable that the program not be exclusively dependent on grants for funding.

Dean Sterling noted that one dimension, which is true for all programs in development at this time, is “right size, right budget.” For programs that are in research-sponsored disciplines, in which research funding is a heavy component of the students’ funding, the Graduate School is trying to work out specific agreements about funding, in which the Graduate School will provide X percentage and Y percentage would come from the grants of the faculty. This program will not be different from any other program in this area. There has been awareness of this issue in the development of the program; the start will be small, and progress will be monitored.

Dean Crawford reported on comparisons with Brown, Princeton and other aspirational peers, against which Notre Dame models its numbers in terms of graduate programs. These institutions have multiple umbrella programs; in the case of Princeton, they are funded through different external mechanisms. For Notre Dame, it will be an opportunity to bring in external funding, not just for grants with a single PI investigator, but bringing together all the PI investigators and the departments, to bring new dollars in externally. The participation of IU will also be beneficial because the school has a lot of adjunct faculty at Notre Dame with Notre Dame students, and this will provide an opportunity for those faculty to participate with some of their funds to help out our students. It bodes well with the Harper Cancer Institute that has just been launched, which is the public/private partnership between IU and Notre Dame.

Dean Crawford also spoke about fund raising. This program has an endowment provided by a donor who was attracted in part to the interconnectivity represented by the development of the program, which brings together all these parts—departments across Notre Dame as well as IU. It is expected that this story will continue to resonate with donors who value the interdisciplinary approach of the program. He noted that it can be very hard to raise money for a single fellowship; this program provides a unique focus that is attractive to donors.

Prof. Susan Ohmer conveyed a general concern expressed by library faculty in the instances of the development of new academic programs. The library faculty are concerned and urge close attention to the need for library resources in the development of these proposals, since the cost of databases and other materials is significant. Prof. Ohmer noted that this year, the President’s Grant helped to absorb the costs of some of these kinds of resources, but as a general rule going forward, the proposal for a new program ought to include funding for new library resources.

Prof. John LoSecco asked to which entity the student of this program will be responsible. Prof. Baker said that the 'hurdle' requirements, such as exams and course work, are set by the program rather than the departments. The department's responsibility will be to insure the student gets paid; administrative issues will be the department's responsibility. The hurdles, however, are set by the program.

Prof. Brown, seeking clarification, described this system as 'mixed governance.' If the requirements emanate from the program, but the oversight of them devolves to the departments, then, under this system, he asked who determines whether the student is making successful progress toward a degree. Prof. Goodson stated that the director of the program will determine successful progress, in conjunction with the student's committee. She noted that this kind of practice already occurs in individual cases on campus, so this type of process exists and works reasonably well. Prof. Brown wondered if a situation could arise in which the department does not think the student is doing well but the program does; under these circumstances, the department would still be obliged to pay the student. Prof. Baker said the decision ultimately lies with the department; the program cannot and will not dictate to the department. This system will require very close communication between the director of the program and the directors of graduate studies (DGS) in each department. The DGS will interface with the program director about appropriate actions in individual cases. The decision ultimately lies with the departments.

Dean Sterling added that some analogous situations already exist on campus: the Peace Studies program through the Kroc Institute is one such example. In all cases, it appears to have worked quite well. Such a mixed governance system requires effective communication and goodwill. He noted that the current DGSs are supportive of the plan. Prof. Baker reported that there had been a more complex committee structure with the DGS, along side of the steering committee. It proved too complicated. Instead, to insure communication, the DGS will be involved, kept in the loop, and invited to meetings with a deciding vote on individual cases. By design, the participation of the DGS in each department is key to the success of the structure.

The Academic Council voted unanimously to approve the proposal. Father Jenkins offered congratulations and good luck to the new program.

The meeting adjourned to committee meetings.