

## Departmental Graduate Program Strategic Planning

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This paper presents a strategic planning process for a departmental graduate program based on a recent planning retreat experience. The underlying assumption is that the graduate program, though administered by the Graduate School, is fundamentally owned by the departmental graduate faculty. The paper will cover preplanning efforts by committee, overview the role of key university officials in casting a strategic vision and identify a process useful by faculty for identifying key issues in a retreat setting. After identification of key issues from breakout sessions, we included a time portion for consensus development. Breakout groups reconvened to develop action plans for key issues. Faculty convene as a unit to develop consensus on “Who, What and When” regarding key action items. The purpose of the exercise is to develop consensus on departmental requirements, to evaluate possible curricula for new degree programs such as the ME degree.

### Background

The biological and agricultural engineering department is the engineering component that provides instruction at the University of Georgia in “mechanic arts” required at land grant schools in the US. Georgia is unique in that all other land grant institutions have a college of Engineering, which satisfies the mandate. Public instruction in engineering was transferred to Georgia Tech in Atlanta in the early part of the last century, except for Agricultural Engineering. The general nature of the discipline is the consistent characteristic of the agricultural engineering discipline. The scope of the agricultural engineering discipline has expanded to include problems and issues beyond the farm gate to the consumers home.

How does one accomplish this generalization in an environment where there is a rather rigid separation between classical agricultural engineering and other engineering disciplines? We have chosen to capitalize on the strengths of allied science departments, particularly those in the life sciences and ecology. This has enabled a BS degree in biological engineering and MS in biological engineering and a PhD degree. Soon after the BS degree was approved, the University embarked on a program to convert from quarters to semesters. We expended much effort in redesigning the undergraduate curriculum of both the agricultural engineering and the biological engineering, resulting in “burnout” when the time came to discuss the graduate curriculum. Such diverse activities require that departmental faculty be of one mind and a unified vision. Extreme focus on the undergraduate curriculum coupled with the inherent specialization with the PhD degree fostered a collective need for the department to reevaluate our graduate programs status and refocus on how we could unify our efforts to achieve maximum success. An evolving effort to increase visibility of engineering at the University of Georgia by creating a networking framework among the many engineers working in other science and business departments which

we call the Faculty of Engineering also required that we bring focus and order to our graduate programs.

### Retreat Foundations

Leadership of the effort to refocus on the departmental graduate programs begins with the department head and flows through the graduate coordinator, who works with the departmental graduate committee. Our process began with a pre-retreat of the departmental graduate committee in an off-campus location (September 1999). The following issues surfaced at that retreat:

- \* The University as a whole is placing increased emphasis on graduate programs.
- \* Graduate engineering courses are extremely limited, with adverse impacts on recruiting and student experience.
- \* Given the sources of students, engineering needs around the state, and the range of faculty expertise in the department, there may be new and creative graduate options.
- \* There is a major need to create a more comprehensive engineering program in UGA which would provide the foundational support for meeting the contemporary needs of agricultural engineering programs and meeting the contemporary needs science disciplines across campus.

Successful identification of issues such as these requires, particularly of the graduate coordinator, an interest in national and local university trends along with a philosophic orientation. Specific recommendations with respect to faculty hiring, faculty evaluation, student recruiting, the admissions process and the curriculum were passed to the department head and faculty.

### Retreat Agenda

The excellent work of the graduate committee required additional events to stimulate action. The idea of devoting an annual departmental meeting to the subject was appealing to the department head, and thus the retreat concept was born. The graduate committee was charged with developing an agenda for such a process. An annotated version of the agenda is given below.

1. **(1 pm to 1:15)** Welcome and Introduction
  - a. "Shaping the Future" report (the report of the graduate committee pre-retreat)
  - b. Overall plan and desired outcome
    - i. Define graduate program excellence in BAE
    - ii. How we will enhance our graduate program
    - iii. Develop a strategic plan for graduate program in BAE
  - c. Logistics
2. **(1:15 to 2:15)** Strategic Vision presentations and panel discussion
  - a. Faculty of Engineering Development -- Departmental Implications (Department head)
  - b. University growth management strategy – Implications for Graduate Programs (Assoc. Dean of Graduate School)
  - c. Graduate Programs and their role in a comprehensive university setting (Assoc. Dean, your college)

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d. Discussion – How can we better mentor, retain and prepare our students for 21<sup>st</sup> century realities of the contemporary academic and nonacademic work place? How will we enhance departmental graduate program excellence within the university and national/international research communities? Your input is vital for developing the direction and design of our program. Your ideas are critical in making this initiative happen in our department.

3. (2:15 – 2:30) Current Snapshot – Graduate coordinator

4. (2:30 – 2:50) Break

5. (2:50 to 3:50) Breakouts – What constitutes graduate program excellence at your school?

a. Graduate plan-of-study and degree program design

1. What engineering courses (include potential new and revised) should be common to most or all programs of study?

2. What levels of math and statistics should be required of MS and PhD graduates?

3. What should we cover in Research Methods (a required course for all of our graduate students)?

b. Incorporation of professional development in a student's graduate experience

1. How should "ethics" training accomplished in the program?

2. How can we enrich the industry experience of students?

3. How can we expand graduate students' involvement in our teaching programs?

c. Interfacing a quality graduate program with research and public service/outreach programs

1. What do you perceive that limits your research and public service productivity?

2. What is required to overcome the perceived or real impediments?

3. What innovative approaches could increase the impact of graduate programs on the research and extension functions and vice-versa?

d. Designing the message we send to potential students

1. From your experience, what are potential students looking for in a graduate program?

2. What are the key points that market us versus other engineering graduate programs?

3. How should we identify potential students in our/other program(s)?

e. (other topics that may emerge during the afternoon)

6. (3:50 to 4:30) Group reports

7. (4:30 to 5:30) Consensus development

a. Consensus discussion on graduate programs of study—Can we agree on an approach that adequately prepares students without adding superfluous requirements?

b. Consensus discussion on criteria for admitting non-ABET BS students

8. Adjourn for evening meal as a group.

**After dinner presentation...**

9. Conquering real or imagined boundaries inhibiting excellence

## **Day 2, 8:15 am...**

10. (8:15) Reconvene
11. (8:30 - 8:50) Available resources – Making it happen- Department head
12. (8:50 - 10:00) Implementation – Breakout groups develop action plans
  - a. New or retooled graduate courses – Who should develop/retool? When?
  - b. Strategies for monitoring and enhancing student professional development -- Implementation guidelines, Who? When?
  - c. Strategies for increasing involvement of extension/outreach faculty in the departmental graduate program.
  - d. Recruitment program implementation strategy – Who, What, When?
    1. What products are necessary to increase awareness of our graduate program?
    2. Critique the attached survey instrument (if applicable)
  - e. (other topics that may emerge during meeting)
13. (10:00 – 10:15) Break
14. (10:15-11:15) Consensus discussion to identify What? “Who? And When?”
15. (11:15-11:30) Graduate programs wrap-up – Department Head

### Retreat Results and Reflections

Several aspects of the agenda proved to work very well. Keying into contemporary developments relating to our department and other science departments was important for setting the tone of the retreat. The development of a Faculty of Engineering at the University of Georgia and its implications particularly on the graduate program of the department and university was a key driver in our case. Departmental leaders had successfully convinced the Provost and President of the University to include the development of engineering at the university in the strategic plan with the justification that an engineering presence could greatly aid in the competition for extramural funds and that statewide engineering talent needs were currently unmet.

Providing the time to college and graduate school administrators was valuable in that they clearly framed key issues related to the universities goals for graduate programs. The Associate Deans focused upon mentoring and student retention issues. Breakout groups on the selected topics followed by group reports and consensus building proved to be a positive tool. A frank discussion of available teaching and graduate assistantship resources was helpful. Faculty came home from the retreat environment with a willingness to consider new ideas and approaches. The after dinner presentation relating to conquering real and imagined boundaries consisted of a central question: What do we find that inhibits individual excellence in our endeavors. The mini-workshop was oriented towards each person identifying personal boundaries and then developing a systematic approach for pushing these boundaries forward.

The retreat agenda was perhaps overly ambitious. The development of action plans was not completed at the retreat as envisioned. However, the respective breakout task forces committed

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to completing their work after the retreat. Three months after the retreat, the reports were complete. The department graduate committee then began the task of developing action items around the following items:

\*Graduate curriculum questions related to knowledge that should be fundamental in all graduate programs. The following courses were developed/revised:

- Computational Mathematics for Engineers
- Experimental Methods for Engineers
- Measurement Automation and Control
- Advanced Instrumentation
- Process Control
- Material Science and Experimental Stress Analysis
- Advanced Strength of Materials
- Engineering systems analyses

\* Strategies for enhancing student professional development.

We started by considering the unique and changing backgrounds for students entering graduate studies. An increasing number have not graduated with an undergraduate degree in engineering. Many are from other countries and may not have completed a senior design project or other requirements typical of engineering programs in the USA. We also expect to attract increasing numbers of non-traditional students who wish to work outside the university full or part time. Distance learning is likely to have increased demand both for students away from Athens and for benefiting from instructors at outlying campuses, other universities and industry. The need for certificates and professional degrees may also cause a shift in the experience of our students and their expectations from faculty. Specific recommendations included:

1. Develop a Graduate Seminar course on professionalism.
2. Strengthen the graduate student club.
3. Increase professional experience.

\* Strategies for involving extension/outreach faculty in the graduate program

1. Develop a Masters of Engineering degree program
2. Develop a graduate internship course.

\* Recruiting strategies

1. Use students at recruiting fairs; enable students to go to national meetings
2. Develop materials for use at recruiting fairs.
3. Focus on the nontraditional student and unique cultural aspects of the University.
4. Develop and publicize departmental identity
5. Put resources into recruiting.
6. Evaluate the mentoring process and perform a detailed analysis of why students who did not complete the program decided to leave.

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The curriculum planning task committee proved to take the longest time to reach consensus. This group was chaired by the departmental teaching EFT manager, who was committed to finding teaching EFT space for increased graduate course offerings. This task force spent considerable time following the retreat engaging faculty to develop a suite of courses which comprised fundamental knowledge which should be provided to all graduate students. The three-month time was well spent due to the especially critical need to achieve a measure of consensus. The retreat and ensuing discussions have resulted in several new course proposals covering Engineering mathematics, instrumentation, experimental design, materials science and other topics. It is anticipated that the curriculum will be partitioned into Foundations (to include Research methods, experimental design, instrumentation, constituent balances), Computational methods (to include engineering math, statistics) and Discipline electives.

Excellent ideas for professional development and recruiting came forth as well. The activities provided excellent ideas for enhancing professional development through the exposure of students to national meeting and encouraging faculty to use students in teaching activities. The department is committing resources to the recruiting process through the support of the web page and development of brochures. Recruiting and retention was not a critical area within our department, thus this issue did not come to the forefront. The only area that did not bear the fruit hoped for was in the area of extension involvement.

A significant real, though less tangible, outcome of the retreat process was that many faculty came back with a renewed energy for the graduate program. The faculty generally realized the vision of the university central administration towards facilitating engineering at the University of Georgia primarily via research and therefore the graduate program before going to the retreat. This energy source engendered a commitment toward working to find creative ways of strengthening and energizing our graduate program.

### Process Summary

We believe that departmental leadership can facilitate graduate program reinvigoration by considering the following sequential points:

\*Identify large needs. Key into ongoing university wide activities focusing on meeting larger needs. Create space for discussion of large national trends and be exposed to the thoughts and ideas of prominent thinkers of national educational trends. Think big!

\*Engage a small group to flesh out the needs statement and identify strategies to meet the needs in a pre-retreat. Have the tangible commitment of the entire departmental leadership.

\*Engage the faculty at large at a time when the faculty has the collective energy to produce results.

\*Structure a retreat with clearly framed issues.

\*Provide a good mix of breakout sessions and follow-up consensus building among the faculty as a whole.

\*Provide space for task forces who cannot finish their work at the retreat site (due to some missing key information or due to an overly ambitious timetable). Departmental leadership can charge these groups to continue work.

\* Get beyond the “blue sky” to practical reality – creative resource identification is as important as idea development.

\* Do not let momentum die after the retreat.

\* Present action items to the faculty as soon as possible.

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#### Biographical Information

Ernest W. Tollner is professor and graduate coordinator of the Biological and Agricultural Engineering Department of the University of Georgia. He has graduated from the University of Kentucky (BSAE, MSAE) and Auburn University (PhD). His research has been in the area of physical property measurement of foods and soils. He has been with the University Georgia for the past 21 years.