

Request for Senior Projects 2015-2016 Academic Year

Department of Biological and Agricultural Engineering
Texas A&M University

Instructors:

BAEN 479 and BAEN 480

Dr. Ronald E. Lacey, P.E.
979-845-3967 (office)
ron-lacey@tamu.edu

Dr. Rabi Mohtar, P.E.
979-458-9886 (office)
mohtar@tamu.edu

Mr. Greg Stark, P.E.
979-845-3949
gstark@tamu.edu

AGSM 439 and AGSM 440

Dr. Gerald Riskowski, P.E.
979-845-7619 (office)
riskowski@tamu.edu

Lt. Col (Ret.) Russell McGee, P.E.
989-845-3659
romcgee@tamu.edu

Mailing and Fax Information

201 Scoates Hall, MS 2117
College Station, TX 77843-2117
979-862-3442 (fax)

Introduction

The BAEN department requires a two-semester capstone project course for senior undergraduates in the biological and agricultural engineering (BAEN) and agricultural systems management (AGSM) curricula. This document describes the type of problems that we use in the senior capstone courses taught in the Biological and Agricultural Engineering Department at Texas A&M University. We are making a joint call for proposed projects for both AGSM and BAEN. We have found that problems submitted by industry often have both engineering design and management aspects and we hope to use your project(s) in the most appropriate way for our students.

Projects that meet the needs of the classes and the students will be selected for use in instruction during the upcoming academic year. We have used problems submitted by industry and agency partners for decades and have found that the students benefit greatly from working with "real world" problems. The open-ended nature of these problems, coupled with the constraints common in actual practice, create an ideal environment for completing the student's undergraduate education.

There are several advantages to your participation in the program. Participating may allow you to initiate work that is currently delayed because of a lack of resources, to obtain fresh thinking on a problem, to make contact with potential employees before they graduate, and to enable your company engineers and managers to participate in a stimulating experience.

Many other engineering departments charge a substantial fee to industry partners to participate in their capstone programs; however, BAEN does not charge a fixed fee. Our clients range from for-profit manufacturers of goods or providers of services to non-profit or publically funded organizations so the ability to pay varies greatly. If your company is interested in providing funding to support the capstone experience or donations to student-focused endowments, we will be glad to help you arrange this to assure that you received the tax benefits.

Project Organization

Organization of the courses is similar for both AGSM and BAEN. The problem will be assigned mid-way through the Fall semester to a project team of three or four students. The students will have completed all of their freshmen and sophomore classes and should have completed most, if not all, of their junior requirements. The students will be simultaneously enrolled in their senior course requirements as well. Teams will be assigned to insure that an appropriate academic background and skill set exists on each team. The students will also be surveyed to determine their interest in particular problems. We attempt to assign students to a project that aligns with their interests, but we control project assignments to develop a well-balanced team.

Selection of Projects

Projects will be selected based on several criteria:

1. Project Scope

The project will need to have sufficient technical complexity to allow all team members to address one or more technical issues. A specific set of deliverables should be defined, and the team should be expected to produce products appropriate to the problem (engineering design drawings, prototype of their solution, management programs, safety materials, etc.). The problem should be of a quantitative, rather than a qualitative nature, and should require the use of typical tools (e.g. CAD, GIS, mathematical analysis software, financial analysis, etc.). We will also be addressing project scheduling and cost analysis, so ideally problems should have requirements in these areas.

2. Open Ended Nature of the Project

Projects selected for use will not have a single, obvious solution, but should have several possible viable solutions. The problem may be redefined in consultation with the industry client in order to fit within the two 15 week semesters. We are trying to avoid “off the shelf” solutions in order to better challenge the project teams.

3. Commitment by the Client and the Department

Problems selected for use must have a clear commitment by the client to provide an individual to serve as a primary point of contact for the design team. It is expected that the client come to College Station at the end of the spring semester (typically the first week of May) to review the project with the students and participate in the

final review presentations. Clients are welcome to visit at any time and we will be happy to coordinate those visits. We can arrange for teleconferencing or video conferencing if necessary. If the client is within reasonable travel distance from College Station, the project team is encouraged to make site visits to assist them to better define the problem and understand the constraints of “real world” design.

The department will provide a faculty advisor to each team and access to available resources (e.g. software, fabrication facilities, and instrumentation) for the project. If the project requires additional resources beyond those available, then we may either decline to accept the project or negotiate with the sponsoring company to obtain the resources.

4. No Absolute Completion Time or Proprietary Information.

Because of the learning nature of this experience, it would be unfair to clients to accept problems that have absolute deadlines. The students will work to meet a number of deadlines established by the instructor and client; however, if your proposal has an absolute internal deadline, especially one that arrives before the end of the spring semester, we will not be able to use it.

We will be addressing intellectual property issues in the course and the students will be made aware of the importance of proprietary information. The students may sign non-disclosure agreements relative to a proposed problem; however, the faculty and others they consult may not be covered by such agreements. We will make every effort to maintain confidentiality, but if there are data or resources crucial to successful completion of the design that would not be available to the students without a legal agreement, please do not submit the proposal.

5. Intellectual Property

The issue of intellectual property (IP) has been a thorny one and the university does not provide clear guidance for IP developed by students as part of a class. Furthermore, while we have access to support for faculty and staff developed IP; there are no corresponding resources for students. In order to provide some guidance to both clients and students we’ve settled on the following scenarios as models for IP rights:

1. The IP is developed for a project sponsored by an organization that does not wish to retain the rights; therefore, the students will retain ownership of any IP. This generally covers our not-for-profit and publicly funded clients.
2. The IP is developed on a project where the sponsor provided funding to support the work and can be considered “works for hire”. In this case, the sponsor would retain the rights to any IP and that would be made clear to the students before selecting their project preferences. Note that this is not our normal model in BAEN since we do not charge clients for participation in the capstone classes, but we can make an exception in order to clarify any IP concerns.
3. The IP is developed through a joint effort between the project team and the client but no fees have been charged to the client. In this case the ownership of

the IP is unclear and we will need to negotiate an agreement prior to accepting the problem.

4. The IP is developed independent from the project and the rights remain with the students.

If there are specific concerns, please contact us so that we can find a mutually acceptable solution.

Submission of a Proposal

Submit a brief description of the proposed project on the attached form to Dr. Lacey (ron-lacey@tam.u.edu) and Dr. Mohtar (mohtar@tam.u.edu) by October 16, 2015. Email submissions are preferred but faxed or mailed proposals will be accepted. Project teams will be formed before the Thanksgiving break. They will use the balance of the semester to organize and will be dedicated solely to their projects in the spring semester.

Proposed Senior Project

2015-2016 Academic Year

DUE October 16, 2015

Replace the italicized comments with your information and return to ron-lacey@tamu.edu and mohtar@tamu.edu.

1. Contact Information

Contact Name:
Company Name:
Contact Address:
Contact Phone Numbers:
Contact Email:

2. Problem Description:

This should be a brief narrative describing the problem, the rationale behind the need for a solution (e.g. competitiveness, safety, regulatory compliance, etc.), the final requirements of the solution, the environment in which the solution must operate, solutions that have been attempted, and any other general information that would be useful to the students in establishing their problem definition and scope of work.

3. Known constraints on the problem.

This would include factors such as total cost, size, regulatory limitations, available power sources, scheduling conflicts, etc.

4. Desired deliverables

Briefly, what would you like to see as a result of this exercise (e.g. design drawings, project schedule, design prototype, safety program, etc.)

5. Estimate of time required

The seniors will have a total of 75 scheduled class hours plus an additional 225 hours expected for outside of class work. There will be other assignments and activities, particularly during the first semester, but there should be at least 200 hours spent on this design problem per student over the two semester sequence. Keep in mind that these are students, not experienced engineers, so there will be some loss of efficiency. We're estimating that a problem that would take approximately 400 to 600 person-hours would be about the right scope for a design team of four students.

6. Type of problem

Please indicate if your problem is more appropriate for engineering or management students or has aspects appropriate for both.