Implementation Plan Report
Biosystems and Agricultural Engineering
University of Kentucky
Update 2014 – 2015

1. Devise a plan to support machine systems automation engineering in the long run.

Assessment method: The number of machine systems technical elective courses available to our machinery students, and the number of machinery students in those courses.

Results:

Academic Year	BAE 417	BAE 515 Fluid Power	BAE 599 Component Design	BAE 599 Control of Off-Road Vehicles	Total (by year)
12-13 F	4	-	-	-	4
12-13 S	-	-	-	-	
13-14 F	20	-	-	-	31
13-14 S	-	4	7	-	
14-15 F	32	7	-	-	54
14-15 S	-		-	15	
15-16 F	29	10	-		Incomplete year (39 to date)

Analysis of results and reflection: The number of students in our machinery classes has grown exponentially since hiring our two new machinery professors.

Ongoing improvement actions: We will continue to support this area with teaching resources.

2. Determine future department direction based on current areas with strong faculty support and identify areas that need more support.

Assessment method: The development of a departmental hiring plan.

Results: Faculty meetings were held in August 2012 to agree on a faculty hiring order. Course offerings were discussed in December 2012 to meet the course schedule deadline. The course at issue is our senior design course BAE 427: Structures and Environment Engineering. This required course (our students are required to take 3 of 4 classes on a list) had not been taught for three years because we did not have sufficient faculty support to teach it. The larger question was whether or not our department wanted to continue to support the controlled environment sub-specialization. Our discussion at the faculty retreat (see below) confirmed that we want to keep offering this course.

In addition we held a faculty retreat again in the summer 2015 where we discussed future departmental direction. BAE may have up to 5 retirements in the next 5 year, and replacing these faculty members provides an opportunity to redirect our department if desired. As a faculty, we agreed to recruit a new assistant professor to teach BAE 427; this position is currently posted and will close November 1, 2015. We expect to have the individual on campus by summer 2016. In the meantime, the course is being taught by one of Dr. Colliver's PhD students who works in industry in the Controlled Environment area, and the students are very complimentary of his knowledge and teaching ability.

Analysis of results and reflection: The discussion we've begun having within the department is a healthy one, and one that is necessary. We likely will have many more discussions before coming to consensus, but we have solved our immediate concern regarding offering the BAE 427 course.

Ongoing improvement actions: We are developing a long-term hiring plan to focus on fewer areas, but with more depth in each area. This discussion began at the retreat (summer 2014) and continued throughout the year at faculty meetings, and at the summer retreat in 2015. We have a list of positions which we now need to prioritize.

3. Publications or building plans that still have some value should be considered for revision if faculty members, with expertise in the area, are still an active part of the department. Original authors should be a consideration for making a revision, if available. Web links should be reviewed so that the number of broken links to internal publications and plans are resolved.

Assessment method: The revision outdated publications and updating the department's website.

Results: In February, 2013, we hired an Extension Associate Senior, Karin Pekarchik, to coordinate this effort. An extensive overhaul of the website, including Extension pages, was undertaken during 2013 and into 2014. Broken links were corrected, and page navigation was redesigned to allow for easier access by users. Once the basic mechanisms of the website were corrected, an archival project of outdated plans and publications was initiated. Outdated materials — plans and publications over five years old — were moved to an archive page on the website. In addition to moving the older publications and plans to the archive, a warranty disclaimer was added to each individual plan or publication. The warranty disclaimer is found both on the webpage and then on the first page of the PDF, in instances where there is an attachment that can be downloaded. The archive can be found at http://www.bae.uky.edu/ext/Plans/default.shtm.

Analysis of results and reflection: BAE has wrestled with this issue of maintaining older publications and building plans for several years due to differing opinions among the faculty members regarding the usefulness of older extension publications. In the end, the Extension faculty felt that these publications served a purpose, and that with an appropriate warranty disclaimer, the older material would continue to benefit the public. Much care was taken in crafting the warranty disclaimer to ensure that the public would understand that these archived items are conceptual plans only. Every effort has been made to ensure that the warranty disclaimer is prominent and, even if the plan or publication is downloaded, that it remains with the publication/plan as the first page of the document.

Ongoing improvement actions: The entire website will continue to be regularly reviewed, with an eye toward usability, accessibility, and elimination of broken links. Plans and publications will continue to be moved into the archive when they reach five or more years since publication date in instances when it is not appropriate to update them or the author has chosen not to do so. When they are moved to the archive, the warranty disclaimer is added.

4. Lab facilities are an asset to the department, and a mechanism should be adopted for better coordination of labs and equipment.

Assessment method: Monitoring faculty member's ability to conduct their projects in the space assigned to them.

Results: We improved the coordination of laboratory equipment use by creating a lab manger position. The lab manger oversees these issues and consequently labs are being better utilized. We have designated some of our underutilized labs to be shared-use facilities so that projects which need more space intermittently will have room to expand temporarily. We also use the shared-use lab for teaching because with our increased enrollment we need additional space for student laboratories.

Analysis of results and reflection: The situation has improved; however, we continue to work on freeing up space for new activities. Being an engineering department, our faculty members build equipment, and storing these innovations is proving challenging.

Ongoing improvement actions: Our facilities supervisor works with the other managers in BAE to identify and discard items that are no longer in use. We have instituted a yearly "dumpster day" to encourage the entire department to clean their labs. This has worked well. Our facilities manager has also been diligent about moving old projects to storage, and designating items not used in over 5 years as surplus.

5. Growth areas in general should be evaluated to determine the level of support and specialty courses needed to accommodate students.
   Assessment method: The development of a departmental enrollment plan.
   Results: During the summer of 2013, we determined, as a department, what our ideal enrollment growth would be. This was followed (in summer and fall of 2013) by the development of a recruitment plan to encourage students to major in under-populated specializations.
   Analysis of results and reflection: We continue to have lower enrollment in our Controlled Environment and our Food Engineering area; however, we are seeing signs of increased interest in both of these areas. This is the second year we have seen freshman interested in Controlled Environment and Food Engineering, so we believe we are on the right track.
   Ongoing improvement actions: We will continue with our recruitment plan and monitor the results.

6. The department should help students to develop ways to market themselves by using more recognizable terms for résumés and other forms of communication with prospective employers.
   Assessment method: Development of a clear, consistent marketing plan for the department.
   Results: In the summer of 2013, we devised a simple, clear, consistent message regarding our department and we display this message on the web page and educate our students to promote themselves in this manner. Both BAE 102 and BAE 400 have incorporated “BAE elevator speeches” into their courses, so we are beginning earlier to encourage the students to develop their marketing message and then reinforcing this again in their senior year.
   Analysis of results and reflection: BAE is a fairly unique major, especially within Engineering because there is only one program per state as they are associated only with the Land Grant universities. Another challenge is that BAE keeps reinventing the profession to attract more students, which is working, but our marketing message keeps changing. Considerable effort has been made to promote the department in a consistent way in as many arenas as possible. Our goal is to educate our students to market themselves clearly and accurately.
   Ongoing improvement actions: Continue to work with the students. Continue to improve our marketing description on our web page, and use that description consistently in all our recruitment materials.

7. Extension specialists need to explore current options for program delivery that could reduce unnecessary travel and would accommodate teaching schedules.

Assessment method: Determine the need for specific programming and create distance learning opportunities tailored for Extension specialists.
Results: On February 11, 2013, we hired an Extension Associate Senior, Karin Pekarchik, to assist with distance learning and web delivery pedagogy and technology. Last year, SP 2015, BAE debuted a series of "train-the-trainer" webinars, designed to transfer engineering information to Extension agents. Beverly Miller presented "Control Overhead through Building Energy Management"; Richard Warner presented "Home Drip Irrigation Systems," and Matt Dixon presented "Agricultural Features of the Ag Weather Center's New Website." Unfortunately these were not successful, as very few people attended the workshops.
Analysis of results and reflection: The departmental objective is to use departmental resources as efficiently as possible, including program delivery. To this end, the department wants to provide support to faculty members who want to deliver programs from a distance. We need to actively poll our clientele to determine what workshops they would like to see and would actually attend.
Ongoing improvement actions: Continue to think of creative ways to reach our extension clientele. In the summer 2015 retreat, we developed an extension marketing plan which we are implementing to improve our ability to reach our extension clientele.

8. The department needs to strongly encourage publication as a visible way of documenting activity. The department should send a consistent message to graduate students regarding publication of their work and explore a publishing incentive program like that used by the UK Entomology Department, as long as funding sources are available.
Assessment method: Assessment is based upon the number of journal articles per FTE in research.
Results: During spring 2013 evaluations, the department determined each faculty member's publication goals for 2013-2014-2015 and has held people accountable for the goals they set. The departmental goal is for every active scientist (faculty/staff/student) to contribute at least 2 papers per year to the department (one per year for newer graduate students). The UK Department of Biosystems and Agricultural Engineering has seventeen faculty members and twenty-eight graduate students (twenty-two masters, six PH.D.s) in the BAE program in spring 2015, according to enrollment statistics from the UK College of Engineering. According to reported figures for the 127th KAES Annual Report for calendar year 2014, the department met this goal.
Analysis of results and reflection: We met our goal of 2 papers per scientist for the latest reporting period.

Ongoing improvement actions: Continue to monitor progress in publications, possibly tracking on a graph so scientists have a visual encouragement to continue to publish. Ideally, publishing is an on-going part of the departmental culture. We have started recording them and announcing publications at each faculty meeting as an encouragement to keep publishing. BAE will also continue to reward graduate students with money for publishing, as an ongoing incentive.

9. Movement of equipment needs to be monitored to reduce inventory burden. All faculty and staff are encouraged to keep inventory requirements in mind to reduce current problems locating equipment and computers.
Assessment method: Develop an inventory system to identify the location and value of all BAE equipment.
Results: The November 2012 inventory went much more smoothly than did the November 2011 inventory, thanks to the database developed and populated by Alex Fogle, with Julie Tolliver's assistance. In August 2013, the faculty and staff were educated about inventory protocol, and we now do this yearly for new employees through an informal training session. We now have an accurate database of our capital and departmental equipment (valued from $500 - $2000), complete with a photograph and location for each item purchased since 2013 and every item over $2k purchased any year. Processes are in place to keep the database continuously updated.
Analysis of results and reflection: Our departmental database is current, and includes a location and photograph for each item. We are still working with PPD to correct our inventory list. This takes persistence because we have sent in the required paperwork several times for the same items and they have not yet been removed from our inventory.
Ongoing improvement actions: We upgraded to a bar code scanner to perform inventory. This works for 2/3 of our tagged items, however the old tags do not scan. Alex Fogle has found software that will let him scan both types of tags with his iPad to enable us to scan our entire inventory. We will continue to recorded tagged items and enter them into the database.

10. Labs should be maintained in a presentable manner (while maintaining consideration for the need to be productive), so that they serve as a safe environment and are not a detriment to student recruitment.
Assessment method: Identify processes and educate scientists about correct procedures for maintenance of laboratory space.
Results: Our goal is to have productive, safe, and orderly laboratories. Alex Fogle initiated a major clean-up of the labs in August 2012 with the intention of eliminating items that have not been used in the last 5 years. Labs are reviewed

twice per year for accumulated clutter, and these areas are cleaned up as appropriate. We will save analytical samples until the data are published or for 5 years, whichever comes first. Apparatii that have not been used for the past year or so will go to long-term storage, and be disposed of, if not used within 5 years. We have instituted yearly “dumpster days” to encourage lab clean-up.

Analysis of results and reflection: We are consistently making progress towards changing the lab culture and people are beginning to think of needed storage time and space when planning experiments. This is a change of culture for the department and will require consistent vigilance to reinforce our new culture.

Ongoing improvement actions: Alex Fogle, BAE’s facilities manager, reports to the manager’s group on storage space, especially when it becomes limited and is in need of being cleared out. He has identified outdated equipment that will be sent to the UK auction in the spring. We have made “Dumpster Day” an annual event, so people are getting in the habit of a yearly lab clean-up.