

Programs in Manufacturing and Emerging Technologies Roundtable Discussions

1. Are you already including these emerging technologies at your college/university?
 - Mechatronics, two courses articulate to upper level
 - UC Santa Barbara – nano lab, wanting to develop relationships with 2 year schools, similar to the Penn State model
 - Penn State’s program is working well; opened to all CC colleges in PA. Any type of technology student can use program.
 - College of Du Page – Argon National Lab is developing a nanotechnology center could be used by the college. Du Page also has a Mechatronics program. Program outlines seem similar although classes may differ slightly.
 - Most students have jobs and families. How can they transfer to another college/area for a semester capstone course? Colleges could use local industry facilities instead. May not have local industry with these kinds of facilities. Marilyn has met students who make this work – temporarily travel away from family and job to attend the capstone course. Free housing is a big incentive.
 - Having a specialized degree may not be preferred; instead acquire a more general degree.
 - We’re looking at implementing Mechatronics and developing a curriculum.
 - You need to have industry support to justify such a program.
 - Sometimes you have to present your justification of why you are creating such a program. Without industry support, this is very difficult.
 - We are trying to add these types of courses as electives in the Engineering Technology programs. We’re adding them to an existing program. It would be too expensive to create new programs from scratch.

2. How can the presentations on emerging technologies impact your college/university?
3. What can be easily implemented or adapted?
4. What difference will this make?
 - Sinclair has programs in many areas, but different departments. No common place for multifunctional technician. Perhaps we could implement a multidisciplinary program.
 - Middlesex implemented Mechatronics – not easy to pull individual courses together.
 - Marketing purposes – adding “manufacturing” to the title can give “bad” impression. Leave out those words in titles!
 - Use interesting titles, familiar words.
 - Problem with developing engineering math – territorial feeling among departments.
 - Florida gets around this by creating combined course: lab component
 - Partnerships with colleagues necessary. Put courses under multiple disciplines. Name the course with different number to reach students in other disciplines. Same class, same time. Credit earned even though the course has multiple course numbers.
 - We’ve changed the title of our program to Integrative Engineering Technology to simply attract attention to potential students. So far, it’s working! It’s a buzz word to interest students. Good for recruitment, but it doesn’t last (retention).
 - At the associate level, it’s best to present “basics” level.

- Obviously, all these emerging programs need to be industry-driven. We don't want to create a program called Nanotechnology because it is so narrow. We need to stay broad to develop many different skills and attract students.
- Most of these specific programs are being developed in Europe. This isn't being done too much in America, as far as I know.
- FLATE is creating a core that can be used in high schools to prepare students early.

5. Do you know of other emerging technologies being implemented at colleges/universities?

- Sinclair CC: renaming Industrial and Quality programs to be Operations Technology with options in IET. Reworking curriculum. Tom conducts training at high schools, contests, additional outreach to market the new name.
- Getting requests to teach Lean Manufacturing in the programs.
- St. Pied College has a great quality program.
- Northeast Biomanufacturing Collaborative and Center – is developing curriculum of biomanufacturing technician training, comprehensive website.
- Build relationship with parents, not the counselors.
- “Manufacturing” is the umbrella; stick with specific disciplines as mechanical, electrical, etc. But students should not be pigeon-holed with a specific title.
- We're creating an Energy Services program – science, chemistry, and engineering. Focusing on returning students (average age of 28). We've noticed that enrollment in Engineering Technologies is going down.
- In Santa Fe, NM, we're developing manufacturing and engineering technology programs. We're trying to create an Environmental Engineering Technology Institute. 4% growth rate. The difficult questions are: Do we create our programs to encourage industry to come in? Or do we wait for industry to demand the programs?
- A goal of our grant is to create a model of modules that could be used to high school students to Nanotechnology. Nanotechnology is also available as a science elective in high schools in Oklahoma. The sooner we expose students to these types of technologies, the better.
- We're active in the biotechnology area. Biotechnology manufacturing. These new technologies aren't very “meaty,” meaning subjects don't have a lot in them because they are so new.
- We have a biotechnology. We have another group of courses called “Games and Simulations.” Enrollment is very good in these courses. Maybe we should team with game designers to support the need for engineering education.

6. What additional resource would you need to implement these emerging fields?

- Industry partners; lobby for manufacturing education in K-12 schools.
- Time is a hurdle.
- Linda is a director, full time of recruitment and marketing.
- New focus in Florida to hire enrollment specialist – full time for recruiting.
- Schools that are not-for-profit have less recruitment, so they don't emphasize this as they should. Universities have the philosophy of “if you build it, they will come,” when in actuality this is not the case. Recruiting is necessary!
- We need more resources for recruitment.

7. How can the ATE Resource Centers assist you?

- Half of group has registered to a resource center (had experience with).
- Have curriculum models to follow and know how to find them. See other programs and course descriptions, equipment needed, etc.
- Develop module to do online with labs, activities ready.
- NETEC has discussion forum to request materials.
- Prepared course materials would be helpful.
- More indepth curriculum of emerging technologies.
- Summary of emerging technologies to make a presentation to administration.
- Pod cast okay, but need something interactive.
- Tutorials are good for introductory training, class time is more indepth.

8. Do you know of additional resources?

- Each resource center has web links to find more information of emerging technologies.