

**Comprehensive Program Review
Process Technology (PTEC)
Fall 2012**

Advisory Board Update

We have an active advisory board that contains members from the petrochemical industry, employment agencies, local High Schools and alumni. Our advisory board meets at least once a year. Part of our agenda includes updates on curriculum and classes. Our advisors offer input on skill needs and future industry trends.

The PTEC program is very involved with its industrial partners and receives a good deal of support from them. This support includes: company grants, classroom visits, equipment donation, student mentoring, field trips, internship opportunities, and, most importantly, they are hiring our graduates. Following is a list of Advisory Board members:

Allen Aichikawa	Dow Chemical
George Russo	Dow Chemical
Kevin Murray	Dow Chemical/PTEC Instructor
Jim Martin	Dow Chemical/PTEC Instructor
Kim Myers	Dow Chemical/PTEC Alumnus
Robert Muller	Shell Oil Martinez Refinery
Dave Manly	Shell Oil Martinez Refinery
Fred Ferrante	Shell Oil/PTEC Instructor
Nick Plurkowski	Shell Oil/PTEC Alumnus
Joe McCormack	Tesoro – Golden Eagle Refinery
Diana Gonzalez	Tesoro – Golden Eagle Refinery
Jim Ambrose	Chevron
Pat Martucci	USS-POSCO/PTEC Instructor
Derek Burton	Praxair
Jeff Pace	BlackGold Biofuels
Chris German	Calpine
Julie Vitorelo	The Wine Group
Sam Dunnigan	The Wine Group
Melissa Medrano	Kelly Scientific
Melissa Newton	K2 Pure/PTEC Alumnus
Joseph Alvarez	Black Diamond High School

Success/Retention Analysis

According to the data provided by the District, in the reports entitled “LMC Instructional Program Review” and “Program Performance Profile”, PTEC is a successful program. Our skill attainment, completions, persistence/transfer, and non-traditional completion indicators are all above State levels.

The one indicator below the State level was employment rate (-17.41%). The drop in this indicator, we believe, was caused by the Bay Area’s economy. In the Fall 2009 to Spring 2012 period, the Bay Area suffered a large economic downturn that decreased the value of institutional retirement funds and forced workers in the chemical and petrochemical industries to postpone their retirement. This in turn reduced the number of available jobs and the employment rate for our graduates. The good news here is that the economy is slowly recovering and we are beginning to see an increase in new hiring. We therefore expect to see, in future reports, a significant improvement in this indicator.

The overall completion rate for the PTEC program is 92%. In comparison, completion rate for African-American students, Pacific Islanders and Hispanic students are: 84%, 87% and 90% correspondently. Although these are respectable rates, in the absolute sense, the numbers are still below the overall rate and represent an achievement gap. We will like to eliminate the gap and are working with faculty, students, industry partners and others to find strategies to pursue. Thus far, we are finding that a mentorship program, where we ask minority industry partner to mentor minority students and to share their industry experiences, works well. Also, we are encouraging minority students to support each other, work in groups and to share their success after they leave the program. Another strategy that is working well is requiring all students in the program to take PTEC-07 at the start of the program. This is a class designed to give students the soft skill tools necessary to be successful as students and as employees in the petrochemical field.

The number of our non-traditional, women, students is still small (about 20%) compared to the population at large (greater than 50%) but it is high for the industry. The program has a hard time recruiting women but once they are in the program they stay in it and excel. Women graduates are sought after by companies and are usually the first to get hired. They perform very well in the field. We will continue to spread the good news about our women graduates in the hope of attracting more to the program.

Curriculum Update

The course outlines of record for the PTEC program are all up to date. PTEC is working with the TAA grant team to develop contextualized English, Math, Physics and Chemistry courses that will relate to the PTEC curriculum and subject matter.

Course Offering Analysis

The PTEC program offers a Certificate of Achievement and an Associate of Applied Science Degree in Process Technology. Classes are scheduled in the day and evening at times that give students maximum flexibility.

Starting in the Fall of 2013, classes will be offered on a rotating four semester sequence. This change, from all courses being available every semester to some courses being offered once a year, is necessary to improve the program's instructional productivity (FTES/FTEF). The number of students (FTES) enrolling in the program has decreased by 25% in the past year while the faculty (FTES) has only decreased by 11%. The change in FTES may have been caused by a decrease in outreach activity and/or by absence of dedicated outreach/recruiting staff. Most of our current students heard about the program from partner companies or from program alumni. We placed ads on the internet and held information sessions but they seemed to have had little effect on enrollment. Getting the word out about the program and increasing enrollment to historical levels is one of our long term objectives.

Instructional Methodologies

The PTEC program is mainly taught as a series of face to face lectures and hands-on laboratory experiences. The lectures are enhanced with the use of technologies that include the internet, SMART classrooms and classroom response systems (clickers). These devices allow the instructors to bring the industrial environment to the classroom via videos, equipment animations and simulators. Student assessment is done with the help of the *BlackBoard* learning management system, clickers and embedded testing in the simulators. Classroom learning is supplemented with tours of industrial sites and company sponsored internships.

Assessment Summary

The PTEC program is in the process of assessing all of its courses and is on track to complete the assessment by the end of the current (Spring 2013) semester. The PSLOs for the PTEC program have all been completed.

Certificate and Degree Requirements

The PTEC program currently offers a 35 unit certificate and an Associate of Applied Science degree. In the past couple of years we added two, one unit courses, PTEC-7 and PTEC-60. These courses were added to strengthen our student's non-technical career skills, such as dealing with shift work and interviewing. Other certificate and degree requirements include the STEM subjects of physics (PHYS-7), chemistry (CHEM-6) and mathematics (MATH-30). In the coming year we are considering adding English 90 and a basic computer skills course. We will look to our advisory board to guide us on the current need for these skills in industry.

Staffing Structure

The PTEC program has 1 full time faculty member and a pool of 8 part-time instructors that teach as needed. The Industrial technology department (ETEC and PTEC) share the time of 1 Instructional Aide. The Instructional Aide is a permanent classified position at 32 hours per week. The PTEC staff is highly experienced, all have more than 15 years industry experience, and all have been with the program for at least three years. This has led to a stable staff that consistently delivers high quality instruction and content in the courses they teach.

Budget Analysis

The PTEC program 3 year budget data is summarized as follows:

<u>2009-2010</u>	<u>Starting</u>	<u>Ending</u>	<u>Spent</u>
Supplies	\$11,000.00	\$6,166.64	\$4,833.36
Travel/Conference	\$2,200.00	\$2,077.78	\$122.22
Inter-Program	\$750.00	\$730.64	19.36
<u>2010-2011</u>	<u>Starting</u>	<u>Ending</u>	<u>Spent</u>
Supplies	\$11,000.00	\$10,204.19	\$795.81
Travel	2,2000.00	\$2,200.00	0.00
Inter-Program	\$750.00	\$750.00	\$0.00
<u>2011-2012</u>	<u>Starting</u>	<u>Ending</u>	<u>Spent</u>
Supplies	\$9695.00	\$7,656.55	\$2,038.45
Travel	\$2,200.00	\$2,200.00	\$0.00
Inter-Program	\$750.00	\$694.00	\$ 56.00
Class Non-Instructional	\$246.00	-\$123.15	\$369.45

The PTEC program is committed to providing students with skills required for running chemical and petrochemical plants. Acquisition of many of these skills requires the student to spend time running equipment, working on computer based simulators and studying equipment models. We provide students with the opportunity to practice these skills in our indoor, outdoor and simulation labs. Frequent use of lab equipment eventually leads to equipment breakdown and the need of funds to pay for repair and purchase of replacement parts. Additional funds are needed to purchase consumable supplies such as office supplies, lab chemicals, batteries and shop tools. Funds are also needed to upgrade and maintain our simulation software.

The budget data reported above does not show these expenses. In the years between 2009 and 2012 the program was being funded by a Department of Labor (DOL) grant. Most of the expenses incurred by the program in the last three years were charge to the grant and not to the department budget. Hence, numbers show that very few of the allocated funds were spent. The DOL grant ended in fiscal year 2011 and we are now running the program with department funds. The 2013 budget will give a more accurate picture of the program needs.

Facilities

Instructional facilities for the PTEC program include: a simulations lab (CC3-319), an indoor lab (CC3-320) and an outdoor lab (Polaris Unit). In addition, the program uses classrooms throughout the college and has office space for faculty and staff.

Equipment and Technology

The PTEC simulations lab has 30 computers that run state-of-the-art simulation software. We license three multi-unit simulators (Simulation Solutions, Envision and Simtronics). These simulators mimic in interface and response the control rooms of the major petrochemical and chemical companies in the world and are an excellent way for our students to prepare for their future jobs. In the next year or two, the simulator software will be housed on the "Cloud" and will be accessible to students on their home computer and mobile devices. This change will release students from their desk and the limited time the simulators are available in the classroom. We will have to upgrade our licenses for online access in order to take advantage of this instructional opportunity.

The indoor lab houses our distillation columns, boiler, reactor, unit trainers and cut-out equipment. In the outdoor lab we have the Hands-On-Trainer. All this equipment is designed to give students experience running an actual processing unit. Hands-on

experience is very important to the success of our students as their ability to run and troubleshoot equipment is an expectation employers have of our graduates.

Professional Development

Process Technology faculty, full time and part-time, have participated in a range of professional development activities from FLEX training to industry sponsored conferences. Faculty has attended the CCCAOE, the Consortium for the Advancement of Process Technology (CAPT) and the North American Process Technology Alliance (NAPTA) conferences. The program director has attended the NAPTA Instructor Skills conference, interned at Applied Materials as an IISME fellow, attended the Summer Engineering Teaching Institute and regularly attends the Exploratorium's science teachers conferences. In addition, many of the PTEC part-time instructors still work in industry and are required and funded by their companies to attend training and conferences that keep them current in their field of expertise.

Collaboration

The PTEC program is collaborating with the following departments:

- Math, Chemistry and Physics Departments - designing classes with material from the PTEC curriculum; schedule coordination.
- Fire Academy – training in firefighting techniques and safe handling of petrochemicals.
- Auto and Appliance programs – sharing methods for teaching troubleshooting techniques.
- ETEC – designing lab exercises that mimic industry interactions between maintenance and operation technicians; plan and conduct job fair and industry open house.
- Drama – conducting seminars on body language to improve job interview performance.
- Counseling Department – looking for ways to improve program completion.
- Library – Increasing reference materials related to PTEC; making textbooks available for students at start of semester.
- Computer Science – maintaining and upgrading simulation lab.
- Career Services – training in resume writing; job posting; job fairs.
- STEM grant team – course scheduling.
- ACE – team building.

Annual Review Update Analysis

In the past four years we have concentrated our efforts on building program capability. That is, the creation of curriculum, purchasing and installing equipment, building partnerships and student enrollment. Although these efforts will be ongoing, the bulk of our efforts in the future will be in retention, program completion and educational excellence. Our past objectives in curriculum, acquisition of equipment and instructional goals have been met. We have trained plant operators that are building a great reputation for the program and our industrial partners are coming to us with their staffing needs.

Strategic Priorities

The major objective of the PTEC program, since its inception, has been to train a local workforce for jobs in the petrochemical and chemical industries. Continuing with this objective in mind, we will seek to increase our local recruitment efforts. We will specially seek to increase the gender and ethnic diversity of the program by recruiting women, African-Americans and Hispanics. Along with this recruitment effort we seek to retain and graduate all of our students. This will be accomplished with a blend of experienced instructors, industry involvement and the latest in instructional technology. We will strive to increase hands-on activities and increase the number of internship available to the students. These last two activities address the request from industry to move the curriculum to more hands-on experiences.

Long Term Goals

Surveys made by Industry at the time the PTEC program was created showed there will be a need for at least 100 PTEC graduates per year for the next 10 years. Since the LMC PTEC program is the only school in Northern California that teaches this curriculum there will be a need for many more graduates. To prepare for this need the following objectives need to be met.

1. Grow program enrollment to an average of 350 students per semester.
2. Increase efforts to recruit and train more non-traditional students, especially women, African-Americans and Hispanics.
3. Update laboratory equipment and simulation software to reflect industry trends in training.
4. Develop contextualized Math, English, Chemistry and Physics courses.
5. Increase the number of industries that support the LMC PTEC program.